

A+ Technician's On-the-Job Guide to Windows XP
 by Curt Simmons ISBN:0072226900
 McGraw-Hill/Osborne © 2003 (553 pages)

Designed for the IT professional with 1-3 years of experience who needs to put their experience to work quickly and effectively in an XP environment, this practical guide offers readers skill-building as well as troubleshooting information on Windows XP.

Table of Contents

[A+ Technician's On-the-Job Guide to Windows XP](#) [Acknowledgments](#)

[Introduction](#)

- [Chapter 1](#) - Installing Windows XP Professional
- [Chapter 2](#) - Operating System Fundamentals
- [Chapter 3](#) - Managing Folders and Files
- [Chapter 4](#) - Managing Windows XP Hardware
- [Chapter 5](#) - Managing Applications
- [Chapter 6](#) - Managing User Accounts and Permissions
- [Chapter 7](#) - Managing Disks
- [Chapter 8](#) - Managing Printing
- [Chapter 9](#) - Networking with Windows XP
- [Chapter 10](#) - Preventative Maintenance
- [Chapter 11](#) - Remote Desktop and Remote Assistance
- [Chapter 12](#) - Managing Internet Connections
- [Chapter 13](#) - ICS, ICF, and Network Bridging
- [Chapter 14](#) - Configuring Internet Explorer
- [Chapter 15](#) - Working with Digital Media
- [Chapter 16](#) - Gathering Information and Solving Problems
- [Appendix A](#) - Top 25 Windows XP Professional Problems and Solutions

[Index](#)

[List of Figures](#)

[List of Tables](#)

[List of Painful Lessons I've Learned](#)

[List of Tech Talk](#)

[List of Troubleshooting](#)



Back Cover

If you're interested in **About the Author**

Curt Simmons, A+, MCSA, MCSE, CTT, is a technology trainer and author of more than 20 computer books, including *How to Do Everything with Windows XP* from McGraw-Hill/Osborne.



A+ Technician's On-the-Job Guide to Windows XP

Curt Simmons

McGraw-Hill/Osborne

New York • Chicago • San Francisco
Lisbon • London • Madrid • Mexico City
Milan • New Delhi • San Juan
Seoul • Singapore • Sydney • Toronto

The McGraw-Hill Company

McGraw Hill/Osborne
2600 Tenth Street
Berkeley, California 94710
U.S.A.

To arrange bulk purchase discounts for sales promotions, premiums, or fund-raisers, please contact **McGraw-Hill/Osborne** at the above address. For information on translations or book distributors outside the U.S.A., please see the International Contact Information page immediately following the index of this book.

A+ Technician's On-the-Job Guide to Windows® XP

Copyright © 2003 by The McGraw-Hill Companies. All rights reserved. Printed in the United States of America. Except as permitted under the Copyright Act of 1976, no part of this publication may be reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written permission of publisher, with the exception that the program listings may be entered, stored, and executed in a computer system, but they may not be reproduced for publication.

1234567890 DOC DOC 019876543

ISBN 0-07-222690-0

Publisher

Brandon A. Nordin

Vice President & Associate Publisher

Scott Rogers

Acquisitions Editor

Nancy Maragioglio

Project Editor

Jody McKenzie

Acquisitions Coordinator

Jessica Wilson

Technical Editor

Kim Frank

Copy Editors

Andy Saff

Lunaea Weatherstone

Proofreader

Claire Splan

Indexer

Jack Lewis

Computer Designers

Carie Abrew

Lucie Ericksen

Illustrators

Melinda Moore Lytle

Michael Mueller

Lyssa Wald

Series Design

Carie Abrew

Kelly Stanton-Scott

Cover Series Design

Jeff Weeks

This book was composed with Corel VENTURA™ Publisher.

Information has been obtained by **McGraw-Hill/Osborne** from sources believed to be reliable. However, because of the possibility of human or mechanical error by our sources, **McGraw-Hill/Osborne**, or others, **McGraw-Hill/Osborne** does not guarantee the accuracy, adequacy, or completeness of any information and is not responsible for any errors or omissions or the results obtained from the use of such information.

About the Author

Curt Simmons (A+, MCSA, MCSE, CTT) is a technology author and trainer based in Dallas, Texas. Curt is the author of more than 20 high-level and user-level computing books on a variety of topics. When Curt is not writing about new technology, he spends his time with his wife and children. You can visit Curt on the Internet at <http://www.curtsimmons.com> or send him an e-mail at curt_simmons@hotmail.com.

About the Technical Editor

Kim Frank (MCT, MCSE on W2K/NT4.0, MCSE+I, MCSA, MCP+I, A+) has more than 10 years experience in the global Internet technology (IT) arena. He is originally from Denmark, where he worked for a leading multinational professional services organization. Kim is now a technical trainer and cofounder of CTE Solutions, Inc., a prominent Microsoft Certified Technical Education Center (CTEC) in Ottawa, Canada, and teaches at various locations across the country. Among his specialties are .NET Server, Windows XP, and Windows 2000 Active Directory design, implementation, and migration. Kim can be reached at

kim@kimfrank.com.



Acknowledgments

I would like to thank several people who have made this book possible. First, thanks to Nancy Maragioglio for thinking of me for this project—it's been fun. Thanks to Kim Frank for a thorough technical review. Also thanks to Jody McKenzie and Jessica Wilson for keeping things moving in the right direction and bringing the book to completion. As always, thanks to my agent, Margot, for taking care of the details. And finally, thanks to my family for their support.



Introduction

Welcome to A+ Technician's on-the-job Guide to Windows XP

Windows XP is Microsoft's latest operating system, and one that has been well received by the public as well as Microsoft networking environments. It does more, works better, is easier to use, and is problem-free... right? As an A+ technician, or someone who is aspiring to be an A+ technician, you may be faced with the task of supporting Windows XP. Although Windows XP is overall a good operating system, it is a complex operating system that can present you, the problem solver, with complex problems. Why write a book about Windows XP for A+ technicians? To help you do your job!

A+ certification gives you a marketable certification in today's computer support work force. But beyond the standard exam objectives and questions (which now include a lot of Windows XP material), you'll need to support Windows XP as it makes its way into your network. You'll need to know what Windows XP can and can't do, how to configure it, and perhaps most important, how to solve a number of Windows XP problems. This is where this book becomes your help and your guide. I've written this book so that it explores the ins and outs of Windows XP and focuses on the issues you are most likely to face as an A+ technician. In fact, this book even covers all of the A+ exam objectives in light of Windows XP.

What if you are not yet an A+ technician, but you are striving to become one? This book also serves as a great study guide. Although this book is not an exam prep book, it looks at Windows XP in terms of A+ skills. If you have yet to pass your A+ exams, you should definitely study your A+ certification guides, but also study this book so that you'll have a sharper edge for any Windows XP questions that the exam might throw your way. Windows XP is a powerful, popular operating system that is here to stay, and honing your Windows XP skills can only be a help in your career.

A+ Technician's On-the-Job Guide to Windows XP is a new kind of book. It is designed to give you easy-to-use and easy-to-find information, most often in a step-by-step, task-oriented format. After all, performing tasks and solving problems is your job, so this book's format is designed to lead you through each step of those duties. You won't have to read paragraph after paragraph of dry, boring text to find information and answers; this book gives you succinct information about many different Windows XP topics as they relate to the A+ technician's job. In fact, the idea is that you can pull this book off your shelf, find the problem or issue you are experiencing, read about it, and fix it.

You don't have to read this book in any particular order. You can read it from cover to cover if you like, or you can jump around and find answers when you need them—the choice is yours. Just use the table of contents or the book's index to find help on all important Windows XP topics quickly and easily.

This book is for the A+ audience and for those striving to become A+ certified. It assumes that you know a thing or two about computers, but not that you are already a networking expert. If you have passed your A+ certification or if you are moving in that direction, then this book is for you.

To help you along the way, I've also included a few elements that you'll find helpful:

- **Note** Notes are little bursts of information that give you some additional information. You don't have to read these, but they can help you.
- **Secret** Secrets are friendly, timesaving tips I have thrown in from time to time that can make your work with XP easier.
- **Tech Talk** These sidebars provide practical insights into specific task options. These sidebars often contain additional steps, workarounds, and other tricks that you can use on the job to make your work with Windows XP easier.
- **Troubleshooting** These sidebars explore a specific problem and solution. You'll find these scattered throughout the book, and they deal with issues and problems that you are most likely to encounter. Make sure you pay attention to these!
- **Painful Lessons I've Learned** These sidebars point out some painful but important lessons I have learned while supporting Windows XP.

Are you ready? Then let's dive into the world of Windows XP and your job of supporting Microsoft's latest.

Thanks! Enjoy the book!

Curt Simmons
Saint Jo, Texas
Curt_Simmons@hotmail.com
www.curtsimmons.com



Chapter 1: Installing Windows XP Professional

Overview

Installing Windows XP Professional is much the same as installing previous versions of Windows—you run the setup program and follow the prompts, right? Truthfully, you can install Windows XP Professional rather easily and most often without complication. However, as an A+ technician supporting Windows XP, you need to be aware of a number of potential setup issues and setup options to manage Windows XP installations effectively. The good news is we'll cover those issues and setup options in this chapter so that you'll be able to tackle any Windows XP installation problems or situations that come your way. In this chapter, you'll...



Getting Ready for Installation

Windows XP Professional provides you with two different types of installation: attended and unattended. In an attended installation of Windows XP Professional, you “attend” to the computer as installation is taking place. In this situation, you can use a CD-ROM to install Windows XP, or you can install Windows XP over the network from a network share. In either case, you physically run the installation and answer installation prompts as they occur. You can also install Windows XP Professional in several “unattended” ways, which you can learn more about later in this chapter. In an unattended installation, you use an automated method to install Windows XP so that installation occurs automatically without user input.

As with previous versions of Windows, particularly Windows 2000 Professional, the key to a successful Windows XP Professional installation is to plan carefully beforehand. Through proper planning, you can avoid problems before they occur and you can make sure your computer and applications are ready to meet the demands of Windows XP Professional. If you are armed with the correct information, installation is typically anticlimactic because you solve potential problems before they occur. In the following sections, you’ll explore the important planning steps you should take before installing Windows XP Professional.

Minimum Hardware Requirements

Sure, you’ve heard this before, but the simple fact remains: Your computer must be able to handle the hardware demands of Windows XP; otherwise, your installation will either fail or result in a system that is so pitifully slow that it is of no practical value. Before installing Windows XP Professional, you need to check out the computer’s hardware and make sure it’s powerful enough to handle the demands of Windows XP. [Table 1-1](#) gives you the minimum as well as the recommended hardware requirements for Windows XP. As you might expect, the base, or minimum, hardware requirements are just that—what you need to install Windows XP Professional and to ensure that it will actually run. However, if you want good performance from the machine, you should meet the recommended hardware requirements, and preferably exceed them.

Table 1-1: Windows XP Professional Installation Requirements

Component	Minimum Requirement	Recommended Requirement
Processor	233 MHz Pentium	300 MHz or higher—the faster the processor, the better performance you are likely to see. Windows XP Professional also supports two processor systems.
RAM	64MB	128+MB recommended—4GB maximum
Hard disk space	2GB partition with at least 640MB free	4+GB
Monitor	VGA monitor	SVGA monitor
Mouse	Windows-compatible	Windows-compatible
CD-ROM	Windows-compatible CD or DVD-ROM drive	Windows-compatible CD or DVD-ROM drive
Network card	Compatible network card and cable if over-the-network installation is desired	Compatible network card and cable if over-the-network installation is desired

During setup, Windows XP Professional will check the computer’s hardware as well as software applications to determine whether there are incompatibilities. However, your best bet is to check these items first so you can avoid problems during installation. You should also take inventory of the computer’s hardware, such as the sound card, video card, modem, and related components, and check the Windows XP Hardware Compatibility List (HCL) found at www.microsoft.com/hcl. Hardware that is not explicitly listed on the HCL is not recognized as compatible; however, this does not mean that the hardware will not work—it just has not been tested by Microsoft. If you have some questionable hardware, you should check the hardware

manufacturer's web site for more information and possible driver updates or upgrade packs. You should acquire the new drivers or updates before starting the installation of Windows XP Professional.

Network Connections

If your Windows XP Professional computer will be a part of a network, then you will need to gather some information from an appropriate network administrator. If the computer is not connected to a network or is not connected to a Windows domain, you can simply choose the "workgroup" option during setup. You'll need to enter the name of your workgroup (or the name of a new workgroup if you are creating one with this installation).

Let's make sure your terminology is up to speed here. A *domain* is a logical grouping of users and computers on a Microsoft network. The domain is designed to be an administrative unit that is controlled by network administrators via Windows 2000/.NET servers. The domain is an effective way to partition a large network into manageable "chunks." The domain model has been around since the days of Windows NT, but it has been greatly simplified and made less restrictive since the days of Windows 2000. The domain model is recommended on networks with more than 10 computers (but is not required).

A *workgroup*, on the other hand, is a collection of local computers that function together in order to share data. There is no domain controller, or a computer in charge of the network, and each user typically manages his or her own computer on the network. The workgroup model does not have the overhead of a domain, but it can be more difficult to manage as it grows since it is not centrally controlled. If the computer will become a member of a domain, Windows XP Professional can join the domain during the installation of XP, but there is some information you might need to know during setup, which is described in the following bullet list:

- The name of your computer and the name of the domain.
- An appropriate IP address and subnet mask. In order for a computer to communicate on any TCP/IP network, the computer must be configured with an IP address and subnet mask that is appropriate for the particular subnet. In most Windows networks, a Dynamic Host Configuration Protocol (DHCP) Server handles this task automatically. The DHCP server automatically assigns IP addresses and subnet masks to client computers, ensuring that they have both an appropriate address and one that is unique on the network. If DHCP is not used on the network, then you'll need a unique IP address and subnet mask in order for network connectivity to work. See [Chapter 10](#) to learn more about networking.
- Domain controller and DNS server. During the installation, at least one domain controller and DNS server must be online on the network in order for you to join the domain. The computer must have a computer account in the Active Directory (configured by a domain administrator), or your user account must have the permission to create a computer account.
- Hardware. The computer must be outfitted with a network adapter card and it must be physically connected to the network. See [Chapter 5](#) to learn more about hardware.

Note As you are installing Windows XP Professional, keep in mind that you can always join a workgroup or domain once the installation is finished, if it is more convenient for you to do so at that time. Active Directory users have the default right to add up to 10 computer accounts to a domain, unless the network administrator has restricted the default right.

Hard Disk Configuration

If you are installing Windows XP Professional on a computer that has no existing operating system, and XP is the only operating system you want to use, there is nothing you need to do. The setup routine will format the drive for you and allow you to select a file system of your choice (FAT, FAT32, or NTFS). Windows XP is optimized for the NTFS file system, which provides file-level security and a number of additional security features that are not available under FAT or FAT32, such as:

- **Encryption** NTFS drives under Windows XP support encryption. You can seamlessly encrypt user data so that only you can view it, but you can use that data without having to decrypt and reencrypt every time you want to use it.
- **Compression** NTFS drives under Windows XP natively support compression. You can compress a drive or folder in order to save disk space, but you can continue to use the compressed drive normally.
- **Quotas** On NTFS volumes, you can configure how much space a user is allowed to access for data storage. This feature is particularly helpful on systems where a Windows XP Professional computer is functioning as a file server.

The most important difference, however, is file- and folder-level security, which is the backbone of a Windows network. Although FAT and FAT32 are useful in some respects, they do not contain advanced management features, and for this reason, Windows XP is optimized for NTFS.

If an operating system currently exists on your computer, Windows XP can either upgrade the existing operating system or install a clean copy of Windows XP, which installs Windows XP in a different folder. Alternatively, you can install Windows XP Professional in a separate partition for a dual-boot scenario. A dual-boot scenario enables you to boot more than one operating system on the same computer. For example, you could have a system that will boot Windows 2000 Server and Windows XP Professional, or you could have a system that will boot Windows Me or Windows XP Professional. Each operating system resides in its own partition, and during boot, you are given a boot menu that enables you to choose which operating system you want to boot. Across the board, dual-boot configurations are easy to configure, but it is important to keep in mind that only Windows XP, Windows 2000, and Windows NT 4.0 with service pack 4.0 and higher can read NTFS partitions. Windows 9x, Me, and 95 can read only FAT or FAT32 drives. So, if you want the down-level operating system to read the Windows XP partition, you'll need to use FAT or FAT32 as the file system instead of NTFS.

If your computer has more than one partition, or you are working with a new computer for which you want to have more than one partition, you can use Windows XP's Disk Administrator tool to create new partitions as needed. If you are working with a computer that has no current operating system, you can create partitions using FDISK or a third-party tool, such as Partition Magic, or you can create the partitions during Windows XP setup. If you are partitioning a disk for installation, make sure that the partition you will use for Windows XP meets the minimum storage requirements as described in the [previous section](#).

Though dual-boot scenarios and partitioning options are beyond the scope of this book, it is a good idea to get familiar with them, preferably by trying practice configurations on a test machine. You can learn more about dual booting by performing a search at **Microsoft.com** (try Knowledge Base articles Q153762 and Q306559) or any Internet search engine.

Service Packs

Microsoft occasionally releases service packs that contain system updates and fixes to problems. Services packs are available on CD-ROM or downloadable from **Microsoft.com** or the Windows Update web site. Also, check the Windows Update web site for any hotfixes, which are software fixes for Windows XP, that are available and install them as well. Once you install Windows XP Professional, you should also install any current service packs that may be available for the operating system.

Performing a Backup

The best action you can take before installing Windows XP Professional as an upgrade is to back up the previous operating system and all of your data. In the event that something goes wrong during installation, you can always recover from backup. If you are installing a clean copy of Windows XP Professional or installing XP on a new computer with no operating system, such a backup is unnecessary. In an upgrade scenario, however, it is very important to protect your data by backing it up. Depending on the operating system you are currently using, your backup options may vary—you can even use third-party backup tools, so

you'll need to check your current operating system for backup instructions.

Application Compatibility

Before installing Windows XP Professional, you should take a look at the applications that you want to use with the operating system. If you are moving from some earlier version of Windows, such as Windows 98, you may have applications that are not compatible with Windows XP. If you are moving from Windows 2000, you are not likely to experience any problems. The good news is that Windows XP Professional contains an application compatibility tool that will often enable you to run applications designed for previous versions of Windows. See [Chapter 5](#) to learn more about the Program Compatibility tool.

Finally, before you begin installation, you need to check a few last minute items:

- Uninstall any antivirus programs. Setup needs full access to your computer's hard drive, and antivirus programs may interfere.
- You cannot install Windows XP Professional on any drives that are compressed. Decompress affected drives before running the installation.
- Remove any disk management software, as these programs may interfere with installation.
- This is a good time to do housecleaning; remove any programs that you no longer use, that are incompatible with Windows XP, or that are outdated.



Upgrading to Windows XP Professional

In many cases, you will want to upgrade a previous operating system to Windows XP. This feature should enable you to maintain the existing settings and applications during the upgrade to Windows XP. As a general rule, upgrades are more troublesome than clean installations. Windows XP must deal with previous operating system files, possible incompatibilities, driver issues, and often hardware components that were not designed with Windows XP in mind. Because of this, you should study upgrades carefully before performing them. Careful consideration will help you ensure that the upgrade will be successful.

When you begin the installation of Windows XP, the setup routine detects any previous versions of Windows that may be present. Depending on the version, Windows XP can either upgrade the existing operating system or it can install a clean copy of Windows XP. The procedures are as follows:

- **Upgrade** Windows XP installs in the same folder as the previous operating system, upgrading files and drivers as needed. Your existing applications and settings are preserved.
- **Clean Install** Windows XP installs in a different folder. Once installation is complete, you must reinstall any applications that you want to use.

If you want to maintain existing settings and applications, choose the upgrade option. However, in some cases, a clean install may be desirable. For example, let's say you are upgrading Windows 98 to Windows XP. A first choice might be to perform an upgrade and keep your existing settings. However, suppose that you ran into some problems during the Windows 98 installation that you have been unable to resolve. A better choice might be the clean installation, so that you can be sure of avoiding installation problems with Windows XP. In either case, you'll have to decide which option best suits your needs and the particular computer you are installing.

Troubleshooting: Limitations of Upgrades

Notice that Windows 95 did not make the list, nor did any previous versions of Windows NT. If you want to upgrade these operating systems, your choices are a clean install (in which case, you lose all of your applications and settings) or an upgrade of the unsupported operating system to a supported version, followed by an upgrade to Windows XP. For example, you could upgrade Windows 95 to Windows 98, and then to Windows XP.

Before running these kinds of upgrade, however, you should carefully inspect the computer's hardware and make sure it can handle Windows XP. Most Windows 9x computers will need either a RAM or processor upgrade—or both—before installing Windows XP, so be sure to look at not only the operating system, but also the hardware itself before you try to run any upgrades.

All hardware requirements still apply in an upgrade scenario, so it is important to check out the computer's hardware before starting an upgrade. Also, spend a few moments checking out the applications that you are installing to see whether they are compatible with Windows XP. You can check the software vendors' web sites for upgrade information.

Windows XP Professional can directly upgrade the following operating systems:

- All versions of Windows 98
- Windows Me
- Windows NT 4.0 Workstation (with service pack 5 or later)
- Windows 2000 Professional
- Windows XP Home Edition



Running an Attended Installation of Windows XP Professional

You can perform an attended install of Windows XP Professional by using the installation CD-ROM or over the network from a network share. In many network environments, the network installation option is often used to make installations easier and to provide one central location for the installation files. The following sections explore both types of installations.

Installing from CD-ROM

The Windows XP installation CD is bootable, and you can start installation simply by booting from the CD if your computer supports CD booting. In an upgrade or clean install scenario, just insert the CD-ROM while you are booted into your current operating system and follow the setup instructions. If your computer has no operating system and your CD-ROM drive is not bootable, you'll need to boot into DOS using a startup disk (or even a Windows 98 startup disk). You can then start the installation by accessing your CD-ROM drive and running setup.exe.

At the Welcome to Microsoft Windows XP screen, you can launch setup, or you can have setup check your system for compatibility. The following steps walk you through the installation routine.

Installing Windows XP Professional

To install Windows XP Professional, follow these steps:

1. Launch the CD-ROM or setup.exe, as appropriate for your particular installation.
2. Setup begins and collects information about your computer. In the dialog box that appears, choose to Install Windows XP. In the Welcome to Windows Setup screen, you can use the drop-down menu to select New Installation or Upgrade. Make your decision and click Next.
3. The Licensing Agreement window appears. Read the agreement, click the I Accept This Agreement radio button, and click Next.
4. The product key window appears. Enter the 25-character product key that is found on the yellow sticker on the back of your CD case. Enter the key, and click Next.
5. The Setup Options window appears, as shown here (if you selected the New Installation option in step 2). At this point, you can change the Accessibility Options and language if desired. Click the Advanced button.



6. The Advanced Options window appears. You have the following options:

- ◆ **Copy Installation Files from This Folder** You can specify the location from which the setup files should be copied. This feature can be useful if you need to start setup from a CD but actually want the files copied from another location.
- ◆ **To This Folder on My Hard Drive** You can specify the folder name to which the files should be copied. \Windows is the default and typically what you should use.
- ◆ **Copy All Installation Files from the Setup CD** Use this option to copy all files to the computer's hard drive before beginning installation. This feature can be helpful if you need to install several computers but have only one CD. You can copy the files and continue with the installation without the CD-ROM so that it can be used on another machine.
- ◆ **Choose the Install Drive Letter and Partition during Setup** This option allows you to choose the installation drive letter and partition during setup.

Make any desired selections, click OK, and then click Next.

7. The Setup Files window appears. You can choose to connect to the Internet and check for updated files that can be downloaded and used during the installation. For this option to work, your current operating system must be configured with an Internet connection; if you have such a connection, you should use the option. Choose either Yes or No and then click Next.
8. At this point, the file copy process begins. The setup program copies necessary files to your computer's hard drive, and then automatically reboots your computer (make sure there is no floppy disk in the disk drive).
9. Once the computer reboots, the MS-DOS portion of setup begins. The Setup Notification window appears. Press ENTER to continue.
10. In the Welcome to Setup window, you can choose to install Windows XP Professional by pressing ENTER, repair an existing installation by pressing R, or quit setup by pressing F3. Press ENTER to continue with Setup.
11. Depending on your upgrade or clean install choices, you may see a partition window where you can choose the partition in which you want to install Windows XP Professional and format that partition as well. Follow the prompts that appear for selecting a desired partition, creating a partition from unpartitioned space, and formatting that partition.

12. Once the partition is established and formatted with a file system, the file copy process begins. This may take some time and requires no intervention from you.
13. Once the file copy process is complete, the computer automatically reboots. At this point, you see the Windows XP setup screen and the installation continues. This screen displays the approximate amount of time that setup will require. It is not unusual for the screen to flicker several times during this phase of setup.
14. During the installation of Windows XP Professional, the Regional and Language Options window appears. You can click the Customize button to choose a different language or region, or you can click the Details button to view information about your current regional configuration. Click Next to continue.
15. In the Personalize Your Software window, enter your name and organization. Click Next.
16. In the Computer Name and Administrator Password dialog box, enter a name for the computer (or accept the default) and an administrator password. The password will be used in conjunction with the Windows XP Professional administrator account and should be kept private. Typically, for the best security, the local administrator password should be at least seven characters long and should contain both letters and numbers.
17. In the Modem Dialing Information window, choose your country and enter your area code and outside line number (if necessary). This window does not appear if your computer does not have a modem attached. Click Next.
18. In the Date and Time Settings window, use the drop-down menus to choose the correct time, date, and time zone. Click Next.
19. Setup continues, and a Networking Settings window appears if a network adapter card is installed on the computer. You can choose Typical Settings (which installs TCP/IP), Client for Microsoft Networks, or File and Printer Sharing for Microsoft Networks. If you want to select the services and IP address that you will configure, choose the Custom Settings option and click Next to complete the information.
20. The Choose Workgroup or Computer Domain window appears. Choose a desired work or domain name and click Next. If you are creating a new workgroup, enter the desired name in the provided dialog box.

Setup continues and may require another 30 minutes or longer before the computer reboots. Once the computer reboots, Windows XP Professional boots for the first time.

Installing from a Network Share

You can easily install Windows XP on client computers via the network by using a network installation. The actual installation steps and procedures remain the same when installing over a network share, but the installation is started by connecting to the network share and launching setup.exe.

In order to install Windows XP Professional over the network, you must first set up a server that will function as a “distribution server.” This server holds a shared folder that contains all of the contents of the Windows XP Professional installation CD-ROM. The distribution server can even be another workstation—the requirement is that client computers have access to the server, whether it is an actual server or another client computer. To use a distribution server, create a shared folder on the desired computer, then copy the contents from the Windows XP installation CD-ROM to this folder.

For client computers to access the shared folder, the client computer must be configured with a network card and connection cabling. In most cases, the use of a distribution server is helpful for upgrades, where IT support personnel or even end users themselves use the existing operating system to connect to the shared folder and begin installation. If a computer has no current operating system, then you need a network boot disk to install Windows XP in this manner.

To begin the installation, the client computer simply connects to the distribution server’s shared folder and launches setup.exe. For example, if the distribution server’s name is ServerSet and the shared folder’s name is

XP, then you can start the installation by connecting to `\\ServerSet\XP\setup.exe`. When `setup.exe` is launched, the files are copied from the distribution server to client computer, and installation proceeds as it typically would.

Note Prior to starting a network installation, you must create a partition in which Windows XP can be installed.

Using Winnt32.exe

You can modify the setup program using `Winnt32.exe`. `Winnt32.exe` is a setup program used to start a Windows XP installation using a variety of setup switches. Windows XP Professional, like previous versions of Windows, supports `Winnt32.exe`, and you can use this program for an upgrade of supported versions of Windows. Using the provided setup switches, you can make the installation of Windows XP easier by invoking different needs or setup options automatically. Also, if you want to use an unattended installation of Windows XP Professional, you can start the unattended installation using `Winnt32.exe` as well, which you can learn more about later in this chapter. The syntax of `Winnt32.exe` is as follows:

```
winnt32 [/checkupgradeonly] [/cmd:command_line] [/cmdcons]
[/copydir:i386\folder_name] [/copysource:folder_name]
[/debug[level]:[filename]] [/dudisable] [/dupprepare:pathname]
[/dushare:pathname] [/m:folder_name] [/makelocalsource] [/noreboot]
[/s:sourcepath] [/syspart:drive_letter] [/tempdrive:drive_letter]
[/udf:id [,UDB_file]] [/unattend[num]:[answer_file]]
```

Table 1-2 explains the available command-line switches.

Table 1-2: Winnt32.exe Command-Line Parameters

Switch	Explanation
<code>/checkupgradeonly</code>	Checks your computer for upgrade compatibility with Windows XP. If you use this option with <code>/unattend</code> , no user input is required. Otherwise, the results are displayed on the screen, and you can save them under the filename you specify. The default filename is <code>Upgrade.txt</code> in the <code>systemroot</code> folder.
<code>/cmd:command_line</code>	Tells the setup program to carry out a specific command before the final phase of setup. This occurs after your computer has restarted and after setup has collected the necessary configuration information, but before setup is complete.
<code>/cmdcons</code>	Installs the Recovery Console as a startup option on a functioning computer. You can use the <code>/cmdcons</code> option only after the normal setup process is finished.
<code>/copydir:i386\folder_name</code>	Creates an additional folder within the folder in which the Windows XP files are installed. You can use <code>/copydir</code> to create as many additional folders as you want.
<code>/copysource:folder_name</code>	Creates a temporary additional folder within the folder in which the Windows XP files are installed. You can use <code>/copysource</code> to create as many additional folders as you want, but the folders that <code>/copydir</code> creates, <code>/copysource</code> folders, are deleted after the setup program completes.
<code>/debug[level]:[filename]</code>	Creates a debug log at the level specified, for example, <code>/debug4:Debug.log</code> . The default log file is <code>C:\systemroot\Winnt32.log</code> , and the default debug level is 2. The log levels are as follows: 0 represents severe errors, 1 represents errors, 2 represents warnings, 3 represents information, and 4 represents detailed information for debugging. Each level includes the levels below it.

/dudisable	Stops Dynamic Update from running. This option will disable Dynamic Update even if you use an answer file and specify Dynamic Update options in that file.
/dupprepare:pathname	Carries out preparations on an installation share so that it can be used with Dynamic Update files that you downloaded from the Windows Update web site. You can then use this share to install Windows XP for multiple clients.
/dushare:pathname	Specifies a share on which you previously downloaded Dynamic Update from the Windows Update web site and on which you previously ran /dupprepare:pathname. When run on a client, specifies that the client installation will use the updated files on the share specified in pathname.
/m:folder_name	Specifies that the setup program copies replacement files from an alternate location. Instructs the setup program to look in the alternate location first and, if files are present, to use them instead of the files from the default location.
/makelocalsource	Tells the setup program to copy all installation source files to the local hard disk. Use /makelocalsource when installing from a CD to provide installation files when the CD is not available later in the installation.
/noreboot	Instructs the setup program not to restart the computer after the file copy phase of setup is completed, so that you can execute another command.
/s:sourcepath	Specifies the source location of the Windows XP files. To simultaneously copy files from multiple servers, type the /s:sourcepath option multiple times (up to a maximum of eight). If you type the option multiple times, the first server specified must be available, or Setup will fail.
/syspart:drive_letter	Specifies that you can copy setup startup files to a hard disk, mark the disk as active, and then install the disk into another computer. When you start that computer, it automatically starts with the next phase of setup. You must always use the /tempdrive parameter with the /syspart parameter. See Chapter 3 to learn more about the System Preparation tool.
/tempdrive:drive_letter	Directs the setup program to place temporary files on the specified partition. For a new installation, Windows XP will also be installed on the specified partition. For an upgrade, the /tempdrive option affects the placement of temporary files only; the operating system will be upgraded in the partition from which you run winnt32.
/udf:id [,UDB_file]	Uses an identifier (id) for the setup program to specify how a Uniqueness Database (UDB) file modifies an answer file (see the /unattend entry).
/unattend	Runs an upgrade using the previous operating system (if supported). All user settings are taken from the previous installation, so no user intervention is required during the setup process.
/unattend[num]:[answer_file]	Performs a fresh installation in unattended setup mode. The specified answer_file provides the setup program with your custom specifications. num is the number of seconds between the time that the setup program finishes copying the files and when it restarts your computer. You can use num on any computer running Windows 98, Windows Me, Windows NT, Windows 2000, or Windows XP.



Activating Windows XP

Windows XP Home and Professional editions use a new feature from Microsoft called product activation. Due to software piracy, product activation is now used to enforce the end-user license agreement that stipulates that the end user can install one copy of Windows XP on one computer only. This feature prevents the

copying of installation CDs, otherwise known as “softlifting.”

During installation, the product key found on the back of the CD-ROM case is combined with a generated hardware identifier number, taken from information about the computer system on which the software is being installed. Taken together, the two numbers create a unique installation ID that is uploaded to Microsoft servers via the Internet, or manually through a call to Microsoft customer support. Once the product is activated, the CD cannot be used to install another computer with Windows XP Professional, which enforces the end-user license agreement of one CD per one computer. In large environments where a large number of computers are configured with Windows XP Professional, activation may work differently or not be necessary at all, depending on the licensing agreement between Microsoft and the corporation or organization.

Painful Lessons I’ve Learned: Command Line Confusion

The command line installation switches provide you with a number of options for installing Windows XP. Those options can be very helpful in a number of circumstances, but it is important to use only the switches you really need. I have seen techs get really excited about using command line switches for installations, but typically problems occurred because too many switches were used without thinking through all of the effects of those switches. The moral of the story is to use the command line switches you need, think carefully about their impact, but don't make things more complicated than necessary.

In a typical activation scenario, the user is prompted to activate Windows XP once an installation completes, if a modem is detected on the computer. If one is not detected or a connection cannot be made, the user is prompted to contact Microsoft to activate the product manually. Users can skip this step and activate Windows later because there is a 30-day grace period in which to activate. From an IT professional’s perspective, however, users should activate as soon as installation is completed in order to avoid further problems. If Windows XP is not activated immediately after setup, then an Activate icon appears in the Notification Area; to start the activation process, you can click this icon or you can simply click Start | All Programs | Activate Windows.



Performing Unattended Installations

Windows XP Professional’s unattended installation methods fall into two broad categories: scripted installations and image installations. The first category, scripted installations, uses an answer file to answer setup prompts so that once installation begins, the process is completely automated. The second category can be thought of as an imaging process. A computer with no operating system and with similar hardware receives a complete installation image that is copied to the hard drive. Remote installation services and System Preparation tools are both used for image-based installations. As you will see in the following sections, all of these installation options have unique advantages in a number of scenarios.

Using Setup Manager

Windows XP Professional contains a program called Setup Manager that can help you generate answer files for a Windows XP Professional unattended installation. Before getting into answer file creation, let’s back up a bit and talk about unattended installations and answer files. In an unattended installation, you typically start setup using Winnt32.exe, using an unattended switch, and then pointing to an answer file. An answer file is simply a text file that setup can read to find the “answers” to setup prompts. For example, setup always asks whether you want to check for Dynamic Updates on the Web. You can answer the question one time using an answer file. Subsequently, setup will simply read the file and will not require any direct input from you. The advantages are obvious—you can start the installation routine on hundreds of computers at one time and never

have to return to them in order to babysit the setup program. You can find a sample of an answer file, called Unattended.txt, in the I386 folder on your Windows XP Professional CD-ROM. As you can see in Figure 1-1, Unattended.txt is a simple text file that you can read.

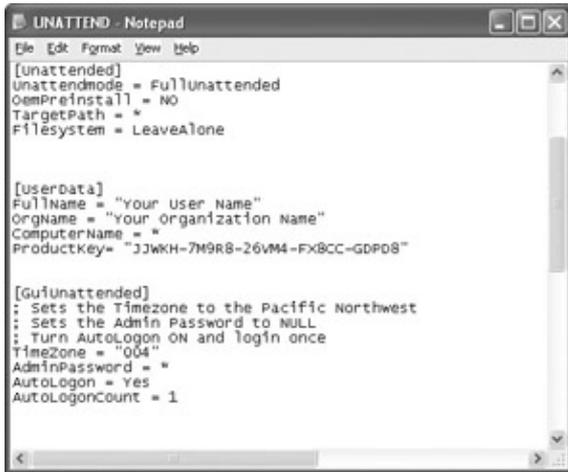
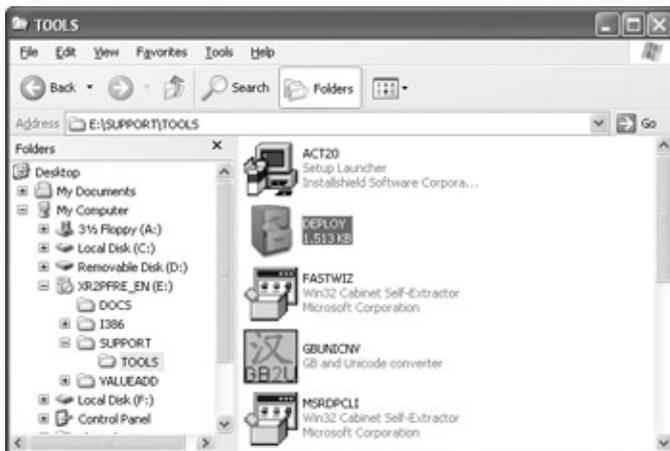


Figure 1-1: Unattended.txt sample answer file found in the I386 folder on the installation CD-ROM
In the past, answer files were somewhat difficult because you had to write them from scratch. With Setup Manager, a wizard guides you through the process and helps you create the answer file, which makes unattended setups a lot easier.

Setup Manager and the other deployment tools explored in this chapter are not available directly from Windows XP Professional after installation. Instead, you must copy from them from cabinet file (compressed) from the Windows XP Professional CD-ROM. The following steps walk you through this process.

Extracting the Deploy.cab Files

1. On the desired computer, log on as the administrator and create a folder in which to place the deployment tools, then name the folder as desired.
2. Insert the Windows XP Professional installation CD-ROM. Close the installation window that appears.
3. Open My Computer, right-click the CD-ROM drive, and click Explore.
4. Open the Support folder, and then open the Tools folder. You'll see the Deploy.cab file, as shown here.



5. Double-click the Deploy.cab file to open it. Several different tools will appear, including Setup Manager (setupmgr).
6. Click Edit | Select All, and then right-click the files and click Extract.
7. In the Select a Destination dialog box that appears, browse for the folder you created, select it, and then click the Extract button. The tools are copied from the CD-ROM to the desired folder.

Now that you have copied the Deployment tools to the desired computer, you can create an answer file to use for an unattended installation. Remember that an answer file simply answers the questions that the setup routine typically poses to you during an attended setup. With this automated method, an IT technician can start an installation and not have to wait for each prompt the setup routine poses. Instead, the answer file contains the answers that you want provided, and it can even provide setup with information about hardware, such as sound cards, modems, and so on.

Secret Windows XP Professional's setup routine is designed to continue, even if certain pieces of hardware, such as modems and sound cards, do not install properly. This feature prevents setup from stopping due to a single hardware problem.

Of course, the Windows XP Professional CD-ROM gives you `unattend.txt`, which you can use for unattended installations. This text file provides basic setup options, but you may need to customize your own setup file. Using Setup Manager, you can easily create this file, as shown in the following steps.

Using Setup Manager to Create an Answer File

1. Launch the `setupmgr` program in your deployment folder.
2. Click **Next** on the **Welcome** screen.
3. In the **New or Existing Answer File** window, you can choose to create a new answer file, or you can modify an existing answer file by selecting the option and browsing for the file. For this exercise, you will create a new answer file. Click the radio button option and then click **Next**.
4. In the **Product to Install** window, you can create the answer file for a **Windows Unattended Installation**, **Sysprep Install**, or **Remote Installation Services** installation. For this exercise, you will create an answer file for a **Windows unattended installation** (you will learn about the other two options later in this chapter). Select the unattended option and click **Next**.
5. In the **Select the Platform That This File Installs** window, choose the **Windows XP Professional** radio button and click **Next**.
6. The **User Interaction Level** window appears, as shown here.



You have five different options, which are:

- ◆ **Provide Defaults** This option provides an unattended setup where the answers you provide are considered the defaults. When the installation is run, the user can see the answer defaults and interrupt setup to change them if desired. As you can see, this option is not fully automated, but does enable the user to review the answers before beginning the installation.
- ◆ **Fully Automated** Using this method, the user is never prompted to answer any questions. All answers are taken from the answer file and the user cannot interrupt setup or change any of the options.
- ◆ **Hide Pages** If you provide all of the answers for the Windows Setup wizard page, the wizard page is hidden from the user.
- ◆ **Read Only** If the Windows Setup wizard page is not hidden from the user, you can use this option so that the page is read only. The user can make no changes to the setup wizard.

◆ **GUI Attended** Only the text-mode portion of Windows setup is automated.

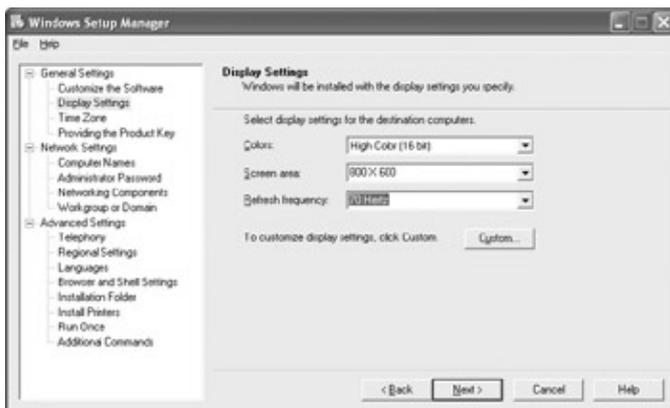
Make your selection based on the level of user input/automation that you want and click Next.

7. The Distribution Folder window appears, as shown next. When using an answer file, you can choose to install Windows XP Professional from the CD or from a distribution folder. A network distribution folder holds the Windows XP Professional installation files so you can connect to this folder over the network.



If you use an answer file, you can roll out any number of installations at one time. Choose the desired radio button; for this exercise, you will create a distribution folder. Click Next.

8. If you chose to create a distribution folder, you can copy the files from CD or from another location. Make your selection and click Next.
9. In the Distribution Folder Name window, you can choose to create a new distribution folder or modify an existing one. If you choose to create a new distribution folder, select the location and the share name for the folder, and then click Next.
10. The License Agreement window appears, if you choose a fully automated installation. Read the basic End User License Agreement (EULA) and click the I Accept check box. Click Next.
11. The Customize window appears, as shown here. At this point, you can click each setting in the left window and enter your answer in the right pane. Setup will use the answers provided here to configure the answer file, which automates setup. Simply respond to the answer prompts and click Next for the entire list of settings.



12. After you answer the final prompt, a dialog box appears telling you that Setup Manager has successfully created an answer file and prompting you for the location to save the file. Choose the desired location and click OK. Click Finish when prompted.

Once the answer file is created, you can begin running unattended setups with the answer file. Before doing so, however, you should open the unattended file you created and scan through it; look for any errors or other issues that might be a problem. If there are any mistakes, you can directly edit the unattended text file as needed.

Once you are ready to run setup, you can use `Winnt32` to begin the unattended installation of Windows XP Professional. The syntax for running the unattended setup is:

```
Winnt32 /s:d:\i386 /u:c:\unattend\unattend.txt
```

where:

- **/s:d:i386** Specifies the location of the Windows XP Professional installation files; this can be your I386 folder on the CD-ROM or a network distribution folder.
- **/u:c:\unattend\unattend.txt** Specifies that this is an unattended installation and that the answer file is `unattend.txt` and is located in the `Unattend` folder on the C drive. Of course, your location will probably be different, so just enter the correct UNC path to the answer file.

Remote Installation Services

Although unattended installations can be extremely helpful if you are installing numerous machines, Windows XP Professional also supports Remote Installation Services, which uses the Active Directory to run setup automatically on computers that connect to the Remote Installation Server. Remote Installation Services (RIS) is technically a service that runs on Windows 2000 Server—it is simply supported by Windows XP Professional and not something you can configure on the Professional computer. For that reason, we'll not go into a lot of detail about using RIS, since you need to be a server administrator to do so, but I do want to give you a quick overview of the feature.

Remote Installation Services was first introduced with Windows 2000 as a way to roll out massive installations of Windows 2000 Professional. A former criticism of Windows workstations was how difficult it was to perform mass installations. Providing Setup Manager and RIS, Microsoft has tried to answer that complaint by making mass installations of Windows 2000, and now Windows XP, much easier. RIS meets that challenge—to a point, anyway.

RIS is a server-based networking product that is designed to use the power of the Active Directory, Dynamic Host Configuration Protocol (DHCP), and Domain Name Service (DNS) to install Windows XP Professional software over the network to machines that support the Pre-Execution Environment (PXE) ROM. PXE enables a computer to boot over the network. In order to support PXE, your computer must be outfitted with a network adapter card that is PXE-compliant. Windows 2000 Server supports only PCI network adapter cards that are PXE-enabled. The good news is that if your computers do not support the PXE boot ROM, you can use an RIS boot disk instead of the PXE network adapter card.

When you start a computer using a PXE boot ROM or an RIS boot disk, the computer queries the network for a DHCP server using a BootP message. The DHCP server must be configured to allocate IP addresses to the BootP client. Boot Information Negotiation Layer (BINL) extensions are used on the DHCP server to redirect the RIS client to the RIS server, so that the installation of Windows XP Professional can begin. Depending on network configuration, the user may need to log on to continue the installations. The server installation is image-based, which means the installation is completely automated. This type of installation is especially helpful in networks that are upgrading all computers at one time, or in new networks where new machines with no operating systems are awaiting installation. When installation begins, the Trivial File Transfer Protocol (TFTP) is used to transfer the image files to the RIS client. Once the installation is completed, the client simply reboots as a normal network client.

Note You can manage RIS through a Group Policy. You can also make use of answer files in order to customize installations as needed.

Using System Preparation

The second type of disk imaging deployment that is supported by Windows XP Professional is System Preparation. System Preparation is also available once you copy the `Deploy.cab` file from the Windows XP installation CD-ROM to your hard drive. This file enables you to prepare a disk image of a particular computer. This image can then be used to install hundreds or thousands of computers. System Preparation is a useful tool for organizations that are rolling out many new computers with the same configuration.

Tech Talk: RIS Safety Controls

Any Windows 2000 Server administrator can install and configure the RIS service on the server. However, as a control and management measure, Windows 2000 requires that a domain administrator who is logged on as an enterprise administrator or a domain administrator of the root domain “authorize” the RIS server with the Active Directory before it can function on the network as an RIS server. The same authorization process occurs with DHCP servers on a Windows 2000 network. Unless the Active Directory authorizes a DHCP server to do so, the server cannot lease IP addresses to clients. The same is true for RIS servers. You do not want someone to create and run a RIS server on the network without Active Directory authorization. Because this authorization scheme requires you to have domain administrator rights in order to authorize an RIS or DHCP server in the Active Directory, the scheme prevents the appearance of “rogue” servers. In a nutshell, authorization is simply a security feature of the Active Directory, but one that is required in order for the RIS server to function.

The System Preparation tool, called SysPrep, which is included in your deployment tools, is used to create an image from a desired Windows XP Professional computer. This image includes all configurations, applications, and virtually everything else on the computer. The computer becomes the master computer and is imaged so that other computers are exactly the same. Windows XP actually only prepares a computer for imaging; you must use a third-party imaging tool to create the image and deploy that image on the network. The use of SysPrep also imposes some additional rules and issues:

- SysPrep images are designed to be used on computers that have the same hardware. The image is not actually installed, but it is burned on the computer’s hard drive. Therefore, the hardware must be the same. The exception is minor plug-and-play devices, such as sound cards, modems, and so on. These can be redetected and installed, but the hard drives, controllers, and Hardware Abstraction Layer (HAL) must be the same. Press F5 during boot to view and select the HAL.
- Sysprep is used for clean installations only. You cannot upgrade a computer using a Sysprep image.
- Sysprep creates the image only. Windows XP or Windows 2000 Server does not provide a way to burn images onto other computers. You’ll need to use a third-party tool, such as Symantec’s Norton Ghost or PowerQuest’s DriveImage software.
- The master computer must be thoroughly tested before Sysprep is run. Otherwise, any problems or errors will be copied to the image as well.
- You must have a volume licensing agreement with Microsoft to comply with the EULA.

Sysprep is a great tool that enables you to generate an image of a Windows XP Professional installation, then copy that complete and configured installation to other computers as necessary. Original Equipment Manufacturers (OEMs) often use this type of imaging. For example, suppose that you own a small computer company that has just sold 8,000 of its new desktop computers to a startup company. All of the hardware is the same, and the operating systems are sold bundled with certain applications. You can use Sysprep to copy a configured system, then generate an image of that system for all of the other computers. When end users boot the computer, they see the mini-setup program running. If you have bought an OEM computer before, such as a Compaq, HP, Dell, or other popular brand, you have seen a type of mini-setup run that completes the imaging that was done at the factory. The end result is that with just a few keystrokes, you can generate an image of an operating system, configuration parameters, and applications for thousands of computers.