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# MCTS 70-680 Cert Guide: Microsoft® Windows 7, Configuring

Don Poulton

Pearson
800 East 96th Street
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# MCTS 70-680 Cert Guide: Microsoft® Windows 7, Configuring

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# Contents at a Glance


Introduction 3

Chapter 1 Introducing Windows 7 17

Chapter 2 Installing Windows 7 47

Chapter 3 Upgrading to Windows 7 87

Chapter 4 Migrating Users and Applications to Windows 7 107

Chapter 5 Deploying Windows 7 127

Chapter 6 Configuring Virtual Hard Disks 187

Chapter 7 Configuring Devices and Updates 211

Chapter 8 Configuring Applications and Internet Explorer 243

Chapter 9 Configuring TCP/IP 297

Chapter 10 Configuring Network and Firewall Settings 339

Chapter 11 Configuring Access to Local and Shared Resources 383

Chapter 12 Configuring Access Controls 433

Chapter 13 Configuring Mobile Computing 475

Chapter 14 Configuring Remote Management and Remote Connections 521

Chapter 15 Disk Management 561

Chapter 16 Managing and Monitoring System Performance 591

Chapter 17 Configuring Backups 643

Chapter 18 Configuring System and File Recovery 661

Practice Exam 689

Answers to Practice Exam 747

Appendix A Answers to the “Do I Know This Already?” Quizzes 785

Appendix B Glossary 817

Index 836

Elements Available on CD

Appendix C Memory Tables

Appendix D Memory Tables Answer Key

# Table of Contents

**Introduction 3**

**Chapter 1 Introducing Windows 7 17**

Leading Up to Windows 7 17
Windows 7 Editions 20
Features of Windows 7 23
Productivity Improvements 23
Security Improvements 27
A Quick Tour of Windows 7 29
Start Menu and Taskbar 30
Configuring Windows 7 Start Menu and Taskbar 32
*Start Menu Properties 32*
*Taskbar Properties 33*
*Toolbars 34*
Libraries 34
Control Panel 35
*System and Security 36*
*Network and Internet 38*
*Hardware and Sound 39*
*Programs 40*
*User Accounts and Family Safety 41*
*Appearance and Personalization 42*
*Clock, Language, and Region 43*
*Ease of Access 43*
Patches, Hotfixes, and Service Packs 43
Summary 44

**Chapter 2 Installing Windows 7 47**

"Do I Know This Already?" Quiz 47
Identifying Hardware Requirements 51
Hardware Compatibility 52
Software Compatibility 53
Network Requirements 55
File System Considerations 56
Product Activation 57
Performing a Clean Installation of Windows 7 as the Sole Operating System 59
Performing an Attended Installation 59

Dual-Booting Windows 7 65
Boot Management Programs Used by Windows 7 65
Setting Up a Dual-Boot System 66
Other Windows 7 Installation Methods 66
USB 67
CD 67
Network Share 67
WDS 68
*Understanding WDS 68*
*Requirements to Use WDS 69*
Troubleshooting Windows 7 Installation Issues 70
Troubleshooting Process 70
*Identifying the Point of Failure 71*
*Discovering the Cause of the Failure 71*
*Defining a Solution 72*
*Testing and Implementing the Solution 72*
*Documenting the Results 72*
Troubleshooting an Attended Installation 72
*Media Problems 73*
*Insufficient Hard Drive Space 73*
*Unrecognizable DVD-ROM Drive 74*
*Unavailable Network 74*
*Advanced Startup 80*
*Refer to Compatibility 80*
Troubleshooting Failed Installations 82
*Stop Errors or Blue Screen of Death 83*
*Stopped Installation 84*
Review All the Key Topics 85
Complete the Tables and Lists from Memory 85
Definitions of Key Terms 85

**Chapter 3 Upgrading to Windows 7 87**

"Do I Know This Already?" Quiz 87
Upgrading to Windows 7 from a Previous Version of Windows 91
Preparing a Computer to Meet Upgrade Requirements 92
*Windows 7 Upgrade Advisor 92*

*Additional Preparatory Tasks 94*
Upgrading the Computer to Windows 7 95
Migrating from Windows XP 97
The `Windows.old` Folder 98
Removing the `Windows.old` Folder 99
Upgrading from One Edition of Windows 7 to Another 100
Windows Anytime Upgrade 101
Upgrading Windows 7 101
Uninstalling Windows 7 102
Review All the Key Topics 104
Complete the Tables and Lists from Memory 104
Definitions of Key Terms 104

**Chapter 4 Migrating Users and Applications to Windows 7 107**
"Do I Know This Already?" Quiz 107
Migrating Users from One Computer to Another 111
User State Migration Tool 111
*Preparing the Server to Run USMT 113*
*Collecting Files from the Source Computer 114*
*Loading Collected Files on the Destination Computer 115*
Windows Easy Transfer 115
*Using Windows Easy Transfer to Collect Files at the Source Computer 116*
*Using Windows Easy Transfer to Save Files at the Destination Computer 118*
Migrating Users from Previous Windows Versions 120
Using the User State Migration Tool 121
Using Windows Easy Transfer 122
Side by Side Versus Wipe and Load 122
Side by Side Migration 123
Wipe and Load Migration 123
Review All the Key Topics 125
Definitions of Key Terms 125

**Chapter 5 Deploying Windows 7 127**
"Do I Know This Already?" Quiz 127
Planning a Windows 7 Deployment 132
Understanding Windows Images 133
Understanding Windows PE 134

Understanding Answer Files 137
*Understanding Configuration Passes 138*
*Creating an Answer File 139*
*Using the Answer Files to Perform an Unattended Installation 144*
Capturing a System Image 145
Understanding the System Preparation Tool 145
Using Sysprep to Prepare a System for Capture 146
Creating a WIM File 148
Automated Image Capture 148
Manual Image Capture 150
Preparing System Images for Deployment 151
Understanding the Deployment Image Servicing and Management Utility 151
Working with DISM 153
Inserting Applications into System Images 154
Inserting Drivers into System Images 156
Inserting Updates into System Images 157
Configuring Tasks to Run After Deployment 157
Deploying Windows System Images 158
Suggested Deployment Strategies 158
*High-Touch with Retail Media 159*
*High-Touch with Standard Image 159*
*Lite-Touch, High-Volume Deployment 160*
*Zero-Touch, High-Volume Deployment 160*
Using Microsoft Deployment Toolkit 2010 to Deploy Windows 7 161
*What's New with MDT 2010 161*
*Downloading and Installing MDT 2010 162*
*Using MDT 2010 Deployment Workbench to Create a Deployment Share 163*
*Adding Windows Images to the Deployment Share 165*
*Adding Additional Features to Windows Images 168*
*Using Task Sequences in MDT 2010 169*
*Using Deployment Points 173*
*Using MDT 2010 to Distribute Images to Multiple Computers 173*
Automated Deployment of Windows 7 by Using Windows Deployment Services 174
*Understanding WDS 174*

*Setting Up WDS 175*
*Using WDS to Perform an Automated Deployment of Windows 7 177*
*Enabling Automatic Network Boot 177*
*Automating the Setup Process 178*
Manually Deploying a Customized Image 179
Troubleshooting an Unattended Installation 180
Problems with Answer Files 180
*Boot Disks 180*
*Switches 181*
*Answer File Specifications 181*
Problems with Sysprep Installations 182
Review All the Key Topics 184
Complete the Tables and Lists from Memory 184
Definitions of Key Terms 185

**Chapter 6 Configuring Virtual Hard Disks 187**
"Do I Know This Already?" Quiz 187
Understanding VHDs 191
What's New in Virtual Hard Disks? 191
Types of Virtual Hard Disks 192
Tools Used with Virtual Hard Disks 193
Creating and Configuring VHDs 194
Creating VHDs 194
*Using Disk Management 194*
*Using DiskPart to Create a VHD 196*
Mounting VHDs 198
Deploying VHDs 199
*Preparing a Custom Windows Image 200*
*Best Practices for Using Native-Boot VHDs 200*
*Creating a Native-Boot VHD 201*
Booting VHDs 203
*Adding a Native-Boot VHD to an Older Computer 204*
Offline Servicing and Updating VHDs 205
Upgrading a Windows Image to a Higher Edition 208
Using an Answer File to Service an Offline VHD 208
Review All the Key Topics 209
Complete the Tables and Lists from Memory 209
Definitions of Key Terms 209

**Chapter 7 Configuring Devices and Updates 211**

"Do I Know This Already?" Quiz 211

Installing and Configuring Device Drivers 215

Installing Devices and Drivers 216

Device Stage 217

Updating Drivers 218

Using Device Manager 219

*Using Device Manager to Uninstall Drivers 222*

*Using Device Manager to Disable Drivers 223*

Maintaining Device Drivers 223

Managing and Troubleshooting Drivers and Driver Signing 224

*What's New with Driver Signing in Windows 7 224*

*Checking Drivers for Digital Signatures 225*

*Driver Installation Permissions in Windows 7 227*

Configuring Driver Settings 227

Troubleshooting Device Drivers 228

Resolving Driver Conflicts 228

*Use of the Action Center to View Device-Related Problems 230*

*Use of System Information to View Device-Related Problems 231*

Using Windows 7 Rollback to Resolve a Problem Driver 231

Configuring Updates to Windows 7 232

Configuring Windows Update Settings 233

Using a WSUS Server with Windows 7 235

Configuring Windows Update Policies 236

Reviewing Update History and Rolling Back Updates 239

Checking for New Updates 240

Review All the Key Topics 241

Complete the Tables and Lists from Memory 241

Definitions of Key Terms 241

**Chapter 8 Configuring Applications and Internet Explorer 243**

"Do I Know This Already?" Quiz 243

Configuring Application Compatibility 248

Configuring Application Compatibility Mode 248

Implementing Shims 250

*Using the Application Compatibility Toolkit 251*

*Windows XP Mode 253*

Internet Explorer Compatibility Issues 255

Configuring Application Restrictions 257
Setting Software Restriction Policies 258
Application Control Policies 262
*Capabilities of AppLocker 262*
*Basic Configuration of AppLocker Policies 263*
*Creating Additional AppLocker Rules 265*
Configuring Internet Explorer 270
Configuring Compatibility View 271
Configuring Security Settings 273
*Configuring Internet Explorer Security Zones 274*
*Configuring Protected Mode in Internet Explorer 276*
*Configuring the SmartScreen Filter 277*
Privacy Tab Settings 279
*Handling Cookies 279*
Blocking Pop-ups 281
*Content Tab Settings 282*
Advanced Tab Settings 283
Configuring Providers 283
Managing Add-ons 285
*Using Accelerators 287*
Using InPrivate Browsing Mode 288
*InPrivate Browsing Group Policies 290*
Certificates for Secure Websites 291
Review All the Key Topics 294
Complete the Tables and Lists from Memory 295
Definitions of Key Terms 295

**Chapter 9 Configuring TCP/IP 297**
"Do I Know This Already?" Quiz 297
Understanding the TCP/IP Protocol 301
Configuring TCP/IP Version 4 303
Static IPv4 Addressing 304
*Classless Inter-Domain Routing 306*
*Private IPv4 Networks 307*
Dynamic IP Addressing 307
Connecting to a Network 308
Using the Network and Sharing Center to Set Up a TCP/IP v4 Connection 309

Configuring IPv4 Name Resolution 313
Implementing APIPA 315
Configuring TCP/IP Version 6 316
IPv6 Address Syntax 316
*IPv6 Prefixes 316*
*Types of IPv6 Addresses 317*
*Compatibility Between IPv4 and IPv6 Addresses 318*
Connecting to a TCP/IP Version 6 Network 319
Configuring TCP/IPv6 Name Resolution 322
Disabling IPv6 323
Link-Local Multicast Name Resolution 323
Resolving IPv4 and IPv6 Network Connectivity Issues 324
Windows 7 Network Diagnostics Tools 324
Using TCP/IP Utilities to Troubleshoot TCP/IP 325
*ARP 326*
*FTP and TFTP 326*
**`Ipconfig`** *327*
**`Nbtstat`** *328*
**`Netstat`** *328*
**`Nslookup`** *328*
**`ping`** *329*
**`tracert`** *330*
**`pathping`** *330*
Troubleshooting IPv4 and IPv6 Problems 330
*A Suggested Response to a Connectivity Problem 331*
*Network Discovery 332*
*Incorrect IPv4 Address or Subnet Mask 332*
*Unable to Connect to a DHCP Server 333*
*Duplicate IP Address 333*
*Unable to Configure an Alternate TCP/IPv4 Configuration 333*
*Using Event Viewer to Check Network Problems 334*
*Additional Troubleshooting Hints When Using IPv6 334*
Review All the Key Topics 335
Complete the Tables and Lists from Memory 335
Definitions of Key Terms 336

**Chapter 10 Configuring Network and Firewall Settings 339**

"Do I Know This Already?" Quiz 339

Configuring Networking Settings 344

*Network Devices and Locations 344*

*Setting Up New Network Connections 346*

*Connecting to Existing Networks 347*

*Setting Up Network Sharing and Discovery 348*

*Using Internet Connection Sharing to Share Your Internet Connection 349*

*Connecting to Wireless Networks 352*

*Wireless Networking Protocols 354*

*Setting Up a Wireless Network Connection 354*

*Managing Wireless Network Connections 357*

*Wireless Network Profiles 359*

*Configuring Location Aware Printing 360*

Configuring Security Settings in Windows Firewall 361

*Basic Windows Firewall Configuration 362*

*Using the Windows Firewall with Advanced Security Snap-in 368*

*Configuring Multiple Firewall Profiles 369*

*Configuring New Firewall Rules 371*

*Modifying Rule Properties 375*

Configuring Notifications 376

*Group Policy and Windows Firewall 376*

Review All the Key Topics 379

Complete the Tables and Lists from Memory 379

Definitions of Key Terms 380

**Chapter 11 Configuring Access to Local and Shared Resources 383**

"Do I Know This Already?" Quiz 383

Configuring Shared Resources 389

*Using the Network and Sharing Center to Configure File Sharing 389*

*Sharing Files, Folders, and Printers 390*

*Modifying Shared Folder Properties 392*

*Use of the Public Folder for Sharing Files 396*

*Mapping a Drive 396*

*Command-Line Administration of Shared Folders 397*

*Password-Protected Sharing 398*

*Media Streaming 398*
*Folder Virtualization 399*
Sharing Printers 401
Configuring Homegroup Settings 403
*Creating a HomeGroup 403*
*Joining a Homegroup 403*
*Modifying Homegroup Settings 405*
Configuring Security Permissions 406
*NTFS File and Folder Permissions 407*
*Applying NTFS Permissions 408*
*Specifying Advanced Permissions 410*
*NTFS Permissions Inheritance 414*
*Taking Ownership of Files and Folders 415*
*Effective Permissions 416*
*Viewing a User's Effective Permissions 417*
Copying and Moving Files and Folders 418
*Copying Files and Folders with NTFS Permissions 418*
*Moving Files and Folders with NTFS Permissions 419*
*Using the Mouse to Copy or Move Objects from One Location to Another 420*
Practical Guidelines on Sharing and Securing Folders 420
Configuring Data Encryption 421
Encrypting File System Basics 422
Preparing a Disk for EFS 424
Encrypting Files 425
Backing Up EFS Keys 426
Decrypting Files 427
EFS Recovery Agents 427
Review All the Key Topics 430
Complete the Tables and Lists from Memory 431
Definitions of Key Terms 431

**Chapter 12 Configuring Access Controls 433**
"Do I Know This Already?" Quiz 433
Configuring User Account Control 438
Features of User Account Control 439
*Application Prompts 442*
Running Programs with Elevated Privileges 443

Configuring User Account Control 444
User Account Control Policies 446
Configuring Authentication and Authorization 449
Controlling Windows Logon 450
Managing Credentials 450
*Adding, Editing, and Removing Credentials in Credential Manager 451*
*Backing Up and Restoring Credentials in Credential Manager 453*
Managing Certificates 454
Using Smart Cards 456
*Smart Cards and Multifactor Authentication 457*
*Smart Card Policies 457*
Configuring Account Policies 458
*Password Policies 458*
*Account Lockout 460*
*Unlocking an Account 460*
Configuring User Rights 461
Resolving Authentication Issues 464
*Resetting Passwords 464*
*Using a Password Reset Disk 465*
Configuring BranchCache 466
Distributed Cache and Hosted Cache 467
Configuring BranchCache Settings 467
*Using the **netsh** Command to Configure BranchCache 467*
*Using Group Policy to Enable BranchCache 468*
*Specifying BranchCache Firewall Rules 470*
BranchCache Network Infrastructure Requirements 471
*Using BranchCache Across a Virtual Private Network 471*
Certificate Management with BranchCache 472
Review All the Key Topics 473
Definitions of Key Terms 473

**Chapter 13 Configuring Mobile Computing 475**
"Do I Know This Already?" Quiz 475
Configuring BitLocker and BitLocker To Go 479
BitLocker Drive Encryption 479
*Preparing Your Computer to Use BitLocker 480*
*Enabling BitLocker 481*

*Managing BitLocker 484*
BitLocker To Go 485
BitLocker Policies 486
*Operating System Drives 487*
*Fixed Data Drive Policies 488*
Use of Data Recovery Agents 489
Configuring DirectAccess 491
Network Infrastructure Requirements 493
*Using IPv6 with DirectAccess 493*
*Use of Network Access Protection 494*
*The DirectAccess Connection Process 494*
Configuring DirectAccess Clients 495
Configuring Authentication 496
Configuring Mobility Options 497
Control Panel 497
Windows Mobility Center 498
Using Offline Files 499
*Client Computer Configuration 500*
*Server Configuration 502*
*Use of the Sync Center 503*
*Offline File Policies 506*
*Configuring Transparent Caching of Offline Files 508*
Configuring Power Options 508
Power Plans 510
*Additional Power Plan Options 511*
*Advanced Power Settings 512*
Battery Meter 515
Power Management and Group Policy 515
Review All the Key Topics 518
Complete the Tables and Lists from Memory 519
Definitions of Key Terms 519

**Chapter 14 Configuring Remote Management and Remote Connections 521**
"Do I Know This Already?" Quiz 521
Configuring Remote Management 525
Remote Desktop 525
*Establishing a Remote Desktop Connection with Another Computer 525*

*Configuring the Server Side of Remote Desktop* 527
*Selecting a Nondefault Port* 529
Remote Assistance 530
Using Windows Remote Management Service 535
*Using Windows Remote Shell* 536
*Using Windows PowerShell* 537
Configuring Remote Connections 540
Understanding Remote Access 541
*Remote Access Authentication Protocols* 541
*Remote Access Security* 543
Establishing VPN Connections and Authentication 544
VPN Connection Security 547
Enabling VPN Reconnect 548
Advanced Security Auditing 549
NAP Quarantine Remediation 550
Configuring Dial-Up Connections 552
Accepting Incoming Connections 554
Published Applications on Remote Desktop 555
*RD Gateway Policies* 557
*Using RemoteApp to Specify Applications* 558
Review All the Key Topics 558
Complete the Tables and Lists from Memory 559
Definitions of Key Terms 559

**Chapter 15 Disk Management 561**
"Do I Know This Already?" Quiz 561
Managing Disks and Volumes 565
Basic and Dynamic Disks 566
*Working with Basic Disks* 568
*Converting Basic Disks to Dynamic* 572
*Working with Dynamic Disks* 574
Troubleshooting Disk Problems 576
Managing File System Fragmentation 578
Disk Defragmenter 578
The **`Defrag.exe`** Command-Line Tool 580
Error Checking 581
RAID Volumes 582

Creating a RAID-0 Volume 582
Creating a Spanned Volume 585
Creating a Mirrored Volume 585
Creating a RAID-5 Volume 585
Using DiskPart to Create Striped, Mirrored, and RAID-5 Volumes 586
Managing and Troubleshooting RAID Volumes 587
Configuring Removable Drive Policies 587
Review All the Key Topics 589
Complete the Tables and Lists from Memory 589
Definitions of Key Terms 589

**Chapter 16 Managing and Monitoring System Performance 591**
"Do I Know This Already?" Quiz 591
Windows System Monitoring Tools 596
Configuring and Working with Event Logs 600
Viewing Logs in Event Viewer 601
Customizing Event Viewer 602
Creating Tasks from Events 603
Using Event Log Subscriptions 604
*Configuring Computers to Forward and Collect Events 604*
*Configuring Event Log Subscriptions 605*
Managing Computer Performance 608
Reliability Monitor 608
Task Manager 610
*Configuring Application Priority 612*
Resource Monitor 613
*CPU Tab 614*
*Memory Tab 614*
*Disk Tab 615*
*Network Tab 615*
Performance Monitor 615
Data Collector Sets 619
*Creating Data Collector Sets 619*
*Using Performance Monitor to Create a Data Collector Set 622*
Optimizing and Troubleshooting Memory Performance 623
Optimizing and Troubleshooting Processor Utilization 625

Optimizing and Troubleshooting Disk Performance 626
Command-Line Utilities 628
Configuring Additional Performance Settings 628
Configuring the Hard Drive Cache 628
*Windows ReadyBoost 629*
System Configuration Utility 631
*General Tab 631*
*Boot Tab 632*
*Services Tab 632*
*Startup Tab 633*
*Tools Tab 633*
Configuring the Relative Priority of Foreground and Background Tasks 633
Configuring Processor Scheduling 634
Action Center 635
Advanced Networking Performance Options 636
Configuring Services and Programs to Resolve Performance Issues 636
Review All the Key Topics 639
Complete the Tables and Lists from Memory 639
Definitions of Key Terms 640

**Chapter 17 Configuring Backups 643**
"Do I Know This Already?" Quiz 643
Using Windows Backup to Protect Your Data 646
Configuring Windows Backup for the First Time 646
Managing and Troubleshooting Your Backups 650
Scheduling Your Backups 653
Using the Command Line to Perform a Backup 654
Creating a System Image 655
Creating a System Recovery Disk 657
Review All the Key Topics 658
Complete the Tables and Lists from Memory 658
Definitions of Key Terms 658

**Chapter 18 Configuring System and File Recovery 661**
"Do I Know This Already?" Quiz 661
Restoring Files and Folders 665
Using Windows Backup to Recover Data 665
Restoring User Profiles 669

Using Shadow Copies to Restore Damaged or Deleted Files 669
System Restore 671
Running System Restore 672
Configuring System Restore Properties 674
Device Driver Rollback 675
Recovering Your Operating System from Backup 676
Using a System Repair Disk 679
Advanced System Startup Options 682
Last Known Good Configuration 682
Safe Mode 684
Boot Logging 685
Low Resolution Video (640 × 480) 685
Debugging Mode 685
Disable Automatic Restart on System Failure 685
Disable Driver Signature Enforcement 685
Review All the Key Topics 686
Complete the Tables and Lists from Memory 686
Definitions of Key Terms 686

**Practice Exam 689**

**Answers to Practice Exam 747**

**Appendix A Answers to the "Do I Know This Already?" Quizzes 785**

**Appendix B Glossary 817**

**Index 836**

**Elements Available on CD**

**Appendix C Memory Tables**

**Appendix D Memory Tables Answer Key**

## About the Author

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Don lives in Burlington, Ontario, with his wife, Terry.

# Dedication

*I would like to dedicate this book to my wife Terry, who has stood by my side and encouraged me throughout the days spent writing this book. This project would not have been possible without her love and support.*

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—Don Poulton

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# Introduction

*MCTS Windows 7 Configuring Cert Guide (Exam 70-680)* is designed for network administrators, network engineers, and consultants who are pursuing the Microsoft Certified Technology Specialist (MCTS) or Microsoft Certified IT Professional (MCITP) certifications for Windows 7. This book covers the "TS: Microsoft Windows 7, Configuring" exam (70-680), which earns you the Microsoft Certified Technology Specialist: Windows 7, Configuration certification. The exam is designed to measure your skill and ability to implement, administer, and troubleshoot computers running all editions of Windows 7. Microsoft not only tests you on your knowledge of the desktop operating system, but also has purposefully developed questions on the exam to force you to problem-solve in the same way that you would when presented with a real-life errors. Passing this exam demonstrates your competency in administration.

This book covers all the objectives that Microsoft has established for exam 70-680. It doesn't offer end-to-end coverage of the Windows 7 operating system; rather, it helps you develop the specific core competencies that you need to master as a desktop support specialist. You should be able to pass the exam by learning the material in this book, without taking a class.

## Goals and Methods

The number-one goal of this book is a simple one: to help you pass the Microsoft MCTS Windows 7, Certification Exam (exam number 70-680) and thereby earn this certification. It is also the first step in obtaining the MCITP certification in either Enterprise Desktop Support Technician 7, which validates technical skills and the ability to operate effectively in a support center, or Enterprise Desktop Administrator 7, which validates skills for deploying operating systems and desktop applications and for managing the client life cycle.

Because Microsoft certification exams stress problem-solving abilities and reasoning more than memorization of terms and facts, our goal is to help you master and understand the required objectives for the 70-680 exam.

To aid you in mastering and understanding the MCTS certification objectives, this book uses the following methods:

- **Opening Topics List:** This defines the topics to be covered in the chapter; it also lists the corresponding 70-680 exam objectives.
- **Do I Know This Already? Quizzes:** At the beginning of each chapter is a quiz. The quizzes, and answers/explanations (found in Appendix A), are meant to gauge your knowledge of the subjects. If the answers to the questions don't come readily to you, be sure to read the entire chapter.
- **Foundation Topics:** The heart of the chapter. Explains the topics from a hands-on and a theory-based standpoint. This includes in-depth descriptions, tables, and figures geared to build your knowledge so that you can pass the exam. The chapters are broken down into several topics each.
- **Key Topics:** The key topics indicate important figures, tables, and lists of information that you should know for the exam. They are interspersed throughout the chapter and are listed in table form at the end of the chapter.
- **Memory Tables:** These can be found on the CD-ROM within Appendix B, "Memory Tables." Use them to help memorize important information.
- **Key Terms:** Key terms without definitions are listed at the end of each chapter. Write down the definition of each term and check your work against the complete key terms in the glossary.

## Study and Exam Preparation Tips

It's a rush of adrenaline during the final day before an exam. If you've scheduled the exam on a workday, or following a workday, you will find yourself cursing the tasks you normally cheerfully perform because the back of your mind is telling you to read just a bit more, study another scenario, practice another skill so that you will be able to get this exam out of the way successfully.

The way that Microsoft has designed its tests lately does not help. I remember taking Microsoft exams many years ago and thoroughly understanding the term "paper certified." Nowadays, you can't get through a Microsoft exam without knowing the material so well that when confronted with a problem, whether a scenario or real-life situation, you can handle the challenge. Instead of trying to show the world how many MCSEs are out there, Microsoft is trying to prove how difficult it is to achieve a certification, including the newly created MCTS and MCITP as well as the MCSE and MCSA, thereby making those who are certified more valuable to their organizations.

## Learning Styles

To best understand the nature of preparation for the test, it is important to understand learning as a process. You are probably aware of how you best learn new material. You might find that outlining works best for you, or, as a visual learner, you might need to "see" things. Or, as a person who studies kinesthetically, the hands-on approach serves you best. Whether you might need models or examples, or maybe you just like exploring the interface, or whatever your learning style, solid test preparation works best when it takes place over time. Obviously, you shouldn't start studying for a certification exam the night before you take it; it is very important to understand that learning is a developmental process. Understanding learning as a process helps you focus on what you know and what you have yet to learn.

People study in a combination of different ways: by doing, by seeing, and by hearing and writing. This book's design fulfills all three of these study methods. For the kinesthetic, there are key topics scattered throughout each chapter. You will also discover step-by-step procedural instructions that walk you through the skills you need to master in Windows 7. The visual learner can find plenty of screen shots explaining the concepts described in the text. The auditory learner can reinforce skills by reading out loud and copying down key concepts and exam tips scattered throughout the book. You can also practice writing down the meaning of the key terms defined in each chapter, and in completing the memory tables for most chapters found on the accompanying CD-ROM. While reading this book, you will realize that it stands the test of time. You will be able to turn to it over and over again.

Thinking about how you learn should help you recognize that learning takes place when you are able to match new information to old. You have some previous experience with computers and networking. Now you are preparing for this certification exam. Using this book, software, and supplementary materials will not just add incrementally to what you know; as you study, the organization of your knowledge actually restructures as you integrate new information into your existing knowledge base. This leads you to a more comprehensive understanding of the tasks and concepts outlined in the objectives and of computing in general. Again, this happens as a result of a repetitive process rather than a singular event. If you keep this model of learning in mind as you prepare for the exam, you will make better decisions concerning what to study and how much more studying you need to do.

## Study Tips

There are many ways to approach studying, just as there are many different types of material to study. However, the tips that follow should work well for the type of material covered on Microsoft certification exams.

## Study Strategies

Although individuals vary in the ways they learn information, some basic principles of learning apply to everyone. You should adopt some study strategies that take advantage of these principles. One of these principles is that learning can be broken into various depths. Recognition (of terms, for example) exemplifies a rather surface level of learning in which you rely on a prompt of some sort to elicit recall. Comprehension or understanding (of the concepts behind the terms, for example) represents a deeper level of learning than recognition. The ability to analyze a concept and apply your understanding of it in a new way represents further depth of learning.

Your learning strategy should enable you to know the material at a level or two deeper than mere recognition. This will help you perform well on the exams. You will know the material so thoroughly that you can go beyond the recognition-level types of questions commonly used in fact-based multiple-choice testing. You will be able to apply your knowledge to solve new problems.

### Macro and Micro Study Strategies

One strategy that can lead to deep learning includes preparing an outline that covers all the objectives and subobjectives for the particular exam you are planning to take. You should delve a bit further into the material and include a level or two of detail beyond the stated objectives and subobjectives for the exam. Then you should expand the outline by coming up with a statement of definition or a summary for each point in the outline.

An outline provides two approaches to studying. First, you can study the outline by focusing on the organization of the material. You can work your way through the points and subpoints of your outline, with the goal of learning how they relate to one another. For example, you should be sure you understand how each of the main objective areas for Exam 70-680 is similar to and different from another. Then you should do the same thing with the subobjectives; you should be sure you know which subobjectives pertain to each objective area and how they relate to one another.

Next, you can work through the outline, focusing on learning the details. You should memorize and understand terms and their definitions, facts, rules and tactics, advantages and disadvantages, and so on. In this pass through the outline, you should attempt to learn detail rather than the big picture (that is, the organizational information that you worked on in the first pass through the outline).

Research has shown that attempting to assimilate both types of information at the same time interferes with the overall learning process. If you separate your studying into these two approaches, you will perform better on the exam.

### Active Study Strategies

The process of writing down and defining objectives, subobjectives, terms, facts, and definitions promotes a more active learning strategy than merely reading the material does. In human information-processing terms, writing forces you to engage in more active encoding of the information. Simply reading over the information leads to more passive processing. Using this study strategy, you should focus on writing down the items highlighted in the book: bulleted or numbered lists, key topics, notes, cautions, and review sections, for example.

You need to determine whether you can apply the information you have learned by attempting to create examples and scenarios on your own. You should think about how or where you could apply the concepts you are learning. Again, you should write down this information to process the facts and concepts in an active fashion.

### Common-Sense Strategies

You should follow common-sense practices when studying: You should study when you are alert, reduce or eliminate distractions, and take breaks when you become fatigued.

## Pretesting Yourself

Pretesting enables you to assess how well you are learning. One of the most important aspects of learning is what has been called *meta-learning*. Meta-learning has to do with realizing when you know something well or when you need to study some more. In other words, you recognize how well or how poorly you have learned the material you are studying.

For most people, this can be difficult to assess. Memory tables, practice questions, and practice tests are useful in that they reveal objectively what you have learned and what you have not learned. You should use this information to guide review and further studying. Developmental learning takes place as you cycle through studying, assessing how well you have learned, reviewing, and assessing again until you feel you are ready to take the exam.

You might have noticed the practice exam included in this book. You should use it as part of the learning process. The ExamGear test-simulation software included on this book's CD-ROM also provides you with an excellent opportunity to assess your knowledge.

You should set a goal for your pretesting. A reasonable goal would be to score consistently in the 90% range.

## Exam Prep Tips

After you have mastered the subject matter, the final preparatory step is to understand how the exam will be presented. Make no mistake: A Microsoft Certified Technology Specialist (MCTS) exam challenges both your knowledge and your test-taking skills. Preparing for the 70-680 exam is a bit different from preparing for those old Microsoft exams. The following is a list of things that you should consider doing:

- **Combine Your Skill Sets into Solutions:** In the past, exams would test whether you knew to select the right letter of a multiple-choice answer. Today, you need to know how to resolve a problem that might involve different aspects of the material covered. For example, on exam 70-680, you could be presented with a problem that requires you to understand how to incorporate drivers in an unattended installation, as well as what errors you might see if you installed a computer that used a device driver incompatible with Windows 7. The skills themselves are simple. Being able to zero in on what caused the problem and then to resolve it for a specific situation is what you need to demonstrate. In fact, you should not only be able to select one answer, but also multiple parts of a total solution.
- **Delve into Excruciating Details:** The exam questions incorporate a great deal of information in the scenarios. Some of the information is ancillary: It will help you rule out possible issues, but not necessarily resolve the answer. Some of the information simply provides you with a greater picture, as you would have in real life. Some information is key to your solution. For example, you might be presented with a question that lists a computer's hard disk size, memory size, and detailed hardware configuration. When you delve further into the question, you realize that the hardware configuration is the problem. Other times, you will find that the hardware configuration simply eliminates one or more of the answers that you could select. For example, a portable laptop does not support dynamic disks, so if the hardware configuration is a portable laptop and one of the answers is a dynamic disk configuration, you can eliminate it. If you don't pay attention to what you can eliminate, the answer can elude you completely. Other times, the hardware configuration simply lets you know that the hardware is adequate.
- **TCP/IP Troubleshooting Is Built Right In:** Because TCP/IP is a core technology to the Windows 7 operating system, you are expected to know how to configure the operating system, how to recognize IP conflicts, and how to use the TCP/IP tools to troubleshoot the problem. Furthermore, Microsoft expects you to know how to work with the new version 6 of TCP/IP along with the traditional version 4 that has been used for many years. You should also be able to

discern between an IP problem and something wrong with the OS or hardware, or even some combination that involves IP along with some other element.

- **It's a GUI Test:** Microsoft has expanded its testing criteria into interface recognition. You should be able to recognize each dialog box, properties sheet, options, and defaults. You will be tested on how to navigate the new interface: for example, the Aero and Aero Glass desktop themes used by Windows 7, as well as the Category View shown in Control Panel. If you have reverted your Windows 7 desktop to the Windows Classic theme and you have not yet learned the new interface, you might end up selecting answers that are deliberately placed to confuse a person used to the old Windows desktop. Of course, if you know the difference between the two, you'll be able to spot the old ones and avoid them.
- **Practice with a Time Limit:** The tests have always been time restricted, but it takes more time to read and understand the scenarios now and time is a whole lot tighter. To get used to the time limits, test yourself with a timer. Know how long it takes you to read scenarios and select answers.

## Microsoft 70-680 Exam Topics

Table I-1 lists the exam topics for the Microsoft 70-680 exam. This table also lists the book parts in which each exam topic is covered.

**Table I.1** Microsoft 70-680 Exam Topics

| Chapter | Topics | 70-680 Exam Objectives Covered |
|---|---|---|
| 1 | Leading Up to Windows 7 | (n/a) |
| | Windows 7 Editions | |
| | Features of Windows 7 | |
| | A Quick Tour of Windows 7 | |
| | Patches, Hotfixes, and Service Packs | |
| 2 | Identifying Hardware Requirements | Installing, Upgrading, and Migrating to Windows 7 |
| | Performing a Clean Installation of Windows 7 as the Sole Operating System | ■ Perform a clean installation |
| | Dual-Booting Windows 7 | |
| | Other Windows 7 Installation Methods | |
| | Troubleshooting Windows 7 Installation Issues | |

**Table I.1** Microsoft 70-680 Exam Topics

| Chapter | Topics | 70-680 Exam Objectives Covered |
|---|---|---|
| 3 | Upgrading to Windows 7 from a Previous Version of Windows<br>Migrating from Windows XP<br>Upgrading from One Edition of Windows 7 to Another | Installing, Upgrading, and Migrating to Windows 7<br>■ Upgrade to Windows 7 from previous versions of Windows |
| 4 | Migrating Users from One Computer to Another<br>Migrating Users from Previous Windows Versions<br>Side by Side versus Wipe and Load | Installing, Upgrading, and Migrating to Windows 7<br>■ Migrate user profiles |
| 5 | Planning a Windows 7 Deployment<br>Capturing a System Image<br>Preparing System Images for Deployment<br>Deploying Windows System Images<br>Troubleshooting an Unattended Installation | Deploying Windows 7<br>■ Capture a system image<br>■ Prepare a system image for deployment<br>■ Deploy a system image |
| 6 | Understanding VHDs<br>Creating and Deploying VHDs<br>Offline Servicing and Updating VHDs | Deploying Windows 7<br>■ Configure a VHD |
| 7 | Installing and Configuring Device Drivers<br>Maintaining Device Drivers<br>Troubleshooting Device Drivers<br>Configuring Updates to Windows 7 | Configuring Hardware and Applications<br>■ Configure devices<br>Monitoring and Maintaining Systems That Run Windows 7<br>■ Configure updates to Windows 7 |
| 8 | Configuring Application Compatibility<br>Configuring Application Restrictions<br>Configuring Internet Explorer | Configuring Hardware and Applications<br>■ Configure application compatibility<br>■ Configure application restrictions<br>■ Configure Internet Explorer |

**Table I.1** Microsoft 70-680 Exam Topics

| Chapter | Topics | 70-680 Exam Objectives Covered |
|---|---|---|
| 9 | Understanding the TCP/IP Protocol | Configuring Network Connectivity |
| | Configuring TCP/IP Version 4 | ■ Configure IPv4 network settings |
| | Configuring TCP/IP Version 6 | ■ Configure IPv6 network settings |
| | Resolving IPv4 and IPv6 Network Connectivity Issues | |
| 10 | Configuring Networking Settings | Configuring Network Connectivity |
| | Configuring Windows Firewall | ■ Configure networking settings |
| | | ■ Configure Windows Firewall |
| 11 | Configuring Shared Resources | Configuring Access to Resources |
| | Configuring Security Permissions | ■ Configure shared resources |
| | Configuring Data Encryption | ■ Configure file and folder access |
| 12 | Configuring User Account Control | Configuring Access to Resources |
| | Configuring Authentication and Authorization | ■ Configure User Account Control (UAC) |
| | Configuring BranchCache | ■ Configure authentication and authorization |
| | | ■ Configure BranchCache |
| 13 | Configuring BitLocker and BitLocker To Go | Configuring Mobile Computing |
| | Configuring DirectAccess | ■ Configure BitLocker and BitLocker To Go |
| | Configuring Mobility Options | ■ Configure DirectAccess |
| | Configuring Power Options | ■ Configure mobility options |
| 14 | Configuring Remote Management | Configuring Network Connectivity |
| | Configuring Remote Connections | ■ Configure remote management |
| | | ■ Configuring Mobile Computing |
| | | ■ Configure remote connections |

**Table I.1** Microsoft 70-680 Exam Topics

| Chapter | Topics | 70-680 Exam Objectives Covered |
|---|---|---|
| 15 | Managing Disks and Volumes<br>Managing File System Fragmentation<br>RAID volumes<br>Configuring Removable Drive Policies | Monitoring and Maintaining Systems That Run Windows 7<br>■ Manage disks |
| 16 | Windows System Monitoring Tools<br>Configuring and Working With Event Logs<br>Managing Computer Performance<br>Configuring Additional Performance Settings | Monitoring and Maintaining Systems That Run Windows 7<br>■ Monitor systems<br>■ Configure performance settings |
| 17 | Using Windows Backup to Protect Your Data<br>Creating a System Recovery Disk | Configuring Backup and Recovery Options<br>■ Configure backup |
| 18 | Restoring Files and Folders<br>System Restore<br>Recovering Your Operating System from Backup<br>Advanced System Startup Options | Configuring Backup and Recovery Options<br>■ Configure system recovery options<br>■ Configure file recovery options |

## How This Book Is Organized

Although this book could be read cover-to-cover, it is designed to be flexible and enable you to easily move between chapters and sections of chapters to cover just the material that you need more work with. If you do intend to read all the chapters, the order in the book is an excellent sequence to use.

Chapter 1, "Introducing Windows 7," is an introductory chapter that is designed to ease readers that are new to Windows 7 into this book. It provides a broad description of the components of the Windows 7 operating system, including the major items that are new or recently updated, the Windows interface, and the Control Panel components.

The core chapters, Chapters 2 through 18, cover the following topics:

- **Chapter 2, "Installing Windows 7":** This chapter identifies hardware requirements for Windows 7 and covers installing Windows 7 on a new computer without an operating system.
- **Chapter 3, "Upgrading to Windows 7":** This chapter covers upgrading a computer running an older version of Windows to Windows 7. It discusses which upgrade paths are supported by Microsoft and which situations require a clean install of the operating system.
- **Chapter 4, "Migrating Users and Applications to Windows 7":** This chapter discusses the procedures available for getting users of older computers working on new Windows 7 computers with a minimum of delay.
- **Chapter 5, "Deploying Windows 7":** A large organization typically has hundreds to thousands of computers that must be installed with or upgraded to Windows 7. This chapter discusses methods you can use to perform such deployments in a rapid, timely fashion.
- **Chapter 6, "Configuring Virtual Hard Disks":** Virtualization is becoming increasingly prevalent in the corporate world these days, and this chapter discusses methods available for creating and using virtual hard disks.
- **Chapter 7, "Configuring Devices and Updates":** This chapter covers procedures you might use to set up and configure a variety of hardware devices, including use of the drivers that interface these devices with the Windows operating system. It also covers methods you might use to ensure that computers are kept up-to-date with the latest Microsoft patches, hotfixes, and service packs.
- **Chapter 8, "Configuring Applications and Internet Explorer":** Applications are the heart of any work done by users with Windows 7 computers. This chapter discusses methods you might use to set up applications and configure or troubleshoot options with these applications and Internet Explorer.
- **Chapter 9, "Configuring TCP/IP":** This chapter discusses versions 4 and 6 of the TCP/IP protocol together with setting up network connections and name resolution. It also discusses network connectivity problems.
- **Chapter 10, "Configuring Network and Firewall Settings":** This chapter focuses on the use of wired and wireless devices for network connections, configuring and troubleshooting firewalls, and methods for remote management of users and computers.

- **Chapter 11, "Configuring Access to Local and Shared Resources":** This chapter covers sharing of files, folders, and printers and restricting access to these resources by users and groups. It also covers the use of the Encrypting File System (EFS) to provide an extra layer of security to sensitive documents.
- **Chapter 12, "Configuring Access Controls":** This chapter covers all aspects of authenticating users to resources, including the BranchCache feature for authenticating users in remote locations. It also discusses the use of User Account Control (UAC) for enhancing the security of computers and the data they contain.
- **Chapter 13, "Configuring Mobile Computing":** This chapter covers topics of special interest to users with portable computers, including data protection, network access, file and folder access, and power options.
- **Chapter 14, "Configuring Remote Management and Remote Connections":** More and more users need to connect to corporate networks from diverse locations such as home, hotels, and client locations. This chapter covers all methods used for creating, authenticating, and troubleshooting these remote connections.
- **Chapter 15, "Disk Management":** This chapter discusses methods you would use for installing and managing disks and disk volumes and troubleshooting problems you might encounter with disks.
- **Chapter 16, "Managing and Monitoring System Performance":** This chapter focuses on computer performance and looks at factors that might cause degraded performance and steps you might take to restore performance to an acceptable level.
- **Chapter 17, "Configuring Backups":** Data on a disk volume can easily be lost if a backup is not available, and days or weeks of work could be wiped out. This chapter discusses how you can back up data so that the risk of loss is minimized.
- **Chapter 18, "Configuring System and File Recovery":** This chapter covers methods you can use to recover computers that have encountered startup and other problems. It also covers options for recovering files when corruption or other damage has occurred.

In addition to the 18 main chapters, this book includes tools to help you verify that you are prepared to take the exam. The DVD includes the glossary, practice test, and memory tables that you can work through to verify your knowledge of the subject matter.

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**This chapter covers the following subjects:**

- **Upgrading to Windows 7 from a Previous Version of Windows:** This section shows you how you can upgrade from Windows Vista to Windows 7.
- **Migrating from Windows XP:** A direct upgrade from Windows XP to Windows 7 is not possible; however, Microsoft has specified ways in which you can get from Windows XP to Windows 7. This section shows you what you must do to accomplish this task.
- **Upgrading from One Edition of Windows 7 to Another:** Certain upgrade paths are available among the various editions of Windows 7. This section identifies these upgrade paths and shows you how to perform these upgrades.

# Upgrading to Windows 7

A lot of individuals have purchased computers running Windows Vista since its rollout in early 2007, and most have been disappointed to a certain extent because of the problems encountered with this operating system, which we have already discussed in Chapter 1, "Introducing Windows 7." Microsoft has provided paths for upgrading these computers to Windows 7. Further, some users of Windows XP computers would like to take advantage of the latest and greatest of Microsoft operating systems. In this chapter, we look at which computers can be upgraded directly to Windows 7 and which computers require a complete reinstall of the operating system.

Many users are attracted by the features available in higher editions of Windows 7, such as Ultimate, but might have purchased a computer on which a lower edition of Windows 7, such as Home Premium, has been preinstalled. For those users, Microsoft has made upgrade paths available that enable them to move to a higher version of Windows 7. As with the upgrade of an earlier version of Windows, these paths enable users to retain Registry settings and account information from the lower version of Windows 7.

## "Do I Know This Already?" Quiz

The "Do I Know This Already?" quiz enables you to assess whether you should read this entire chapter or simply jump to the "Exam Preparation Tasks" section for review. If you are in doubt, read the entire chapter. Table 3-1 outlines the major headings in this chapter and the corresponding "Do I Know This Already?" quiz questions. You can find the answers in Appendix A, "Answers to the 'Do I Know This Already?' Quizzes."

**Table 3-1** "Do I Know This Already?" Foundation Topics Section-to-Question Mapping

| Foundations Topics Section | Questions Covered in This Section |
|---|---|
| Upgrading to Windows 7 from a Previous Version of Windows | 1–4 |
| Migrating from Windows XP | 5–7 |
| Upgrading from One Edition of Windows 7 to Another | 8–10 |

1. Your computer is running Windows Vista Home Premium. Which of the following can you upgrade directly to in one step, without performing a clean installation? (Choose all that apply.)
   a. Windows 7 Home Premium.
   b. Windows 7 Professional.
   c. Windows 7 Enterprise.
   d. Windows 7 Ultimate.
   e. You cannot upgrade directly to any of these operating systems; you must perform a clean install of Windows 7.

2. Your computer is running Windows XP Professional. Which of the following can you upgrade directly to in one step, without performing a clean installation? (Choose all that apply.)
   a. Windows 7 Home Premium.
   b. Windows 7 Professional.
   c. Windows 7 Enterprise.
   d. Windows 7 Ultimate.
   e. You cannot upgrade directly to any of these operating systems; you must perform a clean install of Windows 7.

3. You are preparing to upgrade your Windows Vista computer to Windows 7. Which of the following tasks should you perform before beginning the upgrade? (Choose all that apply.)
   a. Run the Windows 7 Upgrade Advisor.
   b. Run Windows 7 Anytime Upgrade.
   c. Check for any available upgrades for your computer's BIOS.
   d. Scan your computer for viruses.
   e. Remove or disable your antivirus program.
   f. Install the latest service pack for Windows Vista.

4. You insert the Windows 7 DVD-ROM in the drive of your Windows Vista computer and select the option to install Windows and to get the latest updates. You receive the Which Type of Installation Do You Want page, but the option to upgrade is disabled (grayed out). Which of the following is the most likely reason that this option is not available?
   a. You have not accepted the license agreement.
   b. Your computer is running a 32-bit version of Windows Vista, but you have inserted the 64-bit Windows 7 DVD.
   c. Your computer is running Windows Vista Home Premium, and you are attempting to upgrade to Windows 7 Professional.

**d.** Your computer is running Windows Vista Home Premium, and you are attempting to upgrade to Windows 7 Ultimate.

**5.** Your computer is running Windows XP Professional. You want to upgrade to Windows 7 Ultimate. Which of the following is the cheapest and simplest way to perform the upgrade?

**a.** Insert the Windows 7 DVD and upgrade directly to Windows 7 Ultimate.

**b.** Insert the Windows 7 DVD and upgrade to Windows 7 Professional. Then use Windows Anytime Upgrade to upgrade to Windows 7 Ultimate.

**c.** Insert the Windows Vista DVD and upgrade to Windows Vista Ultimate. Then insert the Windows 7 DVD and upgrade to Windows 7 Ultimate.

**d.** Insert the Windows 7 DVD and install a clean copy of Windows 7 Ultimate.

**6.** Your computer is running Windows XP Professional. You insert the Windows 7 DVD and choose the option to perform a clean installation of Windows 7. You then select the same partition on which the Windows XP system files are located and proceed with the upgrade. Which of the following best describes what happens to your Windows XP system files?

**a.** The Windows XP system files are overwritten with the Windows 7 system files.

**b.** The Windows XP system files are placed in a new folder named `Windows.old`.

**c.** The Windows XP system files remain in the same location in an unaltered state, and you create a dual-boot system.

**d.** The Windows XP system files are moved to a new partition, and you create a dual-boot system.

**7.** Fred has saved a large number of Word documents on your computer running Windows XP Home Edition. He installs Windows 7 Home Premium on your computer, using the same partition on which Windows XP was installed. He does not reformat this partition. What happens to these documents?

**a.** They are placed in the `Windows.old\Documents and Settings\Fred\My Documents` folder.

**b.** They remain in the `Documents and Settings\Fred\My Documents` folder.

**c.** They are placed in the `Users\Fred\My Documents` folder.

**d.** They are lost; Fred must restore them from backup.

8. Your computer runs Windows 7 Home Premium and you want to upgrade to a higher edition of Windows 7. Besides Windows 7 Ultimate, what edition can you upgrade to?
   a. Starter
   b. Home Basic
   c. Professional
   d. Enterprise

9. Your computer runs Windows 7 Home Premium and you want to upgrade to Windows 7 Ultimate. You have gone online and purchased a Windows 7 Ultimate upgrade license. What should you do?
   a. Run Windows Anytime Upgrade, enter the key code for the Ultimate upgrade, and let the upgrade proceed.
   b. Insert the Windows 7 DVD, select the option to install Windows, enter the key code for the Ultimate edition, and run the upgrade.
   c. Insert the Windows 7 DVD, select the option to repair Windows, enter the key code for the Ultimate edition, and run the upgrade.
   d. Insert the Windows 7 DVD, select the option to perform a clean install of Windows, enter the key code for the Ultimate upgrade, and let the upgrade proceed.

10. You have upgraded your computer from Windows Vista Home Premium to Windows 7 Home Premium. However, you are dissatisfied with the performance of your computer and want to revert to Windows Vista. You verify that a `Windows.old` folder exists. What should you do?
    a. Access the System and Security applet in Control Panel and select Uninstall Windows 7.
    b. Access the Programs applet in Control Panel and select Uninstall Windows 7.
    c. Use the Windows Recovery Environment and the `Windows.old` folder to recover Windows Vista.
    d. You cannot revert to Windows Vista; you must reformat the partition containing Windows 7 and perform a clean installation of Vista.

# Foundation Topics

## Upgrading to Windows 7 from a Previous Version of Windows

Upgrade paths from previous Windows versions depend on the operating system version currently installed. Table 3-2 lists the available upgrade paths for older operating systems.

Key Topic

**Table 3-2** Upgrading Older Operating Systems to Windows 7

| Operating System | Upgrade Path |
|---|---|
| Windows Vista Home Basic | Can be upgraded directly to Windows 7 Home Basic, Home Premium or Ultimate. |
| Windows Vista Home Premium | Can be upgraded directly to Windows 7 Home Premium or Ultimate. |
| Windows Vista Business | Can be upgraded directly to Windows 7 Professional, Enterprise, or Ultimate. |
| Windows Vista Enterprise | Can be upgraded directly to Windows 7 Enterprise. |
| Windows Vista Ultimate | Can be upgraded directly to Windows 7 Ultimate. |
| Windows 9x/Me<br>Windows NT 4.0 Workstation<br>Windows 2000/XP Professional | Cannot be upgraded. You need to perform a clean installation of Windows 7. |
| Non-Windows operating systems (UNIX, Linux, OS/2) | Cannot be upgraded. You need to perform a clean installation of Windows 7. |

**NOTE** Theoretically, you can upgrade Windows XP computers to Windows Vista and then upgrade to Windows 7. However, the licensing costs for such an upgrade would be higher than that of purchasing a clean copy of Windows 7; besides, such older computers might not meet Windows 7's hardware requirements.

**CAUTION** In addition to the limitations presented in Table 3-2, you cannot directly upgrade a 32-bit Windows Vista operating system to a 64-bit Windows 7 operating system. You also cannot directly upgrade a 64-bit Windows Vista operating system to a 32-bit Windows 7 operating system. Both of these scenarios require a clean installation of Windows 7, regardless of the edition being upgraded.

## Preparing a Computer to Meet Upgrade Requirements

In addition to running one of the supported versions of Windows mentioned here, a computer to be upgraded to Windows 7 must meet the hardware requirements previously described in Chapter 2, "Installing Windows 7." Furthermore, all hardware components should be found in the Windows 7 Logo Program for Hardware. Older software applications also might not be compatible with Windows 7. Such applications might need to be upgraded or replaced to work properly after you have upgraded your operating system.

### Windows 7 Upgrade Advisor

Microsoft provides an Upgrade Advisor that generates reports describing hardware and software components that might not be compatible with Windows 7. You can download and install this program free from http://www.microsoft.com/windows/windows-7/get/upgrade-advisor.aspx. This report identifies any hardware or software problems associated with the computer to be upgraded.

**NOTE** In general, nearly all computers that can run Windows Vista can also run Windows 7. However, it is still worthwhile to run the Windows 7 Upgrade Advisor to reduce the likelihood of encountering problems during or after upgrading to Windows 7. In particular, many antivirus programs that are compatible with Vista will not work with Windows 7.

Use the following procedure to obtain a system compatibility report from the computer to be upgraded:

**Step 1.** Download the Windows 7 Upgrade Advisor from the website already mentioned. Read the information provided and then click the **Download** button.

**Step 2.** On the **File Download–Security Warning** dialog box, click **Run** to run the advisor now or **Save** to save it to your hard disk and run the advisor later.

**Step 3.** If you receive a User Account Control (UAC) prompt, click **Continue**.

**Step 4.** The Windows 7 Upgrade Advisor Setup Wizard starts with a **Welcome** page as shown in Figure 3-1. Select the radio button labeled **I accept the license terms** and then click **Install**.

**Step 5.** The installation takes a minute or two to complete. When the wizard displays the **Installation Complete** message, click **Close**.

**Step 6.** The Upgrade Advisor adds an icon to your desktop. Double-click this icon to run the advisor, and then click **Continue** to accept the UAC prompt.

**Figure 3-1** You must accept the license terms to run the Windows 7 Upgrade Advisor.

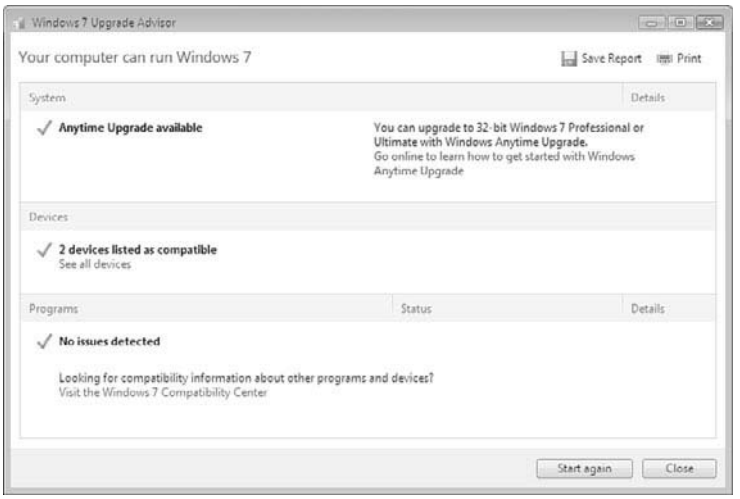
**Step 7.** The Windows 7 Upgrade Advisor displays the page shown in Figure 3-2. Ensure that you have connected and turned on all peripheral devices (such as printers) so that they can be checked. Then click **Start check**.

**Figure 3-2** The Windows 7 Upgrade Advisor displays this introductory page.

**Step 8.** The Upgrade Advisor checks the hardware and software on your computer and then displays a report window similar that shown in Figure 3-3, which indicates any issues it might have found with your computer. Click the links provided if you need additional information.

**Figure 3-3** The Windows 7 Upgrade Advisor informs you of any issues related to system, devices, and programs.

Key Topic




**NOTE** You can also run the Windows 7 Upgrade Advisor on a computer running Windows XP. The only prerequisite to run this program on a Windows XP computer is to install .NET 2.0 Framework or higher. The steps are similar to those described here, and you will receive a report similar to the one shown in Figure 3-3. Among other items, it will inform you that you need to perform a clean installation of Windows 7.

### Additional Preparatory Tasks

Before you upgrade a Windows Vista computer to Windows 7, you should perform several additional tasks, as follows:

Key Topic

- Check the BIOS manufacturer's website for any available BIOS upgrades, and upgrade the computer's BIOS to the latest available functional version if necessary. You should perform this step before a clean install or an upgrade to Windows 7.
- Scan and eliminate any viruses from the computer, using an antivirus program updated with the latest antivirus signatures. You should then remove or disable the antivirus program because it might interfere with the upgrade process. In addition, you should use a third-party program to scan for and remove malicious software (malware).
- Install any upgrade packs that might be required to render older software applications compatible with Windows 7. Consult software manufacturers for details.

- Install the latest service pack for Windows Vista (SP2 at the time of writing), plus any other updates that Microsoft has published. At the very minimum, you must have Vista SP1 installed.

### Upgrading the Computer to Windows 7

After you have checked system compatibility and performed all tasks required to prepare your computer for upgrading, you are ready to proceed. The upgrade takes place in a similar fashion to a new installation, except that answers to some questions asked by the Setup Wizard are taken from the current installation. Perform the following procedure to upgrade a Windows Vista computer to Windows 7.

**Step 1.** Insert the Windows 7 DVD-ROM.

**Step 2.** If you receive a UAC prompt, click **Continue**.

**Step 3.** When the Windows 7 screen appears, select **Install now**.

**Step 4.** Setup copies temporary files, and then the Get Important Updates for Installation page appears. If you are connected to the Internet, select the **Go online to get the latest updates for installations** option. Otherwise, select the **Do not get the latest updates for installation** option.

**Step 5.** Accept the license agreement and then click **Next**.

**Step 6.** On the Which type of installation do you want? page, shown in Figure 3-4, select **Upgrade**.

**Figure 3-4** The Which type of installation do you want? page offers you a choice between upgrading or performing a clean installation.

**Step 7.** Setup checks for compatibility issues and displays the Compatibility Report page with information about any applications or drivers that are

not supported in Windows 7 (see Figure 3-5). Note the information provided and then click **Next**. If the compatibility check does not find any issues, this page might not appear.

**Figure 3-5** The Compatibility Report screen describes items that might be incompatible with the upgrade to Windows 7.

**Step 8.** The Windows 7 upgrade proceeds in a fashion similar to that of a clean installation. It asks for only any information it cannot retrieve from the previous Windows installation.

**Step 9.** After installation has completed and the computer has rebooted, the Help protect your computer and improve Windows automatically dialog box appears (see Figure 3-6). You should select **Use recommended settings**.

**Step 10.** Ensure that the time and date are set properly and then click **Next**. Windows configures your personalized settings and then displays the Windows 7 desktop.

**Step 11.** On the Select Your Computer's Current Location dialog box, make a selection according to your network location.

**Step 12.** Windows finalizes your settings and then displays the logon screen. After you log on, Windows prepares your desktop and you are ready to use Windows 7.

**Figure 3-6** Select **Use recommended settings** to ensure optimum protection for your computer.

## Migrating from Windows XP

As you have seen, Microsoft does not provide a direct upgrade route from Windows XP to Windows 7. If your computer running Windows XP meets the hardware requirements for running Windows 7, you have two choices for upgrading to Windows 7:

Key Topic

- Upgrade your computer to Windows Vista and then upgrade from Windows Vista to Windows 7. This procedure is time-consuming, is expensive (you will need to purchase upgrade editions of both Windows Vista and Windows 7), and is consequently not recommended.
- Back up all your files and then do a clean install of Windows 7. You will need to reinstall all applications on your computer after you have installed Windows 7.

Use the following procedure to upgrade a Windows XP computer:

**Step 1.** Back up all files before starting, especially those on the partition to be used for the Windows 7 operating system files.

**Step 2.** Use one of the procedures detailed in Chapter 2 to install Windows 7 on your computer. When you are offered a choice of upgrade or clean installation, the upgrade option will be unavailable and you must choose the clean installation option.

**Step 3.** If you want to retain the Windows XP operating system files, select a different partition when offered a list of available partitions. Doing so will create a dual-boot system, as discussed in Chapter 2.

**Step 4.** If you choose the Windows XP partition, the old operating system files will be retained in a `Windows.old` folder as discussed in the next section. Do not format this partition.

**Step 5.** After you have finished the installation of Windows 7, you can migrate your settings to the new installation by following procedures covered in Chapter 4, "Migrating Users and Applications to Windows 7." You will need to reinstall all your applications on Windows 7.

**NOTE** For more information on upgrading from Windows XP to Windows 7, refer to "Installing Windows 7 on an Existing Windows XP Computer" at http://technet.microsoft.com/en-us/library/dd939987(WS.10).aspx.

**TIP** Windows 7 requires the NTFS file system. If you are performing a clean installation of Windows 7 on a computer that was running Windows XP, remember that the partition on which you install Windows 7 must be formatted with the NTFS file system. If the Windows XP computer was using a FAT or FAT32 partition, you must execute the `convert c: /fs:ntfs` command from XP before installing Windows 7.

### The **`Windows.old`** Folder

When you upgrade a previous version of Windows to Windows 7, Setup.exe stores copies of the previous operating system subfolders and files in the `Windows.old` folder so that they are available in case you need them. This also happens if you perform an in-place upgrade or reinstallation of a Windows 7 system. This folder assists you in migrating some of your settings to Windows 7 after upgrading from Windows XP. You will find the following subfolders present:

- **`Windows.old\Windows`**: Contains files from the old Windows operating system.
- **`Windows.old\Documents and Settings`**: Contains the following subfolders:
  - **`Windows.old\Documents and Settings\Administrator`**: Contains personal files stored by users of the default Windows XP Administrator account. If you did not use this account, this subfolder might not contain any personal files.
  - **`Windows.old\Documents and Settings\All Users`**: Contains any documents you might have stored in My Shared Documents (as accessed from the default Windows XP Start menu).
  - **`Windows.old\Documents and Settings\`*`Username`***: Contains personal files for the user *username*, such as documents, pictures, and Internet Explorer favorites. If you had multiple users on the Windows XP computer, you will find a separate folder labeled with the username for each user.

- **`Windows.old\Program Files`**: Contains folders for applications that were installed on Windows XP. You might be able to migrate program settings from this folder.

We look at migrating these folders and settings to your Windows 7 computer in Chapter 4. You can also use cut and paste to move their contents to the Windows 7 locations, such as the Documents folder accessed from the Windows 7 Start menu.

**NOTE** For more information on moving files and settings, refer to "How to restore your personal files after you perform a custom installation of Windows Vista or of Windows 7" at http://support.microsoft.com/kb/932912.

### Removing the `Windows.old` Folder

After you have restored files and settings from the `Windows.old` folder and are confident that you do not need anything left behind in this folder, you can use Disk Cleanup to remove this folder and reclaim its disk space. Perform the following procedure:

**Step 1.** Click **Start > All Programs >Accessories > System Tools > Disk Cleanup**. You can also type **`disk`** into the Search box in the Start menu, and then click **Disk Cleanup** from the results list.

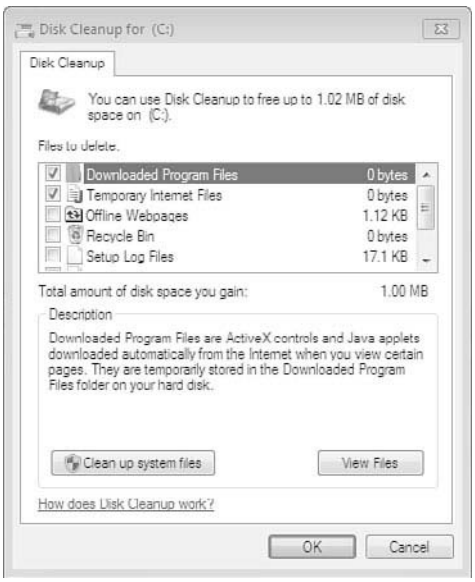
**Step 2.** If you have more than one disk partition, the Disk Cleanup: Drive Selection dialog box appears. Select the partition on which you installed Windows 7.

**Step 3.** Disk Cleanup calculates the amount of space you can free up and then displays the dialog box shown in Figure 3-7, showing you what items can be freed up. Click **Clean up system files**.

**Step 4.** If you receive a UAC prompt, click **Yes**, and if you are again asked for a partition, select the Windows 7 partition again.

**Step 5.** The Disk Cleanup dialog box reappears. Select **Previous Windows Installation**. Also select check boxes for any other files you want to delete, click **OK**, and then click **Delete Files** to confirm your action.

**Figure 3-7** The Disk Cleanup dialog box enables you to remove unnecessary files and folders.




## Upgrading from One Edition of Windows 7 to Another

Chapter 1 introduced you to the editions Microsoft has produced for Windows 7. Just as you can upgrade Windows Vista to Windows 7, you can also upgrade a lower edition of Windows 7 to a higher one. Table 3-3 summarizes the available upgrade paths.

Key Topic

**Table 3-3** Upgrading One Edition of Windows 7 to a Higher One

| Windows Edition You Are Upgrading | You Can Upgrade to This Edition |
|---|---|
| Windows 7 Home Basic or Windows 7 Starter | Windows 7 Home Premium |
| | Windows 7 Professional |
| | Windows 7 Ultimate |
| Windows 7 Home Premium | Windows 7 Professional |
| | Windows 7 Ultimate |
| Windows 7 Professional | Windows 7 Ultimate |
| Windows 7 Ultimate | Cannot be upgraded further |

### Windows Anytime Upgrade

The Windows 7 DVD-ROM contains the code for all editions of Windows 7. When you enter the license key, this tells Setup which edition of Windows 7 you are installing. As mentioned in Chapter 2, you can also install Windows 7 without entering a license key and then select the desired edition. Doing so enables you to preview the capabilities of a given edition before making a purchase decision.

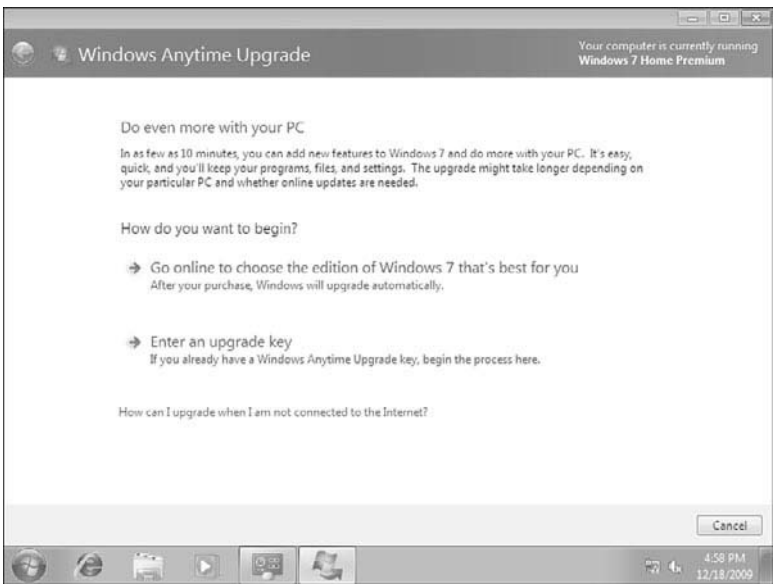
### Upgrading Windows 7

Use the following procedure to upgrade one edition of Windows 7 to a higher one:

**Step 1.** Click **Start > Control Panel > System and Security > Windows Anytime Upgrade**.

**Step 2.** As shown in Figure 3-8, Windows Anytime Upgrade enables you to compare the available editions of Windows 7 or enter an upgrade key that you have already purchased.

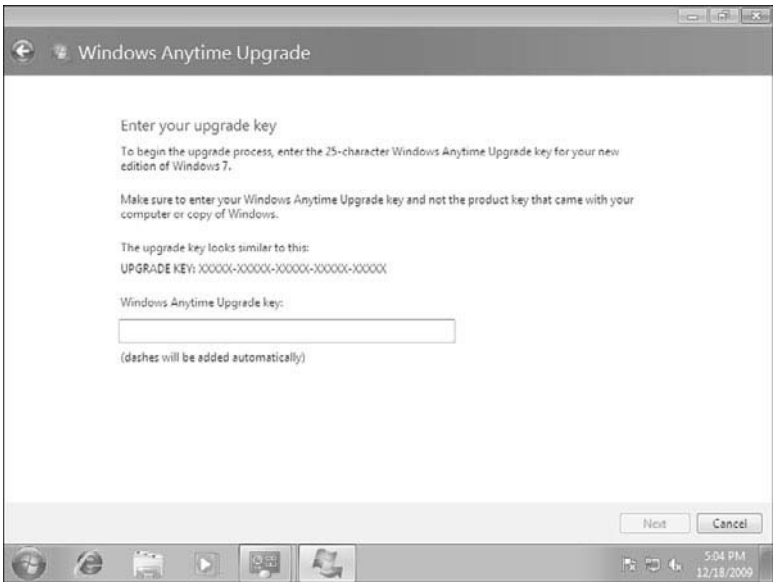
**Figure 3-8** Windows Anytime Upgrade enables you to upgrade your edition of Windows 7.




**Step 3.** If you want to review a summary of available features in different editions, click the **Go online to choose the edition of Windows 7 that's best for you** link. While online, you can purchase the license for the edition you want to upgrade to. When finished, close Internet Explorer to return to Windows Anytime Upgrade.

**Step 4.** To upgrade to a higher edition of Windows 7, click the **Enter an upgrade key** link. This takes you to the window shown in Figure 3-9.

**Figure 3-9** Windows Anytime Upgrade instructs you to enter the upgrade key you purchased to begin the upgrade.




**Step 5.** Type your upgrade key and then click **Next**.

**Step 6.** Windows verifies your upgrade key and, after a few seconds, displays a message to Please accept the license terms. Click **I Accept**.

**Step 7.** Follow the instructions provided to save work and close open programs, and then click **Upgrade**. If you receive a UAC prompt, click **Yes**.

**Step 8.** Windows Anytime Upgrade displays the screen shown in Figure 3-10 as the upgrade takes place. The process might include the downloading of updates.

**Step 9.** After 10 minutes or so, the computer restarts and the upgrade process finishes. The computer restarts a second time to finish the upgrade.

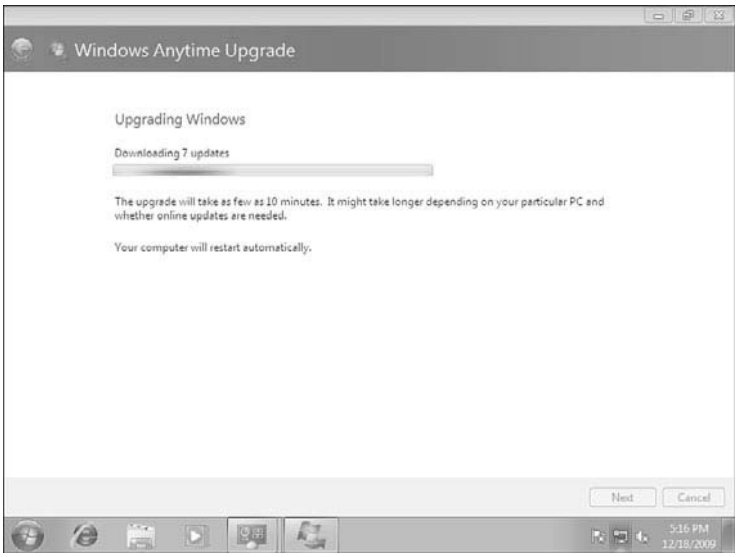
**Step 10.** After this reboot, the Windows 7 logon screen appears with the username(s) you specified while running the previous edition of Windows 7. Select an appropriate username and type the password, if configured.

**Step 11.** You are informed that the upgrade was successful. If desired, click the link provided to find out what's new. Otherwise, click **Close**.

### Uninstalling Windows 7

In some cases, you might be able to uninstall Windows 7 and revert your computer to a previous version of Windows. Microsoft supports the following scenarios for uninstalling Windows 7:

**Figure 3-10** The Windows Anytime Upgrade process includes the downloading and installation of available updates.




- **After Installing Windows 7 over an Earlier Windows Installation:** If the `Windows.old` folder already mentioned in this chapter still exists, you might be able to recover the older Windows installation by using the Windows Recovery Environment. Refer to http://support.microsoft.com/kb/971760/ for more details. We discuss the Windows Recovery Environment in Chapter 18, "Configuring System and File Recovery."
- **After Installing Windows 7 on a Computer That Did Not Have a Previous Operating System Installed:** Use the Windows XP or Vista installation media to install the desired version of Windows over the Windows 7 installation. You will lose all data from the Windows 7 installation, so be sure to back up any data of value before starting.
- **After Upgrading from Windows Vista:** Microsoft does not provide a direct uninstall path (unlike the uninstall path provided in Windows 2000). You need to use the same procedure as mentioned for installing Windows 7 on a computer without a previous operating system.
- **After Creating a Dual-Boot or Multi-Boot System:** Back up your programs, files, and settings from the Windows 7 partition. From the other operating system, delete or format the Windows 7 partition. This frees up all the disk space from this partition, allowing its use by the other operating system.

**NOTE** For more information on these methods of uninstalling Windows 7, refer to "How to Uninstall Windows 7" at http://support.microsoft.com/kb/971762.

# Exam Preparation Tasks

## Review All the Key Topics

Key Topic

Review the most important topics in the chapter, noted with the key topics icon in the outer margin of the page. Table 3-4 lists a reference of these key topics and the page numbers on which each is found.

**Table 3-4** Key Topics for Chapter 3

| Key Topic Element | Description | Page Number |
|---|---|---|
| Table 3-2 | Lists operating systems that can or cannot be upgraded to Windows 7 | 91 |
| Figure 3-3 | The Windows Upgrade Advisor warns of possible upgrade problems | 94 |
| List | Tasks you should perform before upgrading to Windows 7 | 94 |
| List | Identifies methods you can use to upgrade Windows XP to Windows 7 | 97 |
| Table 3-3 | Lists supported upgrades from one edition of Windows 7 to a higher one | 100 |

## Complete the Tables and Lists from Memory

Print a copy of Appendix C, "Memory Tables" (found on the CD), or at least the section for this chapter, and complete the tables and lists from memory. Appendix D, "Memory Tables Answer Key," also on the CD, includes completed tables and lists to check your work.

## Definitions of Key Terms

Define the following key terms from this chapter, and check your answers in the glossary.

Windows Anytime Upgrade, Windows Upgrade Advisor, Disk Cleanup, `Windows.old`

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# Index

## A


**accelerators, 271, 287–288**

**account lockout, unlocking, 460**

**ACEs (access control entries), 407**

**ACLs (access control lists), 407**

**ACT (Application Compatibility Toolkit), 251–252**

**Action Center, 230, 635**

**add-ons**

accelerators, 287–288

configuring in Internet Explorer, 285–287

**Admin Approval Mode, 438**

**advanced power settings, configuring, 512–514**

**advanced security auditing, 549–550**

**Advanced Security snap-in (Windows Firewall), 368–371**

notifications, configuring, 376

rules, configuring, 371–372, 375–376

**Advanced tab settings (Internet Explorer), configuring, 283**

**Advanced Tools dialog box, 598**

**Aero Glass, 26**

**AIK (Windows Automated Installation Kit), preparing USMT, 113–115**

**answer files, 137**

configuration passes, 138

creating, 139–144

offline VHDs, servicing, 208

Unattend.xml, 133

unattended installations

*performing, 144–145, 152*

*troubleshooting, 180–182*

**answers to practice exam, 747–782**

**anycast addresses, 317**

**APIPA (Automatic Private IP Addressing), configuring, 315–316**

**Application Compatibility Mode, configuring, 248**

**application control policies, 257, 262–269**

**application priority, configuring, 612–613**

**application prompts, UAC, 442–443**

**applications**

compatibility

*ACT, 251–252*

*shims, 250–251*

*Windows XP Mode, 253–254*

inserting into system images, 154–155

restrictions

*application control policies, 262–269*

*configuring, 257–258*

*software restriction policies, 258–261*

**AppLocker, 262**

policies, configuring, 263–265

rules, creating, 265–269

**ARP (Address Resolution Protocol), troubleshooting TCP/IP, 326**
**attended installations**
performing, 59–61, 64
troubleshooting, 72–81
**attributes, 845, 861**
**authentication, 449**
account lockout, unlocking, 460
DirectAccess, configuring, 496
password policies, configuring, 458–460
passwords, resetting, 464–466
remote access authentication protocols, 541-543
smart cards, 456–458
**authorization, 449**
**automated deployment, performing with WDS, 177–179**
**automated image capture, 148–149**

# B

**backing up**
credentials, 453–454
data, 643
EFS keys, 426–427
**Backup and Restore applet**
restoring data, 665–668, 672–674
*user profiles, 669*
*with shadow copies, 670–671*
**backups**
managing, 650, 653
performing with wbadmin command, 655
scheduling, 653–654
**Balanced power plan, 511**
**baselines, 619**
**basic disks, 566-568**
converting to dynamic disks, 573
partitions, creating, 568–572
**battery meter, 515**
**BitLocker, 479–480**
DRAs, 489–491
enabling, 481–484
managing, 484–485
policies, 486
*for fixed data drives, 488–489*
*for operating system drives, 487–488*
preparing for use, 480
**BitLocker Drive Encryption, 422**
**BitLocker To Go, 485–486**
**boot logging, 685**
**booting VHDs, 203–204**
**BranchCache**
certificate management, 472
configuring, 466–470
network infrastructure requirements, 471
using across VPNs, 471
**BSOD (blue screen of death), troubleshooting, 83–84**
**built–in local groups, 461**

# C

**CD as source for Windows 7 installation files, 67**
**Certificate Manager, 454–456**
**certificates, 291–293**
managing with BranchCache, 472
**Change Permission (special access permission), 845, 860**
**checking for updates, 240**

**CIDR (classless inter–domain routing), 306–307**
**clients (DirectAccess), configuring, 495–496**
**cloning, 182**
**clusters, 578**
**cmdlet (command-let), 537**
**collecting events, 605**
**colon-hexadecimal addressing scheme, 316**
**compatibility**
Application Compatibility Mode, configuring, 248
Internet Explorer, issues with, 255–257
IPv4 with IPv6, 318–319
shims
*ACT, 251–252*
*implementing, 250–251*
Windows XP Mode, 253–254
**Compatibility View feature (Internet Explorer), configuring, 271–272**
**components of Windows 7 editions, 21–23**
**compression, incompatibility with data encryption, 425**
**Computer Management snap-in, 390**
**Computer Management tool, 565**
**configuration passes, 138**
**configuring**
Application Compatibility Mode, 248
application priority, 612–613
application restrictions, 257–258
*application control policies, 262–269*
*software restriction policies, 258–261*
BranchCache, 466–470
certificates, 456
data encryption, 421
*backing up EFS keys, 426–427*
*disk preparation, 424*
*EFS, explained, 422–423*
*file decryption, 427*
*file encryption, 425–426*
*recovery agents, 427–428*
device drivers, 227
device properties, 222
dial-up connections, 552–554
DirectAccess, 492
*authentication, 496*
*clients, 495–496*
*connection process, 494–495*
*network infrastructure requirements, 493–494*
dual-booting on Windows 7, 66
event log subscriptions, 605–607
hard drive cache, 628–630
Internet Explorer, 270
*accelerators, 287–288*
*add-ons, 285–287*
*Advanced tab settings, 283*
*Compatibility View feature, 271–272*
*InPrivate Browsing, 288–291*
*search providers, 283–285*
*security settings, 273–282*
Location Aware Printing, 360–361
mobility options, Control Panel, 497
*Offline Files feature, 499–508*
*Windows Mobility Center, 498–499*
network performance, 636
network settings, 345–346
*existing networks, connecting to, 347*
*sharing options, 348–352*
password policies, 458–460

power options, 508–509
*advanced settings*, *512–514*
*Group Policy*, *515–517*
*power plans*, *510–511*
processor scheduling, 634
Remote Assistance settings, 532–535
remote desktop connection
*nondefault port*, *selecting*, *529–530*
*server side*, *528–529*
removable drive policies, 587–588
security permissions, 406
*copying files/folders*, *418–419*
*dragging files/folders*, *420*
*effective permissions*, *416–418*
*file and folder permissions*, *407–416*
*guidelines for*, *420–421*
*moving files/folders*, *419–420*
services, 637
shared resources
*folder virtualization*, *399–400*
*homegroup settings*, *403–406*
*sharing printers*, *401*
*with Network and Sharing Center*, *389–398*
smart card policies, 457–458
Start menu properties, 32
System Restore properties, 674
task priority, 633
Taskbar properties, 33–34
TCP/IP
*APIPA*, *315–316*
*IPv4*, *303–308*, *313–315*
*IPv6*, *316–317*, *322–323*
*Network and Sharing Center*, *309–310*, *313*
UAC, 444–449
updates to Windows 7, 232–235
user rights, 461–463
VHDs, tools, 193
WDS, 175–177
Windows Backup, 646, 649
Windows Firewall, 361–364
*Advanced Security snap-in*, *368–376*
Windows Update policies, 236–239
Windows XP Mode, 254
wireless network profiles, 359
**connecting**
to corporate networks with DirectAccess, 494–495
to existing networks, 308, 347
to IPv6 version networks, 319–321
to wireless networks, 352–354, 357
**connectivity**
dial-up, configuring, 552–554
remote access, 541
*authentication protocols*, *541–543*
*security*, *543–544*
troubleshooting, 324–325, 331–334
VPN connections
*establishing*, *544–549*
*security*, *547–548*
**Content tab settings (Internet Explorer), configuring, 282**
**Control Panel**
features, 35–43
mobility options, configuring, 497
Power Options applet, 508–509
*advanced settings*, *512–514*
*battery meter*, *515*
*power plans*, *510–511*
**control sets, 682**
**controlling logon, 450**
**Convert.exe utility, 424**
**converting basic disks to dynamic, 573**

**cookies, handling in Internet Explorer, 279–281**
**copying files/folders, NTFS permissions, 418–419**
**CPU tab (Resource Monitor), 614**
**creating**
answer files, 139–144
data collector sets, 619–622
mirrored volumes, 585–586
partitions, 568–572
RAID-5 volumes, 585–586
spanned volumes, 585
striped volumes, 583–586
system image, 655–656
system recovery disk, 657
tasks from events, 603
VHDs
*native-boot, 201–203*
*with Disk Management, 194–198*
WIM files, 148
**Credential Manager, 450–454**
**custom Windows image, preparing, 200**
**customized images, manual deployment, 179–180**
**customizing**
Event Viewer, 602–603
images, 168–169
power plans, 514

# D

**data collector sets, creating, 619–622**
**data encryption**
configuring, 421
*backing up EFS keys, 426–427*
*disk preparation, 424*
*EFS, explained, 422–423*
*file decryption, 427*
*file encryption, 425–426*
*recovery agents, 427–428*
incompatibility with compression, 425
**debugging mode, 685**
**decrypting files, 427**
**defrag command, 578–581**
**deleting logical drives, 572**
**denying permissions, 417**
**DEP (Data Execution Prevention), 597**
**deploying**
VHDs, 199–201, 203
Windows 7, 132
*answer files, 137–145, 152*
*automated image capture, 148–149*
*customized images, manually deploying, 179–180*
*DISM, 151–157*
*high-touch with retail media, 159*
*high-touch with standard image, 159*
*images, customizing, 133, 168–169*
*Lite-Touch with High-Volume Deployment strategy, 160*
*manual image capture, 150–151*
*Microsoft Deployment Toolkit 2010, 161–167*
*OCSetup.exe, 157–158*
*Sysprep, 145–148*
*WDS, 174–179*
*Windows PE, 134–137*
*Zero-Touch with High-Volume Deployment strategy, 160–161*
**deployment points, 173**
**deployment shares**
adding images to, 165–167
creating with MDT 2010, 163–165

**device drivers**
configuring, 227
driver signing, 224
installing, 216–217, 227
rolling back, 675
**Device Manager, 219–223**
**Device Stage, 217**
**dial-up connections, configuring, 552–554**
**dial-up networking, remote access, 541**
authentication protocols, 541–543
security, 543–544
**differencing VHD, 192**
**digital signatures, checking for, 225–227**
**DirectAccess**
authentication, configuring, 496
clients, configuring, 495–496
configuring, 492
connection process, 494–495
network infrastructure requirements
*IPv6, 493*
*NAP, 494*
**disabling**
drivers, 223
IPv6, 323
**discovery volume, 485**
**Disk Defragmenter, 578–581**
**disk errors, troubleshooting, 576–578, 581**
**Disk Management tool**
basic disks
*converting to dynamic disks, 573*
*partitions, creating, 568–572*
dynamic disks, 574–576
VHDs
*creating, 194–198*
*mounting, 198–199*
**disk performance, optimizing, 626–628**
**disk preparation for EFS, 424**
**Disk tab (Resource Monitor), 615**
**Diskpart command, 586**
**DISM (Deployment Image Servicing and Management), 151, 205**
applications, inserting into system images, 154–155
drivers, inserting into system images, 156
images, mounting, 153–154
technologies, 152–153
updates, inserting into system images, 157
**Distributed Cache mode (BranchCache), 467**
**distributing images to multiple computers, 173**
**DLLs, 225**
**Domain Profile, 369**
**domains, homegroups and, 404**
**downloading MDT 2010, 162**
**dragging files/folders, NTFS permissions, 420**
**DRAs (data recovery agents), 489–491**
**driver signing, 224**
**driver store, 224**
**drivers**
configuring, 227
conflicts, troubleshooting, 228–232
digital signatures, checking for, 225–227
disabling, 223
inserting into system images, 156
installing, 216–217

rolling back, 675
uninstalling, 223
updating, 218
**dual-booting Windows 7, 65–66**
**dynamic disks, 567, 574–576**
**dynamic IPv4 addressing, CIDR, 307–308**
**dynamic VHD, 192**

# E

**editions of Windows 7, 20–23**
**effective permissions, 416–418**
**EFS (Encrypting File System), 422–423**
backing up EFS keys, 426–427
disk preparation for, 424
file decryption methods, 427
file encryption methods, 425–426
recovery agents, 427–428
**elevated privileges, 443**
**enabling**
BitLocker, 481–484
BitLocker To Go, 486
InPrivate Filtering, 289
media streaming, 398
**Encrypting File System (EFS), 422–423**
backing up EFS keys, 426–427
disk preparation for, 424
file decryption methods, 427
file encryption methods, 425–426
recovery agents, 427–428
**encryption**
BitLocker, 479
*DRAs, 489–491*
*enabling, 481–484*
*managing, 484–485*
*policies, 486–489*
*preparing for use, 480*
BitLocker To Go, 485–486
**establishing**
remote desktop connection, 525–527
VPN connections, 544–549
**Event Subscriptions, 604–607**
**Event Viewer**
customizing, 602–603
event tasks, creating, 603
logs, viewing, 601–602
Subscriptions, 604–607
**events, collecting/forwarding, 605**
**existing networks, connecting to, 347**

# F

**failed installation, troubleshooting, 82–84**
**FAT16, 56, 578**
**FAT32, 578**
**features**
adding to Windows images, 168–169
of Control Panel, 35–43
of UAC, 439–440
of Windows 7
*productivity improvements, 23–27*
*security improvements, 27–29*
**file system requirements, identifying for Window 7 installation, 56–57**
**files**
decrypting, 427
encrypting, 425–426

NTFS permissions
*copying, 418–419*
*dragging, 420*
*moving, 419–420*
*sharing, 407–416*
sharing, 390–392
*effective permissions, 416–418*
*public folder sharing, 396*
**fixed data drive policies (BitLocker), 488–489**
**fixed VHD, 192**
**Flip 3D, 25**
**folder virtualization, 399–400**
**folders**
copying, NTFS permissions, 418–419
dragging, NTFS permissions, 420
moving, NTFS permissions, 419–420
sharing, 390–391
*effective permissions, 416–418*
*guidelines for, 420–421*
*mapping network drives, 396–397*
*methods of, 389*
*modifying shared folder properties, 392–395*
*net share command, 397–398*
*NTFS file and folder permissions, 407–416*
*password-protected sharing, 398*
**forwarding events, 605**
**FTP (File Transfer Protocol), troubleshooting TCP/IP, 326**

# G

**GPT (GUID Partition Table), 567**
**Group Policy**
advanced security auditing, 549–550
InPrivate Browsing policies, configuring, 290–291
power management, configuring, 515–517
removable drive policies, configuring, 587–588
Windows Firewall, configuring, 376–378

# H

**hard drives**
cache, configuring, 628–630
defragmenting, 578–581
error checking, 581
**hardware requirements, identifying for Window 7 installation, 51–54**
**hash, 260**
**hibernation, 509**
**High Performance power plan, 511**
**high-touch with retail media deployment strategy, 159**
**high-touch with standard image deployment strategy, 159**
**history of Windows, 17–20**
**homegroups, configuring, 403–406**
**Hosted Cache mode (BranchCache), 467**
**hotfixes, 44**

# I

**ICS (Internet Connection Sharing), configuring sharing options, 349–352**
**image files, 133**
**images**
adding to deployment share, 165–167
automated capture, 148–149

cloning, 182
deploying
*high-touch with retail media, 159*
*high-touch with standard image, 159*
*Lite-Touch, High-Volume Deployment, 160*
*Zero-Touch, High-Volume Deployment, 160–161*
DISM, 151
*applications, inserting into system images, 154–155*
*drivers, inserting into system images, 156*
*mounting images, 153–154*
*updates, inserting into system images, 157*
distributing to multiple computers, 173
features, adding, 168–169
manual capture, 150–151
preparing for capture with Sysprep, 146–148
system components, inserting into system images, 157–158
WIM files, creating, 148

**ImageX**
automated image capture, 148–149
WIM files, creating, 148

**implementing shims, 250–252**

**import address table, 250**

**incoming calls, receiving, 554–555**

**increasing size of volumes, 575**

**inheritance, NTFS permissions, 414–415**

**InPrivate Browsing mode (Internet Explorer), 288–291**

**InPrivate Filtering, enabling, 289**

**inserting**
applications into system images, 154–155
drivers into system images, 156
system components into system images, 157–158
updates into system images, 157

**installing**
device drivers, 216–217, 227
MDT 2010, 162
Windows 7
*attended installation, 59–61, 64*
*file system requirements, identifying, 56–57*
*from CD, 67*
*from network share, 68*
*from USB portable drive, 67*
*from WDS, 68–70*
*hardware requirements, identifying, 51–54*
*network requirements, identifying, 55–56*
*troubleshooting installation issues, 70–76, 79–84*
*WPA, 57–58*

**integrity levels, 440**

**Internet Explorer**
accelerators, configuring, 287–288
add-ons, configuring, 285–287
Advanced tab settings, configuring, 283
certificates, 291–293
compatibility issues, 255–257
Compatibility View feature, configuring, 271–272
configuring, 270–271
InPrivate Browsing mode, 288–291
search providers, configuring, 283–285
security settings, configuring, 273–282

**Internet Explorer Compatibility Test Tool, 255–257**

**ipconfig, troubleshooting TCP/IP, 327–328**

**IPv4, 303**
connectivity, troubleshooting, 331–334
dynamic addressing, 307–308
name resolution, configuring, 313–315
static addressing, 304–305
*CIDR, 306–307*
*private IPv4 networks, 307*
**IPv6, 302**
address syntax, 316–317
as requirement for DirectAccess, 493
compatibility with IPv4, 318–319
connectivity, troubleshooting, 331–334
disabling, 323
LLMNR, 323
name resolution, configuring, 322–323
networks, connecting to, 319–321

# J–K–L

**joining homegroups, 403**
**jump lists, 30**

**Last Known Good Configuration, 682–683**
**libraries, 25, 34–35, 399–400**
**Lite-Touch, High-Volume Deployment strategy, 160**
**LLMNR (Link-Local Multicast Name Resolution), 323**
**Location Aware Printing, configuring, 360–361**
**logical drives, deleting, 572**
**logman command, 628**
**logon, controlling, 450**
**logs, viewing in Event Viewer, 601–602**

# M

**managing**
backups, 650, 653
BitLocker, 484–485
certificates, 454–456, 472
credentials, 451–452
driver signing, 224
RAID volumes, 587
VHDs, tools, 193
wireless network connections, 357–359
wireless network profiles, 359
**manual deployment of customized images, 179–180**
**manual image capture, 150–151**
**mapping network drives, 396–397**
**MBR (Master Boot Record), 567**
**MDT (Microsoft Deployment Toolkit) 2010, 161**
deployment points, 173
deployment shares, creating, 163–165
downloading, 162
images
*adding to deployment share, 165–167*
*distributing to multiple computers, 173*
task sequences, 169, 172
**media streaming, enabling, 398**
**memory performance, optimizing, 623–625**
**Memory tab (Resource Monitor), 615**
**migrating users, 111–115**
from previous Windows versions, 120
USMT, 121–122
side by side migration, 123
wipe and load, 124
**mirrored volumes, creating, 585–586**

**mobility options**
in Control Panel, configuring, 497
in Windows Mobility Center, configuring, 498–499
Offline Files feature, configuring, 499–508
**mounting**
images with DISM, 153–154
VHDs, 198–199
**moving files/folders, NTFS permissions, 419–420**
**multicast addresses, 317**
**multifactor authentication, 457**
**multiple firewall profiles, configuring, 369–371**

# N

**name resolution (IPv6), configuring, 322–323**
**NAP (Network Access Protection), 550**
as requirement for DirectAccess, 494
enforcement options, 552
**native-boot VHDs**
adding to older computer, 205
creating, 201–203
**nbstat utility, troubleshooting TCP/IP, 328**
**net share command, 397–398**
**netstat utility, troubleshooting TCP/IP, 328**
**Network and Sharing Center**
advanced sharing settings, 389
*enabling media streaming, 398*
*mapping network drives, 396–397*
*modifying shared folder properties, 392–395*
*net share command, 397–398*
*password-protected sharing, 398*
*public folder sharing, 396*
*sharing files/folders/printers, 390–392*
existing networks, connecting to, 347
network settings, configuring, 345–346
sharing options, configuring, 348–349
TCP/IP connections, configuring, 309–310, 313
wireless network connections, managing, 357–359
**network diagnostic tools, troubleshooting connectivity, 324–325**
**Network Discovery, 332**
**network drives, mapping, 396–397**
**network infrastructure requirements**
for BranchCache, 471
for DirectAccess
*IPv6, 493*
*NAP, 494*
**network performance, configuring, 636**
**network requirements, identifying for Window 7 installation, 55–56**
**network settings**
configuring, 345–346
sharing options, configuring, 348–352
wireless networking, 354
*connections, managing, 358–359*
*profiles, managing, 359*
*security, 357*
**network share as source for Windows 7 installation files, 68**
**Network tab (Resource Monitor), 615**
**networks, connecting to, 308**
**notifications (Windows Firewall), configuring, 376**
**nslookup utility, troubleshooting TCP/IP, 329**

**NTFS permissions, 578**
configuring, 406
*copying files/folders, 418–419*
*dragging files/folders, 420*
*effective permissions, 416–418*
*file and folder permissions, 407–416*
*guidelines for, 420–421*
*moving files/folders, 419–420*

# O

**OCSetup.exe, 157–158**
**Offline Files feature, configuring mobility options, 499–508**
**offline servicing, 205–208**
**online support, Remote Assistance, 530–535**
**operating systems**
dual-booting, 65–66
recovering from backup, 676–678
**optimizing**
disk performance, 626–628
memory, 623–625
processor utilization, 626
**ownership in NTFS file and folder permissions, 414–416**

# P-Q

**packages, adding to system images, 154–155**
**partitions**
creating, 568–572
deleting, 572
shrinking, 570
**password policies, configuring, 458–460**
**password-protected sharing, 398**
**passwords, resetting, 464–466**
**patches, 44**
**pathping utility, troubleshooting TCP/IP, 330**
**performance**
hard drive cache, configuring, 628-630
troubleshooting, 636
**Performance Monitor, 615–618**
**performance monitoring tools**
data collector sets, creating, 619–622
Performance Monitor, 615–618
Reliability Monitor, 608–609
Resource Monitor
*CPU tab, 614*
*Disk tab, 615*
*Memory tab, 615*
*Network tab, 615*
Task Manager, 610–613
**permissions**
configuring, 406
denying, 417
driver installation, 227
effective permissions, 416–418
shared folders, modifying, 392–395
shared printers, 401
**ping utility, troubleshooting TCP/IP, 329**
**pinned items, 31**
**PnP, 216**
**policies**
AppLocker, configuring, 263–265
BitLocker, 486
*for fixed data drives, 488–489*
*for operating system drives, 487–488*
for Offline Files feature, configuring, 506–507
UAC, 446–449

Windows Update, configuring, 236–239
**Pop-up Blocker (Internet Explorer), configuring, 281–282**
**power options**
advanced settings, configuring, 512–514
battery meter, 515
configuring, 508–511, 515–517
**power plans, 510–511, 514**
**Power Saver power plan, 511**
**practice exam, 689–744**
answers, 747–782
**preparing**
computer for BitLocker, 480
custom Windows image, 200
system for image capture, 146–148
USMT, 113–115
**printers**
Location Aware Printing, configuring, 360–361
sharing, 390–392, 401
**priority of tasks, configuring, 633**
**Privacy tab settings (Internet Explorer), configuring, 279–281**
**private IPv4 networks, 307**
**Private Profile, 369**
**processor scheduling, configuring, 634**
**processor utilization, optimizing, 626**
**productivity improvements to Windows 7, 23–27**
**profiles (Windows Firewall), configuring, 369–371**
**programs, running with elevated privileges, 443**
**properties of shared folders, modifying, 392–395**
**Protected Mode (Internet Explorer), configuring, 276–277**
**public folder sharing, 389, 396**
**public key cryptography, 422**
**Public Profile, 369**

# R

**RAID, 582**
mirrored volumes, creating, 585–586
RAID-5 volumes, creating, 585–586
spanned volumes, creating, 585
striped volumes, creating, 583–586
volume management, 587
**RD Gateway (Remote Desktop Gateway), 555–558**
**RDP (Remote Desktop Protocol), remote desktop connection**
establishing, 525–527
nondefault port, selecting, 529–530
server side, configuring, 528–529
**receiving incoming calls, 554–555**
**recovering**
data, 665
*shadow copies, 670–671*
*user profiles, 669*
*System Restore, 672–674*
operating system from backup, 676–678
**recovery agents (EFS), 427–428**
**Registry, Last Known Good Configuration, 682–683**
**Reliability Monitor, 608–609**
**relog command, 628**
**remote access**
authentication protocols, 541–543
dial-up connections, configuring, 552–554
incoming calls, receiving, 554–555
RD Gateway, 555–558
security, 543–544, 550–552

VPN connections
*establishing*, *544–549*
*security*, *547–548*
**Remote Assistance, 530**
configuring, 532–535
shadow sessions, 534
**remote desktop connection**
establishing, 525–527
nondefault port, selecting, 529–530
server side, configuring, 528–529
**removable drive policies, configuring, 587–588**
**requirements for upgrading to Windows 7, 92–96**
**resetting passwords, 464–466**
**resolving driver conflicts, 228–232**
**Resource Monitor, 613**
CPU tab, 614
Disk tab, 615
Memory tab, 615
Network tab, 615
**restoring, 643**
credentials, 453–454
data, 665–668
*user profiles*, *669*
*shadow copies*, *670–671*
*System Restore*, *672–674*
operating system from backup, 676–678
**restrictions for applications**
application control policies, 262–269
configuring, 257–258
software restriction policies, 258–261
**reviewing update history, 239**
**rolling back drivers, 675**
**rules**
AppLocker, creating, 265–269
Windows Firewall, configuring, 371–376

# S

**Safe Mode, 684–685**
**scheduling**
backups, 653–654
synchronization activities, 505
**search providers, configuring in Internet Explorer, 283–285**
**secure desktop mode, 440**
**security**
advanced security auditing, 549–550
for wireless networks, 357
improvements to Windows 7, 27–29
Internet Explorer, certificates, 291–293
NAP, 550–552
permissions, configuring, 406
*copying files/folders*, *418–419*
*dragging files/folders*, *420*
*effective permissions*, *416*, *418*
*file and folder permissions*, *407–416*
*guidelines for*, *420–421*
*moving files/folders*, *419–420*
remote access, 543–544
VPN connections, 547–548
Windows Firewall
*configuring*, *361–376*
*Group Policy*, *376–378*
**security settings (Internet Explorer), configuring, 273–275**
Content tab settings, 282
Pop-up Blocker, 281–282
Privacy tab settings, 279–281

Protected Mode, 276–277
SmartScreen Filter, 277–279
**service packs, 44**
**Services snap-in, 637**
**shadow copies, recovering data, 670–671**
**shadow sessions, 534**
**shared resources, configuring**
folder virtualization, 399–400
homegroup settings, 403–406
Network and Sharing Center, 389–398
sharing printers, 401
**sharing**
files, 390–392
*effective permissions, 416–418*
*NTFS file and folder permissions, 407–416*
*public folder sharing, 396*
folders, 390–392
*effective permissions, 416–418*
*guidelines for, 420–421*
*mapping network drives, 396–397*
*methods for, 389*
*modifying shared folder properties, 392–395*
*net share command, 397–398*
*NTFS file and folder permissions, 407–416*
*password-protected sharing, 398*
network options, configuring, 348–352
printers, 390–392, 401
**shims**
ACT, 251–252
implementing, 250–251
**shrinking partitions, 570**
**SHVs (system health validators), 551**
**side by side migration, 123**
**SIM (Windows System Image Manager), 137**
answer files
*creating, 139–144*
*unattended installations, performing, 144–145, 152*
**site-local IPv6 addresses, 318**
**smart cards, 456–458**
**SmartScreen Filter (Internet Explorer), configuring, 277–279**
**software compatibility, verifying for Windows 7 installation, 53–54**
**software restriction policies, 257–261**
**spanned volumes, creating, 585**
**special access permissions (NTFS), 410–414**
**standard folder sharing, 389**
**Start menu, 30–32**
**static IPv4 addressing, 304–305**
CIDR, 306–307
private IPv4 networks, 307
**stopped installation, troubleshooting, 84**
**streaming media, enabling, 398**
**striped volumes, creating, 583–586**
**subnet masks, 305**
**Subscriptions (Event Viewer), 604–607**
**Sync Center (Offline Files feature), configuring mobility options, 503–505**
**synchronization, scheduling, 505**
**Sysprep, 145**
installations, troubleshooting, 182–183
optional switches, 146
preparing a system for capture, 146–148
**system components, inserting into system images, 157–158**

**System Configuration Utility, 631–633**
**system images**
creating, 655–656
deploying
*high-touch with retail media, 159*
*high-touch with standard image, 159*
*Lite-Touch, High-Volume Deployment, 160*
*Zero-Touch, High-Volume Deployment, 160–161*
**system recovery disk, creating, 657**
**System Repair Disk, 679–681**
**System Restore, recovering data, 672–674**

# T

**Task Manager, 610–613**
**task sequences, 169, 172**
**Taskbar, 30–31**
configuring, 33–34
toolbars, configuring, 34
**tasks**
creating from events, 603
priority, configuring, 633
**TCP/IP, 301–303**
APIPA, configuring, 315–316
configuring with Network and Sharing Center, 309–310
IPv4
*configuring, 304–308*
*name resolution, configuring, 313–315*
IPv6
*configuring, 316–317*
*LLMNR, 323*
*name resolution, configuring, 322-323*
*networks, connecting to, 319–321*
troubleshooting
*with ARP, 326*
*with FTP, 326*
*with ipconfig, 327–328*
**TPM (Trusted Platform Module) version 1.2, 479–480**
**tracert utility, troubleshooting TCP/IP, 330**
**transferring files to new computer, 115–117, 120**
**transparent caching for Offline Files feature, configuring, 508**
**troubleshooting**
backups, 650, 653
connectivity, 324–325, 331–334
disk errors, 576–578
disk performance, 626–628
driver conflicts, 228–232
memory performance, 623–625
performance issues, 636
processor utilization, 626
RAID volumes, 587
Sysprep installations, 182–183
TCP/IP
*with ARP, 326*
*with FTP, 326*
*with ipconfig, 327–328*
Windows 7 installation issues, 70–71
*attended installation, 72–81*
*failed installation, 82–84*
*stopped installation, 84*
*unattended installations, answer files, 180–182*
**typeperf command, 628**

# U

**UAC (User Access Control), 438**
application prompts, 442–443
configuring, 444–445
features, 439–440
policies, configuring, 446–449
programs, running with elevated privileges, 443
**Unattend.xml answer file, 133**
**unattended installations**
answer files, troubleshooting, 180–182
performing, 144–145, 152
**unicast addresses, 317**
**uninstalling**
drivers, 223
Windows 7, 102–103
**unlocking accounts, 460**
**update history, reviewing, 239**
**updates**
checking for, 240
configuring, 232–235
inserting into system images, 157
**updating drivers, 218**
**upgrading**
to Windows 7, 91, 100–102
*from Windows XP, 97–99*
*requirements, 92–96*
Windows image to higher edition, 208
**USB portable drive as source for Windows 7 installation files, 67**
**user profiles, restoring, 669**
**user rights, configuring, 461–463**
**users, migrating from previous Windows versions, 120**
**USMT (User State Migration Tool)**
preparing to run, 113–115
users, migrating, 111–115, 121–122

# V

**VHD Boot, 199**
**VHDs (virtual hard disks), 191–192**
booting, 203–204
creating, 194–198
deploying, 199–203
managing tools, 193
mounting, 198–199
native-boot
*adding to older computer, 205*
*creating, 201–203*
offline servicing, 205–208
**viewing effective permissions, 417**
**virtual folders, 399–400**
**volumes, creating, 575–576**
**VPN connections**
security, 547–548
establishing, 544–549
**VPN Reconnect, 548–549**

# W

**wbadmin command performing backups, 655**
**WDS (Windows Deployment Services), 174**
as source for Windows 7 installation files, 68–70
automatic deployment, performing, 177–179
configuring, 175–177
**WIM files, creating, 148**

**Windows operating systems, history of, 17–20**
**Windows 7**
dual-booting, 65–66
editions, 20–23
installation issues, troubleshooting, 70–71
*attended installation*, *72–81*
*failed installation*, *82–84*
*stopped installation*, *84*
installing
*attended installation*, *59–61*, *64*
*file system requirements*, *identifying*, *56–57*
*hardware requirements*, *identifying*, *51–54*
*network requirements*, *identifying*, *55–56*
*from network share*, *68*
*from USB portable drive*, *67*
*from WDS*, *68–70*
*WPA*, *57–58*
productivity improvements, 23–27
security improvements, 27–29
upgrading to higher edition, 100–102
uninstalling, 102–103
upgrading to from previous version, 91, 97–99
**Windows 7 Rollback, resolving driver issues, 232**
**Windows Backup, configuring, 646, 649**
**Windows Easy Transfer, 115–122**
**Windows Experience Index, 596**
**Windows Firewall**
Advanced Security snap–in, configuring, 368–376
configuring, 361–364
Group Policy, 376–378
**Windows Mobility Center, 498–499**
**Windows PE, 134–137**
**Windows PowerShell, 537–538**
**Windows ReadyBoost, 629**
**Windows Update, configuring policies, 236–239**
**Windows Upgrade Advisor, 92–95**
**Windows Vista, reasons for poor reception of, 18**
**Windows XP, upgrading to Windows 7, 97–99**
**Windows XP Mode, 253–254**
**WinRM (Windows Remote Management), 535**
Windows PowerShell, 537–538
WinRS, 536–537
**WinRS (Windows Remote Shell), 536–537**
**wipe and load migration, 124**
**wireless networks**
connecting to, 352–357
connections, managing, 357–359
profiles, managing, 359
**WPA (Windows Product Activation), 57–58**
**Write permission, 845, 861**
**WSUS (Windows Server Update Services), configuring updates, 232–235**

# X–Y–Z

**zero compression, 316**
**Zero-Touch, High-Volume Deployment strategy, 160–161**