

NETWORKING

**MCTS Guide to  
Microsoft® Windows 7**

Byron Wright  
Leon Plesniarski

**MCTS  
MCITP**

Exam #70-680

# MCTS Guide to Microsoft® Windows 7™

**Byron Wright**  
**Leon Plesniarski**



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**MCTS Guide to Microsoft® Windows 7™  
(Exam # 70–680)**

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# Introduction

Welcome to *MCTS Guide to Windows 7*. This book offers you real-world examples, interactive activities, and many hands-on activities that reinforce key concepts and prepare you for a career in network administration using Microsoft Windows 7. This book also features troubleshooting tips for solutions to common problems that you will encounter in the realm of Windows 7 administration.

This book offers in-depth study of all the functions and features of installing, configuring, and maintaining Windows 7 as a client operating system. Throughout the book, we provide detailed Activities that let you experience firsthand the processes involved in Windows 7 configuration and management. We then provide pointed Review Questions to reinforce the concepts introduced in each chapter and help you prepare for the Microsoft certification exam. Finally, to put a real-world slant on the concepts introduced in each chapter, we provide Case Projects to prepare you for situations that must be managed in a live networking environment.

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## Certification

*MCTS Guide to Microsoft Windows 7* is intended for people getting started in computer networking as well as experienced network administrators new to Windows 7. To best understand the material in this book, you should have a background in basic computer concepts and have worked with applications in a Windows environment. The Microsoft Certified Technology Specialist (MCTS) certification allows technology professionals to prove their expertise in working with specific Microsoft technologies. This book prepares you to take exam 70-680: TS: Windows 7, Configuring, which leads to the MCTS: Windows 7, Configuration certification. After completing this book, you will not only be prepared to take the certification exam, but will also be prepared to implement and maintain Windows 7 in a business environment.

## New to This Edition

The entire book has been updated from Windows Vista to Windows 7, covering the functions and features of installing, configuring, and maintaining Windows 7 as a client operating system. New activities, review questions, and case projects have been created to reinforce the concepts

and techniques presented in each chapter and to help you apply these concepts to real-world scenarios. A new, full-color interior design brings the material to life and full-color screenshots provide a more detailed look at the Microsoft Windows 7 interface.

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## Chapter Outline

The topics covered in the 14 chapters of this book are comprehensive and organized as described in the following descriptions.

**Chapter 1**, “Introduction to Windows 7,” outlines the versions of Windows 7 in the features available in each. It also introduces the new and improved features in Windows 7, including the updated user interface, hardware requirements, and system hardware support. New features for application support, connectivity applications, and enhanced networking models are also covered.

In **Chapter 2**, “Installing Windows 7,” we discuss the deployment enhancements in Windows 7 and the considerations for choosing an installation method and installation type. We also explore transferring settings from one computer to another by using Windows Easy Transfer. Detailed explanations of attended and unattended installations are provided. Finally, imaging of Windows 7 by using the Windows Imaging Format is discussed.

**Chapter 3**, “Using the System Utilities,” examines the tools used to manage Windows 7: namely, the Microsoft Management Console (MMC), Administrative Tools, Task Scheduler, and Control Panel applets. These tools are used to install and configure new hardware, power management, and the display.

In **Chapter 4**, “Managing Disks,” we explore the differences between basic and dynamic storage and discuss the drive configurations supported by Windows 7. This chapter also introduces partition and volume management as well as the common disk management tools. The new virtual hard disk files available in Windows 7 are also discussed.

**Chapter 5**, “Managing File Systems,” introduces the concept of file systems and describes the benefits and features of both FAT and NTFS. File system security is covered, including NTFS permissions and inheritance. Finally, accessing and restoring previous versions of files is discussed.

In **Chapter 6**, “User Management,” we introduce the concepts involved in working with users, groups, profiles, and Parental Controls. This discussion includes setting up, naming, and managing local users and groups and default user and group accounts. User profiles and their role in user management are covered. User security in peer-to-peer and domain-based networks are evaluated. Finally the use of Parental Controls is explored as a method for controlling user access.

**Chapter 7**, “Windows 7 Security Features,” teaches you about the security improvements in Windows 7, how to configure security by using the local security policy, and how to enable auditing. You will also learn about User Account Control, which is a way for user privileges to be managed. Malware security using Windows Defender and Microsoft Security Essentials is covered. Using Encrypting File System and BitLocker Drive Encryption for data protection is discussed. Finally, using Windows Update to automatically apply patches is covered.

**Chapter 8**, “Networking,” describes the networking components and architecture of Windows 7. You learn about the TCP/IPv4 and TCP/IPv6 protocols. You also learn about file sharing, Internet connectivity, Windows Firewall, network bridging, and HomeGroup networks.

In **Chapter 9**, “Using Productivity Tools,” we discuss Windows 7 printing and faxing. We also look at the new Windows Explorer libraries and search feature that make finding information easier. Finally, the new features and security of Internet Explorer 8 is discussed.

**Chapter 10**, “Performance Tuning,” gives you the information you need to understand the performance and monitoring tools found in Windows 7. You learn performance tuning concepts that can be used for Windows 7 and other operating systems. Then you learn how to use the Performance Monitor along with Task Manager to monitor Windows 7. The performance ranking system in Windows 7 is discussed and you see some methods for optimizing system performance.



In **Chapter 11**, “Application Support,” we discuss the Windows 7 architecture for supporting applications. The registry is also discussed. Support for applications compatibility including file and registry virtualization and compatibility tools are also discussed.

We introduce you to disaster protection and recovery concepts in **Chapter 12**, “Disaster Recovery and Troubleshooting.” You learn about the general principals of troubleshooting that can be used to diagnose problems with any computer system. Tools used for information gathering are covered including Event Viewer and Problem Reports and Solutions. Also, you learn about the utilities that can be used for system maintenance and repair such as Windows Backup and the Advanced Boot Options Menu. Finally, you learn about advanced troubleshooting tools used for DirectX and the Windows 7 boot process.

**Chapter 13**, “Enterprise Computing” describes Windows 7 features and functions that are used in large companies. You learn how Active Directory and Group Policy can be used to manage hundreds or thousands of Windows 7 computers. As well, deployment planning and enterprise deployment tools for Windows 7 are described. Finally, you learn how Windows Server Update Services and Network Access Protection can be used to ensure that computers on your network have appropriate updates installed.

In **Chapter 14**, “Remote Access,” we examine remote access. You learn how to use remote access under Windows 7, including how to use Remote Desktop and Remote Assistance. The new DirectAccess and BranchCache features are discussed. Finally, you learn about the Sync Center for mobile users.

**Appendix A**, “MCTS 70-680 Exam Objectives,” maps each exam objective to the chapter and section where you can find information on that objective.

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## Features and Approach

*MCTS Guide to Microsoft Windows 7* differs from other networking books in its unique hands-on approach and its orientation to real-world situations and problem solving. To help you see how Microsoft Windows 7 concepts and techniques are applied in real-world organizations, this book incorporates the following features:

**Chapter Objectives**—Each chapter begins with a detailed list of the concepts to be mastered. This list gives you a quick reference to the chapter’s contents and is a useful study aid.

**Activities**—Activities are incorporated throughout the text, giving you practice in setting up, managing, and troubleshooting a network system. The Activities give you a strong foundation for carrying out network administration tasks in the real world. Because of the book’s progressive nature, completing the Activities in each chapter is essential before moving on to the end-of-chapter materials and subsequent chapters.

**Chapter Summaries**—Each chapter’s text is followed by a summary of the concepts introduced in that chapter. These summaries provide a helpful way to recap and revisit the ideas covered in each chapter.

**Key Terms**—All terms introduced with boldfaced text are gathered together in the Key Terms list at the end of the chapter. This provides you with a method of checking your understanding of all the terms introduced.

**Review Questions**—The end-of-chapter assessment begins with a set of Review Questions that reinforce the ideas introduced in each chapter. Answering these questions correctly will ensure that you have mastered the important concepts.

**Case Projects**—Finally, each chapter closes with a section that proposes certain situations. You are asked to evaluate the situations and decide upon the course of action to be taken to remedy the problems described. This valuable tool will help you sharpen your decision-making and troubleshooting skills, which are important aspects of network administration.

## Text and Graphic Conventions

Additional information and exercises have been added to this book to help you better understand what's being discussed in the chapter. Icons throughout the text alert you to these additional materials. The icons used in this book are described as follows:



Tips offer extra information on resources, how to attack problems, and time-saving shortcuts.



Notes present additional helpful material related to the subject being discussed.



Each Activity in this book is preceded by the Hands-On icon.



Case Project icons mark the end-of-chapter case projects, which are scenario-based assignments that ask you to independently apply what you have learned in the chapter.

## CertBlaster Test Preparation

The *MCTS Guide to Microsoft Windows 7 (Exam # 70-680)* includes an exam objectives coverage map in Appendix A. The guide also includes CertBlaster test preparation questions that mirror the look and feel of the MCTS exam. For additional information on the CertBlaster test preparation questions, go to <ftp://ftp.certblaster.com/1/Course/>.

### Please follow these directions to install and launch your CertBlaster application:

1. Click the title of the CertBlaster you want to download.
2. Save the program (.EXE) file to a folder on your C: drive. (Warning: If you skip this step, your CertBlaster will not install correctly.)
3. Click Start and choose Run.
4. Click Browse and then navigate to the folder that contains the .EXE file. Select the .EXE file and click Open.
5. Click OK and then follow the on-screen instructions. In order to complete the installation, you will need the CertBlaster access code. The access code can be found inside the card in the back of your textbook.
6. When the installation is complete, Click Finish.
7. Click Start, choose All programs and Click CertBlaster.

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## Instructor Resources

The following supplemental materials are available when this book is used in a classroom setting. All the supplements available with this book are provided to the instructor on a single CD-ROM. All the information has been updated to cover Windows 7.

**Electronic Instructor's Manual**—The Instructor's Manual that accompanies this textbook includes additional instructional material to assist in class preparation, including suggestions for classroom activities, discussion topics, and additional projects.

**Solutions**—The solutions are provided for the end-of-chapter material, including Review Questions, and, where applicable, Hands-On Activities and Case Projects. Solutions to the Practice Exams are also included.

**ExamView®**—This textbook is accompanied by ExamView, a powerful testing software package that allows instructors to create and administer printed, computer (LAN-based), and Internet exams. ExamView includes hundreds of questions that correspond to the topics covered in this text, enabling students to generate detailed study guides that include page references for further review. The computer-based and Internet testing components allow students to take exams at their computers and also save the instructor time by grading each exam automatically.

**PowerPoint presentations**—This book comes with Microsoft PowerPoint slides for each chapter. These are included as a teaching aid for classroom presentation, to make available to students on the network for chapter review, or to be printed for classroom distribution. Instructors, please feel at liberty to add your own slides for additional topics you introduce to the class.

**Figure files**—All the figures and tables in the book are reproduced on the Instructor Resources CD, in bitmap format. Similar to the PowerPoint presentations, these are included as a teaching aid for classroom presentation, to make available to students for review, or to be printed for classroom distribution.

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## Companion Lab Manual

A companion lab manual is available with this book. It includes additional exercises for every chapter to complement the exercises in the book. The ISBN of the lab manual is 1-1113-0978-7.

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## System Requirements

### Hardware

All hardware should be listed on Microsoft's Hardware Compatibility List for Windows 7. However, the Activities in this book have been designed to run with virtualization software such as Microsoft Virtual PC, Microsoft Virtual Server, Microsoft Hyper-V, VMWare Virtual Server, and VMWare Workstation.

### Software

Microsoft Windows 7 Enterprise for each computer. Other versions can be used, but some activities may not be possible to perform. For example, the Parental Controls feature is not available in business versions of Windows 7. Students perform the installation of all necessary software during the course.

Software used during this course can be obtained at the following locations:

- Windows 7 Enterprise 90-day Trial—<http://technet.microsoft.com/en-us/evalcenter/cc442495.aspx>

Component	Requirement
CPU	1 gigahertz or faster, x86 or x64
Memory	1 GB of RAM (2 GB recommended for x64)
Disk Space	40 GB hard disk
Video	Monitor supporting a resolution of 1024×768 DirectX 9 capable graphics processor with WDDM support (recommended)
Keyboard	Keyboard
Pointing Device	Microsoft mouse or compatible pointing device
Drives	A DVD-ROM drive
Networking	Internet connectivity recommended. Network connectivity required for some activities.
Cards	A Windows 7-compatible network adapter card and related cable

- Windows Automated Installation Kit for Windows 7—<http://www.microsoft.com/downloads/details.aspx?FamilyID=696dd665-9f76-4177-a811-39c26d3b3b34&displaylang=en>
- Windows Server 2008 R2 Trial—<http://www.microsoft.com/windowsserver2008/en/us/trial-software.aspx>

## Set Up Instructions

To successfully complete the Activities, you need a computer system meeting or exceeding the minimal system requirements for Windows 7. Confirming those requirements and installing Windows 7 (along with available service packs) is covered in Chapters 1 and 2.

## Acknowledgments

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Since joining Broadview Networks in 2001, he is leading his technical team's efforts to help companies design, deploy, and benefit from Microsoft technology. Leon continues to proudly direct and grow the skills of master consultants and enterprise architects employed at Broadview, students at the next level of applied knowledge. You can reach Leon at [leon@broadviewnetworks.ca](mailto:leon@broadviewnetworks.ca).

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# Introduction to Windows 7

**After reading this chapter and completing the exercises, you will be able to:**

- Describe the versions of Windows 7
- Discuss the new features in Windows 7
- Understand the Windows 7 user interface
- Define the hardware requirements and understand the hardware support of Windows 7
- Describe the application support built in to Windows 7
- Identify essential connectivity applications used in Windows 7
- Understand the networking models supported by different versions of Windows 7

**The digital world has changed our lives and our expectations of the world around us.** Our day-to-day life is often touched by the digital information created to describe, control, and experience it. More data exists than ever before, and people find themselves overwhelmed as they try to use it.

With its latest client operating system, Windows 7, Microsoft safely and reliably connects users with the information they need in the digital world, providing enhanced user interface and operating system features.

Windows 7 is the successor to Microsoft's previous client operating system, Windows Vista. Windows Vista built on the effectiveness of Windows XP and offer improvements in security, data handling, and portability. The computing community was slow to adopt Windows Vista due to the perception that it was slow and too restrictive in its attempts to protect the user. Windows 7 users can use their computers and see fewer security prompts than they did in Windows Vista, yet they are better protected than ever before.

Windows 7 maximizes performance on today's hardware which is very important as new computers no longer fully support Windows XP. For maximum performance, Windows 7 eclipses Windows Vista in many performance categories. These improvements together enable a Windows 7 user to concentrate on using their computer safely and productively.

This chapter outlines the versions of Windows 7 and the features available in each. This information enables users to determine which version is appropriate for their specific needs. The chapter also introduces new and improved features in Windows 7, including the updated user interface, hardware requirements, and system hardware support. Updated features for application support, connectivity applications, and enhanced networking models are also covered in the chapter.

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## Windows 7 Versions

Windows 7 is available in different versions to meet different consumer requirements. A consumer can upgrade from one version to another to get the extra features found in enhanced versions. Retail versions support this feature, called Windows Anytime Upgrade. The installed retail version has full support for all retail editions of Windows 7 already built-in. If the user purchases an upgrade key they can unlock an upgraded edition of Windows 7 on the computer in about 10 minutes.

If Windows 7 is pre-installed from the factory by the Original Equipment Manufacturer (OEM) of the computer, the Windows 7 license is tied to that computer hardware. This limits the operating system upgrade and downgrade rights to the terms specified by the OEM Windows 7 license. OEM licenses of Windows 7 are not transferable to new computer hardware.

In corporate environments, Windows 7 licenses may be purchased in bulk by purchasing a Volume License (VL) that entitles upgrades of computers with an existing operating system to a volume licensed version of Windows 7. Volume licensing has rules and limits that are subject to change, therefore the upgrade terms should be researched at the time of the sale.

The four mainstream versions of Windows 7 are:

- Windows 7 Home Premium
- Windows 7 Professional
- Windows 7 Enterprise
- Windows 7 Ultimate

Several additional specialized versions of Windows 7 are:

- Windows 7 Starter
- Windows 7 Home Basic
- Windows 7 N & K Editions

General descriptions of each product and new Windows 7 features are provided in the following sections.



## Windows 7 Home Premium

Windows 7 Home Premium concentrates on enabling the home user to enjoy a rich productive multimedia experience. Business enhancements such as encrypted files, joining a domain, and processing Group Policy settings are not available unless the operating system is upgraded to a business-grade edition. This version includes the following:

- Full Aero interface
- Multiple monitors
- Support for up to 2 physical CPUs
- 32-bit and 64-bit versions
- 64-bit version supports up to 16 GB RAM
- Support for tablet PCs and MultiTouch controls
- Display personalization
- Desktop enhancements
- Windows Media Center capabilities
- Creation and use of HomeGroups
- Windows Mobility Center
- Network printing
- Internet Connection Sharing
- Fast user switching
- Games

## Windows 7 Professional

In a corporate environment, the enhanced manageability of Windows 7 Professional allows a business to simplify its operations and concentrate on doing business. This version includes the features of Windows 7 Home Premium and additionally:

- 64-bit version supports up to 192 GB RAM
- Multi-user fast switching
- Remote Desktop hosting
- Support for domain networking
- Location aware printing
- Dynamic disks
- Encryption File System
- Windows XP Mode with Windows Virtual PC
- Volume licensing

## Windows 7 Enterprise

Windows 7 Enterprise is available only to customers who purchase **Software Assurance (SA)** from Microsoft. Software Assurance is available to medium- and large-scale customers who purchase Microsoft products at a volume level.

This version includes the features found in Windows 7 Professional and adds:

- Multiple Language User Interface for companies spanning the globe
- UNIX-based application support



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