Chapter Objectives

• To distinguish between the Windows XP, Vista, and 7 operating systems
• To install, configure, and troubleshoot Windows XP, Vista, and 7
• To install hardware and software
• About various tools and features, such as System Restore, driver roll back, and WinRE
• What Windows goes through to boot the system and how to troubleshoot boot problems
• About the Computer Management console, Task Manager, and Event Viewer
• How to avoid burnout in the IT field
802-1.1: Compare and contrast the features and requirements of various Microsoft operating systems.

802-1.2: Given a scenario, install, and configure the operating system using the most appropriate method.

802-1.3: Given a scenario, use appropriate command-line tools.

802-1.4: Given a scenario, use appropriate operating system features and tools.

802-1.5: Given a scenario, use Control Panel utilities.

802-1.7: Perform preventive maintenance procedures using appropriate tools.

802-1.9: Explain the basics of client-side virtualization.

802-2.1: Apply and use common security prevention methods.

802-2.2: Compare and contrast common security threats.

802-4.6: Given a scenario, troubleshoot operating system problems with appropriate tools.

802-4.7: Given a scenario, troubleshoot common security issues with appropriate tools and best practices.
Windows XP Editions

- Windows XP Professional
- Windows XP Professional x64
- Windows XP Home
- Windows XP Tablet PC
- Windows XP Media Center
Windows Vista/7 Editions

- Vista/7 Starter
- Vista/7 Home Basic
- Windows Vista/7 Home Premium
- Windows Vista Business
- Windows Vista/7 Enterprise
- Windows Vista/7 Ultimate
## 32-Bit and 64-Bit Windows

<table>
<thead>
<tr>
<th>32-Bit Windows</th>
<th>64-Bit Windows</th>
</tr>
</thead>
<tbody>
<tr>
<td>32-bit or 64-bit processor</td>
<td>64-bit processor</td>
</tr>
<tr>
<td>4GB RAM limitation</td>
<td>1 to 192+GB RAM supported</td>
</tr>
<tr>
<td>32 bits processed at a time</td>
<td>64 bits processed at a time</td>
</tr>
<tr>
<td>32-bit drivers required</td>
<td>64-bit device drivers required, digitally signed</td>
</tr>
<tr>
<td>DEP (Data Execution Prevention)</td>
<td>&quot;Always-on&quot; DEP support for 64-bit processes</td>
</tr>
</tbody>
</table>

© 2014 Pearson IT Certification
www.pearsonITcertification.com
Windows Installation

- Upgrade
- Clean Install
- Microsoft Upgrade Advisor
- Easy Transfer Program
- USMT (User State Migration Tool)
- Dual-Boot
- Multi-Boot
- Format

© 2014 Pearson IT Certification
www.pearsonITcertification.com
# Windows XP Professional Recommended Hardware Requirements

<table>
<thead>
<tr>
<th>Component</th>
<th>Minimum Requirements</th>
<th>Recommended Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>Intel Pentium or 300MHz or higher</td>
<td>300MHz or higher</td>
</tr>
<tr>
<td></td>
<td>AMD K6/Athlon/Duron 233MHz</td>
<td>300MHz or higher</td>
</tr>
<tr>
<td>RAM</td>
<td>64MB</td>
<td>128MB or higher</td>
</tr>
<tr>
<td>Hard Disk Space</td>
<td>1.5GB</td>
<td>&gt;1.5GB</td>
</tr>
<tr>
<td>Video</td>
<td>VGA or higher</td>
<td>SVGA with PnP monitor</td>
</tr>
<tr>
<td>Optical Drive</td>
<td>CD or DVD drive (12x or higher)</td>
<td>CD or DVD drive (12x or higher)</td>
</tr>
<tr>
<td>Input Device</td>
<td>Keyboard and mouse or pointing device</td>
<td>Keyboard and mouse or pointing device</td>
</tr>
</tbody>
</table>
## Vista Home Premium, Business, and Ultimate Recommended Hardware Requirements

<table>
<thead>
<tr>
<th>Component</th>
<th>Minimum Requirements</th>
<th>Recommended Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>800MHz 32-bit or 64-bit multiple core</td>
<td>1GHz 32-bit or 64-bit multiple core and dual processors</td>
</tr>
<tr>
<td>RAM</td>
<td>512MB</td>
<td>1GB</td>
</tr>
<tr>
<td>Hard Drive Space</td>
<td>20GB (a minimum of 15GB of available space)</td>
<td>40GB (a minimum of 15GB of available space)</td>
</tr>
<tr>
<td>Graphics</td>
<td>SVGA</td>
<td>128MB of video memory and support for DirectX9 or higher with WDDM driver, Pixel Shader 2.0 in hardware, 32-bit color</td>
</tr>
<tr>
<td>Optical Drive</td>
<td>CD-ROM</td>
<td>DVD-ROM</td>
</tr>
<tr>
<td>Sound</td>
<td></td>
<td>Audio output</td>
</tr>
<tr>
<td>Network</td>
<td></td>
<td>Internet connectivity</td>
</tr>
</tbody>
</table>
# Windows 7 Recommended Hardware Requirements

<table>
<thead>
<tr>
<th>Component</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>1GHz</td>
</tr>
<tr>
<td>RAM</td>
<td>1GB (32-bit)/2GB (64-bit)</td>
</tr>
<tr>
<td>Graphics</td>
<td>Support for DirectX9 or higher with 1.0 WDDM driver</td>
</tr>
<tr>
<td>Hard drive</td>
<td>16GB (32-bit)/32GB (64-bit)</td>
</tr>
</tbody>
</table>
Virus Types

- BIOS Virus
- Boot Sector (MBR) Virus
- File Virus
- Hijack Virus or Browser Hijacker
- Macro Virus
- Trojan (Horse) Program
- Stealth Virus
- Polymorphic Virus
- Worm Virus
- Phage Virus
Corporate Windows Deployment Tools

- Sysprep
- SIM (System Image Manager)
- WDS (Windows Deployment Services)
- Microsoft Setup Manager
- MDT (Microsoft Deployment Toolkit)
Corporate Computer Deployment Methods

- PXE Boot (Preboot Execution Environment)
- LTI (Lite Touch Installation)
- Unattended Installation or ZTI (Zero Touch Installation)
- Remote Network Installation
A Type 1 hypervisor is also known as a native hypervisor because the operating system runs on top of the hypervisor. Examples of Type 1 hypervisors include VMware's ESXI and Microsoft's Hyper-V.

A Type 2 hypervisor, also known as a hosted hypervisor, runs on top of a host operating system such as Windows 7. VMware Workstation, Oracle VirtualBox, and Windows Virtual PC are examples of Type 2 hypervisors.
A common misconception about virtualization is that you don't have to buy both operating systems when two operating systems are installed. This is not always true. Depending on the virtual software used, if you wanted to install Windows XP in one virtual machine, Windows 7 in another virtual machine, and Windows Server 2008 in a third virtual machine, you would have to purchase all three operating systems.

You may have to enable virtualization in the BIOS before you can install any type of virtualization software (including Virtual PC/Windows XP Mode) on the computer.

A common misconception about virtualization is that you don't have to worry about security because you are in a "protected" environment. This is not true. The protection is that one operating system is protected from the other operating system, but all virtual machines are susceptible to viruses and security attacks. Install the appropriate protection.
Windows Updates

- Patch
- Service Pack
- Hotfix

Choose how Windows can install updates

When your computer is online, Windows can automatically check for important updates and install them using these settings. When new updates are available, you can also install them before shutting down the computer.

How does automatic updating help me?

Important updates

- Download updates but let me choose whether to install them

Install new updates:

- Every day at 3:00 AM

Recommended updates

- Give me recommended updates the same way I receive important updates

Who can install updates

- Allow all users to install updates on this computer

Microsoft Update

- Give me updates for Microsoft products and check for new optional Microsoft software when I update Windows

Software notifications

- Show me detailed notifications when new Microsoft software is available
Adding Devices

- Device Driver
- Plug and Play
- Adapters
System Restore

- Restore Points
- Shadow Copy
Microsoft Computer Management Console

System Tools
Storage
Services and Applications
Windows Boot Options

- Hard Drive
- Optical Drive
- USB
- PXE (Preboot Execution Environment)
### Windows Advanced Boot Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safe Mode</td>
<td></td>
</tr>
<tr>
<td>Safe Mode with Networking</td>
<td></td>
</tr>
<tr>
<td>Safe Mode with Command Prompt</td>
<td></td>
</tr>
<tr>
<td>Enable VGA Mode (XP only)</td>
<td></td>
</tr>
<tr>
<td>Enable low-resolution video (640 X 480) (Vista or 7)</td>
<td></td>
</tr>
<tr>
<td>Last Known Good Configuration</td>
<td></td>
</tr>
<tr>
<td>Debugging Mode</td>
<td></td>
</tr>
<tr>
<td>Enable Boot Logging</td>
<td></td>
</tr>
<tr>
<td>Disable automatic restart on system failure (Vista or 7)</td>
<td></td>
</tr>
<tr>
<td>Disable driver signature enforcement (Vista or 7)</td>
<td></td>
</tr>
<tr>
<td>Start Windows Normally</td>
<td></td>
</tr>
<tr>
<td>Repair Your Computer (Vista or 7)</td>
<td></td>
</tr>
<tr>
<td>Reboot</td>
<td></td>
</tr>
</tbody>
</table>

© 2014 Pearson IT Certification  
www.pearsonITcertification.com
Windows Utilities

- Remote Desktop
- Remote Assistance
- Task Manager
- Event Viewer
- Windows XP's Dr. Watson
- Windows XP's System Monitor and Performance Logs and Alerts
- Windows Vista/7's Reliability Monitor and Performance Monitor
- Windows Vista/7's Problem Reports and Solutions
- System Configuration Utility (msconfig Command)
Preventive Maintenance for Your Operating System

- Always have an antivirus software program that has current virus definitions.
- Make frequent data backups.
- Have a backup of your operating system. Many external hard drives include backup software. Remember that Windows XP Home and Vista Home Basic/Premium do not include a backup utility.
- Ensure that the System Restore utility is enabled.
- Update the operating system with service packs and patches.
- Use the Task Scheduler tool to automate some of the preventive maintenance tasks.
Burnout is commonly caused by too much work and stress.

Burnout is a mental state that can also affect emotional and physical capabilities.

Working too much, having too many responsibilities, and expecting too much of yourself can all lead to burnout.

Technicians should monitor their own attitude and mental state constantly and watch for warning signs associated with burnout.
CompTIA recommends that you have one year of experience before taking the exam. Students have been able to pass this exam right after the course, however.

Redo all the labs. Ensure that you pay attention to the purpose of the tool and consider why (or in what situation) you would use each Windows tool.

When your own computer momentarily slows down, use some of the tools to examine the cause.

Ensure that you know how to control the boot process and use the Advanced Boot Options menu effectively. Go into each of those menus before the exam and be confident that you know when to use each one.

Know the difference between Remote Assistance and Remote Desktop and the port number that must be opened through a firewall.

Know the upgrade paths for Windows 7.

Be able to articulate the difference between the Windows XP, Vista, and 7 control panels.

Be able to control, upgrade, and roll back a device driver.

Know the different user groups and what they can do.

Know virtualization emulator requirements and the purpose of the hypervisor.
Windows operating systems can be 32-bit or 64-bit. The 32-bit versions are limited to a maximum of 4GB of RAM. 32-bit operating systems or applications are sometimes referred to as x86 instead of 32-bit.

Windows operating systems come in different editions that have various features and tools. For example, the Home versions cannot join corporate network domains or encrypt files/folders.

Windows XP has WFP and Windows Vista/7 have WRP to protect the key operating system files. sfc /scannow checks system files.

There are specific operating system in-place upgrade paths that are permitted. Otherwise, a clean install must be performed. You must activate the Windows license by phone or Internet. A repair installation is performed when Windows has to be reloaded. Use the Upgrade Advisor before upgrading Windows.

Multiple operating systems can be installed. (Install the oldest one first, and install the operating systems on separate partitions.) Virtualization can also be used to have multiple operating systems installed.

Compatibility mode, Windows XP Mode, or virtualization can be used to allow older applications to operate properly.

No machine should be deployed without antivirus software installed. Symptoms of a virus include the computer not booting, computer running slowly, hard drive activity increases, files are missing, applications do not work or do not work properly, unusual messages or graphics appear, and so on.
Corporate Windows deployment involves creating a master image and deploying that image across a network. Deployment methods include PXE boot, unattended installations, LTIm, and remote network installation. Network bandwidth is affected by imaging.

Operating system installation failures are often caused by lack of planning for the installation: insufficient or incompatible hardware, incompatible software, and lack of operating-specific drivers.

A computer that uses virtualization must have more hardware than a single operating system environment.

To back up the Windows registry, use regedit, the Backup utility, or the System Restore tool.

Windows updates include device driver updates. Use the driver roll back feature or System Restore when an update causes the system to not work.

The Computer Management console is used to access System tools (Task Scheduler, Event Viewer, Shared Folders, Local Users and Groups, Performance, and Device Manager), Storage, and Services and Applications.

The Advanced Boot Options menu is commonly used when the tools within Windows cannot be used in the normal boot environment. The most commonly used options are Safe Mode, Safe Mode with Networking, Enable Low Resolution (Vista/7), Last Known Good Configuration, Disable Automatic Restart on System Failure (Vista/7), Disable Driver Signature Enforcement (Vista/7), and Repair Your Computer (Vista/7).
• The bootrec command can be used to detect and repair master boot issues, operating system files, or the boot sector.

• The System Configuration utility (msconfig) can be used to control what applications load during the boot process.

• Task Manager can be used to display system performance, stop applications that are not working properly, and view which applications and processes are taking up memory.

• Event Viewer logs issues with applications and the operating system to provide a historical record and timeline of when things occur.

• Remote Assistance (the msra command) and Remote Desktop (the mstsc command) are used to control and use a remote computer. Remote Assistance displays a prompt requesting permission.

• Task Scheduler can be used to perform preventive maintenance on a regular basis. Preventive maintenance can reduce downtime and includes keeping the operating system and applications patched, keeping the antivirus definitions current, and keeping the hard drive defragmented and with ample space.

• Technicians can do positive things to avoid burnout including getting good rest, avoiding drugs and alcohol, doing non-technical things, and having good time-management skills.