



Windows 7 Hardware Assessment

Summary Report

Created by: Samudra Dutta Gupta, HexCode Technologies K K

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Microsoft

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Executive Overview

This document summarizes the results from the Windows 7 Hardware Assessment generated by the Microsoft Assessment and Planning (MAP) tool. The accompanying Microsoft Office Excel® workbook, the Windows 7 Hardware Assessment Report, provides detailed information about each inventoried computer on your organization's network, allowing you to perform analysis of your existing computer hardware.

This assessment indicates which computers in your environment are ready to upgrade to Windows 7 Enterprise. Client computers that currently run Windows Vista® should be ready to upgrade to Windows 7 Enterprise with little intervention. For more information about the requirements to support Windows 7 Enterprise, see Appendix A, "Windows 7 Enterprise Hardware Requirements." This document also provides recommendations that can help you identify which of the computers in your environment could be ready for Windows 7 Enterprise through hardware upgrades.

Inventory results (data, charts, and tables) shown in this summary document report about computers in your environment that are already running a Microsoft Windows client operating system, such as Windows® 2000 Professional, Windows XP Professional, or Windows Vista.

Windows 7 Enterprise Features

Windows 7 Enterprise has unique technology designed to address the needs of enterprise customers. Built on the Windows Vista foundation, Windows 7 Enterprise helps make people productive anywhere, provides enhanced security and control, and streamlines computer management. Like Windows Vista Enterprise, Windows 7 Enterprise is only available to customers through Microsoft Software Assurance licensing. Customers who use Windows 7 Enterprise can take advantage of the following features that are not available in Windows 7 Professional:

- DirectAccess
- BranchCache
- Enterprise Search Scopes
- BitLocker and BitLocker To Go
- AppLocker
- Virtual Desktop Infrastructure (VDI) optimizations
- Multi Lingual User Interface.

DirectAccess

DirectAccess in Windows 7 enhances the productivity of mobile workers by connecting them seamlessly and more securely to their corporate network any time they have Internet access—without the need to VPN. When IT enables DirectAccess, the whole corporate network file shares, intranet Web sites, and line-of-business applications can remain accessible wherever you have an Internet connection.

In addition, DirectAccess helps IT manage remote computers more effectively. Without DirectAccess, IT administrators can only manage mobile computers when users connect to a VPN or physically enter the office. With DirectAccess, IT administrators can manage mobile computers by updating Group Policy settings and distributing software updates any time the mobile computer has Internet connectivity, even if the user is not logged on. This flexibility gives IT the opportunity to service remote computers on a regular basis and ensures that mobile users stay up-to-date with company policies.

BranchCache

In Windows 7, BranchCache helps increase network responsiveness of applications, giving users in remote offices an experience more like working in the head office. When they access content stored on Windows Server 2008 R2, users in a branch office need not wait as long to download files from headquarters. When IT enables BranchCache, a copy of data accessed from an intranet Web site or a file server is cached locally within the branch office. When another user on the same network requests the file, the user can access the content almost immediately because it is downloaded from the local cache rather than over a limited bandwidth connection back to headquarters. BranchCache only serves content to users who have the right permissions and always checks to make sure it delivers the latest version of the file.

BranchCache can operate in one of two modes:

- **Hosted Cache mode.** A server in the branch running Windows Server 2008 R2 hosts the cached files.
- **Distributed Cache mode.** A branch server is not required, because copies of files are directly cached on computers in the branch and sent to other Windows 7–based clients as needed.

BranchCache supports common protocols for Web content and file servers enabling it to work with a wide variety of application types. BranchCache only retrieves data from headquarters when the user requests it. Because it is a passive cache, it decreases bandwidth utilization between headquarters and the branch. BranchCache only caches read requests, so it never interferes with a user saving a file. Finally, it works seamlessly with network security technologies, including SSL, SMB Signing, and IPsec to improve application performance even if the content is encrypted.

Enterprise Search Scopes

Enterprise users need to access data from a variety of sources in their daily tasks. With Windows Vista, Microsoft introduced advanced desktop search technology, enabling users to find information on their computers instantly. Microsoft Office SharePoint® Server 2007 and the Enterprise Search family of products deliver highly secure, manageable, server-based search. Windows 7 combines these experiences to provide an improved and seamless search experience across local and networked corporate data directly within Windows Explorer.

Benefits of Enterprise Search Scopes include:

- **Find and organize information intuitively.** Advancements to Windows 7 help users quickly find what they are looking for. Recommendations based on recent searches help narrow results. Libraries provide a single view for accessing documents, presentations, or any type of file that might be located in different folders, on different hard drives, or even on different computers. Windows 7 creates default Libraries for such items as Documents and Pictures, but you can also create custom Libraries, for example to provide one entry point under which to organize, access, and search files spread across multiple locations.
- **Search multiple locations from a single interface with Search Federation.** Windows 7 enables users to search remote document repositories, SharePoint sites, and Web applications through the familiar Windows interface. Windows 7 Search Federation uses an existing public standard called OpenSearch. Users can select which sites are available for searching, or IT can populate the list using Group Policy. Federated search results are presented in Windows Explorer much like local files, with rich views, file details, and previews.
- **Flexible search scopes.** Making it easy to discover and search intranet sites can help organizations maximize their return on these investments. With Windows 7, IT

administrators can populate links on the Start menu or in Windows Explorer. These links simplify access to the most appropriate, complete, authoritative data sources on the network, which makes content on intranet portals easier to discover and access.

BitLocker and BitLocker To Go

With the continued growth of the mobile workforce, protecting sensitive data on mobile computers remains a major concern of IT decision makers. With Windows Vista, Microsoft introduced BitLocker™ Drive Encryption to help protect sensitive data from being accessed by unauthorized users who come into possession of lost, stolen, or improperly decommissioned computers.

Windows 7 Enterprise makes the original functionality even easier to use and also introduces BitLocker To Go, which extends BitLocker protection to USB storage devices. In contrast to lost or stolen laptops, misplaced USB drives often go unreported—or even unnoticed. Yet prohibiting the use of USB storage devices is often impractical because employees have valid business reasons to store data on removable devices.

BitLocker To Go lets IT administrators set a policy that requires users to apply BitLocker protection to removable drives before they can write to them, enables the drives to be restricted with a passphrase, and lets IT control passphrase length and complexity.

AppLocker

Users who run unauthorized software can experience a higher incidence of malware infections, generate more help desk calls, and undermine efforts to standardize corporate desktops. With the vast number of applications available on the Web, IT pros need sophisticated tools to ensure that user desktops run only approved, licensed software.

Windows 7 offers new application control policies with AppLocker, a mechanism that enables IT pros to specify exactly what is allowed to run on user desktops. AppLocker restricts unauthorized software while allowing the applications, installation programs, and scripts that users need. With this capability, IT can realize the security, operational, and compliance benefits of application standardization.

AppLocker provides simple, powerful, rule-based structures that are centrally managed using Group Policy. It introduces "publisher rules" that are based on an application's digital signature, making it possible to build strong rules that account for application updates. By crafting correctly structured rules, IT pros can safely deploy updates without having to build a new rule for each version update.

Virtual Desktop Infrastructure (VDI) Optimizations

Delivering desktop functionality using virtual machines hosted on servers—a solution known as Virtual Desktop Infrastructure (VDI)—is an emerging model for desktop deployment that enables users to access their desktops remotely, thereby centralizing data, applications, and operating systems. Windows 7 delivers the latest enhancements to VDI to provide a richer user experience and easier management for IT.

VDI in Windows 7 gives users an experience that is closer to using a local computer. Features include support for:

- Use of the Windows Aero® interface.
- Video viewing in Windows Media Player 11.
- Multiple-monitor configurations.
- New microphone support that enables remote desktops running Windows 7 Enterprise to provide voice over IP (VoIP) and speech recognition functionality.
- Easy Print technology so that users can print to local printers.

With Windows 7, IT pros can use the same rich management tools and processes to manage both native WIM-based system images and Windows 7–based virtual machine images (VHDs). This enables offline servicing of VHD files to add, remove, and

enumerate software updates, language packs, drivers, and other components of the operating system image.

Note Using Windows for VDI scenarios requires the Windows Vista Enterprise Centralized Desktop (VECD) license.

Additional Benefits

Other Windows 7 Enterprise benefits include subsystem for UNIX-based applications (SUA), license rights to run up to four additional copies of Windows 7 in virtual machines, and license rights for network booting of Windows 7. In addition, Windows 7 provides numerous enhancements that appear in other editions as well. These include:

- **Improve IT department productivity with improved manageability.** Windows 7 management technologies enable powerful automation, troubleshooting, and configuration features that help IT pros become more productive, reduce costs, reduce support calls, and keep users productive while enabling more flexible configuration across the organization.
- **Reduce costs and increase IT productivity with enhanced automation.** Windows 7 enables IT pros to automate repetitive and complex tasks using Windows PowerShell 2.0, which simplifies the development of Windows PowerShell scripts by providing a graphical environment in which to write, debug, and run such scripts.
- **Keep users productive and decrease support calls.** Windows 7 provides a comprehensive, extensible tool based on Windows PowerShell 2.0 that helps users quickly resolve technical issues without involving help desk and helps support staff fix escalated issues quickly. The Windows Troubleshooting Toolkit provides a graphical user interface that you can use to develop custom Troubleshooting Packs, for example to support a custom LOB application.
- **Enable more flexible configuration across the organization.** Windows 7 improves the ability to centrally manage the most critical aspects of computers by providing additional Group Policy settings that focus on data protection and improved auditing. Windows 7 delivers built-in support for Group Policy Preferences, which extend the range of what Group Policy can manage, how it applies settings to specific users or computers, and lets IT pros decide how much flexibility to give users who want to customize these settings.
- **Streamlined migration from Windows Vista.** Windows 7 is designed to minimize deployment challenges and costs—particularly when upgrading from Windows Vista, because both operating systems are built on the same underlying foundation.
- **Use hardware you have today.** Because the requirements for Windows Vista and Windows 7 are similar, your investments in hardware that is capable of running Windows Vista will largely carry over to Windows 7. This can reduce the expense of upgrading and help you get the most value from your hardware purchases.
- **Windows Vista application compatibility.** Microsoft is committed to maximizing application compatibility between Windows Vista and Windows 7. Most applications that already work on Windows Vista will continue to work with little or no difficulty. Much of the work done to mitigate application incompatibility in Windows Vista will carry over to Windows 7 deployments. For example, application updates created for Windows Vista can be applied to Windows 7 as well.
- **Keep your Windows Vista deployment processes.** Windows Vista introduced significant advances in deployment with a more componentized operating system, offline servicing, and file-based images that enable organization to create a single global image that works on a variety of hardware. Windows 7 builds on the strong foundation of Windows Vista and enhances its system imaging, image delivery, and data migration tools to improve the end-to-end deployment experience.

Assessment Results Summary

With the results of the Windows 7 Hardware Assessment, you can make informed decisions about the deployment of Windows 7 in your organization. The information in this section summarizes the results of the assessment conducted on your network and what is required to make Windows 7 work for your organization.

According to the assessment performed using the MAP tool, your organization has the potential to take advantage of the benefits of Windows 7 Enterprise in a very short time. The Windows 7 Enterprise Hardware Assessment found 972 client computers in your environment. A total of 2 computers are already running Windows Vista and can be upgraded to Windows 7 Enterprise. Of the remaining computers, 92 are ready for Windows 7 Enterprise, 780 could be ready for Windows 7 Enterprise with hardware upgrades, and 1 are not capable of running Windows 7 Enterprise. The assessment could not be completed on 191 computers because of insufficient data.

Hardware Analysis

This section provides summary information about assessed computers on your network and provides details about whether these computers can run Windows 7 Enterprise. This section uses the term "ready for Windows 7" to describe a computer that meets the hardware requirements for Windows 7 Enterprise.

As part of the assessment, the MAP tool gathers information about the client operating systems that are already in use in your environment. You can upgrade those computers that are already running Windows Vista to Windows 7 Enterprise without difficulty. The client computers in your environment that are running earlier versions of Windows might require hardware upgrades before you upgrade them to Windows 7.

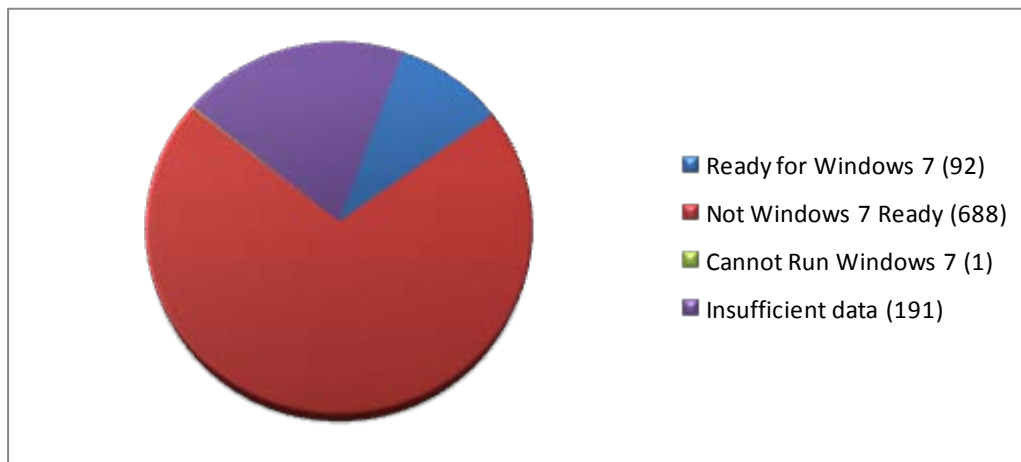


Figure 1. Client computer readiness for Windows 7 Enterprise

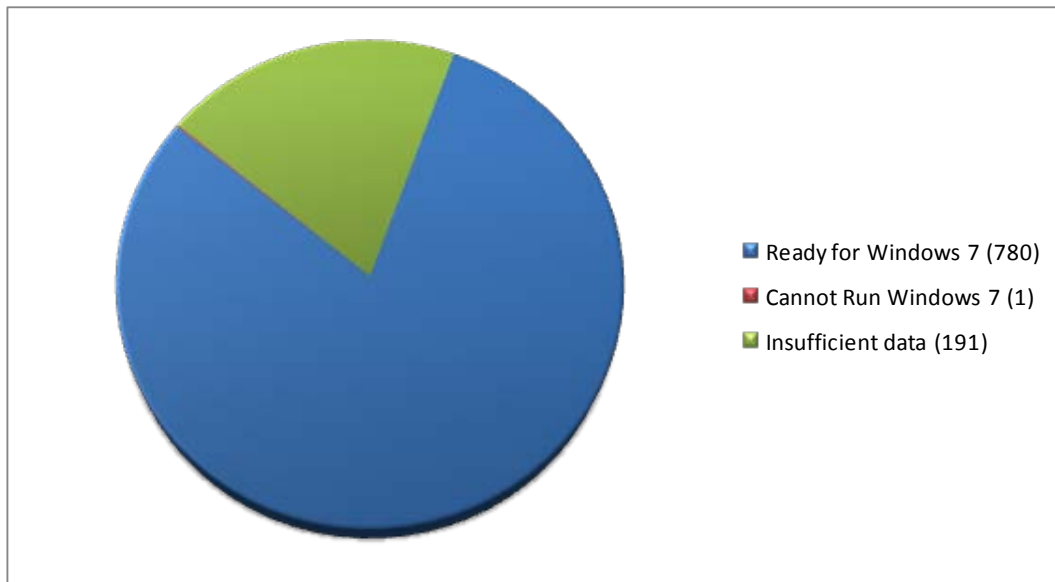
The Windows 7 Hardware Assessment workbook that accompanies this assessment provides detailed information about each of the computers inventoried. This Summary Report does not provide specific recommendations about how to upgrade expensive system components. You can, however, research this topic by comparing the results presented on the **Client Assessment** worksheet of the Windows 7 Hardware Assessment workbook with the information in Appendix A, "Windows 7 Enterprise Hardware Requirements."

The following table indicates the number of computers in your environment that can be upgraded to Windows 7 directly, how many might require hardware upgrades, and the number that are not capable of running Windows 7. The table shows how many of your client computers are currently ready for Windows 7 as percentage of the total number of computers assessed in your environment.

Table 1. Windows 7 Ready Computers

Relative Readiness for Windows 7	Computer Count	Percentage
Ready for Windows 7	92	9%
Not Windows 7 Ready	688	71%
Cannot Run Windows 7	1	0%
Insufficient data	191	20%
Total	972	100%

If you decide to upgrade hardware, you can increase the number of computers that are ready for Windows 7 Enterprise to 780. The following figure shows client computer readiness for Windows 7 Enterprise after the hardware upgrades are made.

**Figure 2. Client computer readiness for Windows 7 Enterprise with hardware upgrades****Table 2. Windows 7 Enterprise Ready Computers (with recommended hardware upgrades)**

Windows 7 Enterprise Ready Computers (with recommended Hardware Upgrades)	Computer Count	Percentage
Ready for Windows 7	780	80%
Cannot Run Windows 7	1	0%
Insufficient data	191	20%
Total	972	100%

For the most current information about [Windows 7 Enterprise hardware requirements](http://go.microsoft.com/fwlink/?LinkId=155674), see <http://go.microsoft.com/fwlink/?LinkId=155674>.

Recommended Hardware Upgrades

The following table describes the number of computers and the type of upgrade that is recommended to make a computer ready for Windows 7 Enterprise. Because CPU upgrades are assumed to be too costly to be considered, they are excluded from this list.

Table 3. Count of Computer Hardware Upgrades Recommended

Recommended Hardware Upgrade	To Minimum	To Recommended
Increase System RAM	1	11
Increase Hard Disk Free Space	11	145
Upgrade Graphics Card	0	424
Upgrade Optical Drive	687	685
Add Audio Output Capability	0	5
Upgrade BIOS	0	0

Some of the computers in your organization may require more hardware upgrades than others. For example, some computers can be made ready for Windows 7 Enterprise with a single hardware upgrade, such as the addition of extra system memory. Other computers might need two hardware changes, such as the addition of extra system memory and the replacement of the hard disk with one that has greater capacity. The following table classifies computers by the number of hardware upgrades that they will require to be ready for Windows 7 Enterprise.

Table 4. Count of Computers by the Number of Recommended Hardware Upgrades

Number of Recommended Hardware Upgrades	To Minimum	To Recommended
Computers that require NO hardware upgrades	13	79
Computers that require 1 hardware upgrade	677	214
Computers that require 2 hardware upgrades	11	396
Computers that require 3 or more hardware upgrades	0	87

Software Analysis

The software analysis provides the following information:

- Summary of devices and how to obtain drivers for the devices discovered on client computers.
- Current client operating systems discovered during the assessment.
- Summary of the most prevalent software applications discovered on client computers during the assessment.

Device Driver Analysis

Computers require drivers to use hardware devices such as optical disk drives or network adapters. The assessment distinguishes between three categories of device drivers:

- Drivers that are included on the Windows 7 installation disks.
- Drivers that are available from Microsoft Update.
- Drivers that should be available from the device manufacturer.

The following table describes the number of devices and percentage of devices where the device driver is available through the specified source.

Table 5. Count of Device Drivers by Source

Source of Device Driver	Hardware Devices	Percentage
Included on the Windows 7 DVD	24084	90%
Available from Microsoft Update	763	3%
Information available from manufacturer website	896	3%
Contact the Device Manufacturer (unknown driver or incompatible)	1890	7%
Total	26737	100%

Operating System Analysis

The following table shows the client operating systems that the assessment found in your environment and indicates the number of installations for each operating system.

Table 6. Operating Systems That the Assessment Found

Operating System Name and Version	Computer Count	Percentage
Insufficient Data	1	0%
Microsoft Windows XP Professional Service Pack 2	3	0%
Microsoft Windows XP Professional Service Pack 3	53	5%
Samba Unknown Service Pack Level	2	0%
Windows 2000 Professional Service Pack 4	4	0%
Windows 2000 Professional Unknown Service Pack Level	1	0%
Windows 2000 Unknown Service Pack Level	1	0%
Windows 7 Enterprise Unknown Service Pack Level	1	0%
Windows 7 Ultimate	1	0%
Windows 7 Ultimate Unknown Service Pack Level	1	0%
Windows Vista™ Enterprise Unknown Service Pack Level	2	0%
Windows XP Professional Service Pack 2	40	4%
Windows XP Professional Service Pack 3	678	70%
Windows XP Professional Unknown Service Pack Level	180	19%
Windows XP Unknown Service Pack Level	4	0%
Total	972	100%

Application Summary

The following table lists the most prevalent software installed on the client computers on the network and indicates the number of installations. The Windows 7 Hardware Assessment Report workbook provides a complete list of all of the programs that were found on the network.

Table 7. Prevalent Software Installed on the Network

Name	Version	Installations
WebFldrs XP	9.50.7523	766
Microsoft .NET Framework 1.1	1.1.4322	713
MSXML 4.0 SP2 (KB936181)	4.20.9848.0	710
Microsoft Office Professional Edition 2003	11.0.8173.0	670
Microsoft .NET Framework 2.0	2.0.50727	639
2007 Office system 互換機能パック	12.0.6021.5000	603
Adobe Reader 9.1 - Japanese	9.1.0	586
Microsoft .NET Framework 1.1 Japanese Language Pack	1.1.4322	558
管理会計SetUp	1.0.0	524
SMS アドバンスト クライアント	2.50.4160.2000	482
Microsoft .NET Framework 2.0 Language Pack - JPN	2.0.50727	450
Windows Genuine Advantage v1.3.0254.0	1.3.0254.0	431
MSChartSetup	1.0.0	423
Symantec AntiVirus	10.0.359.0	333
Windows Presentation Foundation	3.0.6920.0	259
Windows Workflow Foundation	3.0.4203.2	193
Microsoft .NET Framework 3.0	3.0.04506.30	193
Windows Communication Foundation	3.0.04506.30	192
Symantec AntiVirus	10.1.5000.5	188
MSXML 6.0 Parser (KB927977)	6.00.3890.0	175
Windows Communication Foundation Language Pack - JPN	3.0.04506.30	153
Microsoft .NET Framework 3.0 Japanese Language Pack	3.0.04506.30	153
SMS アドバンスト クライアント	2.50.4253.3000	152
Windows Presentation Foundation Language Pack (JPN)	3.0.6920.0	152
Windows Workflow Foundation JA Language Pack	3.0.4203.2	152

In addition to evaluating the hardware readiness of your organization's computers, it is recommended that you evaluate the application compatibility of the software that your organization uses. We recommend the Microsoft Application Compatibility Toolkit 5.0 to complete the application compatibility assessment. This toolkit will help you discover all of the applications that are currently in use in your environment and determine their compatibility with Windows 7. For more information, see [Microsoft Application Compatibility Toolkit 5.0](http://go.microsoft.com/fwlink/?LinkID=79963) at <http://go.microsoft.com/fwlink/?LinkID=79963>.

Next Steps

With the results of the Windows 7 Hardware Assessment, you can determine the level of investment in client hardware upgrades that are necessary to migrate to Windows 7 and identify specific groups of client computers that can be migrated.

To prepare for your deployment of Windows 7 Enterprise, you will need to do the following:

1. Decide which client computers you intend to upgrade to Windows 7 Enterprise.
2. Perform application compatibility analysis to determine the compatibility of commercial software, custom developed applications, and Microsoft Office–based programs.
 - a. The Application Compatibility Toolkit can help you create a complete list of all of the applications in use in the organization and determine their compatibility with Windows 7 Enterprise. To download this toolkit, see [Microsoft Application Compatibility Toolkit 5.0](http://go.microsoft.com/fwlink/?LinkID=79963) at <http://go.microsoft.com/fwlink/?LinkID=79963>.
 - b. The Office Migration Planning Manager helps determine the best way to upgrade to the 2007 Office release. It is available at with the [2007 Microsoft Office System Migration Guidance](http://go.microsoft.com/fwlink/?LinkID=105598) at <http://go.microsoft.com/fwlink/?LinkID=105598>.
3. Decide how you plan to acquire the software licenses, such as through Volume Licensing.
4. Visit the [Windows Optimized Desktop Scenarios](http://go.microsoft.com/fwlink/?LinkID=129908) site to download free planning guidance on how to select the right optimized desktop technologies including Windows 7, Windows Vista, App-V, MED-V, VDI, and more: <http://go.microsoft.com/fwlink/?LinkID=129908>.
5. Verify the availability of all required device drivers and their compatibility with Windows 7 Enterprise by using the Windows 7 Enterprise Hardware Assessment Report workbook.
6. Perform any hardware upgrades that may be required. After completing the upgrades, you can run the Assessment Wizard again to verify that computers are ready for client operating system migration.
7. Start deployment. Microsoft provides the Microsoft Deployment Toolkit (MDT)—formerly known as Business Desktop Deployment—to help you plan and migrate to Windows 7 Enterprise.

MDT provides comprehensive guidance and tools to optimize your deployment of desktops running Windows 7 Enterprise. The desktop deployment tools that MDT provides are suitable for small to large organizations. Smaller organizations might use the Lite Touch Installation (LTI) method, whereas large organizations that use software distribution tools (Microsoft Systems Management Server 2003 or System Center Configuration Manager 2007) might choose the Zero Touch Installation (ZTI) method. To download the toolkit, see the [Microsoft Deployment Toolkit 2008](http://go.microsoft.com/fwlink/?LinkID=105599) site at <http://go.microsoft.com/fwlink/?LinkID=105599>.
8. Provide antivirus and antispyware protection for your systems. As you plan your Windows 7 deployment, remember to address the virus and spyware protection needs or your organization. Microsoft Forefront Client Security provides unified virus and spyware protection. For more information, see the [Microsoft Forefront](http://go.microsoft.com/fwlink/?LinkID=105631) site at <http://go.microsoft.com/fwlink/?LinkID=105631>.

Note Remember to protect those computers that your organization chooses not to migrate to Windows 7. Ensure that the latest service packs and patches are installed by using [Microsoft Windows Server Update Services](http://go.microsoft.com/fwlink/?LinkID=105601) at <http://go.microsoft.com/fwlink/?LinkID=105601>.

Appendix A: Windows 7 Enterprise Hardware Requirements

You should be able to upgrade client computers in your environment that are currently running Windows Vista to Windows 7 Enterprise with little difficulty. To determine definitively whether your client computers are ready for Windows 7, you can compare the results presented on the **Client Assessment** worksheet of the Windows 7 Hardware Assessment workbook with the information in the following list of hardware requirements.

To run Windows 7 Enterprise, the client computer requires at least:

- 1 GHz 32-bit (x86) or 64-bit (x64) processor
- 1 GB of system memory (32-bit)/ 2 GB (64-bit)
- 16 GB available disk space (32-bit)/20 GB (64-bit)
- DirectX 9 graphics processor with WDDM 1.0 or higher driver

Table 8. Microsoft and User Defined Thresholds

Property	Microsoft Recommended x86	Used in this Assessment x86	Microsoft Recommended x64	Used in this Assessment x64
Processor (GHz)	1	1	1	1
Memory (MB)	1024	1024	2048	2048
Free Disk (GB)	16	16	20	20
Optical Drive	true	true	true	true
Video	true	true	true	true
Audio	true	true	true	true

Appendix B: Windows 7 Hardware Assessment Report Worksheets

The following information is provided in the detailed Windows 7 Hardware Assessment Report workbook.

- **Summary.** This worksheet provides a quick summary of the number of computers, currently running a Windows client operating system, that will be ready for Windows 7 before and after recommended hardware upgrades are performed.
- **Assessment Values.** This worksheet provides the hardware configurations and properties used in the assessment.
- **Client Assessment.** This worksheet provides a printable assessment summary for each client computer and the Windows 7 readiness of that computer.
- **Device Summary.** This worksheet describes each unique hardware device found during assessment and provides information on how to obtain Windows 7 drivers for the device.
- **Device Details.** This worksheet reports all of the devices found for each computer and how to obtain Windows 7 drivers for the devices.
- **Minimum After Upgrades.** This worksheet provides recommendations for hardware upgrades for computers that currently are not capable of running Windows 7 but can be upgraded.
- **Recommended After Upgrades.** This worksheet provides recommendations for hardware upgrades for computers that currently are not capable of running Windows 7.
- **Discovered Applications.** This worksheet provides a list of applications found on the computers and the number of installed copies found.