

## **New Lab - Windows 7 Clean Install**

After completing the laboratory activity, you will be able to:

- Perform a Windows 7 Clean install process.
- Identify the minimum and recommended hardware specifications for a Windows 7 clean install.
- Explain the difference between a new installation and a Windows 7 upgrade.
- Identify and describe the three network locations as related to installing a Windows 7 operating system.
- Identify common problems associated with a Windows 7 operating system install process.

There are two major methods of installing Windows 7 on a computer, a Windows 7 new installation and a Windows 7 upgrade. A new installation is also referred to as a clean install. A Windows upgrade is performed when a previous operating system is replaced by a newer or upgraded operating system.

For example, installing Windows 7 over an existing Windows Vista operating system would be classified a Windows upgrade. Installing a Windows 7 operating system on a brand new computer (that never had an operating system) would be classified a new installation or a clean install. If you are installing Windows 7 on an existing computer that has an operating system, but first you are completing wiping out the existing operating system and all files/directories on the partition of the hard drive, you would also be considered as doing a clean or new installation.

In this laboratory activity you will perform a Windows 7 new installation which is also referred to as a clean installation. Typically, the installation goes quit well with very little difficulty but at times there can be problems. The problems are usually encountered due to the fact that the computer has been used by previous students and the hard disk drive can still have remnants of previous operating systems, which can make the installation more complicated. If you encounter problems, always request assistance from your instructor.

The hardware requirements for installing Windows 7 are as follows:

## **Windows Basic**

- CPU 800 MHz
- RAM 512 MB
- Graphics Processor that supports DirectX9.

## **Windows 7 Premium or better**

- CPU 1 GHz, 32-bit (x86) or 64-bit (x64).
- RAM 1 GB for 32-bit or 2 GB for 64-bit
- Graphics Processor that supports DirectX9, 128 MB graphics memory, pixel shader 2.0 and 32 bits per pixel, Windows Display Driver Model (WDDM) driver support. Many games and applications require DirectX10 even though Windows 7 does not.

**Minimum Hard Drive** space is 16 GB for 32-bit or 20 GB for 64-bit.

**Recommended Hard drive** 40 GB minimum with 20 GB of free space. Note the difference between recommended and minimum. The minimum space will work but performance will be limited.

### **DVDROM drive**

Note: The minimum hardware requirements for Windows Home and Ultimate are similar.

Note: XP Mode option requires an additional 1 GB of RAM and an additional 15 GB of HDD space.

## **Select type of installation location.**

There are three choices of network location, Home, Public and Work. The network location selected will determine your firewall settings and network discovery options are configured. The firewall and Discovery configuration directly relates to your computer security as related to the network. There will be much more about the firewall and Discovery configurations later in more advanced laboratories.

**Home** – Used for computers in a home environment where the other devices in the local area network are trusted.

**Public** – This setting is used for public locations such as airports, coffee shops, or anywhere where public access to the Internet is provided.

**Work** – This location is a typical small office or home location and is very similar to the Home location. The main difference is you cannot create or join a HomeGroup. The HomeGroup is new in Windows 7 and is a simple convenient way to share computer

resource such as picture and music files. Document sharing is not configured by default in HomeGroup.

Note: You can join a HomeGroup in any edition of Windows 7, but you can only create one in Home Premium, Professional, or Ultimate editions. There will be much more about HomeGroup, sharing, the firewall, and network discovery in later laboratory activities.

## Windows 7 Product Activation

During the installation process you will be presented with a default option to perform the Windows 7 Product Activation (WPA). Once activated, the Windows 7 product will be identified by Microsoft and you will not be able to install the product on another computer. You should not activate the Windows 7 operating system unless told to do so by your instructor. Microsoft also recommends that you not activate the product during the installation but rather wait until you are sure the operating system is working correctly and is completely compatible with all hardware devices and software applications that you install to complete the system. Microsoft products have a 30 day grace period. You can use the operating system for 30 days without activation. To avoid activation simply choose not to install the product identification key. You also have an option to extend the 30 day activation to a total of 120 days by using the ***slmgr.vbs rearm*** command from the command prompt.

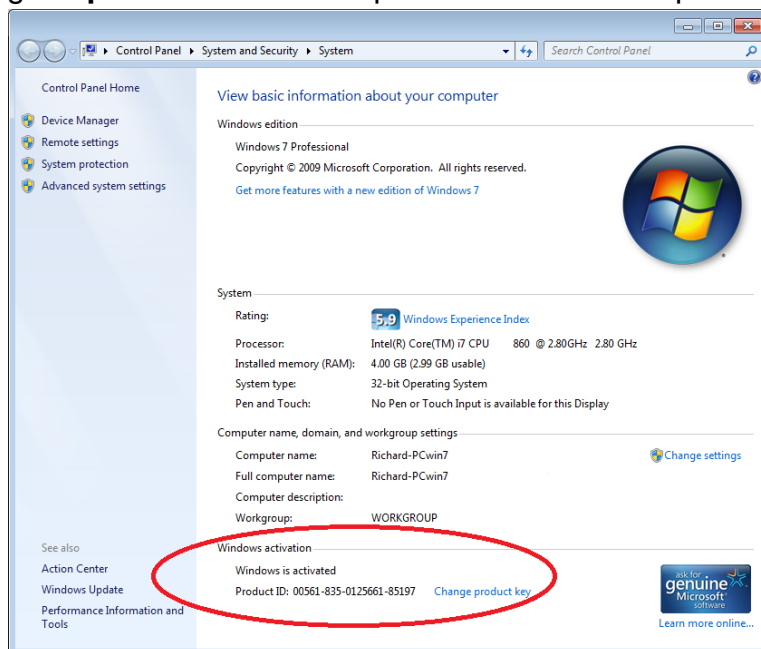
Windows Product Activation is composed of three product identifiers, Hardware ID, Product ID and Installation ID. The Product key is the 25-character key typically supplied with the retail version of the software.

The Hardware ID is a unique 20 character key generated during the installation process and is based on the hardware configuration. The hardware ID will change if there are significant changes in the hardware configuration such as replacing the mother board, the hard disk drive, the CPU and such. A significant change in the hardware configuration appears to the operating system that the Microsoft operating system has been installed on a second computer system in violation of the licensing agreement. A message is generally generated informing the user that the operating system requires to be activated. The system will only operate for an additional 30 days unless the system is reactivated. If the system is not reactivated, the operating system will no longer be considered legal and the system will fail to complete the boot operation. Many times the reactivation will fail and cause the user to call Microsoft and explain the hardware changes so that they can reactivate the operating system.

The installation ID is based upon the Hardware ID and the Product ID. The installation ID is forwarded automatically through the Internet to Microsoft when you activate the

system. If the system will operate for 30 days by default if you choose not to activate during the installation process. If there is no Internet connection or a problem arises you can activate the system by telephone.

You can view the **Product ID** by right-clicking on **Computer** located on the **Start** menu and then selecting **Properties** from the drop down menu list of options.



The unique Product ID consists of 20 characters arranged in the following format XXXXX-XXX-XXXXXXXX-XXXXX.

You also have the option available to change the current Product Key. This option is used to perform an upgrade of the local system.

## Partitions

During the installation process at least one partition must be created on the hard disk drive. The partition is also referred to as a volume. A hard disk drive must be first partitioned and then formatted before the operating system can be installed on the hard disk drive. There will be much more about partitions, volumes and formatting in later laboratory activities as well as your textbook. For now just remember that the hard disk must be partitioned and formatted before it can be used to support an operating system.

### **Common problems encountered during a clean installation process.**

Performing the Windows 7 operating system Clean Installation laboratory activity will be early in your instructional program. You may not have the ability as of yet to perform corrective actions for a failed installation. You may very well need assistance of an advanced student or your instructor to correct installation problems. Three commonly encountered problems are listed that you need to be aware of. When encountering these three problems you will most likely need the assistance of your instructor.

Installation media fails to boot. – Check the BIOS setup to see the device boot order. The DVD drive should be the first boot device. If you are not familiar with BIOS setup do not attempt to make changes without direct supervision by your instructor. An incorrectly configured BIOS setup can cause the computer system to fail.

Can't choose correct hard disk during configuration. – Caused typically by device driver failure. You may need to access a command prompt during installation and then copy the driver using the "Load Driver" option presented during the installation after selecting the Drive options (advanced) option encountered during the installation process. You may need your instructor assistance to install the hard disk drive driver during the installation process.

Used Hard disk drive has existing operating system. – The hard disk drive that you will be using for your laboratory activity has a previous operating system such as Linux installed which can present unique installation problems. Some Linux partition formats cannot be automatically detected by Windows and as a result will cause Windows to fail to boot after what appears to be a successful install. You will need assistance by a more experienced student or your instructor to remove a Linux partition.

### **Materials and information required**

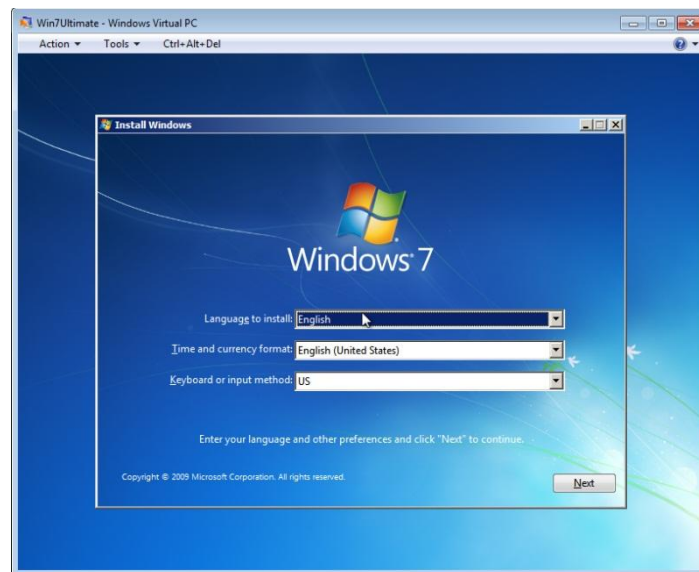
- 1 workstation which meets or exceeds the minimum hardware requirements.
- 1 Windows 7 installation DVD edition type to be determined by your instructor.
- Internet connection desired but not required.
- Hard Drive Partition/Volume size \_\_\_\_\_ (40 GB or to be determined by the instructor)
- Product Key \_\_\_\_\_ Note: you can still perform the Windows installation without the product key. You will have 30 days to enter the product key before the operating system times out.
- User Account Name \_\_\_\_\_
- Computer Name \_\_\_\_\_
- Network Location \_\_\_\_\_ (Home, Work, Public.)

Note: Some screen may appear that do not match the laboratory activity. Many of the Windows that do not require installer action have been eliminated.

The screen captures used for the laboratory activity were taken while installing Windows 7 Ultimate on a Windows Virtual PC machine. Your sequence may not exactly match the laboratory sequence but will provide all necessary information and examples that will allow you to successfully perform a new Windows 7 install using any of the Windows 7 editions.

1. \_\_\_\_ Gather required materials and report to your assigned workstation.
2. \_\_\_\_ Boot the workstation and place the Windows 7 installation DVD into the DVD-drive. Reboot the workstation to start the installation process.

Note: If the installation fails to start from the Windows 7 installation DVD, check the BIOS setup to see if the first boot device is the DVD-drive. You may need to change the boot sequence.



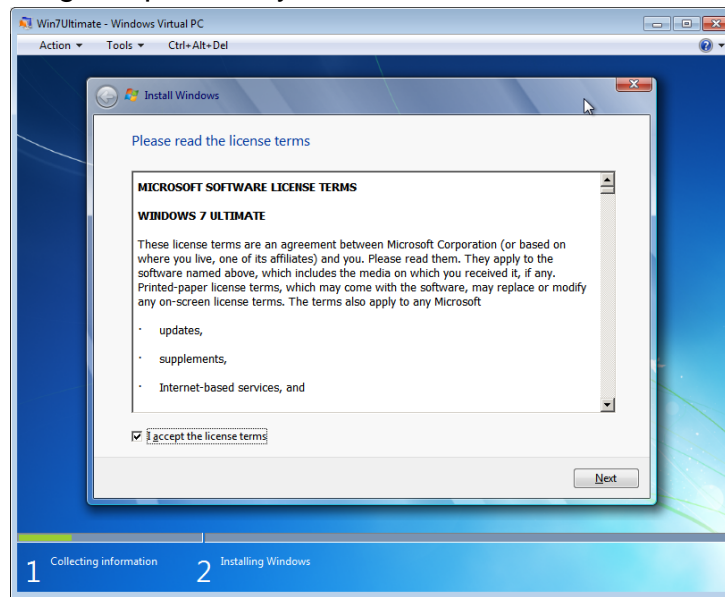
After a black screen appears with a message stating that the first dialog box to appear will prompt you for information concerning the default Language to use as well as the time and currency and the type of keyboard. You should accept the default configuration by selecting the “**Next**” button.

3. \_\_\_\_ The next dialog box presents you with three choices. **Install now**, **What to know before installing Windows**, and **Repair your computer**.



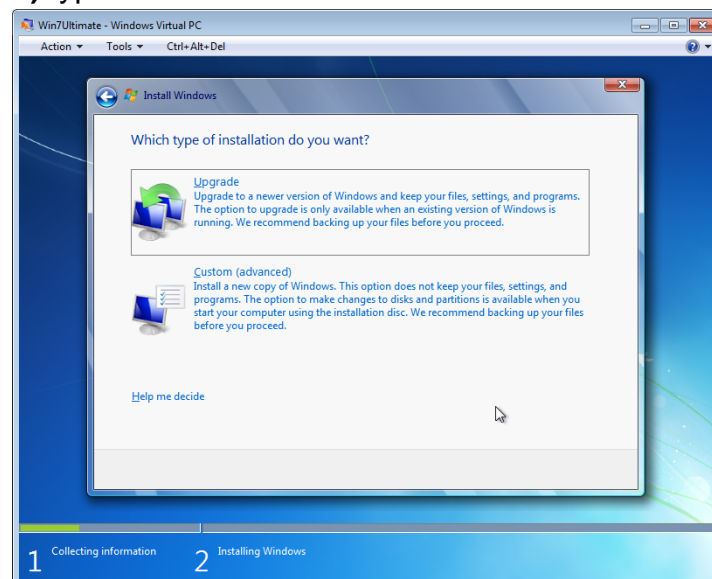
Select the **Install now** option.

4. \_\_\_\_ The next dialog box presents you with the Microsoft License Terms.



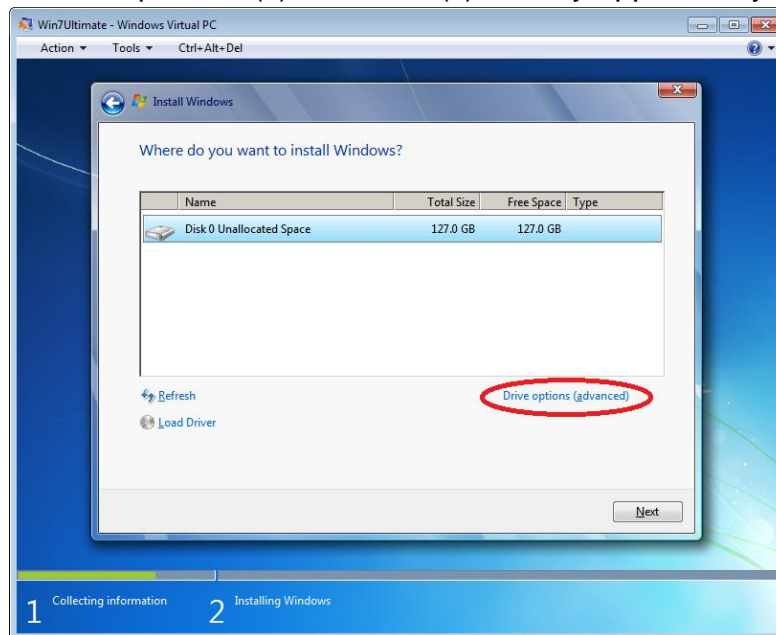
You must accept the license terms and then select the “Next” button.

5. \_\_\_\_ The next dialog box to appear will prompt you to select either an **Upgrade** or **Custom (advanced)** type of installation.



You will select the “Custom (advanced)” option for this laboratory activity.

6. \_\_\_\_ After selecting the **Custom (advanced)** option a dialog box showing the existing hard disk drive partition(s) or volume(s) as they appear for your workstation.



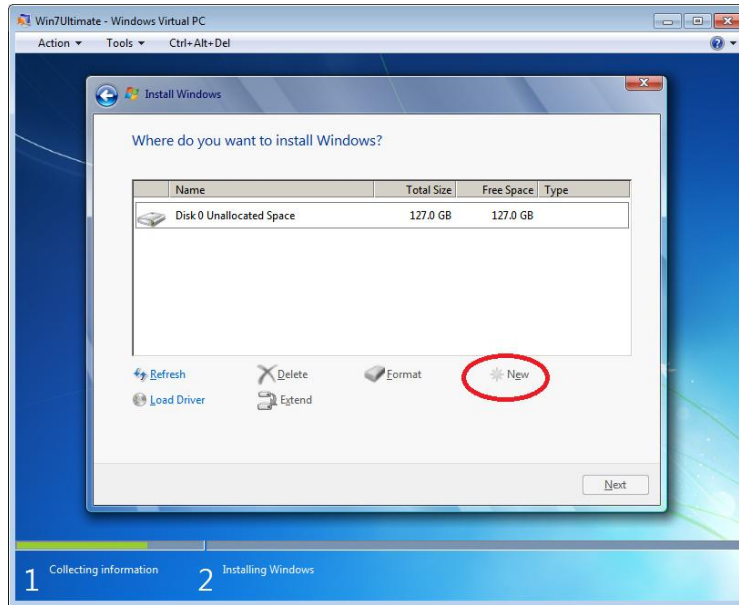
Your disk configuration most likely will not exactly match the one in the screen capture. This is especially true for teaching classroom laboratory equipment. You could have several partitions left on the workstation computer or none at all.

Pay particular attention to the “**Load Driver**” and “**Drive options (advanced)**” optional links. The Load Driver option provides an opportunity to load a device driver to support the particular hard disk drive. Typically you will not have a problem but when the hard disk drive fails to appear then you most likely have a driver problem.

You also have an optional link **Drive options (advanced)** which provides a means of changing the default hard drive configuration. Typically the entire disk drive is selected by default. In a laboratory environment you may want to use a small partition/volume for your installation. This is especially true when using a very large hard disk drive. A large new hard disk drive can take a long time to partition and format. Choosing a minimal size partition can greatly reduce the time needed to perform the laboratory activity. Select the Drive options (advanced) link option.

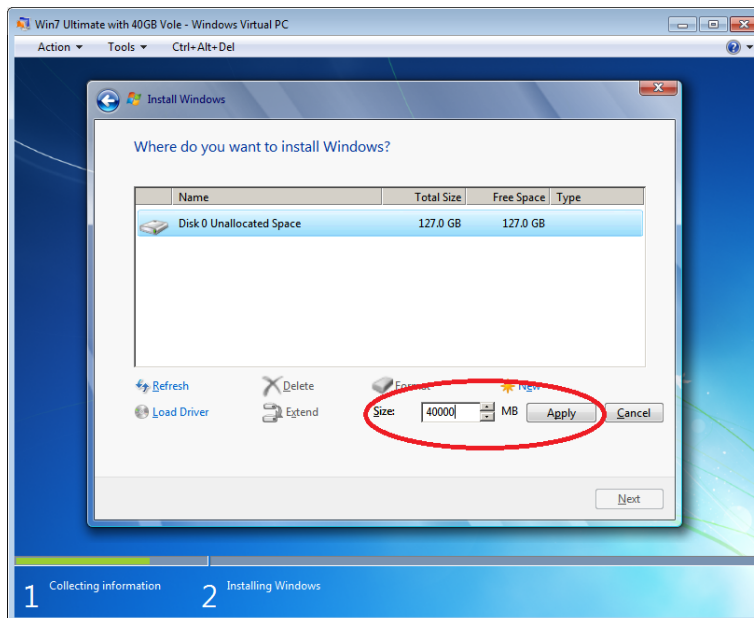
7. \_\_\_\_ After selecting the **Drive options (advanced)** link, a dialog box similar to the one below will appear.



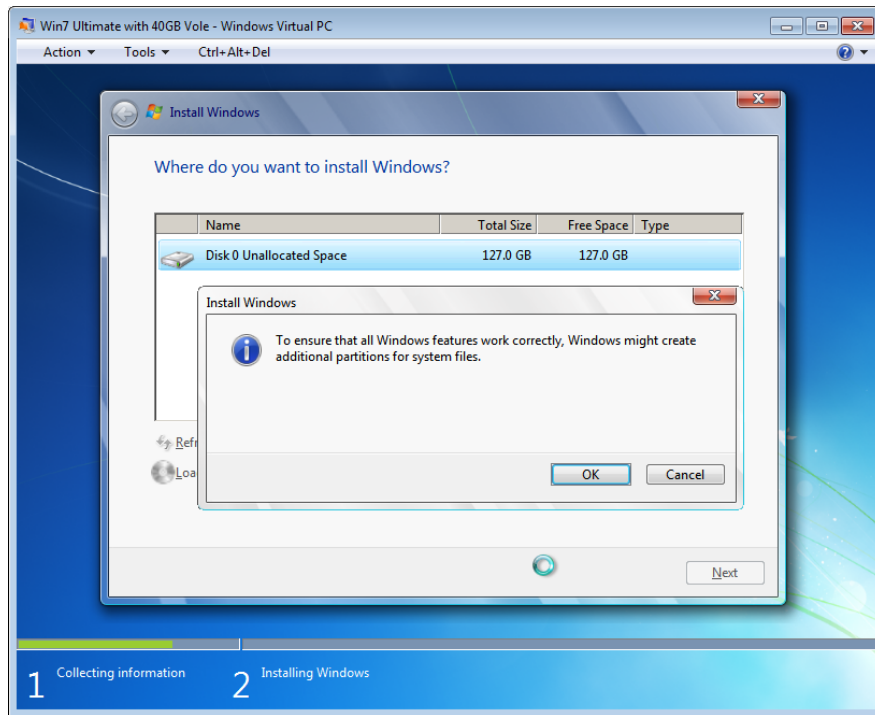


You now will be presented with partition configuration options such as **Delete**, **Extend**, **Format**, and **New**. For this laboratory activity you will create a new partition rather than use the entire drive. Select the **New** option now.

8. \_\_\_\_ After selecting “**New**” option you will see a dialog box prompting you for the size of the new partition.

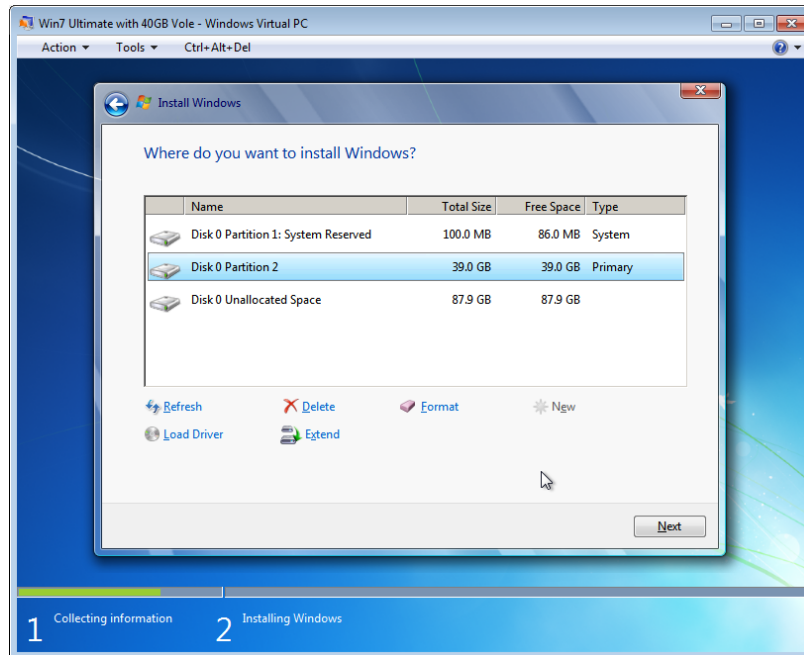


Enter the size partition you desire and then select the “**Apply**” button. A warning similar to the one in the screen capture will appear.



Notice that Windows 7 states that additional partitions might be created for system files. This is a reference to the additional 100 MB partition used for system files such as Windows boot loader. This option will not appear on all hardware systems. After selecting the "OK" button you will see a dialog box confirming the creation of the new partition. The intended 40 GB partition is actually 39 GB. This is a result of the calculation based upon the number of sectors created on the actual physical disk platter. A 40 GB partition/volume is the minimum size recommended by Microsoft for a typical installation. Selecting the entire hard disk drive as one big partition and then formatting the partition could require a time period longer than your laboratory period.

Your instructor will inform you as to what size partition/volume to use.



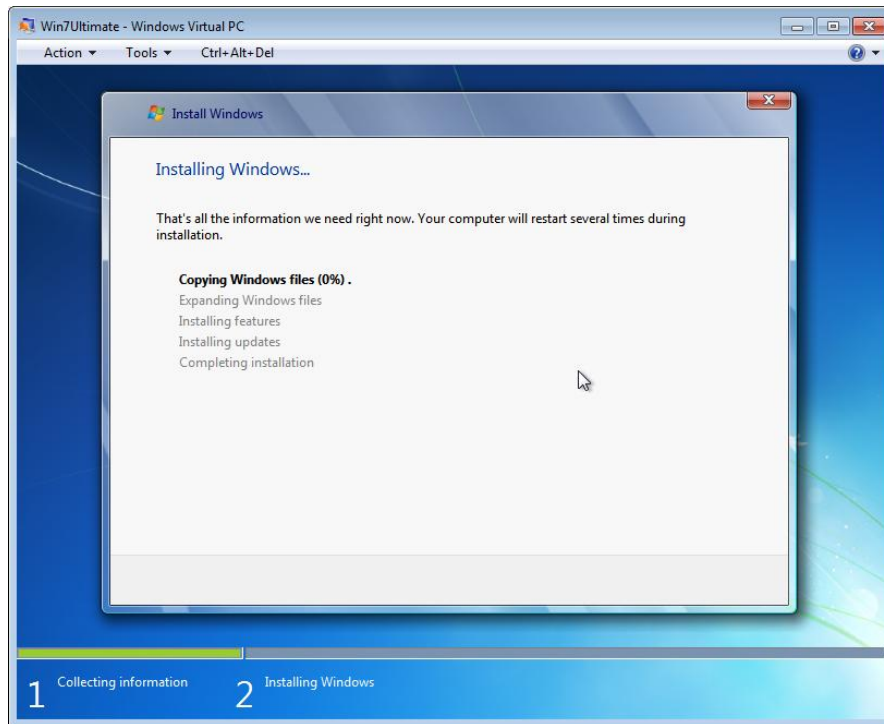
In the screen capture you can see multiple volumes created. The Disk 0 Partition 2 is 39.0 GB and will be used to host the Windows 7 installation. The intended size was 40 GB but because of the disk physical storage sector size and locations, the actual size is 39 GB. Disk 0 Unallocated Space is as stated, space not partitioned or formatted. Notice Disk 0 Partition1: System Reserve is an additional partition created in Windows 7 and is by default when performing a clean install. This is normally a hidden partition and was first introduced and used in Windows Vista and Server 2008 to support the Bitlocker option. **Today Windows 7 uses the System Reserve to store the Windows boot loader file.** The System Reserve partition is only created on disk drives that do not contain existing partitions such as when performing a system upgrade on a machine that has partitions already created.

For now simply accept the configuration and ignore the System Reserve partition. There will be more about the system reserve in later lab activities and the textbook.

Have your instructor inspect your partitions before proceeding.

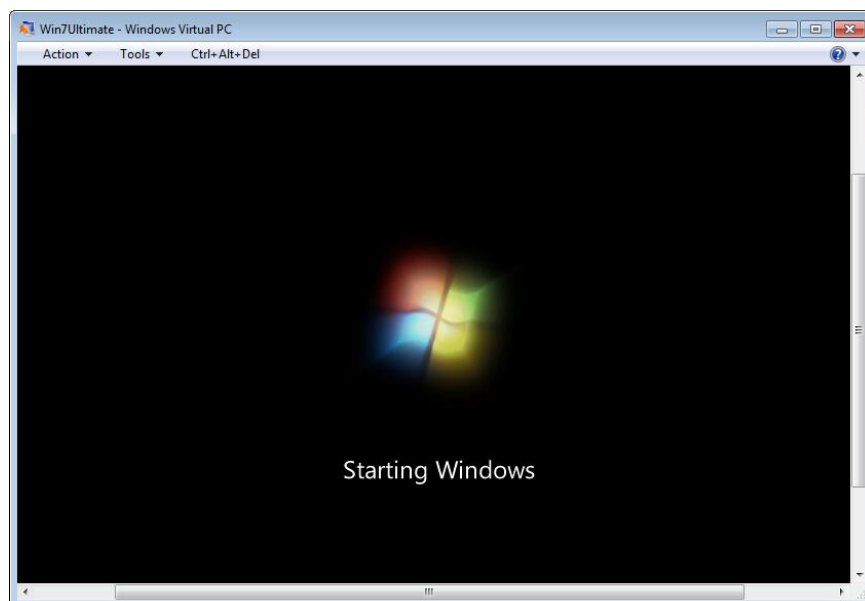
After your instructor approval of partitions you may proceed by selecting the “Next” button.

9. \_\_\_\_ A dialog box will appear showing the progress of the installation process.

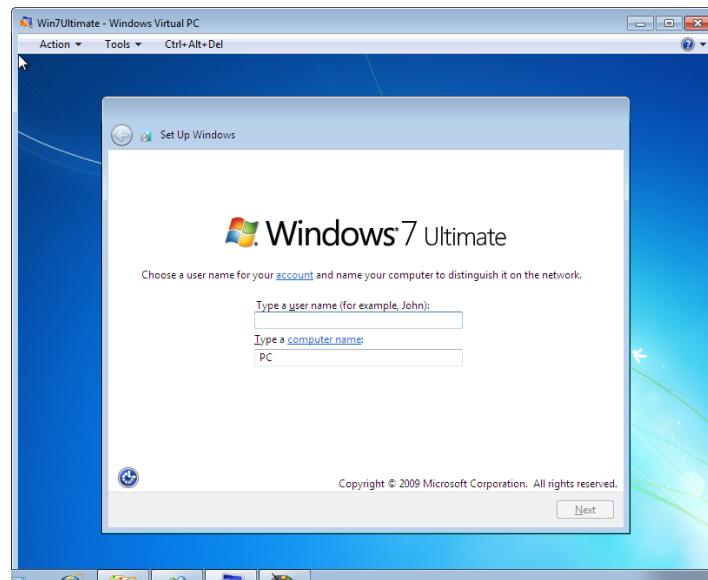


The amount of time required to complete the installation process will vary according to the size of the partition and the performance factors of the machine based upon the amount of RAM and CPU speed.

After the undetermined amount of time you will see a window similar to the one in the screen capture telling you that the operating system is **Starting Windows**.

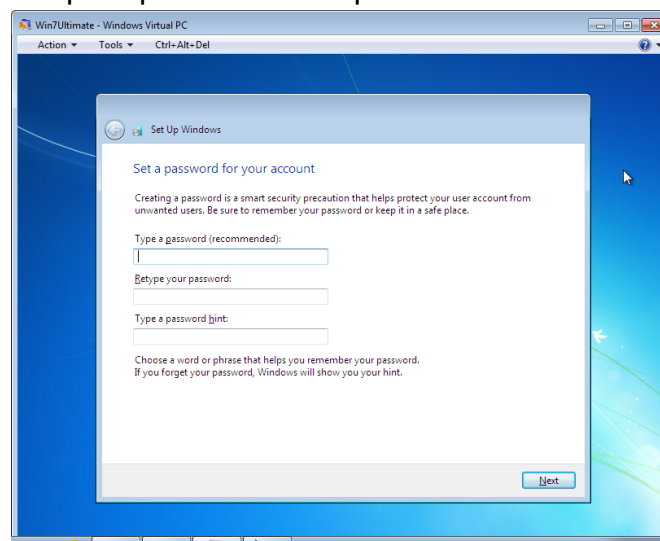


.10. \_\_\_\_ The next major step in the installation is the dialog box prompting you for a user account name. Use the user account name and computer name provided by your instructor.



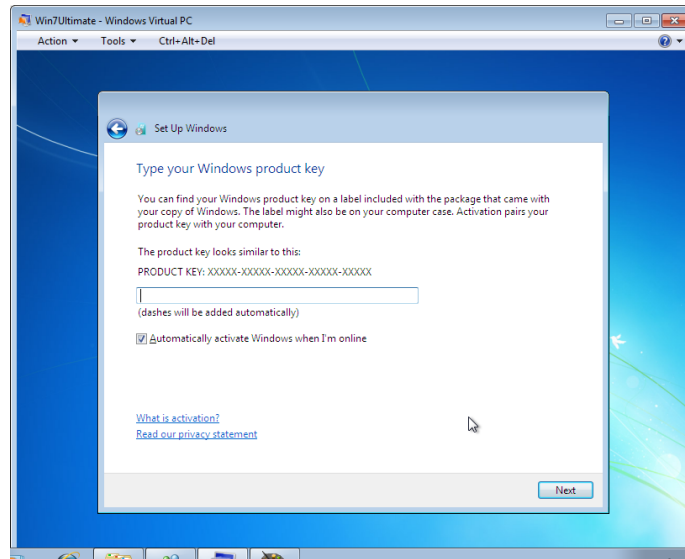
After entering the user name, a computer name will be automatically created based upon the user name. You can change the computer name if you like rather than use the automatically generated computer name. Change the computer name to match the one approved by your instructor.

11. \_\_\_\_ Next you will be prompted to enter a password twice as well as a password hint.



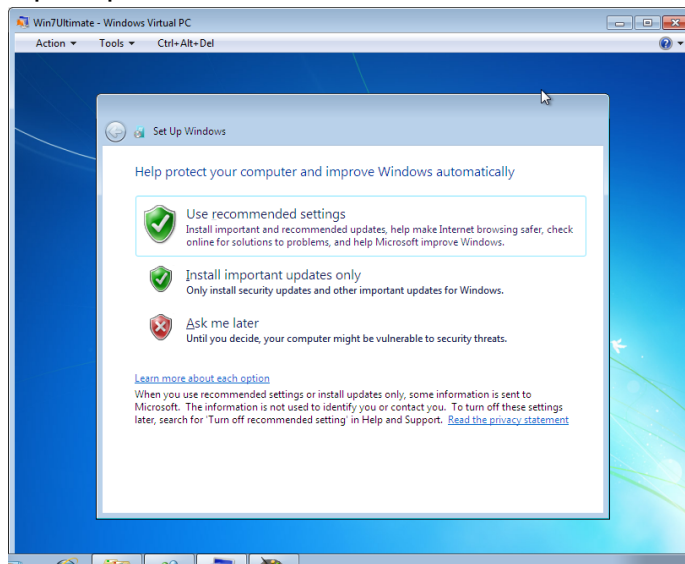
The password hint is optional.

12. \_\_\_\_ The next dialog box prompts you for the Windows product key.



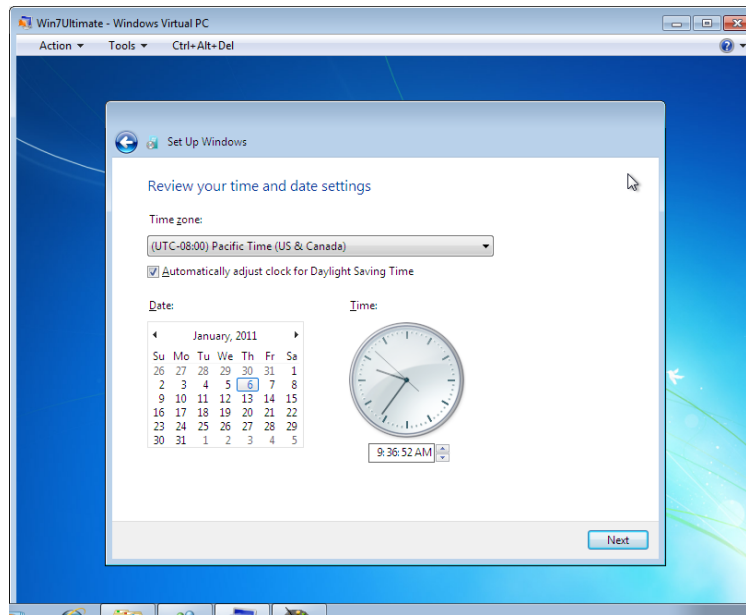
It is not necessary to enter a product key at this time. Also remove the check mark from the “**Automatically activate Windows when I’m online**”. If you provide the product key and allow the computer to be activated on line, than this particular installation DVD cannot be used legally on another computer. You can always provide the product key and activate the software at a later date up to 30 days later.

13. \_\_\_\_ Next you are prompted to select how to handle Windows automatic updates.



To save time in this laboratory activity, select the “Ask me later” option to save laboratory time. You can install important updates at a later time.

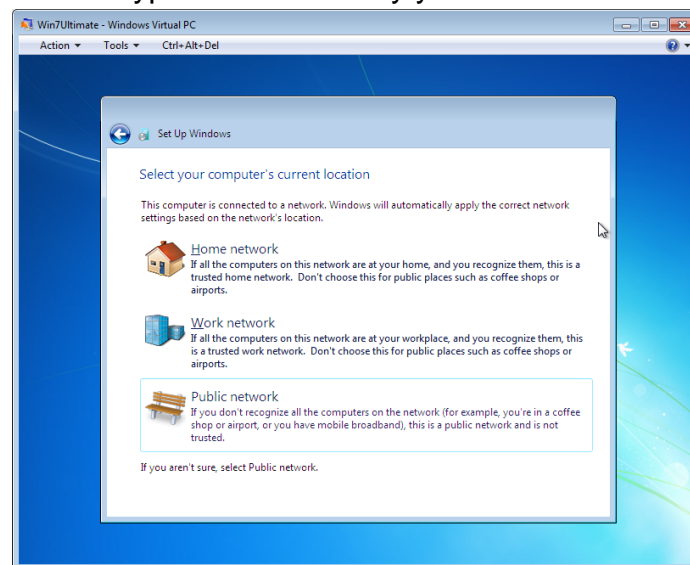
14. \_\_\_\_ Now you are prompted to verify the correct time zone, time and date.



Make appropriate time zone selection and the date and time will most likely be correct.

15. \_\_\_\_ Next you just select a type of computer network location for the installation.

Select the network location type as indicated by your instructor.

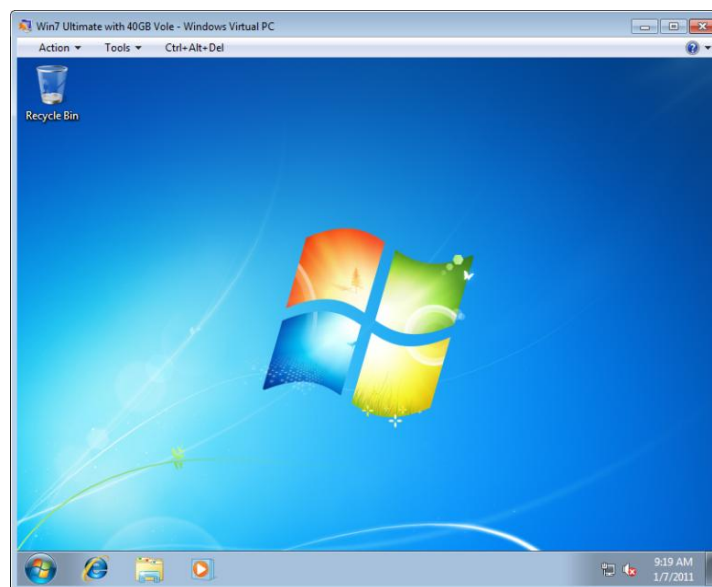


You three choices of computer network locations are **Home network**, **Work network** and **Public network**. Once selected, the computer will be automatically configured with default network security configuration to match the network location.

16. \_\_\_\_ The next major dialog box will be the Windows 7 logon screen. You may see several other dialog boxes before the actual logon screen appears. The number and various dialog boxes will be determined by the type of network location and type of Windows automatic update you selected as well as the availability of an Internet connection.



Now enter your user account password and the Windows 7 desktop should appear similar to the one in the screen capture below.



Call your instructor to inspect your laboratory activity.

17. \_\_\_\_ Answer the review questions.



### **Review Questions**

1. What are the CPU requirements for Windows Home Basic?
2. What is the recommended minimum RAM size for Windows Home Basic?
3. What are the recommended minimum graphics requirements for Windows Home Basic?
4. What is the recommended minimum CPU requirement for Windows 7 Premium (both 32 and 64 bit)?
5. What is the recommended minimum amount of RAM for Windows 32-bit and 64-bit Premium?
6. What are the recommended minimum graphics requirements for Windows Premium?
7. What is the recommended minimum hard disk drive size for the overall physical drive and the amount of free space required?
8. Must you enter the Windows product key at the time of installation?
9. How long before you must enter the Windows product key and activate Windows 7?
10. What are the three network locations?
11. What is the purpose of choosing one of the three network locations during the install process?
12. What is another name for a clean install?
13. What is the difference between the Product Key and the Installation ID?
14. What might cause the operating system to require to be reactivated?
15. Where can you view the Windows Activation Product ID?
16. What is the Change Product Key option used for?
17. What is another name for a partition?

### Review Question Answers

1. What are the CPU requirements for Windows Home Basic? CPU 800 MHz.
2. What is the recommended minimum RAM size for Windows Home Basic? RAM 512 MB.
3. What are the recommended minimum graphics requirements for Windows Home Basic? Graphics Processor that supports Directx9.
4. What is the recommended minimum CPU requirement for Windows 7 Premium (both 32 and 64 bit)? CPU 1 GHz, 32-bit (x86) or 64-bit (x64).
5. What is the recommended minimum amount of RAM for Windows 32-bit and 64-bit Premium? 32 Bit 1 GB, 64-bit 2 GB RAM.
6. What are the recommended minimum graphics requirements for Windows Premium? Graphics Processor that supports Directx9, 128 MB graphics memory, pixel shader 2.0 and 32 bits per pixel, Windows Display Driver Model (WDDM) driver support.
7. What is the recommended minimum hard disk drive size for the overall physical drive and the amount of free space required? Recommended Hard drive 40 GB minimum with 20 GB of free space. Minimum Hard Drive space is 16 GB for 32-bit or 20 GB for 64-bit.
8. Must you enter the Windows product key at the time of installation? No.
9. How long before you must enter the Windows product key and activate Windows 7? 30 days.
10. What are the three network locations? Home, Work, and Public.
11. What is the purpose of choosing one of the three network locations during the install process? The computer is automatically configured with default network security configuration to match the network location.
12. What is another name for a clean install? A new installation.
13. What is the difference between the Product Key and the Installation ID? The Product key is the 25 character key that accompanies the installation DVD. The Installation ID is generated during the installation process and is based upon the Product Key and the Hardware ID.
14. What might cause the operating system to require to be reactivated? A significant change to the hardware system.
15. Where can you view the Windows Activation Product ID? In the Computer Properties dialog box.
16. What is the Change Product Key option used for? To upgrade the version of windows operating system.
17. What is another name for a partition? Volume.