

PC ASSEMBLING AND INSTALLATION

UNIT I

Parts of the Computer: CPU – Motherboard, IO Cards, Cables, Floppy drives, HDD, CD drive, Pen drive. Peripherals – keyboard, mouse, speakers, printers, scanners, monitor.

Parts of the computer

A computer system consists of mainly four basic units; namely input unit, storage unit, central processing unit and output unit. Central Processing unit further includes Arithmetic logic unit and control unit, as shown in the figure:. A computer performs five major operations or functions irrespective of its size and make. These are

- Accepts data or instructions as input,
- Stores data and instruction
- Processes data as per the instructions,
- Controls all operations inside a computer, and
- Gives results in the form of output.

Functional Units:

Input Unit: This unit is used for entering data and programs into the computer system by the user for processing.

Storage Unit: The storage unit is used for storing data and instructions before and after processing.

Output Unit: The output unit is used for storing the result as output produced by the computer after processing.

Processing: The task of performing operations like arithmetic and logical operations is called processing. The Central Processing Unit (CPU) takes data and instructions from the storage unit and makes all sorts of calculations based on the instructions given and the type of data provided. It is then sent back to the storage unit. CPU includes Arithmetic logic unit (ALU) and control unit (CU)

The physical parts are

System unit, Storage, Mouse, Keyboard, Monitor, Printer, Speakers and Modem

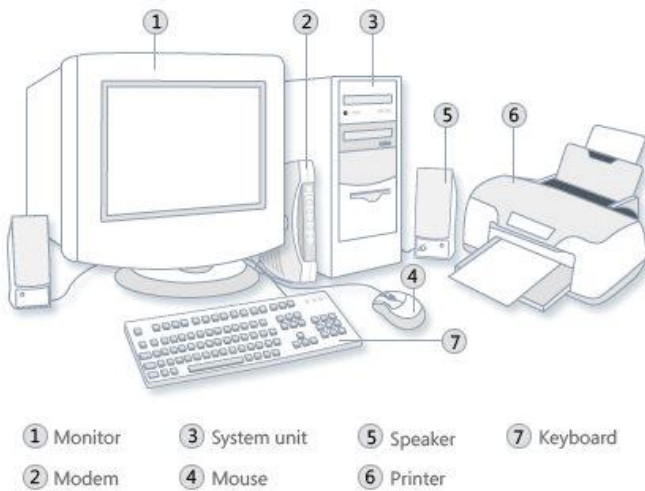


A computer is really a system of many parts working together. The physical parts, which we can see and touch, are collectively called hardware. (Software, on the other hand, refers to the instructions, or programs, that tell the hardware what to do.)

Laptops are for the user who prefers portability. This unit is common for someone like - a college student, consumers who travel frequently and business people who find themselves working in places other than their office.

The **desktop**, or **tower**, is intended for a user who doesn't need a computer that is portable. They are larger in design and often have more features and computing power.

The following illustration shows the most common hardware in a desktop computer system. Our system might look a little different, but it probably has most of these parts. A laptop computer has similar parts but combines them into a single, notebook-sized package.



Desktop computer system

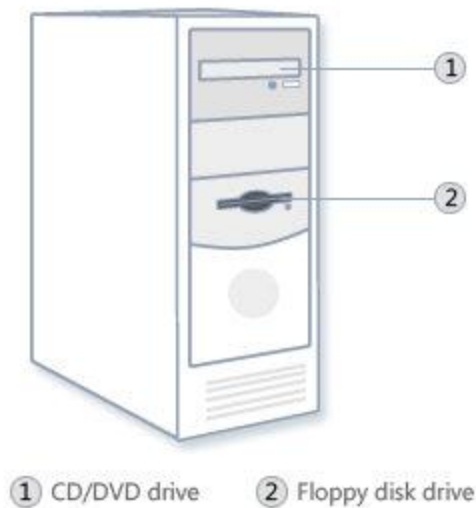
Let's take a look at each of these parts.

System unit

The system unit is the core of a computer system. Usually it's a rectangular box placed on or underneath your desk. Inside this box are many electronic components that process information. The most important of these components is the **central processing unit** (CPU), or **microprocessor**, which acts as the "brain" of your computer.

Another component is **random access memory** (RAM), which temporarily stores information that the CPU uses while the computer is on. The information stored in RAM is erased when the computer is turned off.

Almost every other part of your computer connects to the system unit using **cables**. The cables plug into specific **ports** (openings), typically on the back of the system unit. Hardware that is not part of the system unit is sometimes called a **peripheral device** or **device**.



System unit

1.1. Central Processing Unit (CPU)

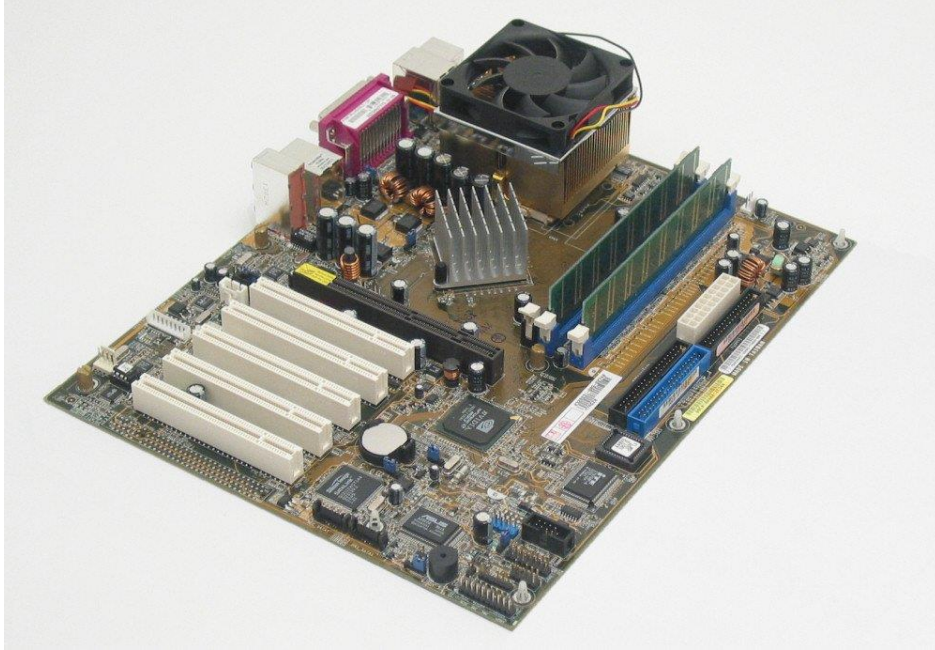
Motherboard

It's the basis of our computer. It's the first component installed in the system unit, and it holds all of the circuitry that ties the functions of the computer components together.

We can think of it like our car (which has many computer systems of its own). If you have a frame and tires, you've got a car (or you've got a system unit), but it won't take you very far! Now, add your engine - the motherboard - where all the systems tie in one way or another, and you've got the start of a working vehicle.

the motherboard controls the functions of different components. The number of connection slots for peripheral devices and the number and type of memory slots are important properties of the motherboard.

In addition to the various connections, the motherboard also has a small battery ensuring that settings made on the board are retained even when the computer is switched off.

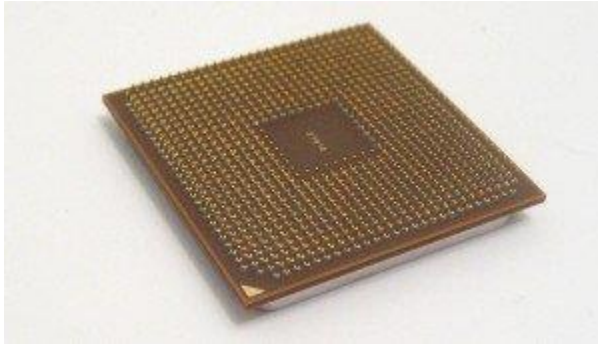


Motherboard

The motherboard and circuitry need to have **power**. There is a power box included with our system unit, and we'll see a cord coming out of the back of your computer for that. The **central processing unit**, or the brains of the computer, sits on the motherboard and does actually have its own cooling **fan**. The processors now are so fast they need to be cooled down. All the instructions you give the computer - like a click of a mouse - go through the CPU, which processes in billions of cycles per second.

Commonly installed processors have quad-cores, or four separate processors in one component. There are six-core and eight-core available, and the more advanced the technology the higher the cost.

The processor



The processor can be considered to be the 'engine' of the computer because it executes the lion's share of the information processing; the processor fetches commands and necessary information from the RAM, carries out the tasks specified by the commands, and returns the processed information to the RAM.

The speed of a computer depends largely on the speed of the processor. The processor's speed, in turn, is affected by various factors, such as the so-called clock frequency (usually expressed as gigahertz, GHz), the amount of cores and of the so-called cache memory inside the processor.

Storage

Our computer has one or more **disk drives**—devices that store information on a metal or plastic disk. The disk preserves the information even when your computer is turned off.

Random access memory



The RAM (Random Access Memory) is a memory storage that functions during computer use and is especially utilised by the processor. In modern computers, the amount of RAM is around 4 – 16 GB depending on the type and purpose of the computer. The RAM consists of one or more memory modules (see image above).

When the computer is started, the operating system is loaded into the RAM (an operating system is a program that controls the devices and programs in a computer)

The computer also loads the files being processed – music, assignments, videos etc – to the RAM.

If there is enough RAM, the computer executes requested tasks quickly. This is why it is a good idea to add to the memory by buying more memory modules as the need arises.

Memory, Cache, RAM, ROM

Next to the CPU sits the **cache**, or the temporary memory where things we are working on sit for quick interpretation by the CPU. The RAM chip is also near this location.

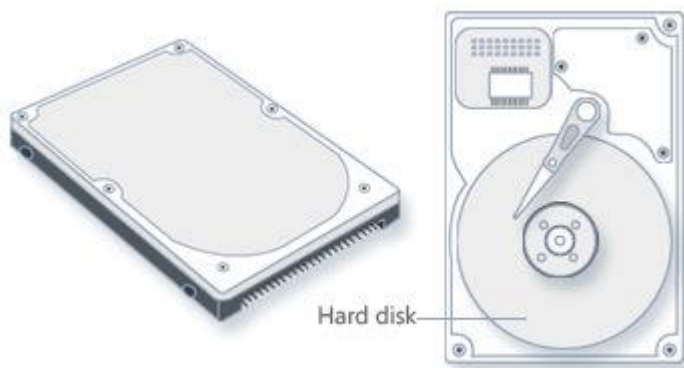
Random-access memory is volatile, or temporary, memory. Whenever you turn on a program, its instructions are stored in RAM while the machine is on. Once you shut the machine down, both the cache and the RAM are completely cleared out. RAM storage is common at eight, ten or twelve gigabytes.

ROM, or **read-only memory**, is located here as well. This is a permanent, or non-volatile, memory. As soon as we turn on your computer, the start-up instructions that are stored in ROM begin to execute. Even when we turn it off, the instructions stored in ROM remain. So if we have a machine that runs Windows, as soon as we hit the power-up button, we'll get a short screen that might give you a message from the manufacturer. Then in the background we'll just see black and the Windows logo come through, and it will say 'Starting Windows.' What's going on there is that as soon as you hit the power button, the ROM is kicking in and starting up all those instructions for systems checks.

The part attached to the motherboard is most likely to recognize is the **hard drive**. The hard drive doesn't sit directly on the motherboard, but it is connected to the circuitry by electrical wire. The hard drive stores software you've put in there like Firefox, WordPad or a music player. It also stores the data files those programs have created and used. Hard drive storage commonly begins at one terabyte now and goes up to two and a half terabytes.

Hard disk drive

Our computer's hard disk drive stores information on a hard disk—a rigid platter or stack of platters with a magnetic surface. Because hard disks can hold massive amounts of information, they usually serve as our computer's primary means of storage, holding almost all of your programs and files. The hard disk drive is normally located inside the system unit.



Hard disk drive

Hard drive



The hard drive is the permanent memory of the computer where saved files remain even when the computer is turned off. This is why the hard drive is used for saving files.

The capacity of hard drives varies; currently the typical capacity is 500-1000 GB, but hard drives of over 1500 GB, i.e. 1,5 terabit, are also available. However, the capacity of the internal hard drives in laptop computers is often less than that. You can add to the capacity of your computer by attaching an additional hard drive, either internally or externally. The hard disk is used for the storage of the computer's operating system and all important files. It is therefore packed in a fixed protective housing. The disks may become damaged in spite of this protection, so you should absolutely make backup copies of files on the hard drive from time to time

CD and DVD drives

Nearly all computers today come equipped with a CD or DVD drive, usually located on the front of the system unit. CD drives use lasers to read (retrieve) data from a CD; many CD drives can also write (record) data onto CDs. If you have a recordable disk drive, you can store copies of your files on blank CDs. You can also use a CD drive to play music CDs on your computer.



CD

DVD drives can do everything that CD drives can, plus read DVDs. If we have a DVD drive, we can watch movies on our computers since it is capable of much storage compared to CDs. Many DVD drives can record data onto blank DVDs.

If we have a recordable CD or DVD drive, periodically back up (copy) our important files to CDs or DVDs. That way, if our hard disk ever fails, we won't lose our data.

Most computers these days come with a **Blu-ray** drive or a **DVD (Digital Versatile Disk)** drive with writing capabilities, with which you can burn such things as backup copies of important files to DVDs. **CD drives** are older and have mostly been replaced with DVD drives. CD drives can only burn data on CDs, which have a substantially smaller storage capacity, while DVD drives can burn data to both CDs and DVDs with more capacity

Floppy disk drive

Floppy disk drives store information on floppy disks, also called **floppies or diskettes**. Compared to CDs and DVDs, floppy disks can store only a small amount of data. They also retrieve information more slowly and are more prone to damage. For these reasons, floppy disk drives are less popular than they used to be, although some computers still include them.



Floppy disk

Why are these disks called "floppy" disks? The outside is made of hard plastic, but that's just the sleeve. The disk inside is made of a thin, flexible vinyl material.

Pen Drive

A pen drive is a portable Universal Serial Bus (USB) flash memory device for storing and transferring audio, video, and data files from a computer. As long as the desktop or laptop has a USB port, and the pen drive is compatible with the operating system, it

should be easy to move the data from the hard drive to the device — and to another computer — in a matter of minutes. The drive gets its name from the fact that many have a retractable port connector like a ballpoint pen, and they are small enough to fit into a pocket. Other names include flash drive, jump drive, and thumb drive.

1.2. PERIPHERALS

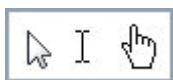
Mouse

A mouse is a small device used to point to and select items on our computer screen. Although mice come in many shapes, the typical mouse does look a bit like an actual mouse. It's small, oblong, and connected to the system unit by a long wire that resembles a tail. Some newer mice are wireless.



Mouse

A mouse usually has two buttons: A primary button (usually the left button) and a secondary button. Many mice also have a wheel between the two buttons, which allows us to scroll smoothly through screens of information.



Mouse pointers

When we move the mouse with our hand, a pointer on our screen moves in the same direction. (The pointer's appearance might change depending on where it's positioned on your screen.) When we want to select an item, we point to the item and then click (press and release) the primary button. Pointing and clicking with our mouse is the main way to interact with our computer.

Touchpad

Almost all laptop computers have a **touchpad** which is used to move the cursor. Some models also have a so-called **pointing stick**. In addition, portable computers have keys with the clicking function of mouses. The **touchpad** is a pad where you can control the cursor by moving your finger along the pad. Tapping the pad serves the same function as clicking a mouse.

Pointing stick

The **pointing stick** is a 'nub' located in the middle of the keyboard, and controls the cursor. The pointing stick can be 'clicked' by tapping the stick or using the separate buttons in the keyboard. In the right-hand image above, you can see a portable computer with both a pointing stick (blue) and a touchpad (the large, dark grey area in front of the keyboard).

Touchscreen

Devices that are smaller than a laptop, such as phones and tablets, usually do not have a separate keyboard or pointer device. In these devices, the entire screen of the device works as an input device. A **touchscreen** is used like the track pad on a laptop, and when typing is required, a keyboard appears on the screen.

Keyboard

A keyboard is used mainly for typing text into your computer. Like the keyboard on a typewriter, it has keys for letters and numbers, but it also has special keys:

The **function keys**, found on the top row, perform different functions depending on where they are used.

The **numeric keypad**, located on the right side of most keyboards, allows us to enter numbers quickly.

The **navigation keys**, such as the arrow keys, allow us to move your position within a document or webpage.



Keyboard

We can also use your keyboard to perform many of the same tasks we can perform with a mouse.

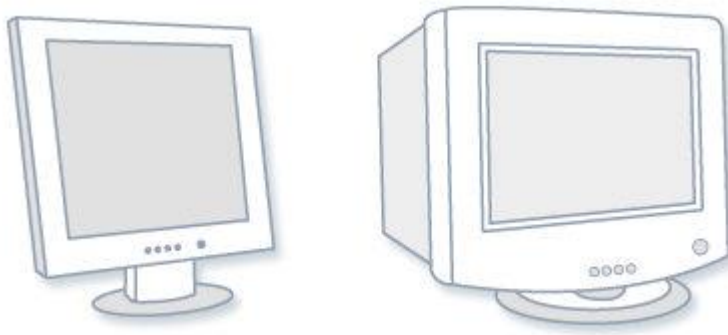
Scanners

A scanner is a device that captures images from photographic prints, posters, magazine pages, and similar sources for computer editing and display. Scanners come in hand-held, feed-in, and flatbed types and for scanning black-and-white only, or color. Very high resolution scanners are used for scanning for high-resolution printing, but lower resolution scanners are adequate for capturing images for computer display. Scanners usually come with software, such as Adobe's Photoshop product, that lets you resize and otherwise modify a captured image.

Monitor

A monitor displays information in visual form, using text and graphics. The portion of the monitor that displays the information is called the screen. Like a television screen, a computer screen can show still or moving pictures.

There are two basic types of monitors: CRT (cathode ray tube) monitors and the newer LCD (liquid crystal display) monitors. Both types produce sharp images, but LCD monitors have the advantage of being much thinner and lighter.



LCD monitor (left); CRT monitor (right)

Most computer displays are so-called LCD displays (Liquid Crystal Display), where the image display is produced by liquid crystals between two transparent sheets. Display sizes range between only a few inches in handheld apparatuses to large 24 inch desktop displays.

One of the most important features of the display is its **resolution**, i.e. how many pixels (picture elements) the image consists of. A normal 22 to 24-inch widescreen display usually has 1920 pixels horizontally and 1200 pixels vertically (1920×1200). These displays can reproduce **FullHD (full high definition)** image.

No matter what the type of display is, the computer must contain a so-called **display adapter** that allows you to attach the display to the computer and controls the display image. Practically all motherboards come equipped with a display adapter, so you do not need to buy one separately, unless you want to enhance the capabilities of your desktop computer e.g. for gaming, video editing, or 3D imaging purposes.

Video and Sound Cards

Let's take a peek at the **video card**, or the graphics card. This card is used to process images so you can see them on your computer. As a standard computer user, the video card included with the system we are looking at will suffice. If we are a gamer, or really into working with photos or digital art, we may be looking for higher-end cards. These cards are more expensive, but typically have their own CPU for better and faster

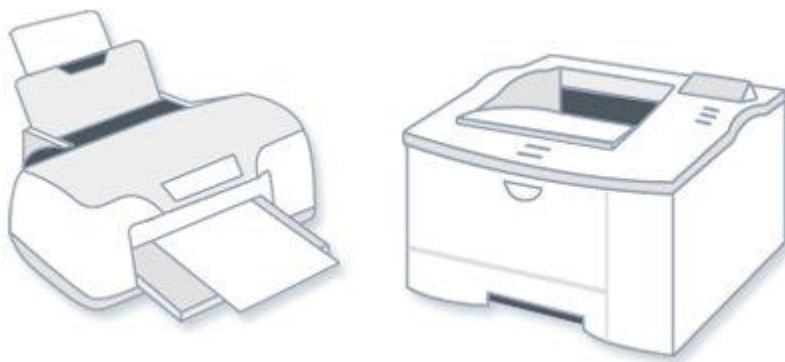
processing of images. Many video cards now allow for more than one monitor to be hooked up to the system.

The **sound card** on the motherboard lets us hear from an internal speaker. We can also plug in peripheral devices such as speakers, microphones or headphones. If we're going to end up needing to use headphones most of the time, or speakers that are included with your system, the stock sound card will work just fine for us.

Printer

A printer transfers data from a computer onto paper. We don't need a printer to use our computer, but having one allows us to print e-mail, cards, invitations, announcements, and other material. Many people also like being able to print their own photos at home.

The two main types of printers are inkjet printers and laser printers. Inkjet printers are the most popular printers for the home. They can print in black and white or in full color and can produce high-quality photographs when used with special paper. Laser printers are faster and generally better able to handle heavy use.



Inkjet printer (left); laser printer (right)

Speakers

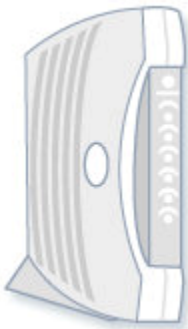
Speakers are used to play sound. They can be built into the system unit or connected with cables. Speakers allow you to listen to music and hear sound effects from your computer.



Computer speakers

Modem

To connect your computer to the Internet, you need a modem. A modem is a device that sends and receives computer information over a telephone line or high-speed cable. Modems are sometimes built into the system unit, but higher-speed modems are usually separate components.



Cable modem

Sample desktop computer system configuration

1. Processor Intel Core i5-4440 --> 10,690
2. Motherboard ASUS B85M-G -->5,989
3. RAM Gskill RipjawsX F3-12800CL9D-8GBXL (2 x 4GB) --> 5,950
4. HDD Seagate Barracuda 1TB --> 3,550
5. Graphics CardPrice ZOTAC GTX 660 2 GB --> 12,800
6. Cabinet Thermaltake Versa H21 --> 2,730
7. PSU Seasonic S12II 620 Watts --> 5620
8. Optical Drive Samsung SH-224DB/IDDS --> 950
9. Monitor Dell S Series S2415H 24-Inch Screen Full HD HDMI LED Monitor ->16500

Sample desktop computer system configuration

Processor Brand	Intel
Processor Type	Core i3
Processor Speed	1.7 GHz
RAM Size	4 GB
Memory Technology	DDR3
Hard Drive Size	500 GB
Hard Disk Technology	Mechanical Hard Drive
Speaker Description	HD Audio Stereo Speakers with Waves MaxxAudio
Graphics Coprocessor	Nvidia GeForce
Graphics Card Description	Nvidia GeForce Graphics
Graphics Card Ram Size	2
Connectivity Type	Wireless, WiFi and Bluetooth
Wireless Type	802.11bgn
Number of USB 2.0 Ports	2
Number of USB 3.0 Ports	1
Front Webcam Resolution	1 Pixels

Some of the Brand names of different parts of computers

- **Rack-mount computer cases**

AMAX Information Technologies, Antec, AOpen, SuperMicro, In Win Development, etc.,

- **Laptop Computer Cases**

Clevo, MSI, Sager, etc.,

- **List of motherboard manufacturers**

Acer, ACube, Systems AMAX Information Technologies, AOpen, ASRock, Biostar, Chassis Plans, Gigabyte Technology, Gumstix, IBM (only for their mainframes), Intel, Powercolor, Sapphire Technology, Shuttle Inc. Simmtronics, Supermicro, Trenton Technology, Tyan, etc.,

- **Chipsets for motherboards**

AMD, Intel, Nvidia, ServerWorks, Silicon Integrated Systems etc.,

- **Central processing units (CPUs)**

AMD, ARM Holdings, Cyrix, Freescale, Fujitsu, IBM, Intel, Marvell, MediaTek, NexGen, Nvidia Tegra, Oracle (previously Sun Microsystems), Qualcomm, NexGen, Samsung, SigmaTel, etc.,

- **List of current hard disk drive manufacturers:**

Seagate Technology, including its subsidiary brands Maxtor and Samsung, Toshiba

Western Digital, including its subsidiary brand HGST, etc.,

- **List of keyboard manufacturers:**

Alps, APEVIA, Arctic, BTC, Chassis Plans, Cherry, Chicony Electronics, Corsair, Cooler Master, CTI Electronics Corporation, Das Keyboard, Fujitsu-Siemens

,Genius, Gigabyte Technology, Hama Photo, IOGEAR, Kensington Computer Products Group, KeyScan, Key Tronic, Lite-On, etc.,

- **List of mouse manufacturers:**

A4Tech, Acer, Alienware, APEVIA, Arctic, Asus, Creative Technology, General Electric, Genius, Gigabyte Technology, HP, TVS Electronics, Key Tronic, Labtec, Logitech, Microsoft, Mikomi, Mitsumi, Razer, Sony, etc.,

- **List of computer speaker manufacturers:**

Altec Lansing, AOpen (stopped making speakers), Auzentech, Behringer, Bose Corporation, Cerwin-Vega , Corsair Memory, Creative Technology, Edifier, Genius, General Electric, Gigabyte Technology, Hercules, Logitech, Philips, Sony, Yamaha, etc.

- **List of modem manufacturers:**

3Com, Agere Systems, Alcatel, Aopen, Arris Group, AVM GmbH, Belkin International, Inc., Coolpad, D-Link, Cisco, Huawei, Microcom, Motorola, USRobotics, Zoom Technologies, ZyXEL, etc.

- **List of printer manufacturers:**

Brother, Canon, Dell, Epson, HP, Konica Minolta, Kyocera, Lexmark, OKI, Olivetti, Ricoh, Samsung, Seiko Epson, Xerox, Qume, etc.

- **List of image scanner manufacturers:**

Brother, Canon, Fujitsu, HP, Kodak, Lexmark, Microtek, Mustek Systems, Panasonic, Plustek, Ricoh, Seiko Epson, Umax, Visioneer, XEROX

- **List of USB flash drive manufacturers:**

ADATA, Aigo, Apacer, ATP Electronics, Corsair Memory, Crucial Technology, HP, Imation, IronKey, Kingston Technology, Konami, Lexar, Netac, OCZ, ORCHID, Philips, Strontium Technology, Toshiba, Transcend, TrekStor, Umax, etc.,

- **List of webcam manufacturers:**

Behavior Tech Computer, Canon, Creative Technology, FaceVtion, General Electric, Genius, Hama Photo, Hewlett-Packard, Intel, Labtec, Lenovo, Logitech, Kodak, Microsoft, Philips, Sabrent, Silicon Power, Trust, iMicro

Difference between hardware and software

The beauty of a computer is that it can run a word-processing program one minute—and then a photo-editing program five seconds later. In other words, although we don't really think of it this way, the computer can be reprogrammed as many times as you like. This is why programs are also called software. They're "soft" in the sense that they are not fixed: they can be changed easily. By contrast, a computer's hardware—the bits and pieces from which it is made (and the peripherals, like the mouse and printer, you plug into it)—is pretty much fixed when you buy it off the shelf. The hardware is what makes your computer powerful; the ability to run different software is what makes it flexible. That computers can do so many different jobs is what makes them so useful.

How Computer Works?

The computer does its primary work in a part of the machine we cannot see, a control center that converts data input to information output. This control center, called the central processing unit (CPU), is a highly complex, extensive set of electronic circuitry that executes stored program instructions. All computers, large and small, must have a central processing unit. The central processing unit consists of two parts: The control unit and the arithmetic/logic unit. Each part has a specific function.

Before we discuss the control unit and the arithmetic/logic unit in detail, we need to consider data storage and its relationship to the central processing unit. Computers use

two types of storage: Primary storage and secondary storage. The CPU interacts closely with primary storage, or main memory, referring to it for both instructions and data. For this reason this part of the reading will discuss memory in the context of the central processing unit. Technically, however, memory is not part of the CPU.

Recall that a computer's memory holds data only temporarily, at the time the computer is executing a program. Secondary storage holds permanent or semi-permanent data on some external magnetic or optical medium. The diskettes and CD-ROM disks that you have seen with personal computers are secondary storage devices, as are hard disks. Since the physical attributes of secondary storage devices determine the way data is organized on them, we will discuss secondary storage and data organization together in another part of our online readings.

Now let us consider the components of the central processing unit.

The Control Unit

The control unit of the CPU contains circuitry that uses electrical signals to direct the entire computer system to carry out, or execute, stored program instructions. Like an orchestra leader, the control unit does not execute program instructions; rather, it directs other parts of the system to do so. The control unit must communicate with both the arithmetic/logic unit and memory.

The Arithmetic/Logic Unit

The arithmetic/logic unit (ALU) contains the electronic circuitry that executes all arithmetic and logical operations.

The arithmetic/logic unit can perform four kinds of arithmetic operations, or mathematical calculations: addition, subtraction, multiplication, and division. As its name implies, the arithmetic/logic unit also performs logical operations. A logical operation is usually a comparison. The unit can compare numbers, letters, or special

characters. The computer can then take action based on the result of the comparison. This is a very important capability. It is by comparing that a computer is able to tell, for instance, whether there are unfilled seats on airplanes, whether charge- card customers have exceeded their credit limits, and whether one candidate for Congress has more votes than another.

Logical operations can test for three conditions:

- **Equal-to condition.** In a test for this condition, the arithmetic/logic unit compares two values to determine if they are equal. For example: If the number of tickets sold equals the number of seats in the auditorium, then the concert is declared sold out.
- **Less-than condition.** To test for this condition, the computer compares values to determine if one is less than another. For example: If the number of speeding tickets on a driver's record is less than three, then insurance rates are \$425; otherwise, the rates are \$500.
- **Greater-than condition.** In this type of comparison, the computer determines if one value is greater than another. For example: If the hours a person worked this week are greater than 40, then multiply every extra hour by 1.5 times the usual hourly wage to compute overtime pay.

A computer can simultaneously test for more than one condition. In fact, a logic unit can usually discern six logical relationships: equal to, less than, greater than, less than or equal to, greater than or equal to, and not equal. The symbols that let you define the type of comparison you want the computer to perform are called relational operators. The most common relational operators are the equal sign(=), the less-than symbol(<), and the greater-than symbol(>).

Registers: Temporary Storage Areas

Registers are temporary storage areas for instructions or data. They are not a part of memory; rather they are special additional storage locations that offer the advantage of speed. Registers work under the direction of the control unit to accept, hold, and transfer instructions or data and perform arithmetic or logical comparisons at high speed. The control unit uses a data storage register the way a store owner uses a cash register-as a temporary, convenient place to store what is used in transactions. Computers usually assign special roles to certain registers, including these registers:

- **An accumulator**, which collects the result of computations.
- **An address register**, which keeps track of where a given instruction or piece of data is stored in memory. Each storage location in memory is identified by an address, just as each house on a street has an address.
- **A storage register**, which temporarily holds data taken from or about to be sent to memory.
- A general-purpose **register**, which is used for several functions.

Memory and Storage

Memory is also known as primary storage, primary memory, main storage, internal storage, main memory, and RAM (Random Access Memory); all these terms are used interchangeably by people in computer circles. Memory is the part of the computer that holds data and instructions for processing. Although closely associated with the central processing unit, memory is separate from it. Memory stores program instructions or data for only as long as the program they pertain to is in operation. Keeping these items in memory when the program is not running is not feasible for three reasons:

- Most types of memory only store items while the computer is turned on; data is destroyed when the machine is turned off.

- If more than one program is running at once (often the case on large computers and sometimes on small computers), a single program can not lay exclusive claim to memory.
- There may not be room in memory to hold the processed data.

How do data and instructions get from an input device into memory? The control unit sends them. Likewise, when the time is right, the control unit sends these items from memory to the arithmetic/logic unit, where an arithmetic operation or logical operation is performed. After being processed, the information is sent to memory, where it is hold until it is ready to be released to an output unit. The chief characteristic of memory is that it allows very fast access to instructions and data, no matter where the items are within it. We will discuss the physical components of memory-memory chips-later in this chapter.

To see how registers, memory, and second storage all work together, let us use the analogy of making a salad. In our kitchen we have:

- a refrigerator where we store our vegetables for the salad;
- a counter where we place all of our veggies before putting them on the cutting board for chopping;
- a cutting board on the counter where we chop the vegetables;
- a recipe that details what veggies to chop;
- the corners of the cutting board are kept free for partially chopped piles of veggies that we intend to chop more or to mix with other partially chopped veggies.
- a bowl on the counter where we mix and store the salad;
- space in the refrigerator to put the mixed salad after it is made.

The process of making the salad is then: bring the veggies from the fridge to the counter top; place some veggies on the chopping board according to the recipe; chop the

veggies, possibly storing some partially chopped veggies temporarily on the corners of the cutting board; place all the veggies in the bowl to either put back in the fridge or put directly on the dinner table.

The refrigerator is the equivalent of secondary (disk) storage. It can store high volumes of veggies for long periods of time. The counter top is the equivalent of the computer's motherboard - everything is done on the counter (inside the computer). The cutting board is the ALU - the work gets done there. The recipe is the control unit - it tells you what to do on the cutting board (ALU). Space on the counter top is the equivalent of RAM memory - all veggies must be brought from the fridge and placed on the counter top for fast access. Note that the counter top (RAM) is faster to access than the fridge (disk), but can not hold as much, and can not hold it for long periods of time. The corners of the cutting board where we temporarily store partially chopped veggies are equivalent to the registers. The corners of the cutting board are very fast to access for chopping, but can not hold much. The salad bowl is like a temporary register, it is for storing the salad waiting to take back to the fridge (putting data back on a disk) or for taking to the dinner table (outputting the data to an output device).

Now for a more technical example. let us look at how a payroll program uses all three types of storage. Suppose the program calculates the salary of an employee. The data representing the hours worked and the data for the rate of pay are ready in their respective registers. Other data related to the salary calculation-overtime hours, bonuses, deductions, and so forth-is waiting nearby in memory. The data for other employees is available in secondary storage. As the CPU finishes calculations about one employee, the data about the next employee is brought from secondary storage into memory and eventually into the registers.

The following table summarizes the characteristics of the various kinds of data storage in the storage hierarchy.

Storage	Speed	Capacity	Relative Cost (\$)	Permanent?
Registers	Fastest	Lowest	Highest	No
RAM	Very Fast	Low/Moderate	High	No
Floppy Disk	Very Slow	Low	Low	Yes
Hard Disk	Moderate	Very High	Very Low	Yes

Modern computers are designed with this hierarchy due to the characteristics listed in the table. It has been the cheapest way to get the functionality. However, as RAM becomes cheaper, faster, and even permanent, we may see disks disappear as an internal storage device. Removable disks, like Zip disks or CDs (we describe these in detail in the online reading on storage devices) will probably remain in use longer as a means to physically transfer large volumes of data into the computer. However, even this use of disks will probably be supplanted by the Internet as the major (and eventually only) way of transferring data.

How the CPU Executes Program Instructions

Let us examine the way the central processing unit, in association with memory, executes a computer program. We will be looking at how just one instruction in the program is executed. In fact, most computers today can execute only one instruction at a time, though they execute it very quickly. Many personal computers can execute instructions in less than one-millionth of a second, whereas those speed demons known as supercomputers can execute instructions in less than one-billionth of a second.

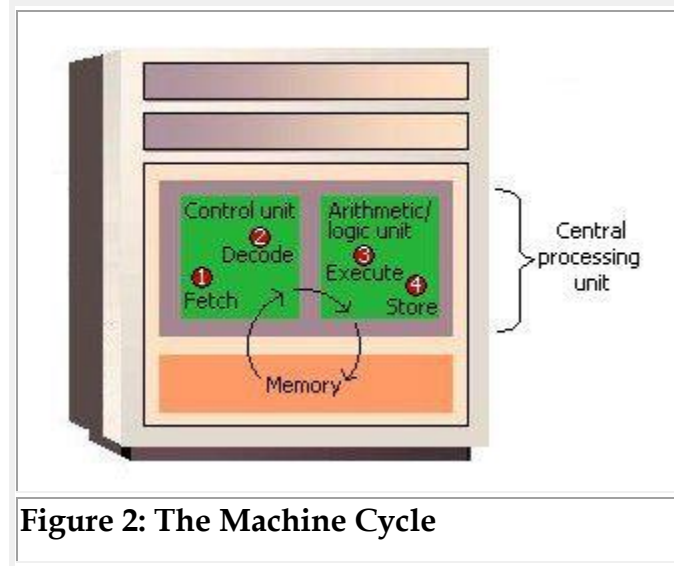


Figure 2: The Machine Cycle

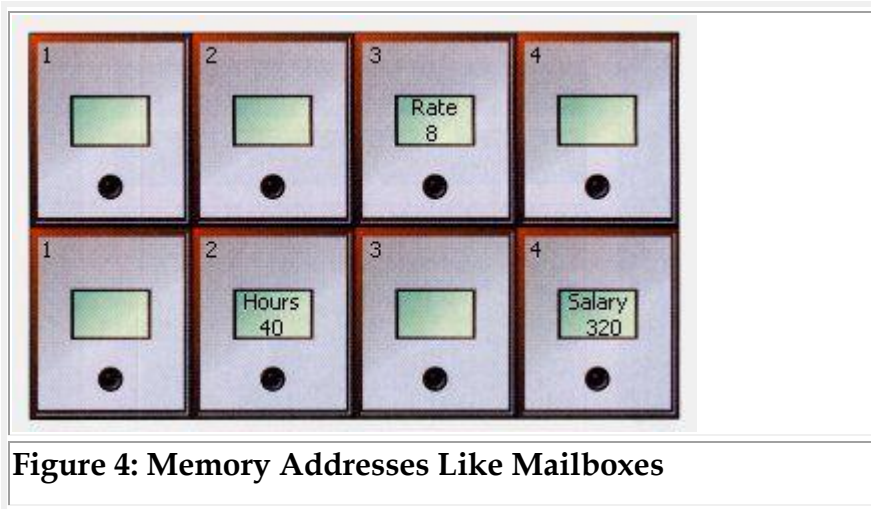
Before an instruction can be executed, program instructions and data must be placed into memory from an input device or a secondary storage device (the process is further complicated by the fact that, as we noted earlier, the data will probably make a temporary stop in a register). As Figure 2 shows, once the necessary data and instruction are in memory, the central processing unit performs the following four steps for each instruction:

1. The control unit fetches (gets) the instruction from memory.
2. The control unit decodes the instruction (decides what it means) and directs that the necessary data be moved from memory to the arithmetic/logic unit. These first two steps together are called instruction time, or I-time.
3. The arithmetic/logic unit executes the arithmetic or logical instruction. That is, the ALU is given control and performs the actual operation on the data. The arithmetic/logic unit stores the result of this operation in memory or in a register. Steps 3 and 4 together are called execution time, or E-time.
4. The control unit eventually directs memory to release the result to an output device or a secondary storage device. The combination of I-time and E-time is

called the machine cycle. Figure above shows an instruction going through the machine cycle.

Each central processing unit has an internal clock that produces pulses at a fixed rate to synchronize all computer operations. A single machine-cycle instruction may be made up of a substantial number of sub-instructions, each of which must take at least one clock cycle. Each type of central processing unit is designed to understand a specific group of instructions called the instruction set. Just as there are many different languages that people understand, so each different type of CPU has an instruction set it understands.

It is one thing to have instructions and data somewhere in memory and quite another for the control unit to be able to find them. How does it do this?



The location in memory for each instruction and each piece of data is identified by an address. That is, each location has an address number, like the mailboxes in front of an apartment house. And, like the mailboxes, the address numbers of the locations remain the same, but the contents (instructions and data) of the locations may change. That is,

new instructions or new data may be placed in the locations when the old contents no longer need to be stored in memory. Unlike a mailbox, however, a memory location can hold only a fixed amount of data; an address can hold only a fixed number of bytes - often two bytes in a modern computer. Above Figure shows how a program manipulates data in memory. A payroll program, for example, may give instructions to put the rate of pay in location 3 and the number of hours worked in location 6. To compute the employee's salary, then, instructions tell the computer to multiply the data in location 3 by the data in location 6 and move the result to location 8. The choice of locations is arbitrary - any locations that are not already spoken for can be used. Programmers using programming languages, however, do not have to worry about the actual address numbers, because each data address is referred to by a name. The name is called a symbolic address. In this example, the symbolic address names are Rate, Hours, and Salary.

UNIT II

Assembling: components required, installing CPU, steps in installing Processor in CPU, Motherboard installation, Drives installation, installation of video, graphics card, sound card, modem and adapter. Connectors: system panel connector.

ASSEMBLING

Modern computers become more affordable when users supplement their monetary investment with a few hours of effort. This computer assembling will be very basic and requires minimum hardware knowledge to have a functional system. After all of the necessary parts and materials are procured, it will take between 2 and 4 hours to assemble a computer and it is enough to use simple hand tools, such as a screwdriver and a pair of pliers.

The assembling is explained in steps. The basic steps normally needed are as follows

I Components Required

First you will need to buy the parts necessary to build the computer. The parts of the computer are labeled in figure below:



Figure 1

1. Processor (CPU)
2. Computer Case
3. Optical Drive (DVD RW and SATA capable)
4. Memory (RAM)
5. Power Supply

6. SATA Cables
7. Motherboard (SATA Capable)
8. Processor Fan
9. Case Fan
10. Hard Drive (SATA Capable)
11. Assortment of case and drive screws (Not Pictured)

All of these parts can be bought together in what is known as a “barebones kit”. Normally, the case, motherboard, CPU, hard drive, and memory were bought together as a barebones kit. This leads to advantages like very less time consumption and economical. The DVD drive and cables were purchased separately.

II Required Tools

The tools required for assembling is listed as follows.

- Screwdriver
- Wire cutters and strippers
- Needle-nosed pliers
- Utility knife
- Adjustable wrench
- Small flashlight
- Small container to hold screws
- Heat sink compound

III Opening the Case



First step in assembling is to open the computer case by removing the side panels. Find the screws that hold the side panels in place and remove them (shown in figure circled in red). The panel is removed by first sliding it back then lifting it away from the case.

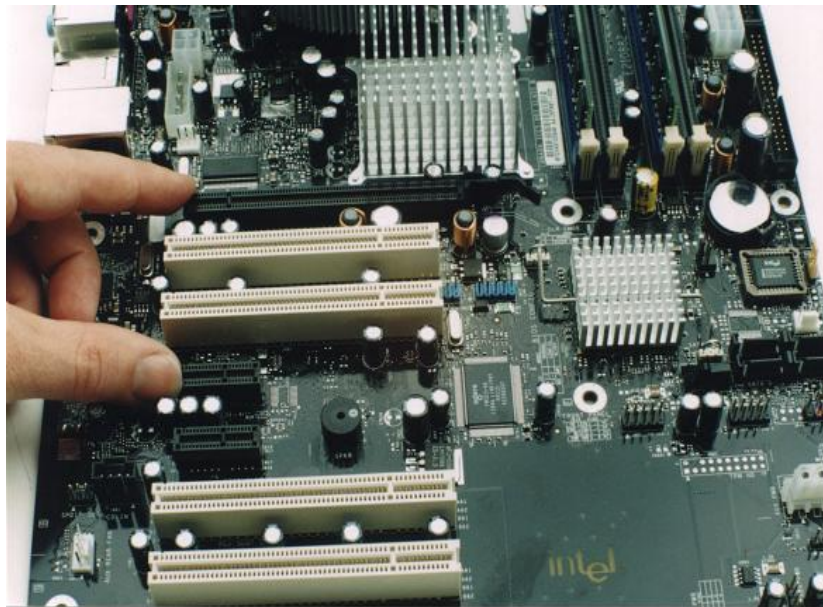
Remove any parts or packaging materials that may have been shipped inside the case and cover for the optical drive.

Make note of the cables pre-installed in the case. These should be front panel connections for features such as the power switch, audio jacks and USB ports. If they are not labeled, consult the manufacturer’s documentation and label them yourself

now before other parts are installed in the case.

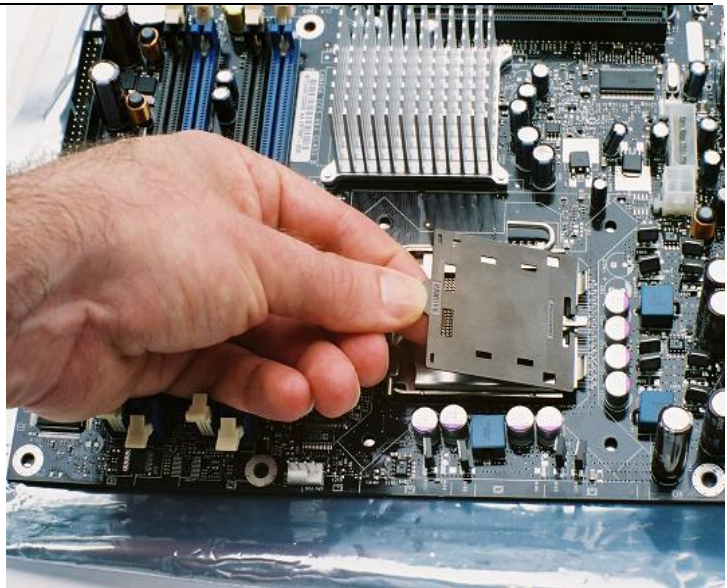
IV Installing the CPU

The CPU is the brain of the computer. Here the sample taken for assembling is Pentium 4. The motherboard and CPU used are typical of standard ATX parts. The CPU sockets are bigger than the Socket 775 used in this build, but all are LGA sockets, and the building techniques are identical. The suitable motherboard for our Pentium 4 is an Intel D925XCV. This was one of the first motherboards to support the LGA (Land Grid Array) version of the Pentium 4. Install both the CPU and the memory before mounting the motherboard in the case. The PCI Express slots are black.

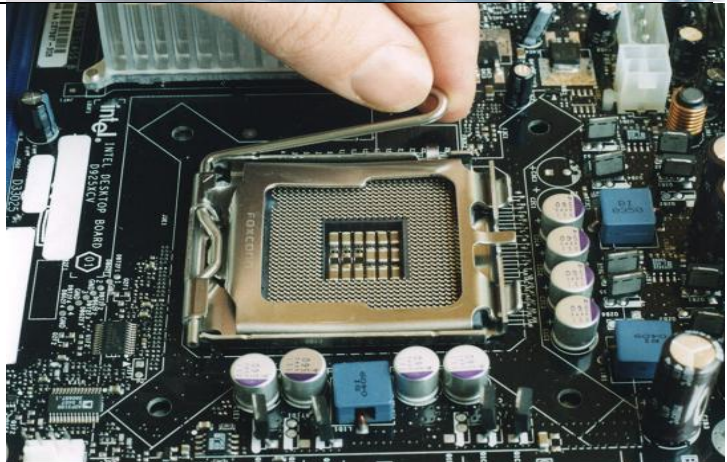


V. Steps in Installing Processor in CPU

The first step is to remove the protective cover from the CPU Socket. Since Socket 775 consists of pins, rather than holes, it could be irreparably damaged if something bashed or bent in a number of pins. The plastic cover is picked up on the end with "remove" stamped on it, then lifted away from the socket.



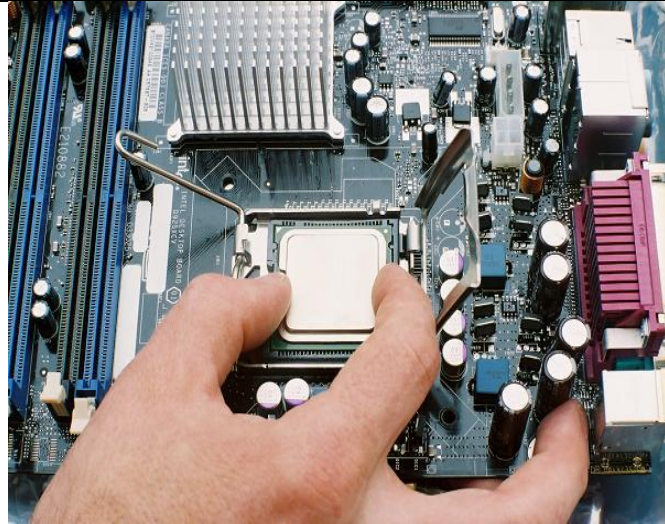
After that lift the load lever by pulling it slightly away from the socket wall to disengage from the plastic ear, then lift it well past the vertical and let it down at the end of its travel. The load lever is several times heavier than locking levers on recent CPU sockets, because it actually compresses the spring steel of the load plate after the CPU is installed.



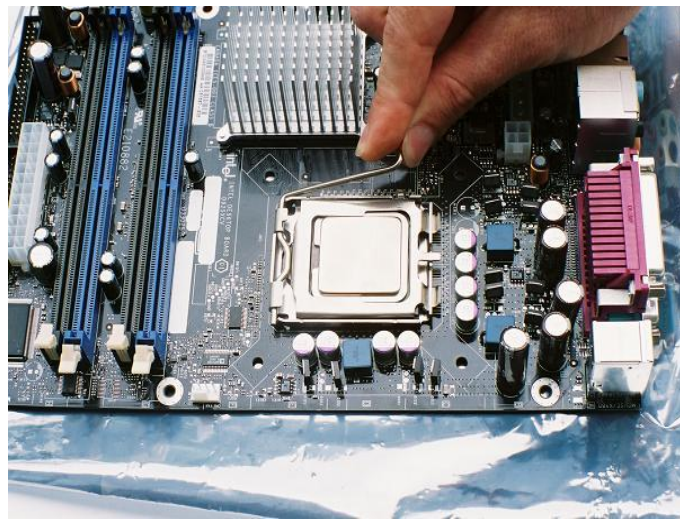
The load plate is lifted up, a little past the vertical, where it stops and should remain in place. There's a little gold triangle on one corner of the CPU package that matches the pin 1 corner of the socket. The CPU is aligned by two keys in the socket and two notches towards one side of the CPU package, so it can only sit flush in the socket when inserted properly.



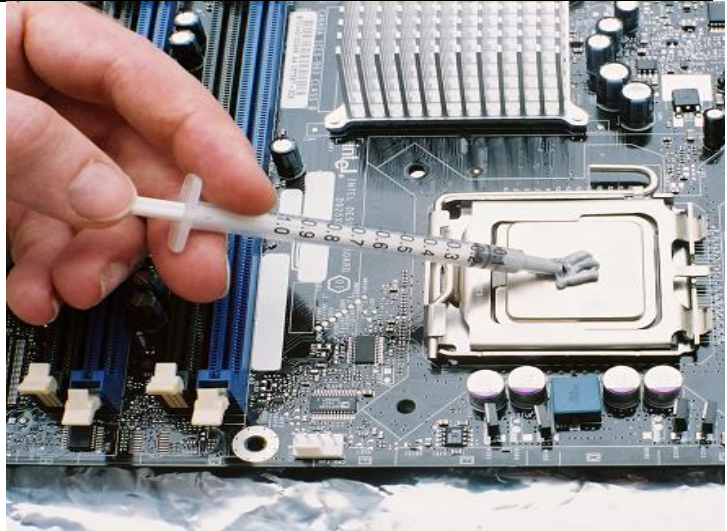
Have a good hold on the CPU as you lower into the socket, because the CPU could damage the landing pins if it gets dropped on a steep angle.



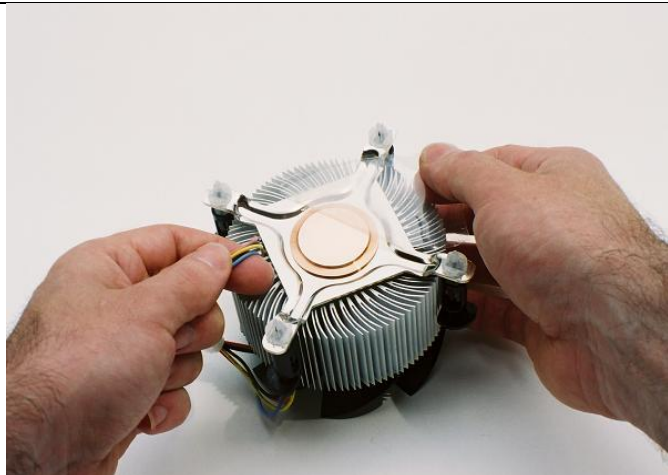
Once Pentium 4 is seated in the socket then, the two notches in the CPU package are filled with the socket keys, are visible and it lowers the load plate. So it has to be seated loosely on the top of the CPU package. Then bring the load lever back up through the vertical and lower it until you can snap it under the stub holder on the side of the socket. Lowering the lever takes a bit of force because you are compressing the load plate, which in turn forces the CPU down tightly on the landing pins.



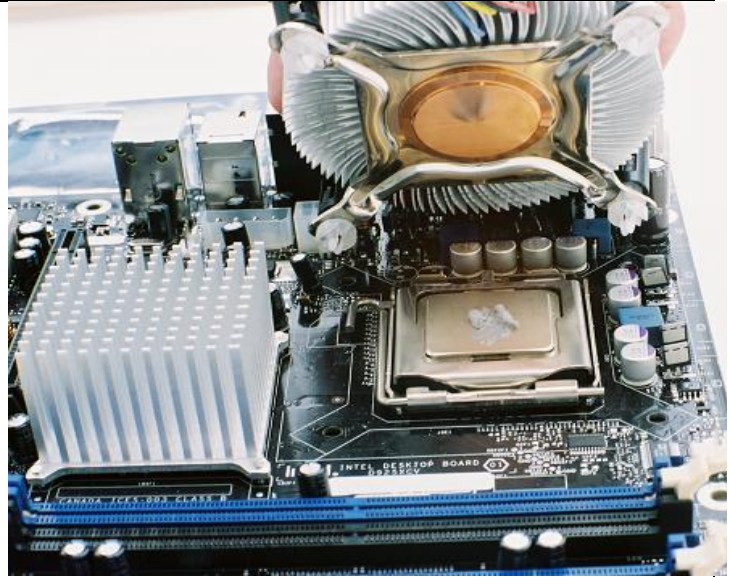
Next we apply the thermal compound supplied with our Intel heatsink to the CPU. The instructions that came with the heatsink actually suggested we "mound" the thermal compound on the center of the CPU, which is what we did. Note this is in sharp contrast with many older types of heatsink/socket combinations that require just a drop of thermal grease. The small holes for the heatsink fasteners are visible less than an inch from each corner of the socket.



The evaluation heatsink assembly Intel supplied shipped with a protective plastic film over the copper core of the heatsink. The fan wiring needs to be routed right through the heatsink fins and pulled out the bottom, so it doesn't interfere with the fan. The left hand in the picture is holding the wires in place as the right hand peels off the plastic film.



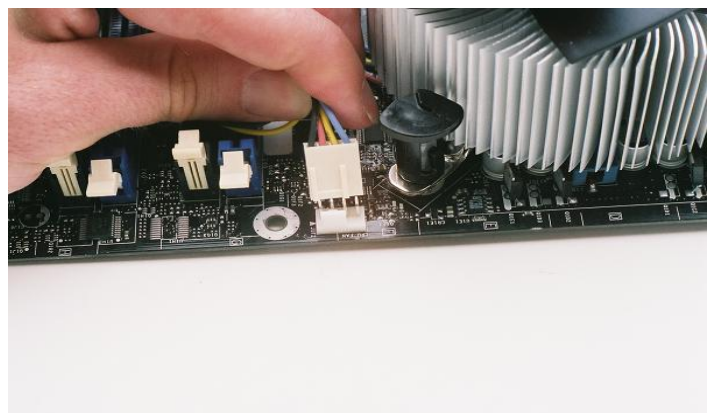
The heatsink should be lowered straight down on the CPU, but we're showing it on a tilt here so not to completely obscure the socket. There is a white snap-in fastener on each corner of the heatsink, and four matching holes in the motherboard.



Once the snap-in fasteners on each corner of the heatsink are matched with the holes in the motherboard, simply push down on each black fastener cap until it clicks into place. The only trick is to lift up the motherboard a little so there's room for the connector to go through the hole. Flip the motherboard over when you're done and make sure the fasteners are fully engaged.



As soon as the heatsink is properly installed, connect the power for the heatsink fan to the designated fan connector on the motherboard. The connector is usually located right of the edge of the motherboard next to the CPU socket, but make sure the printing on the motherboard or the accompanying manual identifies it as the CPU fan point.



VI. Motherboard Installation

The first step to installing our motherboard is to remove the standard I/O core shield that shipped with our case and replace it with the custom shield that matches the motherboard I/O core. Some standard I/O shields are actually stamped out of the same metal as the back of the case. This standard I/O shield is a separate piece held in place by spring force of the folded metal strips along the edges of the shield. A screwdriver serves to help compress the spring along one edge, after which the shield can be pushed down into the case.

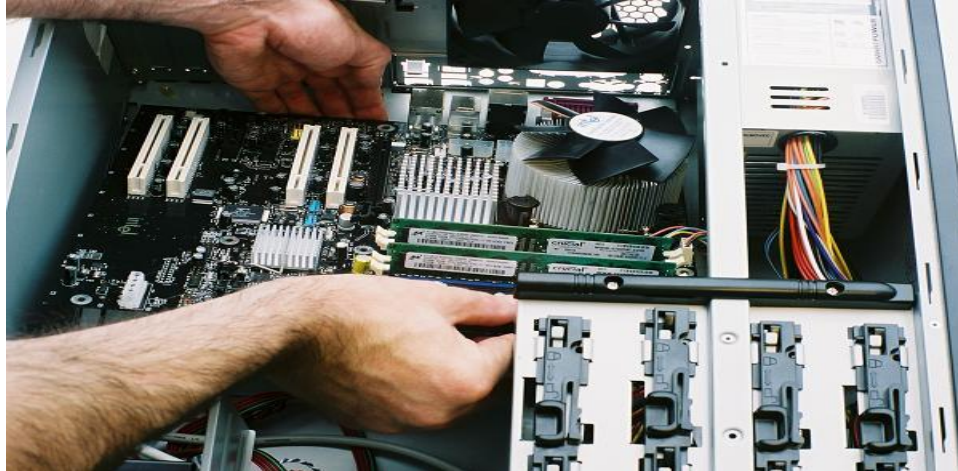


The custom I/O shield is now installed in the opening from the inside of the case. The symbols identifying the I/O ports face the outside of the case, and any grounding or positioning tabs above the port holes face the inside of the case. The two round port holes for the keyboard and the mouse go next to the power supply. The I/O shield is simply pressed into the opening, where spring force keeps it in place.



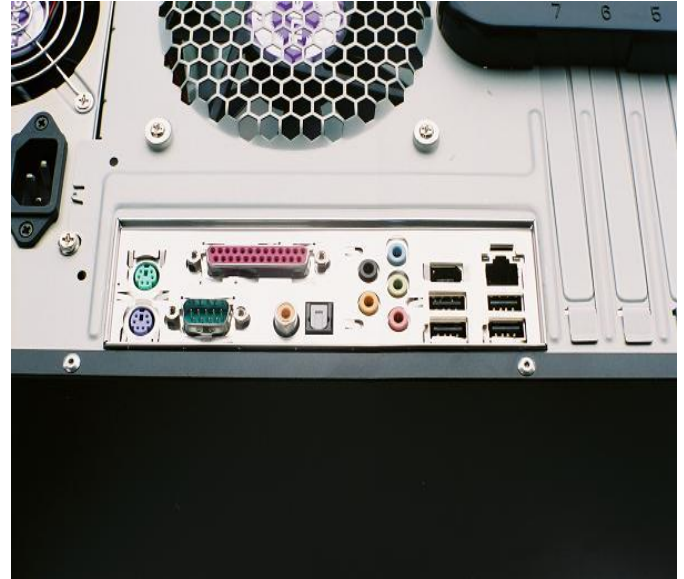
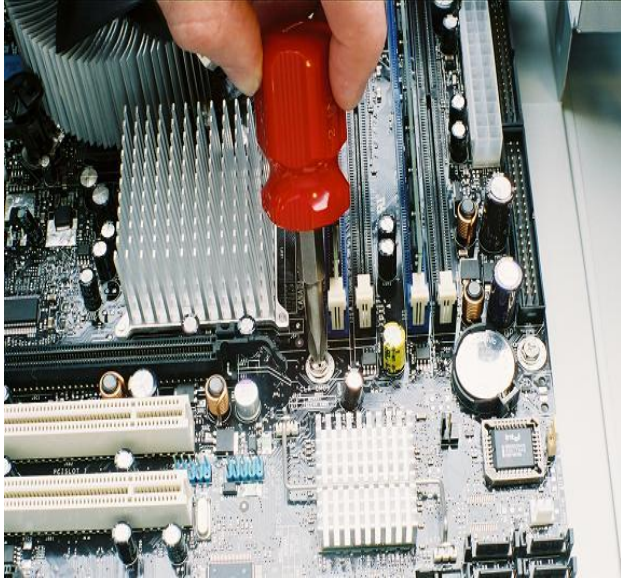
Next test fit the motherboard in the case, lowering it down onto the standoffs with two hands and then easing towards the back of the case until the I/O core is in position

through the I/O shield. To avoid dragging the motherboard on the standoffs during this operation, lift a little on one of the white PCI slots and on the motherboard edge towards the front of the case. Now inspect the solder ringed holes in the motherboard and make sure there's a brass standoff under each. If you have trouble determining this, shining a flashlight through the holes or under the motherboard can help.



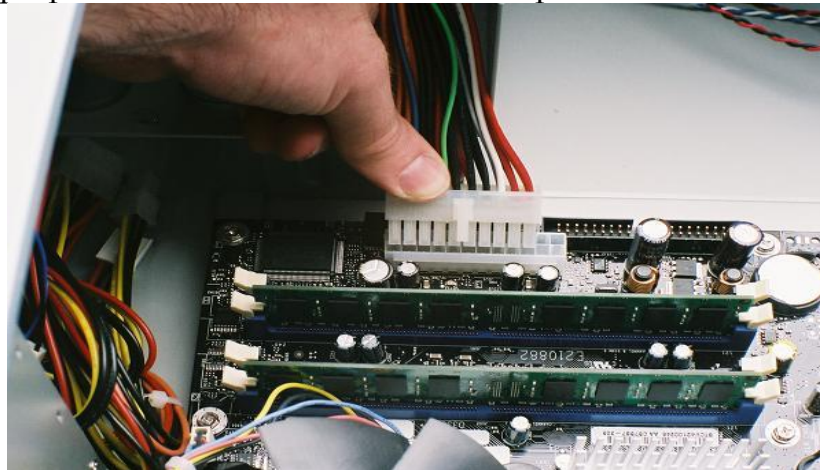
Next, remove the motherboard again, take out any standoffs that didn't align with holes, then tighten the remaining standoffs. You can use a nut driver, socket, adjustable wrench or even pliers, just make sure you don't create any brass splinters, or clean them up if you do. A fraction of a turn is all it takes to tighten a standoff. Count the standoffs, reinstall the motherboard, and install a screw in each ringed hole. If the screw count doesn't match the standoff count, you're going to have to remove the motherboard again and recount.

Double check that the I/O core is fully engaged through the I/O shield, and that none the metal tabs have been folded over any port openings. The I/O cores of this Intel D925XCV motherboard includes all the standard I/O ports, plus a Gigabit Ethernet port, four USB 2.0 ports, a FireWire port, optical and coaxial S/PDIF ports. Five audio out ports are present for the integrated eight channel (7.1) sound.

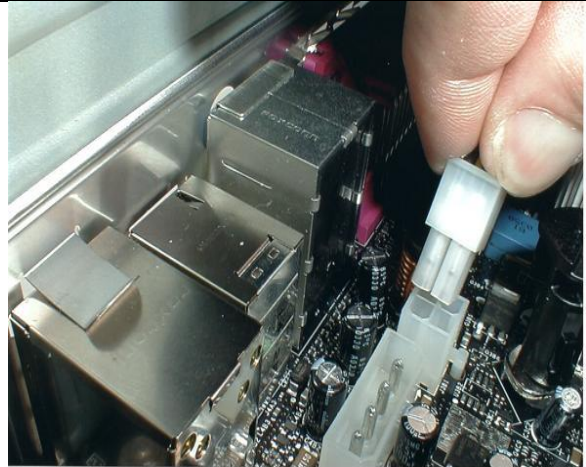


6.1 Motherboard Connections

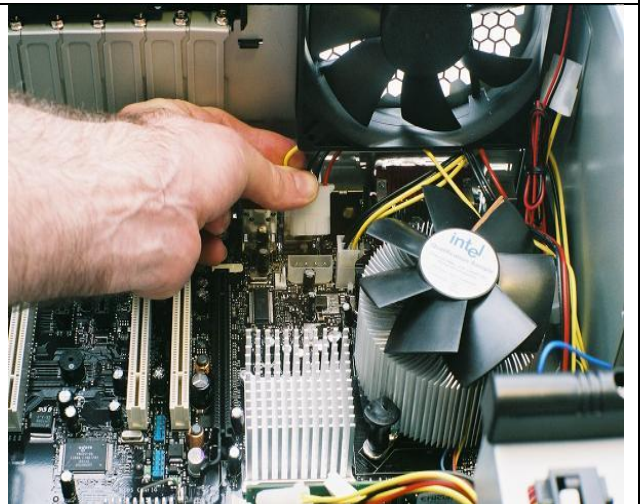
The most important step in making motherboard connections is to consult the manual that shipped with the motherboard. There are two options for powering this motherboard; one uses the standard ATX 20 wire connector, the other uses the 24 wire ATXe connector borrowed from the world of PC servers. The 24 wire receptacle on this particular Intel motherboard accepts the 20 pin connector, and it's keyed so it can only be inserted in the proper location, to one end of the receptacle.



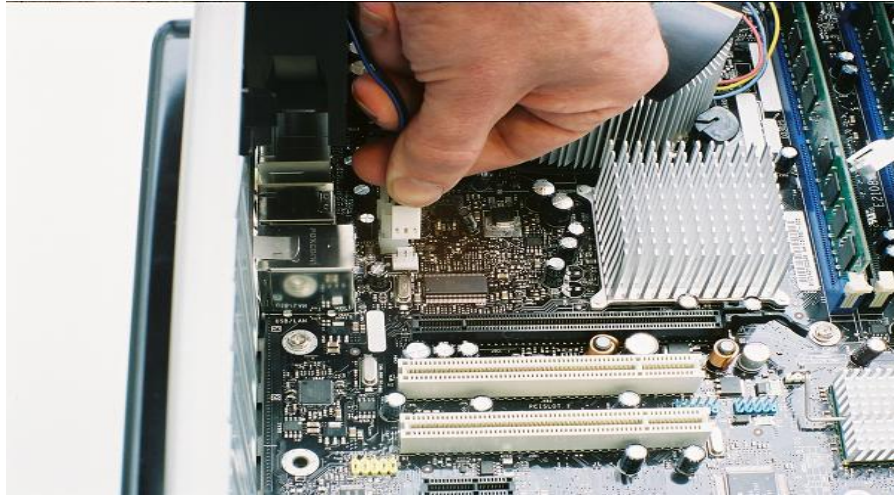
In addition to the standard 20 wire ATX power connector, this style motherboard also requires an additional 12 V connection. This is implemented as a square four wire connector that is normally located near the CPU. The connector is keyed so that it can only be inserted in the proper orientation. Finally, we need to do a "make up" connection, to compensate for the fact that we used a 20 wire instead of a 24 wire connector for the main motherboard power.



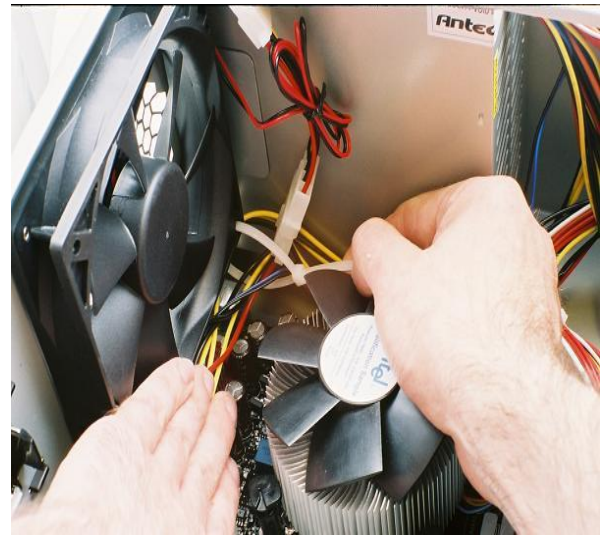
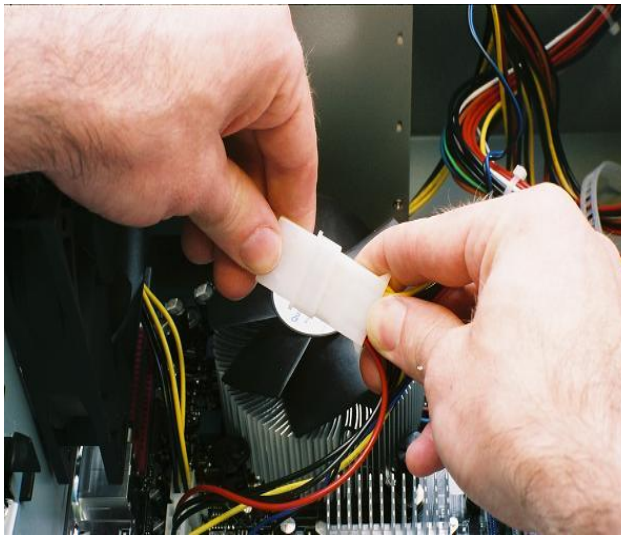
The motherboard provides an extra receptacle for a 1x4 power supply lead, which is located adjacent to the 12 V Connector in the board.



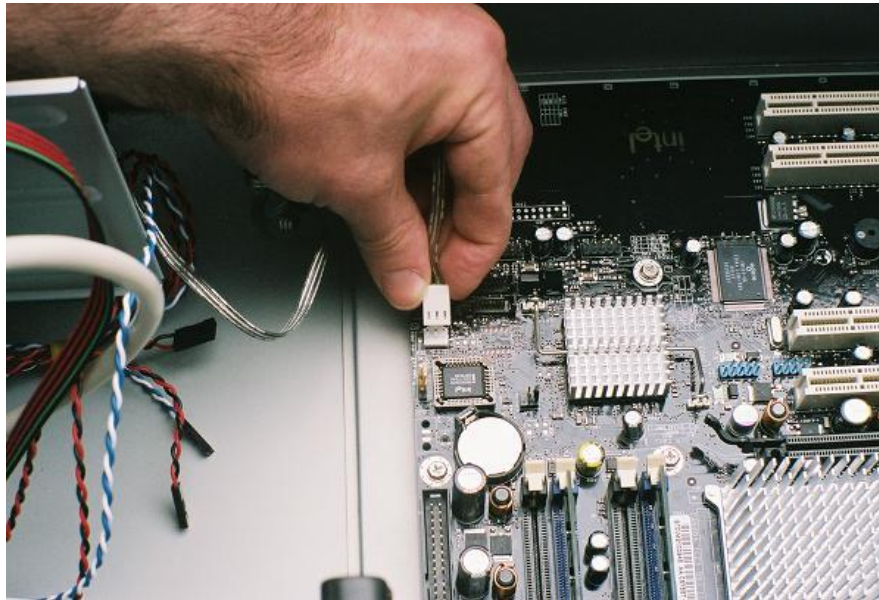
Some power supplies can vary the fan speed for enhanced cooling or decrease the speed for quiet operation. In order for the BIOS to monitor the fan speed, the power supply must have a external fan connector that can be attached to the motherboard. Since this connection is for information only, the fan doesn't draw power from the connector and it may only use one wire. This can be attached to the auxiliary or back fan connection point.



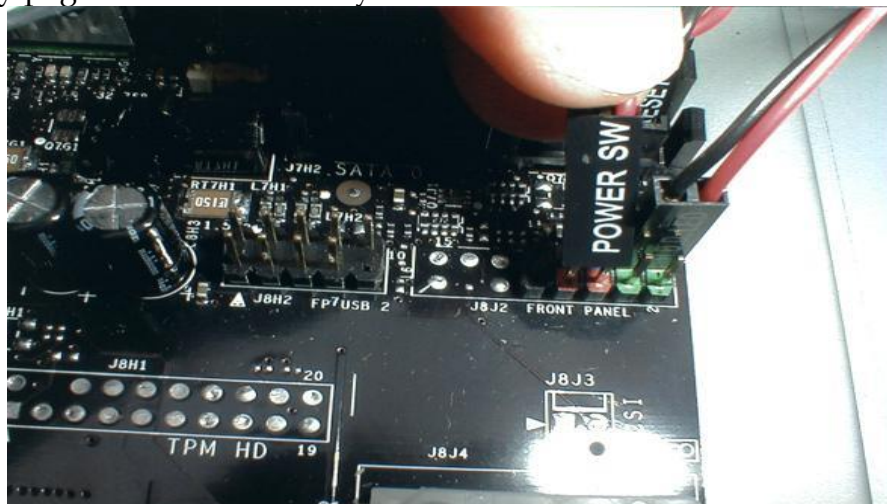
The large 120 mm exhaust fan that came preinstalled in is powered by a 1x4 connector from the power supply. Since we already brought a power supply lead to the back of the case for the auxiliary power, the second connector on the lead makes a convenient power point for the fan. With such a large number of power supply leads routed between the rear exhaust fan and the CPU heatsink and fan, it's necessary to secure them out of the way where they won't interfere with the fans. It is danger also due to the insulator degradation when contact with heatsink fins. We bundle all the loose leads together and cable tie them to the exhaust fan frame.



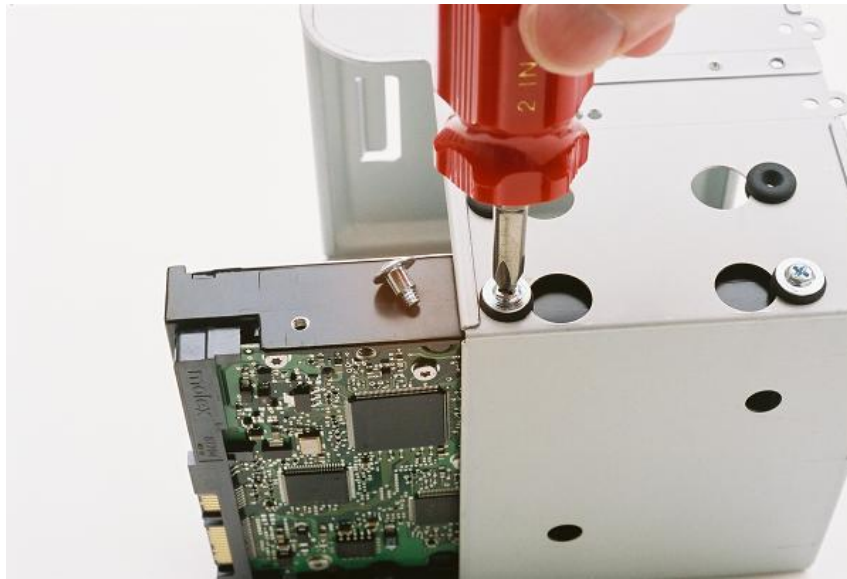
The power lead for the front intake fan attaches to the front fan point on the motherboard. The 80 mm fan was equipped with a 1x4 adapter for direct connection to the power supply if a motherboard connection point wasn't available.



The most important connection from the front panel to the motherboard is the power switch, without which the PC can't be turned on. Depending on the motherboard and the case manufacturer, some of the front panel leads may be color coded, or even bundled into semi-standard block connectors. The functions of the front panel leads are printed right on the connectors, but the motherboard labeling may be cryptic or even absent, so have the manual at hand, or print the necessary pages if the manual only exists as a PDF on the driver CD.



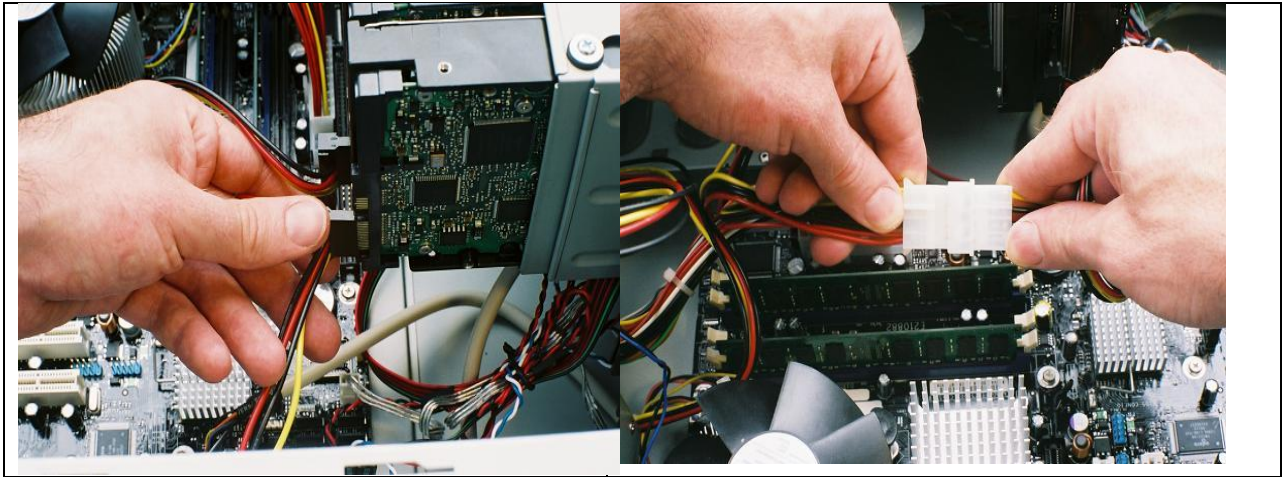
Front panel LED leads installed backwards does not operate and it is harmless, while switches will work as long as they go on the correct two posts. Most of the recent cases in the market have front panel USB and audio ports, and in this instance, the connector for the front two USB ports is integrated into a single cable and keyed to be installed in the proper orientation.



The second hard drive is installed in the cage right above the first. The advantage of the removable drive cage is that the drives can be aligned and secured with screws on both sides without having to access the other side of the case. The top two bays in the cage could be used for a floppy drive and another 3.5" drive, but we won't be installing either in this build. With both drives installed in the shock absorbing bays of the drive cage, you can see that there's a small air space between them. The drives do not touch each other.

While the drive cage is supported in the vertical plane by the case infrastructure as soon as it's slid into place, it will still slide in the horizontal until you close the locking lever. The lever should operate with very little resistance, if it seems to be bound, remove the cage again and make sure it actually slid in properly on the guides. Next install the SATA power connectors on the drives. This is another step that we are taking now simply because it would be very difficult to carry it out once the video adapter is installed. The two SATA power connectors are fit on the smaller edge connectors of the hard drive, and they are keyed so they can only be installed in the proper orientation.

Connect the drives with power supplies by using SATA power connectors or by using simple adapter as below. Two connectors located on a 4 wire cable bundle, is then connected to a standard 1x4 connector from the power supply.



Optical Drive

The optical drive is 5.25" wide and is installed in the drive bay that we removed the cover from in a previous step. Cable access considerations apply to this drive also. To install the drive:

- Slide the drive into the drive bay until the screw holes are lined up and the front of the drive is flush with the front of the case.
- Make sure that it is orientated correctly.
- Install the screws



VII. Adapter Card Installation

Adapter cards are also called as expansion card, add-on-card, interface adapter, internal adapter is a printed circuit board(PCB) which fits into an expansion slot on a computer. It is used to give a computer additional capabilities, such as enhanced video performance via a graphics card. They are also available as expansion cards and can also be onboard, the motherboard which is permanent.

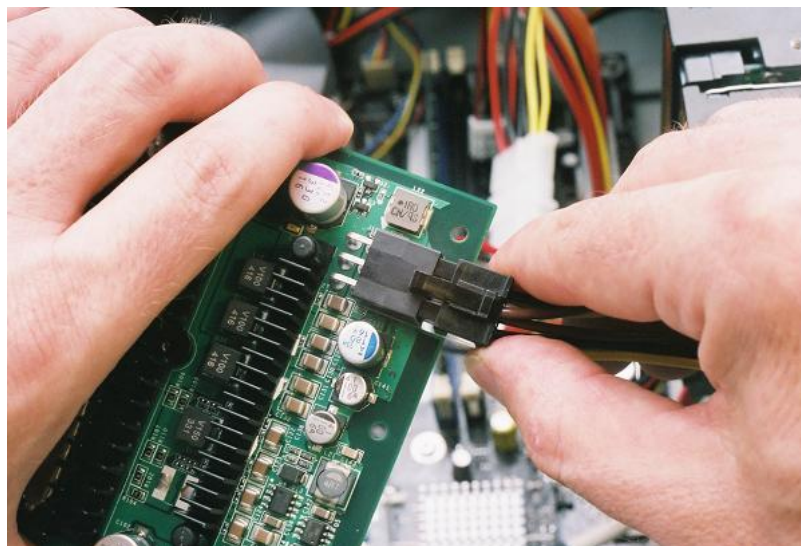
Types of adapter cards in a computer

There are many types of adapter cards that can be installed in a computer, like sound, video, modem, network, interface card, and a number of others. In many cases, these cards will fit in a slot in the computer called a PCI slot. However, in the case of video cards and a few others, they may fit into other types of slots, like an AGP slot or a PCI Express slot. Before purchasing and installing an expansion card, make sure you know which slots your computer has available on the motherboard.

To install an expansion card, turn off your computer, unplug the power cord from the back of the computer, and remove the side panel from the computer case. You should be able to see the motherboard in the computer case. The expansion card slots are typically located on the bottom half of the motherboard. Find the expansion slot that is of the same type as the expansion card. Remove the metal bracket slot cover on the computer case that corresponds to the expansion or if you're upgrading an older expansion card unscrew and remove the expansion card. If you're replacing an expansion card remove the old expansion card first

Installation of Video / Graphics Card

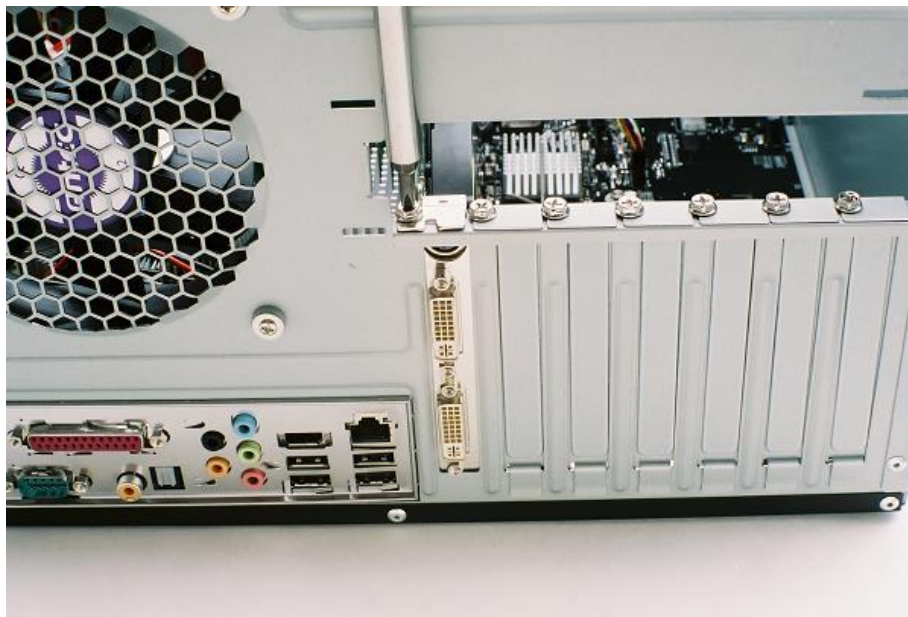
The video adapter has an onboard programmable graphics processor and is equipped with a large heatsink and cooling fan. In order to ensure that the adapter gets sufficient power, it requires a direct connection to the power supply. The video adapter was shipped with a custom power adapter, which in turn is connected to a standard 1x4 power supply lead, just like our SATA power adapter.



The PCI Express 16X adapter is installed in the sole matching slot on the motherboard. There is a locking mechanism to help keep the adapter seated in the slot, though it's not the full lock that's commonly used on AGP slots. The little black locking tab is being pushed out by the finger to the lower right of the mermaid, while the adapter is seated in the slot with even pressure from both hands.



Make sure the video ports are all fully exposed through the rear of the case, and secure it in place with a screw. This model of the Nvidia GeForce adapter sports two digital video monitor connectors (DVI) and an S-video port, but not a single standard VGA port. A simple DVI to VGA adapter allows you to run a monitor with an analog connector, including most older LCDs, on this video card. Large plasma displays and newer LCDs are generally equipped with DVI connectors, or both types.



Sound Cards

After installing a sound card, you must connect 1/8-inch mini-jack cables from speakers and the microphone to the sound card. Most sound cards use the same PC99 color-coding standards for audio hardware that are used by onboard audio solutions, as described in Table 3-7.

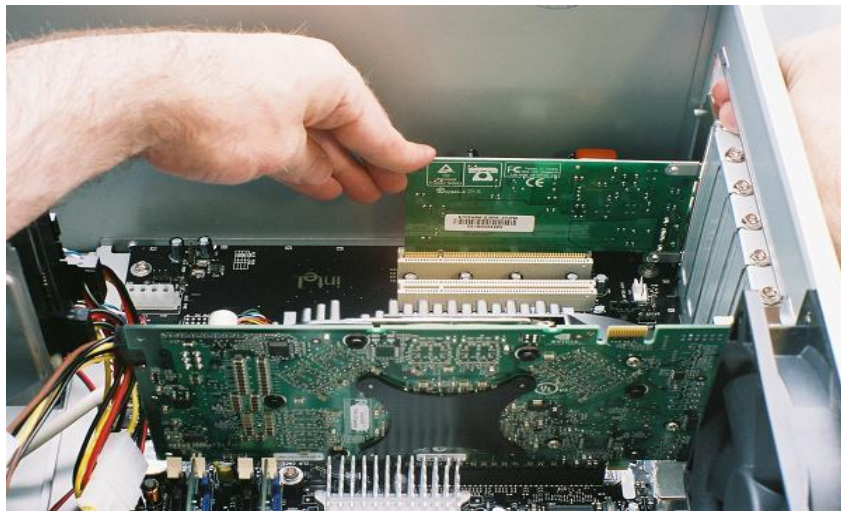
Table 3-7. PC99 Color Coding for Audio Jacks

Usage	Color	Jack Type
Microphone input (mono)	Pink	Mini-jack
Line in (stereo)	Light blue	Mini-jack
Speaker or headphone (front/stereo)	Lime green	Mini-jack
Speaker out/subwoofer	Orange	Mini-jack
Game port/MIDI out	Gold	15-pin DIN

After installing the sound card, you are prompted to install drivers when you restart the system. The driver set might also include a customized mixer program that is used to select speaker types, speaker arrangement (stereo, 5.1, and so on), and provides speaker testing and diagnostics. Be sure to test the speakers to assure they are plugged into the correct jack(s) and are working properly.

7.3 Modem Installation

Install a V.92 modem in the bottom PCI slot, as far as possible from the video adapter, which needs room for the cooling fan to be effective. The modem is seated in the slot with even pressure on both ends, which is made easy thanks to the opening in the back of the case above the adapter mounting area.



The "line" and "phone" ports on the modem take up nearly the whole width of the slot opening, so it's important to make sure the full port is exposed before securing the adapter with a screw. While it's easy to get a phone jack into a port even if it's a little off center, it's impossible to get it out again without straightening the modem.



The final step to installing the adapters is to replace the plastic slots cover. It hinges on the right side and snaps into place on the left, where the release latch extends into the case. You can see the raised lettering of the "Hardware" compartment, a handy place to store any leftover screw when the build is complete.

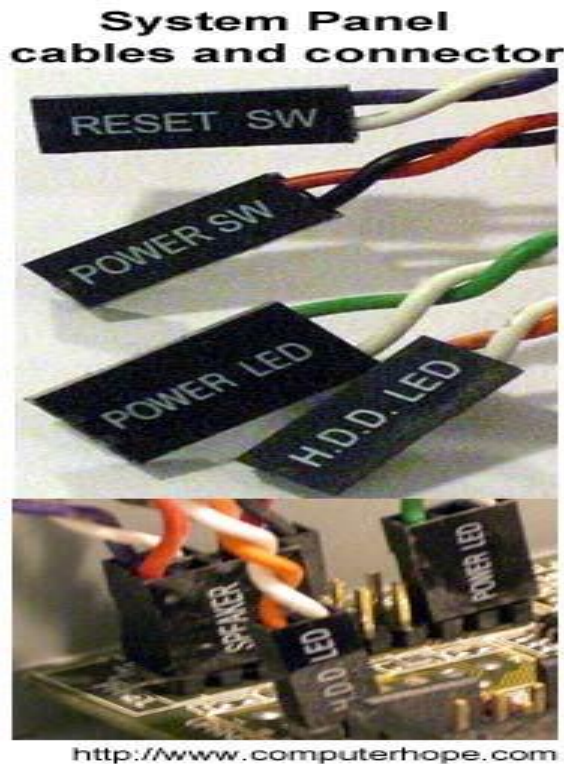


Adapter/ Expansion Card Removal

To remove an expansion card, turn off your computer, unplug the power cord and all cables from the back of the computer, and remove the side panel from the computer case. You should be able to see the motherboard in the computer case. The expansion card slots are typically located on the bottom half of the motherboard.

VIII. Connectors - System Panel Connector

Alternatively referred to as the fpanel or front panel connector, the system panel connector or system panel header controls a computer power button, reset button, and LED's. The System panel cables, as shown in the picture are two wire cables that are color coded to help identify where they connect to the motherboard system panel connector.



The black and white wire is the ground (GND) wire and the colored wire is the powered wire. The cables, colors, and connections vary depending on the computer case and motherboard you have, however, generally include the cables mentioned below.

Types of system panel cables

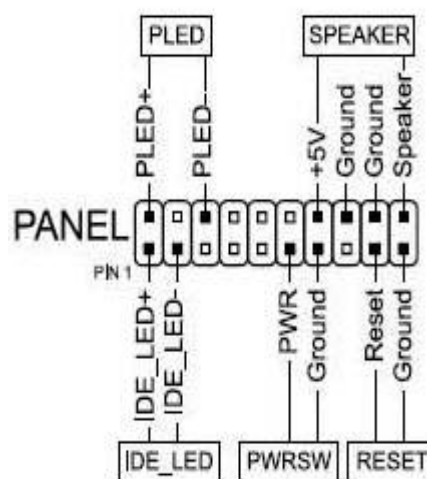
- HDD LED (IDE LED) - The LED activity light for the hard drive. This is the LED that flashes as information is being written and read from the hard drive.
- Power LED (PLED) - The LED power light, which indicates when the computer is on, off, or in Standby.
- Power SW (PWRSW) - Controls the power button that allows you to turn on and off the computer.
- Reset SW - Handles the reset button to restart the computer.

- Speaker - The internal speaker used to sound the beep noises you hear from your computer when it is booting.
- Front panel audio cables are often available with both AC97 and HD-Audio connectors, where HD-Audio is a slightly newer standard and AC97 is extinct. Using the "wrong" connector may temporarily reduce the number of available audio channels, but will not harm any components. The key-pin for audio headers is in a different location from other panel connectors to ease installation

With most computer motherboards, the system panel cables are connected directly to the motherboard. However, some motherboard manufacturers such as ASUS include a Q-Connector with the motherboard. With a Q-Connector, the user can connect the system panel cables away from the motherboard and then connect the Q-Connector to the motherboard.

Drection of the System Panel Cables Connection

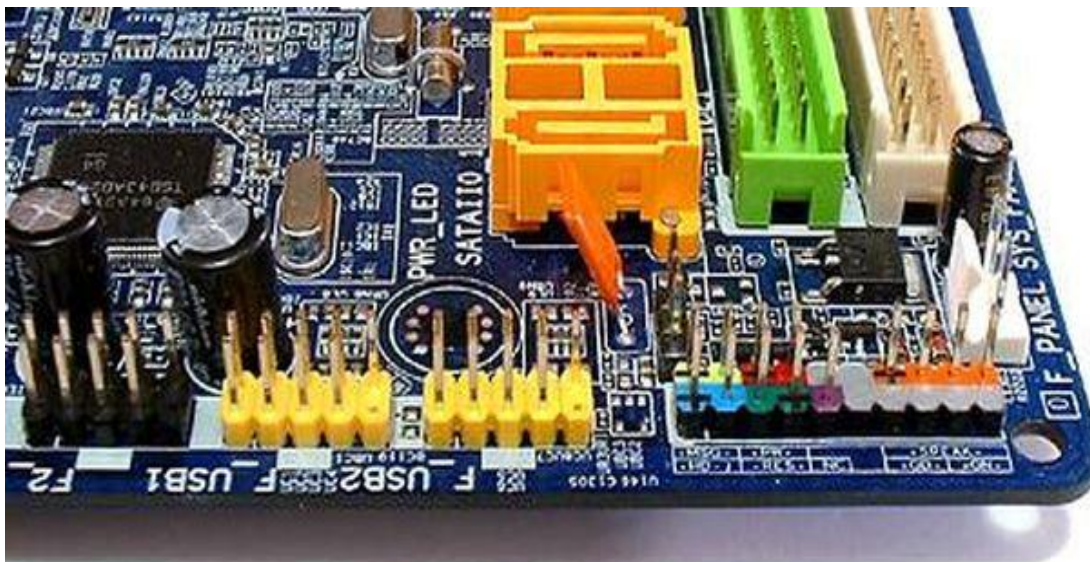
The system panel cables are not keyed so can be plugged in any direction. With the exception of the LED cables, the system panel connector cables can be plugged in any direction. If the LED cables are plugged in backward, the LED light will not work. Usually with most modern motherboards you can identify what cable goes where by looking at the motherboard for a + and a - symbol. The colored wire (powered wire) would connect to the + symbol and a white or black cable (ground) would connect to the - symbol.



In the above motherboard diagram, you can clearly see how each of these cables connects to the motherboard. For example, in the top left portion for the Power LED (PLED) the first pin is PLED+, which indicates the colored wire side of the connector connects to this pin. Keep in mind that how these cables connect vary depending on your motherboard.

A 4-pin CPU fans power connector and the front-panel audio connector is shown below. On-board 4-pin fan connectors are designed to provide pulse width modulation (PWM) automatic speed control, but the connectors are once again cross compatible with 3-pin fans. Some motherboards are able to control fan speed via either voltage changes or pulse width, while others will run the “wrong” fan at full speed, continuously, without harming the system.

The 4-pin or 8-pin ATX 12V connector satisfies the electrical demands of the CPU. It was added by Intel to supplement its Pentium 4 processors, and later adapted by AMD motherboard designers. The newer 8-pin versions were originally meant to address phenomenally power-hungry Pentium D and Prescott-based Pentium 4s, but many modern AMD and Intel processors are efficient enough to once again work from 4 pins. Most 8-pin boards will work with both 8-pin and 4-pin power, as the connectors are cross compatible.



USB connectors have been standardized for over fifteen years, and we suggest that first-time builders not attempt to incorporate any parts older than that. The missing pin location is blocked by most front-panel USB connectors to assure that the connector is polarized correctly. A reversed connection would damage the motherboard, so 4-pin, 8-pin, or single-row internal break-out cables require special care. The missing pin indicates the negative/ground end of the connector.

UNIT III

Installing Operating System: How to install a new operating system on your computer- Method1: determining which operating system to install, Method 2: installing your new operating system UBUNTU. Step by step guide to installing windows7. Remote Desktop and Remote assistance- Setting User Accounts and Parental Controls-Setting up the windows home network

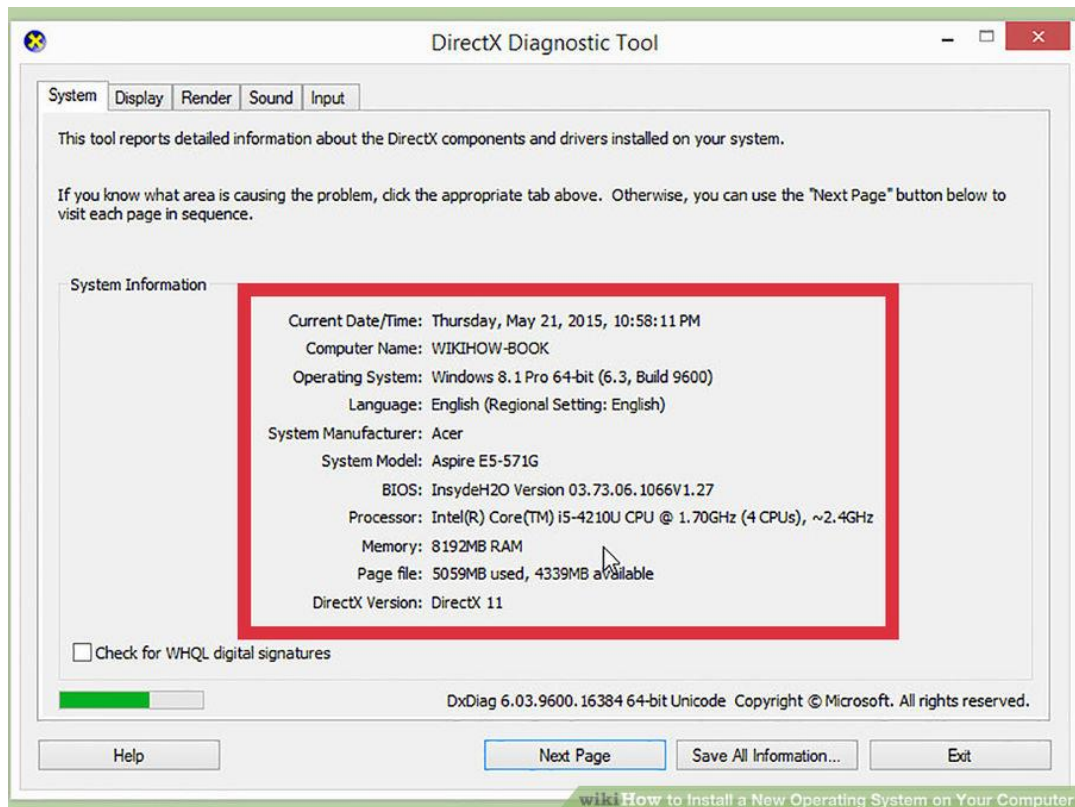
Installing Your New Operating System

Is it time to upgrade your operating system? Looking to make the switch from Windows to Linux? Maybe you want to try dual-booting both at the same time. Follow this guide to install any brand new operating system on your computer.

Method 1

Determining Which Operating System to Install

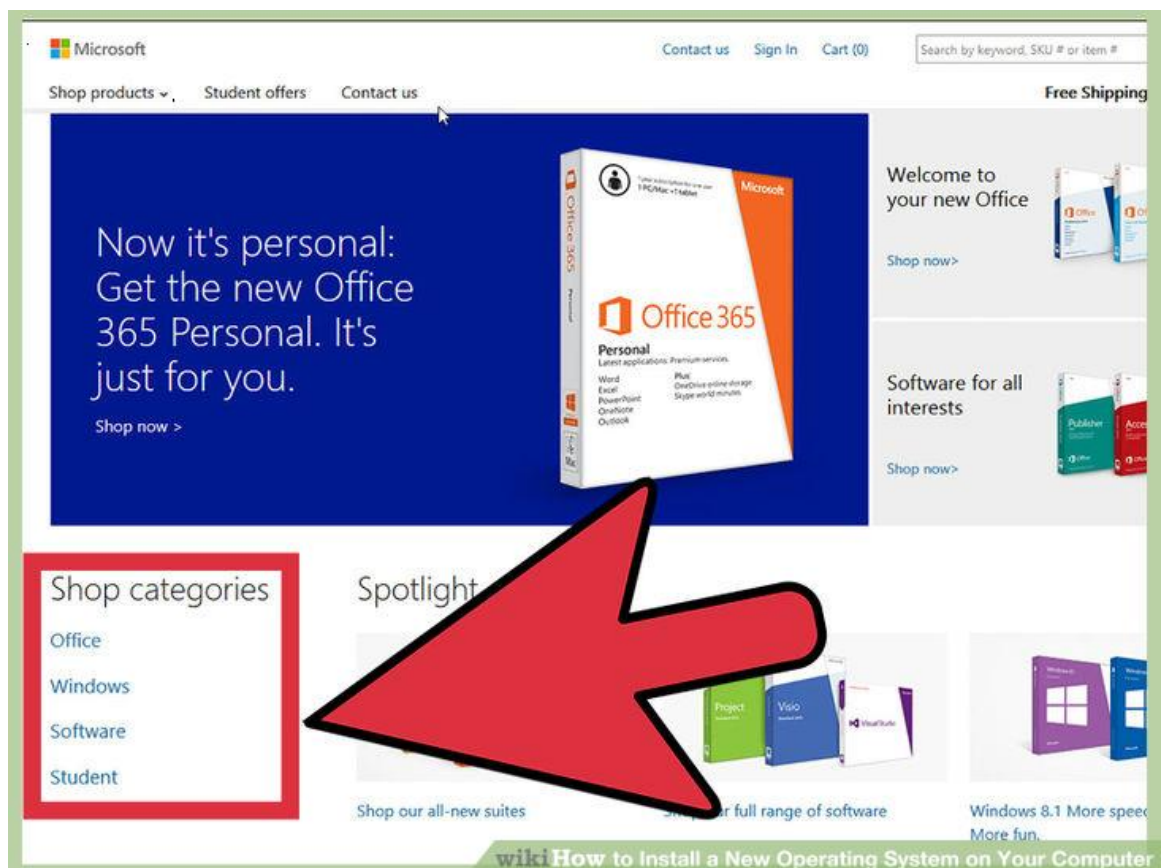
1



Check the system requirements. If you've decided that you want to install a new operating system, you'll first need to figure out which one you want to use. Operating systems have varying system requirements, so if you have an older computer, make sure that you can handle a newer operating system.

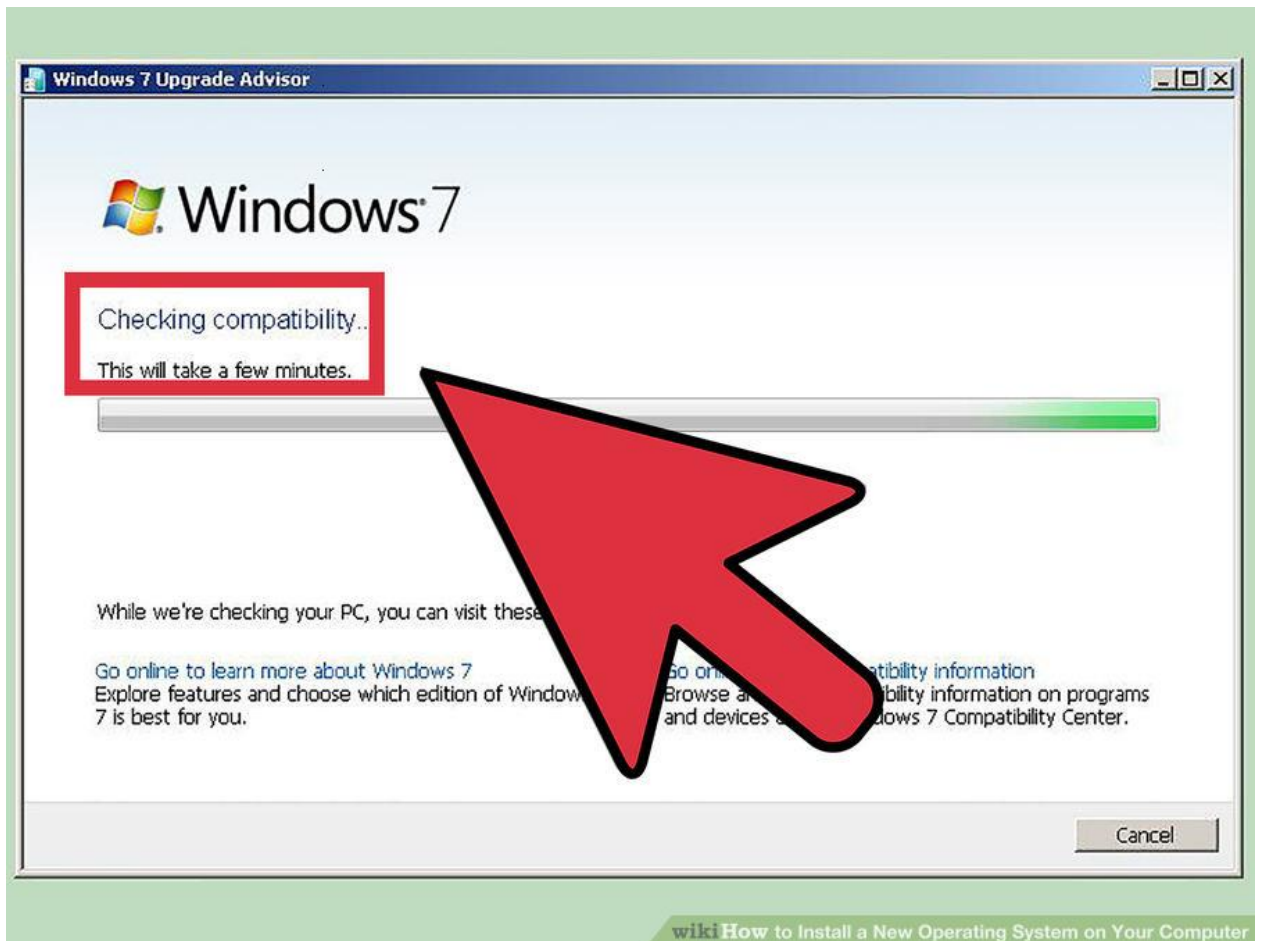
- Most Windows installations require at least 1 GB of RAM, and at least 15-20 GB of hard disk space. Also, your CPU needs to be powerful enough to run the OS you want to run. Make sure that your computer can accommodate this. If not, you may need to install an older operating system, such as Windows XP.
- Linux operating systems typically don't require as much space and computing power as Windows operating systems. The requirements vary depending on the distribution you choose (Ubuntu, Fedora, Mint, etc.).

2



Decide whether to purchase or download. Windows licenses need to be purchased. Each license comes with a key good for one installation. Most Linux distributions are free to download and install as much as you'd like, though some Enterprise versions are closed and require purchase (Red Hat, SUSE, etc.).

3.



Research your software compatibility. Make sure that the operating system you want to install supports the programs that you want to use. If you use Microsoft Office for work, you won't be able to install it on a Linux machine. There are substitute programs available, but the functionality may be limited.

- Many games that work on Windows will not work on Linux. The number of supported titles is growing, but be aware that if you are an avid gamer your library might not transfer over smoothly.

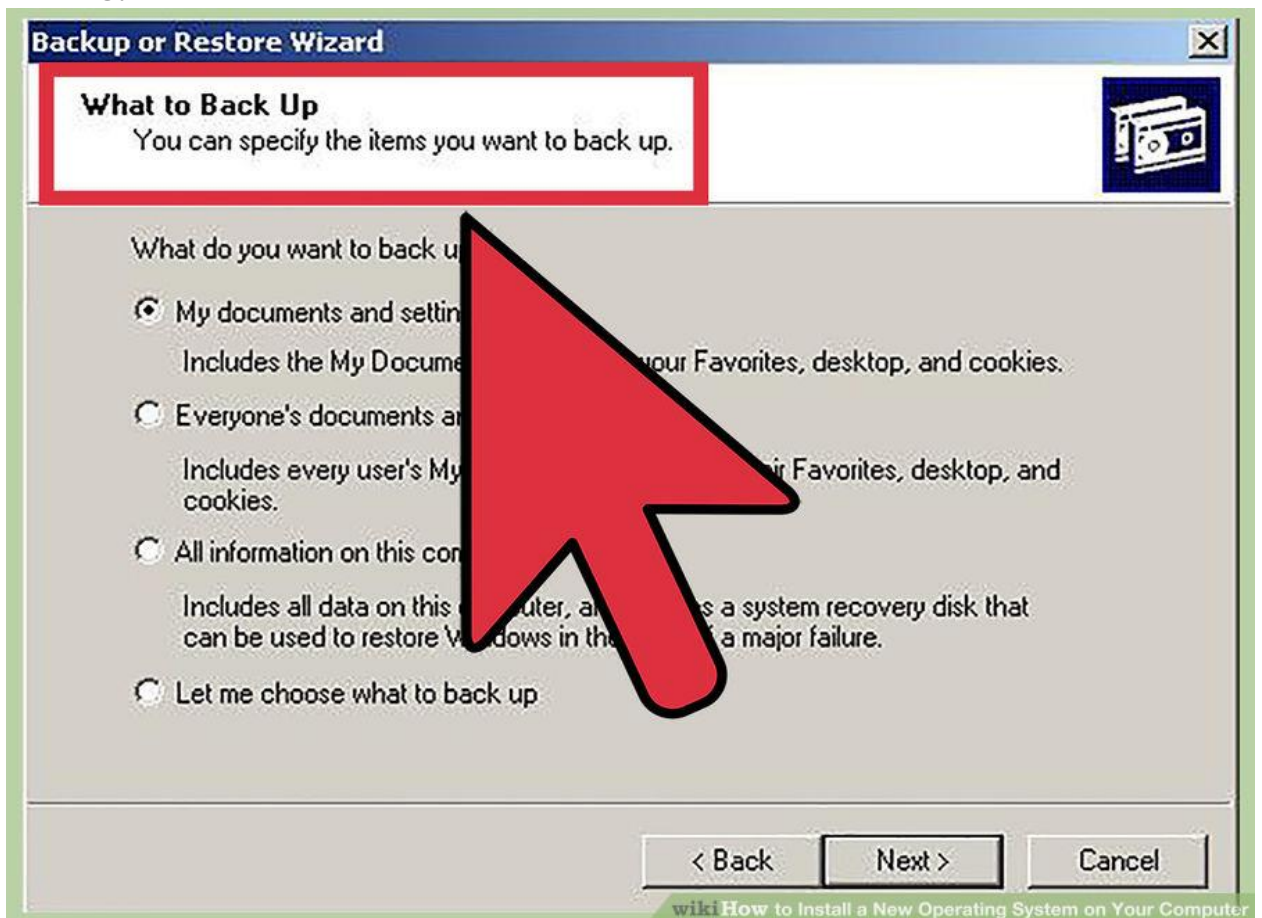
4.



Obtain your new operating system. If you've purchased a copy of Windows from a store, you should have received an installation disc along with your product code. If you don't have the disc but have a valid code, you can download a copy of the disc online. If you are installing Linux, you can download an ISO of the distribution from the developer's website.

- An ISO file is a disc image that needs to be [burned to a disc](#) or copied to a [bootable USB drive](#).

5.



Backup your data. When you are installing a new operating system, you are most likely going to be wiping the hard drive in the process. This means that you will lose all of your files on the computer unless you back them up. Always make sure that any important files are copied to a backup location before starting the installation process. Use an external hard drive or burn the data to DVDs.

- If you are installing the operating system alongside your existing one, you most likely will not have to delete any data. It is still wise to backup important files just in case.
- You cannot backup programs; they will need to be reinstalled once you have finished installing your new operating system.

Method 2

Installing Your New Operating System



1

Determine your installation order. If you are installing a Linux distribution that you want to run alongside Windows, you need to install Windows first and then Linux. This is because Windows has a very strict boot loader that needs to be in place before Linux is installed, otherwise Windows won't load.

Language			
Amharic	Français	Македонски	Tamil
Arabic	Gaeilge	Malayalam	தமிழ்
Asturianu	Galego	Marathi	Thai
Беларуская	Gujarati	Burmese	Tagalog
Български	עברית	Nepali	Türkçe
Bengali	Hindi	Nederlands	Uyghur
Tibetan	Hrvatski	Norsk bokmål	Українська
Bosanski	Magyar	Norsk nynorsk	Tiếng Việt
Català	Bahasa Indonesia	Punjabi (Gurmukhi)	中文(简体)
Čeština	Íslenska	Polski	中文(繁體)
Dansk	Italiano	Português do Brasil	
Deutsch	日本語	Português	
Dzongkha	ქართული	Română	
Ελληνικά	Қазақ	Русский	
English	Khmer	Sámegillii	
Esperanto	ಕನ್ನಡ	සිංහල	
Español	한국어	Slovenčina	
Eesti	Kurdî	Slovenščina	
Euskara	Lao	Shqip	
فارسی	Lietuviškai	Српски	
Suomi	Latviski	Svenska	

F1 Help F2 Language F3 Keymap F4 Modes F5 Accessibility F6 Other Options

wiki How to Install a New Operating System on Your Computer

2

Boot from your installation disc. Insert the installation disc into your optical; drive, and reboot your computer. Normally a computer boots from the hard drive first, so you will need to adjust some settings in your BIOS in order to boot from the disc drive. You can enter the BIOS by hitting the designated Setup key during the boot process. The key will be displayed on the same screen as your manufacturer's logo.

- Common Setup keys include F2, F10, F12, and Del/Delete.
- Once you are in the Setup menu, navigate to the Boot section. Set your DVD/CD drive as the first boot device. If you are installing from a USB drive, make sure that the drive is inserted and then select it as the first boot device.
- Once you've selected the correct drive, save your changes and exit Setup. Your computer will reboot.



3

Try your Linux distribution before installing. Most Linux distributions come with a copy that can be loaded directly from the installation disc. This will allow you to “test drive” your new operating system before you commit to the installation process. Once you are ready to install, click the Installation program on the desktop.

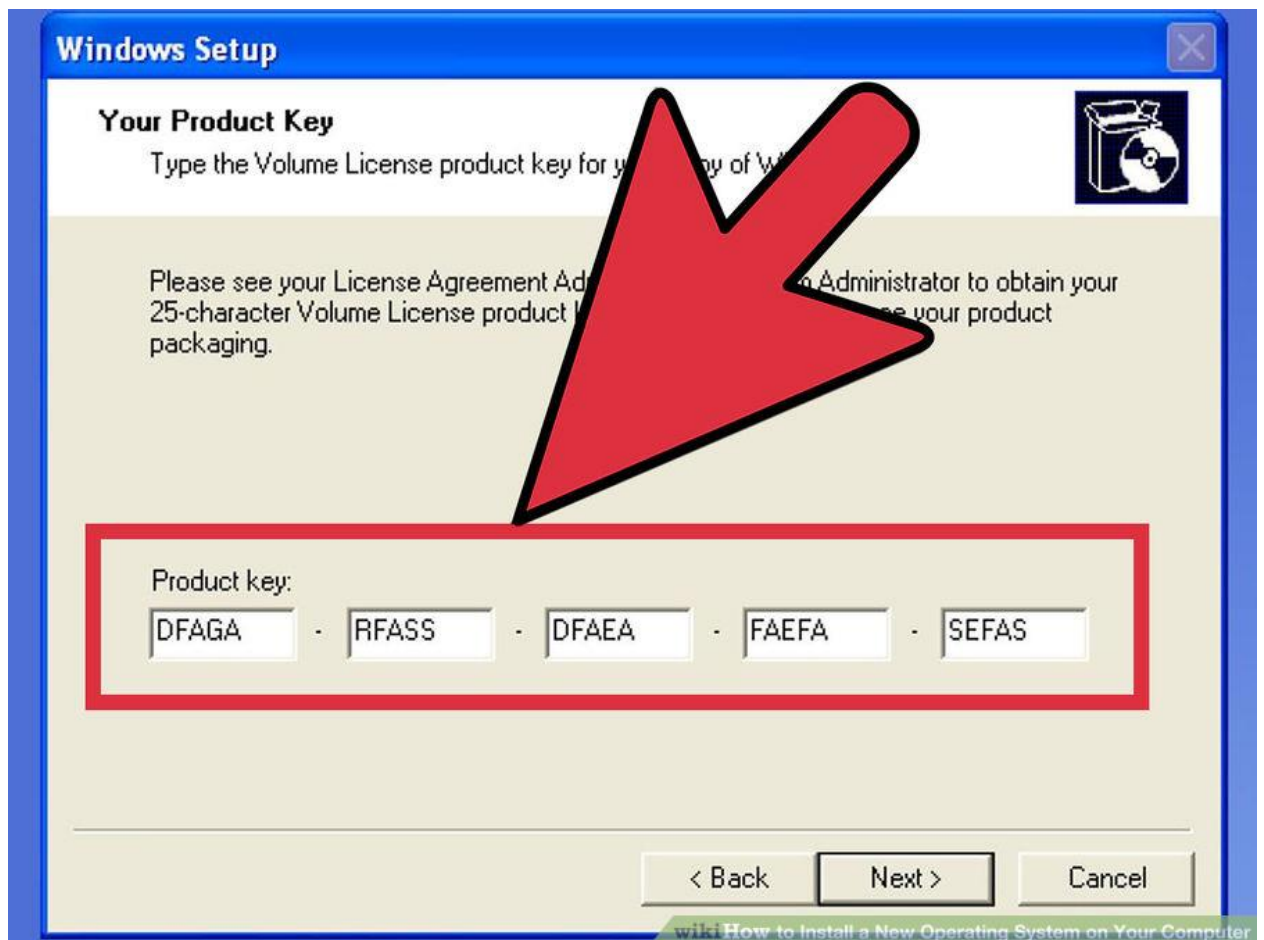
- This is only possible with Linux distributions. Windows does not allow you to test out the operating system before you install.



4

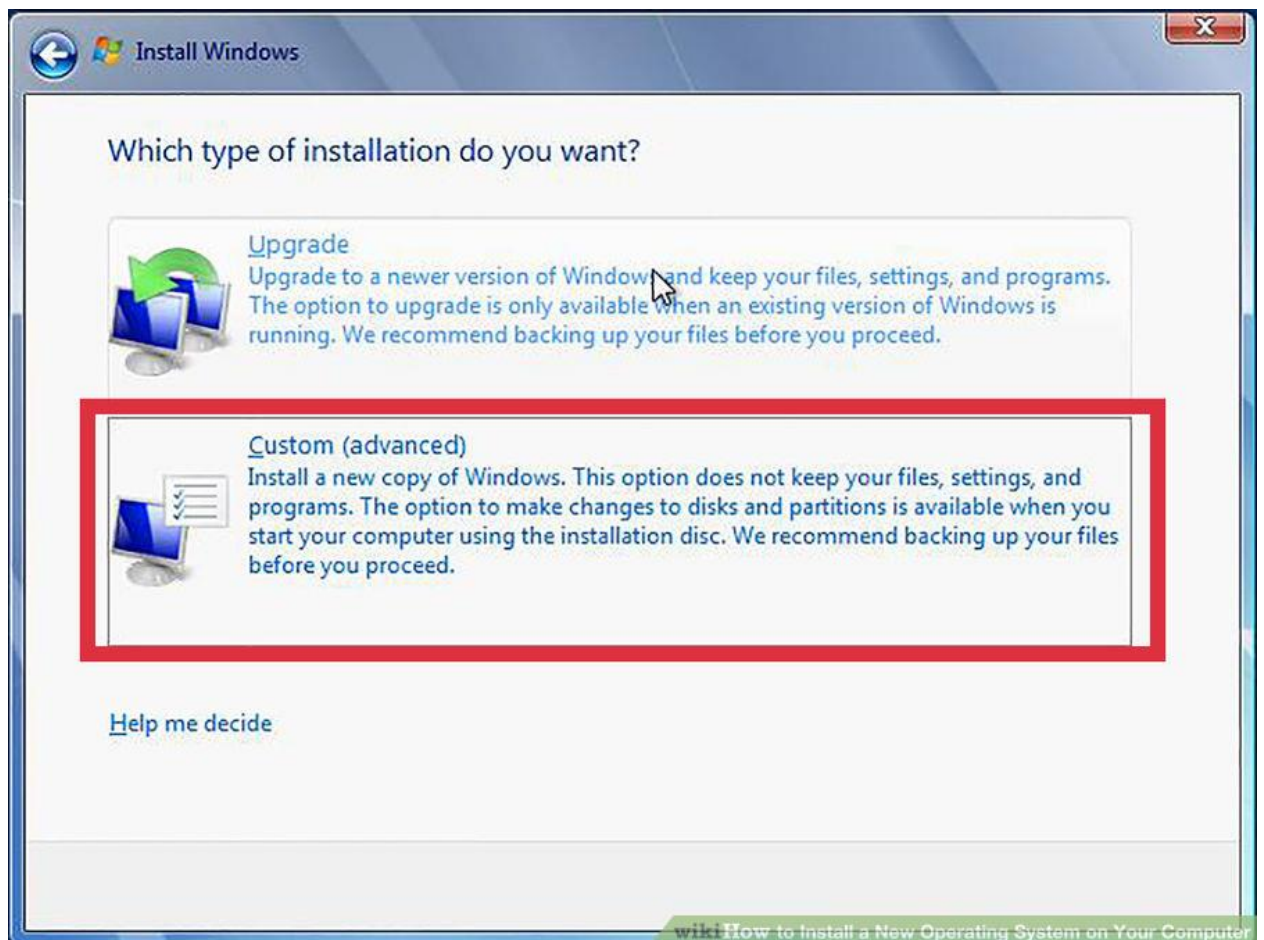
Wait for the Setup program to load. No matter which operating system you choose, the setup program will need to copy some files to your computer before it can continue. This can take several minutes, depending on the speed of your computer's hardware.

- You will most likely need to choose some basic options, such as language and keyboard layout.



5

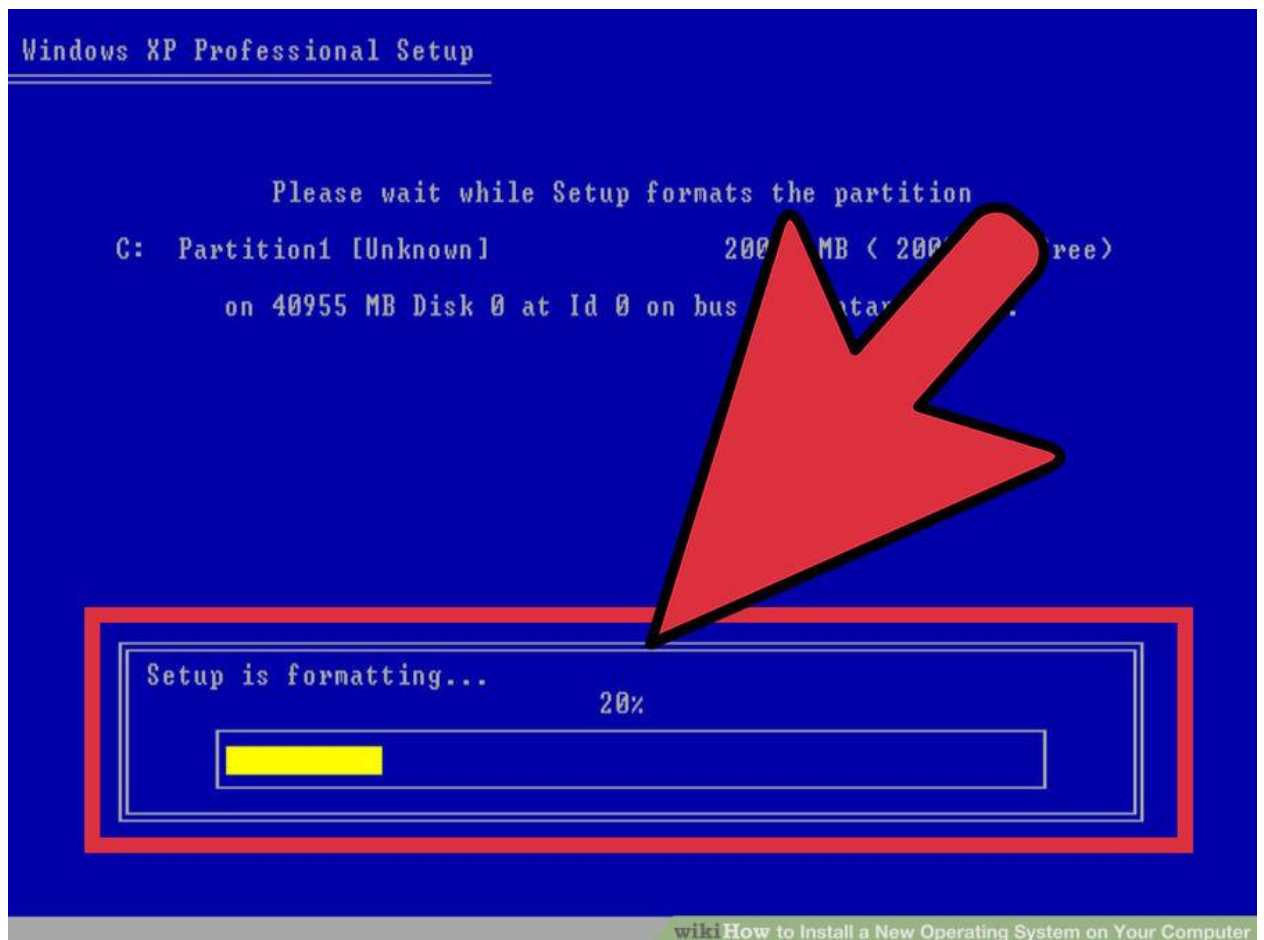
Enter your product key. If you are installing Windows 8, you will need to enter your product key before you can begin the installation. Older Windows versions will ask for the product key after installation is complete. Linux users will not need a product key unless it is a purchased version such as Red Hat.



6

Choose your installation type. Windows will give you the option of Upgrading or performing a Custom installation. Even if you are upgrading an older version of Windows, it is highly recommended that you choose Custom and start from scratch. This will minimize problems that may arise later from combining old settings and new ones.

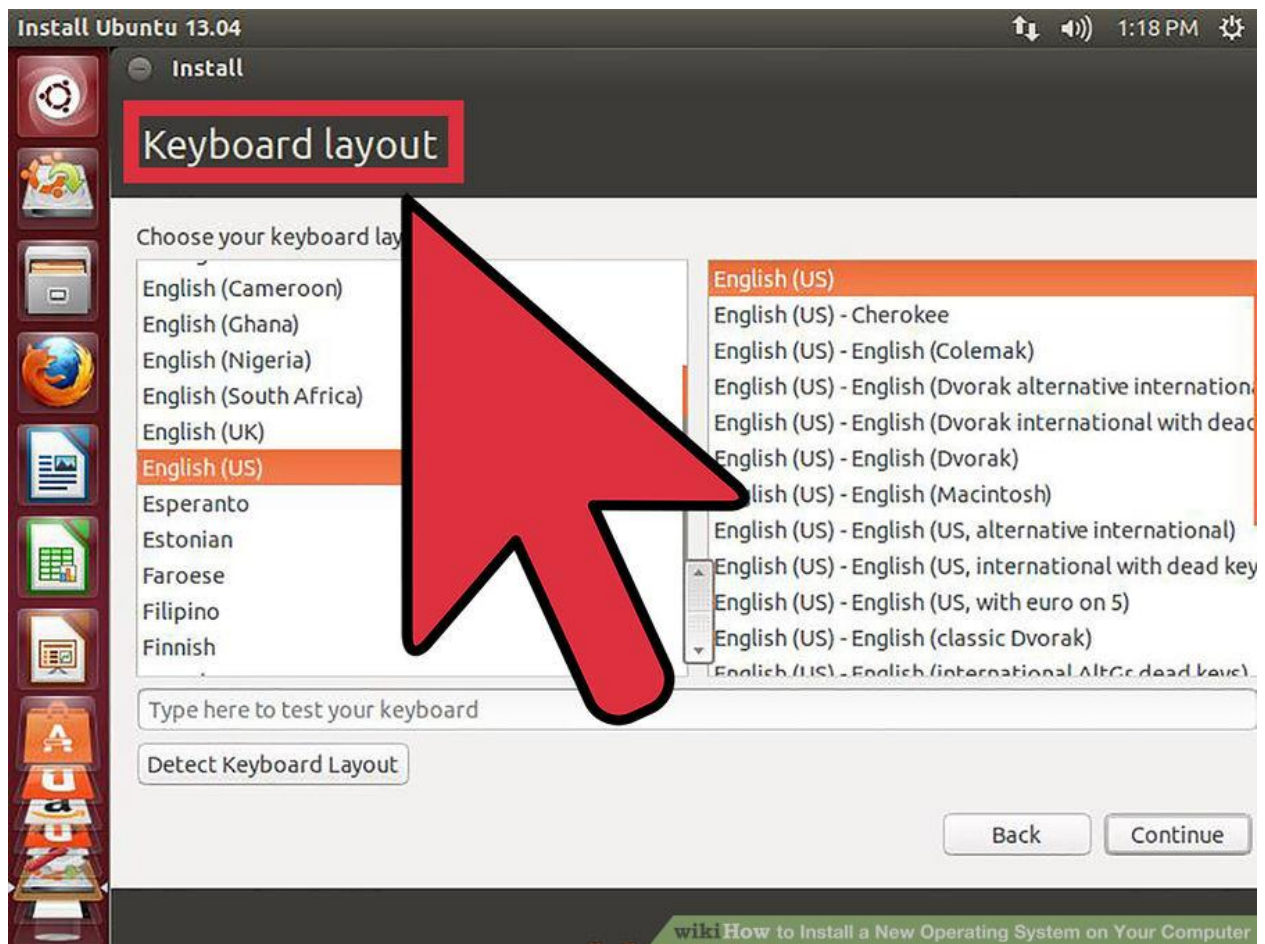
- If you are installing Linux, you will be given the option to install alongside your existing operating system (Windows), or to erase the disk and install Linux by itself. Choose the option that best meets your needs. If you choose to install alongside Windows, you will be given the option to choose how much hard disk space you want to designate for Linux.



7

Format your partitions. If you are installing Windows, you will need to choose which hard drive partition you want to install it on. Deleting partitions will wipe the data on the partition and return the space to the Unallocated section. Select the unallocated space and create a new partition.

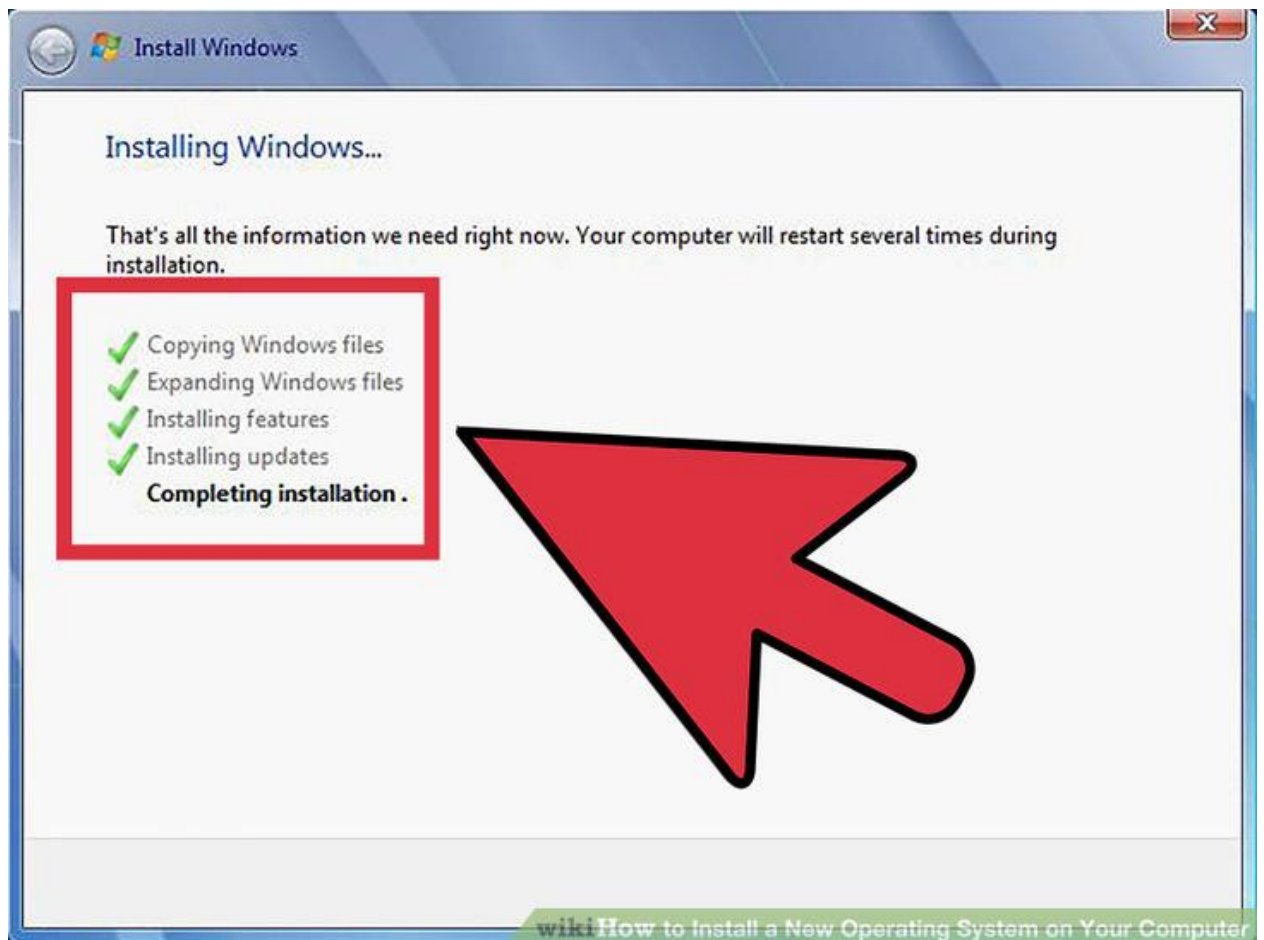
- If you are installing Linux, the partition needs to be formatted in the Ext4 format.



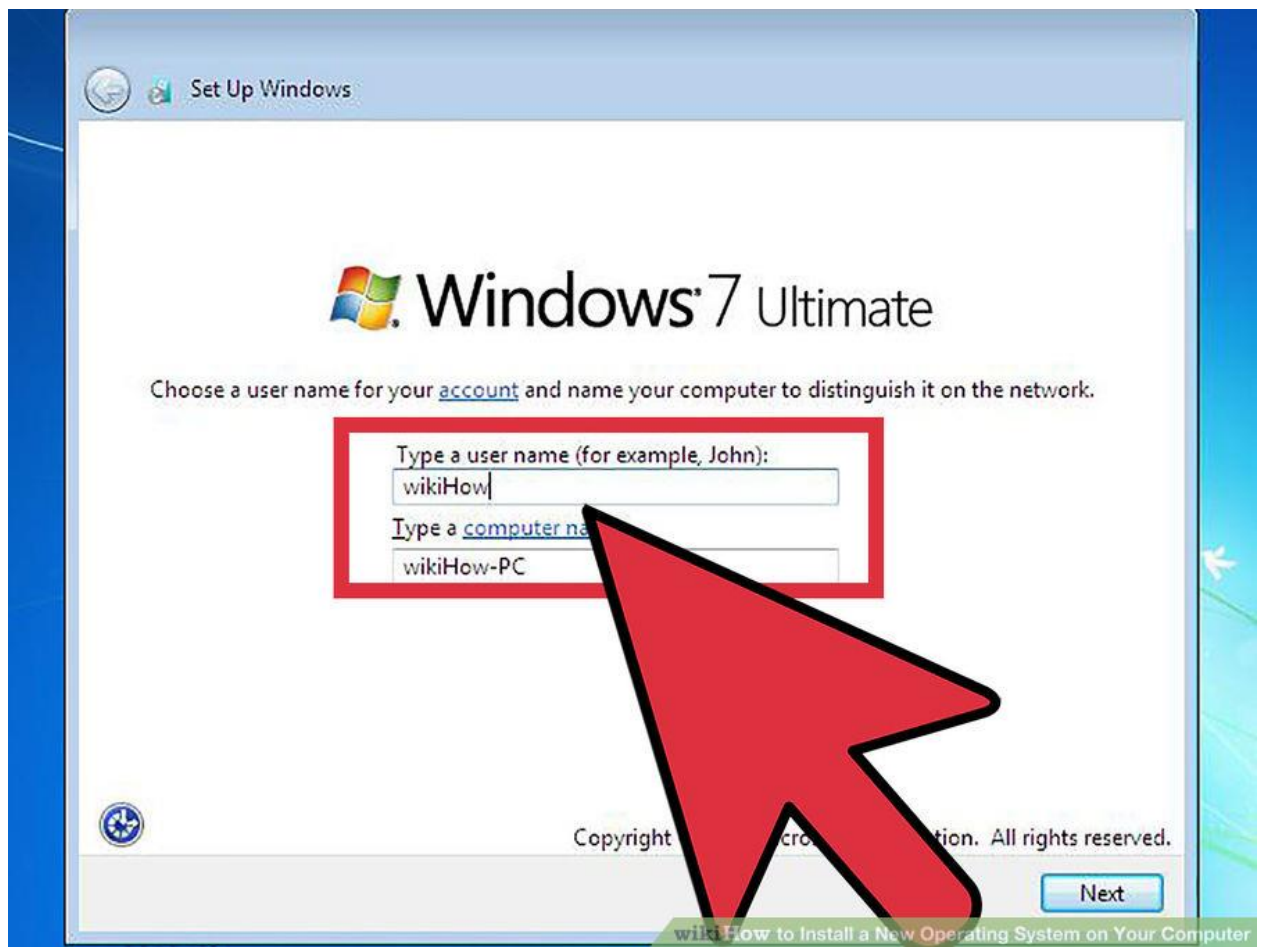
8

Set your Linux options. Before installation begins, your Linux installer will ask you for your time zone, and you will need to create a username and password. You will use this to log in to your Linux distribution as well as authorize system changes.

- Windows users will fill out personal information after the installation is complete.



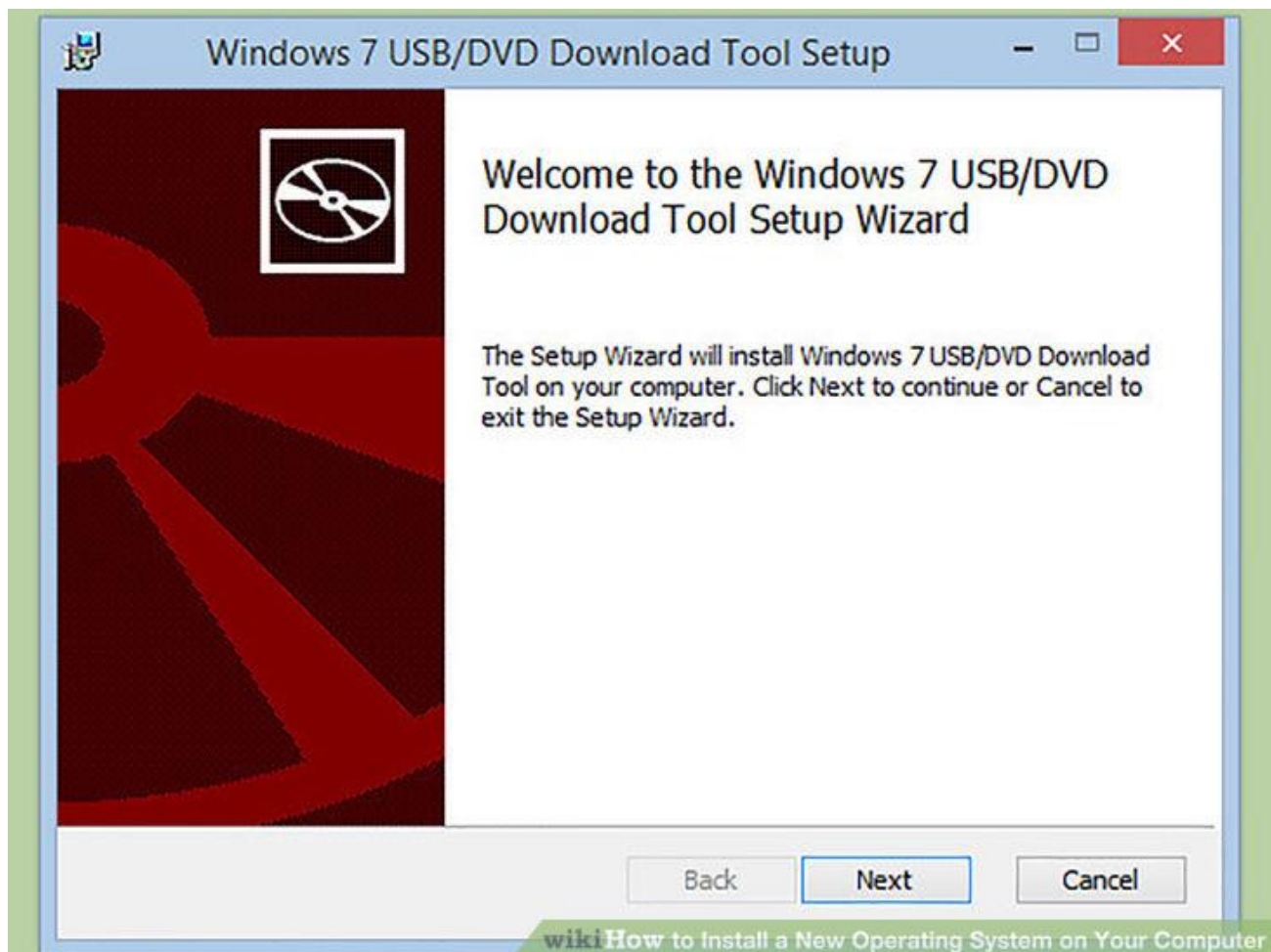
9Wait for the installation to complete. Depending on the speed of your computer, this can take up to an hour to finish. Most installations are hands-off at this point. Your computer may reboot several times during the installation process.



10

Create your Windows login. Once your Windows installation is complete, you will need to create a username. You can also choose to create a password, though this is not necessary. After creating your login info, you will be asked for your product key.

- In Windows 8, you will be asked to customize the colors first. After that, you can choose to either log in with a Microsoft account or use a more traditional Windows username.



11

Install your drivers and programs. Once the installation is complete, you will be taken to your new desktop. From here, you can begin installing your programs and make sure that your [drivers are installed and up to date](#). Make sure to install an [antivirus program](#) if you are going to be connecting to the internet.

Tips

- A good way to make setup faster is when you back up data, don't copy it, but move it, then defragment the disk. Try to do this the night before you install the new operating system, as the install will be able to format the disk much faster. This is especially true if you have an IDE disk that is over 40 gigabytes, or Serial ATA (SATA) disk that is over 500 gigabytes.

- Some operating systems, specifically Linux, have expert setups and normal setups. If you don't know about disk partitioning, use the automatic setup. It will partition the disks for you.

Warnings

- Windows will be unable to read Linux partitions.
- If you are moving from Windows to Linux, and don't know what you're doing with Linux, perhaps a full install isn't right. If your computer is new enough to boot to a USB device, install Linux to a flash drive. Otherwise, just boot from CD to use it.
- If you are installing Windows and you go online, be sure to install antivirus software before you do so.
- Be sure to backup everything before you do this unless you are upgrading. However, it is wise to backup while upgrading, too.

Windows 7 Installation Step by Step

In order to install your copy of the Windows 7 operating system please make sure to have the following items:

- Windows 7 Installation disk
- Drivers CD: * Use after installation process if needed.

***NOTE:** Please make sure to back up all of your important data before proceeding with this installation.

Step 1. Insert the Windows 7 operating system disk into your DVD drive, and then restart your computer

Step 2. You will see a prompt that says '**Press any key to continue**' after the ZT logo disappears. When you see this press any key immediately.

***NOTE:** The following screen shots may differ from what you may see during your installation. (i.e. Win7 version, HDD disk space etc..)



Fig.1

Step 3 'Starting Windows' with the Windows7 logo will appear.



Fig.2

Step 4. Language options, by default English will be set along with "time and currency format" and "keyboard or input method"



Fig.3

Step 5.

Click "Install Now"

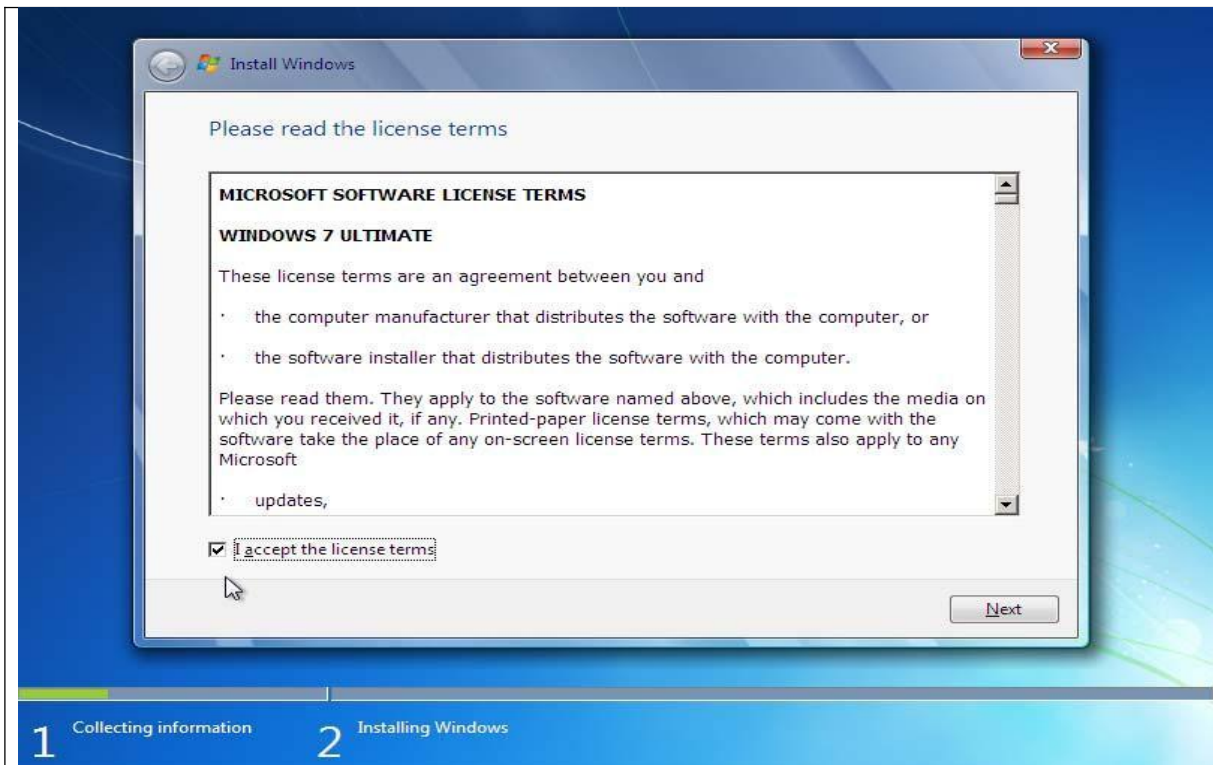


Fig. 4

Step 6. End User License Agreement (E.U.L.A.), check the box to accept, and click "Next"

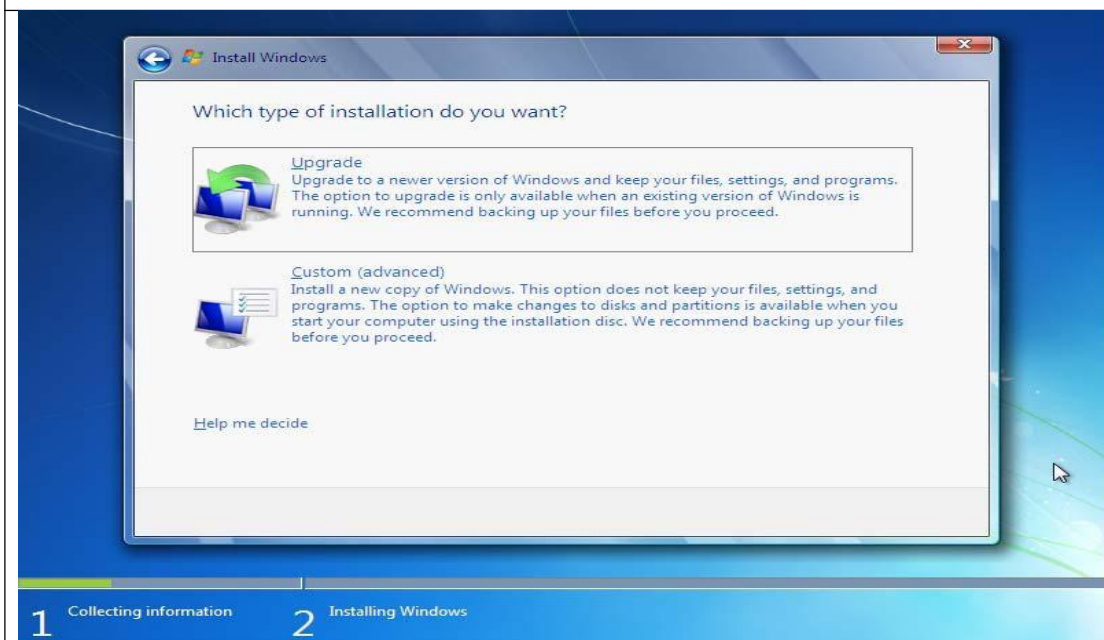


Fig. 5

Step 7. “Which type of installation?” window will appear. Upgrade will be greyed out; the only option you should be able to choose is Custom (advanced).

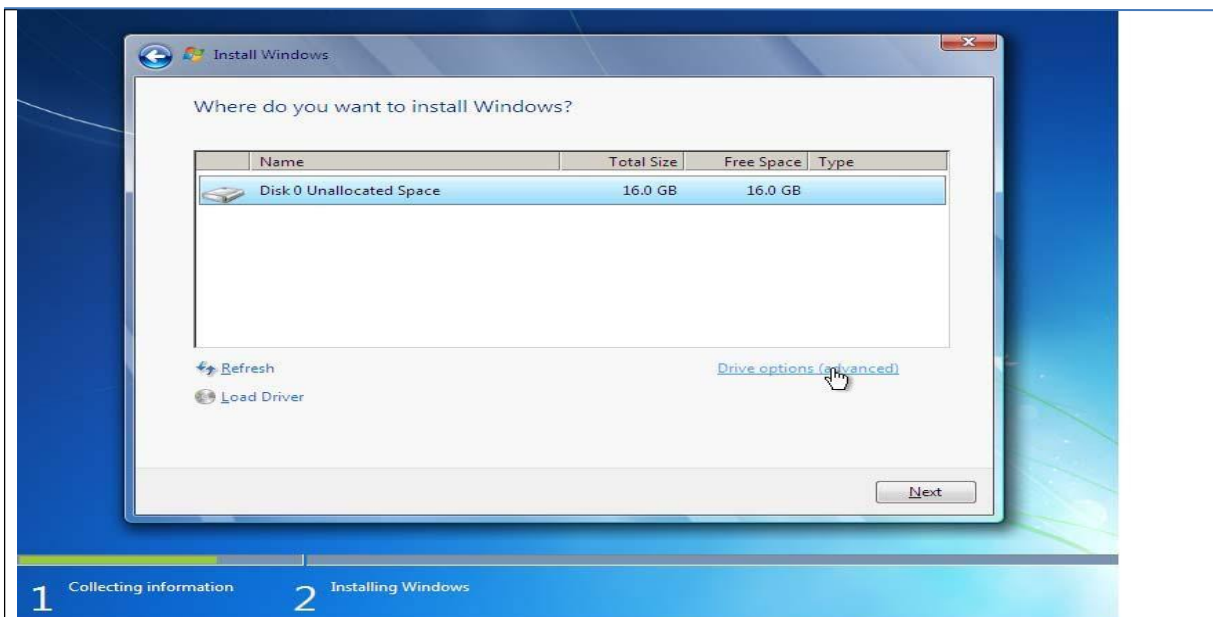


Fig.6

Step 8. “Where do you want to install windows?” Make sure the partition is highlighted.

Step 9. Delete the partition by clicking on Drive options (advanced) on the bottom right corner of the field. Make sure the partition is highlighted and click on Delete. If drive advanced options is greyed out, then the partition will not have to be deleted.

***NOTE:** Deleting the partitions will erase all data on the system

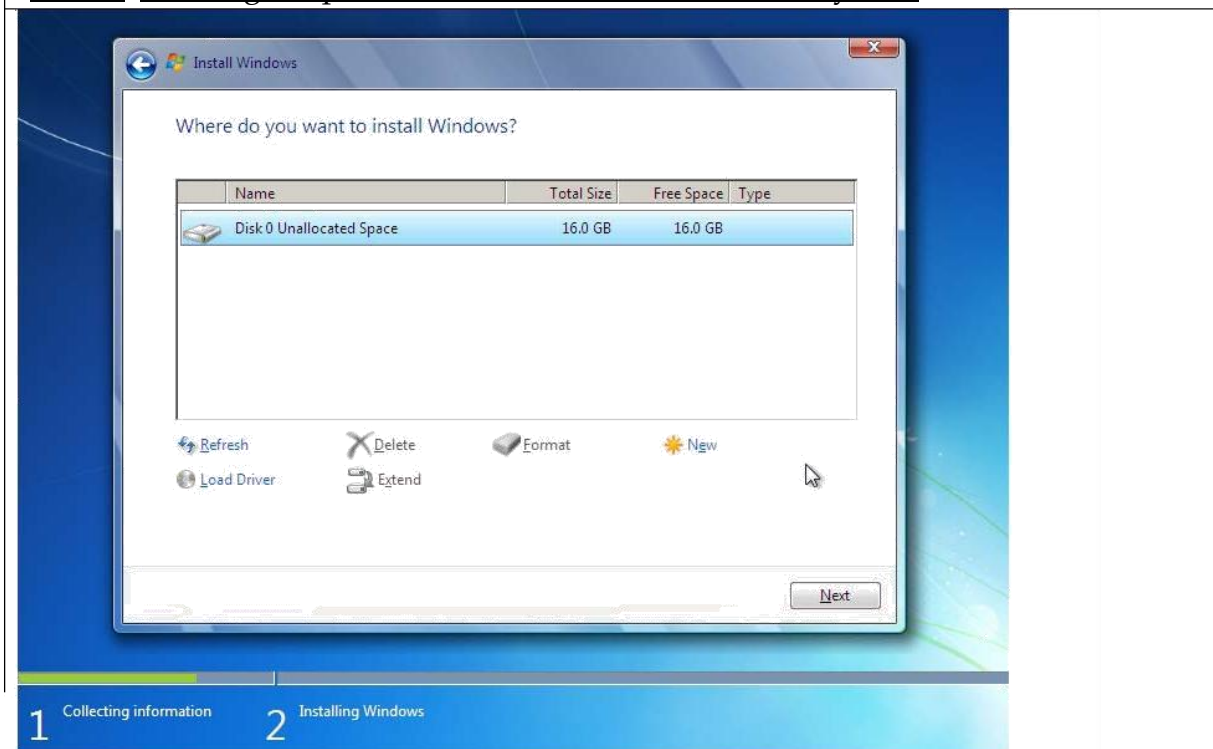


Fig. 7

Step 10. Disk 0 Unallocated Space should be the only listing at this point. If it is press next, If not please proceed to delete any additional partitions that may be listed.

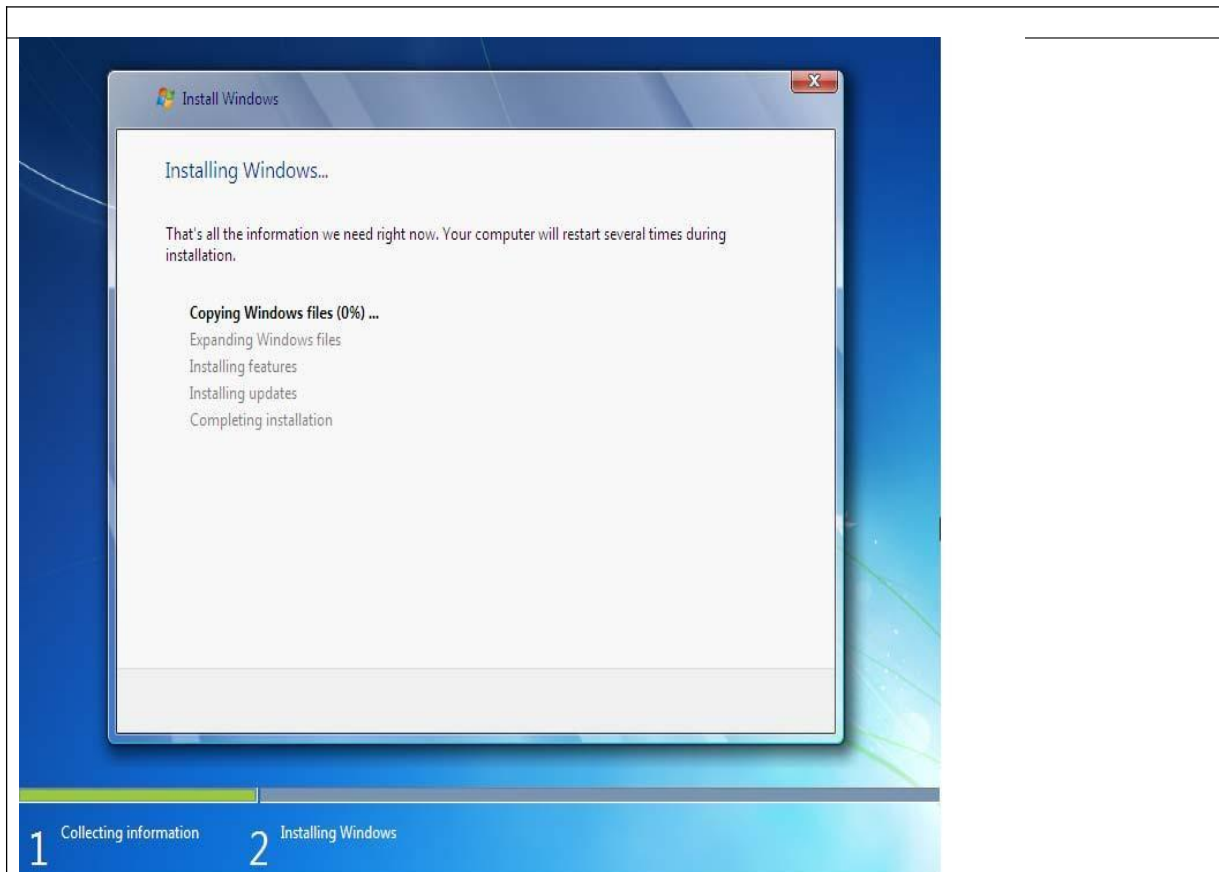


Fig. 8

Step 11. The next screen will show “Installing Windows”. This process should take approximately 10 minutes after which the system will reboot

***NOTE:** Do not press any keys during this boot up process so as to not disturb the rest of the installation.

Step 12. The next screen will show “Installing Windows” again to complete the installation process.

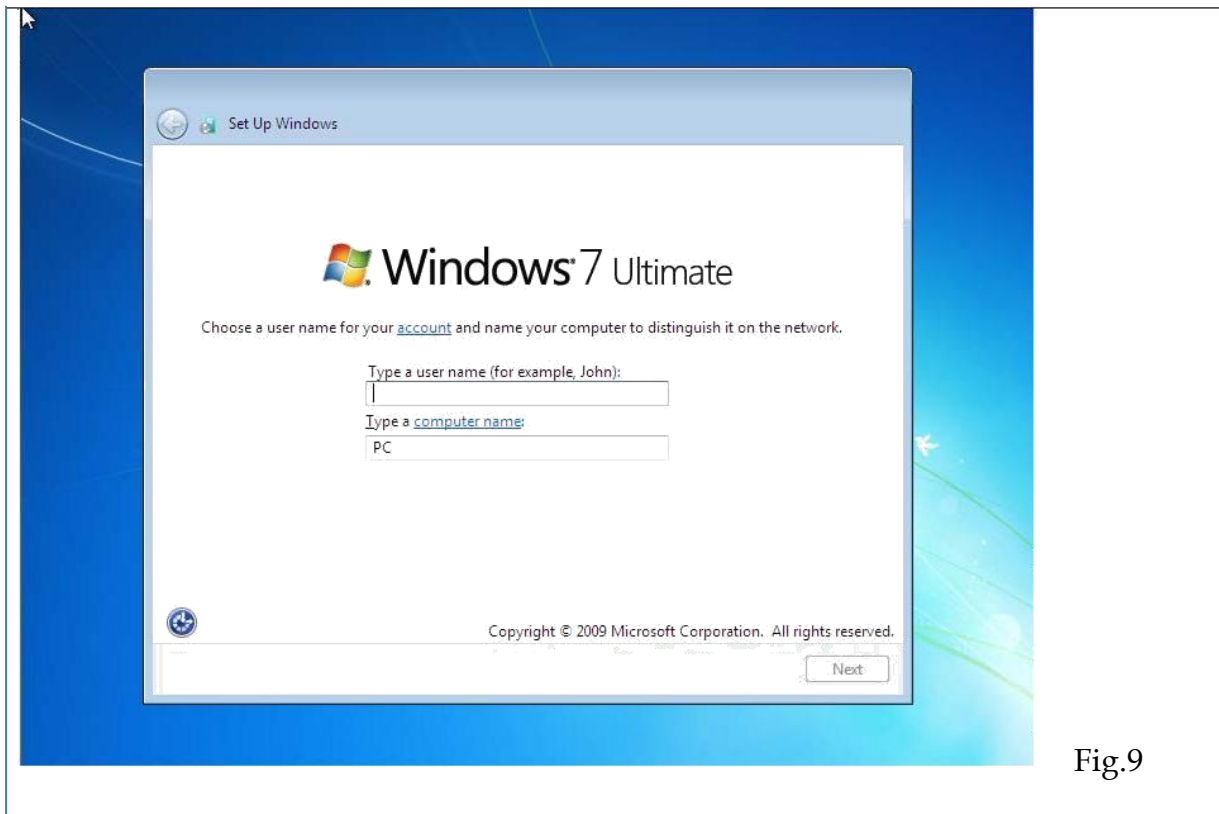


Fig.9

Step 13. "Setup is starting Windows" will appear on the screen, then you will be asked to create a user name and a computer name.

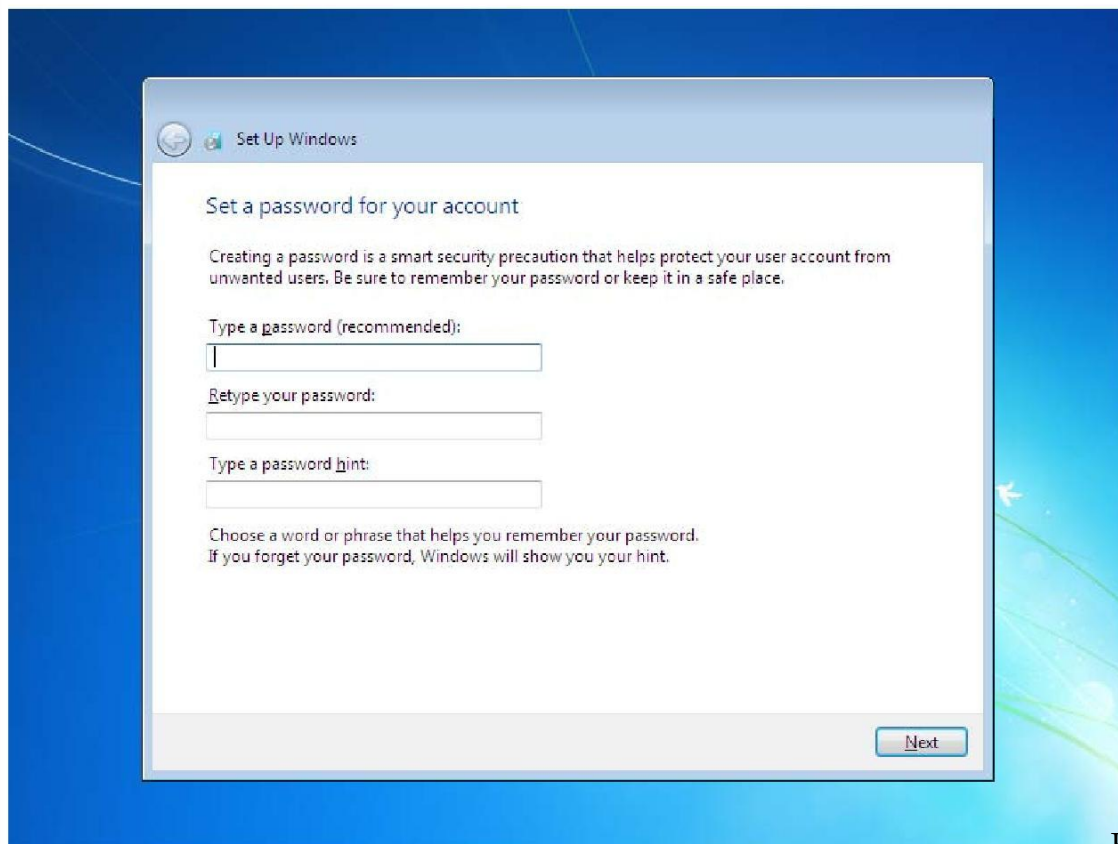


Fig.10

Step 14. The next step will prompt you to create a password for your account (optional).

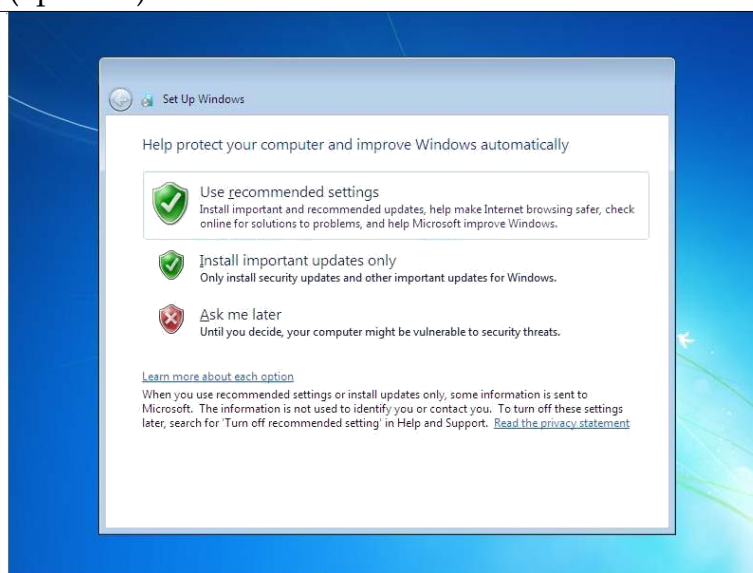


Fig.11

Step 15. The next screen will come up and ask you to choose one of three options: "Use recommended settings", "Install important updates only" and "Ask me later".

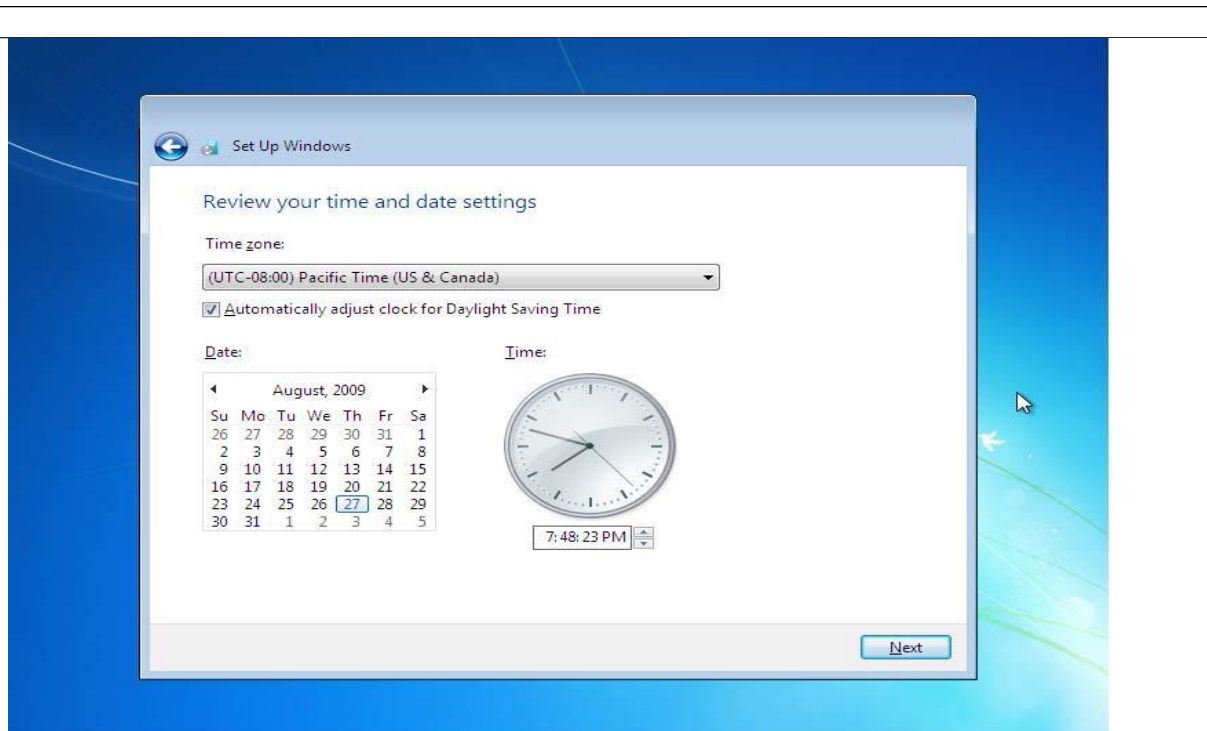


Fig. 12

Step 16. This screen will allow you to choose your local time zone and also adjust the date and time.

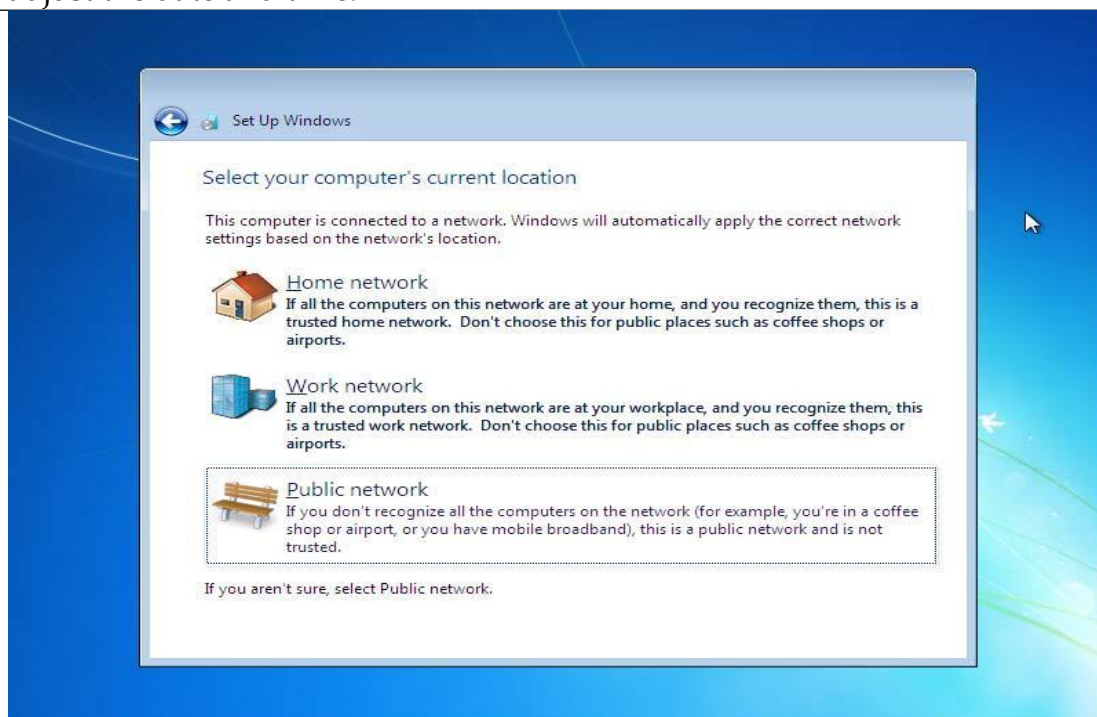


Fig. 13

Step 17. Click on the appropriate location of your computer to enable Windows 7 to apply the correct network settings.

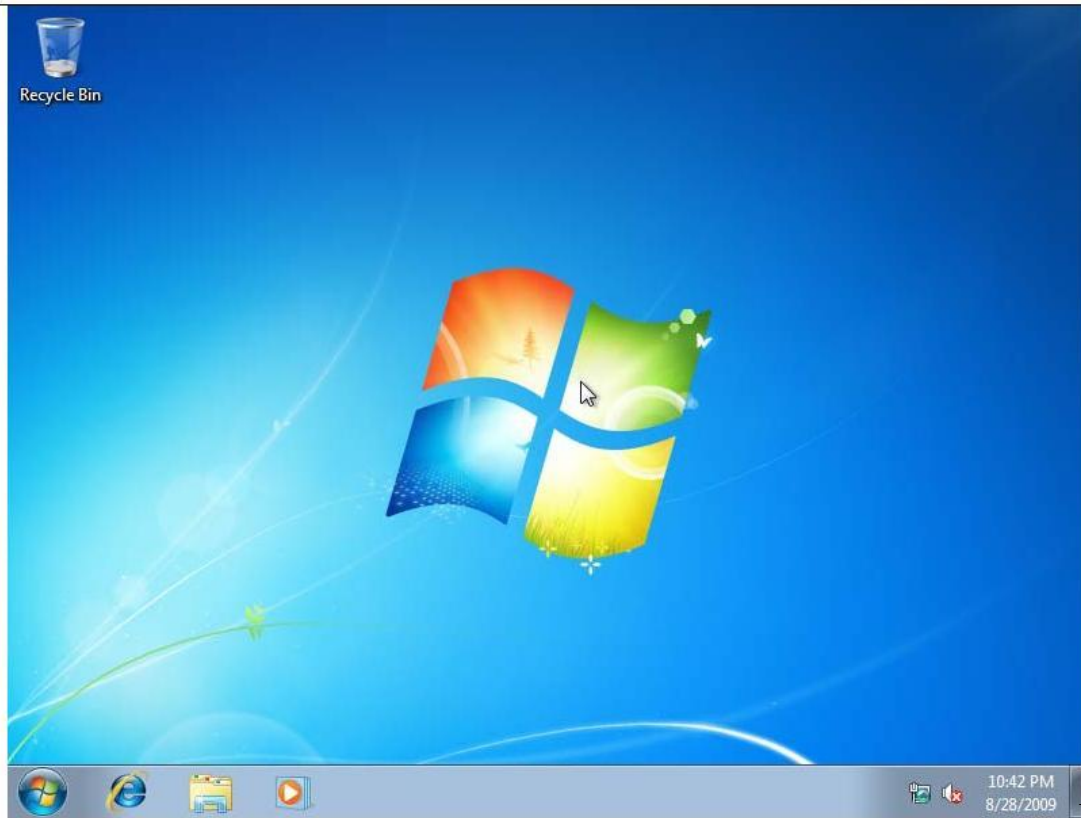


Fig. 14

The installation is done! You have successfully installed Windows 7 on your ZT computer.

Step by Step Guide to Installing Windows 7

Windows 7 is perhaps the best Microsoft operating system to date and is very easy to install compared to windows XP.

Before starting the installation we should make sure that the computer meets all the Hardware requirements for installing Windows 7.

Minimum Hardware requirements:

1. 1 GHz 32 bit processor.
2. 1Gb RAM for good performance
3. Graphics adapter that supports Direct x 9 graphics. Minimum 512 Mb of Graphics memory.
4. 20 GB free Hard disk space.

Different Editions in Windows 7:

1. Windows 7 starter
2. Home basic
3. Home premium
4. Professional
5. Enterprise
6. Ultimate

The steps to install Windows 7 operating system are as follows:

1. Start your computer. Press f2 or delete at start up to enter the bios menu. Select First boot device as 'CD ROM' if you installing from DVD ROM. Second boot device as 'Hard Disk' so that the computer boots from Hard disk if OS is not in DVD ROM. Press f10 to save your settings and select yes to restart your computer.
2. Insert the installation disc for Windows 7 and start your computer. The computer will ask you to 'Press any key to boot from CD/DVD'. Press any key on your keyboard and it will start loading the operating system from the CD.
3. After loading windows 7 successfully, it opens an install window. Enter the Language time & currency format and keyboard or input method. Click 'Next'. The 'Install windows 7' screen will appear.
4. Click 'Install now'. Setup will start and you will see a message on the screen 'Set up is starting...'
5. Now it will show the License agreement screen. Check the 'I accept the License terms' and click 'Next'. The 'Install windows' wizard will appear.

6. Select Custom (Advanced) option. The screen will prompt you to select the location to install windows. Click drive option (Advanced menu). Click on 'New', you are then asked to allot a size on the disk for installation. Enter the appropriate volume size and then click 'Apply' to create partitions for the installation, click 'Next'. Windows will start the installation. Now the installation status screen appears. You will have to wait for the following tasks to get complete.
 1. Copying Windows
 2. Expanding Windows files
 3. Installing features
 4. Installing updates
 5. Completing Installation
 6. The computer will restart several times during this process so do not worry.
 7. After successful installation of Windows 7 it will ask you to specify the 'computer name'. It will also ask you enter a 'User account' and 'Password'. Enter the password in the respective field and also the password hint, click 'Next'.
 8. The setup key will open the 'Product Key' option. Enter the correct product key, make sure that 'Automatically activate windows when I am online' check box is selected and click 'next'.
 9. Now a window to set time on your computer will be displayed. Set the correct 'Time Zone', date and click 'Next' option.
 10. The 'Computer network location' option will be displayed if your computer is already connected to a network. Select 'Network type' and click 'next'.
 11. Windows will now finalize the setup and start to prepare your Windows 7 Desktop.

Upgrading to Windows 7

1. To upgrade to Windows 7 you need Windows Vista in your computer.
2. Turn on your computer. Once windows Vista is started open the installation media for windows 7. If you are using a DVD, insert DVD disc in your computer. Setup will start automatically. If it does not start, Click on 'Start' – Computer – double click the DVD drive – double click the setup file.
3. Click 'Install now' button. 'Get important updates for installation' page appears. Select 'Go online and select the latest updates for installation (recommended).
4. The 'License agreement' page appears. Check 'I accept the License term' and click 'next'.
5. The windows to 'Install windows' will appear. Select 'Upgrade' option. Now windows will check for the compatibility with the help of windows upgrade

advisor and generate report if it finds any compatibility problems. If no compatibility issues are found then Windows 7 starts up gradation process.

All the applications, data, settings and documents existed on the computer running windows vista will be available in windows 7 after the upgrade. We should run windows upgrade advisor before we start up gradation. Most of the applications which run in windows vista will run in windows 7. But some significant applications and hardware may not. This is called as compatibility issues. Windows upgrade advisor will is an application which helps you in determining any applications which may not run properly on windows 7. If any problem is occurred during the up gradation of windows 7 it will automatically restore the previous operating system. If you are experiencing any problem at the time of login then you can roll back you vista operating system manually. You cannot upgrade a 64 bit version of windows 7 operating system to 32 bit version of windows 7 operating system. Also you cannot upgrade from Windows 7 ultimate edition to Windows 7 home premium.

Remote Desktop & Remote Assistance

Remote Desktop

Remote desktop and Remote assistance is available in professional, business and ultimate editions of Windows 7. It is a technology which allows you to access remote computer from one place. Remote desktop is disabled by default on computer running Windows 7. You can enable the Remote desktop connection from the 'Remote' tab of the 'System properties' dialog box.

Remote Assistance

Remote assistance is a helpdesk feature used to view the screen of the user whom they are supporting. If a person experiencing any difficulty on his computer or on any applications or software products, the help desk staff can view and provide support to them remotely using Remote Assistance.

There are three options to configure Remote Assistance:

1. Save this invitation as file. Save the invitation as file and send this invitation to the helper as an attachment through web based email.
2. Use Email to send an Invitation. Use this option to send the invitation to the sender through email directly without saving the invitation on your local

computer. You cannot use this option if you have not configured the email program.

3. Use easy connect. This method is applicable only on a local network if the peer name resolution protocol is present on the server. A DNS server and email server configuration is required on the network.

Note: In all of the above methods, the person requesting for help needs to provide a password to the person who provides assistance.

Configure Remote Desktop in windows 7:

1. Right click 'Computer' icon on the desktop, select 'Remote settings' in the left pane, select 'Allow remote connections from computer running any version of Windows'.
2. Click 'Apply' - 'Ok'. This will enable remote desktop in the computers who want to remotely connect to each other.
3. Click 'Start' - 'All programs' - 'Accessories' - 'Remote Desktop Connection'. The Remote desktop connection window appears.
4. Enter the Name/IP address of the computer which you want to connect. Click on 'Connect' Button.
5. The Remote desktop connection starts to configure remote desktop session. It will ask you to type the username and password to provide authentication to the remote computer.
6. Once the authentication process is done remote connection is established with another computer and you can now control the computer and resolve the issues.

Configure Remote Assistance in windows 7:

1. Right click 'Computer' icon on the desktop, select 'Remote settings' in the left pane, select 'Allow Remote assistance connections to this computer'.
2. Click 'Apply' - 'Ok'. This will enable Remote Assistance in the computers you want to access remotely.
3. Type 'Remote assistance' in search box of the 'Start menu'. Open 'Windows remote assistance' console. The Windows Remote assistance window appears.
4. IF you want help from someone, then you have to select the first option 'Invite someone you trust to help you'. The Windows Remote assistance screen appears. Click on 'Save this invitation as a file'. Give a specific path on a shared folder so that another person having access to the shared folder can access the invitation file.

5. Open the invitation file and it will display a 'Password' for another person to connect using the same file.
6. The person who wants to help you will access the 'Windows Remote assistance' console from the search box of the 'Start' menu. Select 'Help someone who has invited you' option. The 'Windows Remote assistance' page appears.
7. Click on 'Use an invitation file' and browse the location to open the invitation file from the remote computer. Type the password generated by the first user and this will allow providing remote assistance to his computer. Click 'Ok'.

Setting User Accounts & Parental Controls

User account:

Several people can work on a single computer by creating their own user account. Every user account has its own settings and preferences. They can be configured to set their own desktop background, screen saver, themes etc. You can create different types of account in your computer. Windows 7 allows you to create, modify and delete a user account. You can also set a password for your user account.

Types of user accounts:

1. Administrator account: An administrator account allows you to make changes that will affect other users of the computer like installing software or changing security settings of the computer. The built in administrator account is disabled and the account created by the user at the time of installation is used. Administrator account has complete access to your computer.
2. Standard account: A standard account cannot make changes that will affect other users and security of the computer. Standard account can use most of the programs in the computer but cannot install or uninstall them. Any account that does not have administrative rights is a standard account.
3. Guest account: A guest account can log onto the computer but will not have access to all of your files. A guest account can log onto a network, browse the internet and can shutdown the PC.

Creating a new user account in windows7:

1. Click on 'Start'- 'Control panel' – User accounts and family safety.
2. Click 'Add or remove user accounts'. The account management window is displayed.
3. Click 'Create a new account' option on 'Manage accounts' page. The 'Create a new account' window will appear. In the 'New account name' field enter the name of the new account that you want to create.

4. Select the type of the account. Two options are available namely 'Administrator and Standard user'. Select the appropriate option and click 'Create account' button.
5. Now the user account has been created and you can see the account in the list of 'Manage account' window.

Changing the account name and type:

1. Click on 'Start' - 'Control panel' - User accounts and family safety. The 'User account and family safety' page appears.
2. Click 'User accounts' from 'User accounts and family safety' page. The 'User account window appears. Click 'Change your account name'. The 'Change your name windows appears. Enter the name that you want to change and click 'Change Name' button.
3. Click 'Change your account type' from 'User account' screen to change the type of user account. Select the required type of account and click 'Change Account type'.

Setting password for the User account:

1. Click 'Start' - 'Control Panel' - 'User account and family safety' - User accounts.
2. Click 'Create a password for your account'. The create password window appears.
3. Enter the password that you want to set and confirm the password, type the 'Password Hint'. Click on 'Create password' button.

Parental Control

Parental control helps you to decide how other users want to use your PC. You can block access to a particular game, websites and programs by configuring parental control. You can set time limit in hours that another user can use the computer through parental control utility. Parental control can be applied only to the standard account. You can restrict the kinds of websites that children visit and games, programs, etc. Parental control feature is available in windows 7 Home premium, ultimate & Enterprise editions.

Configure Parental Control:

1. Click 'Start' - 'Control panel' - 'User account and Family safety' - 'Parental control'. The 'Parental control' windows will appear.
2. Select the standard user for which you want to set the parental control. Select 'On, Enforce current settings' under parental control settings. Set the individual

settings such as 'time limits', control over 'games' and 'Allow or Block specific programs' and click 'Ok' to apply parental control.

Set Logon Hours:

1. Click 'Start' - 'Control panel' - 'User account and Family safety' - 'Parental control'. The 'Parental control' windows will appear.
2. Select the standard user for which you want to restrict logon hours.
3. If the parental control feature is not enabled, then enable it and click on 'Time limits'.
4. Now you can select different logon hours for each and every day of the week by selecting the squares. Blue space indicates 'blocked'. White space indicates 'Allowed'.

Block games using parental control:

1. Click 'Start' - 'Control panel' - 'User account and Family safety' - 'Parental control'. The 'Parental control' windows will appear.
2. Select the standard user for which you want to apply 'Game control'.
3. In the 'User account control' windows click the 'Games' link. Click 'Yes' option.
4. Click on 'Block or allow specific Games' link. You can select 'Always allow' or 'always block' for the games which you want to allow or block.

Parental control is not applicable for administrator and the members of Administrator group.

Installing Windows Server 2008

Windows server 2008 has a new feature called as 'Server core installation' & 'Full Installation'. The 'Server core installation' is a command based version of Windows Server 2008 whereas, the 'Full installation' is a Graphical based installation in Server 2008.

The different Editions in Windows server 2008 are:

1. Standard Edition
2. Enterprise Edition
3. Data centre Edition
4. Web server Edition

Steps to install Windows Server 2008:

1. Insert the 'Windows Server 2008' bootable DVD into the DVD rom. Restart your computer and press any key when the 'Boot from CD/DVD' option appears.

2. The installation screen in the beginning will show you the following options:
 1. Language to Install
 2. Time and currency format
 3. Keyboard or input method
 4. Select the appropriate Language, Time and currency and Keyboard input method.
 5. Click 'Next' – 'Install now'.
 6. You will be prompted to enter the product key. Enter the right 'Product key' and click on 'Next'.
 7. The 'License agreement' window will be displayed, select 'Accept the license and agreement' checkbox and click 'Next'.
 8. Select the 'Custom' option if you are performing a new installation. Click 'Next'; select the partition space (at least 25000 MB).
 9. Select the desired partition and 'Install'.
 10. The installation begins and the system will restart once or twice and the installation will complete after a while.
 11. The Windows login screen will ask you to type a new Administrator password. Once you type the password you can start working on the Windows Server 2008.

Server Roles in Windows Server 2008:

1. Active Directory Certificate Services
2. Active Directory Domain Services
3. Active Directory Federation Services
4. Active Directory Rights Management Services
5. Application Server
6. DHCP Server
7. DNS Server
8. Fax Server
9. File Services
10. Network Policy and Access Services
11. Print Services
12. Terminal Services
13. UDDI services
14. Web server (IIS)
15. Windows Deployment services
16. Windows SharePoint Services

Features of Windows Server 2008

1. .NET framework 3.0 features
2. Bit locker Drive Encryption

3. BITS Server Enterprises
4. Connection Manager Administrator Kit
5. Desktop Experience
6. Group Policy Management Installed
7. Internet Printing Client
8. Internet Storage Name Server
9. LPR Port Monitor
10. Message Queuing (Installed)
11. Multipath I/O
12. Network Load Balancing
13. Peer Name Resolution Protocol
14. Quality Windows Audio Video Experience
15. Remote Assistance
16. Remote Differential Compression
17. Remote Server Administration tools
18. Removable Storage Manager
19. RPC over HTTP Proxy
20. Simple TCP/IP Services

These are the few features of Windows Server 2008.

Windows Activation

Volume Activation is use to manage the licensing process for operating system software like Windows Vista and Server 2008. It eliminates the need to manually enter a product key when the Operating System is installed, and it allows you to protect and manage Volume License keys throughout an organization. There are two types of Keys in Windows Server 2008.

1. Multiple Activation Key (MAK): A Multiple Activation Key is used for a one-time activation with Microsoft's hosted activation service. It can be activated via the internet, over the phone, or by using the 'Volume Activation Management Tool' (VAMT).
2. Key Management Service (KMS): A Key Management Service (KMS) license key allows you to host an activation service locally within your own network. Rather than contacting the Microsoft hosted activation service each time KMs allows you to contact the Ms Activation service one time to activate your KMS host, after which all activation traffic is managed locally. Minimum number of physical computers required to allow you to use a KMS key is 25 Vista computers and 5 Windows Server 2008. Internet host has to activate after every 7 days with KMS host and will require connecting at least once every 180 days to maintain its license.

Setting Up the Windows Home Network

Home group:

Home group is a new feature in windows 7 which allows you to connect to other computers and also allows you to share music, pictures, documents, printers and other files with other computers. Home group cannot be created on a Domain network. We can allow other computers on home group to modify our files or make them read only. You can set permissions for other users to access your files.

Steps to create a Home group:

1. You require minimum 2 computers on the same network.
2. Click 'Start' and select 'control panel'. In control panel select 'Network and Internet' and click on choose 'Home group and sharing'. This will display the home group window.
3. Click the 'Create a Home group' button. The Create Home group window will appear. Now select the check box for which items you want to share and click 'Next'. Then it opens a window with password information to other computers.
4. You have to use this same password to add other computers to your network. You can also click on 'Print password and instruction' and give this password to other computers running windows 7 on the network to join your Home group.
5. Click 'Finish' to complete the creation process.

Note: When a computer is connected to the home network where you created your home group, windows 7 prompts you that there is Home group available to join.

Steps to Join a Home group which is already created:

1. Click 'Start' - 'Control Panel' - 'Network and Internet' - 'Home group'. The Home group window will appear.
2. Click 'Join now' button to join your Home group. The join a Home group wizard will appear.
3. On the join a Homepage window, select the items that you want to share with other computer and click 'Next'.
4. Enter the Home group password that you got from the person who created the Home group and click on 'Join now' button.
5. If you want to leave the home group, open the Home group item in the 'Network and sharing center' and then click 'Leave the Home group' option.

Sharing Data in your home group:

1. Type 'compmgmt.msc' in start search box, click on 'Shares' under 'Shared folders'.
2. Right click on shares node and click 'New share'. Then it will open 'Create a shared folder' wizard.

3. Click 'Next' and specify the folder which you want to share. After entering the folder path 'Create a shared folder' wizard appears. Enter 'share name, share path & description' to specify how users see and use this shared folder over a network and click 'Next'.
4. Set the appropriate permission that you want for the shared folder.
5. Click 'Finish' so that the sharing completes.

Sharing a printer in your Home group:

1. Click 'Start' - 'control panel' - 'Hardware and sound' - 'Devices and printers'.
2. Locate the printer and right click the printer which you want to share. Select 'Printer properties'.
3. Click 'Sharing' tab of the printer properties and enable the 'Share this printer' option.
4. To add additional drivers for the printer, Click 'Additional drivers'.
5. Click 'Apply' - 'Ok'.

Stop or change folder sharing:

1. Open windows explorer. Select the folder and right click the folder for which you want to stop sharing. Select 'Share with' and select 'Nobody'. The sharing wizard will appear.
2. Click 'Change sharing permissions. This will allow you to change the existing permissions.
3. To stop sharing permission, click 'Stop sharing' option from share wizard.

Note:

You can assign three different kinds of permissions:

1. Owner permissions: For the user who shared the folder.
2. Read permissions: Allows the user to access files in the shared folder but not to delete or modify them.
3. Write permissions: Allows the user to read, add, delete and modify the files in the shared folder.

UNIT IV

Configuration: Motherboards: BIOS – setting up BIOS options –Processors – Drivers: Role of drivers – Working with drivers – Installing drivers – Peripheral Devices: common peripheral device drivers – Driver Pack Solution.

4.1 Motherboards:

The basic purpose of the motherboard is to provide the electrical and logical connections by which the other system components communicate. Typically, the motherboard contains the CPU, BIOS, CMOS configurable chip, memory (ROM & RAM), real-time clock, jumpers, mass storage interfaces, serial and parallel ports, expansion slots, and all the controllers required to control standard peripheral devices, such as the display screen, keyboard, and disk drive.

The most common method of configuring components on a motherboard is CMOS setup. Some motherboards also use jumpers or DIP switches to adjust configuration settings

Basic Input Output System (BIOS), is the most important chip found on the motherboard. It is the built-in software that determines what a computer should do when you first start it, before loading any OS from a disk.

The primary function of the BIOS is to prepare the machine so other software programs stored on various media (such as hard drives, floppies, and CDs) can load, execute, and assume control of the PC. This process is known as **booting up**.

Computer today store most configuration information in CMOS RAM , also called the realtime clock/non-volatile RAM (RTC/NVRAM) chip , which retains data

even when computer is turned off. CMOS(Complementary Metal-Oxide Semiconductor) is a computer chip responsible for storing settings of a computer system.

Setting Up the BIOS Options:

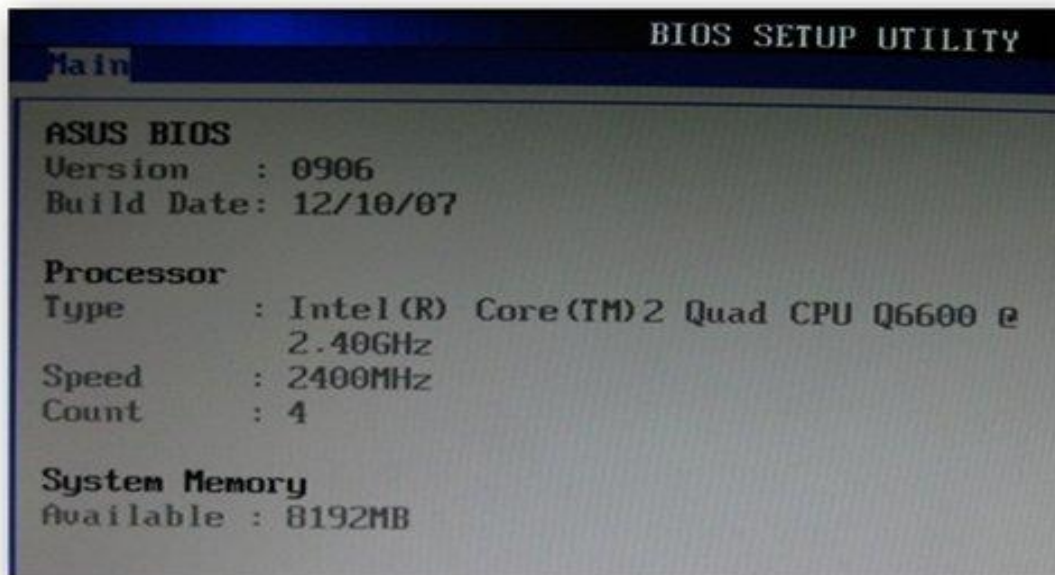
When the computer first powers on, hit a key to enter setup (usually the Delete key). The settings will be different for each motherboard and BIOS version

Screen 1: Usually lets sets clock to the correct time, as well as disable the floppy drive (note Legacy Diskette A is disabled below).



Screen 2:

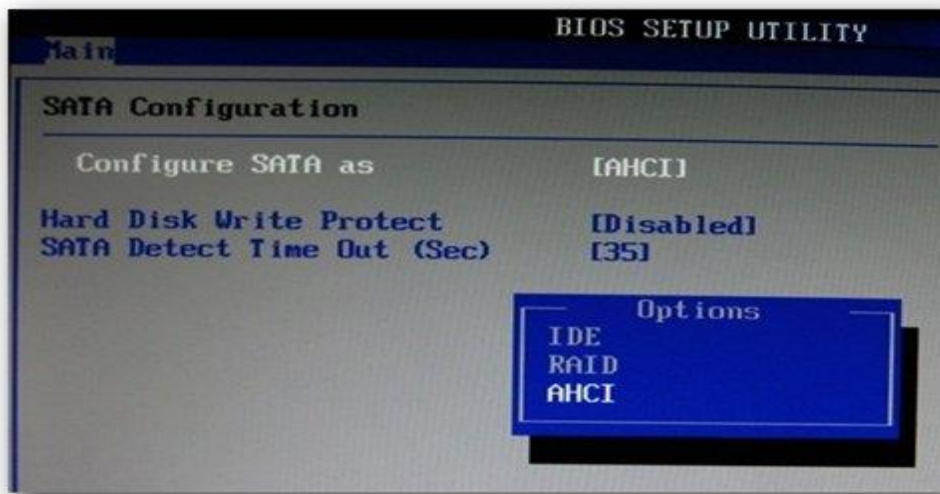
The System Information screen will show the current BIOS version, and verify that the CPU and memory are detected correctly. Otherwise, check the manual if necessary.



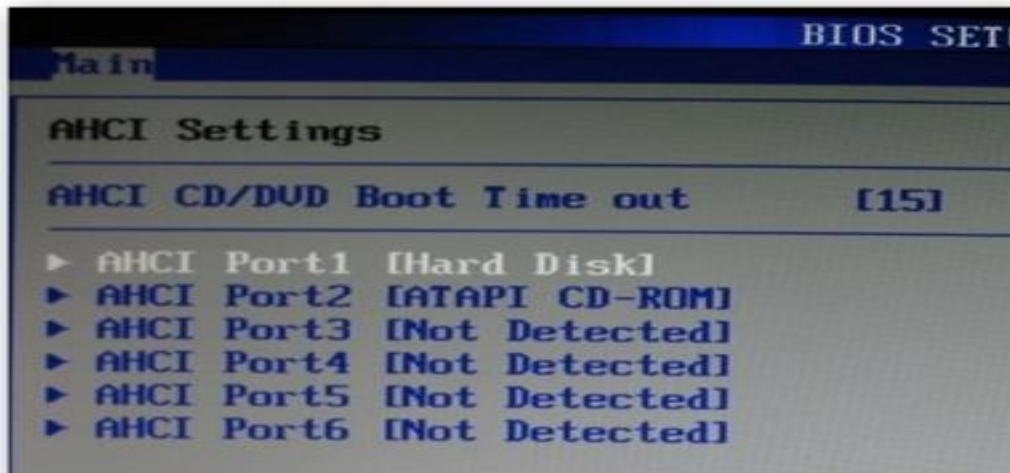
Screen 3:

The SATA Configuration screen has an option that is critically important: Whether SATA to function as IDE or AHCI?

- AHCI mode allows the computer to use the more advanced SATA functions, and will give you better performance.
- Windows Vista or current versions of Linux will function perfectly in AHCI mode.

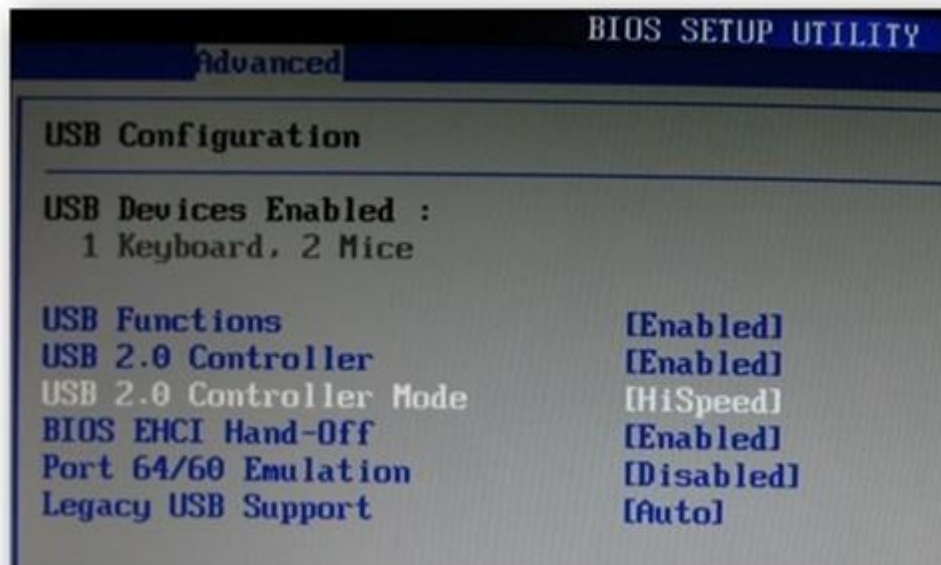
**Screen 4::**

Check to make sure hard drive and CD/DVD drives are detected correctly. This screen will be different depending on BIOS Settings. If the drives aren't detected correctly, verify that it should be installed correctly.



Screen 5:

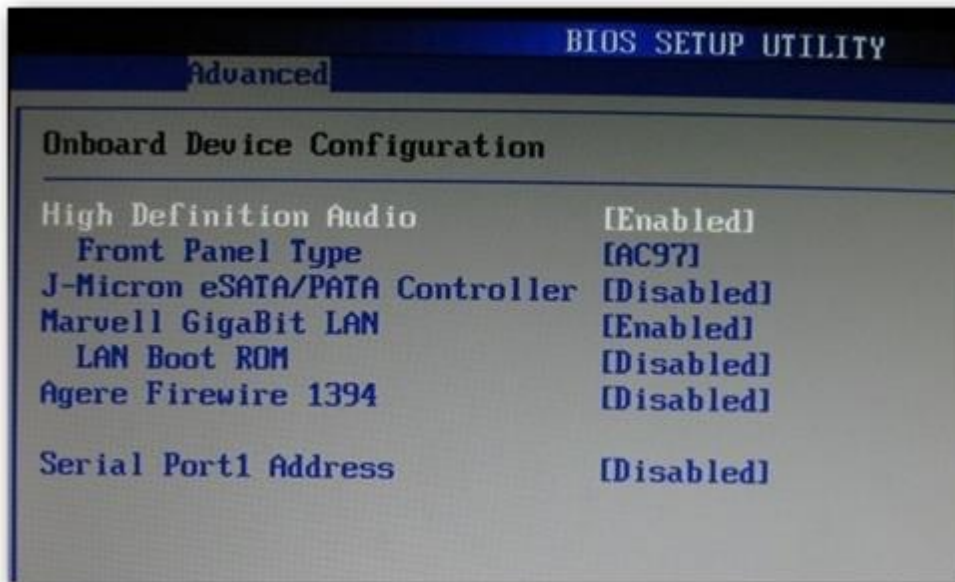
The USB Configuration screen will disable/enable USB. The important setting here is that USB mode should be set to use HiSpeed .



Screen 6:

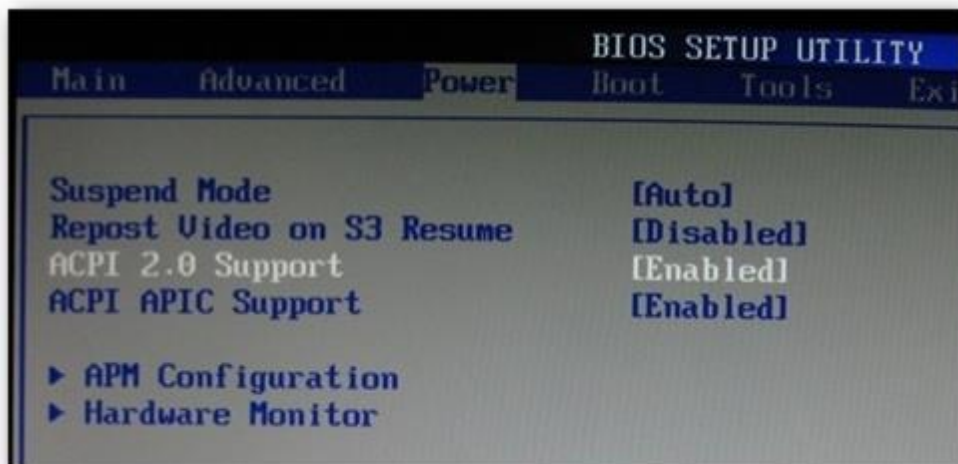
There is a screen that will allow for a couple of important things

For instance, disabling the serial ports or the regular IDE controller. Disable the unused ports to keep Windows from loading unnecessary drivers for hardware.



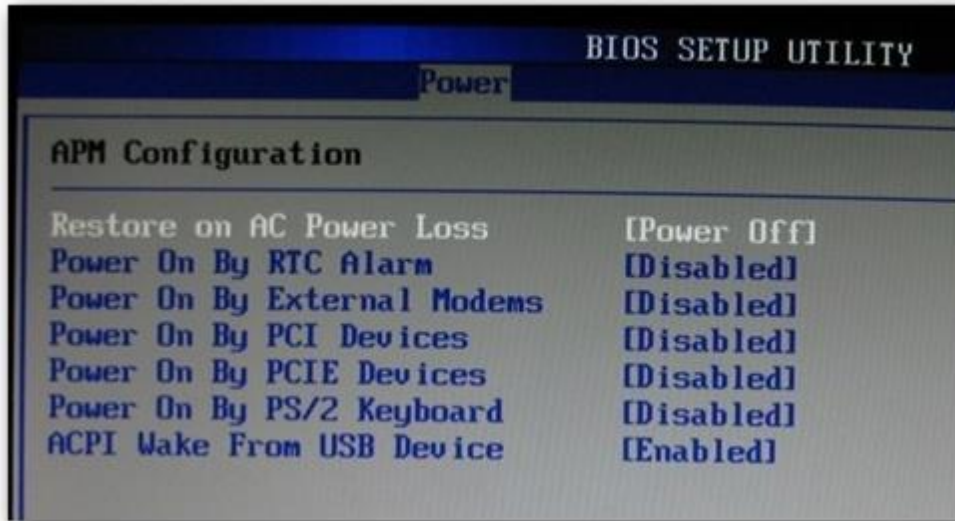
Screen 7:

The Power Management screen will let you choose the power management options.



Screen 8:

And in the APM Configuration screen , user can set a couple more important options:

**POWER-ON SELF TEST (POST) :**

The POST is a series of built-in diagnostic program performed by BIOS that checks the hardware (the processor, video slots, hard drive and so on) to ensure that everything is present and functioning properly before the BIOS begins the actual boot.

Popular motherboards are **INTEL, ASUS, ASRock, GIGABYTE** .

Processors:

Every PC has a Central Processing Unit (CPU) this acts as the brain of system. It connects to the Motherboard and works alongside the other components processing many instructions at the same time between the different hardware and memory systems.

Advancements in CPU technology : Dual Core, Triple core or Quad Core processors (on one single chip) instead of the traditional one core per chip.

Now the total number of Cores can slot into a socket as before and a single heat sink and fan can keep everything to the right temperature.

AMD and INTEL are most popular for their range of processors.

Intel Core is Intel's brand name for various mid-range to high-end home and business microprocessors. As of 2016, the current lineup of Core processors included the Intel Core i7, Intel Core i5, Intel Core i3, Intel Core m7, Intel Core m5 and Intel Core m3.

Windows 10 is the latest version of Microsoft's Windows operating system

System Requirement Comparison: Windows 7 vs Windows 8/8.1 vs Windows 10

Facility	Bit	Windows 10	Windows 8/ 8.1	Windows 7
Processor	32-bit	1 GHz or Higher	1 GHz or Higher	1 GHz or Higher
	64-bit	1 GHz or Higher	1 GHz or Higher	1 GHz or Higher
RAM	32-bit	1 GB	1 GB	1 GB
	64-bit	2 GB	2 GB	2 GB
Free Hard Disk Space	32-bit	16 GB	16 GB	16 GB
	64-bit	20 GB	20 GB	16 GB
Graphics Card		DirectX 9 Graphics With WDDM 1.0 or Higher Driver	DirectX 9 Graphics With WDDM 1.0 or Higher Driver	DirectX 9 Graphics With WDDM 1.0 or Higher Driver

4.2 Drivers:

The Role of Drivers

A driver (sometimes called a **device driver**) is software that enables a computer to work with a particular device.

Although a device might be installed on a computer, the computer's operating system cannot communicate with the device until the driver for that device has been installed and configured.

There are drivers for nearly every type of computer device and peripheral including:

- Input devices
- Hard and floppy disk drives and controllers.
- Multimedia devices, such as microphones, cameras, and recorders.
- Printers, Scanners, plotters, and tape drives.

Working with Drivers

Working with drivers encompasses a variety of tasks, including installation, configuring, updating, and removal.

Installing Drivers

Most popular network operating systems use interactive graphical interfaces, or dialog boxes, that guide the installer through the process.

How a driver is packaged determines how it should be installed. Below is additional information about each of the methods developers use to distribute their drivers as well as how to install them in Microsoft Windows.

- Installing driver from CD, USB drive

Almost all computer and hardware manufacturers include a group of drivers for different hardware devices.

- Downloading and installing driver

Many drivers that is downloaded are single executable file. If the file is not a single executable file, it is a compressed file that contains all the driver files. To install the driver, first need to uncompress the file.

- Installing driver from executable

Many computer and hardware manufacturers today are pre-packaging their

drivers into executable files or have the drivers installed through the setup file. Double-clicking the executable or setup file should install the drivers to the computer for you.

- Using the "have disk" option to install drivers

- Installing a new device
- Open Windows Device Manager.
- In the Device Manager, make sure the device you are attempting to install is not already listed from past install attempts. If the device is found, highlight and remove it from Device Manager to prevent any conflicts during the install.
- Once Device Manager looks okay, reboot the computer.

- As the computer is rebooting, an Install new hardware wizard should appear if Windows detects the new hardware. Using this wizard, you should be able to point Windows to the folder containing your drivers located on the CD, diskette, USB Flash drive, or the folder containing the files you downloaded.
- Install a driver using a .inf
 - Locate the .inf file for your version of Windows.
 - Right-click that file and choose the option for install.

4.3 Peripheral devices:

A **computer peripheral** is a device that is connected to a computer but is not part of the core computer architecture.

Types of Peripheral Devices :

There are many different peripheral devices, but they fall into three general categories:

1. **Input devices**, such as a mouse and a keyboard
2. **Output devices**, such as a monitor and a printer ,scanner
3. **Storage devices**, such as a hard drive or flash drive

They will allow user to interact with the computer by inputting commands, viewing the screen as well as printing out documents and pictures

List of most common Device drivers



Audio & Sound Drivers



Bluetooth Drivers



Digital Camera Driver



DVD & CD Drivers



Ethernet Drivers



Graphics & Video Drivers



Keyboard & Mouse Drivers



Modem Driver



Monitor Driver



Motherboard Driver



MP3 Drivers



Printer Drivers



Scanner Drivers



Webcam Drivers



DRIVERPACK SOLUTION :

- This open source program that makes the job of finding and automatically installing drivers a pleasure.
- DriverPack automatically selects and installs all drivers for free and without limitation.

Suitable for all computers and notebooks, Works on windows 7, 8, 8.1, 10

- More than 920,000 drivers available
- Latest update June 2016

Step 1: Download & first run

Download:

<http://drp.su/download.htm> (including DriverPacks)

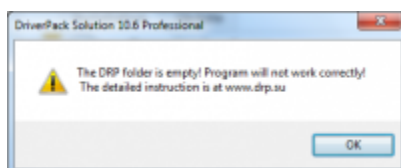
<http://driverpacks.net/applications/latest> (without DriverPacks)

<http://code.google.com/p/driverpacksolution/> (test builds)

First run

If download the full version (with DriverPacks), then it's ready to go!

If downloaded the version without DriverPacks, an error as below.



1. Get the appropriate DriverPacks here

<http://driverpacks.net/driverpacks/latest> and place them in a folder "**drp**".

2. Start DriverPack Solution and allow to make the indexing. This is necessary for fast search.

The program is ready to use!

Step 2: Installation & update drivers

Installation drivers

In the tab "Installation", it will show how many drivers are not installed. Click "Install all" to install drivers.



Update drivers

In the tab "Update", it will show how many drivers are not update. Click "Update all" to update drivers.



UNIT V

Case studies: Windows XP: WINDOWS XP Operating System Installation - Additional Information - WINDOWS XP Control Panel - **Windows 7:** windows 7 - upgrade - Partition on a Windows 7 Hard Disk.

WINDOWS XP OPERATING SYSTEM INSTALLATION

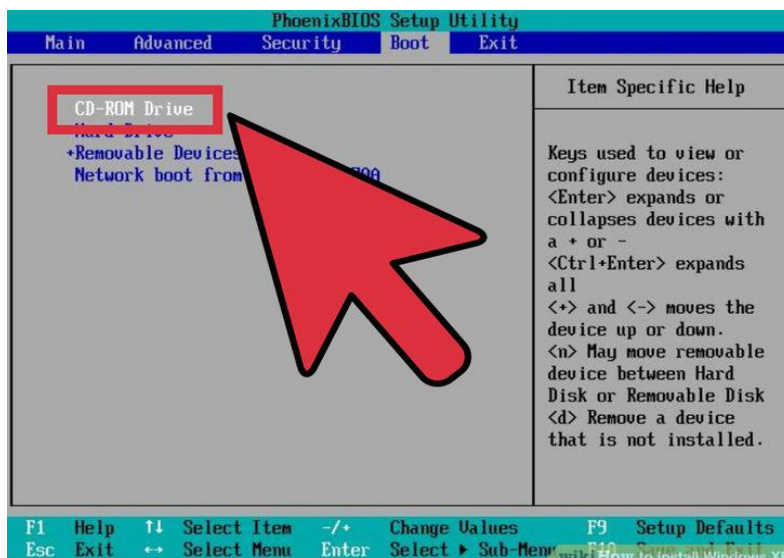
1. **Ensure that your computer can run Windows XP.** Your computer will need to meet or exceed the minimum system requirements in order to run Windows XP. You can find your system information by either checking the computer manufacturer's manual, or by running DirectX Diagnostic on an existing Windows operating system of the computer.

To start the DirectX Diagnostic, open the Run dialog (press WinKey+R simultaneously) and click OK.

Minimum System Requirements

- 300 MHz Intel or AMD CPU
- 128 megabytes (MB) of system RAM
- 1.5 gigabytes (GB) of available drive space
- Super VGA (800x600) or higher display adapter
- CD or DVD-ROM
- Keyboard and mouse, or other pointing devices
- Network Interface Adapter required for Internet and Network Connectivity
- Sound card and speakers or headphones

2. **Find your Windows XP Product Key.** It is printed on a sticker on your software package or located on the computer itself. It is a string of 5 groups of characters (each 5 long), separated by dashes, resulting in 25 characters in all. You need the product key to complete installing Windows.



- 3. Set your computer to boot from CD/DVD.** Before inserting the CD, you'll need to set your computer to boot from a CD instead of from the hard drive. This will allow you to load the Windows XP setup files before your computer boots to its installed operating system. You can change the boot order from the BOOT menu in your BIOS.

To enter the BIOS of your computer, you usually press F9 or DEL when your computer starts or notifies you that you can enter "setup". Click the green "BIOS" link for more information.

In the BOOT menu, set the order so that your CD/DVD-ROM drive is set as the 1st Boot Device.

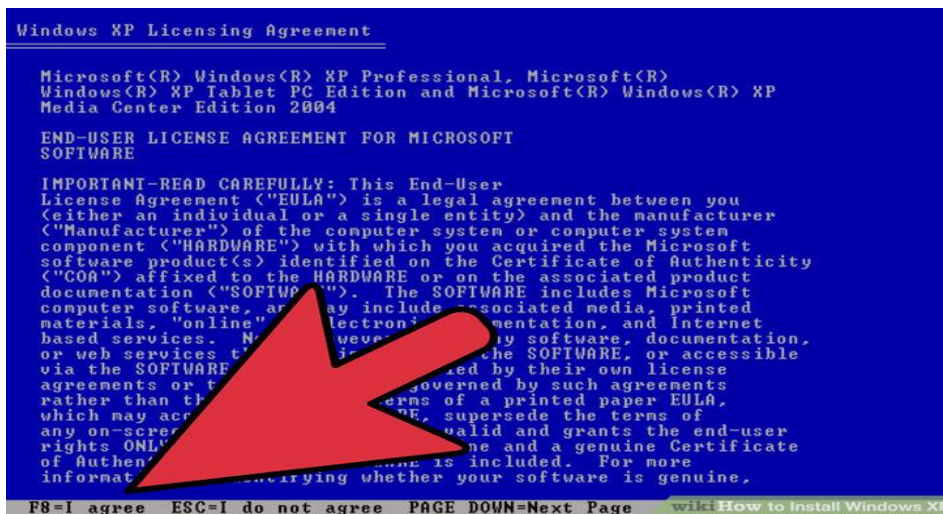
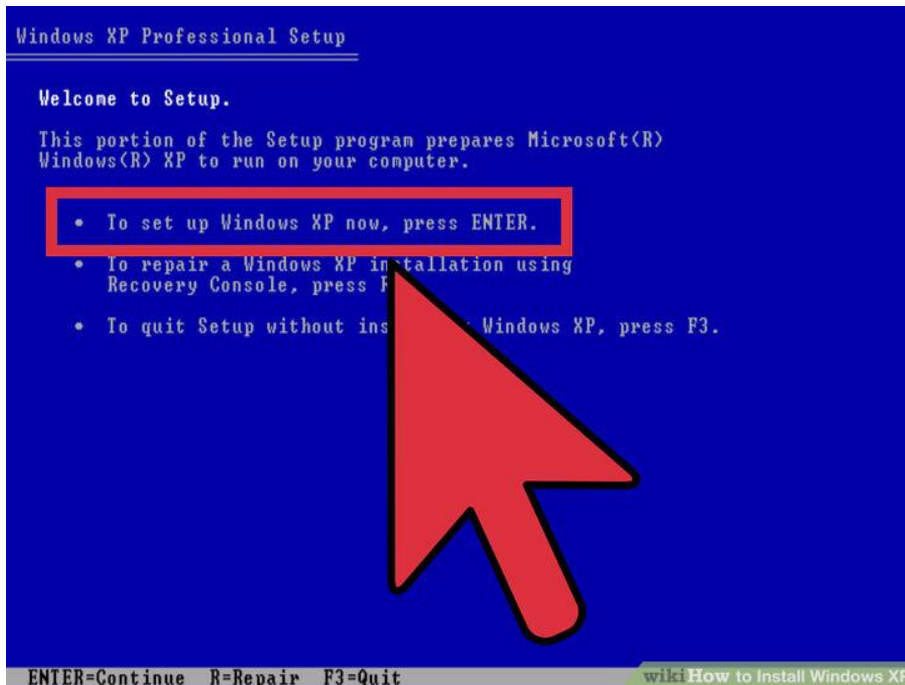
If you are installing Windows XP from a USB drive, make sure that the USB drive is set as the 1st Boot Device. You may need to have the USB drive inserted for it to appear as an option.

Installation



- 4. Load the installer.** Once your Boot Order is set, insert the Windows XP CD into your drive and Save and Exit from the BIOS. Your computer will reboot and you will be presented with the message: Press any key to boot from CD. Press any key on your keyboard to start the Setup program.

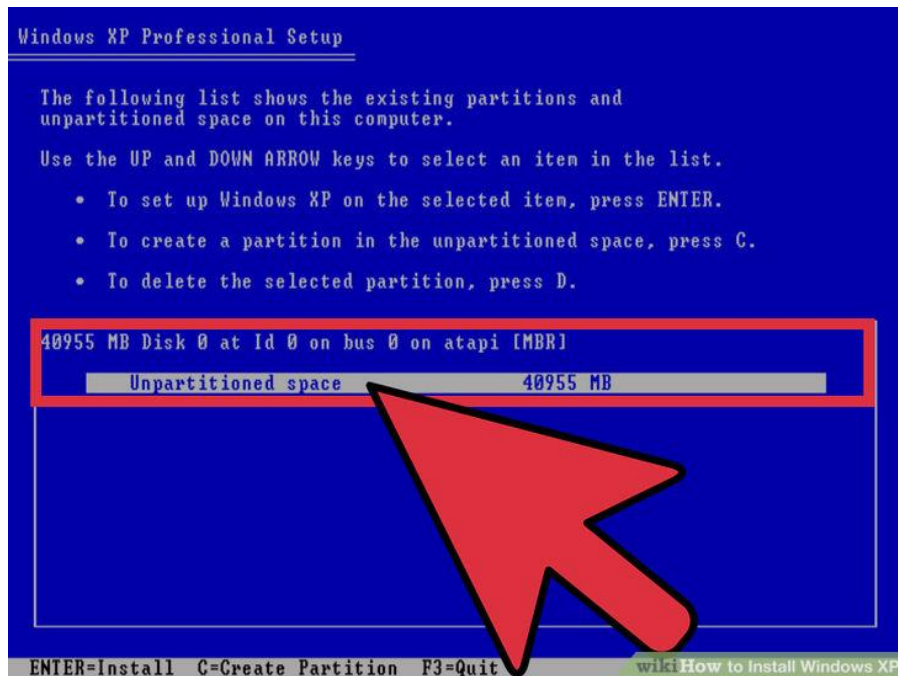
Setup will load files necessary to begin the installation, which may take a few moments. Once the loading is complete, you will be taken to the Welcome screen.



5. Press

ENTER to begin installation. Once the loading is complete, you will be taken to the Welcome screen. You are given several options, but if you are installing or reinstalling Windows XP, you'll want to press ENTER to start the installation configuration.

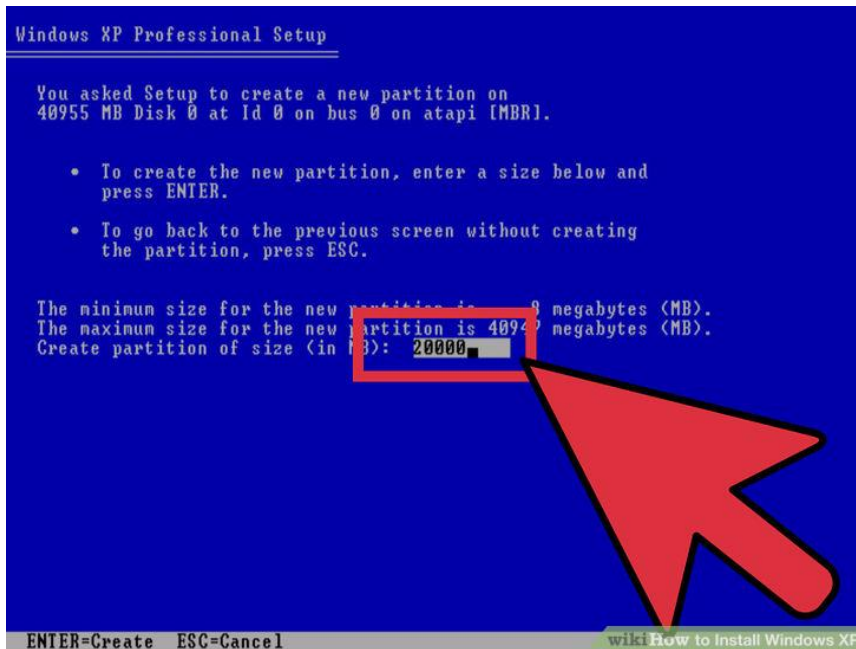
Read the License Agreement. This document tells you what you can and can't do with Windows, and your rights as the consumer. After reading, press F8 indicating you agree to the terms.



6. Select the partition you want to install on. You will see a list of available partitions on your installed hard drives. If you are installing Windows XP on a new hard drive, you should see only one entry labeled "Unpartitioned space." If you have a previous version of Windows or Linux installed on your computer, you will potentially have multiple partitions.

Installing Windows XP will erase all of the data on the partition that you choose. Select a partition that is empty or that contains data that you do not care to lose.

You can delete your partitions with the "D" key. This will return them to "Unpartitioned space". Any data on the partition will be lost when it is deleted.

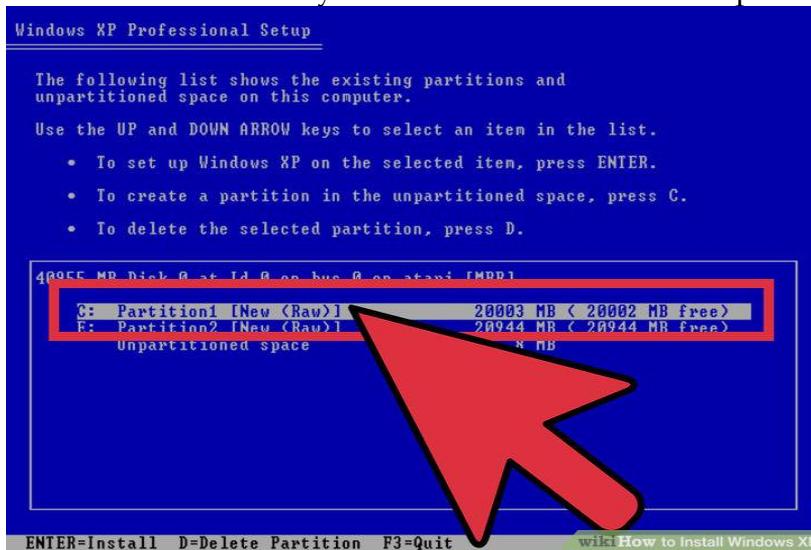


- Create a new partition.** Select the Unpartitioned space and press “C”. This will open a new screen where you can set the partition’s size from the available space. Enter the size in megabytes (MB) for the new partition and then press ENTER.

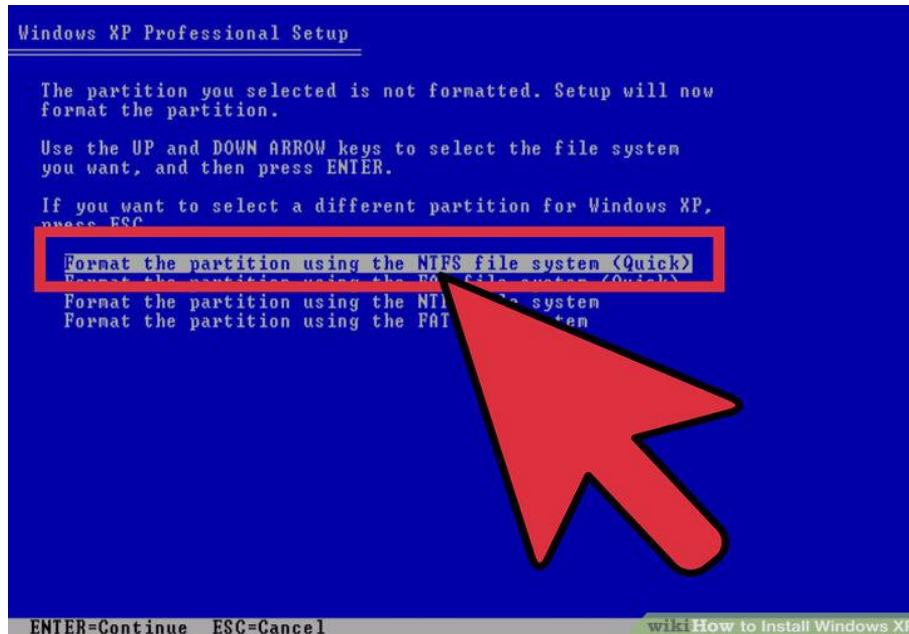
By default, the partition will be set to the maximum amount of available space. Unless you plan on creating multiple partitions, you can usually leave this at its default.

Windows XP requires at least 1.5 gigabytes (1536 MB) for its installation files, but you will want more than this for programs, documents, downloads, and other files. 5 gigabytes (5120 MB) is a good baseline amount for Windows XP, with more if you plan on installing a lot of programs.

You can create multiple partitions on a single drive. This can allow you to separate your programs from your movies and music, or to install another operating system. Windows XP can only be installed on one discrete partition.



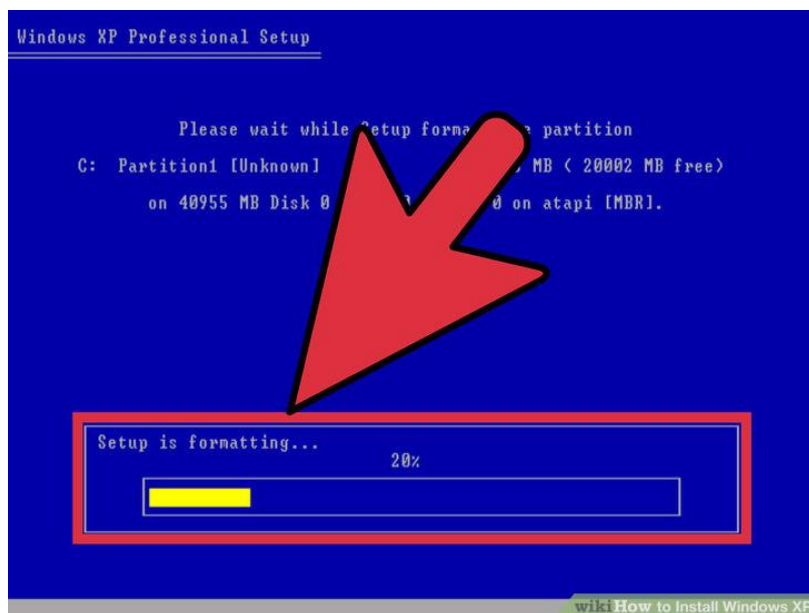
8. **Select your new partition.** Once you've created your installation partition, you will be returned to the partition selection screen. Select your new partition, usually labeled "C: Partition 1 [Raw]" and press ENTER.



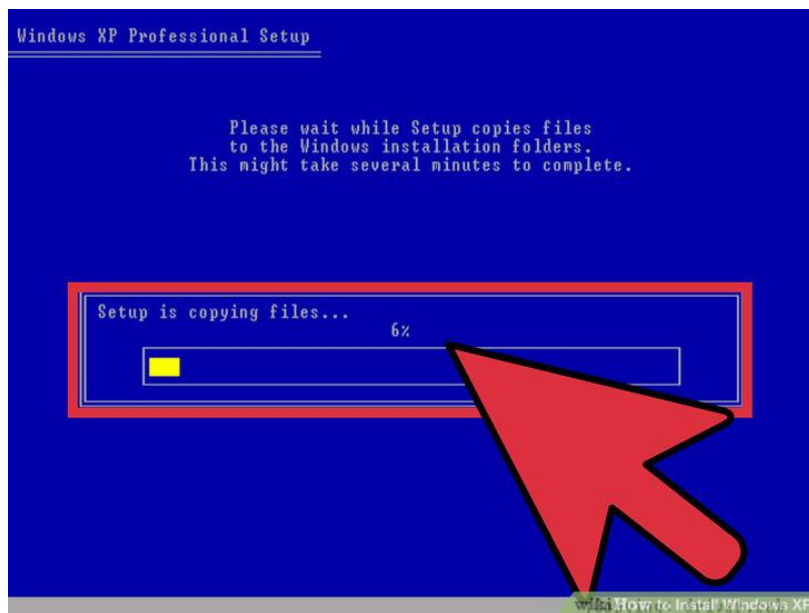
9. Select "Format the Partition using the NTFS File System" and press ENTER. NTFS is the preferred method, supporting a larger amount of disk space per partition than FAT, and including security features at the file system level. NTFS also includes system level compression. There are almost no situations anymore where choosing FAT would be preferable.

If your partition size is larger than 32 GB, you will not be given the option to choose FAT.

It is highly recommended to avoid Quick Format, as this skips an important process that checks the hard drive for errors or bad sectors. This scan is what consumes the majority of the time taken when performing a full format. If there are errors on a disk at the physical level, it's best to catch them now rather than later.



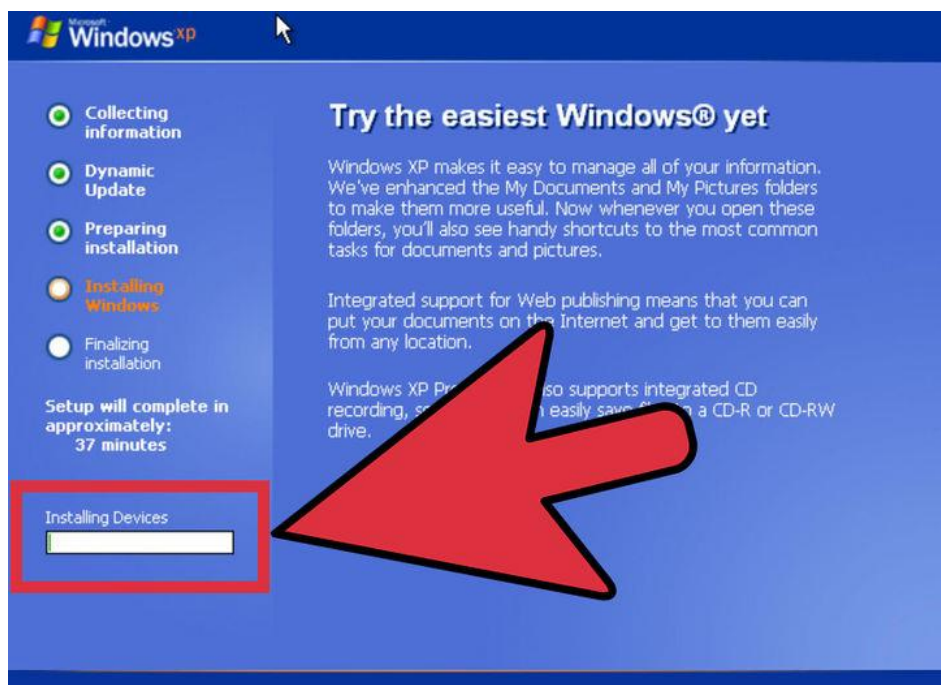
10. Wait for the format to complete. The system will now format the partition. The length of time this process requires depends on the speed and size of the drive. In general, the larger the partition, the longer the process will take.



11. Wait for the Setup files to copy. Windows will now start copying files from the installation disc and prompt you to reboot the computer when the process is completed. Press ENTER when prompted to reboot, otherwise it will do so automatically after 15 seconds.



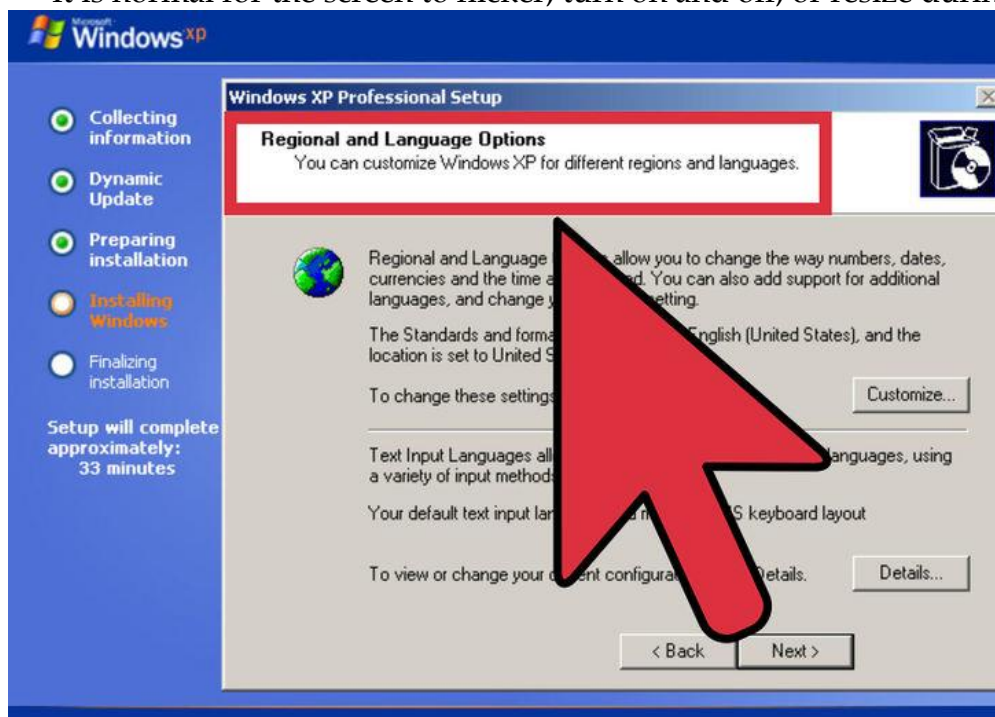
12. Allow the computer to boot normally. You will see the message asking you to press a key to boot from CD. Ignore it and allow the computer to continue booting from the hard drive. You will see the Windows logo as the Setup program loads.



13. Wait for the installation to proceed. After the Windows logo goes away, you will see a list of steps remaining on the left side of the screen, and tips for using

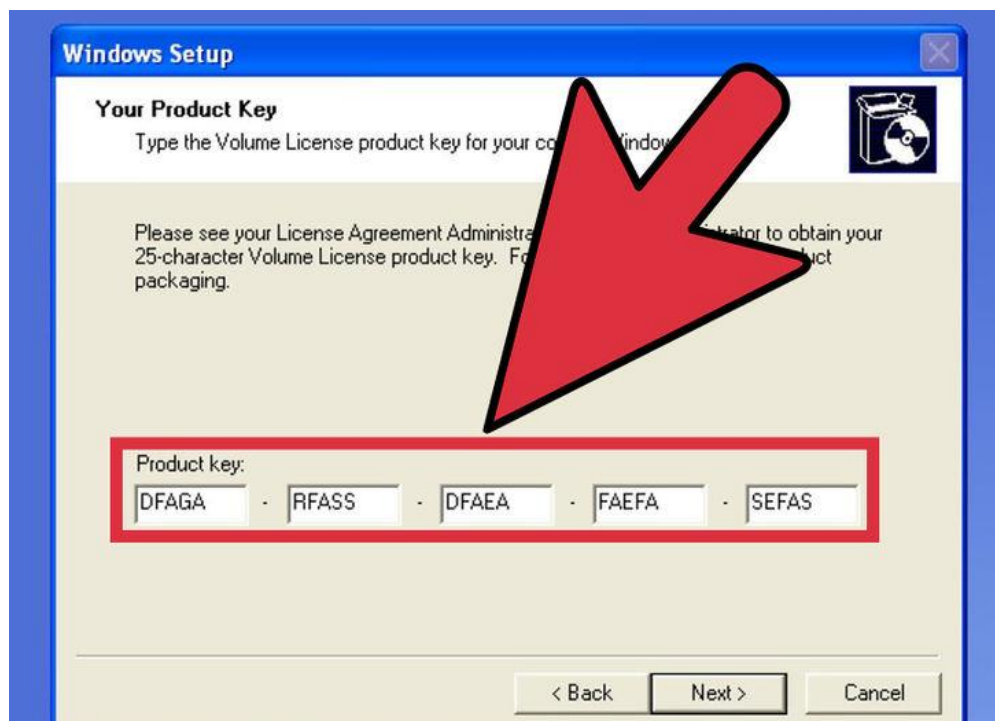
windows on the right. The time remaining for the installation will be displayed below the list of steps remaining.

It is normal for the screen to flicker, turn on and off, or resize during this process.



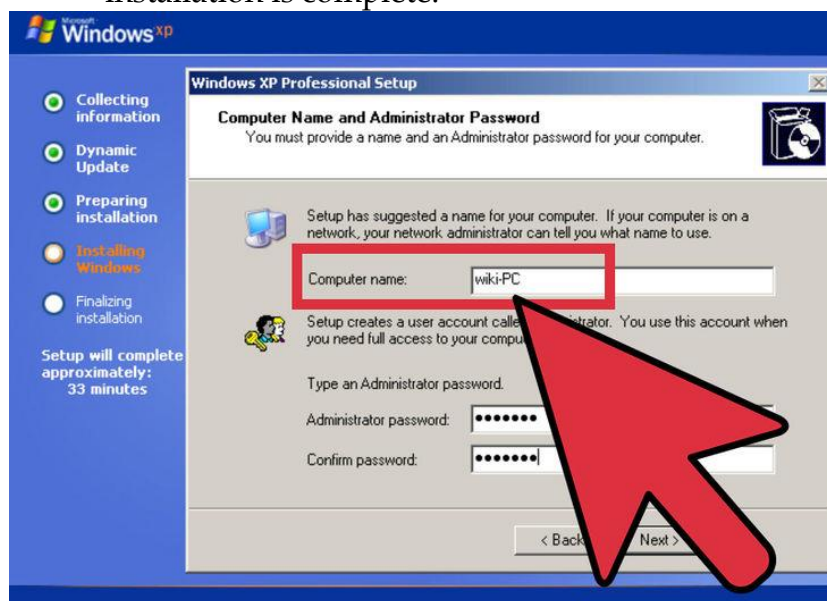
14. Choose your language and region settings. During the installation process a dialog window will appear, asking you to choose your Regional settings. Select appropriate settings native to your area. Click the Next button when that is completed.

Enter your full name if you want. This will be set as the “owner” of Windows, and will be attached to certain things, such as Document creation.

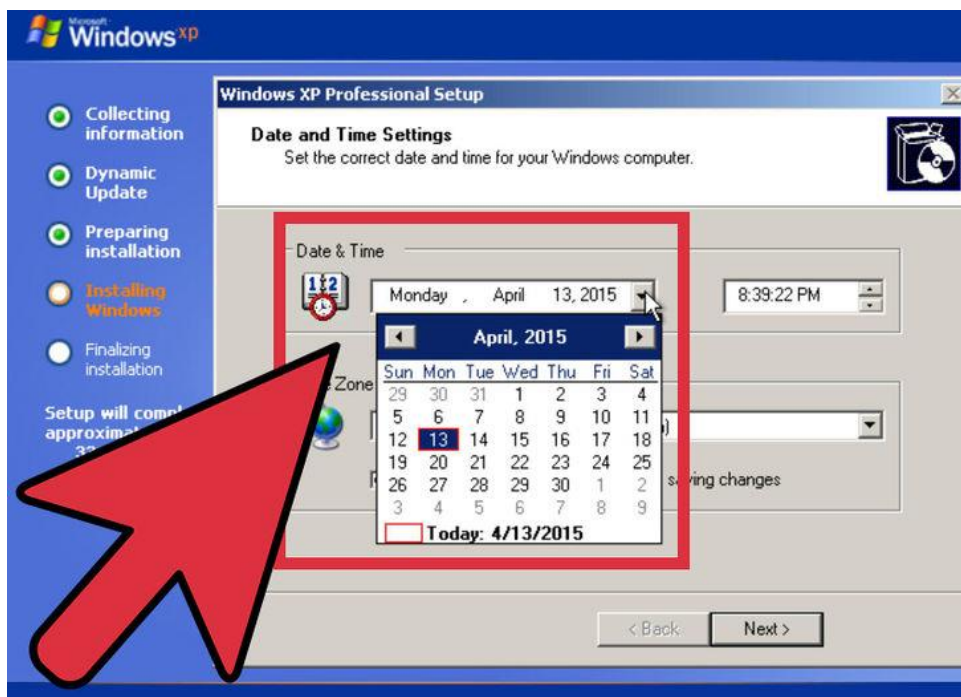


15. Enter your Product Key. You will not be able to complete the installation process without a valid Product Key. Click "Next" to continue.

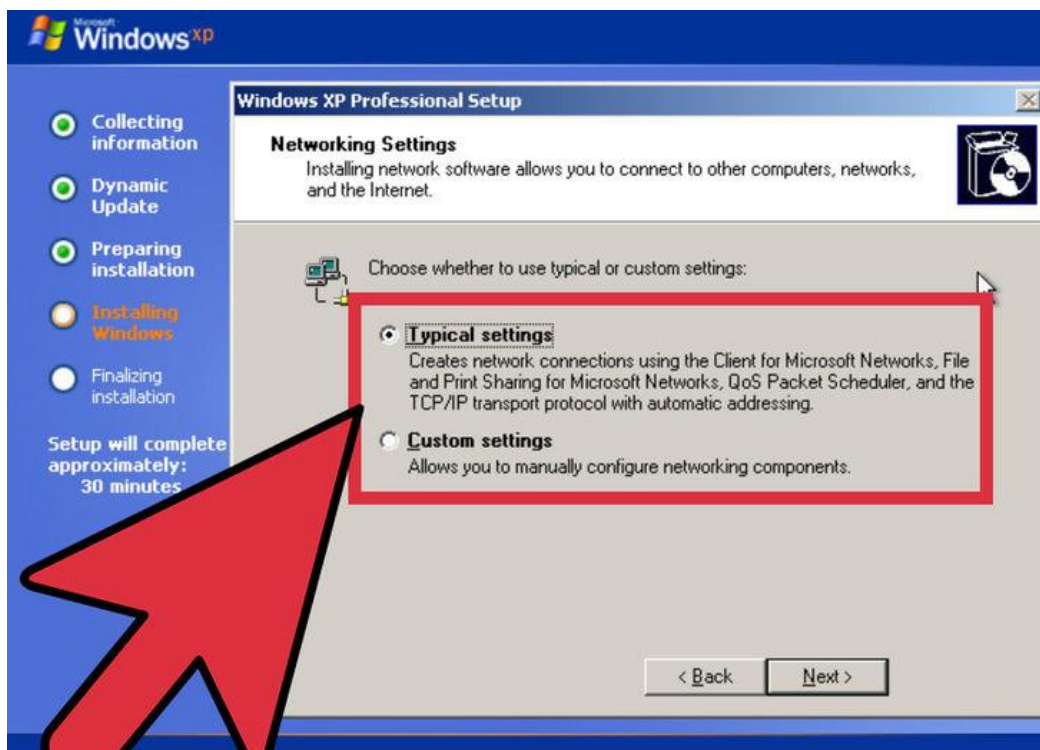
Some versions of Windows will not ask for the Product Key until installation is complete.



16. Set your computer's name. This will be the name that represents the computer on a network. Windows sets a default name, but you can change it if you would like. You can also set a password for the Administrator account. This is optional, but recommended for public computers.



17. Select your time zone. Ensure that the date/time is correct. Click "Next" to continue.

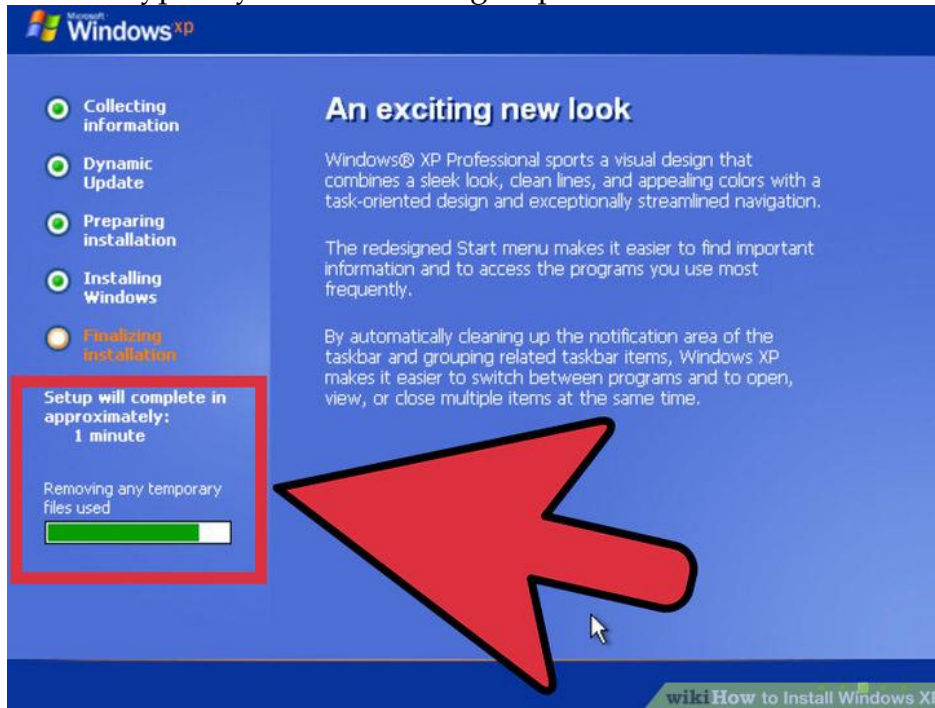


18. Choose your network settings. Almost all users installing Windows XP on a home or personal computer can leave "Typical Settings" selected for Network Setup. If you are installing Windows XP in a corporate or academic environment,

check with the system administrator, though Typical Settings will most likely work.

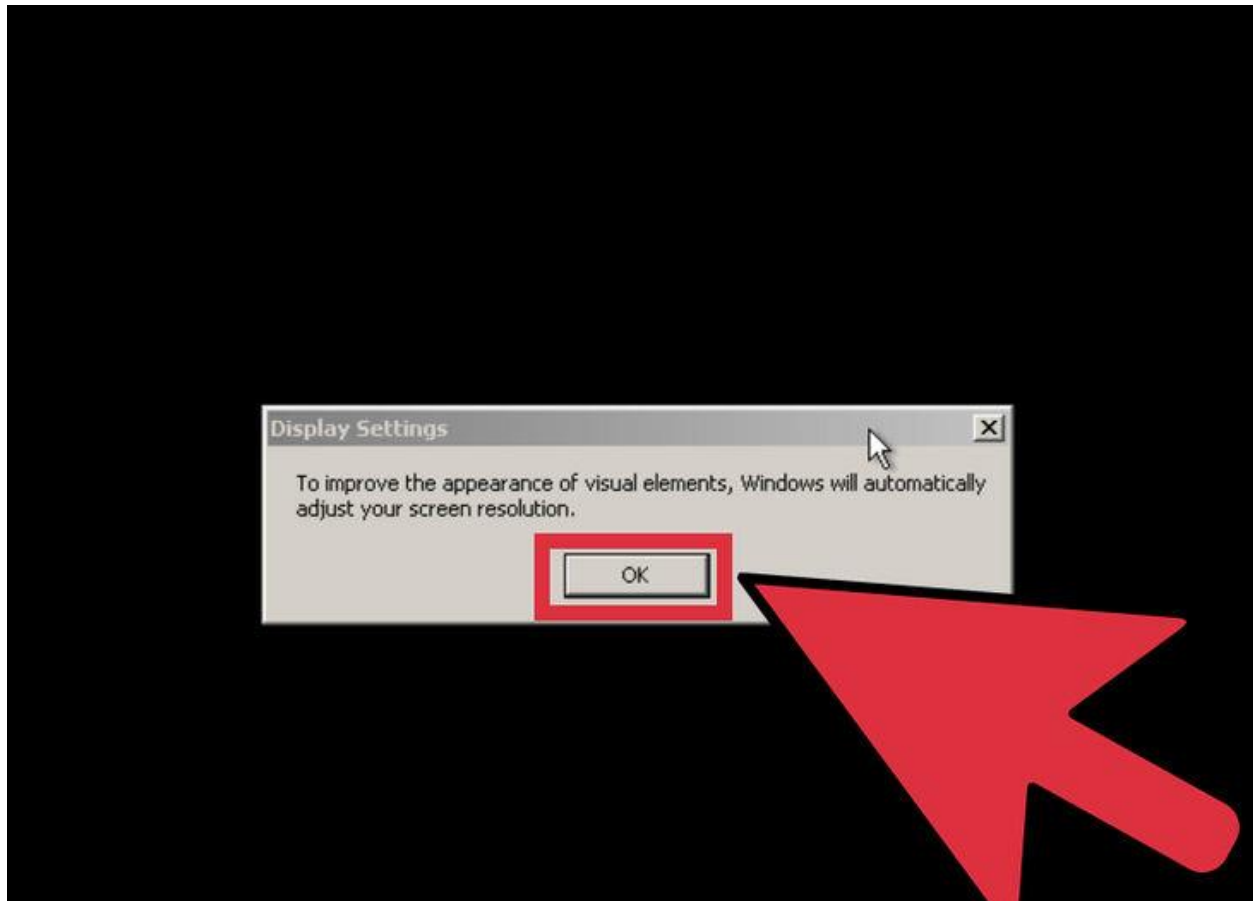
In the next window, nearly all users can select “No, this computer is not on a network, or is on a network without a domain.” If you are in a corporate setting, ask your system administrator which you should choose.

You can typically leave the workgroup name set to default.



19. Wait for the installation to finalize. This will only take a few minutes, and the computer will reboot when it is finished installing. Once the computer reboots, you will be taken to the Windows XP desktop. At this point, installation is complete, though there are a few things left to do before Windows is completely usable..

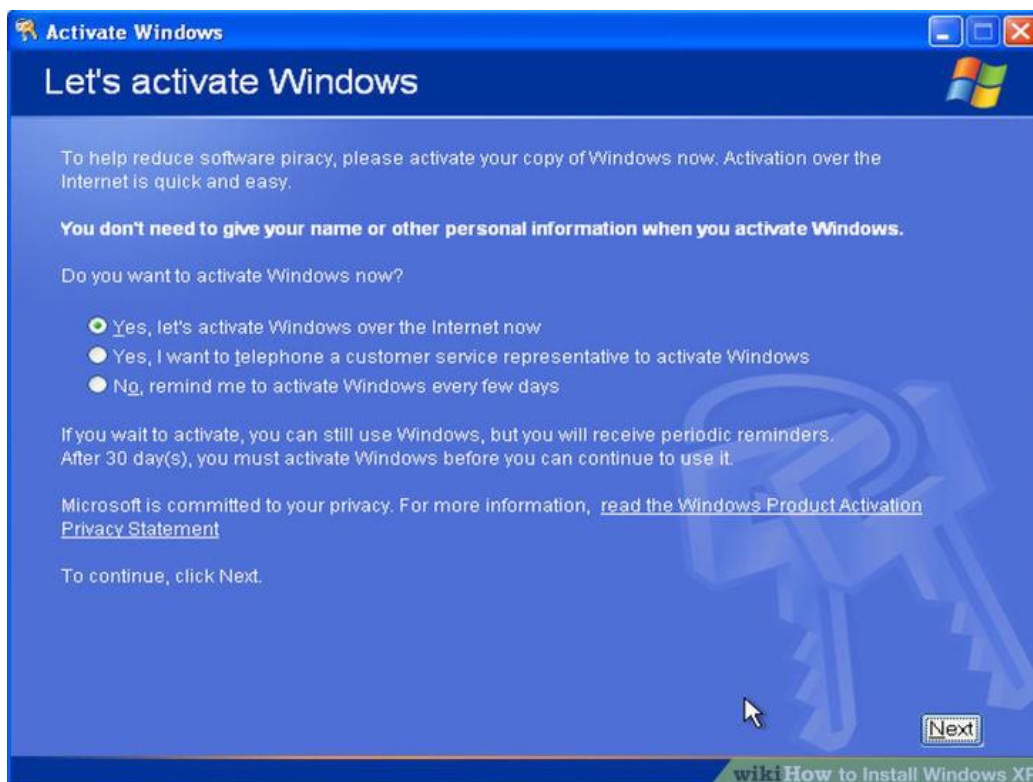
ADDITIONAL INFORMATION



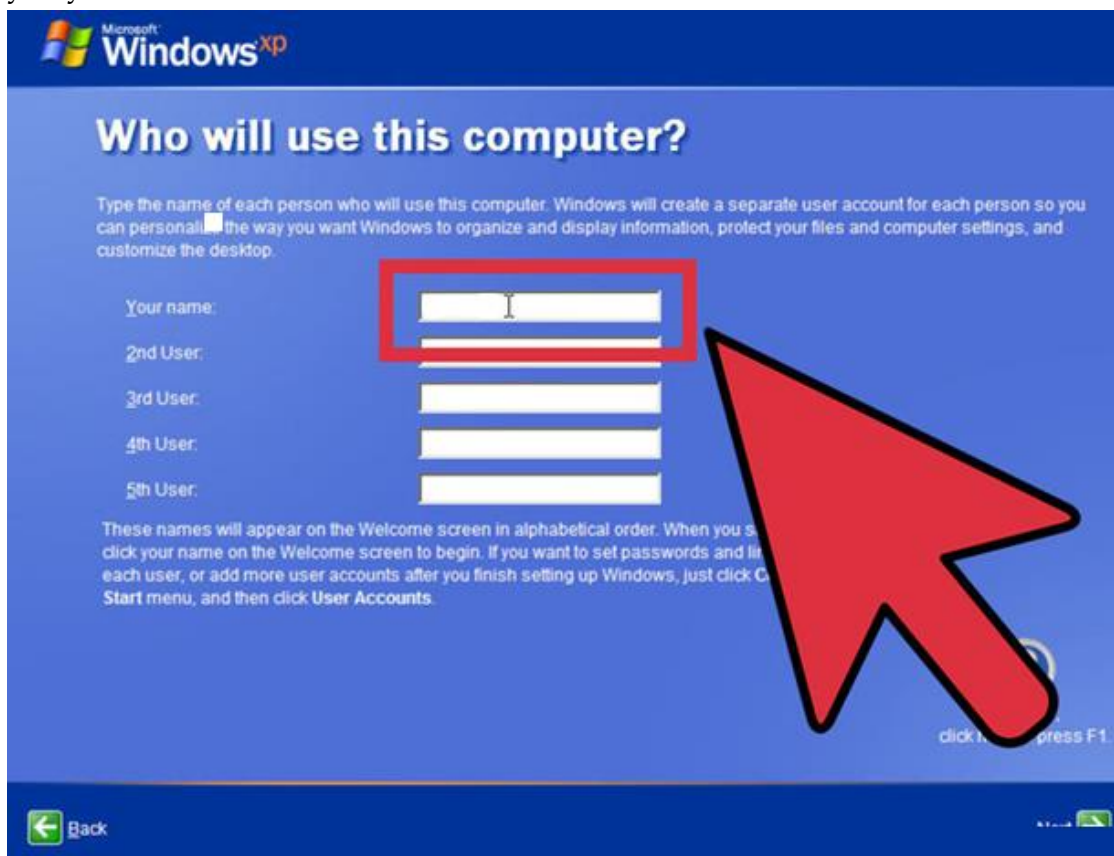
1. Set your display preferences. Once Windows loads, you will be told that Windows will automatically configure your display. Click OK to start the configuration. Your screen will flash a couple times, and then you will be asked if you can read the box that appears.



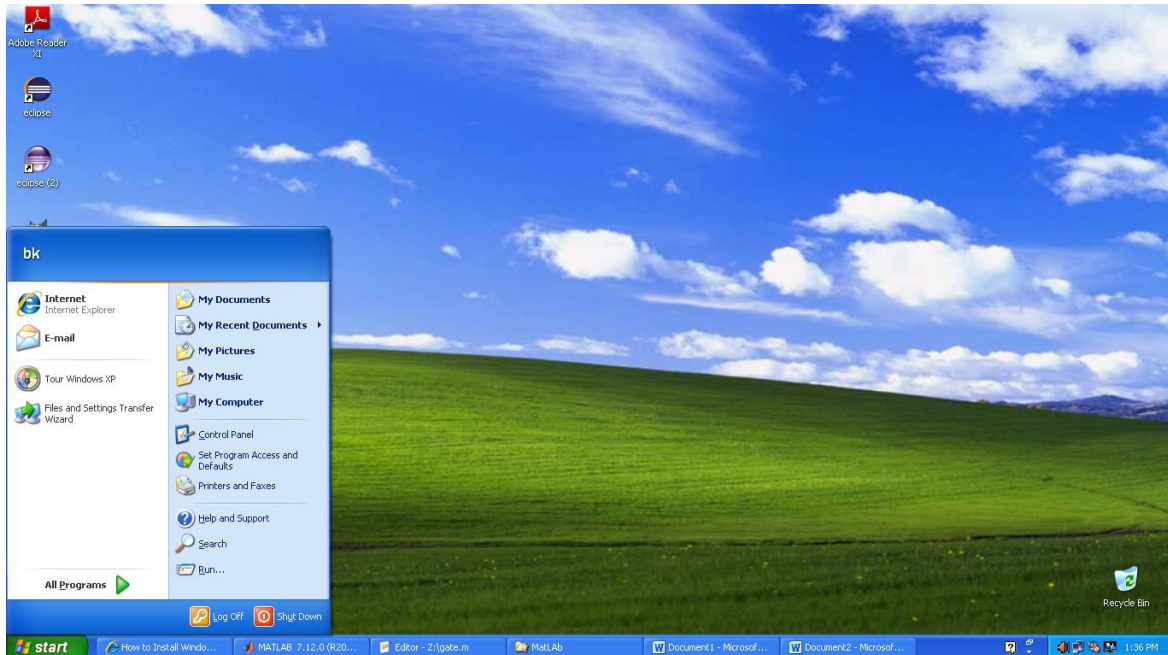
2. Set your connection preferences. If your computer is connected to the internet, select your connection type. Press Next to continue.



3. Activate your copy of Windows. If connected to the Internet, Select "Activate Now." Windows will connect to the activation server and automatically authenticate your copy of Windows. If you haven't entered your Product Key yet, you will need to enter it now.



4. Create Users. After the Activation Process, a window will appear allowing you to select the users for the computer. Enter your name, and the names of others who will be using the machine. Press Next to continue.

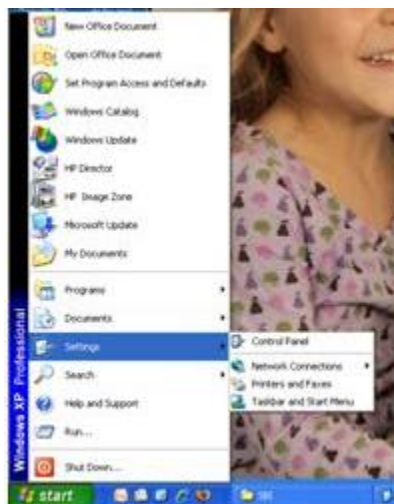


5. Start using Windows. You will now be looking at the default Windows XP Desktop. Congratulations! There are a few things that you should probably do now that you have Windows up and running:

Install any drivers that you need to for your computer's hardware.
 Install an antivirus program if you are connected to the internet.
 Set your BIOS to boot from the hard drive again instead of the CD.

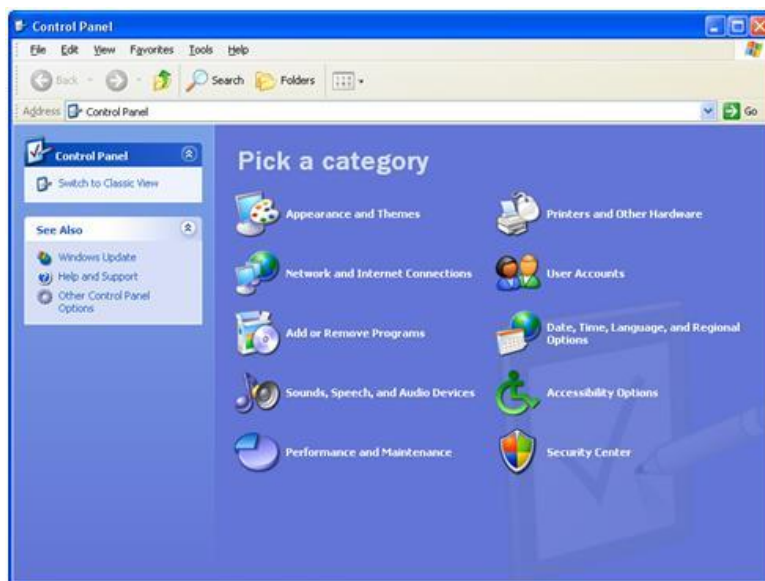
Windows XP Control Panel

The Control Panel is full of tools to change the way Windows looks and behaves.



User Accounts: To open the Control Panel Click on Start then Control Panel in the right hand column. if you are using the XP version of the Start menu, if you have your start menu set to Classic the control panel is under settings

The Control Panel window will open and look like this.

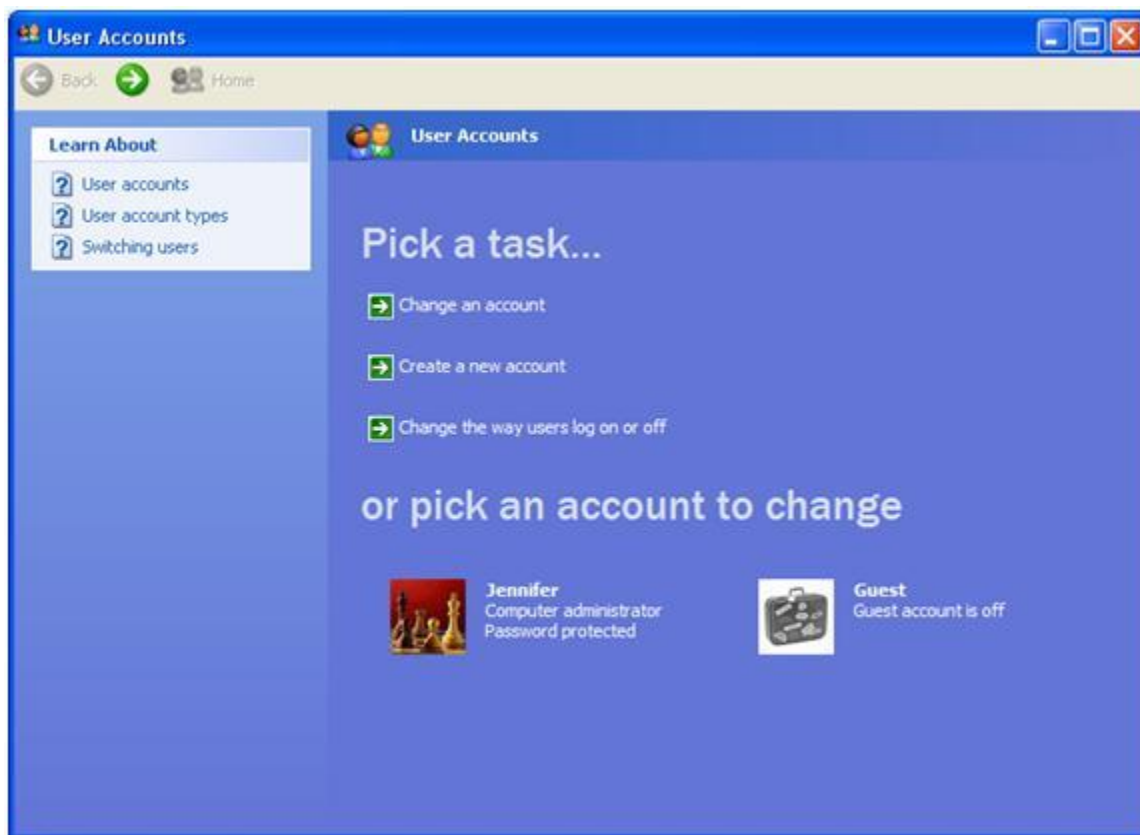


If your control panel looks different you are probably in Classic View. Click on the Switch to Classic View link in the upper left corner. We will be continuing the tutorials in the Category View.

User accounts is a place where you can add or delete users, change a password or password protect your user account, change administration options, Change the picture by your name when you log on, or change the way you log on and off.

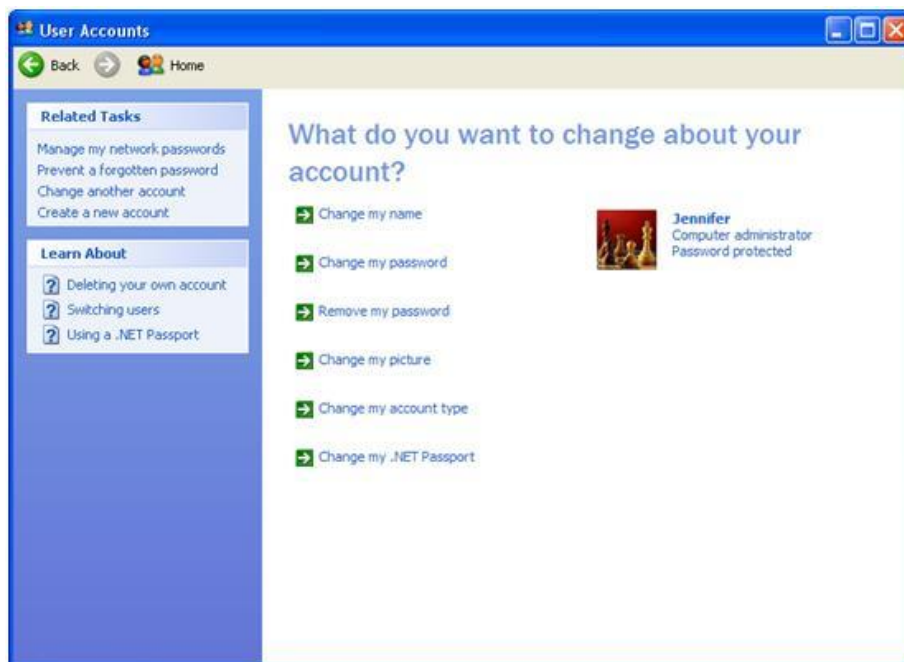
User Accounts is a beneficial tool because it allows each user of the computer to have there own look and feel for the Windows desktop, customize their own favorites on the web, and have their own My Documents folder.

Click on User Accounts and we will get started.



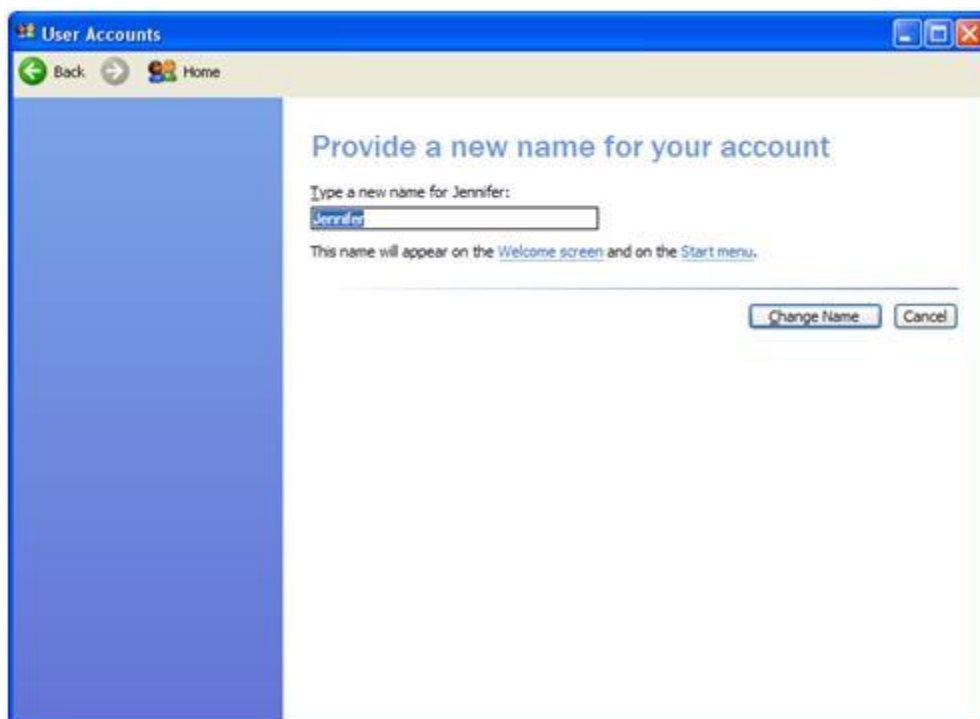
When the User Accounts Window opens you can see it is pretty straight forward. We go through each of the three options. Now click on the Change an account. Then click on one of the accounts in the list.

You can get to this same screen by clicking on one of the accounts at the bottom of the User Account Window.



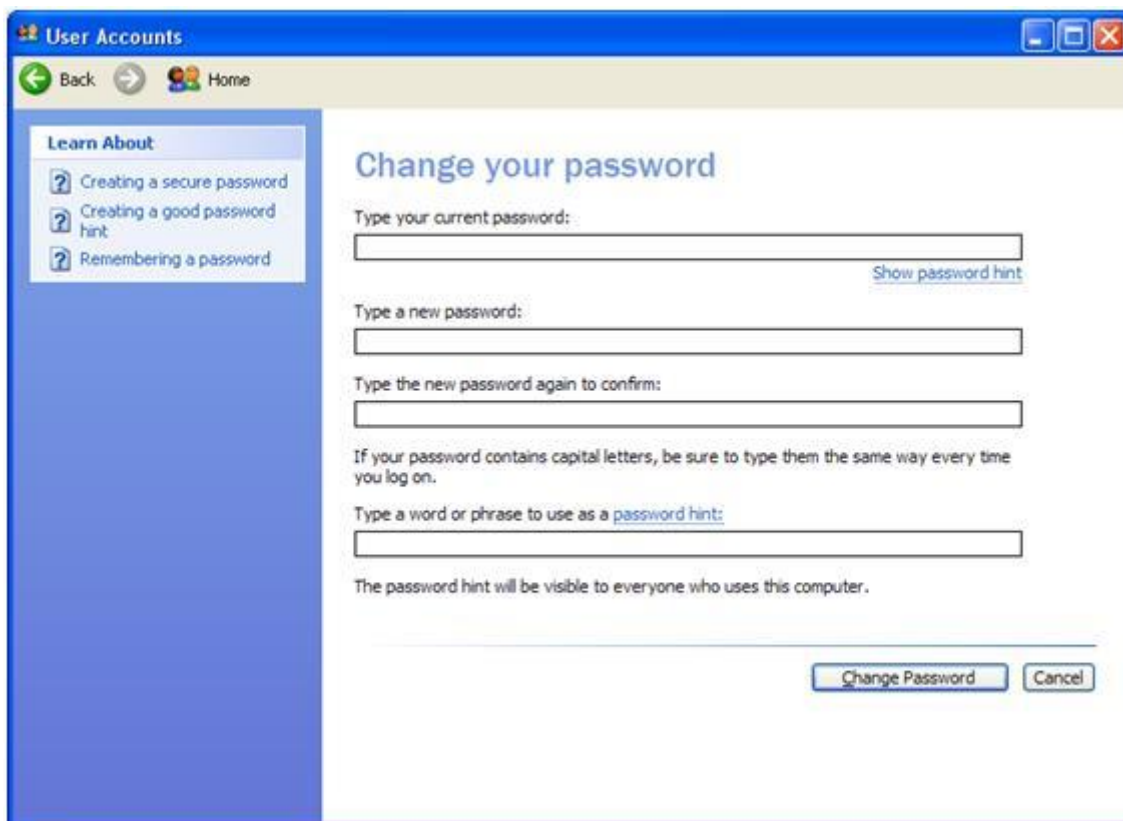
Now let's go one by one through these options. You do not have to make any changes to your computer but I would like you to get a feel for all of the windows if you do need to make changes in the future.

Click on the Change my name link.



If you have a grandchild or child that no longer uses your computer or you purchased a used computer from someone you can put your name here or type the name of someone else that would use that account. If you did not make any changes click cancel to return to the User Account window.

Click the Change My password link.

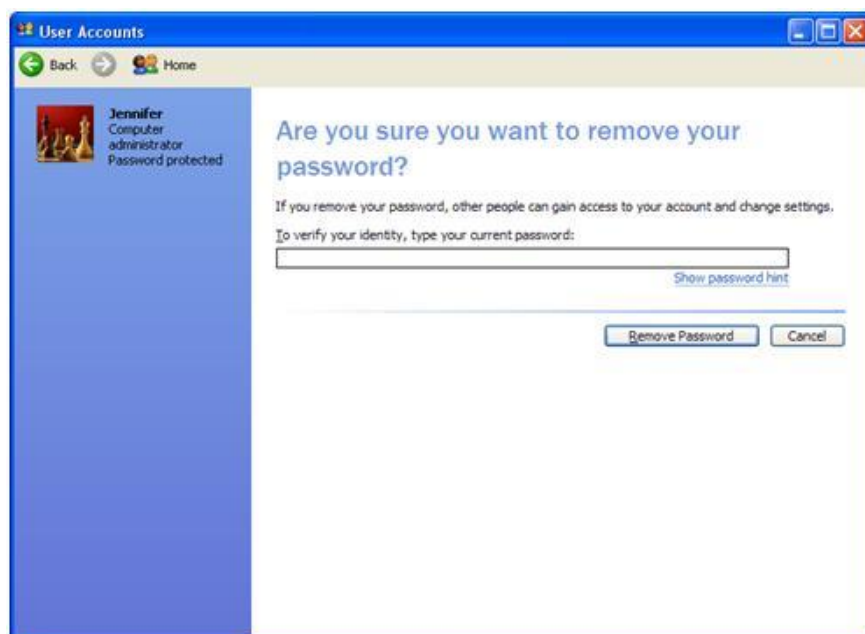


The screenshot shows the 'User Accounts' window with the 'Change your password' section active. On the left, a 'Learn About' sidebar contains links for 'Creating a secure password', 'Creating a good password hint', and 'Remembering a password'. The main area has the title 'Change your password' and contains the following fields and instructions:

- 'Type your current password:' followed by a text box and a [Show password hint](#) link.
- 'Type a new password:' followed by a text box.
- 'Type the new password again to confirm:' followed by a text box.
- A note: 'If your password contains capital letters, be sure to type them the same way every time you log on.'
- 'Type a word or phrase to use as a password hint:' followed by a text box.
- A warning: 'The password hint will be visible to everyone who uses this computer.'
- At the bottom right, two buttons: 'Change Password' and 'Cancel'.

If your account is currently password protected and you would like to change the password you would enter the information in each text box and click the Change Password button at the bottom. If you have forgotten your password you can click the [Show password hint](#) and your hint to help you remember will appear in a little box. Click Cancel if you have not made any changes to return to the User Account Window.

Click on the Remove My Password link.



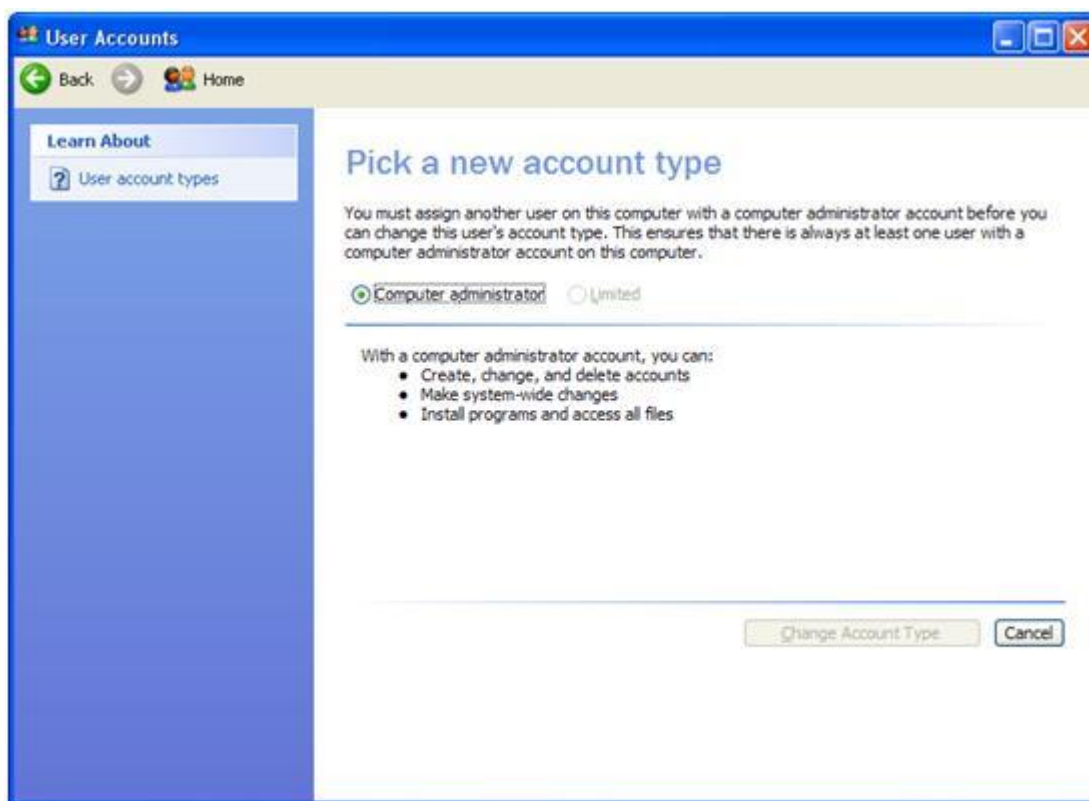
If your computer is currently password protected you can type your current password into the text box and click the Remove Password button and you will no longer need a password to log into your computer. Click Cancel if you did not make any changes to return to the User Account window

Now we are going to move on to the fun link, click on Change My Picture.



In this window you can change the picture that appears next to your name in the Start Menu and when you log on. To scroll through the default Microsoft pictures click the up and down arrows to the right of the pictures click on the picture you would like, or if you would like to pick a picture from your own click on the Browse for more pictures link and select a picture from one of your folders. Then Click open and click the Change Picture button. If you did not make any changes click Cancel to return to the User Accounts window.

Moving on down the list click Change My Account Type.

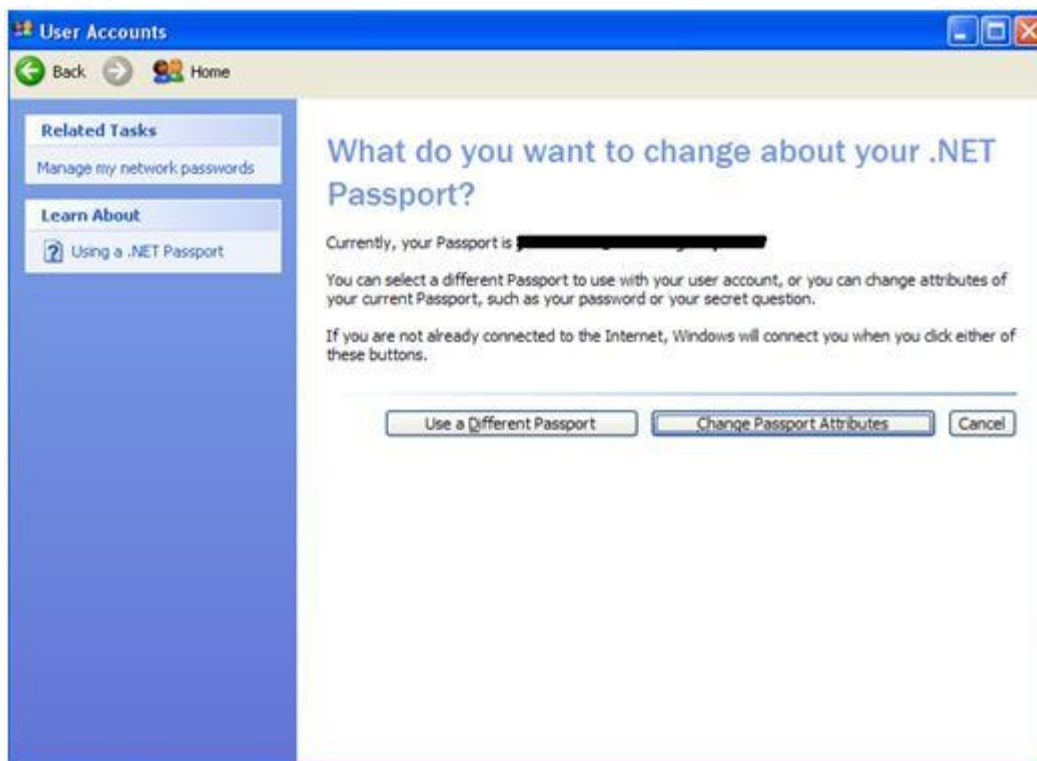


If you are doing this tutorial with your account you are probably set up as the administrator. As the administrator you can access all programs and files and install programs on the computer. If you are set up as a Limited user you might not be able to install certain programs. You will still be able to change your own password, picture and desktop settings.

You cannot change an account to a Limited user if they are set up as an administrator and there is only one administrator. You would need to create another administrator account before changing an administrator to a limited user.

If you made changes click the Change Account Type button, if no changes were made click Cancel to return to the User Accounts window.

Click on Change my .Net passport



A [.Net Passport](#) is a way for you to log into a variety of services and web sites in a secure way with only one user name and password. The most typical way I see seniors and beginner computer users using .Net Passport is with Microsoft Windows Live Messenger.

If you are interested in setting up a .Net Passport you can click the Use a Different Passport button and the .Net Passport Wizard will take you step by step through setting it up.



If you currently have a .Net Passport you can make changes to it by clicking the Change Passport Attributes button which will open a webs for you to sign in and make any necessary changes.

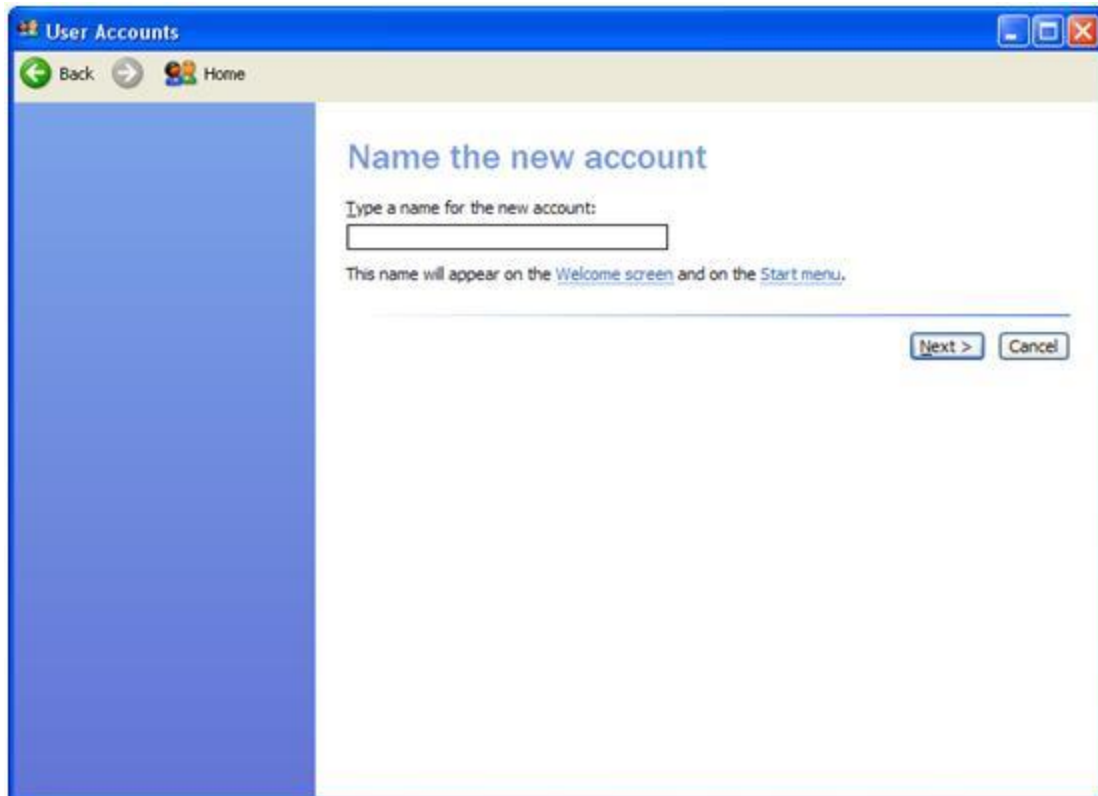
If no changes were made click Cancel to return to the User Accounts window.

We have completed the change user account section. To return to the main User Account Window either click the back arrow icon at the top of the window or the Home

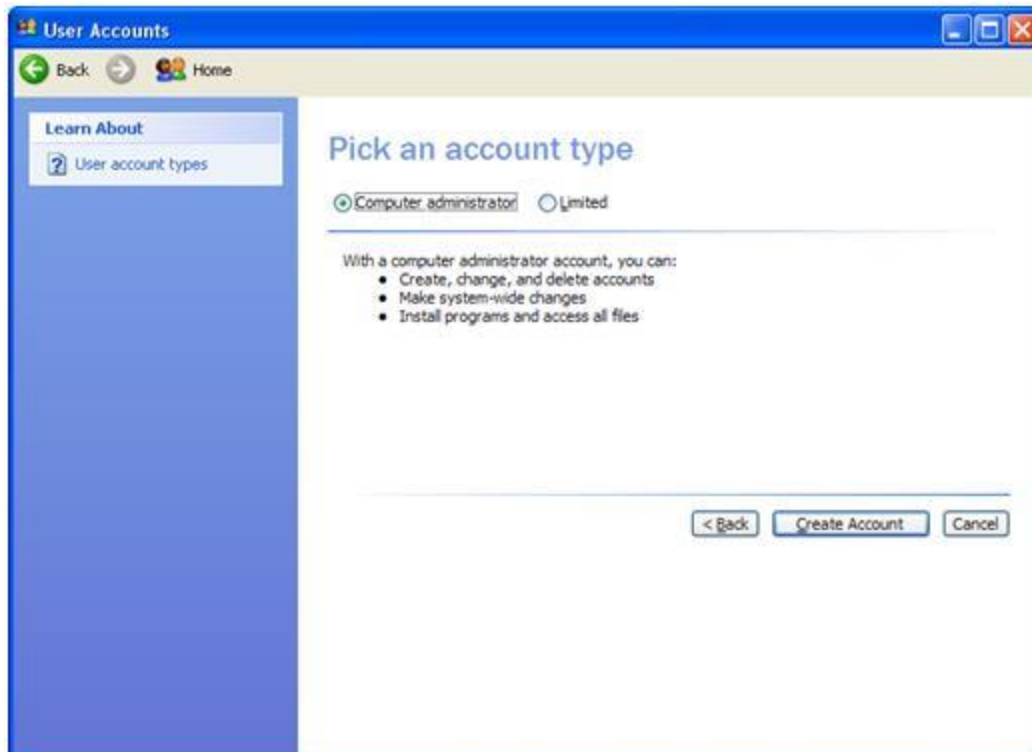


Icon.

Now we are back at the Main User Accounts Menu click on Create a New account.

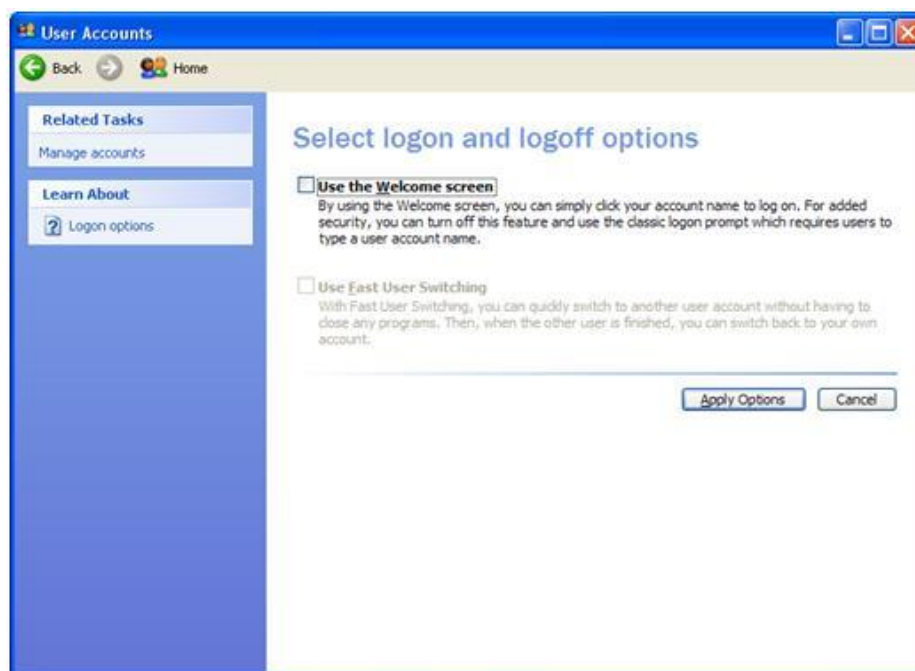


The New account window will open and take you through a mini wizard to set up a new account. Type a name in the text box. If you don't want to set up a new user we will cancel out of it in the next window. Once you have type a name click the Next button

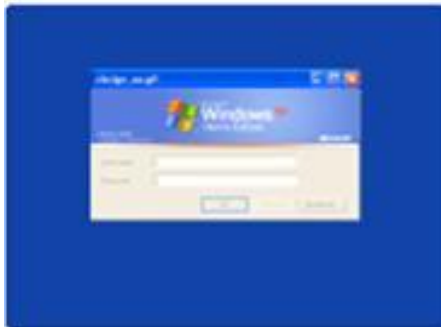


Choose the type of account you would like the user to have. Remember that not everyone should have administrator rights. If this is a real user click Create Account. If it is not a real user click Cancel to return to the Main User Account Menu.

Click the Change the way Users log on or off link for the last section of User Accounts.



Depending on your selection it will change the appearance of the screen when you turn your computer on. If you check the Use the Welcome screen check box your screen when you turn on your computer will look like this. If you like this option I would recommend also clicking the Use Fast User Switching.

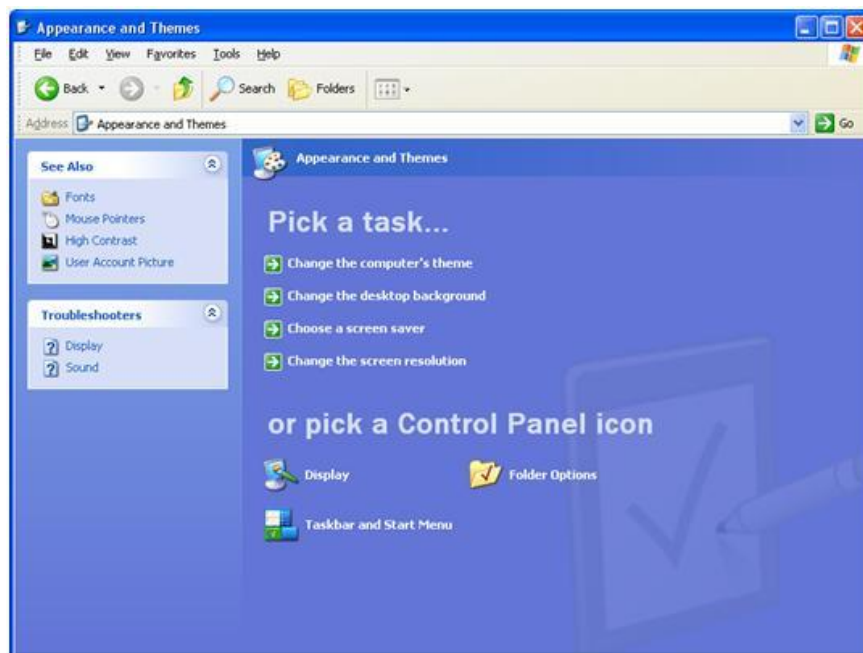


If you do not click the Use the Welcome Screen check box your screen when you turn on your computer will look like this.

Make your selection and click the Apply Options button. If there are no changes click cancel to return to the Main User Account Window.

That wraps up the User Account section of this tutorial click the Back arrow button in the upper left corner to return to the Control Panel window and we will move onto Appearance and Themes.

Click on the Appearance and Themes icon

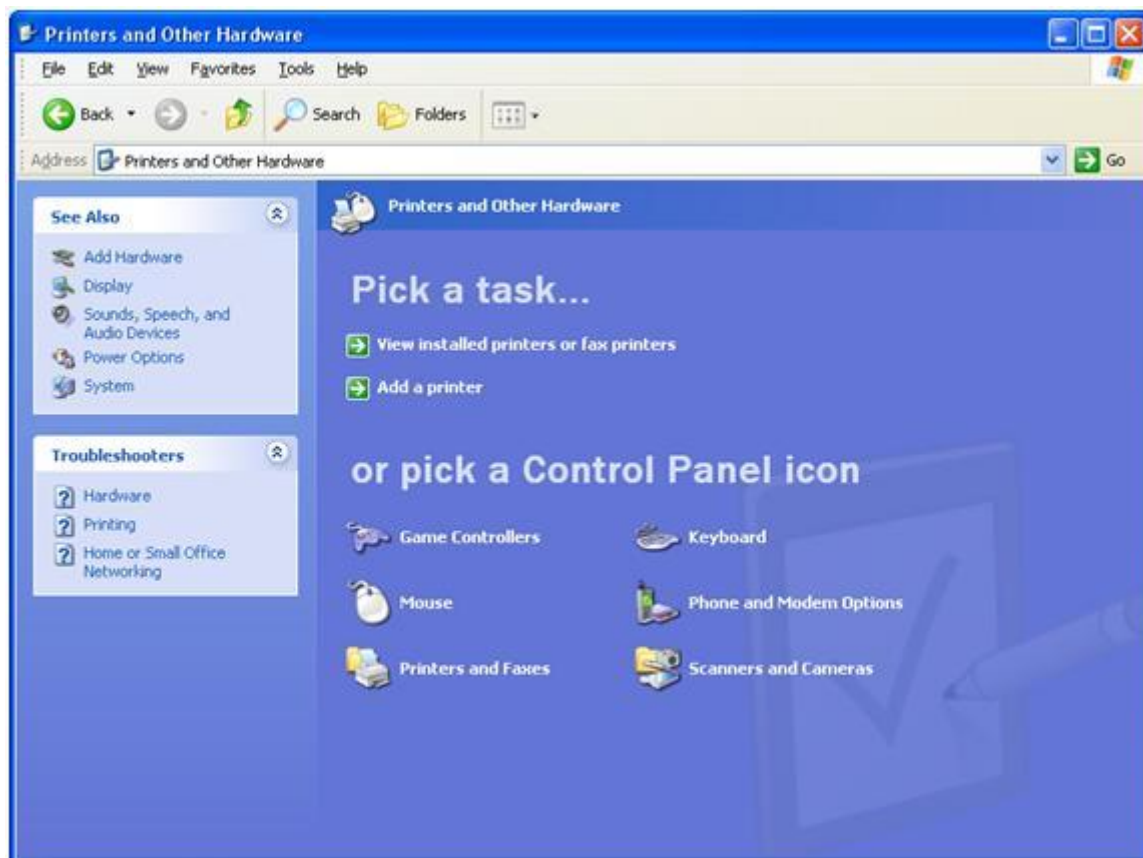


I will only touch on this topic briefly because all of the options in this window we have covered in the [desktop tutorials](#). I had you open this window just to show a different way to get to the same options. Please feel free to click each link see if you recognize the windows.

The only topic we have not covered in the Appearance and Themes Window is the Folder Options and this will be covered in the next tutorials section.

When you are finished exploring the Appearance and Themes Window click the back arrow in the upper left corner to return to the Control Panel.

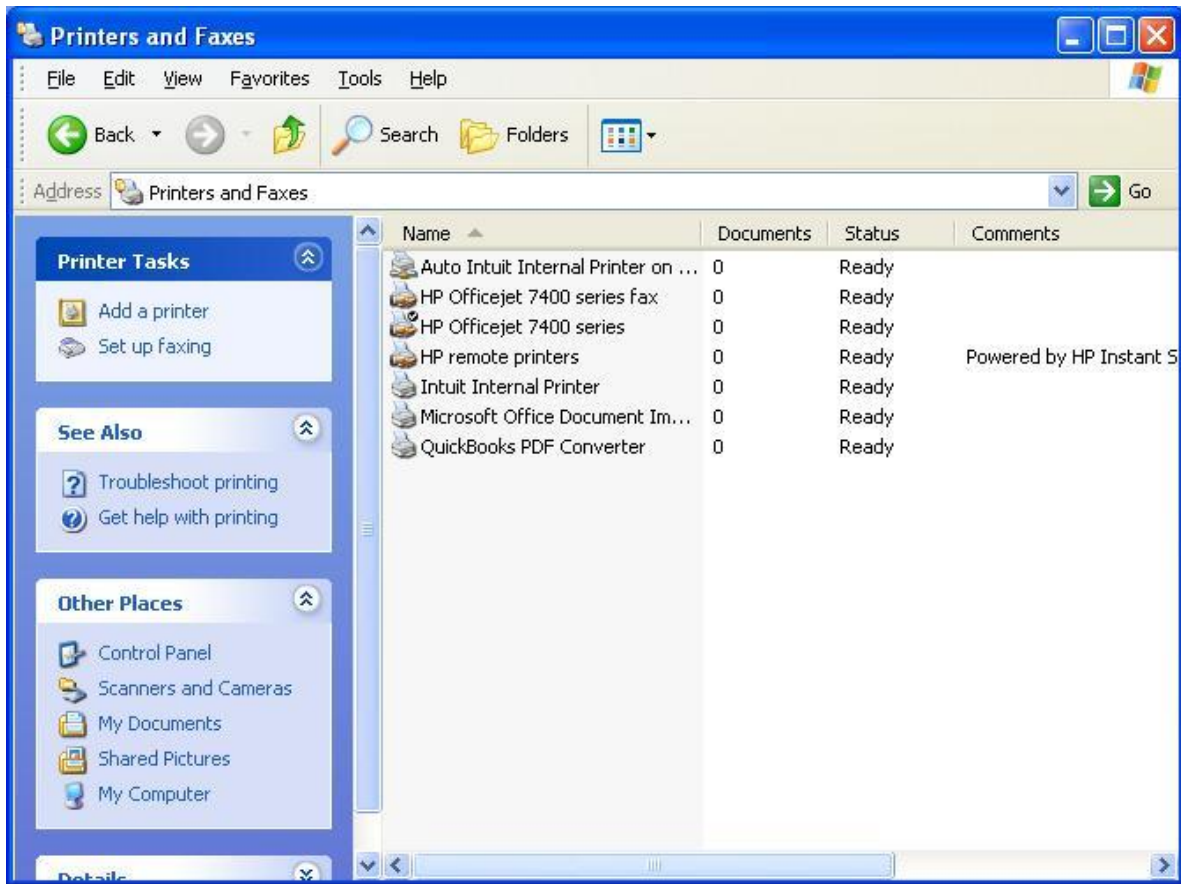
We will now move on to the Printers and Mouse options. Click on the Printers and Other Hardware icon.



In this section we will briefly cover printers, a few tabs in the mouse window and 1 tab in the keyboard window.

We will start with printers. Printers have never been one of my favorite topics. There are so many different brands and types of printers, and they all install and work differently. The best advise I can give you is to follow the instructions that come with the printer for easy installation.

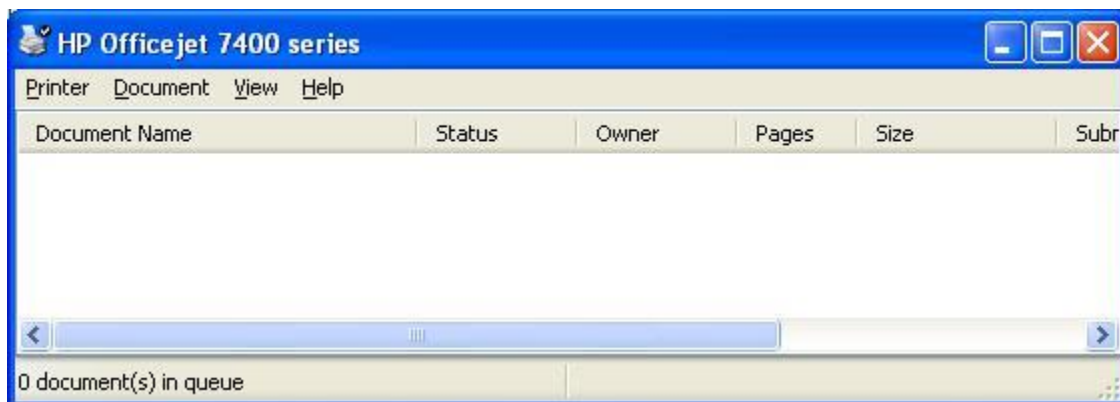
Click on the Printers and Faxes icon link at the bottom of the window. The top View printers and fax printers will take you to the same place.



The Printers and Faxes Window will open. This window gives you all of the information you need to know about the printers you currently have installed on your computer.

The Printers and Faxes Window will tell you the name of your printer. If there is any number other than a 0 in the documents column there are print jobs that are either in the process of being printed or are stuck in the print queue.

Double click on one of your printers to view the window with the list of print jobs.



If you are having printer trouble this is the window you need to be in to see what is going on. Most of the time you have a print job stuck in the queue and it needs to be deleted before you can print another document or re-print the current document.

To delete a document out of the print queue click on the print job to select it and press the delete key on your keyboard. Sometimes you are able to restart the print job to make it work to restart a print job you select the print job you want and click document in the top tool bar. Then click restart.

Click the x to go back to the Printers and Faxes Window.

The last topic on printer I want to cover is Add a printer. Click on the add a printer link in the left hand tool bar.

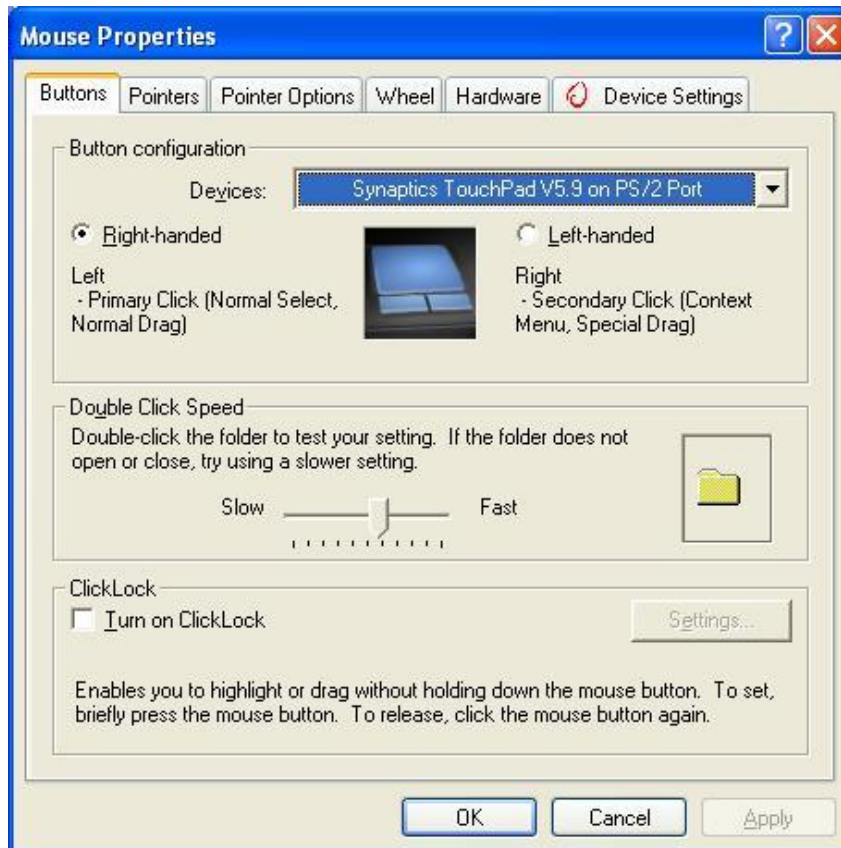


This will open the Add a Printer wizard. You can follow this wizard to install a printer. I am not going to go into detail here because every printer is different. If you have specific questions you can email me and I will send you an individual tutorial.

Click the back arrow in the upper left corner to return to the Printers and Other Hardware window in the control panel

The next topic is the mouse. The mouse options will let you change your curses, change the mouse buttons if you are left handed, and change the click speed if you have trouble doing double click.

Click the Mouse icon link and we will get started.



When the Mouse Properties window opens click on the Buttons Tab.

If you are left handed you can click the left handed radio button in the Button Configuration section of the Button Tab. This will reverse the function of the left and right buttons on your mouse so you can put your mouse on the left side of your computer.

If you have trouble with double clicking play with the slider in the Double Click Speed section of the Button Tab. Move the slider either faster or slower and then try double clicking on the folder to the right of the slider until you feel comfortable with the speed.

If you have trouble holding the mouse button down due to carpal tunnel or arthritis the Click Lock section will help you. Click lock allows you to highlight or drag objects without having to hold the mouse button down. If you would like to use this option check the box then click settings.



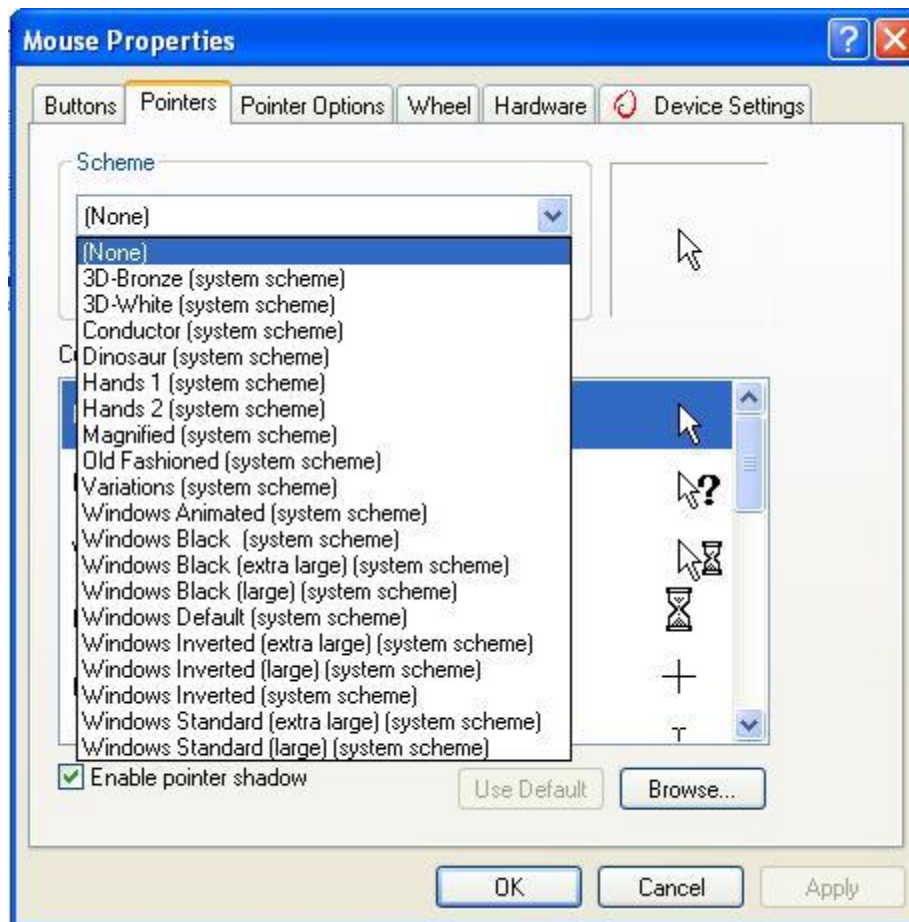
The Settings window lets you choose how long you need to hold the mouse button down before locking the cursor in place so you can drag or highlight. When you have made your selection click OK to return to the Mouse Properties window.

To use the Click lock function place your cursor or pointer over the object and hold the mouse button down just a little longer than a regular click. This will lock the pointer in that location and the pointer will move with the motion of your mouse without having to hold the mouse button down.

If you made any changes click apply and we will move onto the Pointers Tab

Click on the Pointers Tab. The Pointers Tab is where you can have a little fun or change the mouse pointer to be larger if you have trouble seeing it.

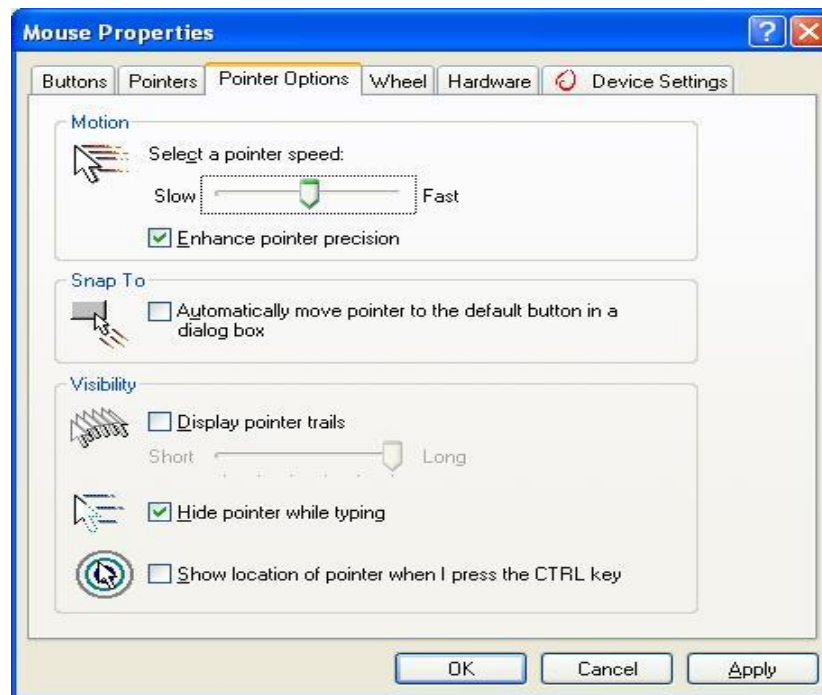
In the first section Scheme click the drop down arrow



You will get a list of all the different pointer schemes. Some people like to have fun and put cute pictures like the dinosaurs or if you have trouble seeing the pointer click on the magnified selection.

If you really want to have some fun with your pointers you can customize each one individually in the customize section by clicking on the type of cursor and then clicking browse and hand pick your pointer.

If you made any changes click apply and we will move to the Pointer Option tab. Click on the Pointer Option tab

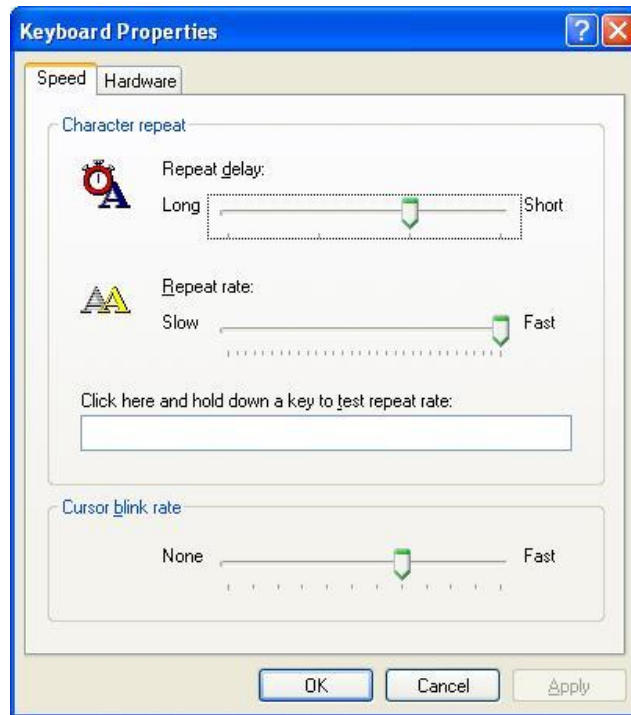


The first section is Motion. If you find that the mouse pointer moves too fast and you have trouble getting it to stop where you want, drag the slider toward slow to slow the mouse down. Play with the slider for a minute to see how it affects your mouse pointer.

If you click the check box in the Snap To section every time you open a new window the mouse will automatically go to the window's default button. For example the OK button in a new Window.

In the last section of the Pointer Options tab, Visibility you will see check boxes. The first check box puts a tail on your mouse pointer that will trail behind the pointer as you move it across the screen. The next check box will hide the mouse pointer when you are typing. Some people like this and some don't. If your pointer gets in the way of you reading while you are typing check this box. If not I would leave it unchecked. The last button is useful if you are a person that has trouble finding the mouse pointer. When this button is checked you can press the CTRL key on your keyboard and a bullseye will appear around your pointer to make it easier to find.

That wraps up the mouse section. Now click the OK button to get back to the Mouse and other Hardware Window. Then click on the Keyboard icon link.



There are only 2 options in the Keyboard Window. These 2 options are useful if you are typing and when you press a key the character types more than once. Repeat delay is how long you need to hold a key down before it will type more than once. Repeat rate is the speed that the character will repeat if you hold the key down too long.

Play with the sliders on both options and click in the test text box and hold down a key on the keyboard to see how the changes affect the keyboard.

The third option is how fast your cursor will blink when you are typing. You can play with the slider if you wish but the default usually works fine.

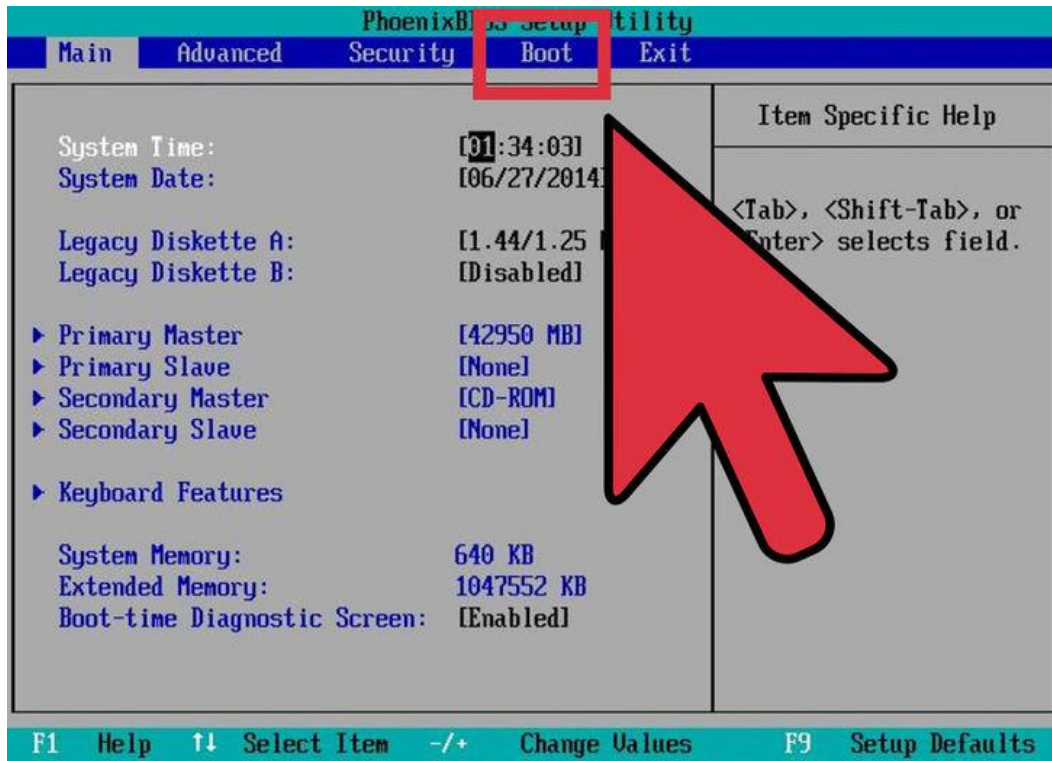
When you are finished click the OK button to return to the Mouse and Other Hardware Window.

How to Install Windows 7

Installing Using a Disc

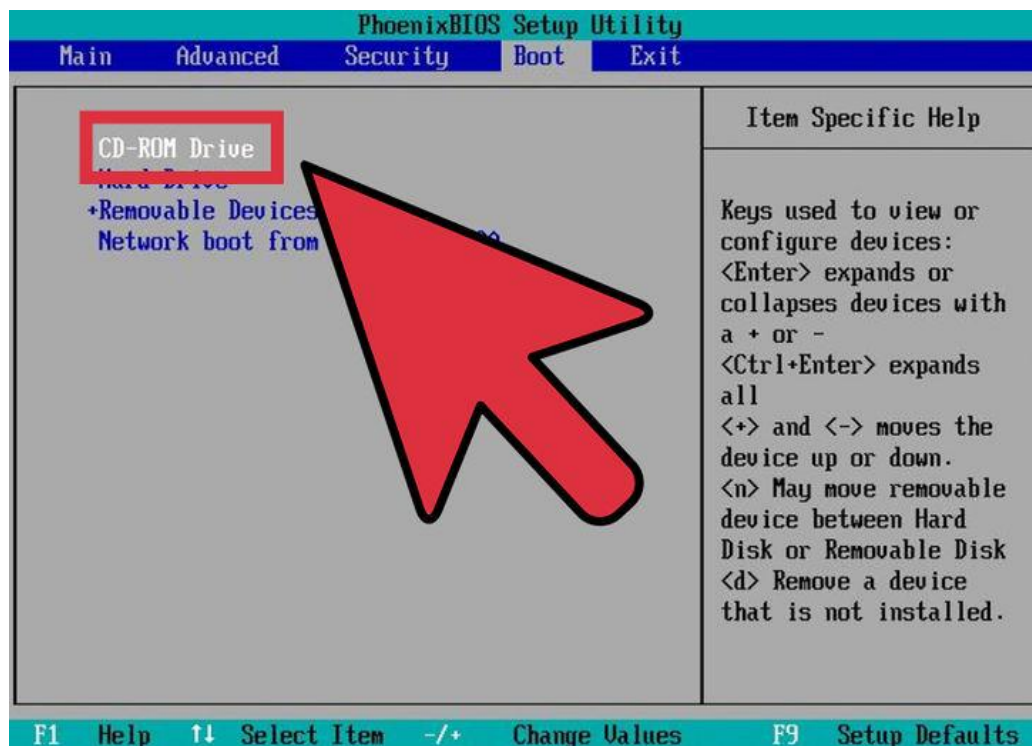
Clean Install: A clean install is intended for users who want to freshly install Windows on their computer or computers that do not have an operating system yet.

1. Enter your computer's BIOS. Turn off the computer that you want to install Windows on then turn it back on. When the BIOS screen appears or you are prompted to do so, press Del, Esc, F2, F10, or F9 (depending on your computer's motherboard) to enter the system BIOS. The key to enter the BIOS is usually shown on the screen.

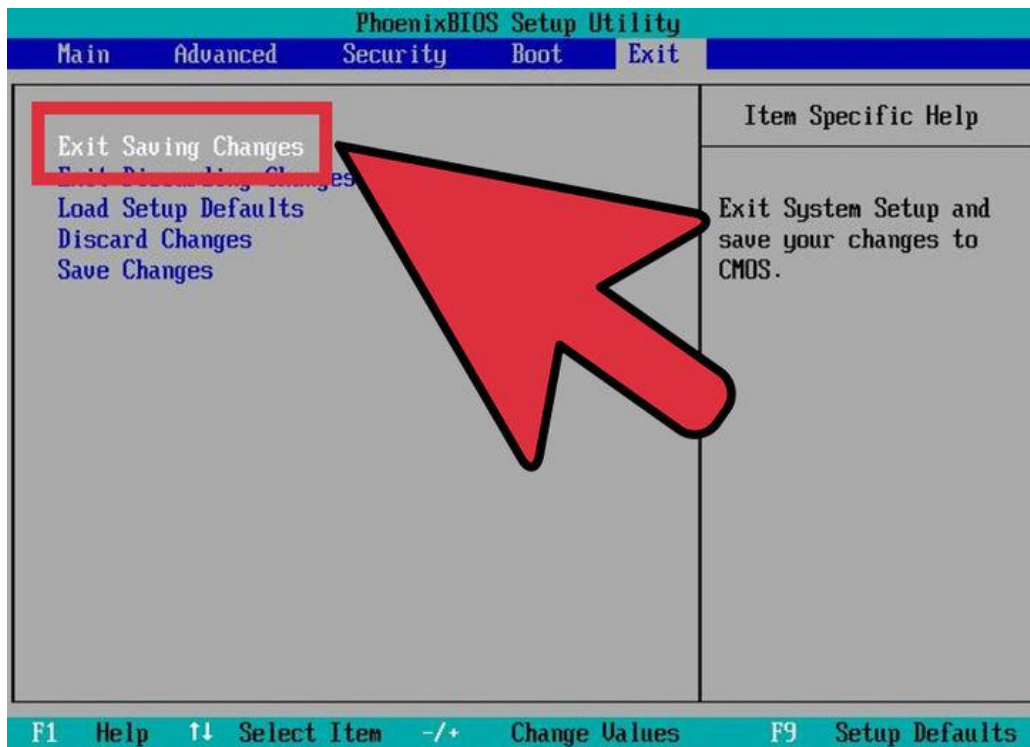


2. Find your BIOS's boot options menu. The boot options menu of your BIOS may vary in location or name from the illustration, but you may eventually find it if you search around.

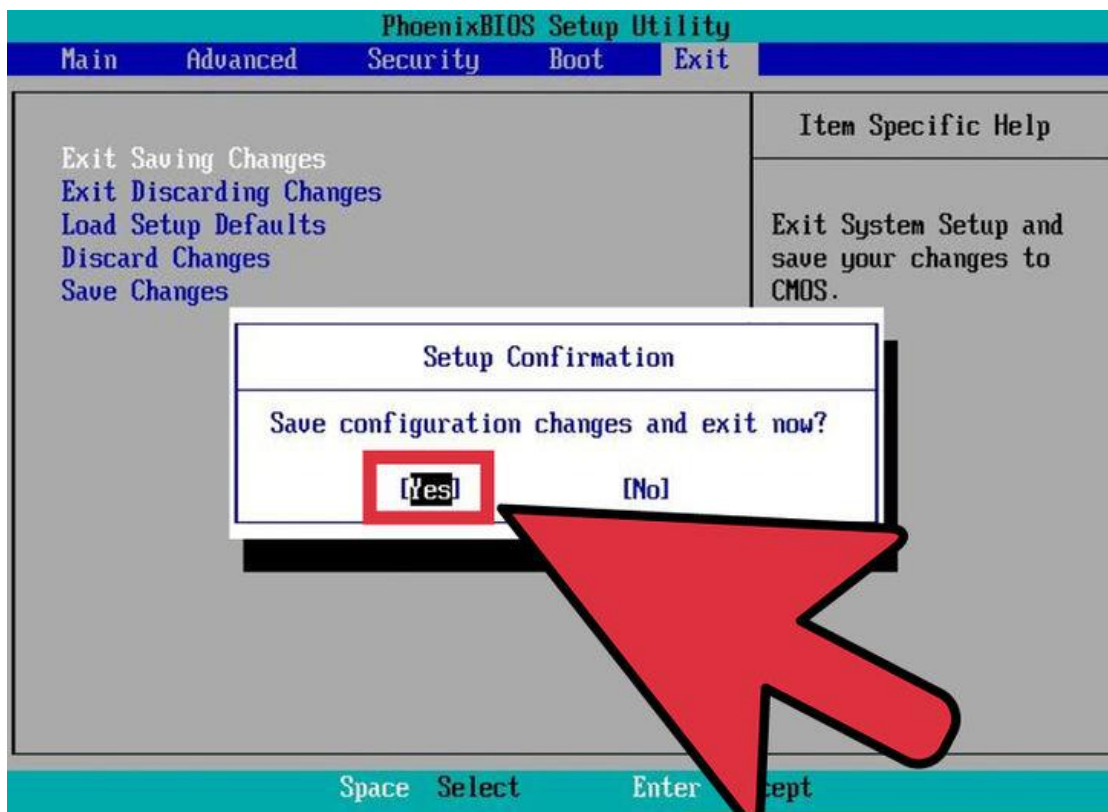
If you can't find the boot options menu, search the name of your BIOS (most likely located in the BIOS menu) online for help.



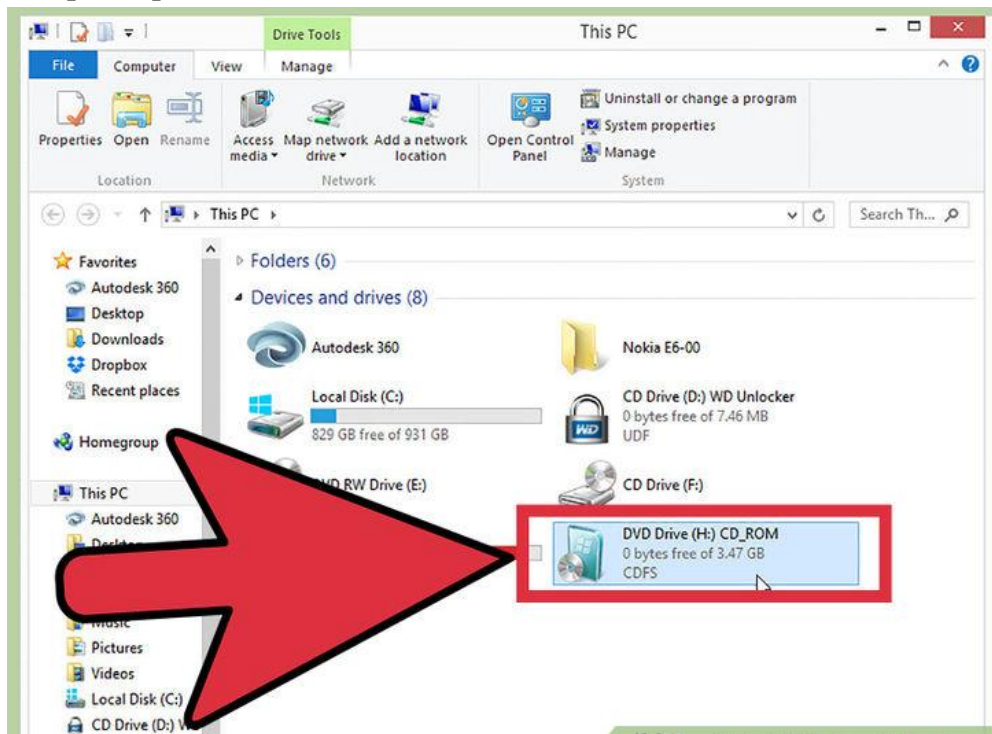
3. Select the CD-ROM drive as the first boot device of your computer. Although this method may vary among computers, the boot options menu is typically a menu of movable device names where you should set your CD-ROM drive as the first boot device. It can also be a list of devices that you can set the order of their boot on.



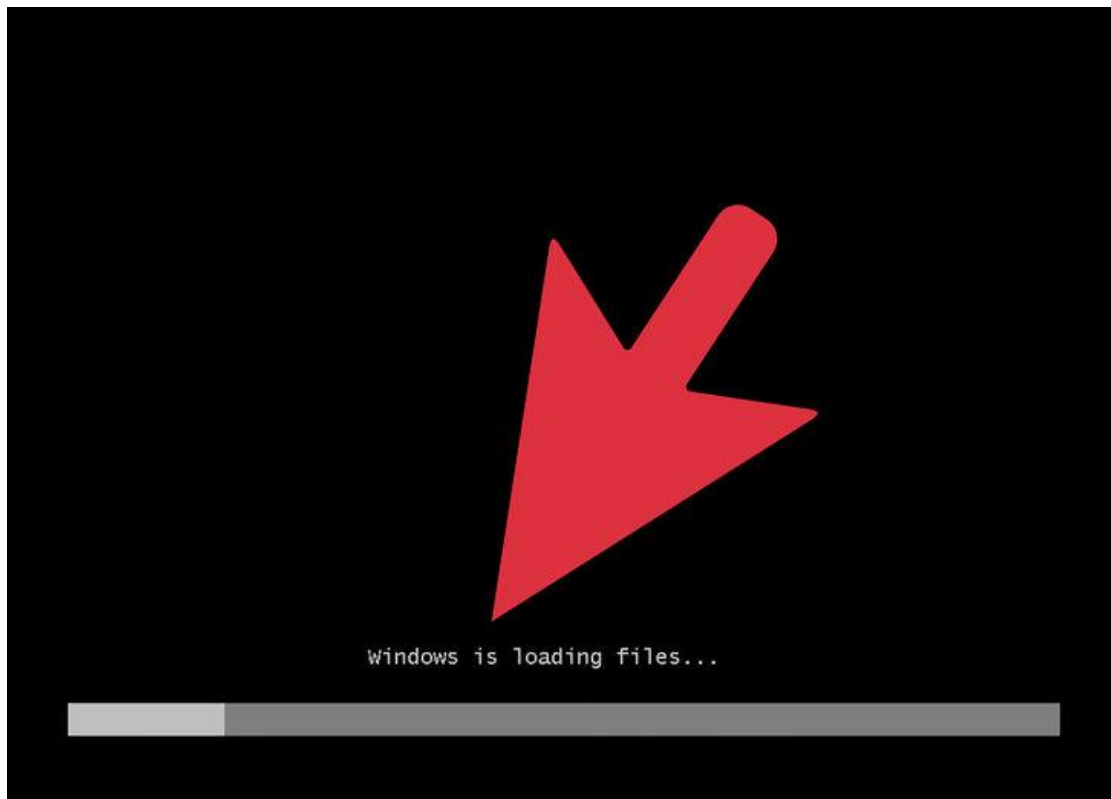
4. Save the changes of the settings. Press the button indicated on the screen or select the save option from the BIOS menu to save your configuration.



5. Shut off your computer. Either turn off the computer by choosing the shut-down option in your current operating system, or hold the power button until the computer powers off.

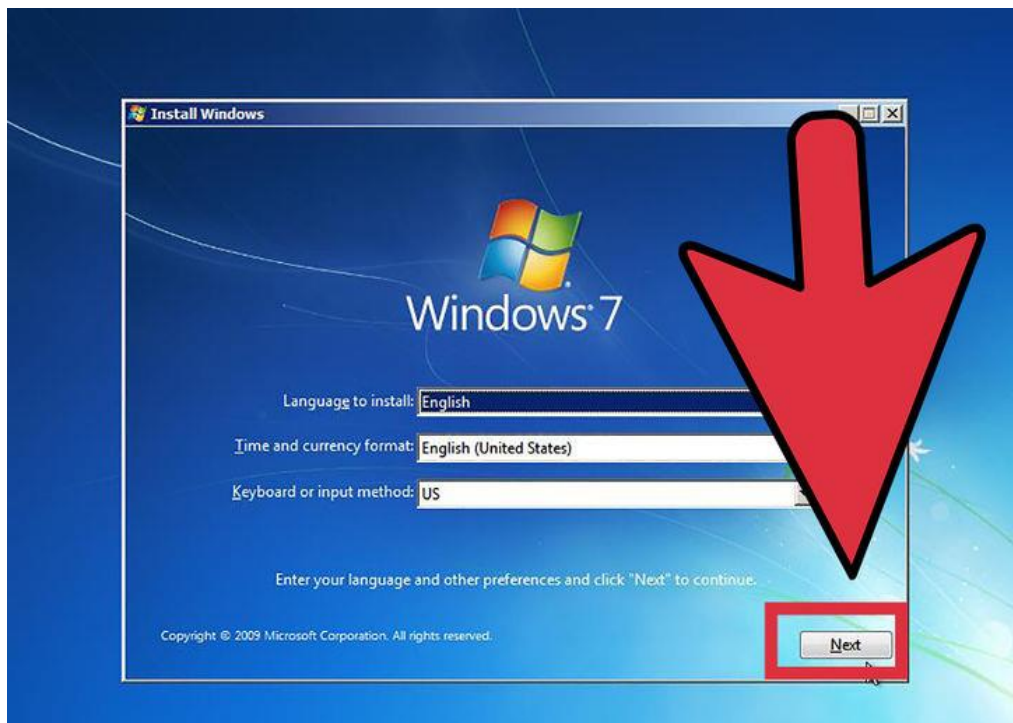


6. Power on the PC and the insert the Windows 7 disc into your CD/DVD drive.

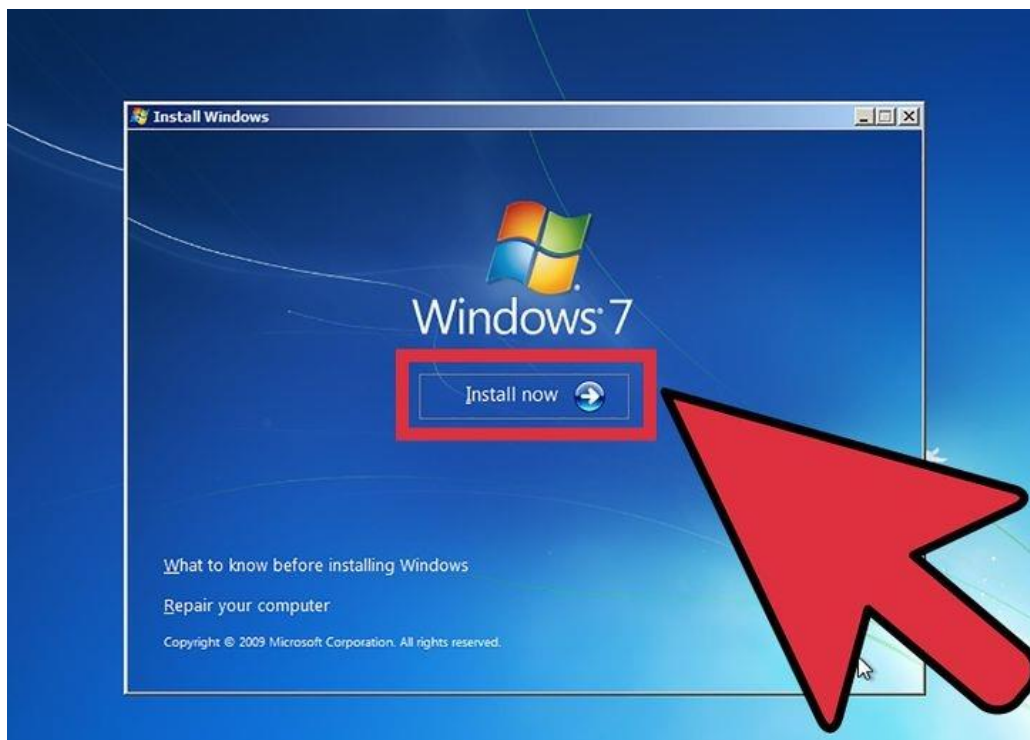


7. Start your computer from the disc. After you have placed the disc into the disc drive, start your computer. When the computer starts, press a key if you are asked if you would like to boot from the disc by pressing any key. After you choose to start from the disc, Windows Setup will begin loading.

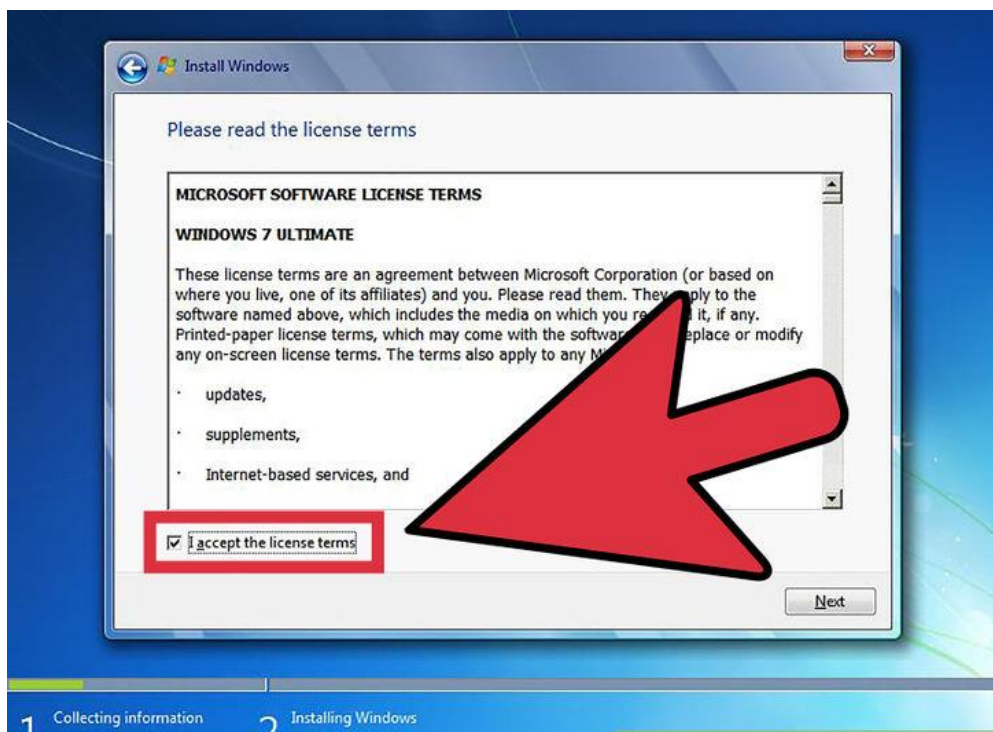
If you are not asked to boot from the disc, you may have done something wrong. Retry the previous steps to solve the problem.



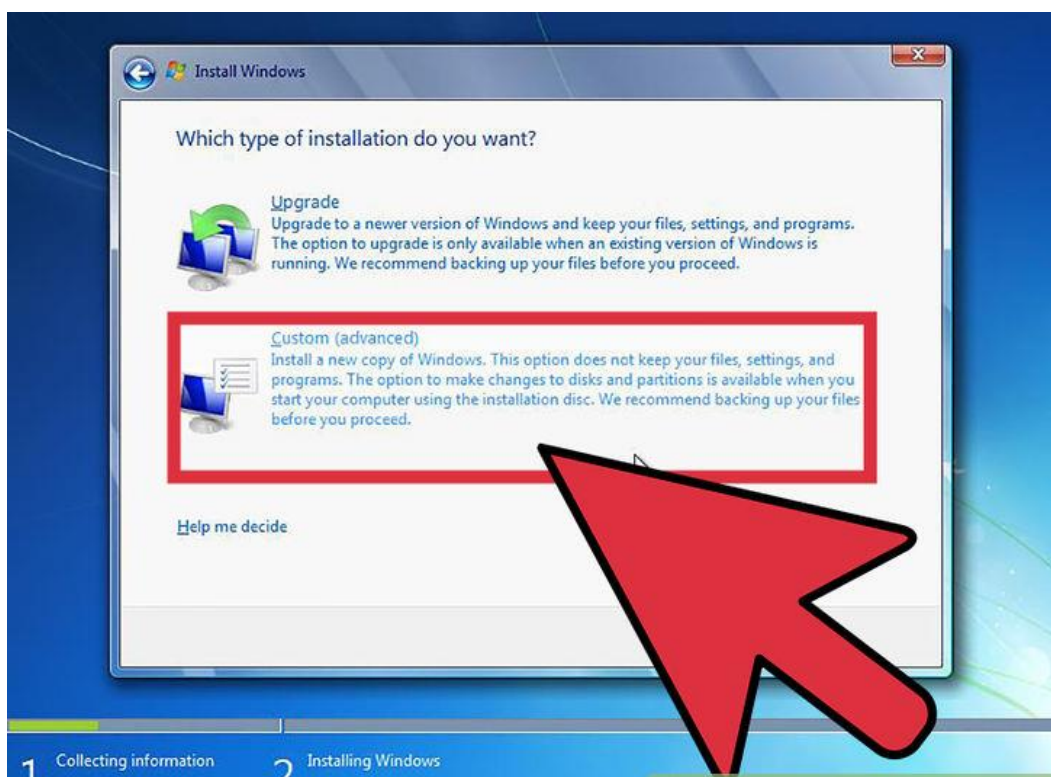
8. Choose your Windows Setup options. Once Windows Setup loads, you'll be presented with a window. Select your preferred language, keyboard type, and time/currency format, then click Next.



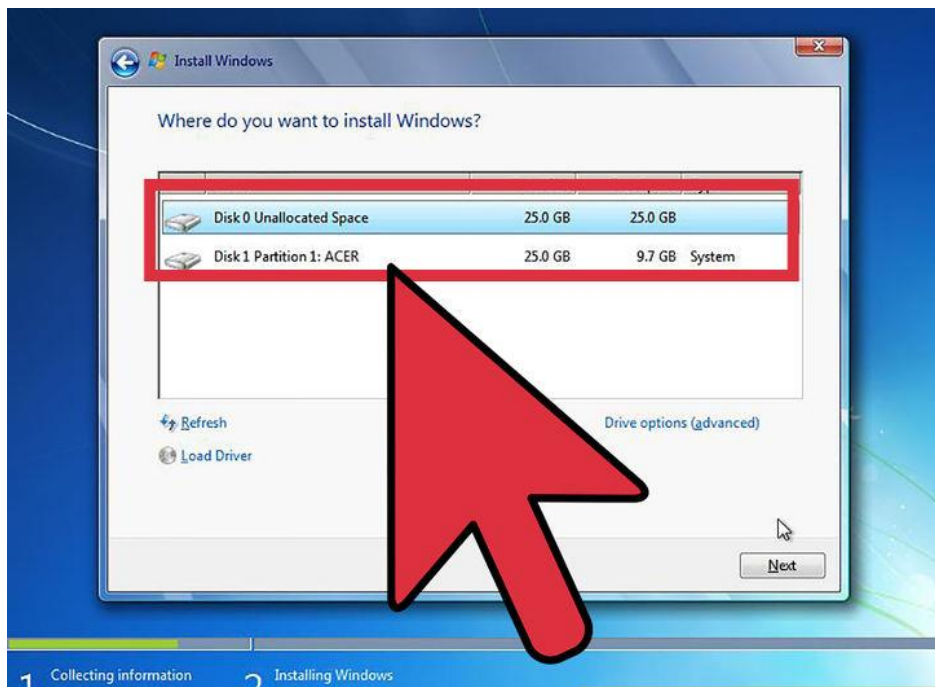
9. Click the Install Now button.



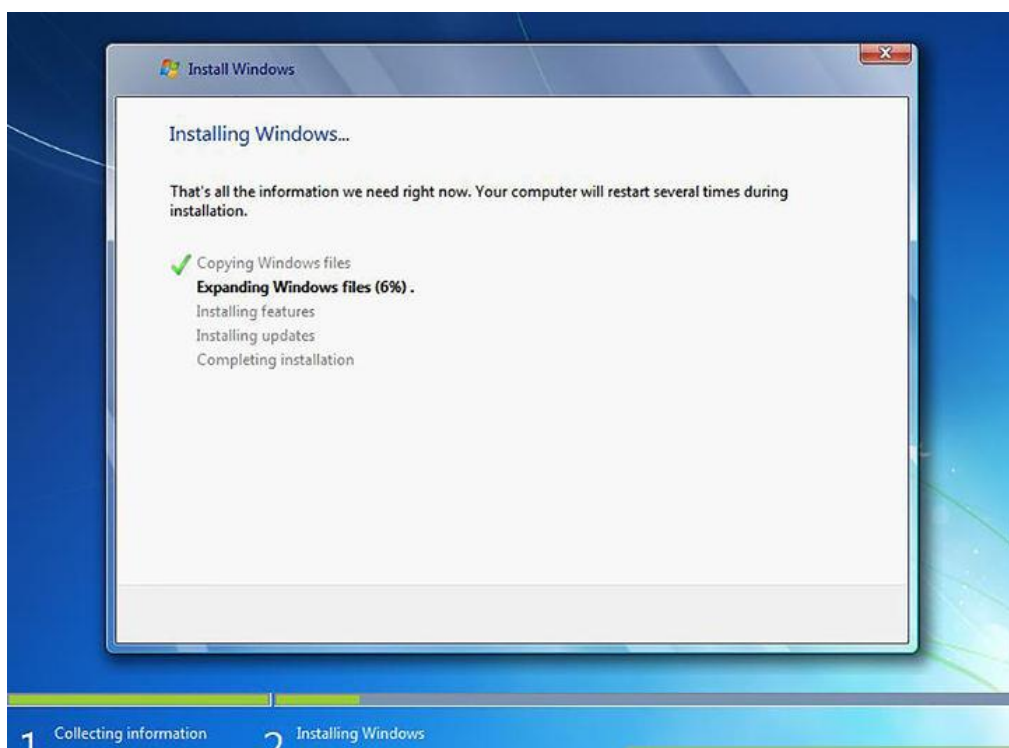
10. Accept the License Terms. Read over the Microsoft Software License Terms, check I accept the license terms, and click Next.



11. Select the Custom installation.



12. Decide on which hard drive and partition you want to install Windows on. A hard drive is a physical part of your computer that stores data, and partitions "divide" hard drives into separate parts.

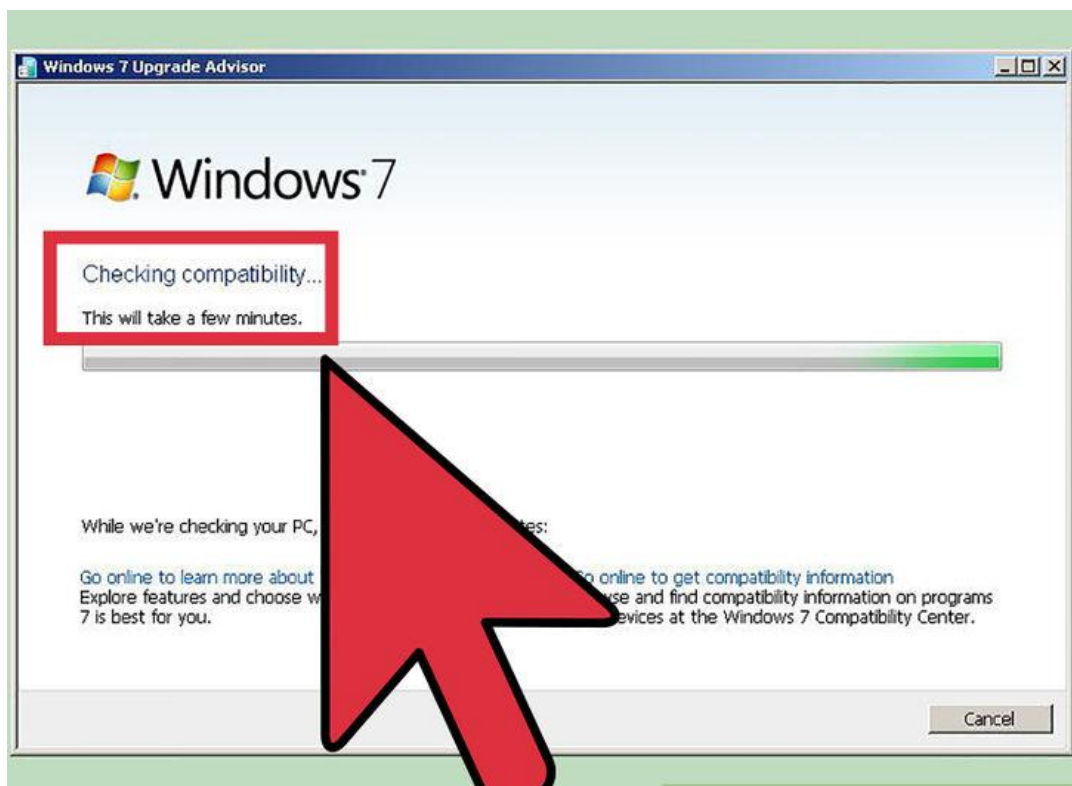


13. Install Windows on your preferred hard drive and partition. Once you've decided on where to install Windows, select it and click Next. Windows will begin installing.

Upgrade

An Upgrade installation upgrades an older version of Windows on your computer (E.G. Windows Vista to Windows 7.)

1. Start your computer normally into your current operating system.

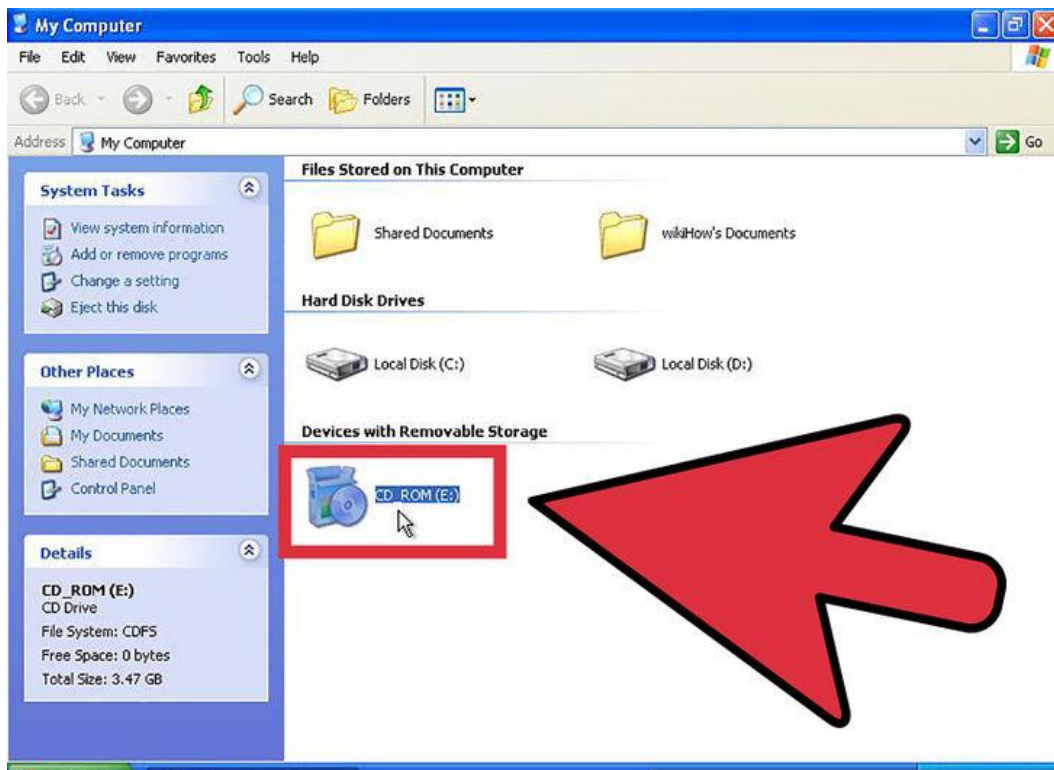


2. Check to see if your computer is compatible with Windows 7. The Windows 7 Upgrade Advisor scans your computer to see if you can upgrade it to Windows 7. Download it here.

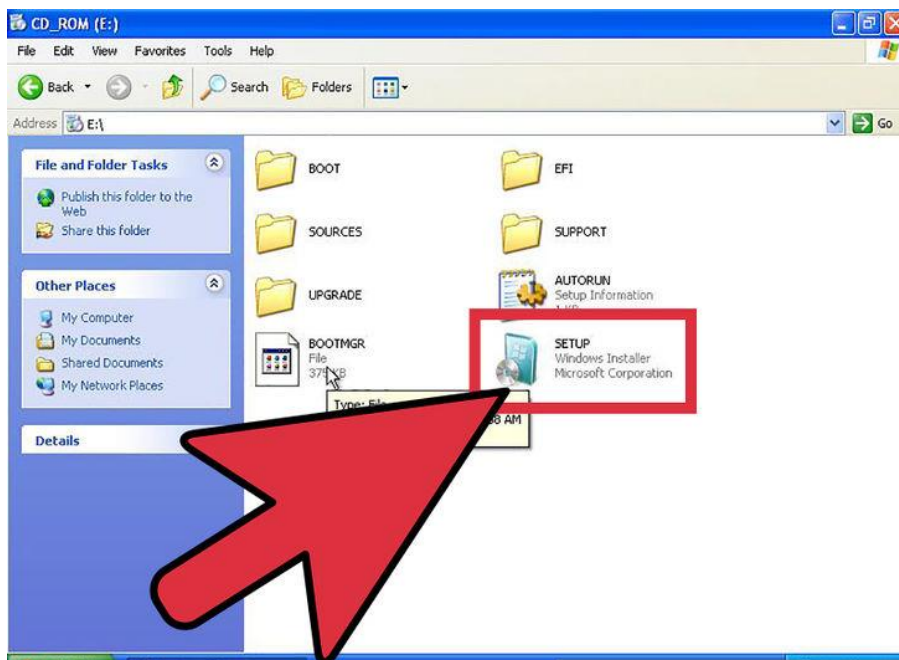


3. Prepare your computer to install Windows.

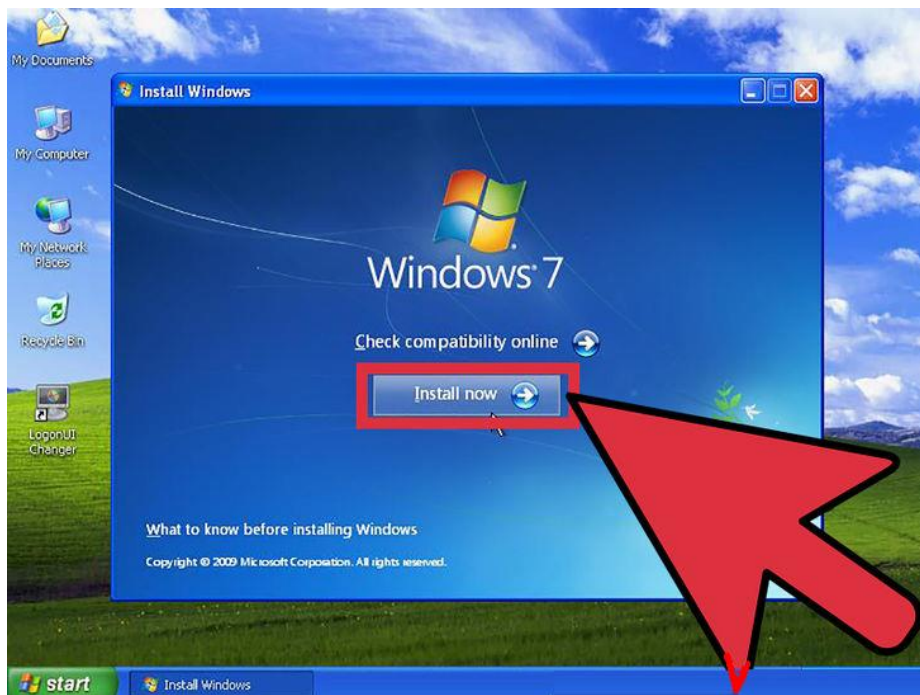
- Scan your computer for malware. Malware can prevent Windows from installing correctly.
- Disable or uninstall any antivirus software because they may interfere with the Windows installation.
- Uninstall some unnecessary programs to speed up the upgrade. You can install them after Windows 7 has finished.
- Update Windows with Windows Update.
- Delete some unnecessary files to speed up the upgrade.
- Back up your hard drive in case the installation fails and you lose your files. (optional).



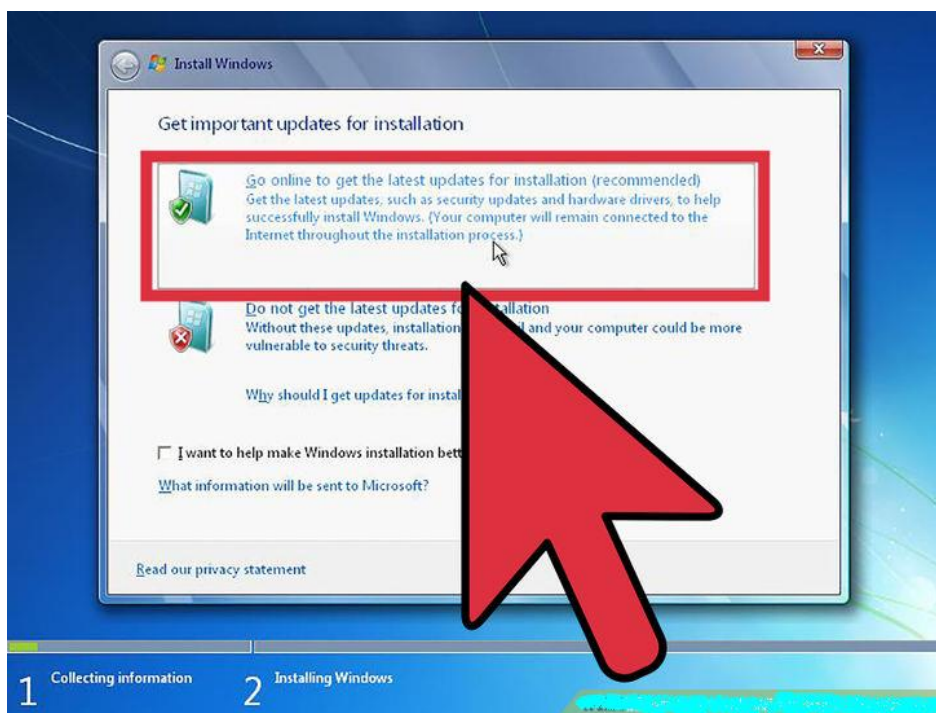
4. Insert your Windows 7 installation disc into the computer at this point.



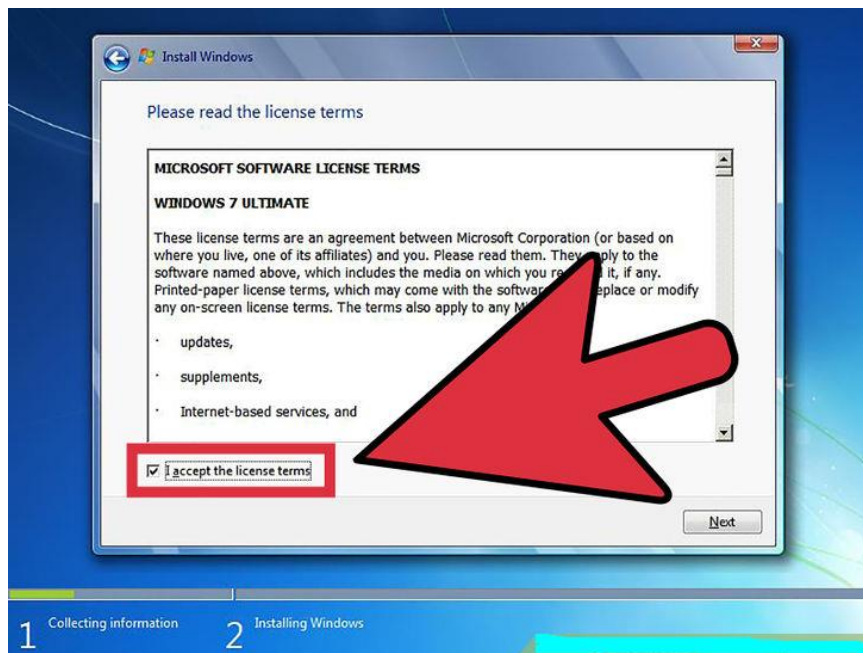
5. Start Windows Setup. After the disc has loaded, click Start → Computer, double click the disc drive that Windows 7 Setup was placed in, and double-click setup.exe on the disc. Allow Setup to start.



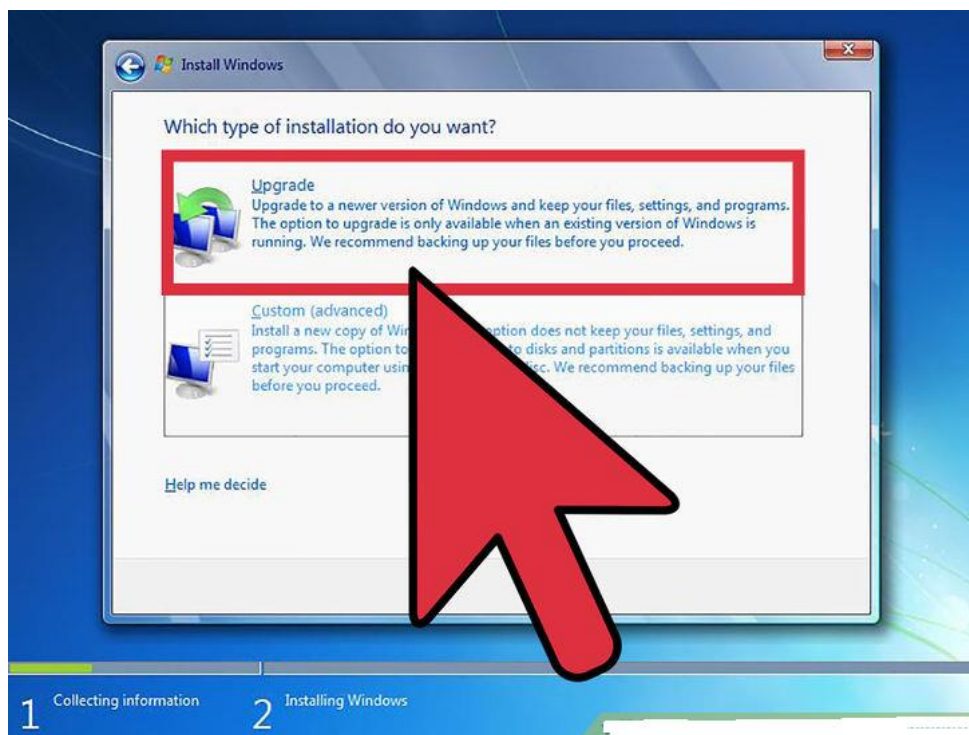
6. Click Install Now.



7. Decide whether to install updates for Windows Setup. The updates are intended to fix known problems with Windows Setup and installing updates makes your installation smoother and more stable. To get updates, click Go Online to get the latest updates for installation (recommended). To skip updates, click Do not get the latest updates for installation.



8. Accept the License Terms. Read over the Microsoft Software License Terms, check I accept the license terms, and click Next.



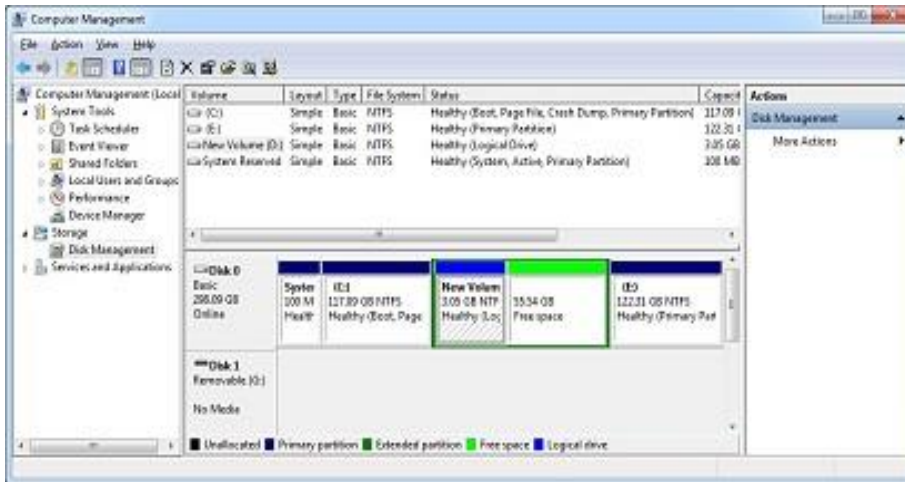
9. Select the Upgrade installation.

Create a New Partition on a Windows 7 Hard Disk

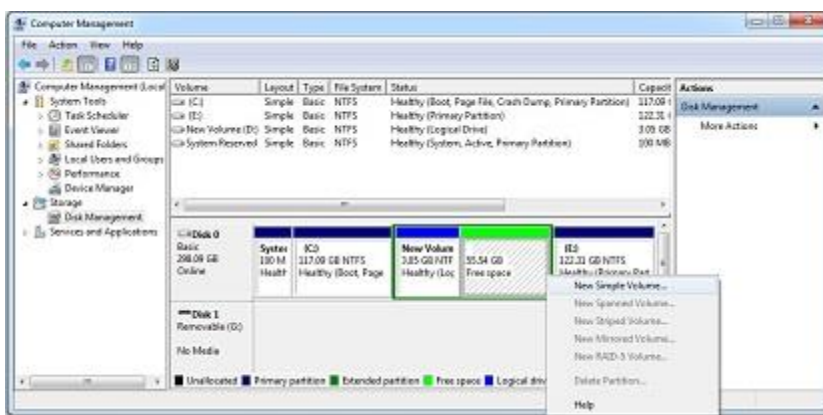
The Windows 7 Disk Management tool provides a simple interface for managing partitions and volumes.

Here's an easy way to create a new partition on your disk.

1. Open the Disk Management console by typing **diskmgmt.msc** at an elevated prompt.

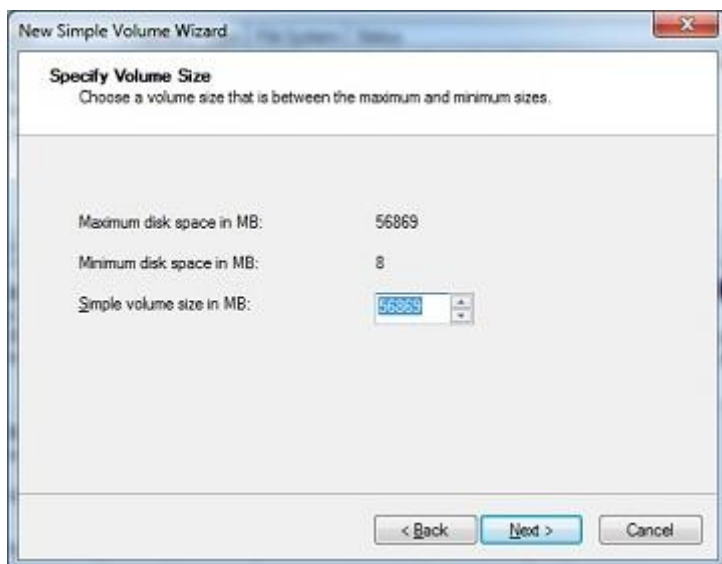


2. In Disk Management's Graphical view, right-click an unallocated or free area, and then click New Simple Volume. This starts the New Simple Volume Wizard. (Note: If you need to create unallocated space, see the Tip [Easily Shrink a Volume on a Windows 7 Disk](#) for information on how to do this.)

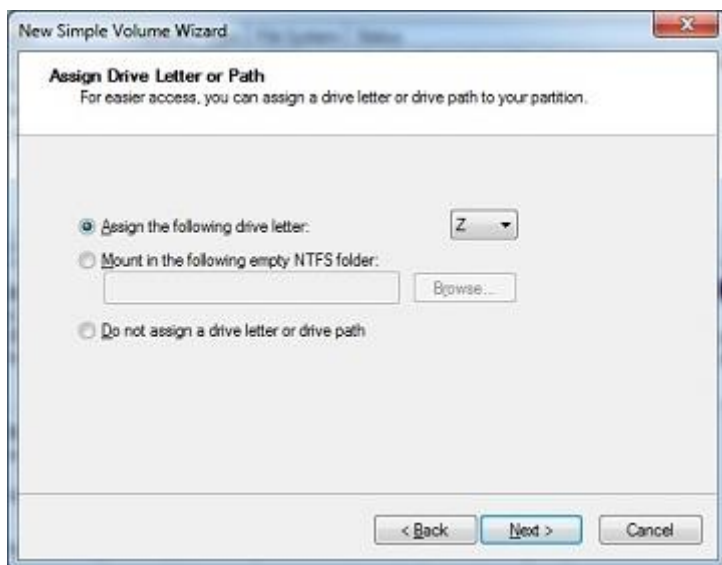


3. Read the Welcome page and then click Next.

4. The Specify Volume Size page specifies the minimum and maximum size for the volume in megabytes and lets you size the volume within these limits. Size the partition in megabytes using the Simple Volume Size field and then click Next.



5. On the Assign Drive Letter Or Path page, specify whether you want to assign a drive letter or path and then click Next. The available options are as follows:



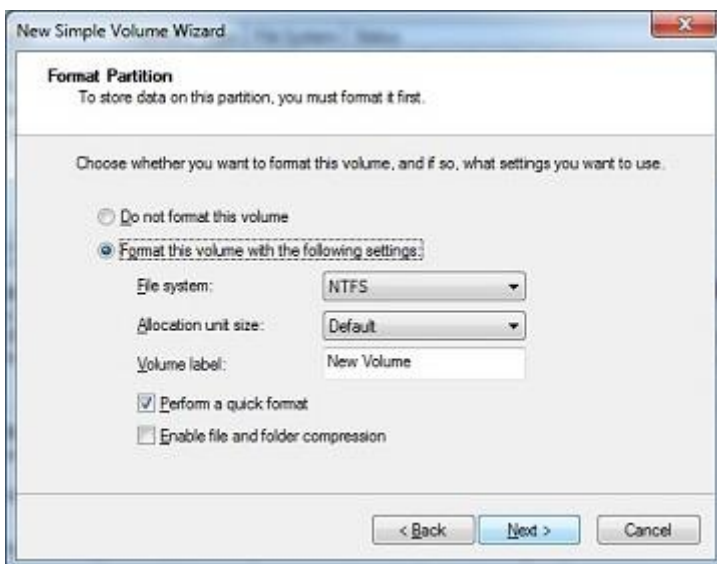
Assign The Following Drive Letter Select an available drive letter in the selection list provided. By default, Windows 7 selects the lowest available drive letter and excludes reserved drive letters as well as those assigned to local disks or network

drives.

Mount In The Following Empty NTFS Folder Choose this option to mount the partition in an empty NTFS folder. You must then type the path to an existing folder or click Browse to search for or create a folder to use.

Do Not Assign A Drive Letter Or Drive Path Choose this option if you want to create the partition without assigning a drive letter or path. Later, if you want the partition to be available for storage, you can assign a drive letter or path at that time.

6. Use the Format Partition page to determine whether and how the volume should be formatted. If you want to format the volume, choose Format This Volume With The Following Settings, and then configure the following options:



File System Sets the file system type as FAT, FAT32, or NTFS. NTFS is selected by default in most cases. If you create a file system as FAT or FAT32, you can later convert it to NTFS by using the Convert utility. You can't, however, convert NTFS partitions to FAT or FAT32.

Allocation Unit Size Sets the cluster size for the file system. This is the basic unit in which disk space is allocated. The default allocation unit size is based on the size of the volume and, by default, is set dynamically prior to formatting. To override this feature, you can set the allocation unit size to a specific value. If you use many small files, you might want to use a smaller cluster size, such as 512 or 1,024 bytes. With these settings, small files use less disk space.

Volume Label Sets a text label for the partition. This label is the partition's volume name and by default is set to New Volume. You can change the volume label at any time by right-clicking the volume in Windows Explorer, choosing Properties, and typing a new value in the Label field provided on the General tab.

Perform A Quick Format Tells Windows 7 to format without checking the partition for errors. With large partitions, this option can save you a few minutes. However, it's usually better to check for errors, which enables Disk Management to mark bad sectors on the disk and lock them out.

Enable File And Folder Compression Turns on compression for the disk. Built-in compression is available only for NTFS. Under NTFS, compression is transparent to users and compressed files can be accessed just like regular files. If you select this option, files and directories on this drive are compressed automatically.

7. Click Next, confirm your options, and then click Finish.



The Windows 7 Disk Management tool will now show the space configured as a new partition.

