



## 2 Marks Questions

### 1.What do you mean by Complete PC?

- A typical PC is more than one device, and you need all of the parts (or at least most) to make the PC work. The most important part of the PC is the one that all of the other parts connect to, called the system unit. **All of the processing and storage takes place in the system unit.** All of the other parts of the PC the printer, the keyboard, the monitor.

### 2.Write a note on Monitor and sound device.

- **Monitor :** A monitor connects to the video connector on the system unit. usually there are two types of video connectors: the older, 15-pin female DB **Video Graphics Array (VGA)** connector or the unique **digital visual interface (DVI)** connector. VGA connectors are colored blue, whereas DVI connectors are colored white.



## Sound

- The sound device in a computer performs two functions. First, it takes digital information and turns it into sound, outputting the sound through speakers. Second it takes sound that is input through a microphone or some other audio source and turns it into digital data.
- To play and record sounds, your sound device needs to connect to a set of speakers and a microphone more.
- All PCs have at least two miniature audio jacks: one for a microphone and another for stereo speakers



### 3.What are the standard sets of External Connections?

- Standard sets of External Connections are *Monitor, Keyboard, Mouse, Speakers, Printer*

### 4.Write a note about USB Connectors.

- **Universal serial bus (USB)** provides the most common general-purpose connection for PCs. USB versions of many devices like, mice, keyboards, scanners, cameras, and printers.
- USB connections come in three sizes: A, B, and mini-B.



### 5.What is Web Servers?

- A remote computer called a **Web server** stores the files that make up a Web site. The Web server uses server programs to store and share the data. So the role of the Web server is to provide access to Web sites.
- Two popular Web server programs are Apache HTTP Server and Microsoft Internet Information Services (IIS).

### 6.What are NIC cards?

- A NIC (Network Interface Card) is also called as network card, network adapter and LAN Adapter is a piece of computer hardware designed to allow computers to communicate over a computer network. It allows users to connect to each other either through wired or wireless network.

## 7.What is crimping and mention its types.

- The process of inserting a Cat5 cable into a RJ45 jack and fixing them firmly is called Crimping.
- **There are Two type of cable crimping available**
  1. Straight cable coloring order.
  2. Cross-cable .

## 8.Write the Steps to identify MAC Address.

To identify MAC Address of a system.

- Double click on the network icon that is available on the tool-bar. Click on the Support tab,
- Click on Details button,



## 9.What is ARP Tables, Which command you will use inorder to display ARP Table.

- ARP is nothing but Address Resolution Protocol and its job is to match MAC address to IP address .
- Run **arp - a** in the command prompt, which will report on all the information that it has stored on the ARP table during the usage of the network for that system.

## 10.What is NetStat Command, Write its syntax.

- NetStat Command: Monitors Internet connections on your computer. It shows the information on all active TCP and UDP connections, local and remote ports, connection states and the owning process

**Syntax: NETSTAT [-a] [-c] [-n] [-s] [-p proto] [-r] [interval]**

Commands	Explanation
-a	Displays all connections and listening ports.
-c	Displays Ethernet statistics. This may be combined with the -s option.
-n	Displays addresses and port numbers in numerical form.
-p	Proto Shows connections for the protocol specified by proto; proto may be TCP or UDP. If used with the -s option to display per-protocol statistics, proto may be TCP, UDP, or IP.
-r	Displays the routing table.
-s	Displays per-protocol statistics. By default, statistics are shown for TCP, UDP and IP; the -p option may be used to specify a subset of the default.
interval	Redisplays selected statistics, pausing interval seconds between each display. Press CTRL+C to stop redisplaying statistics. If omitted, netstat will print the current configuration information once.

## 11.What is the use of IPCConfig Command?

- Shows network, adapters and interfaces configuration. IPCConfig (Internet Protocol Configuration) allows you to renew DHCP (The Dynamic Host Configuration Protocol is an Internet protocol for automating the configuration of computers that use TCP/IP) configuration or send the command to DHCP server to release and discard the IP address configuration. This tool is very useful on computers that are configured to obtain an IP address automatically.

## 12.What is the use of Net Command?

- The net command is used to view the network or send messages or network settings, etc.

### Some of the Net commands are

- **Net Send:** Sends messages to other users, computers, or messaging names on the network.
- **Net View:** This command is used to view the systems that are available in the



### 13. What is EDB?

- ▶ Imagine that we install a set of 16 light bulbs, 8 inside his box and 8 outside his box. Each of the 8 light bulbs inside the box connects to one of the 8 bulbs outside the box to form a pair. Each pair of light bulbs is always either on or off. You can control the 8 pairs of bulbs by using a set of 8 switches outside the box, and the **Man in the Box** can also control them by using an identical set of 8 switches inside the box. This light-bulb communication device is called the **External data bus (EDB)**.



### 14. What are Registers?

- ▶ The Man in the Box provides good insight into the workspace inside a CPU. The EDB gives you a way to communicate with the Man in the Box so you can give him work to do. But to do this work, he needs a **worktable**; in fact, he needs at least four worktables. Each of these four worktables has 16 light bulbs. These light bulbs are not in pairs; they're just 16 light bulbs lined up straight across the table. Each light bulb is controlled by a single switch, operated only by the Man in the Box. By creating on/off patterns like the ones on the EDB, the Man in the Box can use these four sets of light bulbs to work math problems. In a real computer, these worktables are called **registers** and store internal commands and data.



## 15. What is Clock Speed and Clock Wire.

- **Clock Speed:** The maximum number of clock cycles that a CPU can handle in a given period of time is referred to as its clock speed.  
The clock speed is the fastest speed at which a CPU can operate, determined by the CPU manufacturer.
- **Clock Wire:** The bell on a real CPU is a special wire called the clock wire (most diagrams label the clock wire CLK). A charge on the CLK wire tells the CPU that another piece of information is waiting to be processed



## 16. What are the symptoms of Overheating In CPU?

### Symptoms of Overheating

1. Too much thermal paste can impede the flow of heat from the CPU to the heat sink and cause the CPU to heat up rapidly. All modern CPUs have built-in fail-safes that tell them to shut down before getting damaged by heat.
2. Not enough thermal paste or thermal paste spread unevenly can cause the CPU to heat up and consequently shut itself down.
3. Failure to connect the fan power to the motherboard can cause the CPU to heat up and shut itself down.



## 17.What is RAM, Mention its Types.

- Random access memory (RAM) stores programs and data currently being used by the CPU. The maximum amount of programs and data that a piece of RAM can store is measured in units called bytes.

Types of RAM    SDRAM    RDRAM

## 18.What is BIOS?

- CPU needs some sort of support programming loaded into memory that teaches it about a particular device. This programming is called **Basic Input/output services (BIOS)**. The programs dedicated to enabling the CPU to communicate with devices are called services.



## 19.What is CMOS And RTC?

**CMOS:** Since ROM is read only, it needs a place to store all its settings so they don't have to be re-entered every time you boot your computer. That place is a tiny bit of RAM hooked up to a small battery to keep it working with the PC off. We call this memory the **complementary metal-oxide semiconductor (CMOS)** chip.

**RTC:** Stands for Real Time clock ,here you don't have to keep setting the anytime on every boot.

## 20.Expand BIOS,CMOS,RTC.

**BIOS**-Basic Input Output Services  
Semiconductor

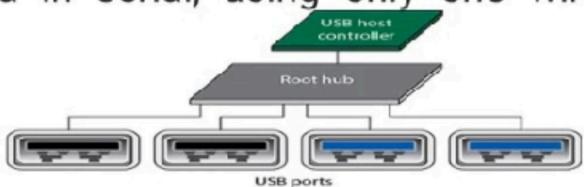
**CMOS**- Complementary Metal-Oxide

**RTC**- Real Time Clock

## 21. What is parallel and Serial ATA

**Parallel ATA (PATA)**: The older **parallel ATA (PATA)** drives send data in parallel, on a wide 40- or 80-wire data cable called a ribbon cable.

**Serial ATA (SATA)**: drives that send data in serial, using only one wire for data transfers.



## 22. What is USB Host Controller?

The **USB host controller**, an integrated circuit that is usually built into the chipset, controls every USB device that connects to it. Inside the host controller is a **USB root hub**: the part of the host controller that makes the physical connection to the USB ports

## 23. What are POST Cards?

POST cards are simple cards that snap into expansion slots on your system. A small, two-character light-emitting diode (LED) readout on the card indicates which device the POST is currently testing.

## 24. What is System Lookup and Page fault?

**System lockups and page faults** in Windows can indicate a problem with RAM.

**A system lockup** is when the computer stops functioning.

**A page fault** is a milder error that can be caused by memory issues but not necessarily system RAM problems.

## 25. What is Auto-detection?

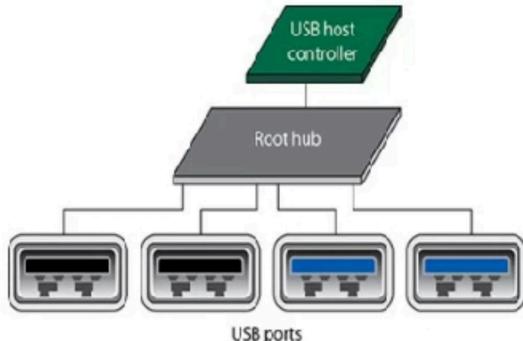
If the controllers are enabled and the drive is properly connected, the drive should appear in CMOS through a process called **autodetection**. Autodetection is a powerful and handy feature that takes almost all the work out of configuring hard drives.

## 26. What is partition table in Master Boot Record.

**partition table**, which describes the number and size of partitions on the disk. MBR partition tables support up to four partitions—the partition table is large enough to store entries for only four partitions. The instructions in the master boot record use this table to determine which partition contains the active operating system.

## 27. What are USB Root Hub?

**USB root hub**: the part of the host controller that makes the physical connection to the USB ports. Every USB root hub is really just a bus—similar in many ways to an expansion bus.



## 5 Marks Questions

### 1.Explain Any Five Devices and Their Connectors.

#### Keyboard

- Keyboard always connect to your computer by either a **mini-DIN port or a USB port**. Many keyboards ship with an adapter so you can use either port.
- Most keyboard plugs and mini-DIN keyboard ports are colored purple.



▪ Figure 3.19 Keyboard plug and port

#### Monitor

- A monitor connects to the video connector on the system unit.
- We usually see one of two types of video connectors: the older, 15-pin female **DB Video Graphics Array (VGA)** connector or the unique **digital visual interface (DVI)** connector.
- VGA connectors are colored blue, whereas DVI connectors Figure are white.
- Many video cards have both types of connectors or two VGA or two DVI connectors.



▪ Figure 3.20 Video card with (from left to right) S-Video, DVI, and VGA ports

- The newest video connector is called **High-Definition Multimedia Interface (HDMI)**. HDMI brings a number of enhancements, such as the ability to carry both video and sound on the same cable. Primarily designed for home theatres, computers with HDMI connectors grow more common every year



• Figure 3.21 HDMI connector

## Sound

- The sound device in a computer performs two functions.
- First, it takes digital information and turns it into sound, outputting the sound through speakers.
- Second, it takes sound that is input through a microphone or some other audio source and turns it into digital data.
- To play and record sounds, your sound device needs to connect to a set of speakers and a microphone more. All PCs have at least two miniature audio jacks: one for a microphone and another for stereo speakers. Better cards provide extra miniature audio jacks for surround sound.

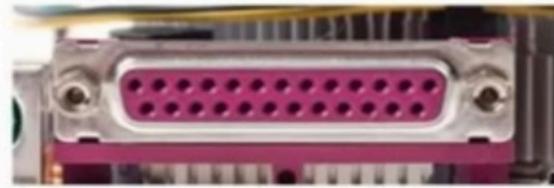


## Mouse

- Mouse enables you to select graphical items on a graphical screen. A PC mouse has at least two buttons, while a better mouse provides a scroll.

## Printer

- For many years, printers only used a special connector called **a parallel port**.
- Modern printers now come with USB ports.



• Figure 3.29 Parallel port

## 2. What is NIC And Explain how to fix NIC onto a system.

- A NIC (Network Interface Card) **is also called as network card, network adapter and LAN Adapter** is a piece of computer hardware designed to allow computers to communicate over a computer network.
- It allows users to connect to each other either through wired or wireless network.
- A network card typically has a twisted pair port where the network cable is connected, and a few LEDs to inform the user of whether the network is active.



## Fixing a NIC onto a system

- The only considerations for installation are that you have an available slot and that the NIC is designed for the slot type you have. Most systems use a PCI (Peripheral Component Interface) slot for a NIC.

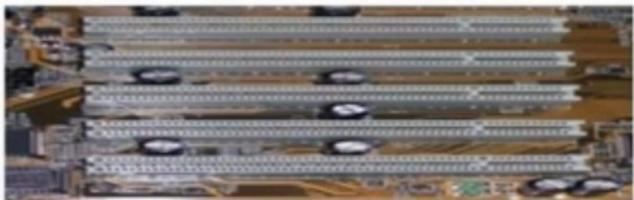


Fig 1.1.2.4 PCI (Peripheral Component)

- Check that you have an available slot and the slot type, before purchasing a NIC.

### Steps:

1. Unplug (Power Off) the system.
2. Remove the cover of the case/cabinet of the CPU (Control Processing Unit).
3. Remove the cover plate adjacent to the slot for your NIC to be fixed.

fig 1.1.2.5.

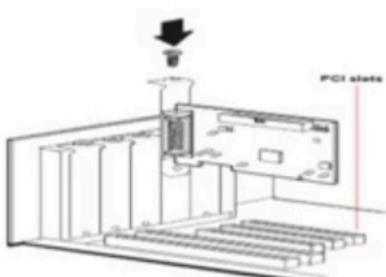
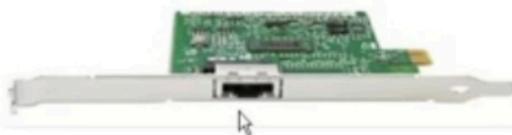


Fig 1.1.2.5 How to mount the Network Interface Card (NIC) onto the motherboard.

4. Align the NIC over the slot with the jack facing the outside of the system.
5. Set the NIC into the slot and press down firmly. Make sure the mounting bracket is properly aligned with any slot that might be present. The card should be level and straight.
6. Secure the NIC mounting bracket to the case with a screw (or replace the securing mechanism your case uses).
7. Replace the cover.
8. Plug in the system.
9. Plug in the Ethernet wire to the RJ-45 jack and plug the other end into the modem, hub, and router or if using a crossover wire, connect directly to another system



## 5 Marks Questions

### 3. Explain Crimping with its Types.



► *The process of inserting a Cat5 cable into a RJ45 jack and fixing them firmly is called Crimping.*

**The steps for crimping are:**

1. Begin by stripping the outer insulation covering from the end of the cable.
2. Cut down the amount of exposed cable. The process of installing the RJ-45 connector will be easier if you have plenty of exposed cable to work with.



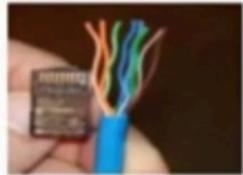
3. Once the outer layer of the wire is removed, you'll see pairs of wire are twisted together (hence the name twisted-pair cable). Untwist these wires.
4. Once all the wires have been separated, pull them backward, so that you can cut off the exposed plastic core. Refer fig 2.25(1).
5. Now that the core has been removed, your next task is to straighten the wires that were previously twisted.

Next arrange the wires in an order by following the standard color code. Refer fig 2.25(2).

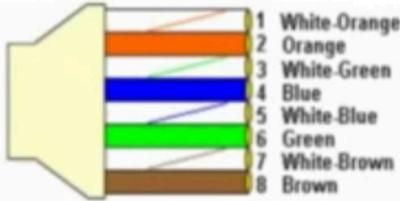
4



6. Next fix the wires inside the RJ45 jack properly. Refer fig 2.25(3).
7. The crimping tool is used to crimp a network cable, so that the wires are firmly fixed inside the RJ45 jack. Refer fig 2.25 (4).
8. Make sure that the wires are arranged in the proper order.  
Refer fig 2.25(2).
9. Test the crimped cable by using the testing tool to verify so that the network cable can be used in a LAN



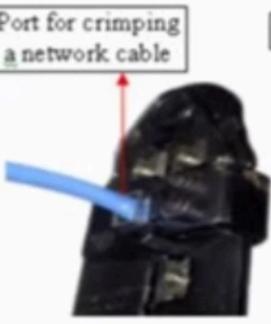
(1)



(2)



(3)



(4)



(5)

Fig 2.25 Crimping

## There are Two type of cable crimping available

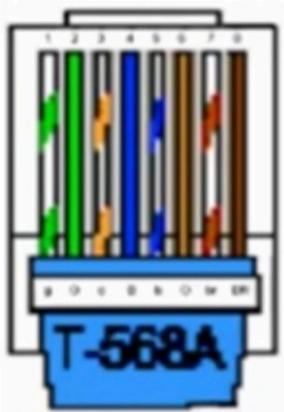
1. Straight cable coloring order.
2. Cross-cable .

### 1.Crimp and Test Straight cable:

- To Crimp, test and connect 4 PC's with a straight cable. Also, check the network connectivity.
- **Crimping:** Using the crimping tool both ends of the RJ45 cable needs to be crimped. Make sure that the cables are fixed inside the jack perfectly and then crimped.
- At the time of crimping one should be conscious of IEEE standard color code format.
- There are 2 types of wires **T-568A** and **T-568B**.

## APPENDIX-A

Color Coding Format for T-568A



Wire No(From Left to Right)	Wire Color
1	White & Green (g)
2	Only Green (G)
3	White & Orange (o)
4	Only Blue (B)
5	White & Blue (b)
6	Only Orange (O)
7	White & Brown (br)
8	Only Brown (BR)

## APPENDIX B

Color Coding Format for T-568B



Wire No(From Left to Right)	Wire Color
1	White & Orange (o)
2	Only Orange (O)
3	White & Green
4	Only Blue (B)
5	White & Blue (b)
6	Only Green (G)
7	White & Brown (br)
8	Only Brown (BR)



- **Connecting:** By using a Cross-over network cable 2 systems can be connected directly without a switch or a hub.
- Connect 2 PC's by using a Cross-over cable and check whether the crimped cable is perfect for use.
  
- The crimped RJ45 cables have to be checked using the **testing** tool.



## 2.Crimp and Test cross-over cable.

To Crimp, test and connect PC's with a cross-over cable and check network connectivity.

**Apparatus:** A Cross-over cable, Crimping tool, Network cable tester and 2 working PC's.



**Crimping:** Using the crimping tool both ends of the RJ45 cable needs to be crimped. Make sure that the cables are fixed inside the jack perfectly. Refer fig 1.1.6.2.



Fig 1.1.6.2 Crimping a Cross over network cable

At the time of crimping one should be conscious of IEEE standard color code format. In the same wire there are 2 different types of ends. One end is T-568A and the other end is T-568B. Refer fig 1.1.6.3.

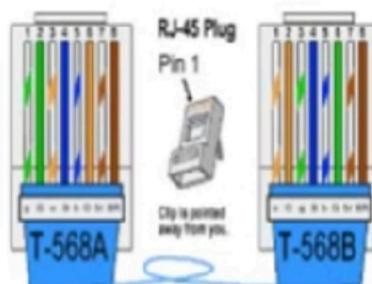


Fig 1.1.6.3 Colour coding format for T-568A and T-568B

## APPENDIX-A



Color Coding Format for T-568A

Wire No(From Left to Right)	Wire Color
1	White & Green (w/G)
2	Only Green (G)
3	White & Orange (w/O)
4	Only Blue (B)
5	White & Blue (w/B)
6	Only Orange (O)
7	White & Brown (w/Br)
8	Only Brown (BR)

## 4.Explain how to setup Local Area Network.

### User Account Creation

#### User Accounts

- Every user account has a user name and a password. A user name is a text string that identifies the user account assigned to a system.
- Examples are “Mike1” or “john.smith” or “some.[person@hotmail.com](mailto:person@hotmail.com).” Associated with every user name is a password: a unique key known only by the system and the person using that user name.
- Every Windows system stores the user accounts as an encrypted database of user names and passwords. Windows calls each record in this database a **local user account**.



## Passwords

- ▶ Passwords help secure user accounts.
- ▶ Make sure users have a **strong password**: at least eight characters in length, including letters, numbers, and non-alphanumeric symbols.



## Create a local user account

1. Select **Start > Settings > Accounts** and then select **Family & other users**. (In some editions of Windows you'll see **Other users**.)
2. Select **Add someone else to this PC**.
3. Select **I don't have this person's sign-in information**, and on the next page, select **Add a user without a Microsoft account**.
4. Enter a user name, password, password hint or choose security questions, and then select **Next**.

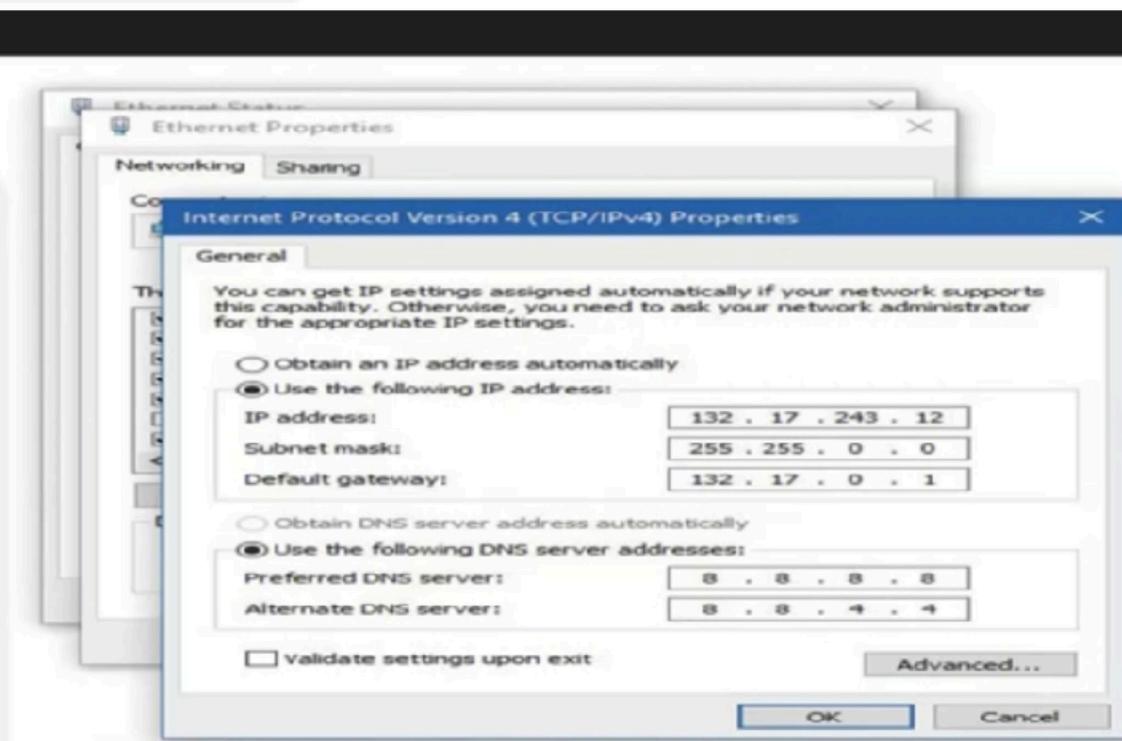
## Configuring the IP Address:

- **Network protocol** software takes the incoming data received by the network card, keeps it organized, sends it to the application that needs it, and then takes outgoing data from the application and hands it to the NIC to be sent out over the network. All networks use some network protocol.

## Configuring TCP/IP

- By default, TCP/IP is configured to receive an IP address automatically from a DHCP server on the network (and automatically assign a corresponding subnet mask). Occasionally, you might need to configure an *alternative IP address in Windows*, either for the computer or for something upstream, like the DNS server. Here's how to do it manually:

1. In Windows, open the Control Panel and go to the Network and Sharing Center applet. Click Change adapter settings. After that, double-click the Local Area Network icon.
2. Click the Properties button, highlight Internet Protocol Version 4 (TCP/IPv4), and click the Properties button.
3. In the Properties dialog box, click the radio button next to Use the following IP address.



4. Enter the IP address in the appropriate fields.
5. Press the TAB key to skip down to the Subnet mask field. Note that the subnet mask is entered automatically, although you can type over this if you want to enter a different subnet mask.
6. Optionally, enter the IP address for a default gateway.
7. Optionally, enter the IP addresses of a Preferred DNS server and an Alternate DNS server.
8. Click the OK button to close the Properties dialog box.
9. Click the Close button to exit the Local Area Connection Status dialog box.

5.Explain how to create user accounts.

6.Explain how to configure IP Address.

7.Write a note on MAC Addressing.

### MAC Addressing

A Media Access Control address is a unique identifier assigned to a Network Interface Controller for use as a network address in communication within network segment.

- To identify MAC Address of a system.
- Double click on the network icon that is available on the tool-bar. Click on the Support tab,

- ▶ Click on Details button,
- ▶ **MAC Address is also called as the Physical/LAN Address.** When the details button is clicked, the MAC address of your system is obtained. Refer the figure available below.

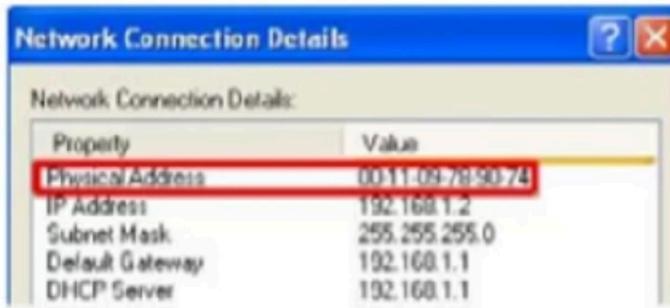


Fig 2.2.1.2 Network connection details window.

An alternate way of finding the MAC Address is as follows,

- ▶ Click Start-> Run (or press Windows button + r),

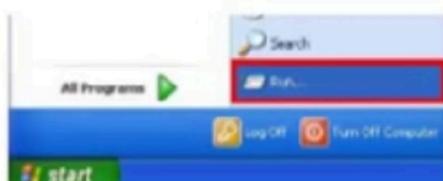


Fig 2.2.1.3 Run command.

- Type “cmd” and click on OK to open the command prompt.

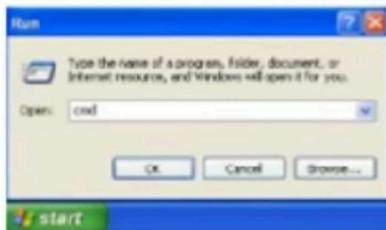


Fig 2.2.1.4 Run command window

- Type ipconfig/all to obtain the MAC addresses of that system,

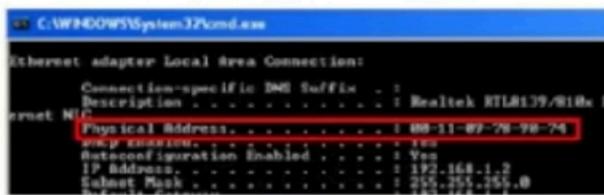


Fig 2.2.1.5 Ipconfig details

## 8. Write a short note on   i. Ping Command      ii. IPConfig Command

- Ping is used primarily to find out if a computer is reachable.
- Ping accomplishes this task by sending out a special packet called the Internet Control Message Protocol (ICMP) echo request packet. ICMP packets are special IP messages that are used to send network information between two hosts (computers, routers, switches, etc.).
- When a machine receives an echo request, it responds with an echo reply.

## **Follow the Steps given below,**

- In a Windows XP environment, click on Start Run. Type command into the dialog box, then click OK.
- In the resulting command line window, type ping hostname, where hostname can be a domain name, a machine name or an IP address.
- Press Enter button on the keyboard. Some of the common outputs obtained are as follows,

### **► Request Timed out -**

- The Request Timed Out **error message** is very common when you use the ping command.
- This error message is obtained when,
  - The host/source system has not received the acknowledgment/response from the destination system.
  - The destination system has not responded to the source in the designated time.

The following example shows the output of an host system trying to ping an invalid IP address:

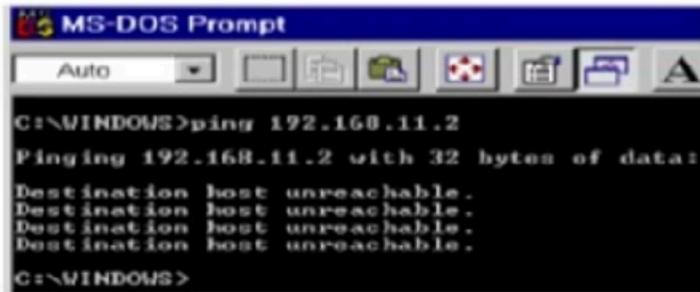
```
C:\>ping 205.127.18.1
Pinging 205.127.18.1 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 205.127.18.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>
```

**Fig 3.1.1.3 Pinging of an invalid IP**

- ▶ **Explanation:**
- ▶ One ICMP (Internet Control Message Protocol - is a message control and error-reporting protocol between a host server and a gateway to the Internet.) Echo request packet is sent every second to the destination system. When the ping program gets an echo reply back from the remote host (destination system), it prints out the response, giving several pieces of information:
- ▶ IP address of where the Echo Reply came from (usually this should be the IP address of destination)
- ▶ Number of bytes of data sent
- ▶ Round trip time it took for a packet to go to and from the remote host
- ▶ Time to live (TTL) field

**Destination host unreachable** - When a router cannot route or a host cannot deliver the packets, the packets are discarded and the router or the host sends a Destination host unreachable message back to the source host that initiated the packets. This message will come up when there are **network problems, possibly due to a hardware failure**



The screenshot shows a MS-DOS Prompt window with the title bar "MS-DOS Prompt". The window contains the following text:  
C:\>ping 192.168.11.2  
Pinging 192.168.11.2 with 32 bytes of data:  
Destination host unreachable.  
Destination host unreachable.  
Destination host unreachable.  
Destination host unreachable.  
C:\>

Fig 3.1.1.6 A varying ping response from the destination.

#### IPConfigCommand :

- Shows network, adapters and interfaces configuration.
- IPConfig (Internet Protocol Configuration) allows you to renew DHCP configuration or send the command to DHCP server to release and discard the IP address configuration.
- This tool is very useful on computers that are configured to obtain an IP address automatically.
- The Syntax, Options and examples for “IPConfig” are given below. This is Obtained by typing in “ipconfig/?” in the command prompt.

- When “ipconfig” alone is typed in the command prompt the information similar to the one below comes up,

```
C:\>ipconfig
Windows IP Configuration

Ethernet adapter Local Area Connection:

  Connection-specific DNS Suffix . . . . . : 192.168.1.13
  IP Address . . . . . : 192.168.1.13
  Subnet Mask . . . . . : 255.255.255.0
  Default Gateway . . . . . : 192.168.1.1
```

Details obtained when ipconfig command is used in the command prompt.

Fig 3.1.3.4 How to use an “ipconfig

## 9. Write a short note on

- i. NetStat Command
- ii. Tracert Command
- iii. Net Command

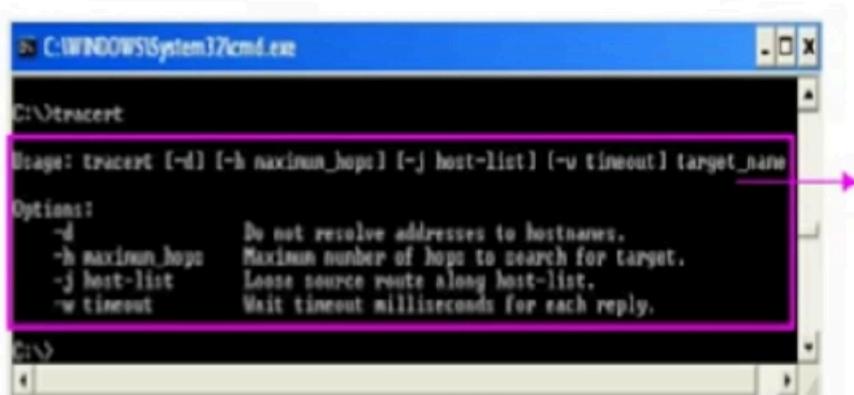
### i. NetStat Command

- Monitors Internet connections on your computer. It shows the information on all active TCP and UDP connections, local and remote ports, connection states and the owning process.
- Click Start Run Type cmd, to enter into the command prompt.

Syntax: NETSTAT [-a] [-e] [-n] [-s] [-p proto] [-r] [interval]

Commands	Explanation
-a	Displays all connections and listening ports.
-e	Displays Ethernet statistics. This may be combined with the -s option.
-n	Displays addresses and port numbers in numerical form.
-p	Proto Shows connections for the protocol specified by proto; proto may be TCP or UDP. If used with the -s option to display per-protocol statistics, proto may be TCP, UDP, or IP.
-r	Displays the routing table.
-s	Displays per-protocol statistics. By default, statistics are shown for TCP, UDP and IP; the -p option may be used to specify a subset of the default.
interval	Redisplays selected statistics, pausing interval seconds between each display. Press CTRL+C to stop redisplaying statistics. If omitted, netstat will print the current configuration information once.

**ii.Tracert Command:** This command is used to visually see a network packet being sent and received and the amount of hops required for that packet to get to its destination.



Details (i.e. Syntax, meaning, etc) for different options under ipconfig

Fig 3.1.3.5 Details of a Tracert



**iii. Net Command:** The net command is used to view the network or send messages or network settings, etc. Some of the Net commands are explained below,

- ▶ **Net Send:** Sends messages to other users, computers, or messaging names on the network. The Messenger service must be running to receive messages.
- ▶ You can send a message only to an name that is active on the network. If the message is sent to a username, that user must be logged on and running the Messenger service to receive the message.



- ▶ **Net View:** This command is used to view the systems that are available in the network.
- ▶ Displays a list of computers in a specified workgroup or the shared resources available on a specified computer.

## **10.Explain Ping Command, and write any 5 ping command options**

- Ping is used primarily to find out if a computer is reachable.
- Ping accomplishes this task by sending out a special packet called the Internet Control Message Protocol (ICMP) echo request packet. ICMP packets are special IP messages that are used to send network information between two hosts (computers, routers, switches, etc.). When a machine receives an echo request, it responds with an echo reply.

### **Follow the Steps given below,**

- In a Windows XP environment, click on Start Run. Type command into the dialog box, then click OK.
- In the resulting command line window, type ping hostname, where hostname can be a domain name, a machine name or an IP address.
- Press Enter button on the keyboard. Some of the common outputs obtained are as follows,

## Request Timed out -

- The Request Timed Out error message is very common when you use the ping command.

This error message is obtained when,

- the host/source system has not received the acknowledgment/response from the destination system.
- the destination system has not responded to the source in the designated time

## ► Understanding Ping Command's options

**Ping Command Options**

Item	Explanation
<b>-t</b>	Using this option will ping the <i>target</i> until you force it to stop by using <u>Ctrl+C</u> .
<b>-a</b>	This ping command option will resolve, if possible, the <u>hostname</u> of an <u>IP address</u> <i>target</i> .
<b>-n count</b>	This option sets the number of ICMP Echo Requests to send, from 1 to 4294967295. The ping command will send 4 by default if <b>-n</b> isn't used.
<b>-l size</b>	Use this option to set the size, in <u>bytes</u> , of the echo request packet from 32 to 65,527. The ping command will send a 32-byte echo request if you don't use the <b>-l</b> option.
<b>-f</b>	Use this ping command option to prevent ICMP Echo Requests from being fragmented by routers between you and the <i>target</i> . The <b>-f</b> option is most often used to troubleshoot Path Maximum Transmission Unit (PMTU) issues.
<b>-i TTL</b>	This option sets the Time to Live (TTL) value, the maximum of which is 255.

-v TOS	This option allows you to set a Type of Service (TOS) value. Beginning in Windows 7, this option no longer functions but still exists for compatibility reasons.
-r count	Use this ping command option to specify the number of <u>hops</u> between your computer and the <i>target</i> computer or device that you'd like to be recorded and displayed. The maximum value for <i>count</i> is 9, so use the <u>tracert</u> <u>command</u> instead if you're interested in viewing all the hops between two devices.
-s count	Use this option to report the time, in Internet Timestamp format, that each echo request is received and echo reply is sent. The maximum value for <i>count</i> is 4, meaning that only the first four hops can be time stamped.
-w timeout	Specifying a <i>timeout</i> value when executing the ping command adjusts the amount of time, in milliseconds, that ping waits for each reply. If you don't use the -w option, the default timeout value of 4000 is used, which is 4

## 11.Explain Microprocessor

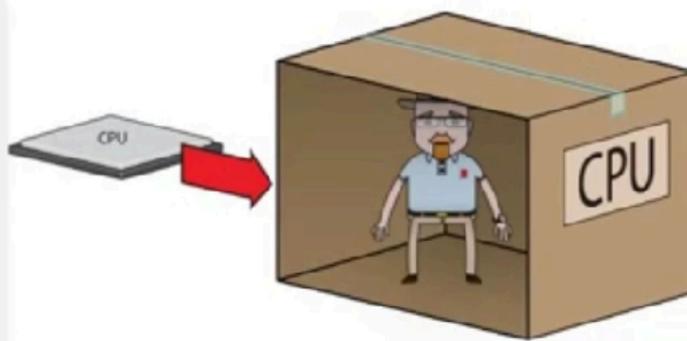
- The central processing unit (CPU) does most of the calculations that make your computer...well, a computer.
- The CPU, also known as a microprocessor, invariably hides on the motherboard below a large heat sink and often a fan assembly as well.

## CPU Core Components

- A CPU functions more like a very powerful calculator than like a brain.
- Today's CPUs add, subtract, multiply, divide, and move billions of numbers per second. Processing that much information so quickly makes any CPU look intelligent. It's simply the speed of the CPU, rather than actual intelligence, that enables computers to perform tasks such as accessing the Internet, playing visually stunning games, or editing photos.

## The Man in the Box

- The Man in the box can perform virtually any mathematical function, manipulate data, and give answers very quickly



- ▶ Before he can work with us, we must come up with a way to exchange information with him
- ▶ Imagine that we install a set of 16 light bulbs, 8 inside his box and 8 outside his box. Each of the 8 light bulbs inside the box connects to one of the 8 bulbs outside the box to form a pair. Each pair of light bulbs is always either on or off. You can control the 8 pairs of bulbs by using a set of 8 switches outside the box, and the Man in the Box can also control them by using an identical set of 8 switches inside the box. This light-bulb communication device is called the **external data bus (EDB)**.
- ▶ In computers, wires repeatedly turn on and off. As a result, we can use this “1 and 0,” or **binary**, system to describe the state of these wires at any given moment.

## Registers

- ▶ The Man in the Box provides good insight into the workspace inside a CPU. The EDB gives you a way to communicate with the Man in the Box so you can give him work to do. But to do this work, he needs a worktable; in fact, he needs at least four worktables. Each of these four worktables has 16 light bulbs. These light bulbs are not in pairs; they’re just 16 light bulbs lined up straight across the table. Each light bulb is controlled by a single switch, operated only by the Man in the Box. By creating on/off patterns like the ones on the EDB, the Man in the Box can use these four sets of light bulbs to work math problems. In a real computer, these worktables are called **registers** and store internal commands and data.

- ▶ All CPUs contain a large number of registers, but for the moment let's concentrate on the four most common ones: the *general-purpose registers*. Intel named them AX, BX, CX, and DX.
  - ▶ By placing machine language commands—called *lines of code*—onto the EDB one at a time, you can instruct the Man in the Box to do specific tasks. All of the machine language commands that the CPU understands make up the CPU's [instruction set](#).
- 

## Clock

- ▶ The bell on a real CPU is a special wire called the [clock wire](#) (most diagrams label the clock wire CLK).
- ▶ A charge on the CLK wire tells the CPU that another piece of information is waiting to be processed.
- ▶ The maximum number of clock cycles that a CPU can handle in a given period of time is referred to as its [clock speed](#).
- ▶ The clock speed is the fastest speed at which a CPU can operate, determined by the CPU manufacturer. The Intel 8088 processor had a clock speed of 4.77 MHz (4.77 million cycles per second), extremely slow by modern standards, but still a pretty big number compared to using a pencil and paper. CPUs today run at speeds in excess of 3 GHz (3 billion cycles per second).

- 1 hertz (1 Hz) = 1 cycle per second
- 1 megahertz (1 MHz) = 1 million cycles per second
- 1 gigahertz (1 GHz) = 1 billion cycles per second

## 12. Write a note about Selection and Installing CPU.

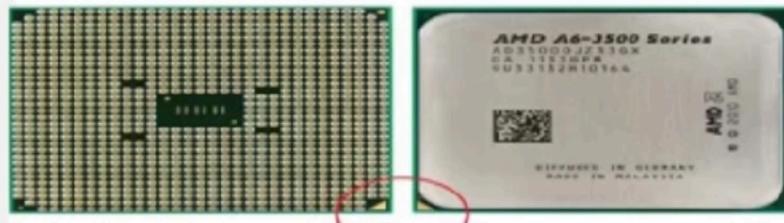
### SELECTING AND INSTALLING CPUS

#### Selecting a CPU

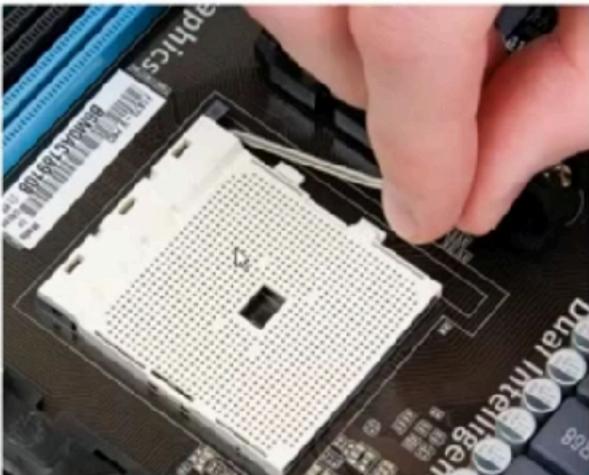
- When selecting a CPU, you need to make certain you get one that the motherboard can accommodate.
- Or, if you're buying a motherboard along with the CPU, then get the right CPU for the intended purpose.
- You need to have a lot more knowledge of all the pieces around the CPU to get the full picture.

#### Installing

- All CPUs and sockets are keyed so you can't (easily) insert them incorrectly.
- Look at the underside of the CPU in [Figure](#) (left). Note that the pins do not make a perfect square, because a few are missing.
- Now look at the top of the CPU (right). See the little mark at the corner? The socket also has tiny markings so you can line the CPU up properly with the socket.



In both socket styles, you release the retaining mechanism by pushing the little lever down slightly and then away from the socket. You next raise the arm fully, and then move the retaining bracket



### **Cooling**

- ▶ CPUs work very hard and thus require power to function.
  - ▶ In electrical terms, CPUs consume wattage, or watts, a unit of electrical power, just like a 100-watt light bulb consumes power whenever it's on.
  - ▶ To increase the capability of the CPUs to handle complex code, CPU manufacturers have added a lot of microscopic transistors over the years.
- 
- 
- ▶ The more transistors the CPU has, the more power they need and thus the hotter they get.
  - ▶ CPUs don't tolerate heat well, and modern processors need active cooling solutions just to function at all. Almost every CPU uses a combination of a heat-sink and fan assembly to avoid heat away from the CPU.

## 13. Write a note on SDRAM And RDRAM.

### SDRAM

- Most modern systems use some form of **synchronous DRAM (SDRAM)**.
- SDRAM made its debut in 1996 on a stick called a **dual inline memory module (DIMM)**. The early SDRAM DIMMs came in a wide variety of pin sizes. The most common pin sizes found on desktops were the 168-pin variety.
- Laptop DIMMs came in 68-pin, 144-pin, or 172-pin micro-DIMM packages; and the 72-pin, 144-pin, or 200-pin small-outline DIMM (SO-DIMM) form factors.

### RDRAM

- Intel announced plans to replace SDRAM with a very fast, new type of RAM developed by Rambus, Inc., called Rambus DRAM, or simply RDRAM.



• Figure 4.11 RDRAM

- ▶ RDRAM was greatly anticipated by the industry for years, but industry support for RDRAM proved less than enthusiastic due to significant delays in development and a price many times that of SDRAM.
- ▶ From a tech's standpoint, RDRAM shared almost all of the characteristic of SDRAM. A stick of RDRAM was called a RIMM.

---

## 14. Explain about Troubleshooting of RAM.

### TROUBLESHOOTING RAM

- ▶ **System lockups and page faults** in Windows can indicate a problem with RAM.
- ▶ **A system lockup** is when the computer stops functioning.
- ▶ **A page fault** is a milder error that can be caused by memory issues but not necessarily system RAM problems.

- ▶ Certainly page faults look like RAM issues because Windows generates frightening error messages filled with long strings of hexadecimal digits, such as "KRNL386 caused a page fault a 03F2:25A003BC." Just because the error message contains a memory address however, does not mean that you have a problem with your RAM. Write down the address. If it repeats in later error messages, you probably have a bad RAM stick. If Windows displays different memory locations, you need to look elsewhere for the problem.

Every once in a while, something potentially catastrophic happens within the PC, some little electron hits the big red panic button, and the operating system has to shut down certain functions before it can save data. This panic button inside the PC is called a **non-maskable interrupt (NMI)**, more simply defined as an interruption the CPU cannot ignore. An NMI manifests as a **proprietary crash screen**. In Windows 7, for example, the crash screen is what techs call the **Blue Screen of Death (BSoD)** a bright blue screen with a scary-sounding error message on it.

- ▶ Windows 8/8.1/10 display a blue screen with a sad face and the words to the effect of Windows has a problem. Restart the machine.
- ▶ A mac OS machine might display a spinning rainbow wheel sometimes called **the Spinning Pinwheel of Death (SPoD)** or, more likely, will simply restart.
- ▶ Finally, intermittent memory errors can come from a variety of sources including a dying power supply, electrical interference, buggy applications, buggy hardware, and so on.

## 15. Write a note on BIOS.

### BIOS

- ▶ The CPU doesn't magically or otherwise automatically know how to talk with any device; it needs some sort of support programming loaded into memory that teaches it about a particular device. This programming is called **Basic Input/output services (BIOS)**.
- ▶ The programs dedicated to enabling the CPU to communicate with devices are called services.

## Bringing BIOS to the PC

- The CPU must have access to BIOS for the most important hardware on your PC: not only the keyboard, but also the monitor, mass storage drives, optical drives, USB ports, and RAM. This code can't be stored on a hard drive or optical disc- these important devices need to be ready at any time the CPU calls them even before installing a mass storage device or an operating system.

The perfect place to store the support programming is on the motherboard. That settles one issue, but another question: What storage medium should the motherboard use? DRAM won't work, because all of the data would be erased every time you turned off the computer. You need some type of permanent program storage device that does not depend on other peripherals to work. And you need that storage device to sit on the motherboard.

## CMOS and RTC

- ▶ Because the BIOS firmware is stored in ROM, and ROM is read only, it needs a place to store all its settings so they don't have to be re-entered every time you boot your computer. That place is a tiny bit of RAM hooked up to a small battery to keep it working with the PC off. We call this memory the **complementary metal-oxide semiconductor (CMOS)** chip. In addition to storing all the various BIOS settings, the CMOS also handles the system's real-time clock (RTC) so you don't have to keep setting the time on every boot.

If the data stored in CMOS about a piece of hardware is different from the specs of the actual hardware, the computer cannot access that piece of hardware. It is crucial that this information be correct. If you change any of the previously mentioned hardware, you must update CMOS to reflect those changes. You need to know, therefore, how to change the data in CMOS.



## **Text-Based UEFI Intel-Based Setup Utility**

- ▶ The Information tab offers straightforward information about the CPU and RAM amount, and cryptic information about the hard drive. Other tabs do more.
  
- ▶ The Configuration tab shows a number of built-in devices that you configure or enable/disable here. Because this is a portable, it has an option to turn on/off wireless networking capabilities.



The Boot tab enables you to set **boot options** to determine which bootable device gets priority. Here is where you provide support for booting to a USB device as well. It looks a little different from the graphical example presented earlier. See “The Boot Process” later in this chapter for more explanation.

## Explain BIOS Concept

### BIOS

- ▶ CPU needs some sort of support programming loaded into memory that teaches it about a particular device. This programming is called **Basic Input/output services (BIOS)**.
- ▶ The programs dedicated to enabling the CPU to communicate with devices are called **services**.
- ▶ In fact, every device on the computer needs BIOS

### BIOS

- ▶ CPU needs some sort of support programming loaded into memory that teaches it about a particular device. This programming is called **Basic Input/output services (BIOS)**.
- ▶ The programs dedicated to enabling the CPU to communicate with devices are called **services**.
- ▶ In fact, every device on the computer needs BIOS

### Bringing BIOS to the PC

- ▶ The **CPU** must have access to BIOS for the most important hardware on your PC: not only the keyboard, but also the monitor, mass storage drives, optical drives, USB ports, and RAM.
- ▶ This code can't be stored on a hard drive or optical disc- these important devices need to be ready at any time the CPU calls them even before installing a mass storage device or an operating system.

- The perfect place to store the support programming is on the motherboard.
- That settles one issue, but another looms: What storage medium should the motherboard use?
- DRAM won't work, because all of the data would be erased every time you turned off the computer.
- You need some type of permanent program storage device that does not depend on other peripherals to work. And you need that storage device to sit on the motherboard.

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## CMOS and RTC

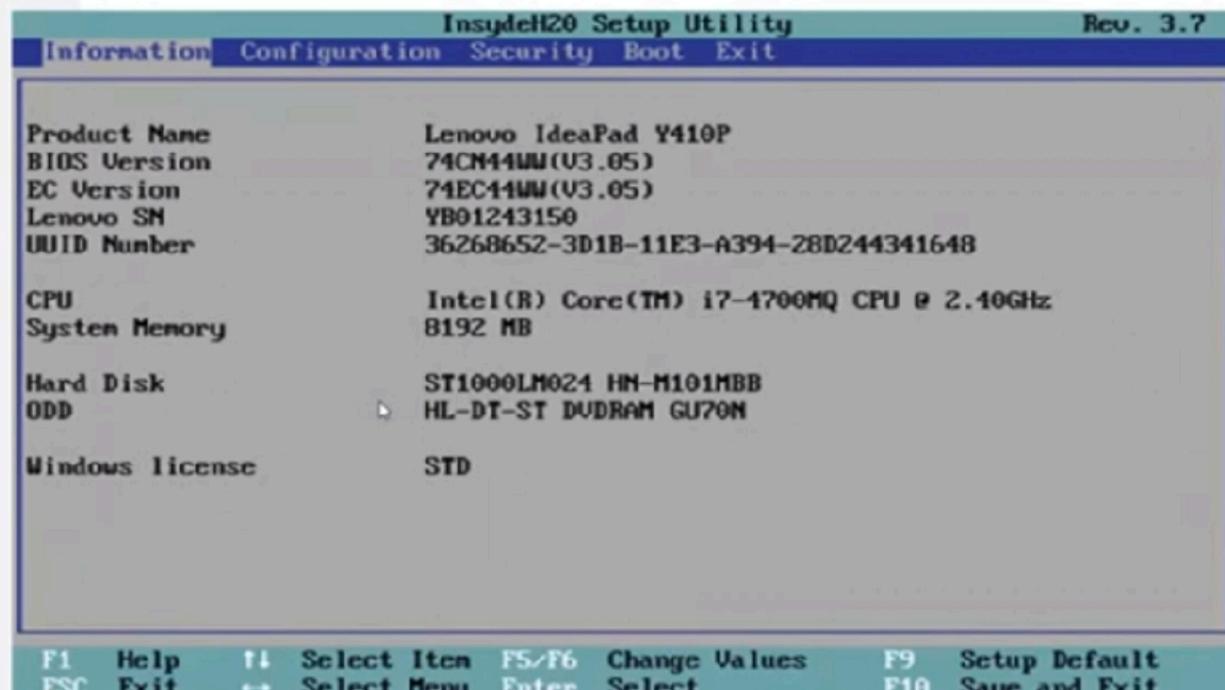
- Because the BIOS firmware is stored in ROM, and ROM is read only, it needs a place to store all its settings so they don't have to be re-entered every time you boot your computer.
- That place is a tiny bit of RAM hooked up to a small battery to keep it working with the PC off. We call this memory the **complementary metal-oxide semiconductor (CMOS)** chip (Figure 5.13).
- In addition to storing all the various BIOS settings, the CMOS also handles the system's real-time clock (RTC) so you don't have to keep setting the time on every boot.

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## Text-Based UEFI Intel-Based Setup Utility

- In this second walkthrough, we'll switch to a UEFI motherboard on an Intel-based portable computer. As we go through the screens, pay attention to the options listed on each.
- The Information tab (see [Figure 5.22](#)) offers straightforward information about the CPU and RAM amount, and cryptic information about the hard drive. Other tabs do more.

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- The Configuration tab (see [Figure 5.23](#)) shows a number of built-in devices that you configure or enable/disable here.
- Because this is a portable, it has an option to turn on/off wireless networking capabilities.
- The Boot tab (see [Figure 5.25](#)) enables you to set **boot options** to determine which bootable device gets priority. Here is where you provide support for booting to a USB device as well.

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## POST Cards (Power On Self Test)

- POST cards are simple cards that snap into expansion slots on your system.
- A small, two- character light-emitting diode (LED) readout on the card indicates which device the POST is currently testing (see [Figure 5.31](#)).



► [Figure 5.31](#) POST card in action

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- Beep codes, numeric codes, and text error codes, although helpful, can sometimes be misleading. Worse than that, an inoperative device can sometimes disrupt the POST, forcing the machine into an endless loop.
- This causes the PC to act dead- no beeps and nothing on the screen. In this case, you need a device, called a POST card, to monitor the POST and identify which piece of hardware is causing the trouble.

---

## Installing and Maintaining Power Supplies

- Although installing and maintaining power supplies takes a little less than selecting the proper power supply for a system, they remain essential skills for any tech.
- Installing takes but a moment, and maintaining is all most as simple.

---

### Installing

- The typical power supply connects to the PC with four standard computer screws, mounted in the back of the case (see Figure 7.28).
- Unscrew the four screws and the power supply lifts out easily (see Figure 7.29).
- Insert a new power supply that fits the case and attach it by using the same four Screws.

- ▶ Handling ATX power supplies requires special consideration.
- ▶ Understand that an ATX power supply never turns off.
- ▶ As long as that power supply stays connected to a power outlet, the power supply will continue to supply 5V to the motherboard.
- ▶ Always unplug an ATX system before you do any work!

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- ▶ Many ATX power supplies provide a real on/off switch on the back of the PSU (see Figure 7.30).
- ▶ If you really need the system shut down with no power to the motherboard, use this switch when working on an ATX system
- ▶ One trick when in that situation is to use a metal key or a screwdriver to contact the two wires to start and stop the system (see Figure 7.31).
- ▶ Your first task after acquiring a new power supply is simply making sure it works.
- ▶ Insert the motherboard power connectors before starting the system.
- ▶ If you have video cards with power connectors, plug them in too.

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## Cooling

- ▶ Cooling is vital consideration when building a computer.
  - ▶ Computers, being electrical devices, generate heat as they operate.
  - ▶ And too much heat can seriously damage a computer's internal components.
- 
- ▶ The **power supply fan** provides the basic cooling for the PC (see Figure 7.32).
  - ▶ It not only cools the voltage regulator circuits within the power supply but also provides a **constant flow of outside air throughout the interior of the computer case**.
  - ▶ A dead power supply fan can rapidly cause tremendous problems, even equipment failure.
  - ▶ If the power supply fan has died, replace the power supply.
- 
- ▶ Some **power supplies** come with a **built-in sensor** to help regulate the airflow.
  - ▶ If the system gets too hot, the power supply fan spins faster (see Figure 7.33).
  - ▶ **Case fans** are large, square fans that snap into special brackets on the case or screw directly to the case, providing extra cooling for key components (see Figure 7.34).
  - ▶ Most cases come with a **case fan**, and no modern computer should really be without one or two.

- The single biggest issue related to case Fans is where to plug them in Case fans may come with standard connectors, which are easy to plug in.
- Or they may come with special power connectors that need to connect to the motherboard.
- You can get adapters to plug these connectors into Molex connectors or vice versa.

## Modular Power Supplies

- To help stylish people, manufacturers created power supplies with modular cables (see Figure 7.41).
- Modular cables are pretty cool, because you add only the lines you need for your system.



## Temperature and Efficiency

- Watch out for power supplies that list their operating temperature at 25° C-about room temperature.
- A power supply that provides 500 W at 25° C will supply substantially less in warmer temperatures, and the inside of your PC is usually 15° C warmer than the outside air.