



Part~B Unit~1

WEB APPLICATIONS

What is a Computer Network?

A computer network is a group of computers and peripheral devices connected through data communication channel that allow sharing of resources and information

Internet is an example of network

TYPES OF NETWORK

Depending on their size, capabilities and the geographical distance they cover, network can be classified as follows

- Personal Area Network ~ PAN
- Local Area Network ~ LAN
- Metropolitan Area Network ~ MAN
- Wide Area Network ~ WAN

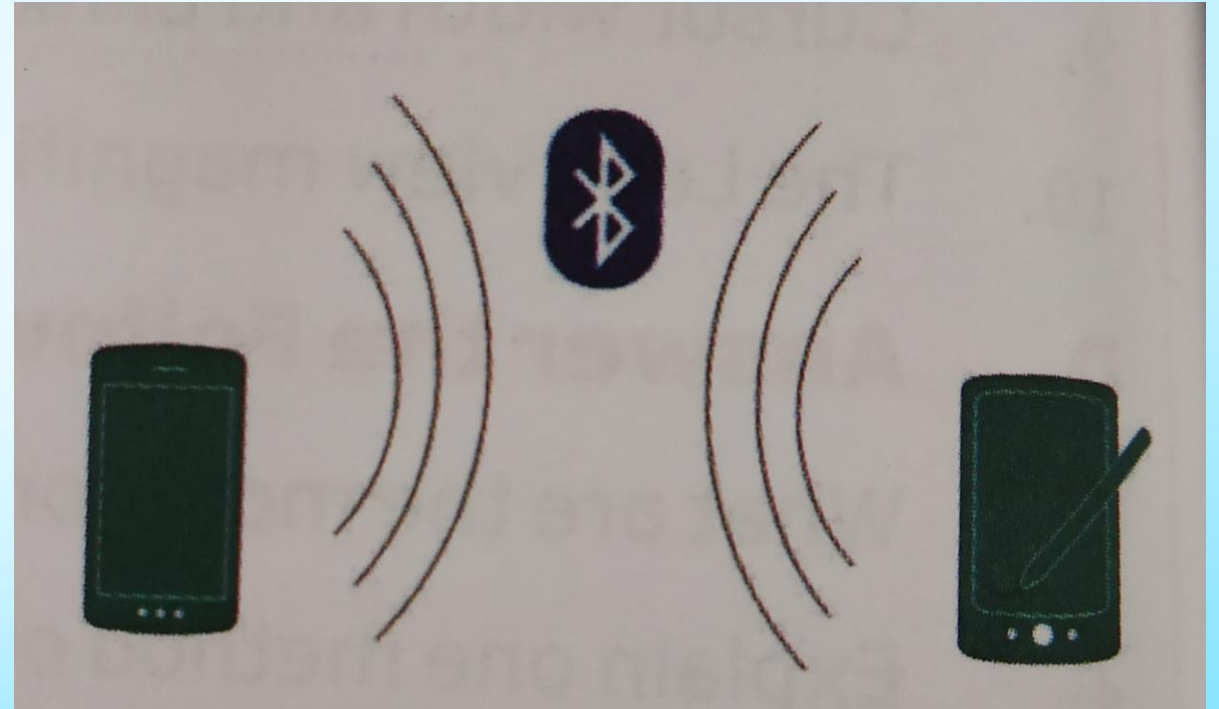
Personal Area Network (PAN)

Very small area network such as home or an office

Computers, tablets, smart phones, printers, wireless headsets are the nodes

Uses Bluetooth, wifi technology

Covers less than 10 meters

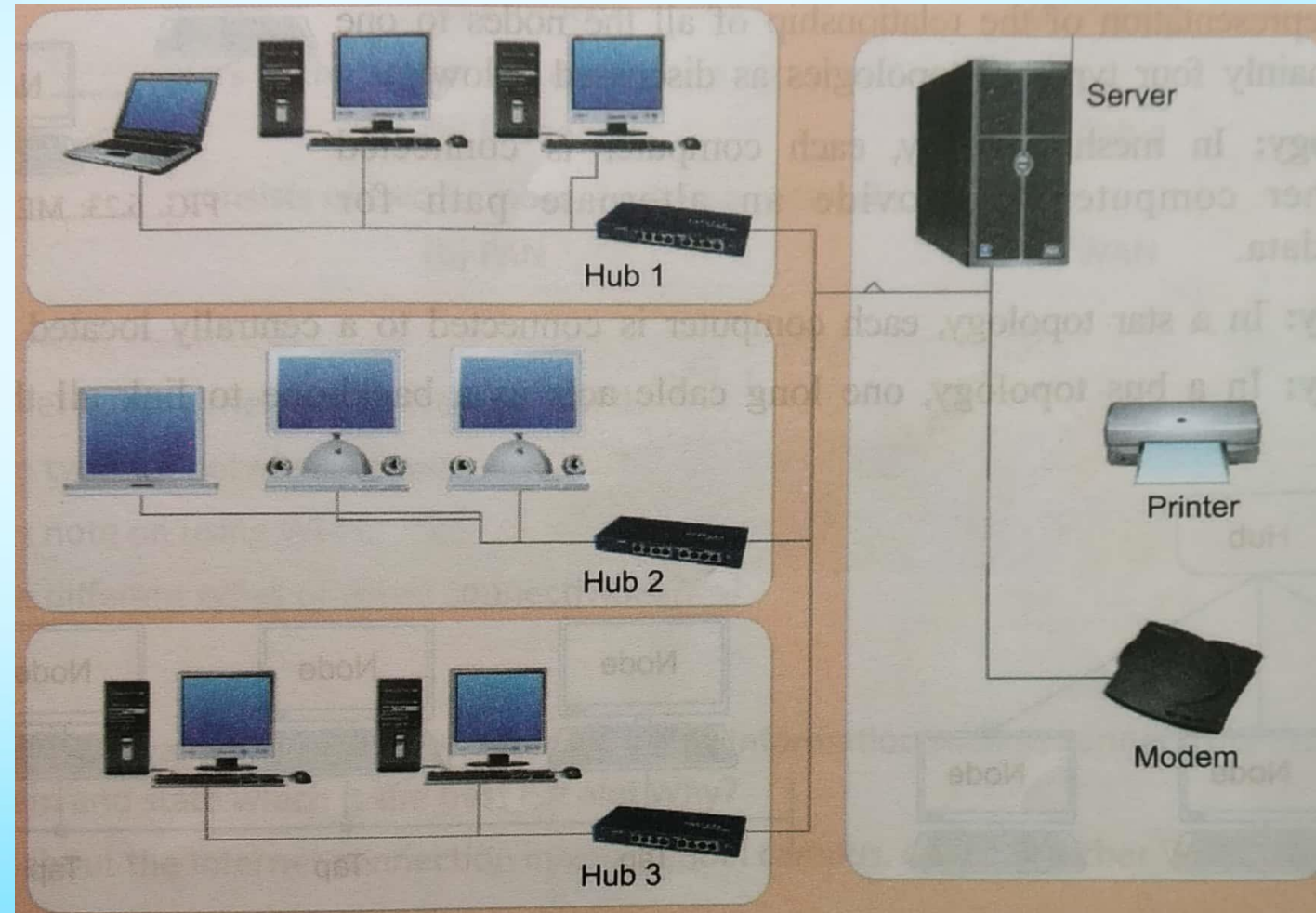


Local Area Network (LAN)

LAN is one which connects computers and devices in a limited geographical area such as home, school, office etc...

It provides high speed.

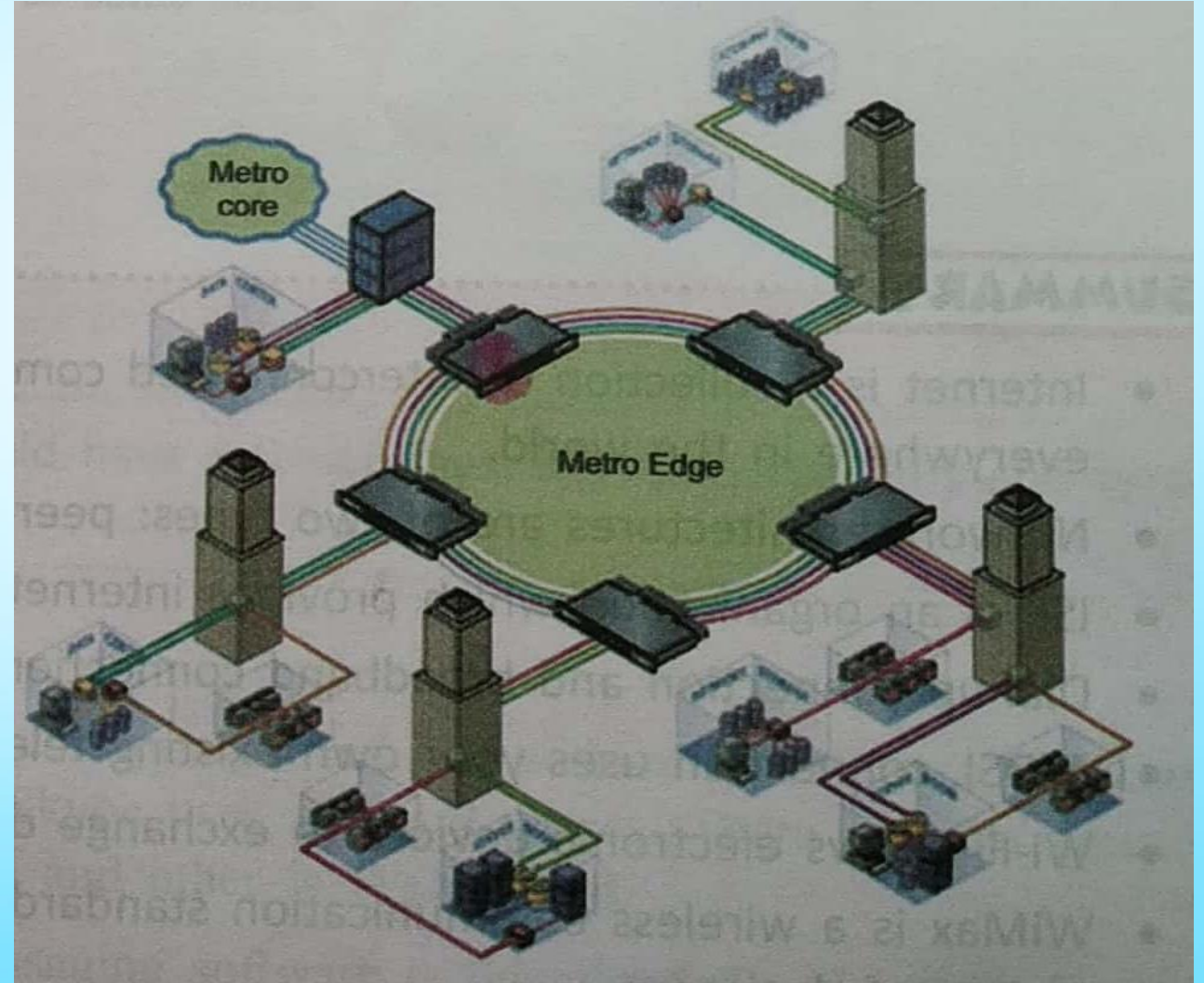
Used for connecting computers and peripherals such as printers and scanners



Metropolitan Area Network (MAN)

MAN is a computer network in which 2 or more computers which are geographically distributed but in the same metropolitan city

Its geographical scope falls between LAN and WAN



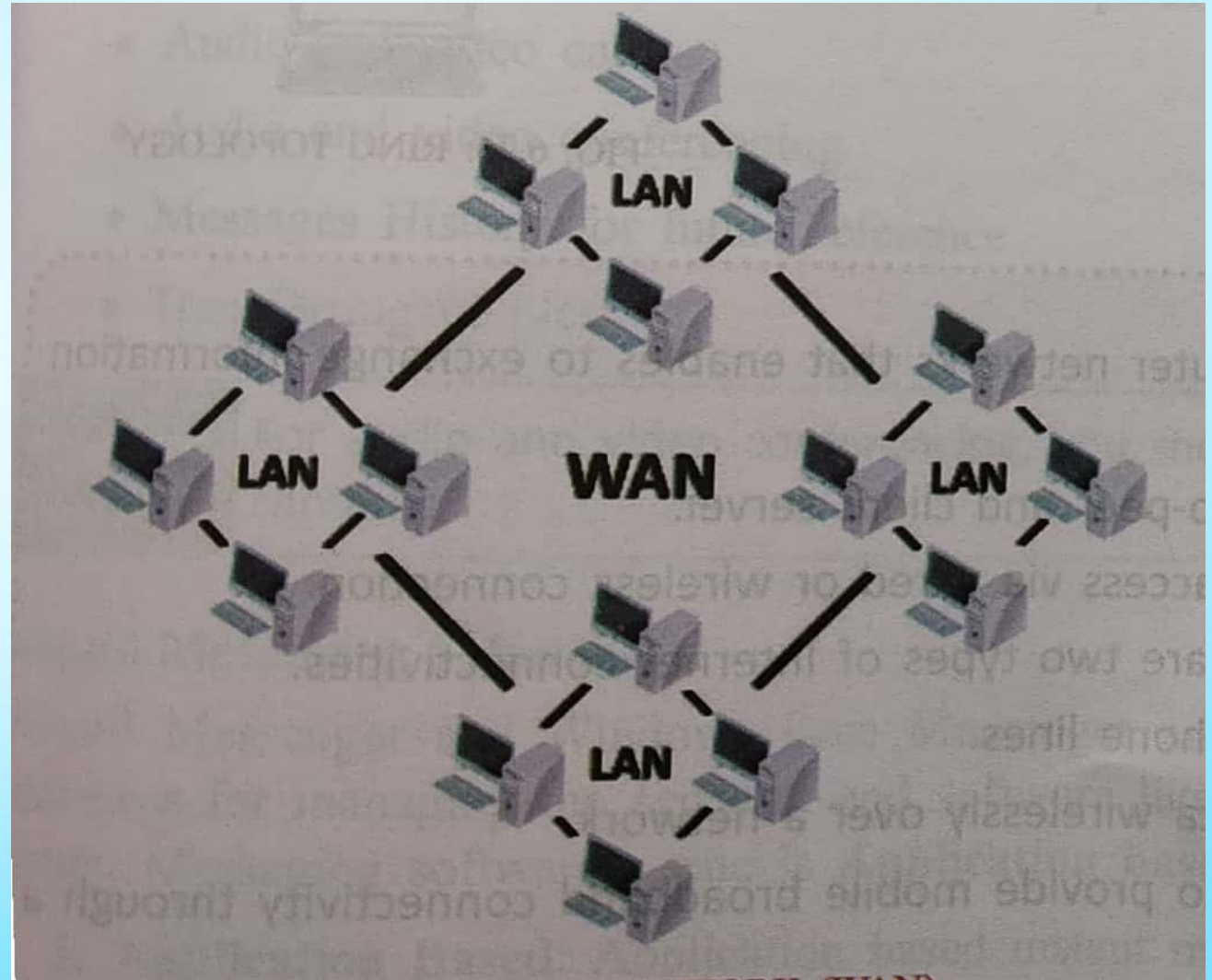
Wide Area Network (WAN)

WAN: One which covers a broad area.

It consists of 2 or more LANs

It is used by government organizations and business

Example : Internet



Advantages of network

- **User communication:** Allows user to communicate
- **File Sharing:** Data or information can be shared or transferred from one computer to another.
- **Hardware Sharing:** Hardware components such as printer scanner etc... can be shared.
- **Software Sharing:** Can share software over the network very easily.
- **Backup:** Can be stored on a central computer or server with a backup system
- **Cost effective:** since hardware, software & storage systems can be shared
- **Minor effect on breakdowns:** A breakdown in the individual computers will not effect the operation of the entire network
- **Saves paper and time:** Reduce the need for generating multiple hardcopies

Disadvantages of network

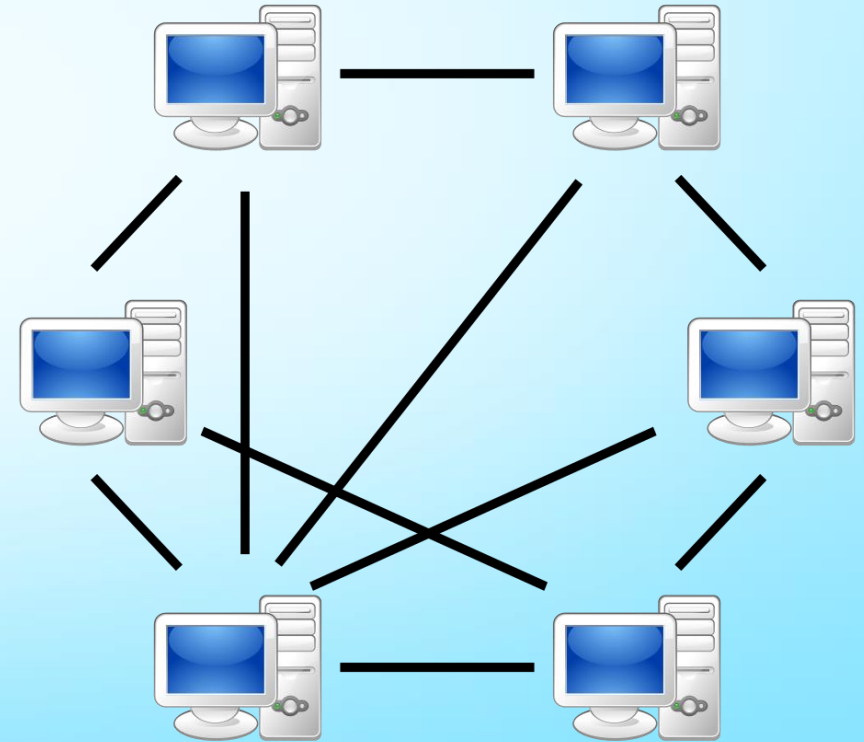
- **Initial Cost:** Initial cost of setting up a network is higher
- **Administration:** If the network is too large, various issues may crop up in the day today operation.
- **Major effect on breakdowns:** If main server breakdown, the entire system would become useless.
- **Virus:** A virus infection in one computer may spread to all the computer
- **Security:** There is a danger of hacking, especially in large networks. Software like firewalls need to be installed

Network architectures

Peer to peer (P2P)

All computers have an equal status or position

All computers are responsible for exchanging/receiving data from one another



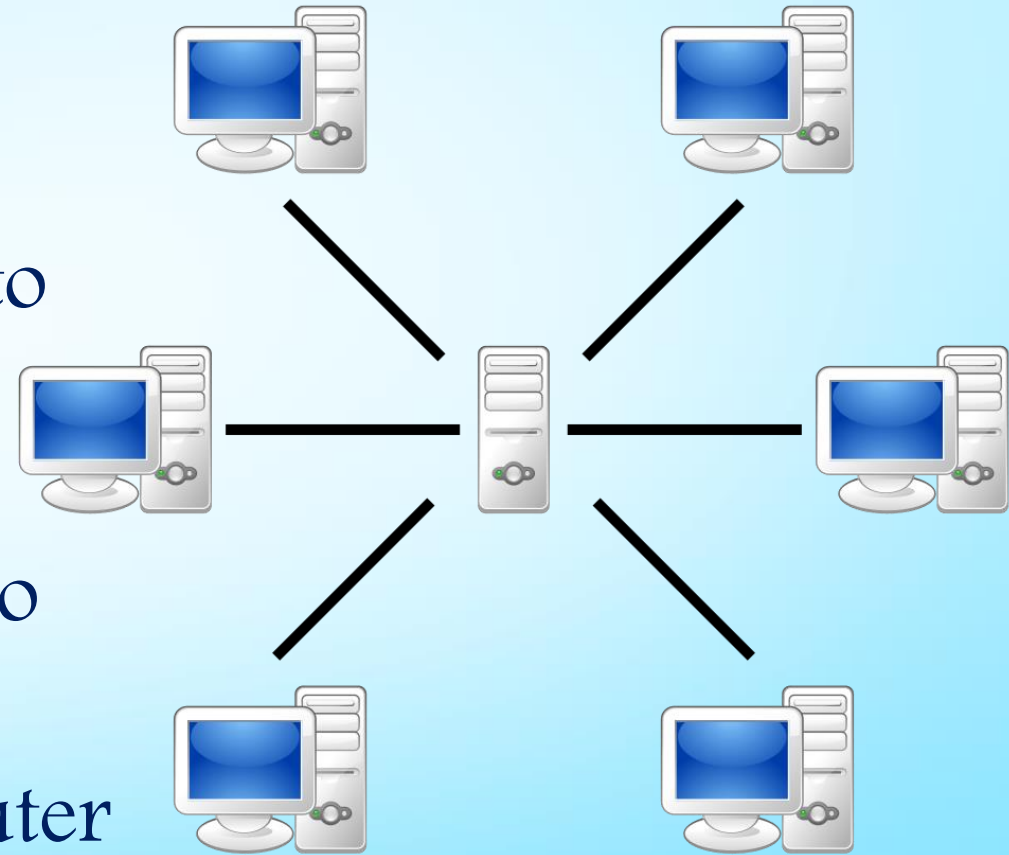
Network architectures

CLIENT~SERVER

Some computers have special dedicated tasks providing services to other computers

Server: A computer which is responsible for providing services to others is called SERVER

Client/Nodes/Workstation: Computer that use these services are called Client



DIFFERENCES

PEER TO PEER	CLIENT SERVER
All computers are equal	A specific computer powerful than other
Each computer can request service and also provide service	Server provide resource, client request resources
Can store its own data	Date stored in centralized computer
Security is a major concern	Easy to make measures to secure the system
Less expensive, Easier to implement	More expensive, Not so easy to implement
Usually implemented for a smaller number of computers located in a limited area	Spread world wide

Switching Techniques

- In large networks there can be multiple paths linking the sender and receiver.
- Information may be switched as it travels through various channel in a digital traffic.

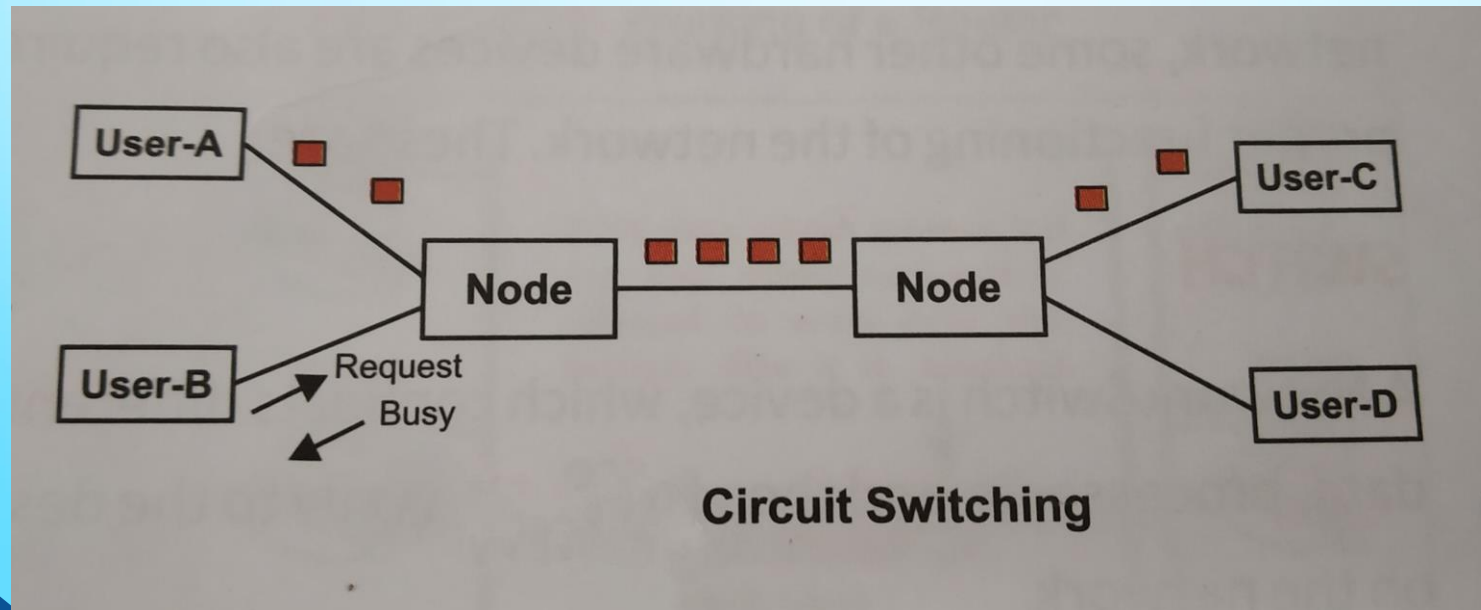
There are 3 types of Switching Techniques employed in Data Communication and Networking:

1. Circuit Switching
2. Message Switching
3. Packet Switching

Circuit Switching

(Circuit - dedicated channels)

- ✓ Technique that connects the sender and the receiver in an unbroken path.
- ✓ A dedicated path exists between the 2 ends unless the connection is terminated.
- ✓ Example: Landline



Circuit Switching

Advantage:

- The communication channel is dedicated

Disadvantages:

- Possible long wait to establish the connection during which no data can be transmitted.
- Most expensive among all other switching techniques as a dedicated line is required.

Message Switching

- ✓ In message switching, the message is send from the sender to the receiver through a series of nodes.
- ✓ Each node receives the message, store it on the disc, and then transmits the message to the next node
- ✓ This type of message is called storage-and-forward network.

Advantage:

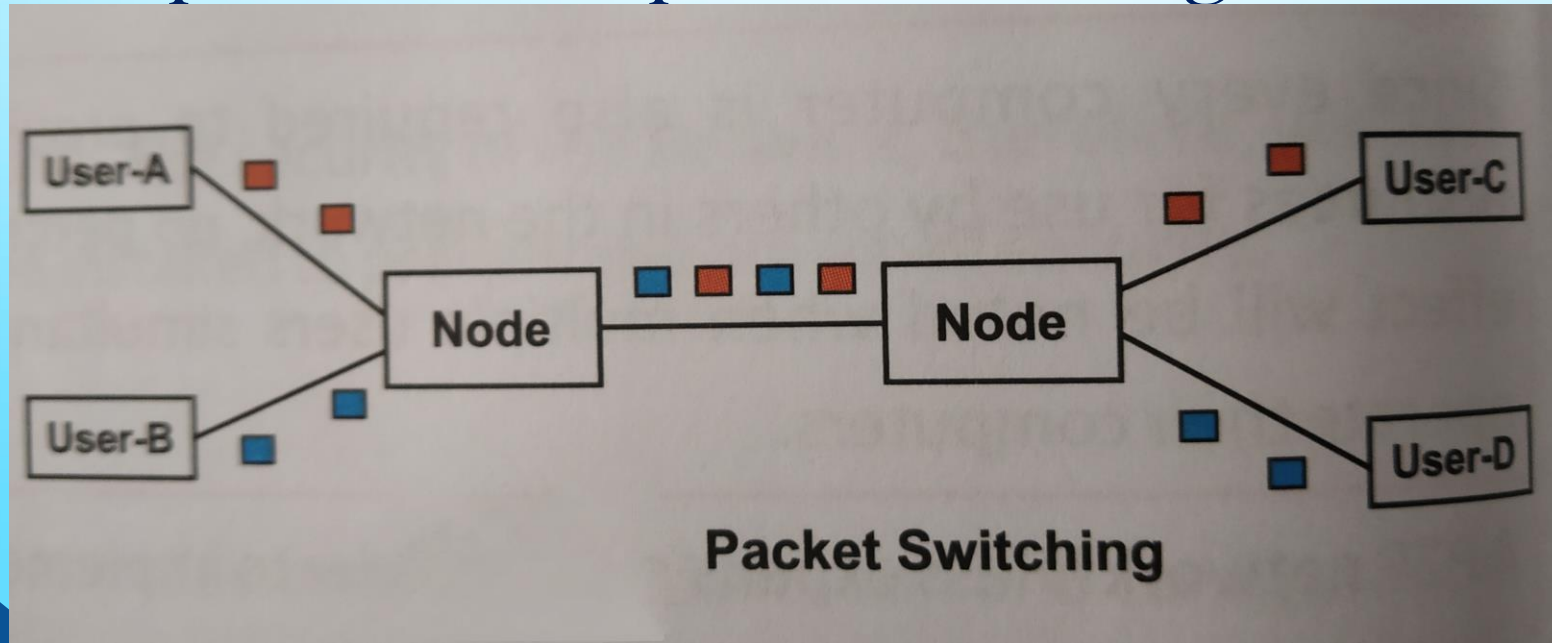
- Channel efficiency is very high because more devices are sharing the channel.
- Traffic congestion is reduced because message can be temporarily stored in the node.

Disadvantage:

- Store and forward devices are expensive as large storage is required to store long message

Packet Switching

- A message is broken into packets of fixed size.
- Each packet has header that contains source and destination address information, error bits and reassembly instruction
- Most efficient for large network
- TCP/IP protocol uses packet switching



Packet Switching

Advantages:

- Cost effective because devices do not require a large amount of switching circuits
- Offers improved delay characteristics as there are no long messages in the queue.
- Packets can be rerouted if the links are busy or disabled.
- Many users can share the same channel at the same time

Packet Switching

Disadvantages:

- Protocols for packet switching are complex and hence have additional cost in implementation.
- If the packet is lost, the sender has to retransmit the data.

Network Devices

In addition to the computers that make up the terminals of a network, some other hardware devices are also required for the proper functioning of the network. These are

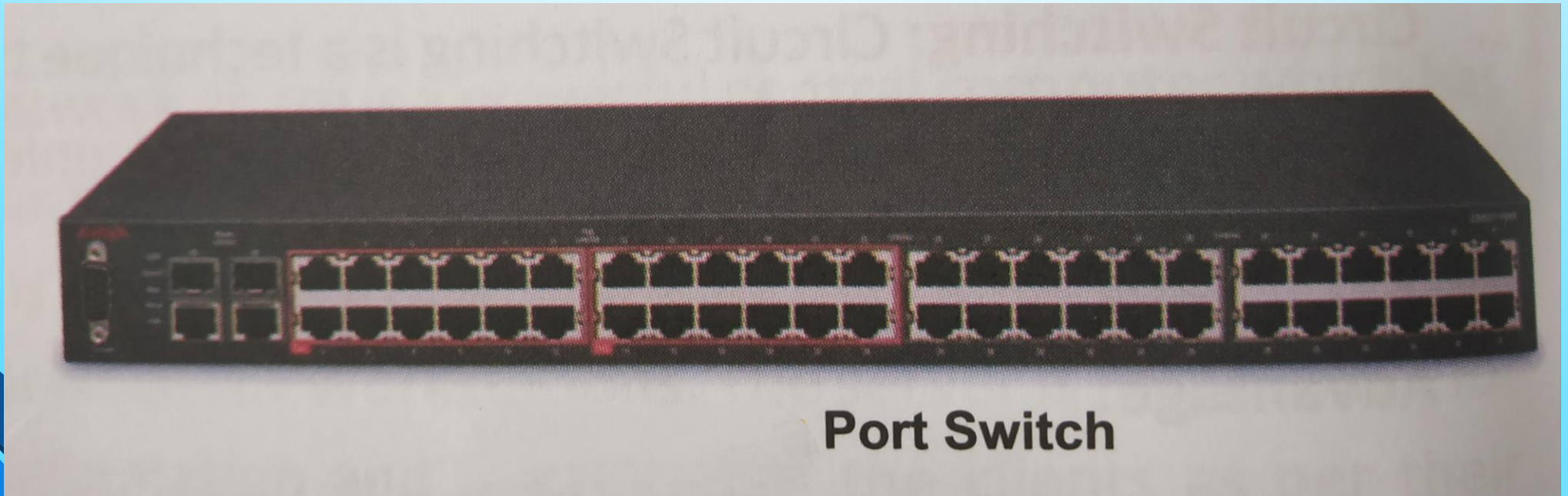
1. Switch
2. Hub
3. Router
4. Bridge
5. Repeater

Network Devices

Switch

A **network switch** is a device, which connects different computers and devices on a computer network.

A switch receives data, processes it, and then forwards it only to the destination device. It uses packet switching techniques to transfer data on the network



Port Switch

Network Devices

HUB

HUB is a central device in a network that provides common connection among the computers or nodes. It is used in star topology. Hubs are Known as **Dumb Switches**



Figure 1.2.13: Port Hub

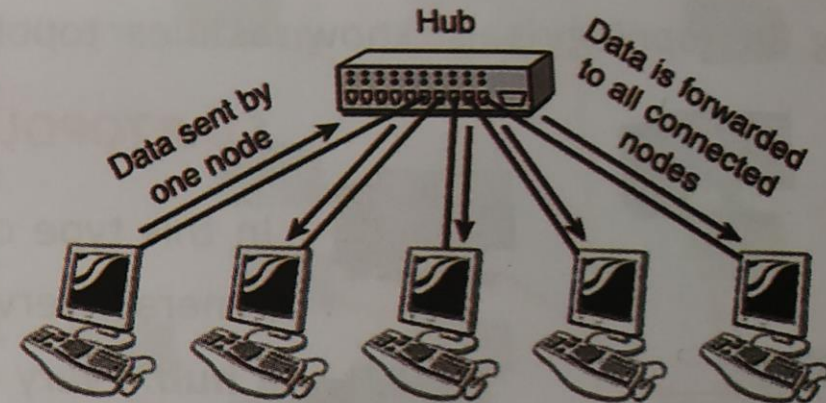


Figure 1.2.14: Working of a Hub

Network Devices

Router

A ROUTER routes the information around the network.

It also used to connect one network to other network.

The header of every packet of the information arriving at a router is checked for the destination and using the best route, the message is forwarded to the next device

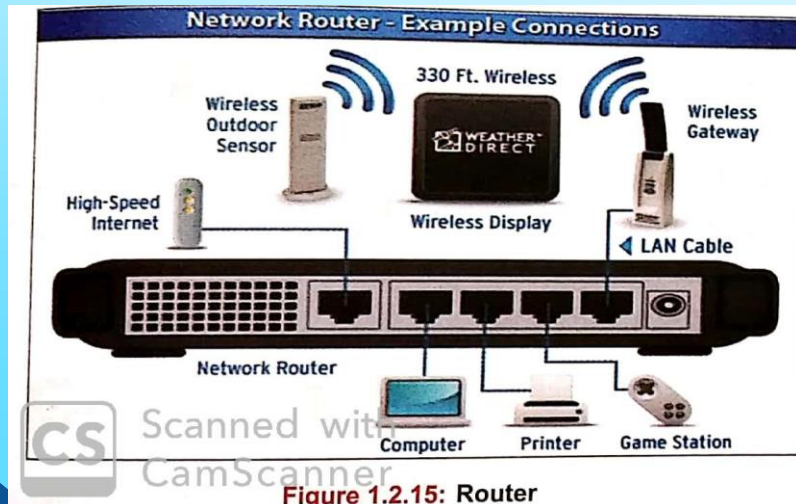


Figure 1.2.15: Router

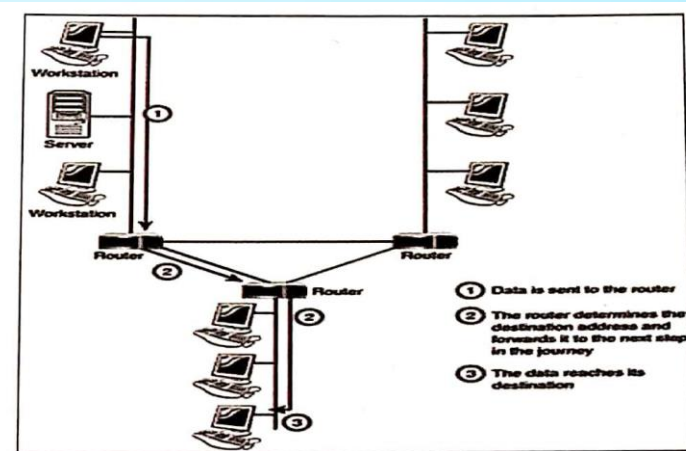


Figure 1.2.16: Working of a Router

Network Devices

Bridge

A BRIDGE is a device that connects and passes packets between two network segments that use the same communication protocols.

A bridge blocks off one segment of a network from another, thus it acts as a filter.

The bridge checks the arriving information and transmits it, only if required.

Network Devices

Repeater

A REPEATER simply copies the information arriving at its input and retransmits it from the output.

This is required at times when the network signal is weakened or distorted over along distance.

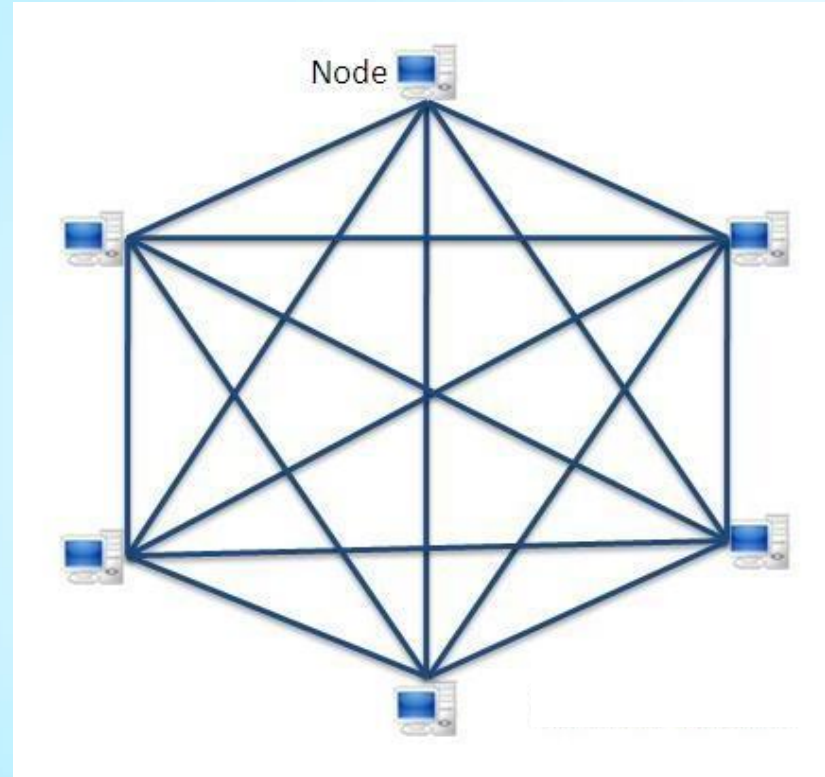
This happens if the network passes through a strong electromagnetic fields.

The weakened or distorted signals at the input are regenerated and then retransmitted by the repeater

Network Layout/Topologies

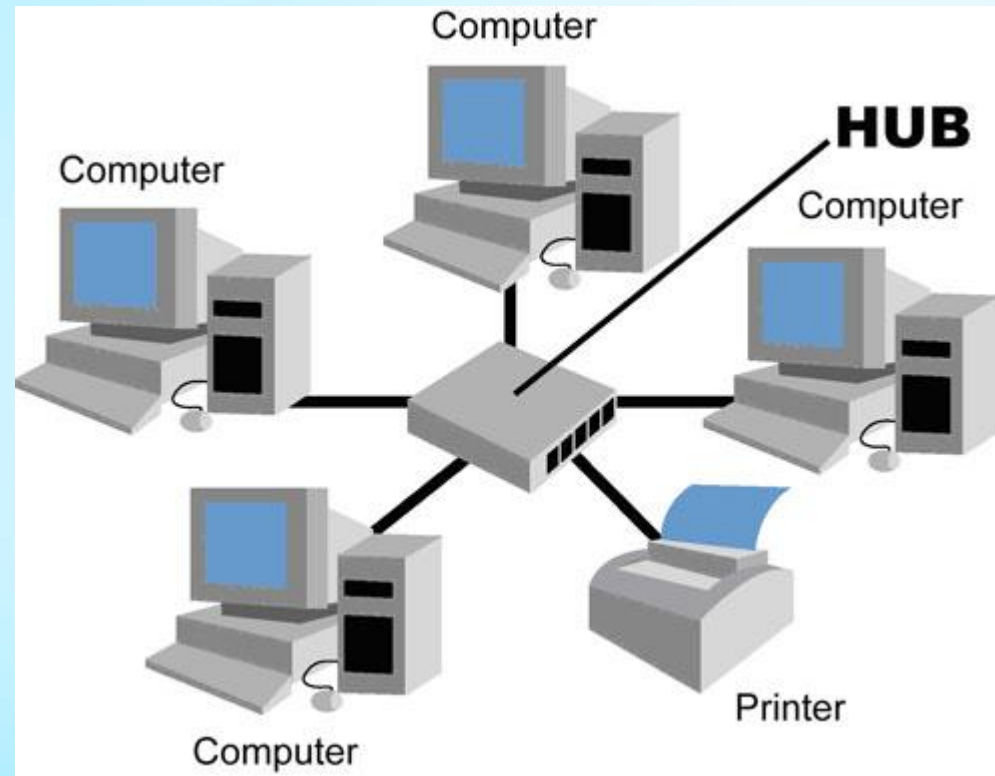
- Layout/Topology : refers the arrangement of connected nodes(computers)
- Its geometric representation of the relationship of all the nodes to one another
- There are mainly 4 types of topologies
 1. Mesh Topology
 2. Star Topology
 3. Bus Topology
 4. Ring Topology
 5. Tree Topology
 6. Hybrid Topology

1. Mesh Topology



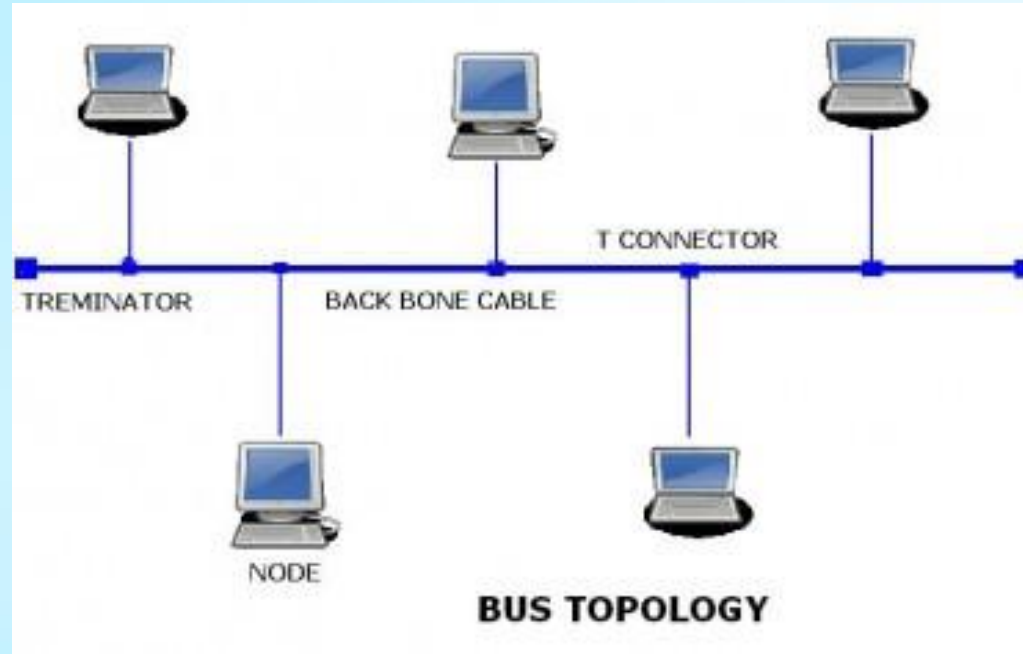
- Each computer is connected to every other computer.
- Provides many path for transferring data

2. Star Topology



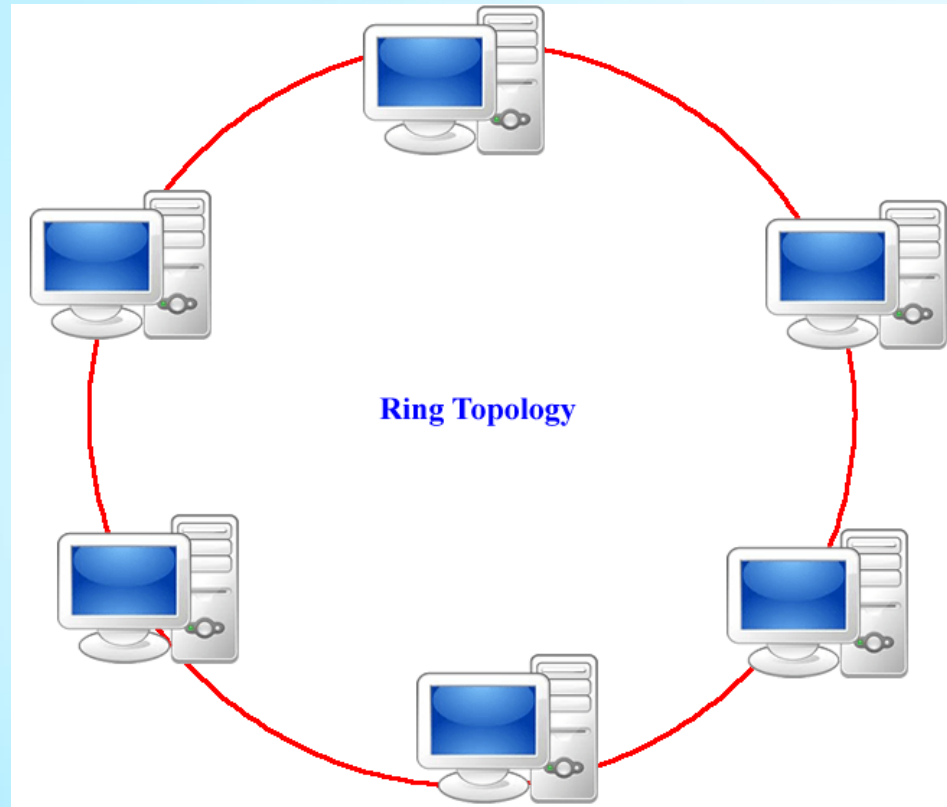
- Each Computer is connected to a centrally located device called hub

3. Bus Topology



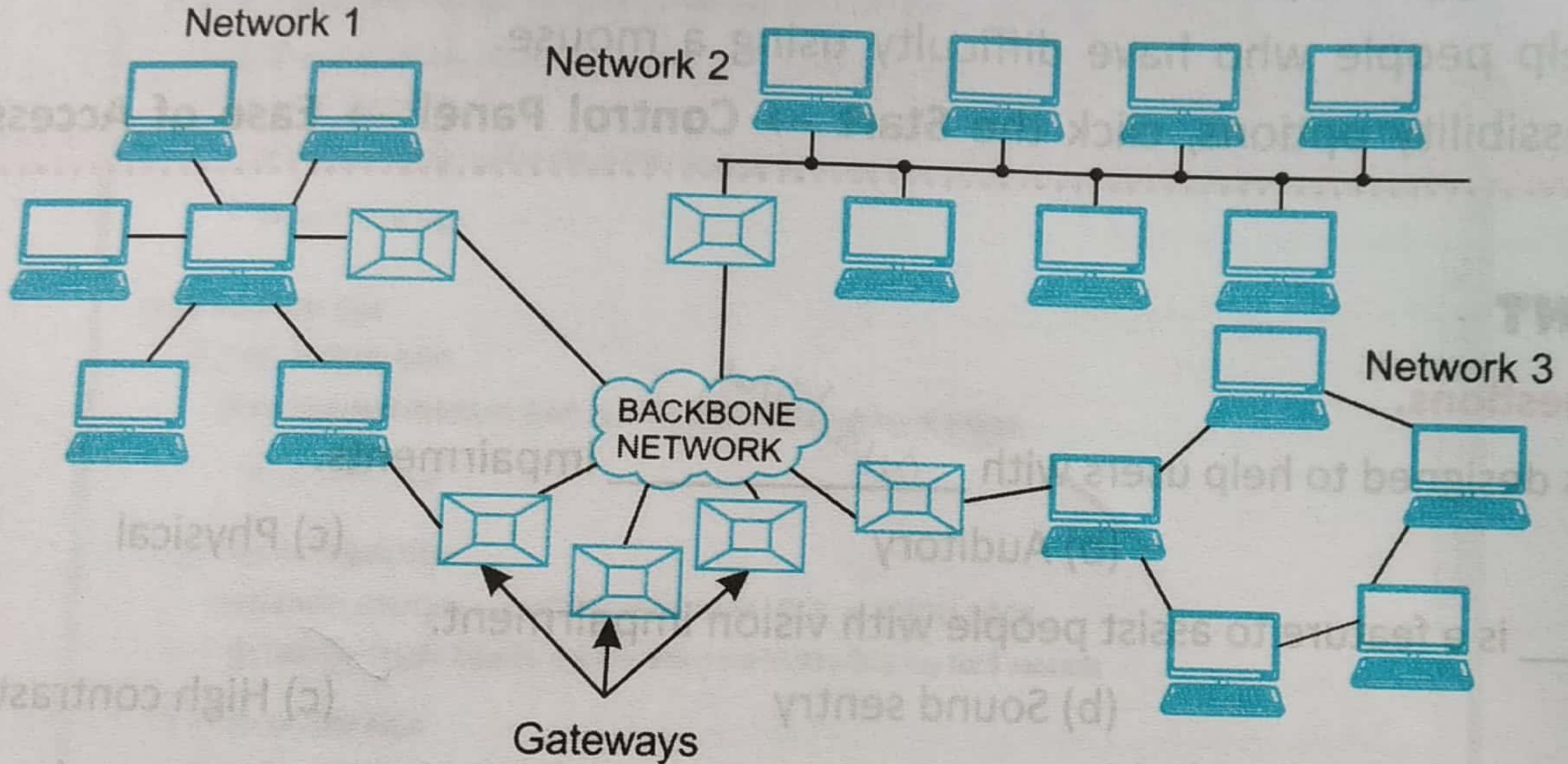
- One long cable acts as a backbone to link all the computers in a network

4. Ring Topology



- Each computer is connected with the 2 computer on either side of it.

Structure of Internet



Internet

- Backbone Network: central structure connecting one or more network just like the spinal cord of human being
- Packets: The file to be sent to another computer is divided into small parts called packets

What is Internet?

Internet is a collection of interconnected computer network. It uses the standard Internet Protocol suite (TCP/IP~Transfer Control Protocol and Internet Protocol)

It is a network that consists of millions of private, public, academic, business and government network.

A set of rules used for communication is called PROTOCOL

Some advantages of Internet

- Widely used by students, teachers, educational institutes, engineers, scientists and others to research, and to gather information
- Largest encyclopedia for all age groups
- Major source of entertainment
- Maintain contacts with friends and relatives through chatting and email system

Getting access to the Internet

- **Internet Service Provider (ISP):** Internet connections are provided by ISP such as BSNL, Airtel, Vodafone etc... It is an organization which provides you with access to the internet via wired or wireless
- You can choose your connection according to the particular technology speed in your area

2 Ways to connects to Internet

```
graph TD; A[2 Ways to connects to Internet] --> B[Dial Up Connection]; A --> C[Broadband Connection]; C --> D[Cable Modem]; C --> E[Digital Subscriber Line]; C --> F[Wireless Connection]; F --> G[Wi Fi]; F --> H[Wi Fi Hotspot]; F --> I[Wi Max];
```

Dial Up
Connection

Broadband
Connection

Cable
Modem

Digital
Subscriber
Line

Wireless
Connection

Wi Fi

Wi Fi
Hotspot

Wi Max

Dial-up Connection

- Connection setup between your computer & ISP Server.
- It is established using a modem.
- The modem connects computer to the telephone lines which serve as the data transfer the medium.
- The modem dials a phone number of an ISP, to receive dial up call.
- Very slow in most of the cases.

Dial-up Connection

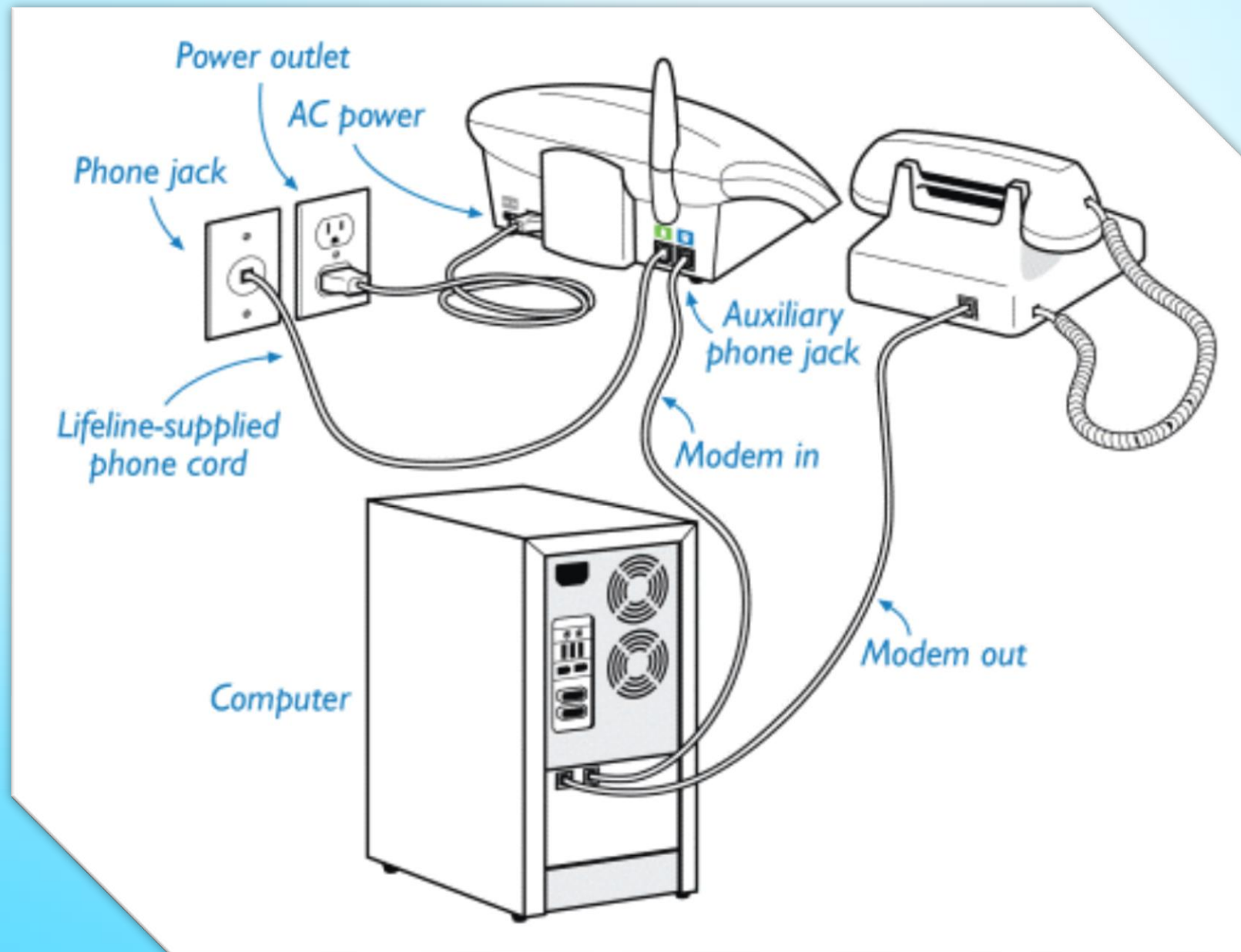
Modem – Modem is short for Modulator & Demodulator.

It converts

Digital signals → Analog signals (can travel over telephone lines)

Analog signals → Digital signals

Dial-up Connection



BROADBAND Connection

Its short term for broad band width and refers to the amount of data that a signal can carry.

Much faster than Dial up connection because these signals carry more data

Measured in Mbps (Megabits per second)

MBps (Megabytes per second)

Broadbands connections are of 3 types

- Cable Modem
- Digital Subscriber Line (DSL)
- Wireless Connection

Cable Modem

- Used in cable television infrastructure
- It is fast. But not available in all areas

Digital Subscriber Line (DSL)

- It uses your existing phone line.
- The data is transmitted over wires of a local telephone line.
- Need a DSL Modem and a subscription

Wireless Connection

Wi-Fi ~ Wireless Fidelity

Provides high speed Internet access

Need an access point with an active Internet connection

Wi-fi router can act as both an Internet connectivity and an access point for wi-fi connectivity

Can keep a password for security

Wi-Fi Hotspot

- It is a venue that provides Wi-Fi access
- Users can use a Wi-Fi phone or other portable device to access the Internet through a Wi-Fi hotspot.
- It may be free or fee based wireless Internet access.

Wi-Max

- It stand for Worldwide Interoperability for Microwave Access
- It is a wireless communication standard to provide mobile broadband connectivity through a variety of devices.
- It can provide wireless access covering many kilometres

Instant Messaging (IM)

- Is a form of communication over the internet that offers an instantaneous transmission of text based messages from the sender to receiver
- Requires a valid messaging account
- They use email address for managing the account
- Examples: Yahoo Messenger, Windows Live messenger, Skype, Google talk

Instant Messaging (IM)

Advantages:

- ✓ Sending text messages to more than one person at same time
- ✓ Audio & Video Calling
- ✓ Audio & Video Conferencing
- ✓ Message history for future reference
- ✓ Transferring of files

Instant Messaging (IM)

There are 2 types of Instant Messaging

✓ Application Based

Application based IM software is downloaded and installed on one's computer

Examples: Yahoo Messenger, Windows Live messenger, Skype, Google talk

✓ Web Based:

Web based IM software is accessed using web browsers such as Mozilla Firefox, Google Chrome etc...

Example: Meebo messenger, MSN Messenger

Instant Messaging-Google Hangouts

- Allows you to communicate via text, voice and video.
- Its developed by Google Inc.
- Need to install/ download in your computer/mobile phone
- Its freely downloadable
- Gmail account is required (account with google)
- It can also use through browser
- URL for GoogleHangout: <http://hangouts.google.com>

Instant Messaging-Google Hangout

- URL for using Google Hangout is <http://hangouts.google.com> or
- If you are logged onto any google service just click on the multiple dotted area of the Google service.
- If hangout not show up, click on more and Click on Hangout. You can see your contact list.
- Whenever your friends will be online, you can see them along with a green dot.
- To start chatting, double click on a contact (visible with green dot) you wish to chat with.
- A window will popup. Type the messages in the text box and Press enter key to send the messages.

General Rules & Netiquette while chatting

- ✓ Use short messages
- ✓ Do not use ALLCAPS as it shows aggressiveness
- ✓ Give people time to respond
- ✓ Be polite while online
- ✓ Respect others while chatting
- ✓ Properly ending a conversation

Chatting on Gmail

- ✓ You can use gmail account for chatting
- ✓ After signing into your account, a contact window will be displayed on the left side within the Gmail account
- ✓ To chat with a contact, double click on its name
- ✓ A popup window will be displayed and start typing the message you want to send

Chatting on Yahoo! Messenger

- ✓ It supports chatting and voice conferencing.
- ✓ Need to download and install Yahoo! Messenger.
- ✓ You need a yahoo mail account for chatting.
- ✓ If you do not have a yahoo mail account, you can create one.
- ✓ As you sign in your account, your contact list will be available to chat.
- ✓ If you do not have any contacts, then you can add Yahoo mail account to your contact list by sending an invitation.
- ✓ Other chat services are MSN, Rediff, Sify etc...

BLOG - Online Diary

Blogs are textual articles but may even have photographs, videos and audios etc... The term blog refers to 'Online Diary'.

- ✓ Used to create personal web pages by technical & non technical users.
- ✓ Users can easily share their comments, thoughts and convey messages about events, news etc...

WEBLOG word coined by Jorn Barger in 1997

Some of the popular websites that offer free blog services are :

www.wordpress.com

www.blog.com

www.blogger.com

www.blogsome.com

Creating a Blog Account in WordPress

1. Open www.wordpress.com and sign up with details like blog address, user name, password, language
 - a) **Email address:** When your WordPress blog is created, an activation link will be sent to you from WordPress. So you should provide a valid email-id
 - b) **Username:** is used to manage your blog
 - c) **Password:** is used to secure your Wordpress blog account
 - d) **Blog address:** is the address which other users will use to view your blog.
2. Click the **‘Continue’** button to create blog.

Creating a Blog Account in WordPress

3. Check email and click on the link to activate your blog
4. WordPress blog account page will display on screen. Your blog is ready to use.
5. Your blog address will be present on the top of the webpage.
6. Double click on the link to go to the home page.
7. Add content to your blog, that you want to others view.
8. To create a new post, click the **'New Post'**

Creating a Blog Account in WordPress

9. In the new window provide unique title for your post and type the content in the text. Click '**Publish**' to publish your content.
10. To view your post, type the blog address in the address bar of the web browser.
11. You can comment on post published by others like in WordPress the comment box is located below the post and labelled as **Leave a Reply**. Fill the required details and click Post Comment.
12. Fill in the required details and click '**Post Comment**'. You will see the blog along with your comment

Using Offline Blog Editors

- You can also use offline blog software to create your blog and publish the content whenever internet connectivity is available.
- Example for free offline Blog Editors are Qumana, Blogdesk, Windows Live Writer
- These blog editors can be downloaded and installed on the computer.

Using Offline Blog Editors

Using Blog Desk

- After successful installation, Double click on BlogDesk
- Configure BlogDesk with the appropriate information for your blog or blogs
- Click File >>Manage Blogs
- Give your blog a descriptive name in Blog Wizard. Click Next
- Enter URL of your blog. Click Next
- Choose your blogging software. For this WordPress is being used. Click Next.
- Enter data(if different from default) in Entry Point. Click Next
- Enter login name and password and click Next

Using Offline Blog Editors

Using Blog Desk

- Get the Blog-ID. Click Next
- Get Categories, if you want to add categories of tag. Click Next
- Test the upload feature to test it through BlogDesk. Click Next
- Look at the screen and start blogging
- Write your post
- If you want to add a link, highlight the text and click on the chain.

Once complete, Click **Green** arrow button at the top of the screen. It is the **Publish** Button. Now your Blog Post is live.

Online Transactions

- E-Commerce is a application of internet. Users can buy or sell goods over the Internet by paying online using a credit and debit card.
- Some of the popular online transaction websites are
- IRCTC: Online portal for booking train & Flight tickets
- Flipkart: Online shopping portal for buying products
- Ebay: Online shopping portal for buying and selling products
- Redbus: Online portal for booking Bus Tickets.

Internet Security

Internet security is a major concern nowadays. It involves network security and browsing security. Many online threats make the computer insecure.

Best Practices for Internet Security

- ✓ Use strong passwords
- ✓ Back up your data
- ✓ Do not share personal information
- ✓ Secure transactions
- ✓ Install firewalls
- ✓ Never install software from unknown sources
- ✓ Clear Browser cookies frequencies
- ✓ Use Antivirus and anti spyware software and keep upto date
- ✓ Never reply to an unknown mail
- ✓ Never use a foreign disk of CD without scanning it for virus

Antivirus Software

An antivirus software is a program that detects, prevents from malicious programs such as viruses.

You can protect your system against viruses by using antivirus software like McAfee, Norton, Quick heal, Kaspersky, Avira etc...

An antivirus program performs following functions:

- Scans every file on the computer
- It scans all drives and outside pendrive or CD on your computer
- It scans incoming emails for attached viruses
- It may detect spyware on your computer

Action Center

Action Center in Windows 7 helps you to make sure that anti virus software is up to date and is set to install updates automatically.

Bitlocker drive

It encrypts your system's hard disk to help keep documents and other data safe. You can protect your data from theft, hackers and accidental loss. Once you turn on Bitlocker, any file that you save on that drive is encrypted automatically.

Working with Accessibility Options

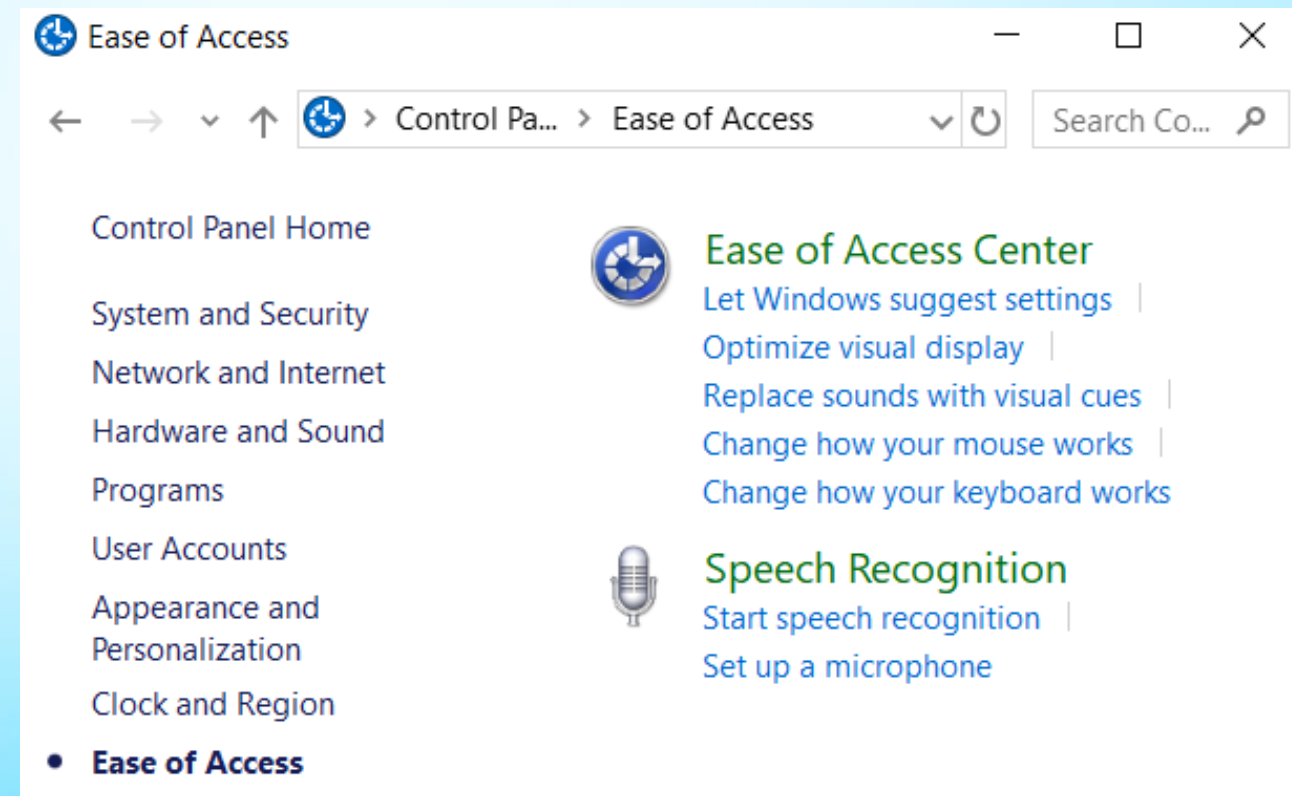
- Accessibility means providing such services for people with disabilities so that they can do their work without facing problems.
- Computer Accessibility refers to customizing the functioning of the computer parts enables people with a disability to use computer.

Various types of impairment or disabilities

- Eyesight like low vision, color blindness etc..
- Dexterity like paralysis of any body part like arm, hand or fingers injured
- Hearing like deafness
- Speech impairment~difficulty in understanding.
- Reasoning like learning disability (dyslexia) or difficult to concentrate.

To use accessibility Options

Start → Control Panel → Ease of Access



Ease of Access Center

- Let Windows Suggest settings
- Replace sounds with Visual Clues
- Change How your mouse works
- Change How your keyboard works

Speech Recognition

- Start Speech Recognition
- Set up a microphone

'Let window suggest settings':

Get recommendations to make your computer easier to use

Answer the following questions to get recommendations for settings that can make your computer easier to see, hear, and use.

For each question, select all statements that apply to you. When you're done, you can decide which settings to turn on.

Your answers are used to determine recommended settings only. If another program or Web site wants to use this information to better suit your needs, you will be explicitly asked for permission by that program. [Privacy](#)

[Statement](#)

Eyesight (1 of 5) _____

Select all statements that apply to you:

- ☐ Images and text on TV are difficult to see (even when I'm wearing glasses).
- ☐ Lighting conditions make it difficult to see images on my monitor.
- ☐ I am blind.
- ☐ I have another type of vision impairment (even if glasses correct it).

Ease of access center option:

Make your computer easier to use

Quick access to common tools

You can use the tools in this section to help you get started.

Windows can read and scan this list automatically. Press the SPACEBAR to select the highlighted tool.

☐ Always read this section aloud

☐ Always scan this section



Start Magnifier



Start Narrator



Start On-Screen Keyboard



Set up High Contrast



Not sure where to start? [Get recommendations to make your computer easier to use](#)

Explore all settings

When you select these settings, they will automatically start each time you sign in.



[Use the computer without a display](#)

Optimize for blindness



[Make the computer easier to see](#)

Optimize visual display



[Use the computer without a mouse or keyboard](#)

Set up alternative input devices



[Make the mouse easier to use](#)

Adjust settings for the mouse or other pointing devices



[Make the keyboard easier to use](#)

Adjust settings for the keyboard



[Use text or visual alternatives for sounds](#)

Set up alternatives for sounds




[Make it easier to focus on tasks](#)

Adjust settings for reading and typing

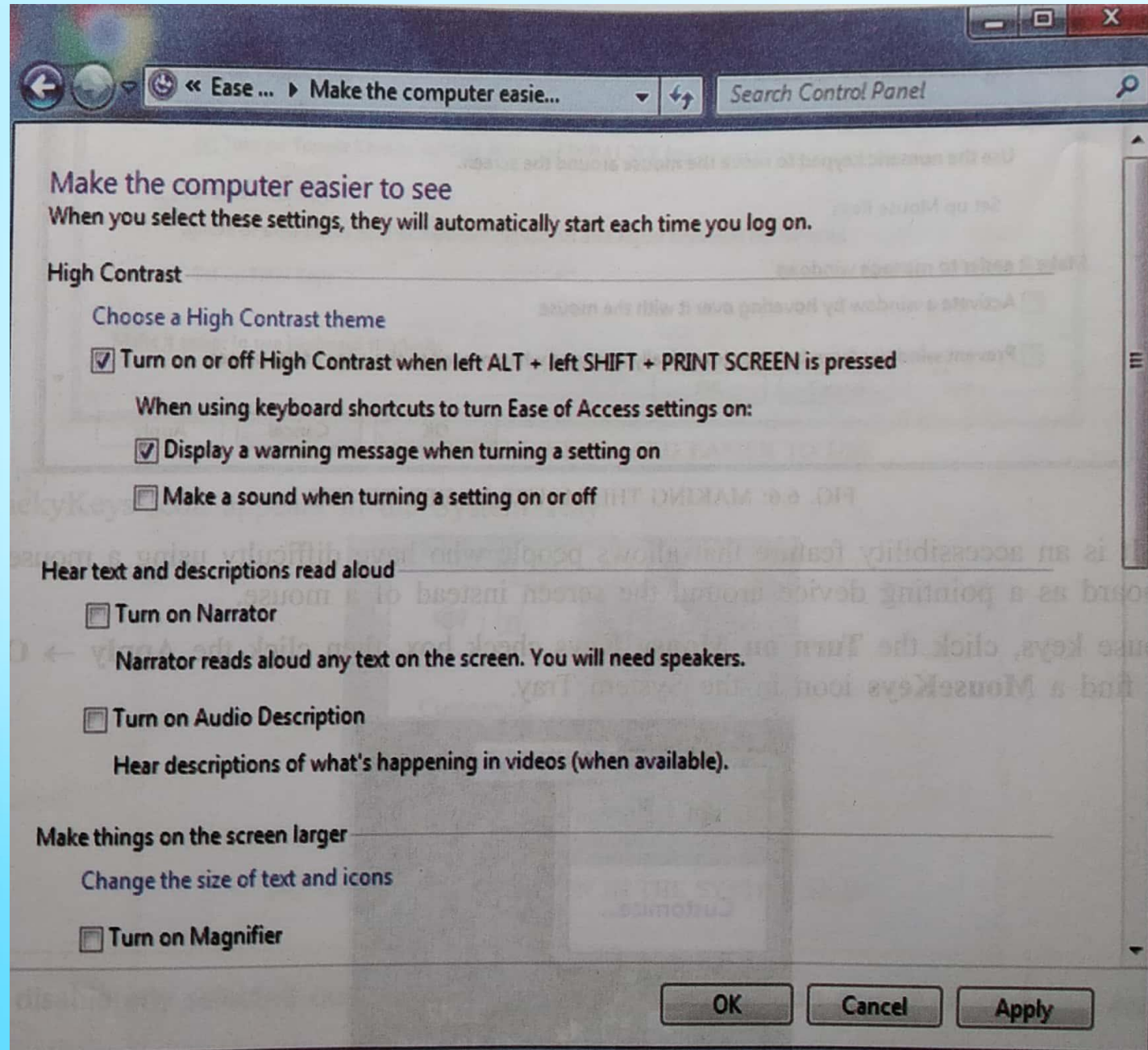


[Make touch and tablets easier to use](#)

Adjust settings for touch and tablets

- 
- Start Magnifier: which allows you to see large fonts
 - Start Narrator: Which will read aloud what is on screen
 - Start on screen keyboard: open ups a on~screen keyboard
 - Set up high contrast: showing settings for color and contrast of display

1. Make the Computer Easier to use:



1. Make the Computer Easier to use: Helps to change the display settings like

High Contrast:

To assist people with eyesight impairment by changing size and color of the font and desktop background for ease of viewing.

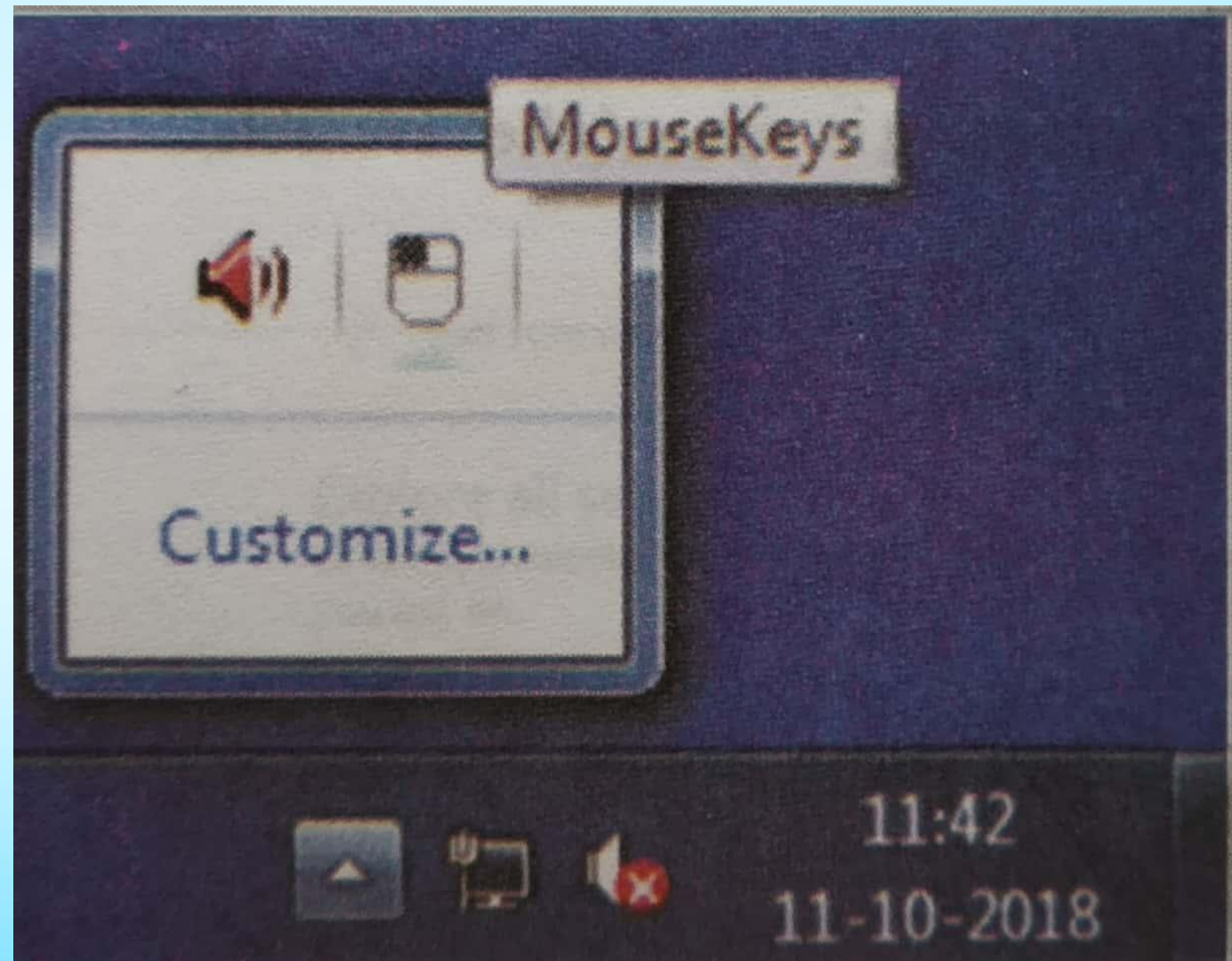
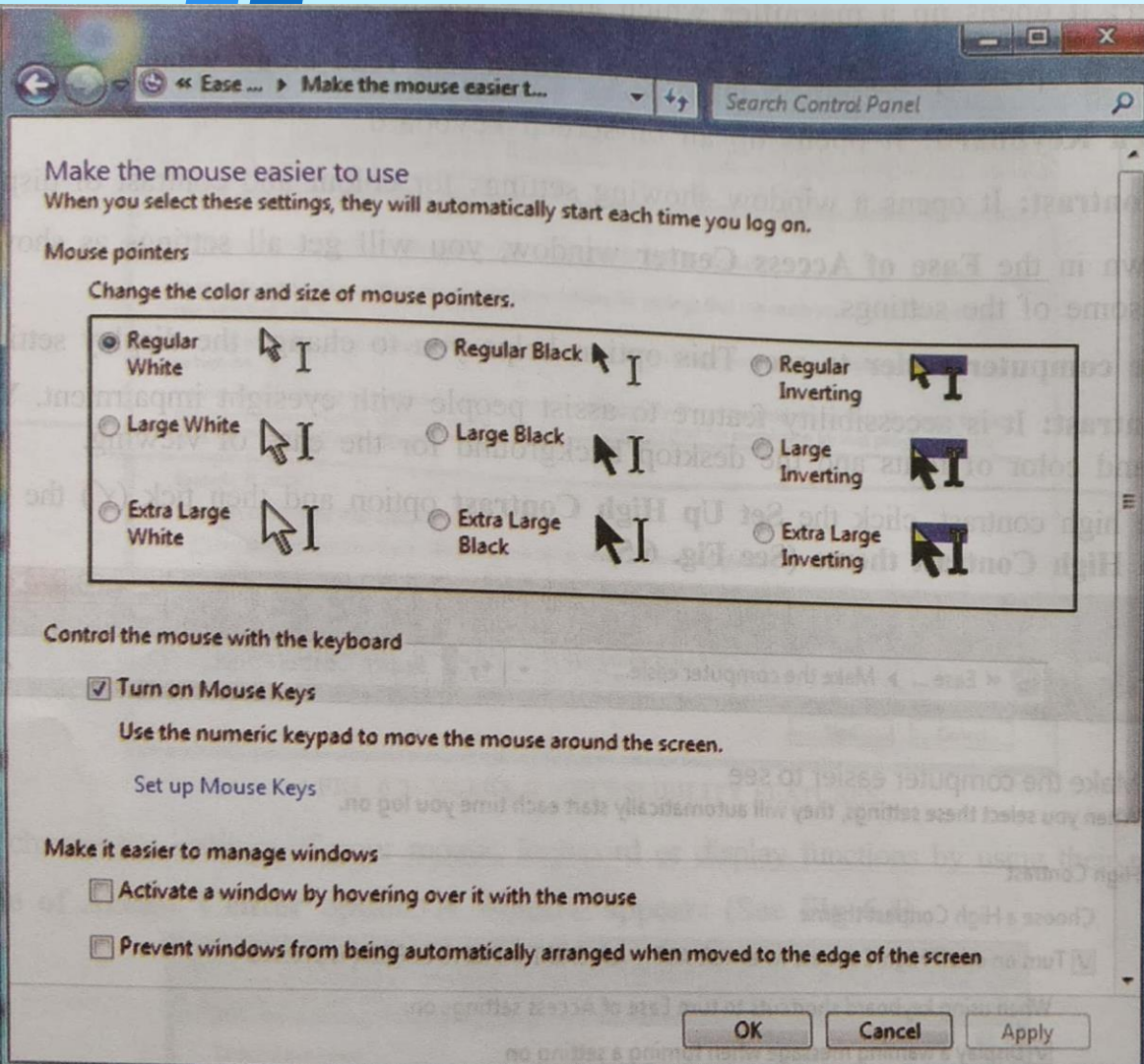
To enable high contrast , click ‘Set up High Contrast’ and then tick the checkbox under ‘Choose a High Contrast Theme’

Cursor Option:

Allows the people to change the thickness of the cursor.

After doing required changes click the Apply → OK

2. Make the mouse Easier to use:



2. Make the mouse Easier to use: Helps to change the color and size of mouse pointers and use of mouse keys

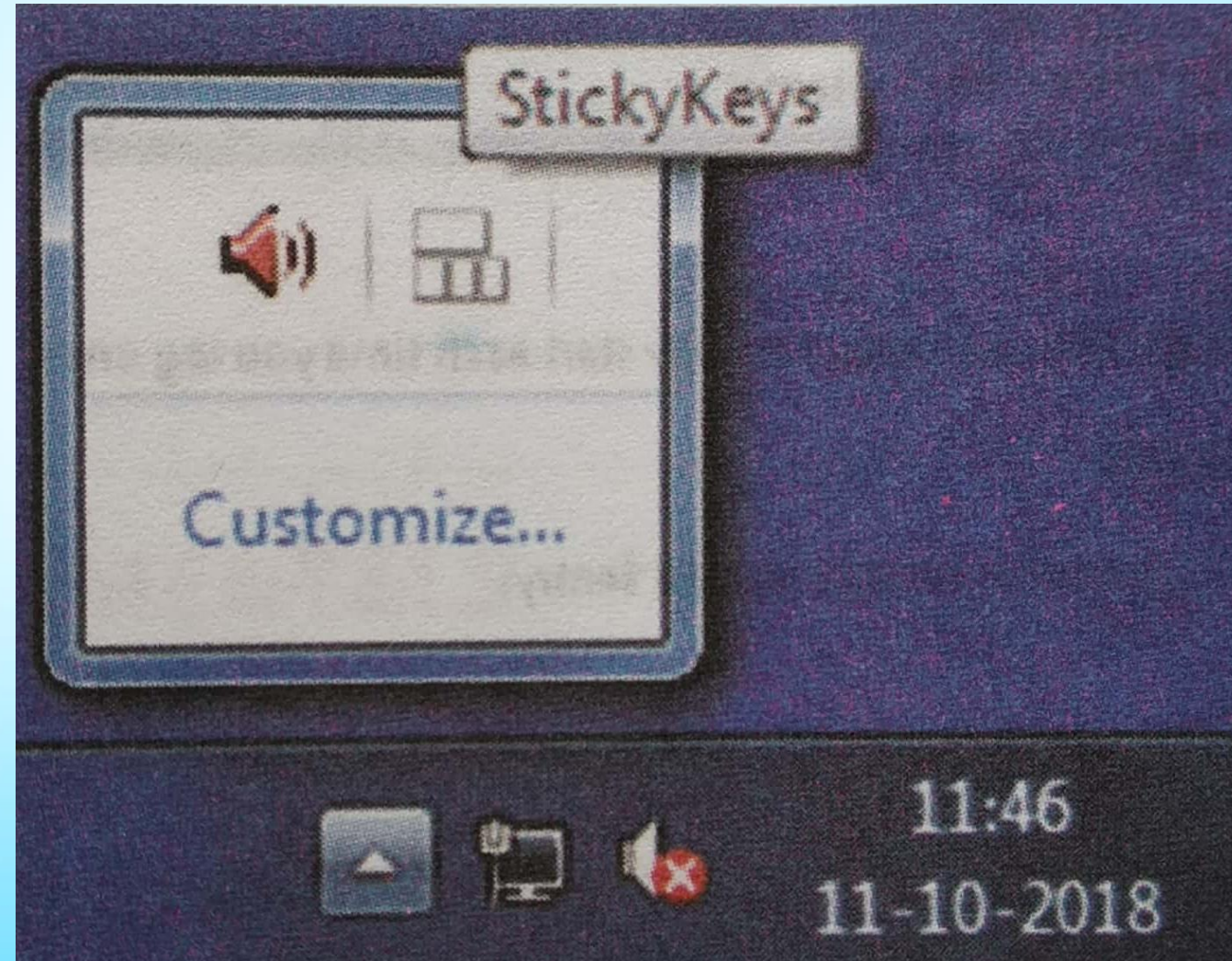
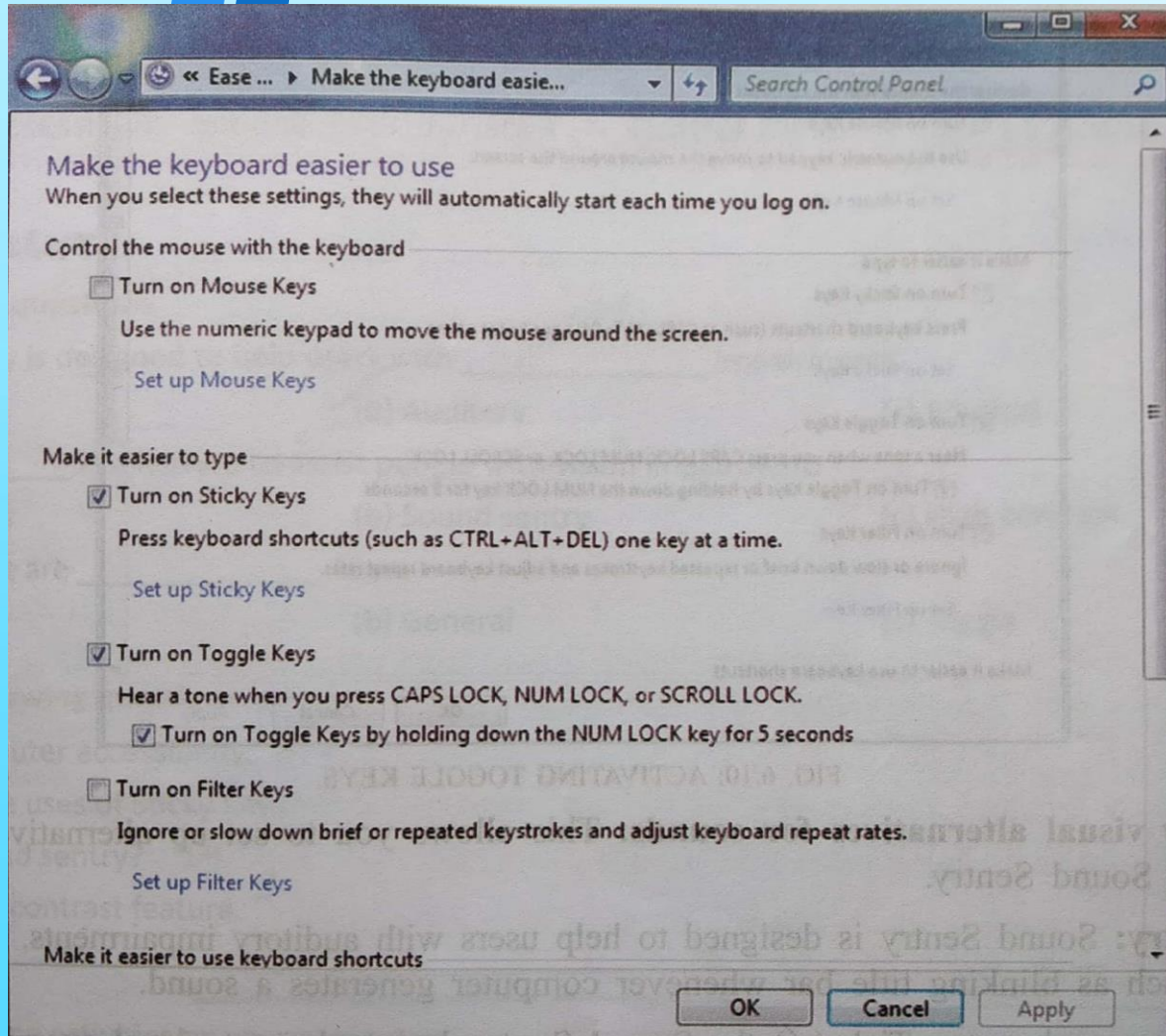
Mouse Keys:

It is an accessibility feature that allows people who have difficulty using a mouse. This option **uses the keyboard** as a pointing device around the screen instead of mouse.

To enable mouse keys, click 'Turn on Mouse Keys' checkbox and then click the Apply → OK

Mouse Key icon will appear in the System Tray

3. Make the keyboard Easier to use:



3. Make the keyboard Easier to use:

Toggle Keys:

Designed for people who have vision impairment. You will hear a tone when you press the keys like Caps Lock, Num Lock or Scroll Lock

To enable toggle keys, click ‘Turn on Toggle Keys’ checkbox under ‘Make it easier to type’ and then click the Apply → OK

Sticky Key icon will appear in the System Tray

3. Make the keyboard Easier to use:

Enables you to adjust settings for the keyboard

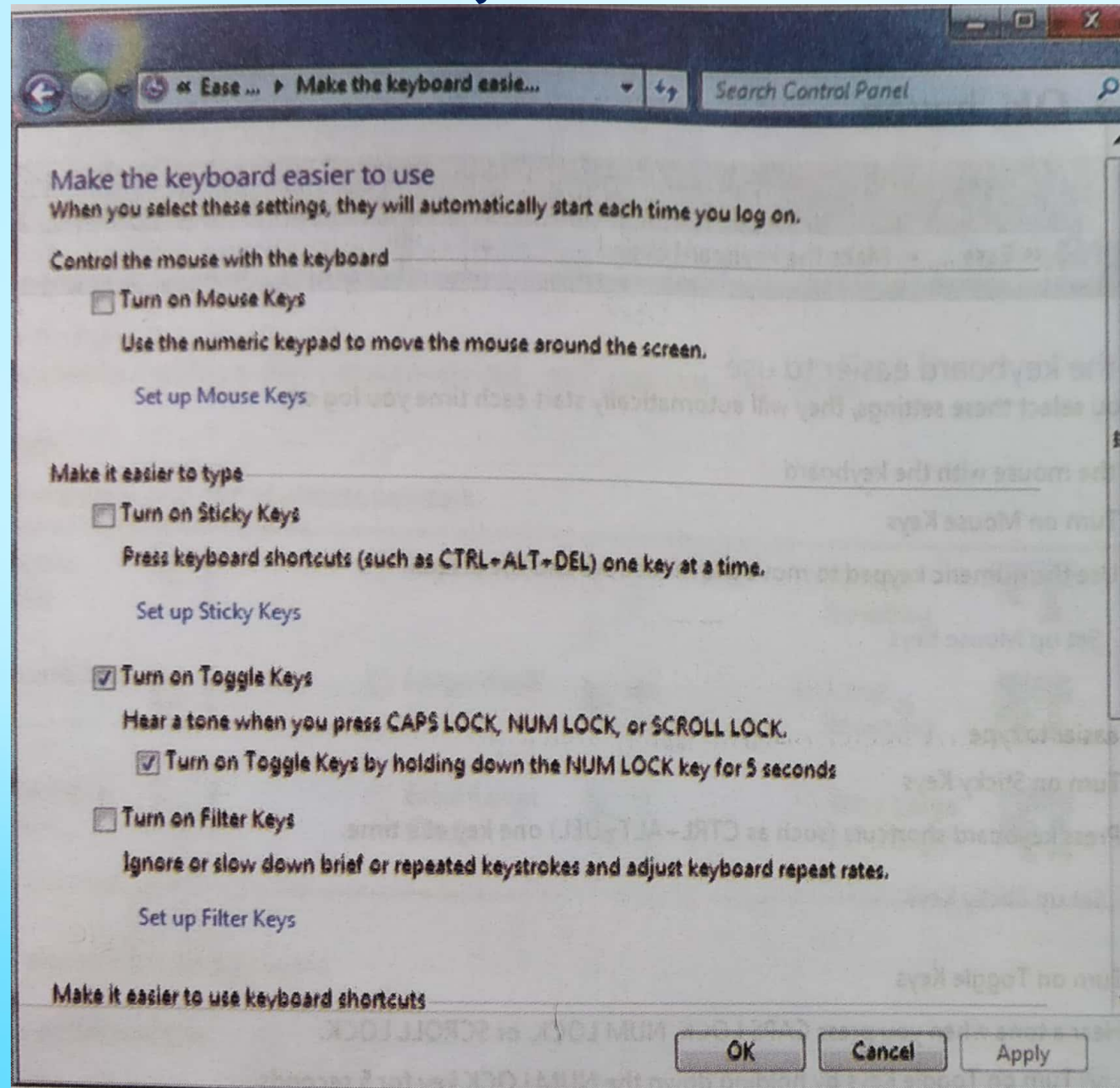
Stick Keys:

It allows the user to press and release a modifier key (Shift, Ctrl, Alt, window) and make it active until any other key is pressed.

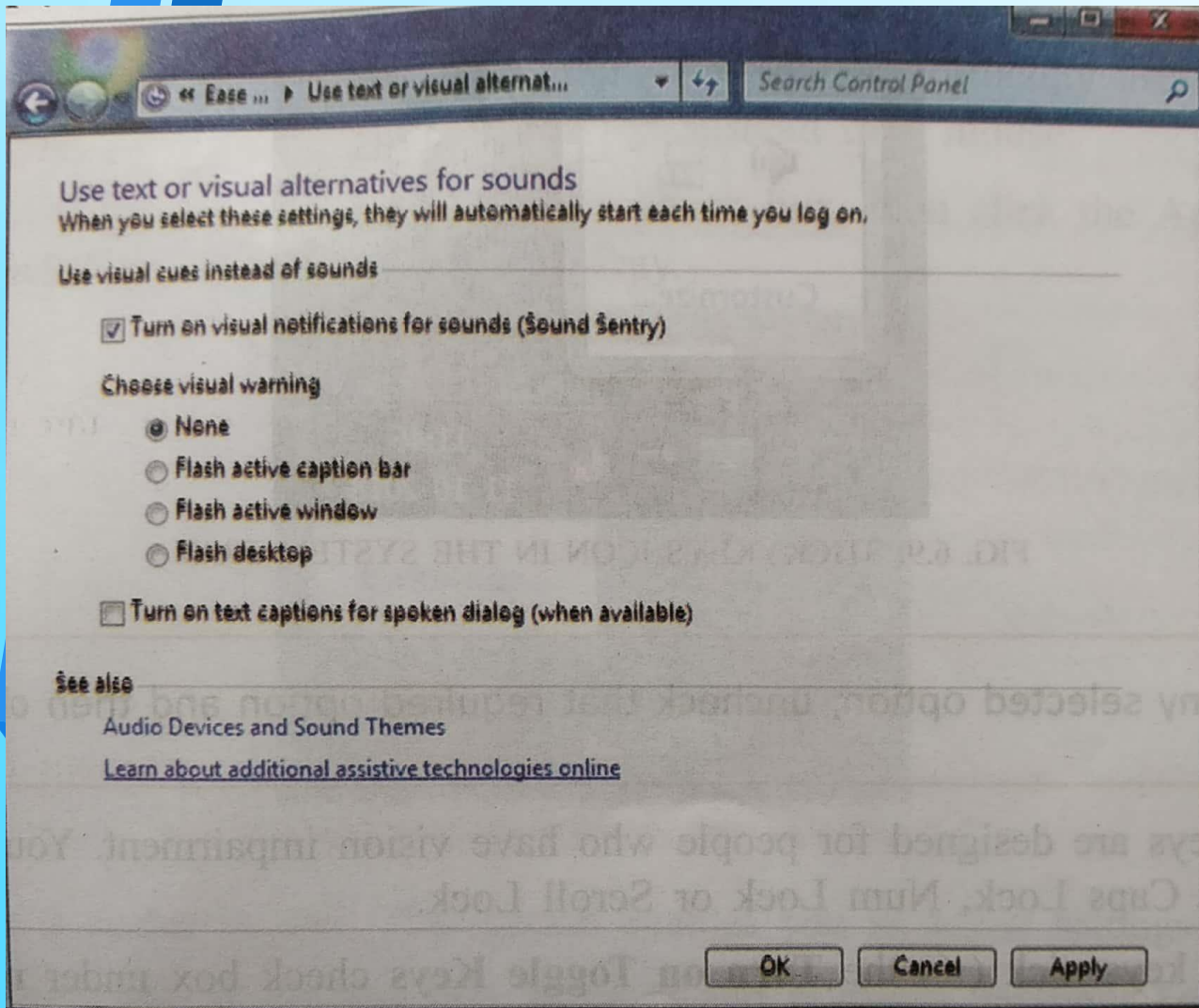
To enable sticky keys, click 'Turn on Sticky Keys' checkbox under 'Make it easier to type' and then click the Apply → OK

Sticky Key icon will appear in the System Tray

3. Make the keyboard Easier to use:



4. Use Text or Visual alternatives for sounds: Allows you to set up alternative for sounds



Sound Sentry:

Designed to help users with auditory impairment. It generates visual warnings such as blinking title bar whenever computer generates a sound.

To enable sound sentry, click 'Sound Sentry' checkbox under 'Use Visual Cues Instead of sounds' and then click the Apply → OK



Thank
You

A blue paper cutout of the words "Thank You" in a playful, rounded font. The cutout is hanging from a thin, light-colored string. The background is a solid light blue, with a dark blue geometric shape in the bottom left corner.