

**ST. LAWRENCE HIGH SCHOOL** A JESUIT CHRISTIAN MINORITY INSTITUTION



#### STUDY MATERIAL – 1 TOPIC – NETWORKING

# SUBJECT: COMPUTER APPLICATION F.M.:15

CLASS: XII DATE: 06.07.2020

## **Networking**

#### Definition:

Networking, also known as computer networking, is the practice of transporting and exchanging data between nodes over a shared medium in an information system. Networking comprises not only the design, construction and use of a network, but also the management, maintenance and operation of the network infrastructure, software and policies.

#### Advantages:

- 1. Network Resource Sharing
- 2. Information Sharing
- 3. Application Program Sharing
- 4. Fault Tolerance
- 5. Data Backup
- 6. Better Communication

### Disadvantages:

- 7. Purchasing the network cabling and file servers can be expensive.
- 8. Managing a large network is complicated, requires training and a network manager usually needs to be employed.
- 9. If the file server breaks down the files on the file server become inaccessible. Email might still work if it is on a separate server. The computers can still be used but are isolated.
- 10. Viruses can spread to other computers throughout a computer network.
- 11. There is a danger of hacking, particularly with wide area networks. Security procedures are needed to prevent such abuse, eg a firewall.

#### Uses of Computers

- Business
- Education
- Healthcare
- Retail and Trade
- Government
- Marketing

- Science
- Publishing
- Arts and Entertainment
- Communication
- Banking and Finance
- Transport
- Navigation
- Working From Home
- Military
- Social
- Booking Vacations
- Security and Surveillance
- Weather Forecasting
- Robotics

## **ANALOGUE & DIGITAL SIGNALS**

ANALOG SIGNAL:

Signal that changes in a continuous manner with time



Analog Signal

DIGITAL SIGNAL:

Signal that changes in a discrete manner with time

## Digital Signal

PARAMETERS	ANALOG COMMUNICATION	DIGITAL COMMUNICATION
Occurrence	Occurs by the transmission of continuously varying electrical pulses proportional to the original signal	Occurs by the switching on or off of some signal levels(representing binary 0s and 1s)
Noise and Distortion	Get affected by Noise	Immune from Noise and Distortion
Hardware	Hardware is complicated and less flexible than digital system.	Hardware is flexible and less complicated than Analog system.
Cost	Low Cost	High Cost
Bandwidth Requirement	Low bandwidth requirement	High bandwidth Requirement
Power Requirement	High power is required	Low Power Requirement
Portability	Less Portable as the components are heavy	More portable due to compact equipments.
Representation of Signal	Analog signal can be represented by sine wave.	Digital signal is represented by square wave.
Signal Values	Consists of continuous values	Consists of discrete values

#### \* Difference between Analogue and Digital Communication

## **MODES OF COMMUNICATION**

Based on the direction of flow of signal & the ability to receive or transmit signal at a given time, one can have the following modes of communication:

- Simplex
- Half Duplex
- Full Duplex

#### > <u>Simplex Mode</u>:

In Simplex mode, the communication is unidirectional, as on a one-way street. Only one of the two devices on a link can transmit, the other can only receive. The simplex mode can use the entire capacity of the channel to send data in one direction.

Example: Keyboard and traditional monitors. The keyboard can only introduce input, the monitor can only give the output.



#### > Half Duplex Mode

In half-duplex mode, each station can both transmit and receive, but not at the same time. When one device is sending, the other can only receive, and vice versa. The half-duplex mode is used in cases where there is no need for communication in both direction at the same time. The entire capacity of the channel can be utilized for each direction.

Example: Walkie- talkie in which message is sent one at a time and messages are sent in both the directions.





#### Full Duplex Mode:

In full-duplex mode, both stations can transmit and receive simultaneously. Fullduplex mode is used when communication in both direction is required all the time. The capacity of the channel, however must be divided between the two directions.

Example: Telephone Network in which there is communication between two persons by a telephone line, through which both can talk and listen at the same time.



## **TRANSMISSION METHODS**

Used for transmitting digital signals from one point to another

#### □ <u>Two types</u>:

- ✓ Serial Communication
- ✓ Parallel Communication

#### > <u>Serial Communication</u>:

- Serial communication is a communication technique used in telecommunications wherein data transfer occurs by transmitting data one bit at a time in a sequential order over a computer bus or a communication channel.
- It is the simplest form of communication between a sender and a receiver.
- Because of the synchronization difficulties involved in parallel communication, along with cable cost, serial communication is considered best for long-distance communication.



#### > <u>Parallel Communication</u>:

• In data transmission, parallel communication is a method of conveying multiple binary digits (bits) simultaneously.



## \* <u>COMPARISON</u>:

Basis for Comparison	Serial Communication	Parallel Communication
Data transmission speed	Slow	Comparatively fast
Number of communication link used	Single	Multiple
Number of transmitted bit/clock cycle	only one bit.	n number of link will carry n bits.
Cost	Low	High
Crosstalk	Not present	Present
System Up- gradation	Easy	Quite difficult
Mode of transmission	Full duplex	Half duplex
Suitable for	Long distance	Short distance

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