

ST. LAWRENCE HIGH SCHOOL A JESUIT CHRISTIAN MINORITY INSTITUTION



STUDY MATERIAL – 2 TOPIC – NETWORKING

SUBJECT: COMPUTER APPLICATION F.M.:15

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NETWORK ARCHITECTURE

- Defines **HOW** a network functions.
- □ Indicates whether certain computers have some special role or all computers have the same role in the network.
- □ Two divisions:
 - ✓ Client Server Network
 - ✓ Peer to Peer Network

> Client Server Network:

- In a client/server network, a number of network clients or workstations request resources or services from the network. One or more network servers manage and provide these resources or services. The clients are computers that depend on the server for data and software.
- Servers are typically computers with more processing speed, memory and hard disk space than a regular desktop computer. The network servers run their own operating system that manages the various network tasks as well as services that run on the network.
- □ Have you ever played Xbox Live or used the PlayStation Network? Your Xbox One is the client, and when it logs into the network, it contacts the Xbox Live servers to retrieve gaming resources like updates, video, and game demos.



□ Advantages of Client-Server Network:

- Client-Server Network has centralized control. i.e., centralized user accounts, security, and access to simplify network administration.
- It does not slow down with heavy use.
- The size of the network can be expanded to any size.
- Proper Management: All the files are stored in the same place. In this way, the management of files becomes easy. Also, it becomes easier to find files.
- As all the data is stored on the server it's easy to make a back-up of it.
- Reduces Data Replication- Data stored on the servers instead of each client, so it reduces the amount of data replication for the application.

Disadvantages of Client-Server Network:

- A specialist network operating system is needed.
- Server failure leads to the whole network failure.
- It is very expensive to install and manage as dedicated hardware (Server) and special software is required.
- Professional IT people are required to maintain the servers and other technical details of the network.

Peer – to – Peer Network:

- In a peer-to-peer or P2P network, the tasks are allocated among all the members of the network. There is no real hierarchy among the computers, and all of them are considered equal. This is also referred to as a distributed architecture or workgroup without hierarchy.
- A peer-to-peer network does not use a central computer server that controls network activity. Instead, every computer on the network has a special software running that allows for communications between all the computers.
- □ Peer-to-peer is mostly used for file sharing.
- Here is how file sharing works: One computer user makes some of the files on the hard disk drive available for sharing. Information on these files is made available to the rest of the users so they can decide if they want to download one or more of these files. Once a second user has downloaded a file, this can also be made available to the rest of the users. So now there are two possible sources from which to download the same file. This is how files can be spread over thousands of users, one download at time.



□ Advantages of Peer to Peer Computing:

• Each computer in the peer to peer network manages itself. So, the network is quite easy to set up and maintain.

- In the client server network, the server handles all the requests of the clients. This provision is not required in peer to peer computing and the cost of the server is saved.
- It is easy to scale the peer to peer network and add more nodes. This only increases the data sharing capacity of the system.
- None of the nodes in the peer to peer network are dependent on the others for their functioning.

Disadvantages of Peer to Peer Computing:

- It is difficult to backup the data as it is stored in different computer systems and there is no central server.
- It is difficult to provide overall security in the peer to peer network as each system is independent and contains its own data.

TYPES OF NETWORK

- □ A computer network is formed when several computers are connected over a small, medium or large geographic area.
- □ Types of Network:
 - ✓ LAN (Local Area Network)
 - ✓ MAN (Metropolitan Area Network)
 - ✓ WAN (Wide Area Network)

> LAN -

- Local Area Network is a group of computers connected to each other in a small area such as building, office.
- LAN is used for connecting two or more personal computers through a communication medium such as twisted pair, coaxial cable, etc.
- It is less costly as it is built with inexpensive hardware such as hubs, network adapters, and ethernet cables.

- The data is transferred at an extremely faster rate in Local Area Network.
- Local Area Network provides higher security.



> MAN -

- A metropolitan area network is a network that covers a larger geographic area by interconnecting a different LAN to form a larger network.
- Government agencies use MAN to connect to the citizens and private industries.
- In MAN, various LANs are connected to each other through a telephone exchange line.
- The most widely used protocols in MAN are RS-232, Frame Relay, ATM, ISDN, OC-3, ADSL, etc.
- It has a higher range than Local Area Network(LAN).



Uses Of Metropolitan Area Network:

- MAN is used in communication between the banks in a city.
- It can be used in an Airline Reservation.
- It can be used in a college within a city.
- It can also be used for communication in the military.

- > WAN -
 - A Wide Area Network is a network that extends over a large geographical area such as states or countries.
 - A Wide Area Network is quite bigger network than the LAN.
 - A Wide Area Network is not limited to a single location, but it spans over a large geographical area through a telephone line, fibre optic cable or satellite links.
 - The internet is one of the biggest WAN in the world.
 - A Wide Area Network is widely used in the field of Business, government, and education.



There exists another type of network-

- > PAN -
 - Personal Area Network is a network arranged within an individual person, typically within a range of 10 meters.
 - Personal Area Network is used for connecting the computer devices of personal use is known as Personal Area Network.
 - Personal Area Network covers an area of 30 feet.
 - Personal computer devices that are used to develop the personal area network are the laptop, mobile phones, media player and play stations.

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