Client

A client is a program that runs on the local machine requesting service from the server. A client program is a finite program means that the service started by the user and terminates when the service is completed.

Server

A server is a program that runs on the remote machine providing services to the clients. When the client requests for a service, then the server opens the door for the incoming requests, but it never initiates the service.

Network Media

In data communication terminology, a transmission medium is a physical path between the transmitter and the receiver i.e. it is the channel through which data is sent from one place to another

**Guided Media:** It is also referred to as Wired or Bounded transmission media

**Twisted Pair Cable**

**Shielded Twisted Pair (STP)  
Coaxial Cable**

**Optical Fiber Cable**

**Unguided Media:**

**It is also referred to as Wireless or Unbounded transmission media**

**Radio waves**

**Microwaves**

**Infrared**

Network Types (LAN and WAN)

LAN(Local Area Network)

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

PAN(Personal Area Network)

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.

MAN(Metropolitan Area Network)

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.

WAN(Wide Area Network)

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

**Internet Connections**

**Cable –** Typically offered by cable television service providers, the internet data signal transmits on the same cable that delivers cable television. It provides a high bandwidth, high availability, and an always-on connection to the internet.

**DSL –** Digital Subscriber Lines also provide high bandwidth, high availability, and an always-on connection to the internet. DSL runs over a telephone line. In general, small office and home office users connect using Asymmetrical DSL (ADSL), which means that the download speed is faster than the upload speed.

**Cellular –** Cellular internet access uses a cell phone network to connect. Wherever you can get a cellular signal, you can get cellular internet access. Performance is limited by the capabilities of the phone and the cell tower to which it is connected.

**Satellite –** The availability of satellite internet access is a benefit in those areas that would otherwise have no internet connectivity at all. Satellite dishes require a clear line of sight to the satellite.

**Dial-up Telephone –** An inexpensive option that uses any phone line and a modem. The low bandwidth provided by a dial-up modem connection is not sufficient for large data transfer, although it is useful for mobile access while traveling.

Network Security Solution (ACL - Access Control List , Firewall and Antivirus)

Lecture 2

Network Protocols

OSI vs TCP/IP

Network Message Delivery Option (Unicast, Broadcast, Multicast)

MAC Address IP Address

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**Day - 2 (Dir : 2 - Lec 3)**  
Physical Layer Media

* Copper Cable; Fiber Optics; Microwave (Wireless) Signal
* Bandwidth (BPS, KBPS, MBPS, GBPS)

Network Media :-

Wired Media

* Copper Media - UTP, Cancel EMI.
* Shielded Twisted Pair
* Coaxial Cable
* Fiber Optic Media (LC, SC, ST, FC, MTRJ, MU, E2000 Connector)

Wireless Media:-

* Wi-Fi
* Wi-MAX
* Bluetooth

Data Link Layer (Error Detection, Packet and Frame Combine, Access to media via MAC)

Network Topology - Physical and Logical Connection

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**Day - 3 (Dir : 2 - Lec 4)**  
Ethernet -

PoE Ethernet Switch

Fixed and Modular Switch  
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**Day - 4 (Dir : 2 - Lec 5)**

Network Layer :- IP Address

IPv4 vs IPv6 (32bit and 128bit : decimal and Hexadecimal : Number of Addresses - 2^32 and 2^128) || Routers - IP Routing using Routing table

Router Memory - RAM ROM NVRAM FLASH

Routing Table - IP and port number of Host

Router Configuration - Need to configure

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**Day - 5 (Dir : 2 - Lec 6)**

Transport Layer :-

Host to Host Communication

TCP and UDP (TCP Slower than UDP || TCP re-transmit packets if lost but UDP Don't || TCP-Mails, Web Browsing , UDP - VoIP, Streaming)

Three Way Handshake (SYN, SYN-ACK, ACK Back)

Data Segmentation

TCP Windowing

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