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| --- | --- |
| 2 models of computer network | - Digital -> Analog  - converts digital data from a device into an analog signal that can be sent over standard telephone lines. |
| Ascending order of coverage? | - Internet Protocol Address.  -Logical address of interface between host and computer network  -The IP address is assigned to each device connected to a computer network using IP for communication.  - IPv4 & IPv6  - Represented by decimal number  - 4 octets, each octet ranging from 0-255 (0.0.0.0 -> 255.255.255.255)  - IPv4 is 32 bits; IPv6 is 128 bits  - Network ID- Host ID |
| Classification of computer network | - Media Access Control Address.  -Physical address or hardware address  -Represented by hexadecimal  -Assigned by manufacturer  - 6 octets  -48 bits  -Manufacturer ID- host ID |
| Function of Application | - Modulator-Demodulator  - [hardware](https://techterms.com/definition/hardware) component that allow a device to connect to the Internet.  - Do 2 works: Modulation and Demodulation |
| Function of Data link | -Address of process or application  -Fixed port number and dynamic port number (0-65535)  - 16 bits |
| Function of Network | an open-source network protocol analysis software program. It captures network traffic on the local network and stores that data for offline analysis. Wireshark captures network traffic from Ethernet, Bluetooth, Wireless (IEEE.802.11) … |
| Function of Physical | an organization that provides a myriad of services for accessing, using, or participating in the Internet. |
| Function of Presentation | -Analog-> Digital  modulates an [analog](https://techterms.com/definition/analog) signal from a telephone or cable wire to [digital](https://techterms.com/definition/digital) data (1s and 0s) that a computer can recognize. |
| Function of Session | Application  Presentation  Session  Transport  Network  Data link  Physical |
| Function of Transport | Application  Transport  Network  Data link  Physical |
| Kinds of data flow? | Arrangement of nodes of a computer network  Bus-Ring- Star- Mesh - Hybrid |
| Kinds of network? | Billions of connected computing devices managed by an organization (ISP: Internet service provider) |
| Layer of TCP/IP model | Client-Server network (CS)  Peer-to-peer network (P2P) |
| Layers of OSI model | Coaxical cable, fiber optic cable, wireless radio |
| List out 2 fundamental approaches of network core | [computer network](https://cio-wiki.org/wiki/Network_Architecture) in which many clients (remote processors) request and receive [service](https://cio-wiki.org/wiki/Service) from a centralized server (host [computer](https://cio-wiki.org/wiki/Computer)). |
| List out some Internet standard? | Decides which path the data will take, multi-node routing and addressing. |
| List out some links in Physical media? | -Dialog control: allow the 2 systems to enter the dialogue  -Synchronization: insert checkpoint (synchronization point) to the big file transmitted. |
| packet transmission delay formula? | Easier for us to deal with complex system (identify the relationships between network’s pieces)  The modular format of layers ease the maintenance + updating. |
| Protocol for Data link layer | Ensure the data is in usable format and encrypt data  It is concerned with the syntax (structure) and sematic (meanings of each section in the file) of the information exchanged by the 2 systems |
| Protocol of Application | Establish, maintain, synchronize the connection (or reconnection) among the communicating devices, control ports and sessions |
| Protocol of network | Ethernet, 802.11 (WiFi), PPP |
| Protocol of Transport | File Transfer and Access management (FTAM)  Mail services  Directory service: store, retrieve, manage info about objects |
| Service of Application | Framing: group the bits of 0 and 1 and we call that grouping as a frame  Physical addressing: IP, MAC, port addressing  Flow control  Error control  Access control |
| Service of Data link | HTTP (Hypertext Transfer Protocol)  FTP ( File Transfer Protocol)  POP (Post Office Protocol)  SMTP (Simple Mail Transfer Protocol)  Domain Name System (DNS) |
| Service of Network | Human-computer interaction layer, high-level API, where application can access the network services. |
| Service of Physical layer | Internet Standard is a normative specification of a technology or methodology applicable to the Internet. |
| Service of Presentation | IP (IPv4& IPv6) (Internet Protocol)  Routing protocols |
| Service of Session | It is responsible for process to process delivery of the entire message including message segmentation, acknowledgement and reliability. |
| Service of Transport | It is responsible for transmitting raw bits stream over physical medium. It also provides electrical and mechanical specification. |
| The Internet structure contains? | L (bits) / R (bits/sec)  L: packet length  R: transmission rate |
| What is Access network/ Physical media? | Logical addressing: deal with IP address, help the router to make decision, the packets received by the routers will have source IP address and destination IP address.  Routing: finding the best rout for the packets to be transmitted |
| What is Client-Server network? | Network edge  Access network, Physical media  Network core |
| What is Demodulation? | network for interconnecting electronic devices centered on an individual person's workspace.  Ex: infrared, ZigBee, Bluetooth and ultrawideband, or UWB |
| What is Internet standard? | Network in which two or more computer systems connect in order to share resources. computers are linked together with equal permissions and responsibilities for processing data |
| What is IP address? | Network of nodes connected by communication links   * Node: end device (ex: computer), intermediate node (router, hub, switch)   Communication link: fiber, copper, radio, satellite (§ transmission rate: bandwidth) |
| What is ISP? | network that extends over large geographical area for primary purpose of computer networking.  Ex: ex: all end and intermediate nodes |
| What is LAN? | network that interconnect computers within a limited area such as residence, school, laboratory, university, office building.  Ex: wired LAN (ethernet, hub,switch), wireless LAN (Wi-fi) |
| What is MAC address? | network that interconnect users from with computer resources with geographic region of the size of a metropilitan area.  Ex: switch, hub, router,bridge ... |
| What is MAN? | OSI model (Open Systems Interconnection Model)  TCP/IP model (Transmission control protocol/ Internet protocol model) |
| What is modem? | Packet switching  Circuit switching   * FDM (Frequency Division Multiplexing)   TDM (Time Division Multiplexing) |
| What is Modulation? | PAN-LAN-MAN-WAN-Internet |
| What is Network core? | Personal area network (PAN)  Local area network (LAN)  Metropolitan area network (MAN)  Wide area network (WAN)  The Internet |
| What is network edge? | Physical characteristics of the media  Representation of bits  Data rate  Synchronization of bits  Physical topology |
| What is Network Topology? | Port addressing  Segmentation and reassembly  Connection control  End-to-end flow control: speed-matching mechanism  Error control |
| What is OSI model? | Protocol is a standardized set of rules for formatting and processing data, which enables computers (or nodes) to communicate with one another. (controls sending and receiving of message) |
| What is PAN? | Responsible for flow and error control on physical link. |
| What is peer-to-peer network? | RFC: Request for Comments  IETF: Internet Engineering Task Force |
| What is port number? | Simplex  Half-duplex  Full-duplex |
| What is protocol? | TCP (Transmission Control Protocol- Connection oriented protocol)  UDP ( User Datagram Protocol- Connectionless Protocol) |
| What is the Computer network? | The area where a device or local network interfaces with the Internet. (include end nodes s.a computer,…) |
| What is the Internet? | The central element of network (interconnected routers) that provide service to user |
| What is WAN? | The protocol defines the rules, syntax and semantics and synchronization of the communication and possibly, find any error recovery methods. |
| What is Wireshark? | The OSI Model (Open Systems Interconnection Model) is a conceptual framework used to describe the functions of a networking system. |
| What protocol define? | -Translation: Converting the info sent by the sender by common format accepted by both  -Encryption (Decryption): Confidential info, we do not want protect data from disclosure or any unauthorized access (convert plain text to unreadable text)  -Compression: reduce the number of bits in transferred files |
| Why layering? | wired, wireless communication links  Physical media: include guided and unguided media |