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Technical Papers Networking Concepts: Networking Concepts Part I

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What are the two types of transmission technology available?

Broadcast and point-to-point

What is subnet?

A generic term for section of a large networks usually separated by a bridge or router.

Difference between the communication and transmission.

Transmission is a physical movement of information and concern issues like bit polarity, synchronisation, clock etc.

Communication means the meaning full exchange of information between two communication media.

What are the possible ways of data exchange?

Simplex, Half-duplex and Full-duplex.

What is SAP?

Series of interface points that allow other computers to communicate with the other layers of network protocol stack.

What do you meant by "triple X" in Networks?

The function of PAD (Packet Assembler Disassembler) is described in a document known as X. 3. The standard protocol has been defined between the terminal and the PAD, called X. 28; another standard protocol exists between hte PAD and the network, called X. 29. Together, these three recommendations are often called "triple X"

What is frame relay, in which layer it comes?

Frame relay is a packet switching technology. It will operate in the data link layer.

What is terminal emulation, in which layer it comes?

Telnet is also called as terminal emulation. It belongs to application layer.

What is Beaconing?

The process that allows a network to self-repair networks problems. The stations on the network notify the other stations on the ring when they are not receiving the transmissions. Beaconing is used in Token ring and FDDI networks.

What is redirector?

Redirector is software that intercepts file or prints I/O requests and translates them into network requests. This comes under presentation layer.

What is NETBIOS and NETBEUI?

NETBIOS is a programming interface that allows I/O requests to be sent to and received from a remote computer and it hides the networking hardware from applications.

NETBEUI is NetBIOS extended user interface. A transport protocol designed by microsoft and IBM for the use on small subnets.

What is RAID?

A method for providing fault tolerance by using multiple hard disk drives.

What is passive topology?

When the computers on the network simply listen and receive the signal, they are referred to as passive because they don't amplify the signal in any way. Example for passive topology-linear bus.

What is Brouter?

Hybrid devices that combine the features of both bridges and routers.

What is cladding?

A layer of a glass surrounding the center fiber of glass inside a fiber-optic cable.

What is point-to-point protocol

A communications protocol used to connect computers to remote networking services including Internet service providers.

How Gateway is different from Routers?

A gateway operates at the upper levels of the OSI model and translates information between two completely different network architectures or data formats

What is attenuation?

The degeneration of a signal over distance on a network cable is called attenuation.

What is MAC address?

The address for a device as it is identified at the Media Access Control (MAC) layer in the network architecture. MAC address is usually stored in ROM on the network adapter card and is unique.

Difference between bit rate and baud rate.

Bit rate is the number of bits transmitted during one second whereas baud rate refers to the number of signal units per second that are required to represent those bits.

baud rate = bit rate/N

where N is no-of-bits represented by each signal shift.

What is Bandwidth?

Every line has an upper limit and a lower limit on the frequency of signals it can carry. This limited range is called the bandwidth.

What are the types of Transmission media?

Signals are usually transmitted over some transmission media that are broadly classified in to two categories.

Guided Media:

These are those that provide a conduit from one device to another that include twisted-pair, coaxial cable and fiber-optic cable. A signal traveling along any of these media is directed and is contained by the physical limits of the medium. Twisted-pair and coaxial cable use metallic that accept and transport signals in the form of electrical current. Optical fiber is a glass or plastic cable that accepts and transports signals in the form of light.

Unguided Media: This is the wireless media that transport electromagnetic waves without using a physical conductor. Signals are broadcast either through air. This is done through radio communication, satellite communication and cellular telephony.

What is Project 802?

It is a project started by IEEE to set standards to enable intercommunication between equipment from a variety of manufacturers. It is a way for specifying functions of the physical layer, the data link layer and to some extent the network layer to allow for interconnectivity of major LAN protocols.

It consists of the following:

- 802.1 is an internetworking standard for compatibility of different LANs and MANs across protocols.

- 802.2 Logical link control (LLC) is the upper sublayer of the data link layer which is non-architecture-specific, that is remains the same for all IEEE-defined LANs.

    1. 6 is distributed queue dual bus (DQDB) designed to be used in MANs.

Media access control (MAC) is the lower sublayer of the data link layer that contains some distinct modules each carrying proprietary information specific to the LAN product being used. The modules are Ethernet LAN (802.3) , Token ring LAN (802.4) , Token bus LAN (802.5) .

What is Protocol Data Unit?

The data unit in the LLC level is called the protocol data unit (PDU) . The PDU contains of four fields a destination service access point (DSAP) , a source service access point (SSAP) , a control field and an information field. DSAP, SSAP are addresses used by the LLC to identify the protocol stacks on the receiving and sending machines that are generating and using the data. The control field specifies whether the PDU frame is a information frame (I-frame) or a supervisory frame (S-frame) or a unnumbered frame (U-frame) .

What are the different type of networking/internetworking devices?

Repeater: Also called a regenerator, it is an electronic device that operates only at physical layer. It receives the signal in the network before it becomes weak, regenerates the original bit pattern and puts the refreshed copy back in to the link.

Bridges: These operate both in the physical and data link layers of LANs of same type. They divide a larger network in to smaller segments. They contain logic that allow them to keep the traffic for each segment separate and thus are repeaters that relay a frame only the side of the segment containing the intended recipient and control congestion.

Routers: They relay packets among multiple interconnected networks (i.e.. , LANs of different type) . They operate in the physical, data link and network layers. They contain software that enable them to determine which of the several possible paths is the best for a particular transmission.

Gateways: They relay packets among networks that have different protocols (e. g. Between a LAN and a WAN) . They accept a packet formatted for one protocol and convert it to a packet formatted for another protocol before forwarding it. They operate in all seven layers of the OSI model.

What is ICMP?

ICMP is Internet Control Message Protocol, a network layer protocol of the TCP/IP suite used by hosts and gateways to send notification of datagram problems back to the sender. It uses the echo test/reply to test whether a destination is reachable and responding. It also handles both control and error messages.

What are the data units at different layers of the TCP/IP protocol suite?

The data unit created at the application layer is called a message, at the transport layer the data unit created is called either a segment or an user datagram, at the network layer the data unit created is called the datagram, at the data link layer the datagram is encapsulated in to a frame and finally transmitted as signals along the transmission media.

What is difference between ARP and RARP?

The address resolution protocol (ARP) is used to associate the 32 bit IP address with the 48 bit physical address, used by a host or a router to find the physical address of another

host on its network by sending a ARP query packet that includes the IP address of the receiver.

The reverse address resolution protocol (RARP) allows a host to discover its Internet address when it knows only its physical address.

What is the minimum and maximum length of the header in the TCP segment and IP datagram?

The header should have a minimum length of 20 bytes and can have a maximum length of 60 bytes.

What is the range of addresses in the classes of internet addresses?

Class A 0.0. 0.0 – 127.255. 255.255

Class B 128.0. 0.0 – 191.255. 255.255

Class C 192.0. 0.0 – 223.255. 255.255

Class D 224.0. 0.0 – 239.255. 255.255

Class E 240.0. 0.0 – 247.255. 255.255

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