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CSE
Course: Data communication
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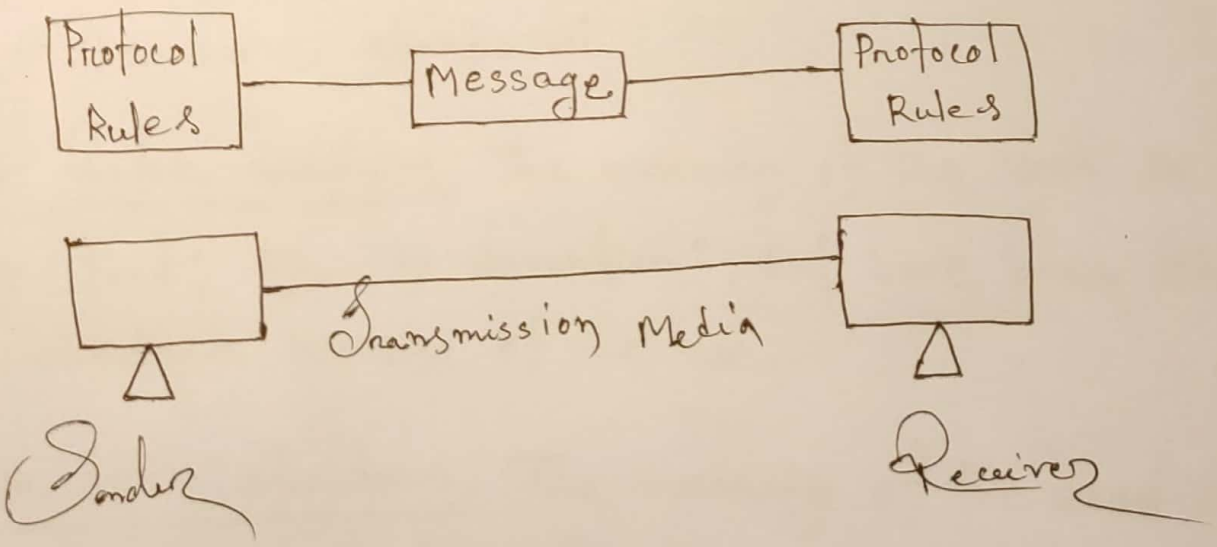
Ans: to: the: Q: NO: 01

(a) Protocol's: In order to make communication successful between devices, some rules & procedures should be agreed upon at the sending & receiving ends of the system. Such rules & procedures should be agreed upon at the sending & receive ends of the system. Such rules & procedurs are called as protocols. Different types of protocols are used for different types of communication.



In above diagram protocols are shown as set of rules. Such that communication between sender & receiver is not possible without protocol.

Key elements of a protocal:

- → syntax
- → Semantics
- → Liming

A protocol is a set of rurals that sentainly govern data communication.

Standards: standards are the set of rules for data communication that are needed for exchange of information among created by various standard Organization like IEEE, ISO, ANSI etc.

Types of standards:

- → De factor standard
- → De jure standard

* De factor standard: The meaning of the work "De factor" is by Fact" or "by convention", but have been adopted as standards because of its use.

* De jure standard: The meaning of the word "De jure" is "by law" or "by regulations". Thus, these are standards that have been approved by officially recognized body like ANSI, ISO, IEE etc.

(b) Application of co-axial cable:

* Domestic Radio & television:

** Domestic televisions sometimes VHF FM or digital radio solution some have external antennas.

** Commercial Radio communication:

→ Coax feeder is used within commercial radio communications system. Like all other RF Feeders used in professional applications, a standards of 50Ω has been adopted for the characteristic impandance.

* Broadcasting:

→ It is necessary to transfer the transmitter to the antenna.

* Satellite antennas:

→ It is not unusual to see sets of satellite antennas used for sending.

** These satelite antennas need to be fed and others.

→ It's applications include feedback connecting audio transmetters & receivers to their attenuer, computer network connections.

Disadvantage of Fiber optic cable:

Fragility: - As they are made of glass, fiber optic Cables are more fragile than electrical wires like copper cabling. If you bend them too much, they will break.

Splicing Difficulties:

When deploying a new fiber optic network or expanding an existing one.

Installation & construction Risk:

Due to how small & compact the fibre optic cable is, it is highly on any construction activities.

Cost: Even though the cost of a fiber-optic cabling installation has dropped dramatically over the last couple of years.

(c) Difference between Guided & unguided media :-

Guided Media	Unguided media
1. In guided media, the signal energy communication via wires.	1. In unguided media the signal energy communicates through the air.
2. Guided media is generally preffered when we want to execute direct communication.	2. Unguided media is generally preffered for media broadcasting in all directions.
3. the guided media formed the different network topologies.	3. the unguided media formed the continuous network topologies.
4. Here, the signals are in the state of current & voltage	4. Here, the signals are in the state of electromagnetic waves.
5. In the case of guided media the trasmission capacity can be boosted by couting more wires.	5. In the case of unguided media, it is not feasible to acquire more capacity.
6. open wire, Twisted pair, coaxial cable & optical fiber are the different kinds of guided media.	6. Microwave Trasmission, radio Transmission & Infrared Trasmission are the type of unguided media.

Ans: the 1 of NO: 02

(a) Internetworks:

→ A network of networks which consists of two or more physical networks is called Internetworks unlike a wan WAN an internetwork may reside in only a single location.

Because it includes too many computers or spans too much distance, an internetworks cannot fit within the scope of a single LAN.

Internetwork is a complex network created when two or more independent networks are connected using routers.

There is chiefly units of Internetworking

1. Extranet.
2. Intranet.
3. Internet.

(b) Wireless WANs and LANs:

A WAN is a network covering any large geographic area. WANs can be as large as a state, a country on the world. The internet it self is a type of WAN, because it covers the entire globe.

Although a network connecting LANs in the same city, like a group of offices belonging to the same company, are usually called intraplitan area networks.

A LAN is a network limited to a small area like a home or office it is usually confined to a single building. The LAN can consists of computers smartphones, TVs & tablets, A wireless LAN is usually limited to the radius of a wirless access point which can be a couple of hundred feet. However, this distance can be extended by linking additional wireless access points of a wireless access point.

A LAN, or local area network, is a small network often whithin a home or business or perhaps within a larger environment like a corporate office park or a college campus.

A LAN can use wireless communication wired connections or both. A wide area network usually traverses multiple geographical areas. The internet is the most prominent example of the WAN network type, though other wide area networks type exist for scientific purposes, military & government work & to connect for flung offices & data centers within some big corporations, It might involve monitoring packet loss or delays.

Ans: to the Q. NO: 03

(a) Implicit congestion signaling:

→ In implicit signaling there is no communication between the congested node or nodes & the source.

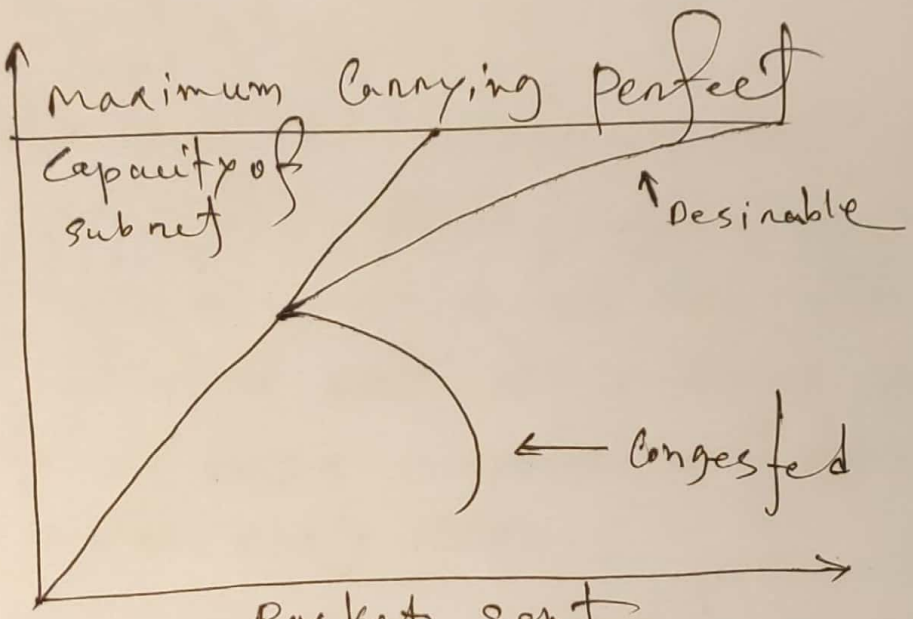
→ The source guesses that there is congestion somewhere in the network when it does not receive any acknowledgment.

Therefore the delay in receiving an acknowledgment is inperpreted as congetion in the network.

→ On seasing this congestion, the source slows down.

→ This type of congestion control policy is used by TCP.

congestion is an important issue that can arise in packet switched network. congestion is a situation in communication networks in which to many packets are present in a part of the subnet, performance degrades, congestion is a network may occur when the load on the network.



Concept of congestion

Implicit congestion signaling involves detecting congress based on observed changes in network performance rather than explicit signals.

(B) OSI model and whole layers in the OSI model :-

The open system interconnection (OSI) model describes seven layers that computer systems use to communicate over a network. It was the first standard model for network communication adopted by all major computer and telecommunication companies in the early 1980s.

The modern internet is not based on OSI, but the simpler TCP/IP model. However, the OSI 7-layer model is still widely used, as it helps visualize and communicate how networks operate, and helps isolate and troubleshoot networking Problems.

OSI model Explained : The OSI 7 layers

7	Application layer	Human computer interaction layer, where application can access the networks.
6	Presentation layer	Ensure that data is a usable format and is where data encryption occurs.
5	session layer	Maintains connections and is responsible for controlling ports and sessions.
4	Transport Layer	Transmits data using transmission Protocols including TCP and UDP.

3	Network layer	Decides which physical path the data will take.
2	Data link layer	Defines the format of data on the network.
1	Physical layer	Transmits raw bit stream over the physical medium.

Layer 7 - Application :

The application layer is the OSI model is the layer that is the closest to the end user." It receives information directly from users and displays incoming data to the user. Oddly enough, applications themselves do not reside at the application layer. Instead the layer facilities communication through lower layers in order to establish connections with applications at the other end. Web browsers Telnet, and FTP, are examples of communications that rely on layer 7.

Layer 6 - Presentation :

The presentation layer represents the area that is independent of data representation at the application layer. In general, it represent the preparation or translation of application format to network format. In other words, the layer "presents" data for the application

on the network. A good example of this encryption and decryption of data for secure transmission, this happens at layer 6.

Layer 5 - Session layer :

When two computers or other networked devices need to speak with one another, a session needs to be created, and this is done at the session layer. Functions at this layer involve setup, coordination and termination between the applications at each end of the session.

Layer 4 - Transport :

The transport layer deals with the coordinati of the data transfer between end systems and hosts. How much data to send, at what rate, where is goes, etc. The best known example of the transport layer is the Transmissi control Protocol (TCP), which is build on top of the internet protocol (IP), commonly know as TCP/IP. TCP and UDP port numbers work at layer 4. while IP address work at layer 3, the network layer.

Layer 3 - network: Here at the network layer is where you'll find most of the routers functionality that most networking professionals care about & love. In its most basic sense, this layer is responsible for packet forwarding including routing though different routers.

Layer 2 - Data link:

The data link layer provides node to node data transfer, & also handles errors connection from the physical layer. Two sublayers exists here as well - the media Access control (MAC) layer & the logical link control (LLC) layer.

In the networking world, most switches operate at layer 2. But it's not that simple.

(c) Comparison between analog & digital signals:

Analog signal	Digital signal
A signal for conveying information which is a continuous function of time is known as analog signal.	A signal which is a discrete function of time, i.e. non-continuous signal, is known as digital signal.
Analog signals use a continuous range of values to represent the data & information.	The bandwidth of a digital signal is relatively high.
Analog signal get effected by the electronic noise easily	The digital signals are more stable & less susceptible to noise than the analog signals.
Due to more susceptibility to the noise, the accuracy of analog signals is less	The digital signals have high accuracy because they are immune from the noise.
Analog signals give use more power for data transmission	Digital signals use less power than analog signals for conveying the same amount of information.

Analog signals	Digital signals
The analog signals give observational errors	The digital signals do not given observational errors.
The common examples of analog signals are temperature, current, voltage, voice, pressure, speed, etc	The common example of digital signal is the data store in a computer memory.
continuous range of values	Discontinuous values
Records sound waves as they are	converts into a binary wave form
only used in analog devices	suited for digital electronics like computer mobiles and more