

Assignment

R-1 Explain need of layered architecture.

Ans Need of Layered Architecture :-

① Divide - and - Conquer approach :-

- Divide and Conquer approach makes a design process in such a way that the unmanageable tasks are divided into small and manageable tasks. In short, we can say that this approach reduces the complexity of the design.

② Modularity :-

- Layered architecture is more modular. Modularity provides each of the layers, which is easier to understand and implement.

③ Easy to Modify :-

- It ensures the independence of layers so that implementation in one layer can be changed without affecting other layers.

④ Easy to Test :-

- Each layer of the layered architecture can be analyzed and tested individually.

Q-2 Write functions of Data link layer in ~~OSI~~ Model.

Ans Functions of Data - link layer :

(1) Framing :-

- The data link layer translates the physical layer's raw bit stream into packets known as frames.
- The Data link layer adds the header and trailer to the frame.



(2) Physical Addressing :-

- The Data link layer adds a header to the frame that contains a destination address.
- The frame is transmitted to the destination address mentioned in the header.
- This header defines the physical address of the sender as well as the receiver.

(3) Flow control :-

- Flow control is the main functionality of the Data - link layer.

- It is the technique through which the constant data rate is maintained on both the sides so that no data get corrupted.
- It ensures that the transmitting station such as a server with higher processing speed does not exceed the receiving station, with lower processing speed.

(4) Error control :-

- It is a mechanism to prevent duplication of frames in case one frame is destroyed due to noise or other reasons.
- If any error seems to occur, then the receiver sends the acknowledgement for the retransmission of the corrupted frames.

⇒ Examples :- Switch, NIC (Network Interface Card).

Q-3 Write difference between TCP/IP and OSI Model.

Ans

OSI

TCP/IP

- (1) It stands for open system Interconnection.
- (2) OSI model has been

- (1) It stands for Transmission control Protocol.
- (2) It was developed by

developed by ISO (International Standard Organization).

ARPANET (Advanced Research Project Agency Network).

(3) It is an independent Standard and Generic Protocol used as a communication gateway between the network and the end user.

It consists of Standard Protocols that lead to the development of an internet. It is a communication protocol that provides the connection among the hosts.

(4) This model is based on a vertical approach.

This model is based on a horizontal approach.

(5) In this model, the session and presentation layers are separated, i.e., both the layers are different.

In this model, the session and presentation layer are not different layers. Both layers are included in the application layer.

(6) In this model, the network layer provides both connection-oriented and connectionless service.

The network layer provides only connectionless service.

(7) Protocols in the OSI model are hidden and can be easily replaced when the technology changes.

In this model, the protocol cannot be easily replaced.

- (8) It consists of 7 layers. It consists of 4 layers.
- (9) OSI model defines the services, protocols, and interfaces as well as provides a proper distinction between them. It is protocol independent.
- In the TCP/IP model, services, protocols and interfaces are not properly separated. It is protocol dependent.
- (10) The usage of this model is very low. This model is highly used.

Q-4 Explain Switch with different strategies of switch.

Ans A switch is a network device that connects multiple computers (or devices) in a LAN, just like a hub, but smarter.

- Unlike a hub (which sends data to everyone), a switch sends data only to the correct device.
- Switch has a buffer for each link to which it is connected. Switch operates in data link layer of the OSI model. When it receives a frame, it stores the frame in buffer of receiving link and checks address to find outgoing link. If the outgoing link is free the switch sends the frame to that

Particluar link.

→ Two different strategies of switch.

- ① Store and forward switch.
- ② Cut-through switch.

① Store and Forward switch

- This switch stores the frame in the input buffer until the whole packet has arrived.

② Cut-through switch

- It forwards the frame to the output buffer as soon as the destination address is received.

→ There are two types of switch.

- ① 2 - Layer switch
- ② 3 - Layer switch

Q-5 Explain Router with its types.

Ans Routers operate in the Physical , data link and network layers of the OSI Model.

- It is most active in network layer.

- Routers are able to access network layer address. of the device.

- It contains software that enables them

to determine which of several paths between those addresses is best for data transmission.

- A packet sent from a station on one network to a device on nearby network goes first to the router which switches packet to the destination network.
- Router consults with a routing table when packet is ready to be forwarded.
- Simplest function of routers is to receive packets from one connected network and pass them to second connected network.
- A Router is a networking device that connects two or more networks together.

⇒ TYPES OF ROUTERS

1) STATIC ROUTER

- Routing Table's information's are entered manually.
- Means this administrator enters the route for each destination into the table.
- It cannot update automatically when there is change in the internet.
- It is more secure.
- It always use the same route.

2) Dynamic Router

- Routing table is created.
- Table is updated using one of the dynamic routing protocols whenever there is change in the internet.

Q6 Explain Application layer of TCP/IP model with its protocols.

Ans An Application layer is the topmost layer in the TCP/IP model.

- It is responsible for handling high-level protocols, issues of representation.
- This layer allows the user to interact with the application.
- When one application layer protocol wants to communicate with another application layer, it forwards its data to the transport layer.
- There is an ambiguity occurs in the application layer.
- It acts like a bridge between your software and the lowest layers of the network that actually send and receive data.

- It also manages things like date formatting, so both sender and receiver understand the date; encryption to keep data safe; and session management to keep track of ongoing connections.

⇒ Following are the main protocols used in application layer :-

→ HTTP :

- HTTP stands for Hypertext Transfer Protocol.
- This protocol allows us to access the data over the world wide web.
- It transfers the data in the form of Plain text, audio, video.
- It is known as Hypertext Transfer Protocol as it has the efficiency to use in a hypertext environment where there are rapid jumps from one document to another.

→ SMTP :

- SMTP stands for Simple Mail Transfer Protocol.
- The TCP/IP Protocol that supports the e-mail is known as a Simple mail transfer Protocol.
- This Protocol is used to send the data to another e-mail address.

→ DNS:

- DNS Stands for Domain Name System.
- An IP address is used to identify the connection of a host to the internet uniquely. But People Prefer to use the names instead of address.
- Therefore, the system that maps the name to the address is known as Domain Name System.

→ FTP:

- FTP Stands for File Transfer Protocol.
- FTP is a standard internet protocol used for transmitting the files from one computer to another computer.