

UNIT III

NETWORK LAYER

1. What are the network support layers and the user support layers?

Network support layers:

The network support layers are Physical layer, Data link layer and Network layer. These deal with electrical specifications, physical connection, transport timing and reliability.

User support layers:

The user support layers are: Session layer, Presentation layer, Application layer. These allow interoperability among unrelated software systems.

2. With a neat diagram explain the relationship of IEEE Project 802 to the OSI model?

The IEEE has subdivided the data link layer into two sub layers:

* Logical link control (LLC)

* Medium access control (MAC)

LLC is non-architecture specific. The MAC sub layer contains a number of distinct modules, each carries proprietary information specific to the LAN product being used.

3. What are the functions of LLC?

The IEEE project 802 model takes the structure of an HDLC frame and divides it into 2 sets of functions. One set contains the end user portion of the HDLC frame – the Other layers

Network Data link Physical Other layers Network

Logical Link Control

Media Access Control Physical logical address, control information, and data. These functions are handled by the IEEE802.2 logical link control (LLC) protocol.

4. What are the functions of MAC?

MAC sub layer resolves the contention for the shared media. It contains synchronization, flag, flow and error control specifications necessary to move information from one place to another, as well as the physical address of the next station to receive and route a packet.

5. What is protocol data unit?

The data unit in the LLC level is called Protocol Data Unit (PDU). It contains four fields.

Destination Service Point Address (DSAP)

Source Service Access Point

Control field

Information field

6. What are headers and trailers and how do they get added and removed?

The control data added to the beginning of a data is called headers. The control data added to the end of a data is called trailers. At the sending machine, when the message passes through the layers each layer adds the headers or trailers. At the receiving machine, each layer removes the data meant for it and passes the rest to the next layer.

7. What are the responsibilities of network layer?

The network layer is responsible for the source-to-destination delivery of packet across multiple network links. The specific responsibilities of network layer include the following:

Logical addressing.

Routing.

8. What is a virtual circuit?

A logical circuit made between the sending and receiving computers. The connection is made after both computers do handshaking. After the connection, all packets follow the same route and arrive in sequence.

9. What are data grams?

In datagram approach, each packet is treated independently from all others. Even when one packet represents just a place of a multipacket transmission, the network treats it although it existed alone. Packets in this technology are referred to as datagram.

10. What are the two types of implementation formats in virtual circuits?

Virtual circuit transmission is implemented in 2 formats.

Switched virtual circuit

Permanent virtual circuit.

11. What is meant by switched virtual circuit?

Switched virtual circuit format is comparable conceptually to dial-up line in circuit switching. In this method, a virtual circuit is created whenever it is needed and exists only for the duration of specific exchange.

12. What is meant by Permanent virtual circuit?

Permanent virtual circuits are comparable to leased lines in circuit switching.

In this method, the same virtual circuit is provided between two users on a continuous basis. The circuit is dedicated to the specific uses.

13. Define Routers.

DSAP SSAP Control Information

Routers relay packets among multiple interconnected networks. They route packets from one network to any of a number of potential destination networks. Internet routers operate in the physical, data link and network layer of OSI model.

14. What is meant by hop count?

The pathway requiring the smallest number of relays, it is called hop-count routing, in which every link is considered to be of equal length and given the value one.

15. How can the routing be classified?

The routing can be classified as,

Adaptive routing

Non-adaptive routing.

16. What is time-to-live or packet lifetime?

As the time-to-live field is generated, each packet is marked with a lifetime, usually the number of hops that are allowed before a packet is considered lost and accordingly, destroyed. The time-

to-live determines the lifetime of a packet.

17. What is meant by brouter?

A brouter is a single protocol or multiprotocol router that sometimes act as a router and sometimes act as a bridge.

18. Write the keys for understanding the distance vector routing. The three keys for understanding the algorithm are

Knowledge about the whole networks Routing only to neighbors

Information sharing at regular intervals

19. Write the keys for understanding the link state routing.

The three keys for understanding the algorithm are Knowledge about the neighborhood.

Routing to all neighbors.

Information sharing when there is a change.

20. How the packet cost referred in distance vector and link state routing?

In distance vector routing, cost refer to hop count while in case of link state routing, cost is a weighted value based on a variety of factors such as security levels, traffic or the state of the link.

16 Marks

1. Explain distance vector routing in detail.

2. Explain packet switching in detail.

3. What are routers? Explain in detail.

4. What are the services provided by DNS server? Explain in detail.

5. Find the class of each IP address. Give suitable explanation. (8 x 2 = 16) i)

227.12.14.87

ii) 193.14.56.22

iii) 14.23.120.8

iv) 252.5.15.111

v) 134.11.78.56

vi) 172.18.58.1

vii) 00000000 11110000 11111111 00110011

viii) 10000000 11110000 11111111 00110011

6. State the major difference between Distance Vector Routing and Link State Routing. Discuss how these routing techniques work.

7. What is the sub network address if the destination address is 200.45.34.56 and the subnet mask

is 255.255.240.0?

8. List and diagrammatically illustrate and discuss the four general categories of attack.

9. With relevant example discuss about Substitution Ciphers.

10. Briefly discuss how DES algorithm works.