

CS1036 INTERNETWORKING TECHNOLOGY

1. Why are protocols needed?

In networks, communication occurs between the entities in different systems. Two entities cannot just send bit streams to each other and expect to be understood. For communication, the entities must agree on a protocol. A protocol is a set of rules that govern data communication.

2. Group the OSI layers by function.

The seven layers of the OSI model belonging to three subgroups. Physical, data link and network layers are the network support layers; they deal with the physical aspects

of moving data from one device to another. Session, presentation and application layers

are the user support layers; they allow interoperability among unrelated software systems. The transport layer ensures end-to-end reliable data transmission.

3 What is a buffer?

Each receiving device has a block of memory called a buffer, reserved for storing incoming data until they are processed.

4 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.

5. 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.

6. Define Routers.

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

7. 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.

8. How can the routing be classified?

The routing can be classified as,

1. Adaptive routing
2. Non-adaptive routing.

9. 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.

10. What is meant by segmentation?

When the size of the data unit received from the upper layer is too long for the network layer datagram or data link layer frame to handle, the transport protocol divides it into smaller usable blocks. The dividing process is called segmentation.

11. What is meant by Concatenation?

The size of the data unit belonging to single sessions are so small that several can fit together into a single datagram or frame, the transport protocol combines them into a single data unit. The combining process is called concatenation.

12. What is meant by congestion?

Congestion in a network occurs if user sends data into the network at a rate greater than that allowed by network resources.

13. What is meant by quality of service?

The quality of service defines a set of attributes related to the performance of the connection. For each connection, the user can request a particular attribute each service class is associated with a set of attributes.

14. Discuss the TCP connections needed in FTP.

FTP establishes two connections between the hosts. One connection is used for data transfer, the other for control information. The control connection uses very simple rules of communication. The data connection needs more complex rules due to the variety of data types transferred.

15. Discuss the basic model of FTP.

The client has three components: the user interface, the client control process, and the client data transfer process. The server has two components: the server control process and the server data transfer process. The control connection is made between the control processes. The data connection is made between the data transfer processes.

16. What is the function of SMTP?

The TCP/IP protocol supports electronic mail on the Internet is called Simple Mail Transfer (SMTP). It is a system for sending messages to other computer users based on e-mail addresses. SMTP provides mail exchange between users on the same or different computers.

17. Why is an application such as POP needed for electronic messaging?

Workstations interact with the SMTP host, which receives the mail on behalf of every host in the organization, to retrieve messages by using a client-server protocol such as Post Office Protocol, version 3 (POP3). Although POP3 is used to download

messages from the server, the SMTP client still needed on the desktop to forward messages from the workstation user to its SMTP mail server.

18. What is the purpose of HTML?

HTML is a computer language for specifying the contents and format of a web document. It allows additional text to include codes that define fonts, layouts, embedded graphics and hypertext links.

19. Define LAN.

A Local Area Network (LAN) is a data communication system that allows a number of independent devices to communicate directly with each other in a limited geographic area.

20. Mention the various architecture in a LAN.

LAN is dominated by 4 architectures.

- a) Ethernet
- b) Token bus
- c) Token ring
- d) Fiber distributed data interface (FDDI)

21. Write short notes on FDDI.

Fiber distributed data interface is a local areas. Network protocol standardized by ANSI and ITU-7. It supports data rates of 100 Mbps and provides a high-speed alternative to Ethernet and token ring access method used here is token passing.

22. Define IP address.

IP address is the 3-bit number for representing a host or system in the network.

One portion of the IP address indicates a networking and the other represents the host in a network.

23. What is the purpose of routers?

Router operates like electronic postal workers that evaluate and forward packets between networks.

24. Define protocol.

A protocol is a formal set of rules that must be followed in order to communicate.

25. Why are the protocols layered?

Layering protocols simplifies the task of communicating over the network and it allows for reuse of layers that are not specific to a particular application.

26. What is the difference between TCP and UDP?

TCP:

Connection oriented transport protocol
Sends data as a stream of bytes
Guarantee of delivery

UDP:

Connection less protocol
Datagram service
No guarantee of delivery.

27. What is the role of server?

The server

1. Manages application tasks
2. Handles storage
3. Handles security

28. What are the sequences of steps for each HTTP request from a client to the server?

1. Making the connection
2. Making a request
3. The response
4. Closing the connection
5. Provides scalability
6. Handles accounting and distribution

29. Explain about HTTP Connection?

It is a communication channel between web browser and web server. It begins on the client side with the browser sending a request to the web server for a document.

Request Header Fields are

1. From
2. Reference
3. If_modified_since
4. Pragma
5. User Agent

30. Define packet switched networks?

Packet switched network means that data traveling on the network is broken into chunks called packets and each packet is handled separately.

4. What is MIDI and what are necessary for creating a MIDI.

MIDI or the Musical Instrument Digital Interface is recording the music .It can be

done only if there is any knowledge of music. We need a sequence software and sound synthesizer.

31. What are the advantages of MIDI over Audio?

MIDI files are much more compact than audio files. Because they are small easily embedded in Web Pages. MIDI files sound better than digital audio files.

Changing the length of MIDI file is possible

32. Give the Disadvantages of MIDI?

Because MIDI doesn't represent sound but musical instrument the playback

will be accurate only if identical play back device is used for production. MIDI cannot easily be used to playback-spoken dialog.

33. What are bridges and gateways used for?

If two LAN's are in close vicinity they can be connected through devices called bridges .If LAN's are located far apart then they may be connected via. WAN or MAN links and devices called gateways.

34. Why internetworking is done?

Better matching of needs.

Improved reliability

Enhanced performance

Easy of management

35. What is the function of repeater?

Input the signal on one end

Remove noise

Regenerate the original signal

Out the signal on the other end

36. What are the different types of repeaters?

Simple repeater: A repeater that connects similar types segments

Two-port repeater: A two-port repeater has two bi-directional ports and two

amplifiers. One amplifies and other copies signal from one segment to other.

Multiport repeater: Used to connect multiple segments of LAN.

Transceiver: A transceiver is a repeater cable of connecting two segment using

different types of signals.

37. How are bridges classified?

Depending on functionality bridges are classified as.

Transparent bridge: connect two similar networks

Translating bridges: connects two dissimilar networks.

iii. Encapsulating bridge: Also connects two dissimilar networks such as Ethernet and FDDI

iv. source routing bridge: It is a bridge with routing capability.

38. Differentiate bridges and routers in routing.

Bridges Routers

1. operate at layer 2 1. operate at layer 3

2. looks at the destination address of every packet that reaches the bridges over shared medium.

2. A router process only those packets that have been send to the router to find a path through network.

39. What is Dithering?

Dithering is a process whereby the color value of each pixel is changed to the

closest matching color value in the target palette.

40. Define Bitmap.

A bitmap 1 or 0 is the only two digits is referred to as binary.

A map is a two dimensional matrix of these bits. A bitmap is a simple matrix

of the tiny dots that form an image and are displayed on a computer screen or printed.

41. What is traffic shaping?

The approach to congestion management widely used in ATM network is called

traffic shaping.

42. What are the two unique design features of IPV6?

To process packet faster

To increase throughput

43. What are the components of delay in networks?

Processing delay

Networking delay

44. What are the advantages of IPV6 over IP V4?

Header simplification
Longer address
Better support for options

45. What are broadband services?

In broadband services transmission and switching is more flexible. Broad band is up to 2Mbps. It was developed in 1980

46. Define throughput.

Capacity of the channel for successful reception.
Through put = (no: of bits taken to transfer)/(time taken to transmit the bits)

47. What is buffer management?

The flow of information is from server to client. The transmit bit is equal to the channel bits + the buffer size bits. Balancing transmit bits, channel bits and buffer size bits is called buffer management.

48. What are the main features of ATM?

Asynchronous Transfer Mode. (ATM) is a self-switched network. The cell size is 53 bytes. 48 byte is allocated for data and 5 bytes for header.

49. Give the QoS parameters.

Bandwidth requirement, peak Bandwidth requirement, delay and loss probability.

50. What are the objectives of resource reservation?

To ensure the application requirements (average bandwidth, end-to- end delay etc)are satisfied.

51. What is caching?

Temporary storage of frequently used data is termed as caching

52. Why ATM is named so?

It uses Asynchronous Time Division Multiplexing of data packets called cells of fixed size.

53. Write two traditional methods used in multicast?

Repeated transmission

Broadcast

54. What is meant by datagram network?

Datagram network means that anyone can send a packet to a destination without having to pre-computed a path.

55. What is meant by call-set-up protocol?

Call set up protocol simply addresses the packet to the right place, and sends it. That is the sending host need not be aware of or participate in the complex route calculation; not need it take part in a complex signaling or call set up protocol.

56. What is Reverse Path Broadcast?

When a sender first starts sending, traffic is flooded out through the network. A router may receive the traffic along multiple paths in different interfaces, in which case it rejects any packet that arrives in any interface other than the one it would use to send a unicast packet back to the source. In this way each link in the whole network is traversed at most once in each direction, and the data received by all routers in the network. So far, this describes Reverse Path Broadcast.

57. Write Multicast routing protocol?

DVMRR- the distance vector multicast routing protocol
DM-PIM- dense-mode protocol independent multicast.

58. What is Administrative scoping?

Administrative scoping allows the configuration of a boundary by specifying a range of multicast address that will not be forwarded across that boundary in either direction.

59. What is reliable multicast?

Reliable multicast means a single protocol at a single 'layer' of a protocol stack, typically the transport layer, that can act as any layered protocol can: provide common functionality for applications that need it.

60. What is TCP adaption algorithm?

Adaption in TCP is both to the round-trip time, in order to dynamically tune retransmit timers for reliable delivery, and of the send rate in order to adapt to the

achievable transfer rate between the sender and receiver. The same techniques can often be applied in other protocols in particular for multimedia services to operate over time-varying network services.

61. What are the two purposes for adaption to delay at the receiver?

1. Adaptive play-out buffer to smooth play –out so that a fixed-rate media device is not starved of data, or overrun.
2. Synchronization of streams from different sources can be achieved at a receiver.

62. Write the reasons for network delay in TCP algorithm?

Other traffic causes the long-term average to vary. Bursts of one's own traffic cause ones own delay to vary quickly.

63. What is the use of RTCP?

RTCP is the real time transport protocol, which may be used as a lightweight companion to RTP to convey a number of statistics and other information about flow between recipients and senders.

64. Write RTCP packet format?

SR: Sender Report for transmission and reception statistics from participants that are active senders.

RR: receiver Report for reception statistics from participants that are not active senders.

SDES: Source Description Item including CNAME

BYE: Indicates End of participation

APP: Application specific functions.

65. What is goal of RTCP?

The intention and original design goal of RTCP messages was for them to act as a distributed source of lightweight session data that would allow a range of highly

fault-tolerant and reasonable scale mechanisms to be built including:

Membership Loss statistics

66. What is Peer to Peer computing?

The term 'Peer o Peer' refers o a class of systems and application that employ

distributed resources to perk a critical function in a decentralized manner.

67. Advantages of Peer to Peer networking?

Improving scalability by avoiding depending on centre points
Eliminating the needs for costly infrastructure by enabling direct communication among clients. Enabling resource aggregation

68. Goals of Peer to Peer?

As with any computing system the goal of peer to peer system is support applications that satisfy the needs of users.

Cost sharing/ reduction

Improved scalability

Resource aggregation and interoperability Increased autonomy

Dynamism

Enabling ad-hoc communication and collaboration.

69. Characteristics of Peer to Peer?

Decentralization

Scalability

Anonymity

Self organization

Cost of ownership

Ad-hoc connectivity

Performance

Security.

70. What is MIME?

MIME (Multipurpose Internet Mail Extensions is the extension) of RFC 82 framework. MIME overcomes the problems and limitations of the use of SMTP and RFC 822 for electronic mail.

71. Write any two Limitation of SMTP/RFC 822 scheme?

SMTP cannot transmit executable files or other binary objects. A number of schemes are used for converting binary files into a text form that can be used by SMTP mail systems. SMTP servers reject mail message over a certain size.

72. Write MIME header format?

MIME -Version

Content-type

Content-transfer-encoding

Content-ID

Content-Description

73. What are the characteristics of RTP?

The RTP time stamp corresponds to the presentation time if the earliest access unit is within packet .RTP packets have sequence numbers in transmission order.

The MPEG-4 time scale is the time –stamp resolution in the case of MPEG-4 systems and must be used as the RTP time scale

Streams should be synchronized using RTP techniques

74.What is the smallest unit of distinguishable sound?

Phonemes.

75) Which transform is used in JPEG still image compression?

Discrete Cosine Transform (DCT).

76) What are the methods used for generating still images?

- a) Bitmaps
- b) Vector drawn

77.How are resources classified?

Resources are classified as:-

- *active or passive
- *exclusive or shared
- *single or multiple.

78.What are the two service primitives provided by IP?

The two service primitives provided by IP are:-

- *Send primitive--used to request transmission of a data unit.
- *Deliver primitive--to notify a user of the arrival of a data unit.

79.what are the three types of addresses allowed by IPv6?

The three types of addresses allowed by IPv6 are:-

- *Unicast
- *Anycast
- *Multicast.

80.What is the length of IPv6 address?

The length of IPv6 address is 128 bits.

81.Which connection provides the least possible propagation delay?

A circuit switched connection provides the least possible propagation delay.

82. Define shortest - path tree in multicast routing.

The final distribution tree formed by the union of shortest paths from each

receiver to the sender is known as shortest - path tree.

83. Write the commonly used multicast routing protocols with their difference?

The two commonly used multicast routing protocols are

- i. The distance vector multicast routing protocol (DVMRP) and
- ii. Dense-mode protocol independent multicast (DM-PIM)

The difference between these is that DVMRP computes its own routing table to determine the best path back to the source, whereas DM-PIM uses the underlying Unicast routing and hence the term 'protocol independent'

84. What are the two ways of performance of multicast scoping?

Multicast scoping can be performed in two ways known as TTL scoping and administrative scoping.

85. Give some NBMA networks.

The non-broadcast multiple access (NBMA) networks are frame relay, SMDS and ATM. These networks are often referred to as switched clouds.

86. Explain RTP.

The real time transport protocol provides a standard format packet header,

media-specific time stamp data, as well as payload format information and sequence numbering amongst other things.

87. Give the function of RTCP.

The real time control protocol (RTCP) packets provide the relationship between the real time clock at a sender and the RTP media timestamps, and provide textual information to identify a sender in a session from the source identity.

88. Explain adaptation in TCP.

Adaptation in transmission control protocol is both to the round-trip time, in

order to dynamically tune the retransmit timers for reliable delivery, and of the send rate in order to adapt to the achievable transfer rate between the sender and the receiver.

89. Give the purpose of using Adoption to delay at the receiver.

Adoption to delay at the receiver can be used for two purposes:

- i. Adaptive play-out buffer to smooth play-out so that a fixed-rate media

device is not starved of data or overrun.

ii. Synchronization of streams from different sources can be achieved at a receiver.

90. What is the goal of transport protocols?

The goal of transport protocols is to provide both end-to-end services that are specific to some modest range of applications and specific services that are not common to all applications.

91. What are the functions provided by RTP?

RTP provides payload identification; multiplexing and feed back from receivers to senders of reception conditions. It also provides hooks for synchronization, both within and between streams.

92. What is meant by call-set-up protocol?

Call set up protocol simply addresses the packet to the right place, and sends it. That is the sending host need not be aware of or participate in the complex route calculation; not need it take part in a complex signaling or call set up protocol.

93. Summaries the IP multicast service model

Senders send to a multicast address

Receivers express an interest in a multicast address

Routers conspire to deliver traffic from the senders to the receivers.

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98. Comment on the standard guaranteed Qos LAN systems in audiovisual systems?

Standard H.322-Guaranteed Qos LAN systems, the proposal that ITU should

have a recommendation covering the provision for LANs and for video telephony and video conferencing facilities. Originally it was known as Isochroous Ethernet (ISO-Enet, but renamed ISLAN 16-T. It can be considered as an upgrade to the conventional 10 Mb/s Ethernet.

99. Define the objective of MPEG-4

MPEG-4 is a standard designed for representation and delivery of multimedia information across a variety of transport protocols. It includes interactive scene management, visual and audio representations and systems functionality like multiplexing, synchronization and object –descriptors framework.

100. Define DMIF?

DMIF is a general applications and transport delivery framework specified by MPEG-4. DMIF's main purpose is to hide the details of the transport network from the user as well as to ensure signaling and transport interoperability between end systems. In order to keep the user unaware of underlying transport details: MPEG-4 defined an

interface between user –level applications and DMIF called DAI

16 MARK QUESTION

- 1.Explain about network topology?
- 2.Explain about client server model?
3. Explain about protocols?
4. Explain about routers and switches?
5. Explain about DNS?
6. Explain about ARP?
7. Explain about RARP?
8. Explain about unreliable delivery?
9. Explain about connectionless delivery system?
10. Explain about internet datagram and datagram options?
- 11.Explain about TCP protocol?
12. Explain about TCP state machine?
13. Explain about silly window syndrome?
14. Explain about SMTP?
15. Explain about POP?
16. Explain about FTP and TELNET?
17. Explain about SNMP?
18. Explain about internet security and firewall?