

Assignment questions

Unit 1: Network Architecture

1. List at-least 5 main responsibilities of Data link layer & Transport layer of OSI reference model.
2. What is layered architecture? Explain the interaction between the layers using a suitable diagram.
3. What are the responsibilities of the network layer in the internet model?
4. Name some services provided by the application layer in the internet model.
5. What is the difference between a port address, a logical address and a physical layer address?
6. What is a peer-to-peer process?
7. What are the concerns of the physical layer in the internet model?
8. What are the headers and trailers, and how do they get added and removed?

Unit 2: Data Link control

1. What are the three protocols considered for noisy channels?
2. Define framing and the reason for its need.
3. Compare and contrast the G0-Back-N ARQ protocol with Selective repeat ARQ.
4. Briefly describe the services provided by the data link layer.
5. Define piggybacking and its uses.
6. Compare and contrast byte-stuffing and bit-stuffing. Which technique is used in byte-oriented protocols? Which technique is used in bit-oriented protocols?
7. Which all the protocols of data link layer uses pipelining concept?
8. Compare and contrast flow control and error control.
9. Compare and contrast HDLC with PPP. Which one is byte-oriented; which one is bit-oriented?
10. Explain the reason for moving from stop-and-wait ARQ protocol to the Go-Back-N ARQ protocol.

Unit 3: Multiple Accesses

1. Define controlled access and list three protocols in this category.
2. Compare and contrast a random access protocol with a channelization protocol.
3. Define channelization and explain the three protocols.
4. List and explain the three categories of multiple access protocols.
5. Explain why collision is an issue in a random access protocol but not in controlled access or channelizing protocols.
6. Compare and contrast a random access protocol with a controlled access protocol.

Unit 4:

1. How is the preamble field different from the SFD field?
2. What is the purpose of an NIC?
3. What is the difference between a unicast, multicast, and broadcast address?
4. What are the advantages of dividing an Ethernet LAN with a bridge?
5. What is the relationship between a switch and a bridge?
6. Why is there no need for CSMA/CD on a full-duplex Ethernet LAN?
7. Compare the data rates for standard Ethernet, Fast Ethernet, Gigabit Ethernet, and Ten-Gigabit Ethernet.
8. What are the common standard Ethernet implementations?
9. What are the common Fast Ethernet implementations?
10. What are the common Gigabit Ethernet implementations?
11. What are the common Ten-Gigabit Ethernet implementations?

Unit 5:

1. What is the difference between a forwarding port and a blocking port?
2. What is the basis for a membership in a VLAN?
3. What is the difference between a bus backbone and a star backbone?
4. How does a VLAN reduce network traffic?
5. How is a hub related to a repeater?
6. How does a repeater extend the length of a LAN?
7. What is a transparent bridge?

Unit 6:

1. What is the difference between the delivery of a frame in the data link layer and the delivery of a packet in the network layer?
2. What is the difference between the connectionless and connection-oriented services?
3. Define fragmentation and explain why the IPv4 and IPv6 protocols need to fragment some packets. Is there any difference between the two protocols in this matter?
4. Explain the procedure for checksum calculation and verification in the IPv4 protocol. What part of the IPv4 packet is covered in the checksum calculation? Why?
5. Explain the need for options in IPv4 and list the options with a brief description of each.
6. Compare and contrast the fields in the main headers of IPv4 and IPv6.
7. List the three transition strategies to move from IPv4 to IPv6. Explain the difference between tunneling and dual stack strategies during the transition period. When is each strategy used?

Unit 7:

1. What is the difference between a direct and an indirect delivery?
2. List 3 forwarding techniques and give a brief description of each.
3. Contrast two different routing tables.
4. What is the purpose of RIP?
5. What are the functions of a RIP message?
6. Why is the expiration timer value 6 times that of the periodic timer value?
7. How does the hop count limit alleviate RIP's problems?
8. List RIP shortcomings and their corresponding fixes.

9. What is the basis of classification for the four types of links defined by OSPF?

Unit 8:

1. Are both UDP and IP unreliable to the same degree? Why or why not?
2. Do port addresses need to be unique? Why or why not? Why are port addresses shorter than IP addresses?
3. Compare the TCP header and the UDP header. List the fields in the TCP header that are missing from UDP header. Give the reasons for their absence.