CN MCQ

Question 1: Which of the following is a key characteristic of connection-oriented protocols?

a) Minimal overhead

b) No guarantee of data delivery

c) Stream-oriented communication

d) No sequencing of data packets

Question 2: In a connectionless protocol, how are data packets delivered to the destination?

a) With guaranteed delivery and sequencing

b) Without any addressing information

c) Using virtual circuit switching

d) Individually, without establishing a formal connection

Question 3: Which protocol operates at the Transport Layer and uses a connection-oriented approach?

a) IP (Internet Protocol)

b) UDP (User Datagram Protocol)

c) ICMP (Internet Control Message Protocol)

d) TCP (Transmission Control Protocol)

Question 4: What is the primary benefit of a connectionless protocol's approach to data transmission?

a) Guaranteed delivery of data packets

b) Minimal delay due to lack of connection establishment

c) Reliable delivery and error correction mechanisms

d) Improved congestion control mechanisms

Question 5: Which protocol is an example of a connection-oriented protocol used for secure data transmission over the internet?

a) HTTP (Hypertext Transfer Protocol)

b) FTP (File Transfer Protocol)

c) UDP (User Datagram Protocol)

d) TLS (Transport Layer Security)

Question 6: In a connection-oriented protocol, what is the purpose of the "Three-Way Handshake" process?

a) To establish a reliable connection before data transmission

b) To exchange routing information with neighboring routers

c) To ensure the confidentiality of data being transmitted

d) To negotiate the encryption settings for the communication

Question 7: Which of the following is true about connection-oriented protocols in terms of efficiency and overhead?

a) They have lower overhead compared to connectionless protocols.

b) They use fewer resources due to lack of sequence numbers.

c) They require more overhead for connection establishment.

d) They are limited in their ability to handle large data packets.

Question 8: Which of these protocols is an example of a connectionless protocol operating at the Transport Layer?

a) UDP (User Datagram Protocol)

b) SMTP (Simple Mail Transfer Protocol)

c) SSH (Secure Shell)

d) HTTP (Hypertext Transfer Protocol)

Question 9: How does a connection-oriented protocol ensure data integrity during transmission?

a) By using checksums in data packets

b) By relying on the underlying network's error correction mechanisms

c) By constantly resending lost packets

d) By using redundant data packets

Question 10: Which protocol uses the concept of virtual circuits and is an example of a connection-oriented protocol?

a) BGP (Border Gateway Protocol)

b) ICMP (Internet Control Message Protocol)

c) OSPF (Open Shortest Path First)

d) ATM (Asynchronous Transfer Mode)

Answers:

1. c) Stream-oriented communication

2. d) Individually, without establishing a formal connection

3. d) TCP (Transmission Control Protocol)

4. b) Minimal delay due to lack of connection establishment

5. d) TLS (Transport Layer Security)

6. a) To establish a reliable connection before data transmission

7. c) They require more overhead for connection establishment.

8. a) UDP (User Datagram Protocol)

9. a) By using checksums in data packets

10. d) ATM (Asynchronous Transfer Mode)

Question 1: During the TCP three-way handshake, what is the purpose of the "SYN" (Synchronize) flag in the initial packet sent by the client?

a) To request acknowledgment from the server

b) To synchronize sequence numbers for data transmission

c) To indicate the end of the connection

d) To indicate the acknowledgment of previously received data

Question 2: In a TCP three-way handshake, what role does the server play after receiving the initial "SYN" packet from the client?

a) It sends an "ACK" (Acknowledgment) packet to the client.

b) It sends a "SYN" packet back to the client.

c) It directly starts sending data to the client.

d) It waits for the client to send more data before responding.

Question 3: Which TCP flag is used to indicate the termination of a connection in the four-way handshake process?

a) FIN

b) RST

c) ACK

d) SYN

Question 4: How does TCP ensure reliable data delivery during communication?

a) By using sequence numbers and acknowledgment mechanisms

b) By encrypting the data packets

c) By broadcasting data to all devices on the network

d) By periodically refreshing routing tables

Question 5: Which field in the TCP header is responsible for providing flow control by specifying the amount of data a receiver can handle at a time?

a) Sequence Number

b) Acknowledgment Number

c) Window Size

d) Urgent Pointer

Question 6: Which characteristic is unique to UDP (User Datagram Protocol) when compared to TCP?

a) Reliable data delivery

b) Connection-oriented communication

c) Error checking and correction

d) Lower overhead and faster transmission

Question 7: In the TCP header, which field indicates the length of the TCP header and any optional data that follows it?

a) Sequence Number

b) Acknowledgment Number

c) Header Length

d) Window Size

Question 8: What does the term "Sequence Number" refer to in the context of TCP communication?

a) The position of a packet in the transmission order

b) The number of packets in the sender's queue

c) The maximum amount of data a receiver can handle

d) The checksum value calculated for the data

Question 9: In the TCP/UDP message format, what is the purpose of the "Source Port" field?

a) Identifies the application layer protocol being used

b) Identifies the port number of the sender's device

c) Specifies the destination port of the receiver

d) Provides information about the type of data being transmitted

Question 10: Which field in the TCP/UDP header is used to verify the integrity of the data during transmission?

a) Checksum

b) Window Size

c) Acknowledgment Number

d) Urgent Pointer

Answers:

1. b) To synchronize sequence numbers for data transmission

2. b) It sends a "SYN" packet back to the client.

3. a) FIN

4. a) By using sequence numbers and acknowledgment mechanisms

5. c) Window Size

6. d) Lower overhead and faster transmission

7. c) Header Length

8. a) The position of a packet in the transmission order

9. b) Identifies the port number of the sender's device

10. a) Checksum

Question 1: In OSPF, what is the purpose of the "Designated Router" (DR) and "Backup Designated Router" (BDR) in a multi-access network segment?

a) They perform route summarization for efficiency.

b) They establish a virtual link to remote areas.

c) They exchange routing updates with external routers.

d) They reduce the amount of OSPF traffic on the segment.

Question 2: In OSPF, what is the significance of the "Area Border Router" (ABR)?

a) It connects to external networks and distributes external routing information.

b) It maintains a detailed link-state database for the entire OSPF domain.

c) It redistributes BGP routes into OSPF to improve convergence.

d) It controls the distribution of OSPF Hello packets within an area.

Question 3: EIGRP uses a metric based on bandwidth, delay, reliability, and load. What is the metric's default value for a feasible successor route in EIGRP?

a) 1

b) 256

c) 1000

d) 128

Question 4: What key advantage does EIGRP have over traditional distance-vector protocols like RIP?

a) EIGRP uses classless routing.

b) EIGRP converges more quickly.

c) EIGRP supports VLSM (Variable Length Subnet Masking).

d) EIGRP operates at the Network Layer.

Question 5: BGP (Border Gateway Protocol) falls under which class of routing protocols?

a) Link-State Routing Protocol

b) Distance-Vector Routing Protocol

c) Hybrid Routing Protocol

d) Path-Vector Routing Protocol

Question 6: What is the purpose of the "AS_PATH" attribute in BGP route advertisements?

a) It determines the cost of the path to the destination.

b) It prevents routing loops in BGP networks.

c) It indicates the autonomous systems through which the route has passed.

d) It identifies the router that originated the BGP update.

Question 7: OSPF uses a Link-State Advertisement (LSA) to communicate routing information. What type of LSA is used to represent an ASBR (Autonomous System Border Router) within an OSPF area?

a) Type 1 LSA

b) Type 2 LSA

c) Type 3 LSA

d) Type 4 LSA

Question 8: In EIGRP, what is the purpose of the "K-values" in the metric calculation formula?

a) They determine the bandwidth of the link.

b) They are used for cryptographic authentication.

c) They control route redistribution between EIGRP and OSPF.

d) They allow administrators to adjust metric weights for specific link characteristics.

Question 9: Which EIGRP message type is used to discover neighbors and establish adjacencies during the initialization process?

a) Update

b) Query

c) Hello

d) Acknowledgment

Question 10: BGP routers use the "NEXT_HOP" attribute to determine the next hop IP address for a BGP route. What role does this attribute play in BGP routing decisions?

a) It indicates the distance to the destination.

b) It specifies the autonomous system number.

c) It determines the exit point from the BGP domain.

d) It helps prevent routing loops in BGP networks.

Answers:

1. d) They reduce the amount of OSPF traffic on the segment.

2. a) It connects to external networks and distributes external routing information.

3. b) 256

4. c) EIGRP supports VLSM (Variable Length Subnet Masking).

5. d) Path-Vector Routing Protocol

6. c) It indicates the autonomous systems through which the route has passed.

7. d) Type 4 LSA

8. d) They allow administrators to adjust metric weights for specific link characteristics.

9. c) Hello

10. c) It determines the exit point from the BGP domain.

Question 1: Which Transport Layer protocol provides connection-oriented communication and ensures reliable data delivery, error detection, and sequencing?

a) UDP (User Datagram Protocol)

b) TCP (Transmission Control Protocol)

c) IP (Internet Protocol)

d) FTP (File Transfer Protocol)

Question 2: UDP (User Datagram Protocol) is considered a connectionless protocol. What advantage does this characteristic offer in certain applications?

a) Guaranteed delivery of data packets

b) Reduced data packet overhead

c) In-order delivery of data packets

d) Congestion control mechanisms

Question 3: How does TCP (Transmission Control Protocol) ensure reliable data delivery?

a) By using hop-by-hop routing

b) By providing error detection and retransmission of lost data

c) By encrypting the data packets

d) By using multicast addressing

Question 4: Which Transport Layer protocol is often used for streaming media and VoIP applications due to its low overhead and speed?

a) TCP

b) HTTP

c) FTP

d) UDP

Question 5: In TCP, what mechanism does the receiver use to acknowledge the receipt of data from the sender?

a) Sequence numbers

b) Checksums

c) SYN/ACK flags

d) Acknowledgment numbers

Question 6: DNS (Domain Name System) operates at which layer of the OSI model and provides a mapping between domain names and IP addresses?

a) Network Layer

b) Data Link Layer

c) Transport Layer

d) Application Layer

Question 7: Which Transport Layer protocol is responsible for secure transmission of data and is often used for secure online transactions?

a) HTTP

b) HTTPS

c) SMTP

d) POP3

Question 8: What is the purpose of the TCP three-way handshake during connection establishment?

a) To establish a reliable connection and exchange data

b) To negotiate encryption settings for secure communication

c) To determine the fastest route for data packets

d) To handle congestion control on the network

Question 9: Which TCP feature allows the receiver to request retransmission of missing or corrupt data packets?

a) Congestion control

b) Flow control

c) Sliding Window

d) Selective Acknowledgment (SACK)

Question 10: How does UDP (User Datagram Protocol) handle lost or out-of-order data packets?

a) It requests retransmission of lost packets

b) It uses sequence numbers for reordering

c) It drops the packets and requests retransmission

d) It doesn't provide mechanisms for handling such issues

Answers:

1. b) TCP (Transmission Control Protocol)

2. b) Reduced data packet overhead

3. b) By providing error detection and retransmission of lost data

4. d) UDP

5. d) Acknowledgment numbers

6. d) Application Layer

7. b) HTTPS

8. a) To establish a reliable connection and exchange data

9. d) Selective Acknowledgment (SACK)

10. d) It doesn't provide mechanisms for handling such issues

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Question 1: Which of the following is a primary function of the Transport Layer?

a) Encapsulation

b) Error detection

c) Physical addressing

d) Data encryption

Question 2: Which Transport Layer protocol provides connection-oriented and reliable communication, ensuring data integrity and sequencing?

a) UDP (User Datagram Protocol)

b) HTTP (Hypertext Transfer Protocol)

c) TCP (Transmission Control Protocol)

d) IP (Internet Protocol)

Question 3: What is the key characteristic of TCP (Transmission Control Protocol) regarding data delivery?

a) No guarantee of delivery

b) Best-effort delivery

c) Reliable, in-order delivery

d) Low latency delivery

Question 4: Which Transport Layer protocol is commonly used for streaming media, online gaming, and VoIP due to its low overhead and speed?

a) HTTP

b) UDP

c) TCP

d) IP

Question 5: Which feature of UDP (User Datagram Protocol) makes it faster than TCP but less reliable?

a) Acknowledgment of received data

b) Flow control

c) Error correction

d) No guaranteed delivery or sequencing

Question 6: Which protocol is responsible for converting domain names into IP addresses for communication over the internet?

a) SMTP (Simple Mail Transfer Protocol)

b) POP3 (Post Office Protocol 3)

c) DNS (Domain Name System)

d) FTP (File Transfer Protocol)

Question 7: Which Transport Layer protocol is associated with secure data transmission using encryption and secure data transfer channels?

a) HTTP

b) HTTPS

c) FTP

d) DNS

Question 8: Which protocol is often used for sending emails and operates over TCP for reliable data transmission?

a) HTTP

b) SMTP

c) FTP

d) SNMP (Simple Network Management Protocol)

Question 9: Which feature of the Transport Layer allows multiple applications to use the network simultaneously on the same device?

a) Flow control

b) Congestion control

c) Port numbers

d) Error detection

Question 10: Which Transport Layer protocol provides a mechanism for checking and managing the integrity of network devices and applications?

a) ICMP (Internet Control Message Protocol)

b) ARP (Address Resolution Protocol)

c) TCP

d) UDP

Answers:

1. b) Error detection

2. c) TCP (Transmission Control Protocol)

3. c) Reliable, in-order delivery

4. b) UDP

5. d) No guaranteed delivery or sequencing

6. c) DNS (Domain Name System)

7. b) HTTPS

8. b) SMTP

9. c) Port numbers

10. a) ICMP (Internet Control Message Protocol)

Question 1: What is the key characteristic of Static Routing?

a) Automatically adapts to network changes

b) Requires manual configuration of routes

c) Shares routing information with all routers

d) Adjusts routing metrics based on bandwidth

Question 2: Which type of routing is more suitable for small networks with few routers and stable topologies?

a) Static Routing

b) Dynamic Routing

c) Link-State Routing

d) Distance Vector Routing

Question 3: Which routing type typically offers faster convergence in case of network topology changes?

a) Static Routing

b) Dynamic Routing

c) Both have similar convergence times

d) Convergence is unrelated to routing type

Question 4: In Dynamic Routing, how do routers exchange routing information with each other?

a) Manually inputting routes

b) Using preconfigured routing tables

c) Via routing protocols

d) By broadcasting DNS requests

Question 5: Which statement best describes Dynamic Routing protocols?

a) They do not adapt to network changes automatically.

b) They require less maintenance than Static Routing.

c) They exchange routing information and adjust routes based on network changes.

d) They are less efficient in handling large networks.

Question 6: Which of the following is an example of a Dynamic Routing protocol?

a) RIP (Routing Information Protocol)

b) OSPF (Open Shortest Path First)

c) BGP (Border Gateway Protocol)

d) EIGRP (Enhanced Interior Gateway Routing Protocol)

Question 7: What type of routing is more suitable for networks with frequently changing topologies or failures?

a) Static Routing

b) Dynamic Routing

c) Both are equally suitable

d) It depends on network size only

Question 8: In which routing type does the administrative distance play a crucial role?

a) Static Routing

b) Dynamic Routing

c) Both types use administrative distance

d) Administrative distance is unrelated to routing

Question 9: Which type of routing is considered less error-prone due to manual intervention?

a) Static Routing

b) Dynamic Routing

c) Both types are equally error-prone

d) Error rate depends on network traffic

Question 10: Which routing type generally requires less memory and processing power on routers?

a) Static Routing

b) Dynamic Routing

c) Both require similar resources

d) Resource usage depends on network complexity

Answers:

1. b) Requires manual configuration of routes

2. a) Static Routing

3. b) Dynamic Routing

4. c) Via routing protocols

5. c) They exchange routing information and adjust routes based on network changes.

6. a) RIP (Routing Information Protocol)

7. b) Dynamic Routing

8. a) Static Routing

9. a) Static Routing

10. a) Static Routing

Question 1: What is the fundamental principle behind Link State Routing algorithms?

a) Finding the shortest path first

b) Exchanging complete routing tables

c) Broadcasting routing updates to all neighbors

d) Sharing local link information with neighbors

Question 2: Which algorithm is a well-known example of a Link State Routing protocol used in IP networks?

a) RIP (Routing Information Protocol)

b) OSPF (Open Shortest Path First)

c) BGP (Border Gateway Protocol)

d) EIGRP (Enhanced Interior Gateway Routing Protocol)

Question 3: What information is shared among routers in a Link State Routing network during the initial flooding phase?

a) Complete routing tables

b) Link state advertisements (LSAs)

c) Distance vectors

d) Hop counts

Question 4: Which type of routing table is typically used in Link State Routing algorithms?

a) Static routing table

b) Dynamic routing table

c) Forwarding table

d) Broadcast table

Question 5: What is the primary advantage of Link State Routing over Distance Vector Routing?

a) Faster convergence

b) Lower memory usage

c) Simpler implementation

d) Better scalability

Question 6: In Link State Routing, how does a router determine the shortest path to a destination?

a) By using the Bellman-Ford algorithm

b) By finding the least number of hops

c) By calculating the maximum link speed

d) By running Dijkstra's algorithm

Question 7: What is the role of the Link State Advertisement (LSA) in Link State Routing?

a) It advertises distance vectors to neighbors

b) It contains routing updates sent to all routers in the network

c) It provides information about the router's interfaces and links

d) It determines the cost of each path in the network

Question 8: How do Link State Routing algorithms handle changes in the network topology?

a) By broadcasting updates to all routers in the network

b) By using split horizon to prevent loops

c) By sending triggered updates to affected routers only

d) By recalculating the shortest paths and updating LSAs

Question 9: What is the purpose of the SPF (Shortest Path First) algorithm in Link State Routing?

a) To calculate the delay for each link

b) To determine the best hop count for each route

c) To find the shortest paths to all destinations

d) To prevent routing loops

Question 10: Which of the following statements is true about Link State Routing updates?

a) Updates are broadcasted periodically to all routers in the network.

b) Updates are sent only when there is a topology change in the network.

c) Updates are based on the number of hops to a destination.

d) Updates are shared in the form of distance vectors.

Answers:

1. b) Exchanging complete routing tables

2. b) OSPF (Open Shortest Path First)

3. b) Link state advertisements (LSAs)

4. c) Forwarding table

5. a) Faster convergence

6. d) By running Dijkstra's algorithm

7. c) It provides information about the router's interfaces and links

8. d) By recalculating the shortest paths and updating LSAs

9. c) To find the shortest paths to all destinations

10. b) Updates are sent only when there is a topology change in the network.

Question 1: What is the main principle behind Distance Vector Routing algorithms?

a) Shortest path first

b) Longest path first

c) Fewest hops first

d) Minimum delay first

Question 2: In Distance Vector Routing, what information does a router store and exchange with its neighbors?

a) Complete routing table

b) Link state information

c) Distance vector containing path costs

d) Sequence number of the last update

Question 3: Which algorithm is commonly associated with Distance Vector Routing in IP networks?

a) OSPF (Open Shortest Path First)

b) BGP (Border Gateway Protocol)

c) RIP (Routing Information Protocol)

d) EIGRP (Enhanced Interior Gateway Routing Protocol)

Question 4: What is the primary drawback of the "count-to-infinity" problem in Distance Vector Routing?

a) Slow convergence

b) Routing loops

c) Limited scalability

d) High memory usage

Question 5: How often do routers in a Distance Vector Routing network exchange routing updates?

a) Whenever a new device connects

b) Once a day

c) Periodically at fixed intervals

d) Only during network initialization

Question 6: Which metric is typically used in Distance Vector Routing to represent the cost of a path between routers?

a) Bandwidth

b) Hop count

c) Delay

d) Reliability

Question 7: In Distance Vector Routing, how does a router decide whether to update its routing table with new information from a neighbor?

a) If the neighbor's IP address is lower

b) If the neighbor has the shortest path

c) If the new path cost is lower than the current one

d) If the new path has the fewest hops

Question 8: What action does a router take when it receives a routing update with a shorter path cost to a destination it already knows about?

a) It updates its own routing table and forwards the update

b) It discards the update as invalid

c) It sends a query back to the sender for verification

d) It broadcasts the update to all routers in the network

Question 9: Which algorithm is used to prevent the "count-to-infinity" problem in many Distance Vector Routing protocols?

a) Split Horizon

b) Poison Reverse

c) Hold-Down Timer

d) Route Poisoning

Question 10: In Distance Vector Routing, what is the meaning of a metric value of 16 in the routing table?

a) The destination is unreachable

b) The path has 16 hops

c) The path cost is infinity

d) The path is under maintenance

Answers:

1. a) Shortest path first

2. c) Distance vector containing path costs

3. c) RIP (Routing Information Protocol)

4. a) Slow convergence

5. c) Periodically at fixed intervals

6. b) Hop count

7. c) If the new path cost is lower than the current one

8. a) It updates its own routing table and forwards the update

9. b) Poison Reverse

10. c) The path cost is infinity

Question 1: What does "IP" stand for in IP packet?

a) Internet Protocol

b) Internet Packet

c) Integrated Protocol

d) Intranet Protocol

Question 2: Which layer of the OSI model is responsible for IP addressing and routing?

a) Data Link Layer

b) Transport Layer

c) Network Layer

d) Application Layer

Question 3: How long is an IPv4 address in bits?

a) 16 bits

b) 32 bits

c) 64 bits

d) 128 bits

Question 4: Which of the following is an example of a private IP address?

a) 192.168.1.100

b) 8.8.8.8

c) 203.0.113.0

d) 172.16.0.1

Question 5: Which component is used to uniquely identify a network interface on a device?

a) MAC Address

b) IP Address

c) Port Number

d) Domain Name

Question 6: How many octets are there in an IPv4 address?

a) 2

b) 4

c) 6

d) 8

Question 7: Which version of IP introduced the concept of 128-bit addresses?

a) IPv4

b) IPv5

c) IPv6

d) IPv7

Question 8: What is the purpose of the subnet mask in IP networking?

a) Encrypt data during transmission

b) Identify the type of IP address

c) Determine the network and host portions of an IP address

d) Define the number of hosts on a network

Question 9: Which class of IP addresses is reserved for multicast groups?

a) Class A

b) Class B

c) Class C

d) Class D

Question 10: Which field in the IP header is used for ensuring the integrity of the packet during transmission?

a) TTL (Time-to-Live)

b) Checksum

c) Flags

d) Source IP Address

Answers:

1. a) Internet Protocol

2. c) Network Layer

3. b) 32 bits

4. a) 192.168.1.100

5. a) MAC Address

6. b) 4

7. c) IPv6

8. c) Determine the network and host portions of an IP address

9. d) Class D

10. b) Checksum

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