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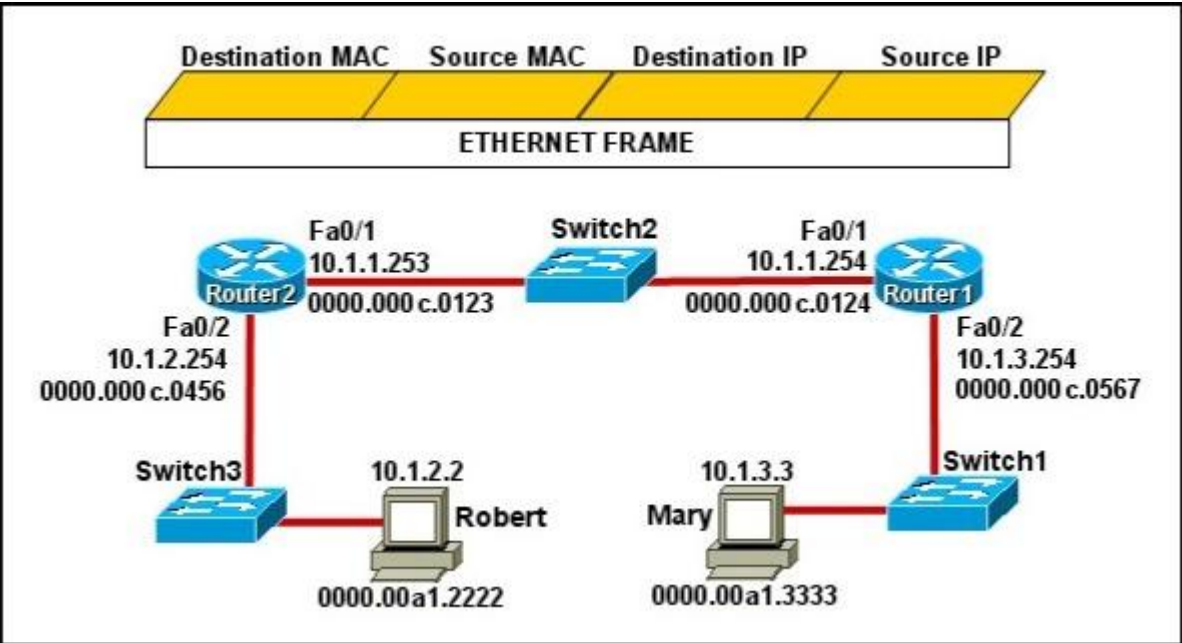
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Refer to the exhibit.

Destination MAC	Source MAC	Destination IP	Source IP

ETHERNET FRAME

Fa0/1
10.1.1.253
Router2 0000.000 c.0123

Switch2

Fa0/1
10.1.1.254
0000.000 c.0124 Router1

Fa0/2
10.1.2.254
0000.000 c.0456

Fa0/2
10.1.3.254
0000.000 c.0567

Switch3

10.1.2.2
Robert
0000.00a1.2222

10.1.3.3
Mary
0000.00a1.3333

Switch1

Mary is sending an instant message to Robert. The message will be broken into a series of packets that will traverse all network devices. What addresses will populate these packets as they are forwarded from Router1 to Router2?

A.

Destination MAC	Source MAC	Destination IP	Source IP
0000.00a1.2222	0000.00a1.3333	10.1.2.2	10.1.3.3

B.

Destination MAC	Source MAC	Destination IP	Source IP
0000.000c.0123	0000.000c.0124	10.1.2.2	10.1.3.3

C.

Destination MAC	Source MAC	Destination IP	Source IP
0000.000c.0123	0000.000c.0124	10.1.1.253	10.1.1.254

D.

Destination MAC	Source MAC	Destination IP	Source IP
0000.00a1.2222	0000.00a1.3333	10.1.1.253	10.1.1.254

E.

| Destination MAC	Source MAC	Destination IP	Source IP
0000.000c.0456	0000.000c.0567	10.1.2.2	10.1.3.3

A. Option A
B. Option B
C. Option C
D. Option D
E. Option E

Answer: B

Explanation:
The Source and Destination IP address is not going to change. Host 1 IP address will stay as being the source IP and the Host 2 IP address will stay the destination IP address. Those two are not going to change.
For the MAC address it is going to change each time it goes from one hope to another. (Except switches… they don't change anything)
Frame leaving HOST 1 is going to have a source MAC of Host 1 and a destination MAC of Router 1.
Router 1 is going to strip that info off and then will make the source MAC address of Router1's exiting interface, and making Router2's interface as the destination MAC address.
Then the same will happen… Router2 is going to change the source/destination info to the source MAC being the Router2 interface that it is going out, and the destination will be Host2's MAC address.
Question: 193

Refer to the exhibit.
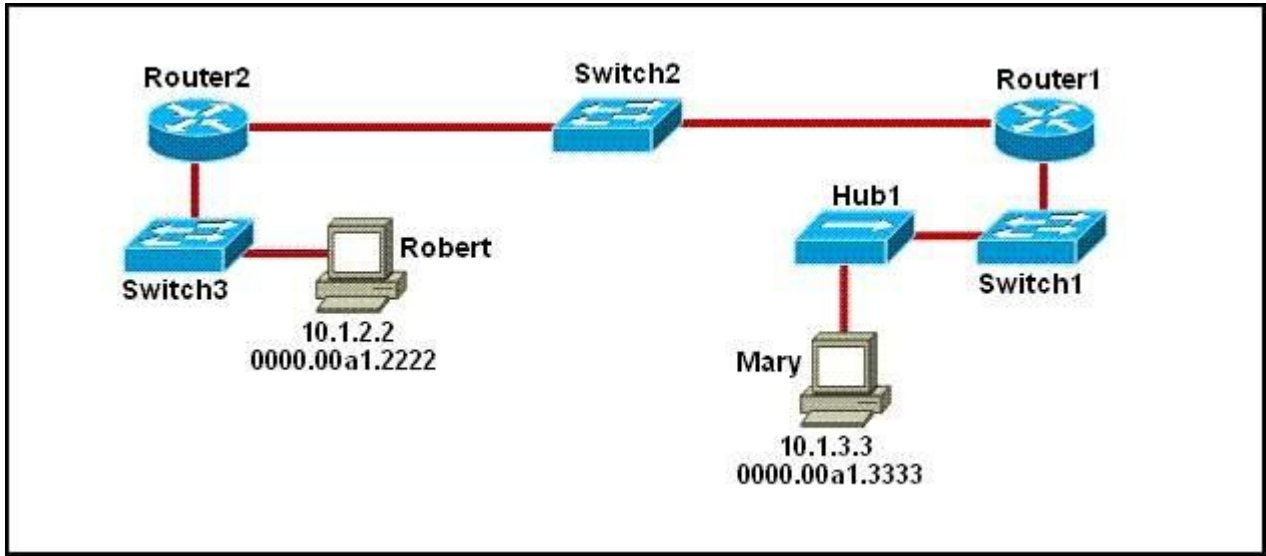
As packets travel from Mary to Robert, which three devices will use the destination MAC address of the packet to determine a forwarding path? (Choose three.)

A. Hub1
B. Switch1
C. Router1
D. Switch2
E. Router2
F. Switch3

Explanation:

Switches use the destination MAC address information for forwarding traffic, while routers use the destination IP address information.

Local Area Networks employ Layer 2 Switches and Bridges to forward and filter network traffic. Switches and Bridges operate at the Data Link Layer of the Open System Interconnect Model (OSI). Since Switches and Bridges operate at the Layer 2 they operate more intelligently than hubs, which work at Layer 1 (Physical Layer) of the OSI. Because the switches and bridges are able to listen to the traffic on the wire to examine the source and destination MAC address. Being able to listen to the traffic also allows the switches and bridges to compile a MAC address table to better filter and forward network traffic.

To accomplish the above functions switches and bridges carry out the following tasks:

MAC address learning by a switch or a bridge is accomplished by the same method. The switch or bridge listens to each device connected to each of its ports and scan the incoming frame for the source MAC address. This creates a MAC address to port map that is cataloged in the switches/bridge MAC database. Another name for the MAC address table is content addressable memory or CAM table.

When a switch or bridge is listening to the network traffic, it receives each frame and compares it to the MAC address table. By checking the MAC table the switch/ bridge are able o determine which port the frame came in on. If the frame is on the MAC table the frame is filtered or transmitted on only that port. If the switch determines that the frame is not on the MAC table, the frame is forwarded out to all ports except the incoming port.

Question: 194

Refer to the exhibit.
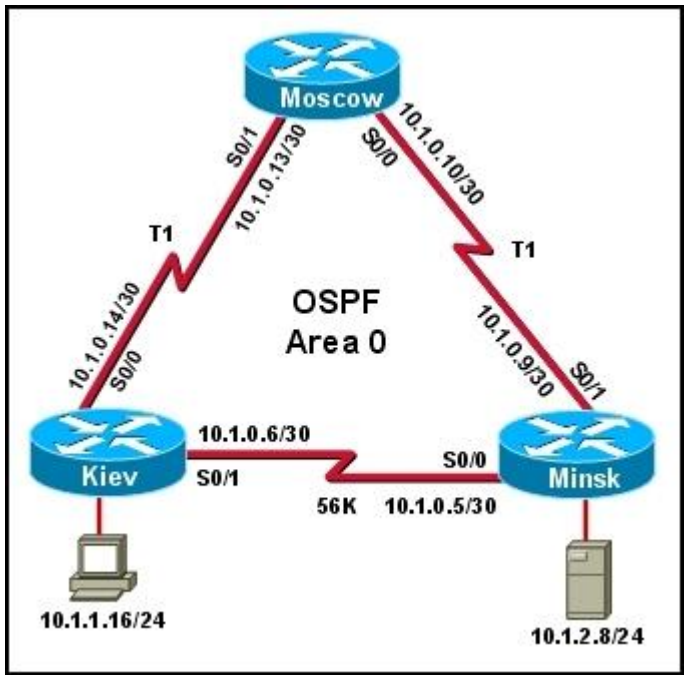
The host in Kiev sends a request for an HTML document to the server in Minsk. What will be the source IP address of the packet as it leaves the Kiev router?

A. 10.1.0.1
B. 10.1.0.5
C. 10.1.0.6
D. 10.1.0.14
E. 10.1.1.16
F. 10.1.2.8

Answer: E

Although the source and destination MAC address will change as a packet traverses a network, the source and destination IP address will not unless network address translation (NAT) is being done, which is not the case here.

Question: 195

Which network device functions only at Layer 1 of the OSI model?

A)

bridge

B)

hub

C)

NIC

D)

router

E)

switch

A. Option A
B. Option B
C. Option C
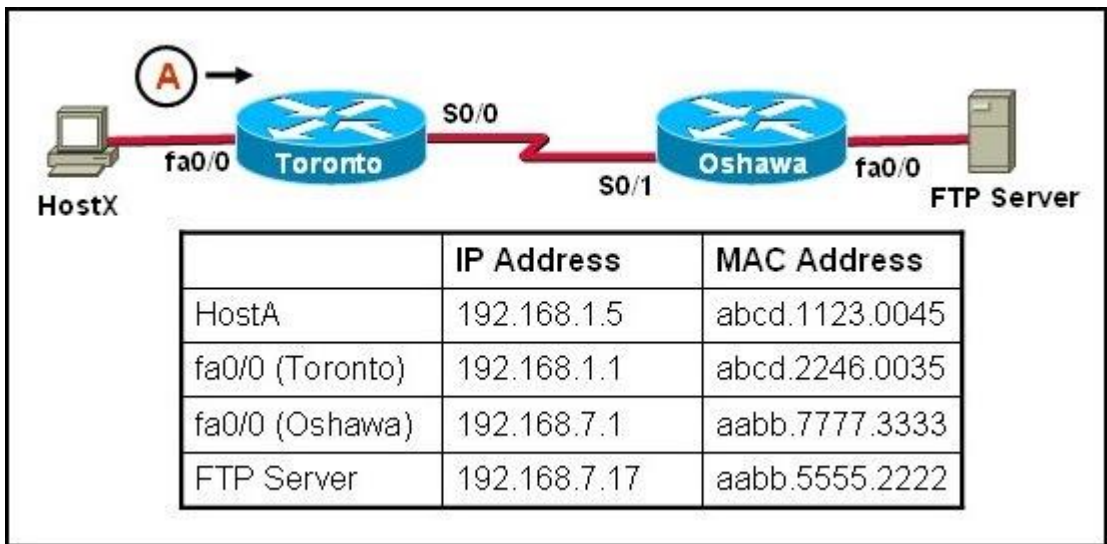**D. Option D**
E. Option E

Answer: B

Explanation:
Most hubs are amplifying the electrical signal; therefore, they are really repeaters with several ports. Hubs and repeaters are Layer 1 (physical layer) devices.
Question: 196

Refer to the exhibit.

HostX is transferring a file to the FTP server. Point A represents the frame as it goes toward the Toronto router. What will the Layer 2 destination address be at this point?
A. abcd.1123.0045
B. 192.168.7.17
C. aabb.5555.2222
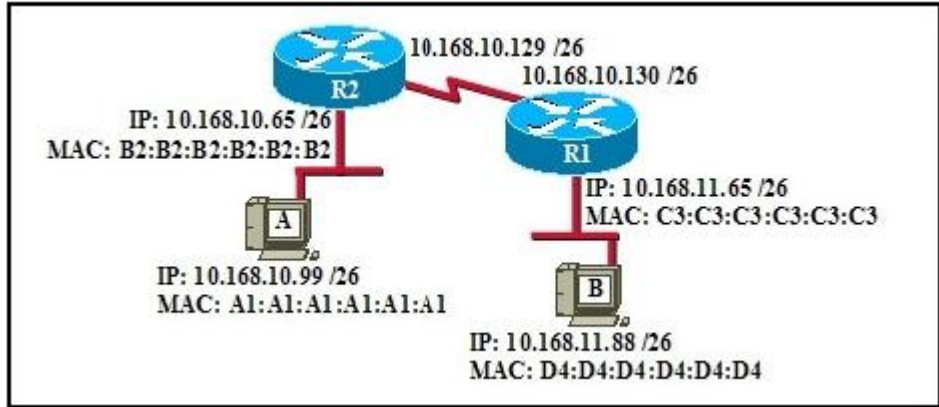**D. 192.168.1.1**
E. abcd.2246.0035

Answer: E

Explanation:
For packets destined to a host on another IP network, the destination MAC address will be the LAN interface of the router. Since the FTP server lies on a different network, the host will know to send the frame to its default gateway, which is Toronto.

Question: 197

Refer to the exhibit.

If host A sends an IP packet to host B, what will the source physical address be in the frame when it reaches host B?
A. 10.168.10.99
B. 10.168.11.88
C. A1:A1:A1:A1:A1:A1
D. B2:B2:B2:B2:B2:B2
**E. C3:C3:C3:C3:C3:C3**
F. D4:D4:D4:D4:D4:D4

Answer: E

Explanation:

When packets transfer from one host to another across a routed segment, the source IP address always remains the same source IP address, and the source physical (MAC) address will be the existing router's interface address. Similarly, the destination IP address always remains the same and the destination physical (MAC) address is the destination router's interface address.

Refer to the exhibit.
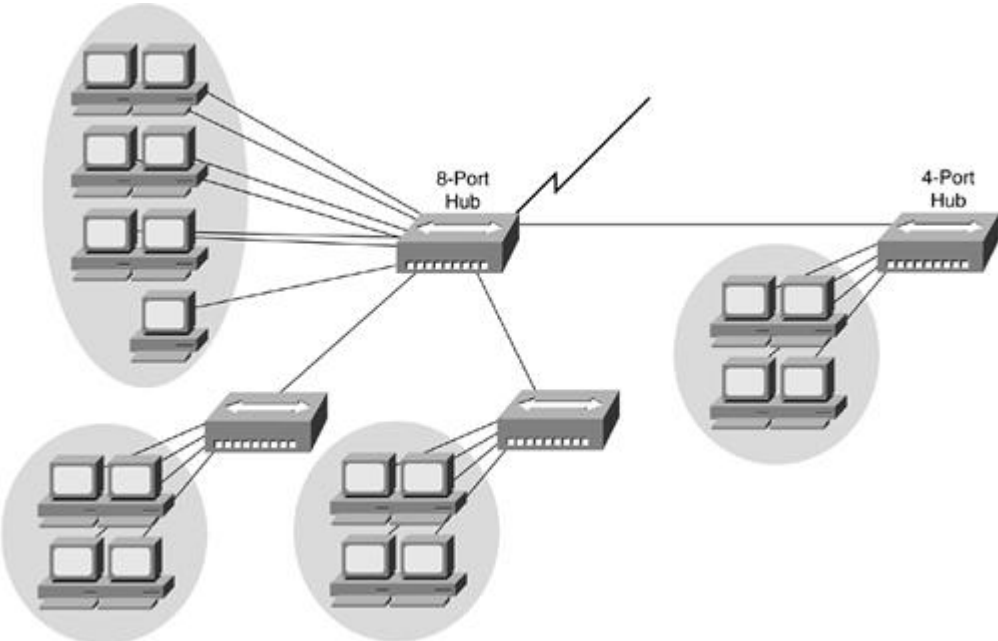
If the hubs in the graphic were replaced by switches, what would be virtually eliminated?
A. broadcast domains
B. repeater domains
C. Ethernet collisions
D. signal amplification
E. Ethernet broadcasts

Answer: C

Explanation:
Modern wired networks use a network switch to eliminate collisions. By connecting each device directly to a port on the switch, either each port on a switch becomes its own collision domain (in the case of half duplex links) or the possibility of collisions is eliminated entirely in the case of full duplex links.

Which protocol uses a connection-oriented service to deliver files between end systems?
A. TFTP
B. DNS
C. FTP
D. SNMP
E. RIP

Answer: C

Explanation:
TCP is an example of a connection-oriented protocol. It requires a logical connection to be established between the two processes before data is exchanged. The connection must be maintained during the entire time that communication is taking place, then released afterwards. The process is much like a telephone call, where a virtual circuit is established–the caller must know the person's telephone number and the phone must be answered–before the message can be delivered.
TCP/IP is also a connection-oriented transport with orderly release. With orderly release, any data remaining in the buffer is sent before the connection is terminated. The release is accomplished in a three-way handshake between client and server processes. The connection-oriented protocols in the
OSI protocol suite, on the other hand, do not support orderly release. Applications perform any handshake necessary for ensuring orderly release.

Examples of services that use connection-oriented transport services are telnet, rlogin, and ftp.

Which layer of the TCP/IP stack combines the OSI model physical and data link layers?
A. Internet layer
B. transport layer
C. application layer
D. network access layer

Answer: D

Explanation:
The Internet Protocol Suite, TCP/IP, is a suite of protocols used for communication over the internet. The TCP/ IP model was created after the OSI 7 layer model for two major reasons. First, the foundation of the Internet was built using the TCP/IP suite and through the spread of the World Wide Web and Internet, TCP/IP has been preferred. Second, a project researched by the Department of Defense (DOD) consisted of creating the TCP/IP protocols. The DOD's goal was to bring international standards which could not be met by the OSI model.
Since the DOD was the largest software consumer and they preferred the TCP/IP suite, most vendors used this model rather than the OSI. Below is a side by side comparison of the TCP/IP and OSI models.
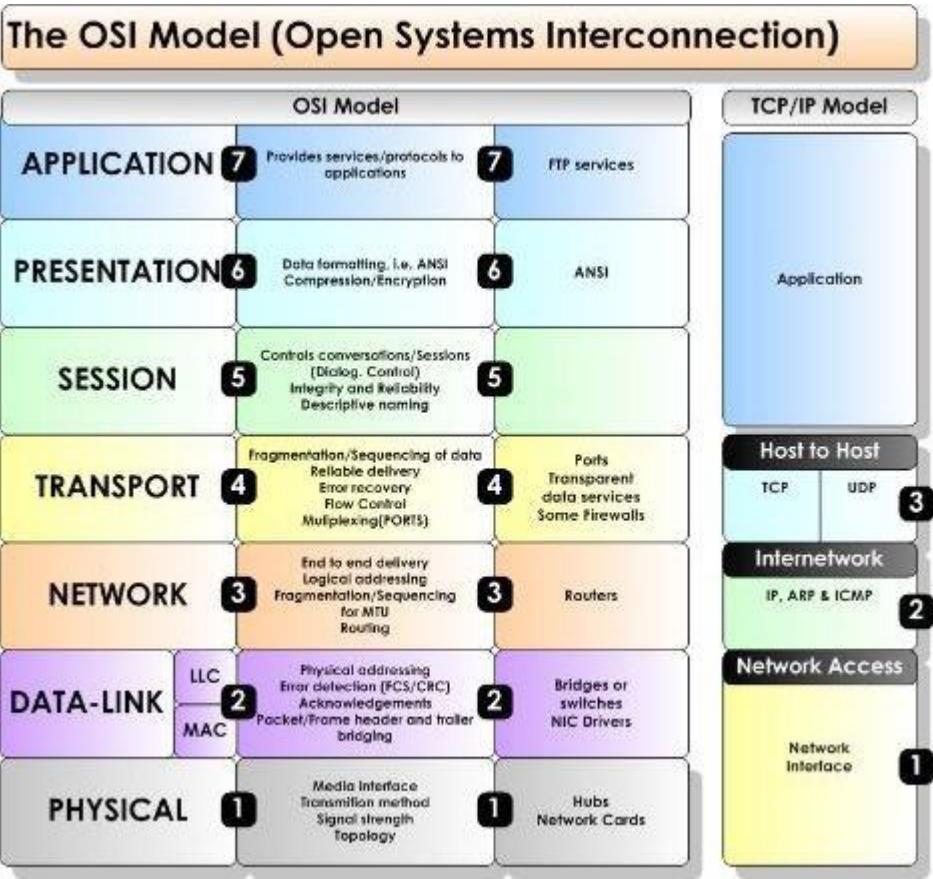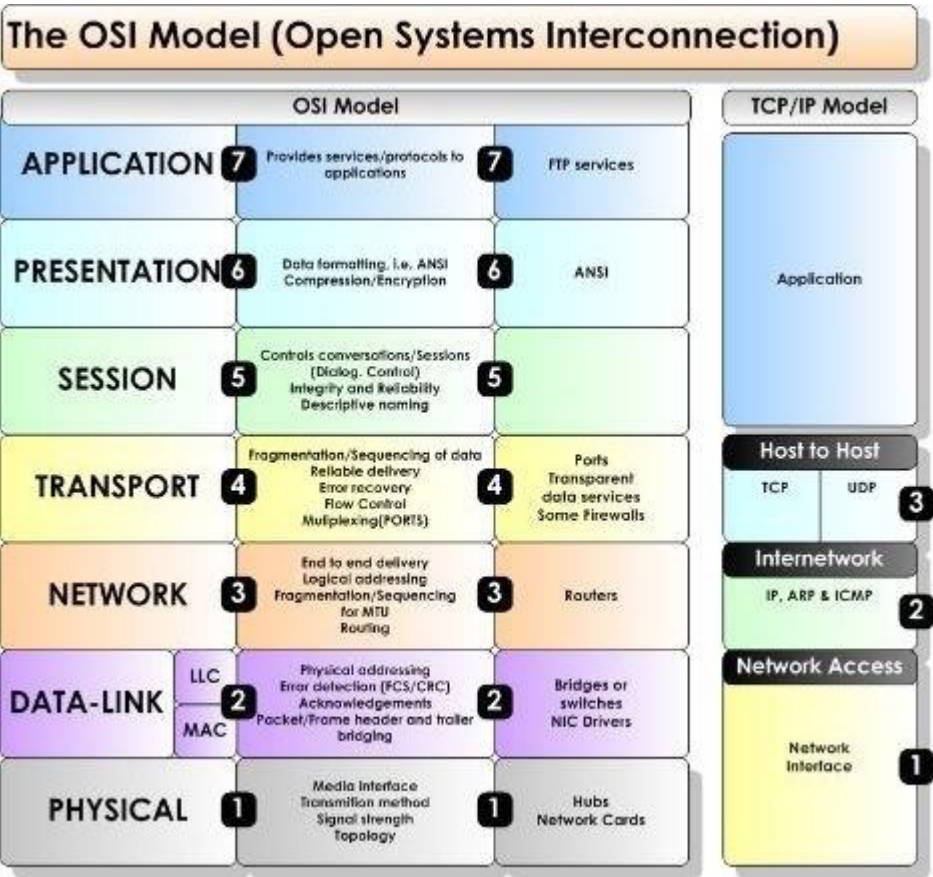

Question: 201

Which OSI layer header contains the address of a destination host that is on another network?
A. application
B. session
C. transport
D. network
E. data link
F. physical

Answer: D

Explanation:

Only network address contains this information. To transmit the packets the sender uses network address and datalink address. But the layer 2 address represents just the address of the next hop device on the way to the sender. It is changed on each hop. Network address remains the same.

The OSI Model (Open Systems Interconnection)

OSI Model			TCP/IP Model
APPLICATION 7	Provides services/protocols to applications	7 FTP services	Application
PRESENTATION 6	Data formatting, i.e. ANSI Compression/Encryption	6 ANSI	
SESSION 5	Controls conversations/Sessions (Dialog. Control) Integrity and Reliability Descriptive naming	5	
TRANSPORT 4	Fragmentation/Sequencing of data Reliable delivery Error recovery Flow Control Multiplexing(PORTS)	4 Ports Transparent data services Some Firewalls	Host to Host — TCP UDP 3
NETWORK 3	End to end delivery Logical addressing Fragmentation/Sequencing for MTU Routing	3 Routers	Internetwork — IP, ARP & ICMP 2
DATA-LINK 2 (LLC/MAC)	Physical addressing Error detection (FCS/CRC) Acknowledgements Packet/Frame header and trailer bridging	2 Bridges or switches NIC Drivers	Network Access — Network Interface 1
PHYSICAL 1	Media Interface Transmition method Signal strength Topology	1 Hubs Network Cards	

Question: 202

DRAG DROP
On the left are various network protocols. On the right are the layers of the TCP/IP model. Assuming a reliable connection is required, move the protocols on the left to the TCP/IP layers on the right to show the proper encapsulation for an email message sent by a host on a LAN. (Not all options are used.)
Select and Place:

On the left are various network protocols. On the right are the layers of the TCP/IP model. Assuming a reliable connection is required, move the protocols on the left to the TCP/IP layers on the right to show the proper encapsulation for an email message sent by a host on a LAN. (Not all options are used.)

UDP	application layer
SNMP	transport layer
IP	internet layer
ARP	network access layer
Ethernet	
TCP	
SMTP	

On the left are various network protocols. On the right are the layers of the TCP/IP model. Assuming a reliable connection is required, move the protocols on the left to the TCP/IP layers on the right to show the proper encapsulation for an email message sent by a host on a LAN. (Not all options are used.)

UDP		SMTP
SNMP		TCP
		IP
ARP		Ethernet

Question: 203

Which three statements are true about the operation of a full-duplex Ethernet network? (Choose three.)
A. There are no collisions in full-duplex mode.
B. A dedicated switch port is required for each full-duplex node.
C. Ethernet hub ports are preconfigured for full-duplex mode.
D. In a full-duplex environment, the host network card must check for the availability of the network media before transmitting.
E. The host network card and the switch port must be capable of operating in full-duplex mode.

Answer: ABE

Explanation:
Half-duplex Ethernet is defined in the original 802.3 Ethernet and Cisco says you only use one wire pair with a digital signal running in both directions on the wire. It also uses the CSMA/CD protocol to help prevent collisions and to permit retransmitting if a collision does occur. If a hub is attached to a switch, it must operate in half-duplex mode because the end stations must be able to detect collisions. Half-duplex Ethernet â typically 10BaseT â is only about 30 to 40 percent efficient as Cisco sees it, because a large 10BaseT network will usually only give you 3- to 4Mbps â at most.
Full-duplex Ethernet uses two pairs of wires, instead of one wire pair like half duplex. Also, full duplex uses a point-to-point connection between the transmitter of the transmitting device and the receiver of the receiving device, which means that with full-duplex data transfer, you get a faster data transfer compared to half duplex. And because the transmitted data is sent on a different set of wires than the received data, no collisions occur. The reason you donât need to worry about collisions is because now Full-duplex Ethernet is like a freeway with multiple lanes instead of the single-lane road provided by half duplex. Full-duplex Ethernet is supposed to offer 100 percent efficiency in both directions; this means you can get 20Mbps with a 10Mbps Ethernet running full duplex, or 200Mbps for FastEthernet.

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