Quiz: The Five-Layer Network Model
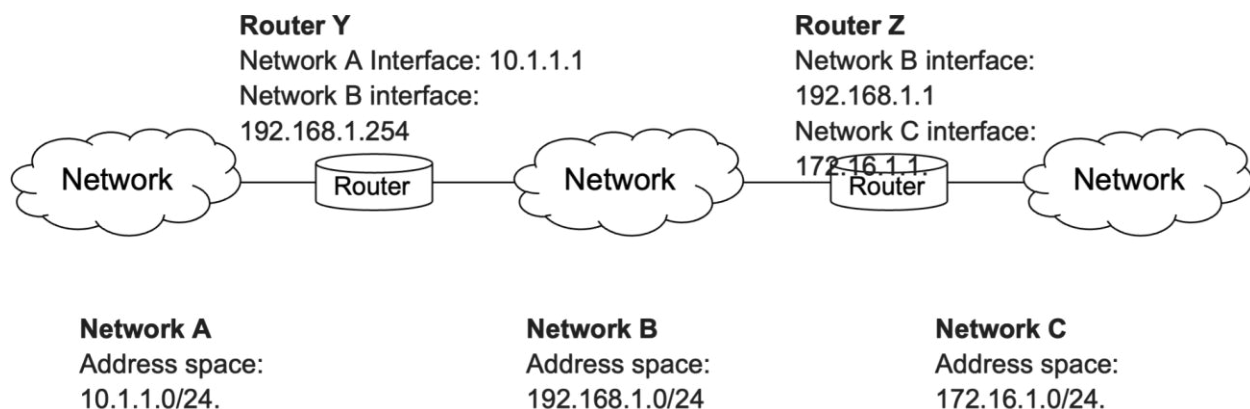
Use the following scenario to answer the questions below:

You have 3 networks (A, B, and C) and 2 routers (Y and Z).

Network A has an address space of 10.1.1.0/24 and is connected to router Y, using the interface 10.1.1.1.

Network B has an address space of 192.168.1.0/24 and is connected to Router Y, using the interface 192.168.1.254. Network B is also connected with router Z, using the interface of 192.168.1.1.

Network C has an address space of 172.16.1.0/24 and is connected to router Z, using the interface 172.16.1.1. The diagram below represents these connections and interfaces.

Router Y
Network A Interface: 10.1.1.1
Network B interface:
192.168.1.254

Router Z
Network B interface:
192.168.1.1
Network C interface:
172.16.1.1.

Network   Router   Network   Router   Network

Network A
Address space:
10.1.1.0/24.

Network B
Address space:
192.168.1.0/24

Network C
Address space:
172.16.1.0/24.

Question 1:

Computer 1 on network A, with IP address of 10.1.1.205, wants to send a packet to Computer 2, with IP address of 172.16.1.57. On which network is computer 2?

Network B

Network A

Network C

Local network

Question 2:

What information is computer 1 looking at in the ARP table on Router Y?

MAC address

Destination MAC address

Port number

TTL value

Question 3:

If it's a TCP connection, which is the first segment that computer 1 needs to build?

Ethernet frame

handshake

IP datagram

TCP segment

Question 4:

What information is in the data payload for the IP datagram?

Network B address space

The ARP discovery request

TCP segment

ART table

Question 5:

When constructing the Ethernet datagram to send the packet from Router Y to Router Z, what information needs to be in the destination MAC address?

Computer 2's MAC address

Computer 1's MAC address

Router Y's MAC address

Router Z's MAC address

Question 6:

Computer 1 on Network A sends a packet to Computer 2 on Network C. What's the first step that Router Z does after receiving the Ethernet frame?

Sends an ARP broadcast message

Increases the TTL by one

Calculates a checksum and compares this checksum with the one in the Ethernet frame header

Checks the destination IP address and changes it to its own

Question 7:

Computer 1 on network A, with IP address of 10.1.1.10, wants to send a packet to Computer 2, with IP address of 192.168.1.14. If the TTL value was set to 64 at the beginning, what is the value of the TTL once it reaches its destination?

65

63

61

0

Question 8:

Computer 1 on network A, with IP address of 10.1.1.8, wants to send a packet to Computer 2, with IP address of 10.1.1.205. Taking in consideration that computer 1 is sending a FTP request to computer

2, and the source port on computer 1 is 21086, which of the following contains the correct information for the first TCP segment of data?

Source Port: 21

Destination Port: 21

Sequence Number: 4

Acknowledgment Number: 1

Source Port: 80

Destination Port: 5000

Sequence Number: 1

Acknowledgment Number: 1

Source Port: 21086

Destination Port: 21

Sequence Number: 1

Acknowledgment Number: 2

Source Port: 5000

Destination Port: 80

Sequence Number: 1

Acknowledgment Number: 2

Question 9:

Computer 1 on network A, with IP address of 10.1.1.10, wants to send a packet to Computer 2, with IP address of 172.16.1.64. Which of the following has the correct IP datagram information for the fields: Version, minimum Header Length, Source IP, and Destination IP?

Version: 4

Header Length: 32

Source IP Address: 10.1.1.1

Destination IP address: 172.16.1.1

Version: 4

Header Length: 20

Source IP Address: 10.1.1.10

Destination IP address: 172.16.1.64

Version: 6

Header Length: 20

Source IP Address: 8a:1a:2b:3c:4d:5f

Destination IP address: 2a:2b:3c:4d:8f

Version: 5

Header Length: 16

Source IP Address: 171.1.1.1.

Destination IP address: 172.16.1.0/24.

Question 10:

The _____ layer is responsible for sending ones and zeros through a process called modulation from Computer 1 to Computer 2.

Application

Physical

Network

Transport

Question 11:

Computer 1 on network A, with IP address of 10.1.1.205, wants to send a packet to Computer 2, with IP address of 172.16.1.57. On which network is computer 2?

Local network

Network A

Network C

Network B

Question 12:

For what purpose would computer 1 send a FF:FF:FF:FF:FF broadcast ARP message to all nodes on network A?

To obtain Computer 2 MAC address

To obtain Router Y's MAC address

To calculate the TTL

To verify the internet connection

Question 13:

Which layer constructs the Ethernet frame?

Application layer

Data link layer

Transport layer

Physical Layer

Question 14:

What information is in the payload section of the TCP segments?

Handshake

The MAC address of Computer 1

The application layer data

ART Table

Question 15:

When constructing the Ethernet datagram to send the packet from Router Z to Computer 2 which is on Network C, what information needs to be in the destination MAC address?

Computer 2's MAC address

Computer 1's MAC address

Router Y's MAC address

No MAC address is needed

Question 16:

Computer 1 on Network A sends a packet to Computer 2 on Network C. What's the first step that Router Z does after receiving the Ethernet frame?

Increases the TTL by one

Sends an ARP broadcast message

Calculates a checksum and compares this checksum with the one in the Ethernet frame header

Checks the destination IP address and changes it to its own

Question 17:

Computer 1 on network A, with IP address of 10.1.1.8, wants to send a packet to Computer 2, with IP address of 172.16.1.64. If the TTL value was set to 64 at the beginning, what is the value of the TTL once it reaches its destination?

60

65

62

0

Question 18:

Computer 1 on network C, with IP address of 172.16.1.57, wants to send a packet to Computer 2, with IP address of 192.168.1.14. Taking in consideration that computer 1 is sending a request to a web server on computer 2, listening on port 80, and the source port on computer 1 is 5000, which of the following contains the correct information for the fourth TCP segment of data?

Source Port: 8081

Destination Port: 50

Sequence Number: 4

Acknowledgment Number: 1

Source Port: 80

Destination Port: 5000

Sequence Number: 1

Acknowledgment Number: 1

Source Port: 5000

Destination Port: 80

Sequence Number: 1

Acknowledgment Number: 2

Source Port: 5000

Destination Port: 80

Sequence Number: 4

Acknowledgment Number: 5

Question 19:

Computer 1 on network A, with IP address of 10.1.1.10, wants to send a packet to Computer 2, with IP address of 172.16.1.64. Which of the following has the correct IP datagram information for the fields: Version, minimum Header Length, Source IP, and Destination IP?

Version: 4

Header Length: 32

Source IP Address: 10.1.1.1

Destination IP address: 172.16.1.1

Version: 4

Header Length: 20

Source IP Address: 10.1.1.10

Destination IP address: 172.16.1.64

Version: 5

Header Length: 16

Source IP Address: 171.1.1.1.

Destination IP address: 172.16.1.0/24.

Version: 6

Header Length: 20

Source IP Address: 8a:1a:2b:3c:4d:5f

Destination IP address: 2a:2b:3c:4d:8f

Question 20:

The Cat6 cable is part of the _____ layer.

Physical

Application

Transport

Network

Question 21:

When referring to RJ45, we are referring to _____.

router velocity

ethernet port

cable plug

network identification

Question 22:

Computer 1 on network A, with IP address of 10.1.1.8, wants to send a packet to Computer 2, with IP address of 10.1.1.205. Taking in consideration that computer 1 is sending a FTP request to computer 2, and the source port on computer 1 is 21086, which of the following contains the correct information for the first TCP segment of data?

Source Port: 80

Destination Port: 5000

Sequence Number: 1

Acknowledgment Number: 1

Source Port: 21086

Destination Port: 21

Sequence Number: 1

Acknowledgment Number: 2

Source Port: 5000

Destination Port: 80

Sequence Number: 1

Acknowledgment Number: 2

Source Port: 21

Destination Port: 21

Sequence Number: 4

Acknowledgment Number: 1

Question 23:

Computer 1 on network B, with IP address of 192.168.1.121, wants to send a packet to Computer 2, with IP address of 172.16.1.57. Which of the following has the correct IP datagram information for the fields: Version, minimum Header Length, Source IP, and Destination IP?

Version: 4

Header Length: 32

Source IP Address: 10.1.1.1

Destination IP address: 172.16.1.1

Version: 5

Header Length: 16

Source IP Address: 10.1.1.0/24.

Destination IP address: 10.1.1.0/23.

Version: 6

Header Length: 20

Source IP Address: 8a:1a:2b:3c:4d:5f

Destination IP address: 2a:2b:3c:4d:8f

Version: 4

Header Length: 20

Source IP Address: 192.168.1.121

Destination IP address: 172.16.1.57