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Lab3 Preparation

[Question 1]

What is the IOS command to change the MTU (Maximum Transmission Unit) for an

interface on a Cisco router?

1) Enter the configuration mode:

configure terminal

2) Choose the interface:

interface {{vlan vlan_ID} | {{type slot/port} | {port-channel port channel number} slot/port}}

3) Change the MTU size

a. For system MTU:

mtu mtu_size

b. For IP protocol MTU:

ip mtu mtu_size

4) Exits the configuration mode

end

[Question 2]

How does a router determine whether datagrams to a particular host can be

directly delivered through one of its interfaces?

An IP datagram contains an IP header and the destination IP address can be found in the IP header. When routers receive an IP datagram, they will try to match the destination IP address to the entries in the routing table. The process is so-called routing table lookup. If the destination IP address matches one of the entries in the routing table, the router will forward the datagram directly to the dedicated interface with correct next hop value. If no match is found, the datagram will be forward to default gateway.

[Question 3]

Which systems generate ICMP route redirect messages--routers, hosts, or both?

I think only routers can generate ICMP route redirect messages. Hosts cannot. The ICMP route redirect message are used to notify a host to send packets to an alternative router and update its routing table. It

means if there is a more direct path to send packets from a source host to a destination, the router in between will send the ICMP route redirect message to tell the source host about the shorter path.

[Question 4]

What is the default maximum TTL value used by traceroute when sending UDP data-

grams?

The default maximum TTL value for sending UDP datagrams is 30.

[Question 5]

Describe the role of a default gateway in a routing table.

If the destination IP address of a datagram doesn't match any entries of the routing table in a router, the router will forward the datagram to the default gateway.

[Question 6]

What is the network prefix of IP address 192.110.50.3/24

The network prefix is 192.110.50.0/24.

[Question 7]

Explain the difference between a network IP address and a network prefix.

The network IP address is the IP address a network. Network prefix is the bit size of the network IP address. The network prefix identifies the number of bits used to identify a network. For example, IP address: 192.110.50.3/24 means the first 24 bits are used to identify the network, and the remaining 8 bits are used to identify host.

[Question 8]

An organization has been assigned the network number 140.25.0.0/16 and it needs

to create networks that support up to 60 hosts on each IP network. What is the

maximum number of networks that can be set up? Expain your answer.

Number of bits can be used: 32 - 16 = 16

Number of bits for hosts: ceiling [log_2 60] = 6

Number of bits for subnet: 16 -6 = 10

Number of subnets can be created: 2^10 = 1024

ceiling[log_2 60] = 6 so 6 bits are required for 60 hosts, leaving 10 bits available for the subnets. 10 bits is enough for 1024 subnets since 2^10 = 1024. Therefore, the organization can set up a maximum number of 1024 networks with each network holds up to 60 hosts on the same network.