CCST Networking – Module 12 Quiz

Questions

1. You're examining the MAC addresses in your switch's MAC address table when you notice an unfamiliar vendor code. What portion of the MAC address indicated the vendor that manufactured the Ethernet interface?

    a. The 16-bit ToS value
    b. The 24-bit OUI value
    c. The 64-bit SFD value
    d. The 96-bit CoS value

2. A network you're administering supports a maximum Layer 3 packet size of 1500 Bytes. However, you know that a Layer 3 packet is encapsulated inside a Layer 2 Ethernet frame. Based on that information, what is the maximum Ethernet frame size supported on this network?

    a. 1522 Bytes
    b. 1564 Bytes
    c. 1508 Bytes
    d. 1518 Bytes

3. You're troubleshooting an issue with an Ethernet switch, where a PC connected to Port 1 is not communicating with a printer connected to Port 13. As you gather information about the switch's configuration, you notice that Ports 1 - 12 belong to VLAN 100, and Ports 13 - 24 belong to VLAN 200. Which of the following is the most likely reason the PC is not communicating with the printer?

    a. One of the VLANs is configured as a Native VLAN.
    b. The switch doesn't have a trunk configured between VLANs 100 and 200.
    c. Traffic needs to be routed between VLANs.
    d. Ports 1 and 13 are configured for different port speeds.

4. A PC has just booted up on the network and obtained IPv4 address information via DHCP. Part of that information includes the IPv4 address of the PC's default gateway. However, the PC also needs to know the MAC address of its default gateway. What will the PC do in order to obtain that MAC address information?

    a. Send an ARP broadcast.
    b. Broadcast a DHCP query.
    c. Send a DNS multicast.
    d. Transmit an ICMP unicast message.

5. You're constructing a small network topology in a lab environment and need to connect a PC's network interface card directly with a Gigabit Ethernet port in a router. What type of cable should you use?

    a. A console cable
    b. A straight-through cable
    c. A crossover cable
    d. A null modem cable

Questions and Answers

1. You're examining the MAC addresses in your switch's MAC address table when you notice an unfamiliar vendor code. What portion of the MAC address indicated the vendor that manufactured the Ethernet interface?

    a. The 16-bit ToS value
    b. The 24-bit OUI value
    c. The 64-bit SFD value
    d. The 96-bit CoS value

    Answer: b

    Explanation: Every Ethernet interface has a unique Media Access Control (MAC) address, which is 48 bits in length. The first 24 bits identify the manufacturer of the Ethernet interface. This 24-bit field is called the Organizationally Unique Identifier (OUI).

    Video Reference: MAC Addresses

2. A network you're administering supports a maximum Layer 3 packet size of 1500 Bytes. However, you know that a Layer 3 packet is encapsulated inside a Layer 2 Ethernet frame. Based on that information, what is the maximum Ethernet frame size supported on this network?

    a. 1522 Bytes
    b. 1564 Bytes
    c. 1508 Bytes
    d. 1518 Bytes

    Answer: d

    Explanation: The Maximum Transmission Unit (MTU) of an Ethernet frame equals the MTU of the packet being encapsulated plus the size of the Ethernet header. An Ethernet header is 18 Bytes in length (Destination MAC Address: 6 Bytes, Source MAC Address: 6 Bytes, Type Field: 2 Bytes, FCS: 4 Bytes).

    Therefore, the MTU of an Ethernet frame on this network is the MTU of the packets being encapsulated (i.e., 1500 Bytes) plus the size of the Ethernet header (i.e., 18 Bytes), which results in a maximum frame size of 1518 Bytes.

    Video Reference: Ethernet Switch Operation

3. You're troubleshooting an issue with an Ethernet switch, where a PC connected to Port 1 is not communicating with a printer connected to Port 13. As you gather information about the switch's configuration, you notice that Ports 1 - 12 belong to VLAN 100, and Ports 13 - 24 belong to VLAN 200. Which of the following is the most likely reason the PC is not communicating with the printer?

    a. One of the VLANs is configured as a Native VLAN.
    b. The switch doesn't have a trunk configured between VLANs 100 and 200.
    c. Traffic needs to be routed between VLANs.
    d. Ports 1 and 13 are configured for different port speeds.

    Answer: c

    Explanation: A Virtual LAN (VLAN) is synonymous with a subnet or a broadcast domain. Therefore, traffic must be routed between VLANs. Some Ethernet switches are considered "multilayer" switches and can route traffic internally. However, a traditional Ethernet switch (i.e., a Layer 2 switch) cannot route traffic. Interestingly, a Layer 2 switch can connect to an external router (via a "router-on-a-stick" configuration), and that external router can route traffic between VLANs on the switch.

    Video Reference: VLANs

4. A PC has just booted up on the network and obtained IPv4 address information via DHCP. Part of that information includes the IPv4 address of the PC's default gateway. However, the PC also needs to know the MAC address of its default gateway. What will the PC do in order to obtain that MAC address information?

    a. Send an ARP broadcast.
    b. Broadcast a DHCP query.
    c. Send a DNS multicast.
    d. Transmit an ICMP unicast message.

    Answer: a

    Explanation: When an Ethernet device needs to learn the MAC address corresponding to a known IPv4 address, it sends an Address Resolution Protocol (ARP) broadcast. This ARP query asks if any device on the subnet (i.e., in the broadcast domain) knows the MAC address corresponding to a known IPv4 address.

    In this instance, the ARP query would be answered by the PC's default gateway. The default gateway would respond with an ARP reply informing the PC of the default gateway's MAC address.

    Video Reference: Router Operation

5. You're constructing a small network topology in a lab environment and need to connect a PC's network interface card directly with a Gigabit Ethernet port in a router. What type of cable should you use?

    a. A console cable
    b. A straight-through cable
    c. A crossover cable
    d. A null modem cable

    Answer: c

    Explanation: When connecting a PC to an Ethernet switch, a straight-through Ethernet cable is typically used. A straight-through cable has identical pin-outs in the RJ-45 connectors at each end of the cable (e.g., Pin 1 on one end of the cable connects to Pin 1 on the other end of the cable). This works with a PC-to-switch connection because the pins a PC uses to transmit are the pins a switch uses to receive, and vice-versa.

    Specifically, the port on a PC's network card is known as an MDI (Medium-Dependent Interface) port, while a port on an Ethernet switch is known as an MDIX (MDI Crossover) port.

    However, the port on a PC's network card and an Ethernet port in a router are both MDI ports. As a result, the PC transmits data over the same wires the router uses to transmit. To resolve this issue, a crossover cable can be used. A crossover cable connects the transmit pins on one end of a cable with the receive pins on the other end of the cable, thus allowing communication between two MDI devices or between two MDIX devices.

    Video Reference: Interconnecting a Network