

## 300-115.Actualtests.163 Questions

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Actual Tests

300-115

Implementing Cisco IP Switched Networks

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### Sections

1. Layer 2 Technologies
2. Infrastructure Security
3. Infrastructure Services

300-115

## QUESTION 1

What is the maximum number of switches that can be stacked using Cisco StackWise?

- A. 4
- B. 5
- C. 8
- D. 9
- E. 10
- F. 13

**Correct Answer:** D

**Section:** Layer 2 Technologies

**Explanation**

### Explanation/Reference:

Explanation:

Up to 9 Cisco Catalyst switches can be stacked together to build single logical StackWise switch since Cisco IOS XE Release 3.3.0SE. Prior to Cisco IOS XE Release 3.3.0SE, up to 4 Cisco Catalyst switches could be stacked together.

Reference: [http://www.cisco.com/c/en/us/products/collateral/switches/catalyst-3850-series-switches/qa\\_c67-722110.html](http://www.cisco.com/c/en/us/products/collateral/switches/catalyst-3850-series-switches/qa_c67-722110.html)

## QUESTION 2

A network engineer wants to add a new switch to an existing switch stack. Which configuration must be added to the new switch before it can be added to the switch stack?

- A. No configuration must be added.
- B. stack ID
- C. IP address
- D. VLAN information
- E. VTP information

**Correct Answer:** A

**Section:** Layer 2 Technologies

**Explanation**

### Explanation/Reference:

Explanation:

Switch Stack Offline Configuration

You can use the offline configuration feature to provision (to supply a configuration to) a new switch before it joins the switch stack. You can configure in advance the stack member number, the switch type, and the interfaces associated with a switch that is not currently part of the stack. The configuration that you create on the switch stack is called the provisioned configuration. The switch that is added to the switch stack and that receives this configuration is called the provisioned switch.

You manually create the provisioned configuration through the switch stack-member-number provision type global configuration command. The provisioned configuration is automatically created when a switch is added to a switch stack and when no provisioned configuration exists.

When you configure the interfaces associated with a provisioned switch (for example, as part of a VLAN), the switch stack accepts the configuration, and the information appears in the running configuration. The interface associated with the provisioned switch is not active, operates as if it is administratively shut down, and the no shutdown interface configuration command does not return it to active service. The interface associated with the provisioned switch does not appear in the display of the specific feature; for example, it does not appear in the show vlan user EXEC command output.

The switch stack retains the provisioned configuration in the running configuration whether or not the provisioned switch is part of the stack. You can save the provisioned configuration to the startup configuration file by entering the copy running-config startup-config privileged EXEC command. The startup configuration file ensures that the switch stack can reload and can use the saved information whether or not the provisioned switch is part of the switch stack.

## Effects of Adding a Provisioned Switch to a Switch Stack

When you add a provisioned switch to the switch stack, the stack applies either the provisioned configuration or the default configuration. Table 5-1 lists the events that occur when the switch stack compares the provisioned configuration with the provisioned switch.

Table 5-1 Results of Comparing the Provisioned Configuration with the Provisioned Switch

### Scenario Result

The stack member number matches the stack member number. The switch stack applies the provisioned configuration to the provisioned switch and adds it to the stack.

2. If the switch type of the provisioned switch matches the switch type in the provisioned configuration on the stack.

The stack member number matches the stack member number. The switch stack applies the default configuration to the provisioned switch and adds it to the stack.

2. The switch type of the provisioned switch does not match the switch type in the provisioned configuration on the stack. The provisioned configuration is changed to reflect switch type in the provisioned configuration on the stack.

The stack member number is not found in the default configuration to provisioned configuration. The switch stack adds it to the stack.

The provisioned configuration is changed to reflect the new information.

The stack member number - The switch stack applies the provisioned stack member number to the provisioned configuration - switch is in conflict with an existing stack member. The switch stack adds it to the stack.

The switch types match:

The provisioned configuration:

1. If the new stack member number is changed to reflect the new information, matches the stack member number in the provisioned configuration on the stack, and

2. If the switch type of the provisioned switch matches the switch type in the provisioned configuration on the stack.

The stack member numbers match, but the switch types do not match: the provisioned switch and adds it to the stack.

1. If the stack member number of the provisioned switch

The provisioned configuration matches the stack member number in the provisioned configuration on the stack, but

2. The switch type of the provisioned switch does not match the switch type in the provisioned configuration on the stack.

The stack member number - The switch stack applies

ber of the provisioned the default configuration to switch is not found in the the provisioned switch and provisioned configuration. adds it to the stack.

Reference:

[http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3750x\\_3560x/software/release/12-2\\_55\\_se/configuration/guide/3750xscg/swstack.html](http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3750x_3560x/software/release/12-2_55_se/configuration/guide/3750xscg/swstack.html)

### QUESTION 3

What percentage of bandwidth is reduced when a stack cable is broken?

- A. 0
- B. 25
- C. 50
- D. 75
- E. 100

**Correct Answer: C**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

Physical Sequential Linkage

The switches are physically connected sequentially, as shown in Figure 3. A break in any one of the cables will result in the stack bandwidth being reduced to half of its full capacity. Subsecond timing mechanisms detect traffic problems and immediately institute failover. This mechanism restores dual path flow when the timing mechanisms detect renewed activity on the cable.

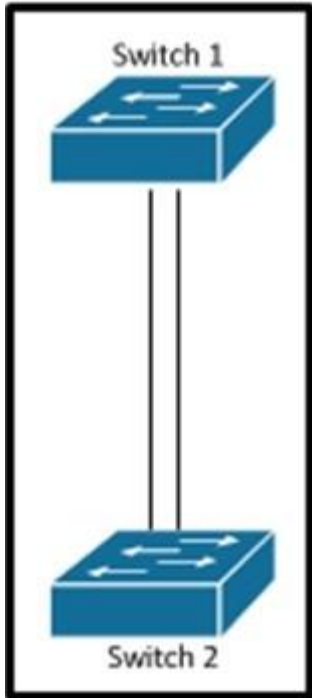
Figure 3. Cisco StackWise Technology Resilient Cabling



Reference: [http://www.cisco.com/c/en/us/products/collateral/switches/catalyst-3750-series-switches/prod\\_white\\_paper09186a00801b096a.html](http://www.cisco.com/c/en/us/products/collateral/switches/catalyst-3750-series-switches/prod_white_paper09186a00801b096a.html)

### QUESTION 4

Refer to the exhibit.



Which set of configurations will result in all ports on both switches successfully bundling into an EtherChannel?

- A. switch1  
channel-group 1 mode active  
switch2  
channel-group 1 mode auto
- B. switch1  
channel-group 1 mode desirable  
switch2  
channel-group 1 mode passive
- C. switch1  
channel-group 1 mode on  
switch2  
channel-group 1 mode auto
- D. switch1  
channel-group 1 mode desirable  
switch2  
channel-group 1 mode auto

**Correct Answer:** D

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

The different etherchannel modes are described in the table below:

Mode Description

active Places an interface into an active negotiating state, in which the interface starts negotiations with other interfaces by sending LACP packets.

auto Places an interface into a passive negotiating state, in which the interface responds to PAgP packets it receives but does not start PAgP packet negotiation. This setting minimizes the transmission of PAgP packets.

desirable Places an interface into an active negotiating state, in which the interface starts negotiations with other interfaces by sending PAgP packets.

on Forces the interface into an EtherChannel without PAgP or LACP. With the on mode, a usable EtherChannel exists only when an interface group in the on mode is connected to another interface group in the on mode.

passive Places an interface into a passive negotiating state, in which the interface responds to LACP packets that it receives, but does not start LACP packet negotiation. This setting minimizes the transmission of LACP packets.

Both the auto and desirable PAgP modes allow interfaces to negotiate with partner interfaces to determine if they can form an EtherChannel based on criteria such as interface speed and, for Layer 2 EtherChannels, trunking state and VLAN numbers.

Interfaces can form an EtherChannel when they are in different PAgP modes as long as the modes are compatible. For example:

- An interface in the desirable mode can form an EtherChannel with another interface that is in the desirable or auto mode.

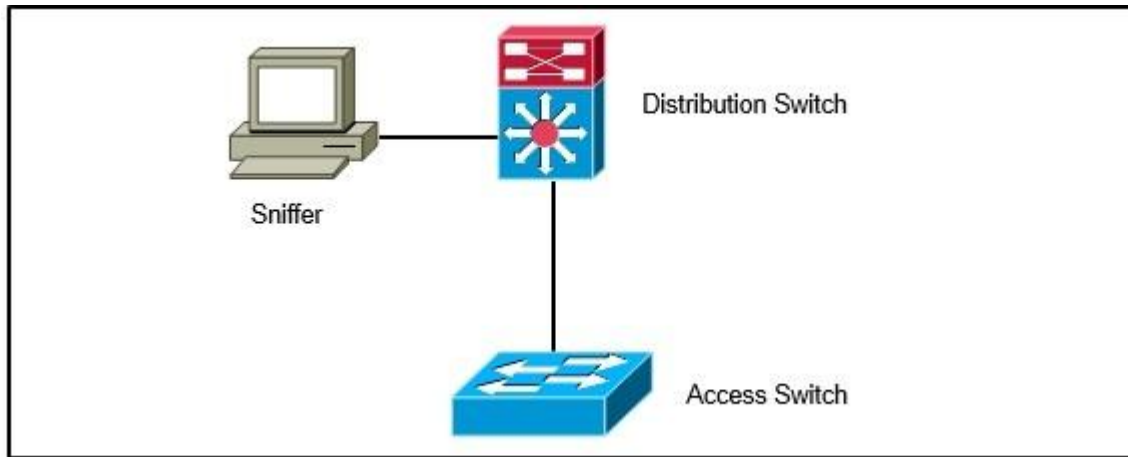
- An interface in the auto mode can form an EtherChannel with another interface in the desirable mode.

An interface in the auto mode cannot form an EtherChannel with another interface that is also in the auto mode because neither interface starts PAgP negotiation. An interface in the on mode that is added to a port channel is forced to have the same characteristics as the already existing on mode interfaces in the channel.

Reference: [http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3550/software/release/12-1\\_13\\_ea1/configuration/guide/3550scg/swethchl.html](http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3550/software/release/12-1_13_ea1/configuration/guide/3550scg/swethchl.html)

## QUESTION 5

Refer to the exhibit.



A network engineer wants to analyze all incoming and outgoing packets for an interface that is connected to an access switch. Which three items must be configured to mirror traffic to a packet sniffer that is connected to the distribution switch? (Choose three.)

- A. A monitor session on the distribution switch with a physical interface as the source and the remote SPAN VLAN as the destination
- B. A remote SPAN VLAN on the distribution and access layer switch
- C. A monitor session on the access switch with a physical interface source and the remote SPAN VLAN as the destination
- D. A monitor session on the distribution switch with a remote SPAN VLAN as the source and physical interface as the destination
- E. A monitor session on the access switch with a remote SPAN VLAN source and the physical interface as the destination
- F. A monitor session on the distribution switch with a physical interface as the source and a physical interface as the destination

**Correct Answer:** BCD

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

You can analyze network traffic passing through ports or VLANs by using SPAN or RSPAN to send a copy of the traffic to another port on the switch or on another switch that has been connected to a network analyzer or other monitoring or security device. SPAN copies (or mirrors) traffic received or sent (or both) on source ports or source VLANs to a destination port for analysis.

RSPAN supports source ports, source VLANs, and destination ports on different switches (or different switch stacks), enabling remote monitoring of multiple switches across your network. The traffic for each RSPAN session is carried over a user-specified RSPAN VLAN that is dedicated for that RSPAN session in all participating switches. The RSPAN traffic from the source ports or VLANs is copied into the RSPAN VLAN and forwarded over trunk ports carrying the RSPAN VLAN to a destination session monitoring the RSPAN VLAN. Each RSPAN source switch must have either ports or VLANs as RSPAN sources. The destination is always a physical port

Reference:

[http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3750x\\_3560x/software/release/12-2\\_55\\_se/configuration/guide/3750xscg/swspan.html](http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3750x_3560x/software/release/12-2_55_se/configuration/guide/3750xscg/swspan.html)

## QUESTION 6

After an EtherChannel is configured between two Cisco switches, interface port channel 1 is in the down/down state. Switch A is configured with channel-group 1 mode active, while Switch B is configured with channel-group 1 mode desirable. Why is the EtherChannel bundle not working?

- A. The switches are using mismatched EtherChannel negotiation modes.
- B. The switch ports are not configured in trunking mode.
- C. LACP priority must be configured on both switches.
- D. The channel group identifier must be different for Switch A and Switch B.

**Correct Answer:** A

**Section:** Layer 2 Technologies

**Explanation**

### Explanation/Reference:

Explanation:

Here we have a situation where one switch is using active mode, which is an LACP mode, and the other is using desirable, which is a PAGP mode. You can not mix the LACP and PAGP protocols to form an etherchannel. Here is a summary of the various etherchannel modes:

#### EtherChannel PAGP Modes

##### Mode Description

**auto** Places a port into a passive negotiating state, in which the port responds to PAGP packets it receives but does not start PAGP packet negotiation. This setting minimizes the transmission of PAGP packets.

This mode is not supported when the EtherChannel members are from different switches in the switch stack (cross-stack EtherChannel).

**desirable** Places a port into an active negotiating state, in which the port starts negotiations with other ports by sending PAGP packets.

This mode is not supported when the EtherChannel members are from different switches in the switch stack (cross-stack EtherChannel).

#### EtherChannel LACP Modes

##### Mode Description

**active** Places a port into an active negotiating state in which the port starts negotiations with other ports by sending LACP packets.

**passive** Places a port into a passive negotiating state in which the port responds to LACP packets that it receives, but does not start LACP packet negotiation. This setting minimizes the transmission of LACP packets.

Reference: [http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst2960/software/release/12-2\\_55\\_se/configuration/guide/scg\\_2960/swethchl.html](http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst2960/software/release/12-2_55_se/configuration/guide/scg_2960/swethchl.html)

## QUESTION 7

An EtherChannel bundle has been established between a Cisco switch and a corporate web server. The network administrator noticed that only one of the EtherChannel links is being utilized to reach the web server. What should be done on the Cisco switch to allow for better EtherChannel utilization to the corporate web server?

- A. Enable Cisco Express Forwarding to allow for more effective traffic sharing over the EtherChannel bundle.
- B. Adjust the EtherChannel load-balancing method based on destination IP addresses.
- C. Disable spanning tree on all interfaces that are participating in the EtherChannel bundle.
- D. Use link-state tracking to allow for improved load balancing of traffic upon link failure to the server.
- E. Adjust the EtherChannel load-balancing method based on source IP addresses.

**Correct Answer: E**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

EtherChannel load balancing can use MAC addresses, IP addresses, or Layer 4 port numbers, and either source mode, destination mode, or both. The mode you select applies to all EtherChannels that you configure on the switch. Use the option that provides the greatest variety in your configuration. For example, if the traffic on a channel only goes to a single MAC address (which is the case in this example, since all traffic is going to the same web server), use of the destination MAC address results in the choice of the same link in the channel each time. Use of source addresses or IP addresses can result in a better load balance. Reference: <http://www.cisco.com/c/en/us/support/docs/lan-switching/etherchannel/12023-4.html>

## QUESTION 8

After the implementation of several different types of switches from different vendors, a network engineer notices that directly connected devices that use Cisco Discovery Protocol are not visible. Which vendor-neutral protocol could be used to resolve this issue?

- A. Local Area Mobility
- B. Link Layer Discovery Protocol
- C. NetFlow
- D. Directed Response Protocol

**Correct Answer: B**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

The Link Layer Discovery Protocol (LLDP) is a vendor-neutral link layer protocol in the Internet Protocol Suite used by network devices for advertising their identity, capabilities, and neighbors on an IEEE 802 local area network, principally wired Ethernet. LLDP performs functions similar to several proprietary protocols, such as the Cisco Discovery Protocol (CDP). Reference: [http://en.wikipedia.org/wiki/Link\\_Layer\\_Discovery\\_Protocol](http://en.wikipedia.org/wiki/Link_Layer_Discovery_Protocol)

**QUESTION 9**

Refer to the exhibit.

```
interface GigabitEthernet0/1
  switchport
  switchport mode trunk
  switchport trunk allowed vlan 1-100
!
interface GigabitEthernet0/48
  switchport
  switchport mode access
!
monitor session 1 source interface GigabitEthernet0/1
monitor session 1 destination interface GigabitEthernet0/48
```

How can the traffic that is mirrored out the GigabitEthernet0/48 port be limited to only traffic that is received or transmitted in VLAN 10 on the GigabitEthernet0/1 port?

- A. Change the configuration for GigabitEthernet0/48 so that it is a member of VLAN 10.
- B. Add an access list to GigabitEthernet0/48 to filter out traffic that is not in VLAN 10.
- C. Apply the monitor session filter globally to allow only traffic from VLAN 10.
- D. Change the monitor session source to VLAN 10 instead of the physical interface.

**Correct Answer: C**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

To start a new flow-based SPAN (FSPAN) session or flow-based RSPAN (FRSPAN) source or destination session, or to limit (filter) SPAN source traffic to specific VLANs, use the monitor session filter global configuration command.

Usage Guidelines

You can set a combined maximum of two local SPAN sessions and RSPAN source sessions. You can have a total of 66 SPAN and RSPAN sessions on a switch or switch stack. You can monitor traffic on a single VLAN or on a series or range of ports or VLANs. You select a series or range of VLANs by using the [ , | -] options.

If you specify a series of VLANs, you must enter a space before and after the comma. If you specify a range of VLANs, you must enter a space before and after the hyphen (-). VLAN filtering refers to analyzing network traffic on a selected set of VLANs on trunk source ports. By default, all VLANs are monitored on trunk source ports. You can use the monitor session session\_number filter vlan vlan-id command to limit SPAN traffic on trunk source

ports to only the specified VLANs.

VLAN monitoring and VLAN filtering are mutually exclusive. If a VLAN is a source, VLAN filtering cannot be enabled. If VLAN filtering is configured, a VLAN cannot become a source.

Reference:

[http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3850/software/release/3se/network\\_management/command\\_reference/b\\_nm\\_3se\\_3850\\_cr/b\\_nm\\_3se\\_3850\\_cr\\_chapter\\_010.html#wp3\\_875419997](http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3850/software/release/3se/network_management/command_reference/b_nm_3se_3850_cr/b_nm_3se_3850_cr_chapter_010.html#wp3_875419997)

## QUESTION 10

Several new switches have been added to the existing network as VTP clients. All of the new switches have been configured with the same VTP domain, password, and version. However, VLANs are not passing from the VTP server (existing network) to the VTP clients. What must be done to fix this?

- A. Remove the VTP domain name from all switches with "null" and then replace it with the new domain name.
- B. Configure a different native VLAN on all new switches that are configured as VTP clients.
- C. Provision one of the new switches to be the VTP server and duplicate information from the existing network.
- D. Ensure that all switch interconnects are configured as trunks to allow VTP information to be transferred.

**Correct Answer: D**

**Section: Layer 2 Technologies**

**Explanation**

### Explanation/Reference:

Explanation:

VTP allows switches to advertise VLAN information between other members of the same VTP domain. VTP allows a consistent view of the switched network across all switches. There are several reasons why the VLAN information can fail to be exchanged. Verify these items if switches that run VTP fail to exchange VLAN information:

- VTP information only passes through a trunk port. Make sure that all ports that interconnect switches are configured as trunks and are actually trunking. Make sure that if EtherChannels are created between two switches, only Layer 2 EtherChannels propagate VLAN information.
- Make sure that the VLANs are active in all the devices.
- One of the switches must be the VTP server in a VTP domain. All VLAN changes must be done on this switch in order to have them propagated to the VTP clients. ·The VTP domain name must match and it is case sensitive. CISCO and cisco are two different domain names.
- Make sure that no password is set between the server and client. If any password is set, make sure that the password is the same on both sides.

Reference:

[http://www.cisco.com/en/US/tech/tk389/tk689/technologies\\_tech\\_note09186a0080890613.shtml](http://www.cisco.com/en/US/tech/tk389/tk689/technologies_tech_note09186a0080890613.shtml)

## QUESTION 11

After implementing VTP, the extended VLANs are not being propagated to other VTP switches. What should be configured for extended VLANs?

- A. VTP does not support extended VLANs and should be manually added to all switches.
- B. Enable VTP version 3, which supports extended VLAN propagation.
- C. VTP authentication is required when using extended VLANs because of their ability to cause network instability.

- D. Ensure that all switches run the same Cisco IOS version. Extended VLANs will not propagate to different IOS versions when extended VLANs are in use.

**Correct Answer: B**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

- VTP version 1 and VTP version 2 do not propagate configuration information for extended-range VLANs (VLAN numbers 1006 to 4094). You must configure extended-range VLANs manually on each network device.
- VTP version 3 supports extended-range VLANs (VLAN numbers 1006 to 4094). If you convert from VTP version 3 to VTP version 2, the VLANs in the range 1006 to 4094 are removed from VTP control.

Reference:

[http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/15.1SY/config\\_guide/sup2T/vtp .pdf](http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/15.1SY/config_guide/sup2T/vtp.pdf)

## QUESTION 12

Which technique automatically limits VLAN traffic to only the switches that require it?

- A. access lists
- B. DTP in nonegotiate
- C. VTP pruning
- D. PBR

**Correct Answer: C**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

VTP pruning enhances network bandwidth use by reducing unnecessary flooded traffic, such as broadcast, multicast, unknown, and flooded unicast packets to only the switches that require it. VTP pruning increases available bandwidth by restricting flooded traffic to those trunk links that the traffic must use to access the appropriate network devices. By default, VTP pruning is disabled.

Reference: <http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst6500/ios/12-2SX/configuration/guide/book/vtp.html#wp1020444>

## QUESTION 13

Interface FastEthernet0/1 is configured as a trunk interface that allows all VLANs. This command is configured globally:  
monitor session 2 filter vlan 1 - 8, 39, 52

What is the result of the implemented command?

- A. All VLAN traffic is sent to the SPAN destination interface.

- B. Traffic from VLAN 4 is not sent to the SPAN destination interface.
- C. Filtering a trunked SPAN port effectively disables SPAN operations for all VLANs.
- D. The trunk's native VLAN must be changed to something other than VLAN 1.
- E. Traffic from VLANs 1 to 8, 39, and 52 is replicated to the SPAN destination port.

**Correct Answer:** E

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

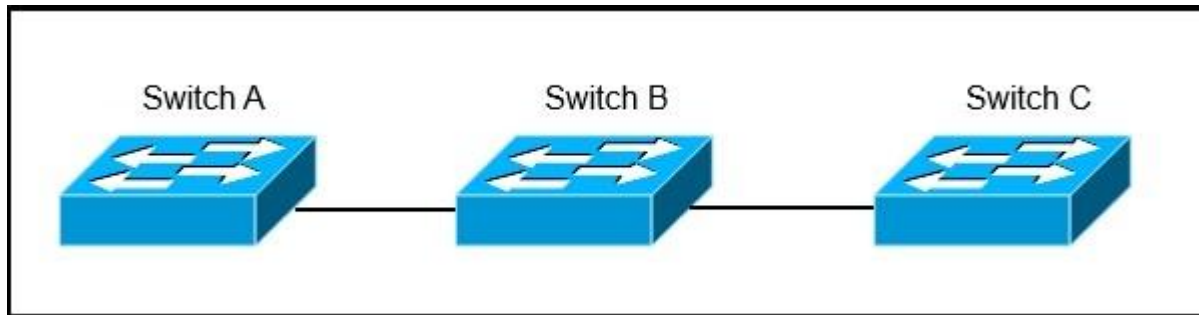
The monitor session filter command is used to specify which VLANs are to be port mirrored using SPAN. This example shows how to monitor VLANs 1 through 5 and VLAN 9 when the SPAN source is a trunk interface:

Switch(config)# monitor session 2 filter vlan 1 - 5 , 9

Reference: <http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst4500/12-2/25ew/configuration/guide/conf/span.html/index.html#wp1066836>

## QUESTION 14

Refer to the exhibit.



Switch A, B, and C are trunked together and have been properly configured for VTP. Switch C receives VLAN information from the VTP server Switch A, but Switch B does not receive any VLAN information. What is the most probable cause of this behavior?

- A. Switch B is configured in transparent mode.
- B. Switch B is configured with an access port to Switch A, while Switch C is configured with a trunk port to Switch B.
- C. The VTP revision number of the Switch B is higher than that of Switch A.
- D. The trunk between Switch A and Switch B is misconfigured.

**Correct Answer:** A

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

VTP transparent switches do not participate in VTP. A VTP transparent switch does not advertise its VLAN configuration and does not synchronize its VLAN configuration based on received advertisements, but transparent switches do forward VTP advertisements that they receive out their trunk ports in VTP Version 2.

Reference:

[http://www.cisco.com/en/US/tech/tk389/tk689/technologies\\_tech\\_note09186a0080094c52.shtml](http://www.cisco.com/en/US/tech/tk389/tk689/technologies_tech_note09186a0080094c52.shtml)

**QUESTION 15**

A network engineer notices inconsistent Cisco Discovery Protocol neighbors according to the diagram that is provided. The engineer notices only a single neighbor that uses Cisco Discovery Protocol, but it has several routing neighbor relationships. What would cause the output to show only the single neighbor?

- A. The routers are connected via a Layer 2 switch.
- B. IP routing is disabled on neighboring devices.
- C. Cisco Express Forwarding is enabled locally.
- D. Cisco Discovery Protocol advertisements are inconsistent between the local and remote devices.

**Correct Answer:** A

**Section:** Layer 2 Technologies

**Explanation**

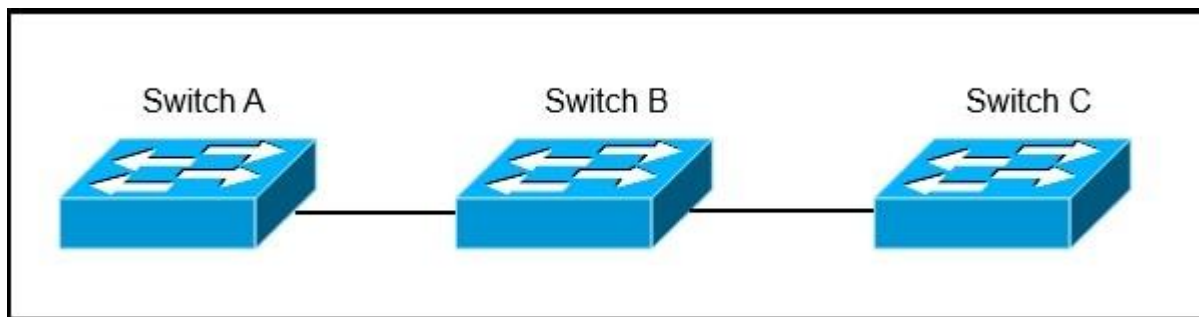
**Explanation/Reference:**

Explanation:

If all of the routers are connected to each other using a layer 2 switch, then each router will only have the single switch port that it connects to as its neighbor. Even though multiple routing neighbors can be formed over a layer 2 network, only the physical port that it connects to will be seen as a CDP neighbor. CDP can be used to determine the physical topology, but not necessarily the logical topology.

**QUESTION 16**

Refer to the exhibit.



Switch A, B, and C are trunked together and have been properly configured for VTP. Switch B has all VLANs, but Switch C is not receiving traffic from certain VLANs. What would cause this issue?

- A. A VTP authentication mismatch occurred between Switch A and Switch B.
- B. The VTP revision number of Switch B is higher than that of Switch A.
- C. VTP pruning is configured globally on all switches and it removed VLANs from the trunk interface that is connected to Switch C.
- D. The trunk between Switch A and Switch B is misconfigured.

**Correct Answer: C**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

VTP pruning increases network available bandwidth by restricting flooded traffic to those trunk links that the traffic must use to reach the destination devices. Without VTP pruning, a switch floods broadcast, multicast, and unknown unicast traffic across all trunk links within a VTP domain even though receiving switches might discard them. VTP pruning is disabled by default. VTP pruning blocks unneeded flooded traffic to VLANs on trunk ports that are included in the pruning-eligible list. The best explanation for why switch C is not seeing traffic from only some of the VLANs, is that VTP pruning has been configured.

## QUESTION 17

After the recent upgrade of the switching infrastructure, the network engineer notices that the port roles that were once "blocking" are now defined as "alternate" and "backup." What is the reason for this change?

- A. The new switches are using RSTP instead of legacy IEEE 802.1D STP.
- B. IEEE 802.1D STP and PortFast have been configured by default on all newly implemented Cisco Catalyst switches.
- C. The administrator has defined the switch as the root in the STP domain.
- D. The port roles have been adjusted based on the interface bandwidth and timers of the new Cisco Catalyst switches.

**Correct Answer: A**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

RSTP works by adding an alternative port and a backup port compared to STP. These ports are allowed to immediately enter the forwarding state rather than passively wait for the network to converge.

RSTP bridge port roles:

- \* Root port A forwarding port that is the closest to the root bridge in terms of path cost
- \* Designated port A forwarding port for every LAN segment

- \* Alternate port A best alternate path to the root bridge. This path is different than using the root port. The alternative port moves to the forwarding state if there is a failure on the designated port for the segment.
- \* Backup port A backup/redundant path to a segment where another bridge port already connects. The backup port applies only when a single switch has two links to the same segment (collision domain). To have two links to the same collision domain, the switch must be attached to a hub.
- \* Disabled port Not strictly part of STP, a network administrator can manually disable a port Reference: <http://www.cisco.com/c/en/us/support/docs/lan-switching/spanning-tree-protocol/24062-146.html>

## QUESTION 18

An administrator recently configured all ports for rapid transition using PortFast. After testing, it has been determined that several ports are not transitioning as they should. What is the reason for this?

- A. RSTP has been enabled per interface and not globally.
- B. The STP root bridge selection is forcing key ports to remain in non-rapid transitioning mode.
- C. STP is unable to achieve rapid transition for trunk links.
- D. The switch does not have the processing power to ensure rapid transition for all ports.

**Correct Answer: C**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

RSTP can only achieve rapid transition to the forwarding state on edge ports and on point-to-point links, not on trunk links. The link type is automatically derived from the duplex mode of a port. A port that operates in full-duplex is assumed to be point-to-point, while a half-duplex port is considered as a shared port by default. This automatic link type setting can be overridden by explicit configuration. In switched networks today, most links operate in full-duplex mode and are treated as point-to-point links by RSTP. This makes them candidates for rapid transition to the forwarding state.

Reference: <http://www.cisco.com/c/en/us/support/docs/lan-switching/spanning-tree-protocol/24062-146.html>

## QUESTION 19

What effect does the mac address-table aging-time 180 command have on the MAC address-table?

- A. This is how long a dynamic MAC address will remain in the CAM table.
- B. The MAC address-table will be flushed every 3 minutes.
- C. The default timeout period will be 360 seconds.
- D. ARP requests will be processed less frequently by the switch.
- E. The MAC address-table will hold addresses 180 seconds longer than the default of 10 minutes.

**Correct Answer: A**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

You can configure the amount of time that an entry (the packet source MAC address and port that packet ingresses) remain in the MAC table.

To configure the aging time for all MAC addresses, perform this task:

Command Purpose

Step 1 switch# configure Enters configuration mode.  
terminal

Step 2 switch(config)# mac- Specifies the time before an entry ages out address-table aging- and is discarded from the MAC address table. time seconds [vlan The range is from 0 to 1000000; the default is vlan\_id] 300 seconds. Entering the value 0 disables the MAC aging. If a VLAN is not specified, the aging specification applies to all VLANs.

This example shows how to set the aging time for entries in the MAC address table to 600 seconds (10 minutes):

switch# configure terminal

switch(config)# mac-address-table aging-time 600

Reference:

<http://www.cisco.com/c/en/us/td/docs/switches/datacenter/nexus5000/sw/configuration/guide/cli/CLIConfigurationGuide/MACAddress.html#wp1126206>

**QUESTION 20**

While working in the core network building, a technician accidentally bumps the fiber connection between two core switches and damages one of the pairs of fiber. As designed, the link was placed into a non-forwarding state due to a fault with UDLD. After the damaged cable was replaced, the link did not recover. What solution allows the network switch to automatically recover from such an issue?

- A. macros
- B. errdisable autorecovery
- C. IP Event Dampening
- D. command aliases
- E. Bidirectional Forwarding Detection

**Correct Answer:** B

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

There are a number of events which can disable a link on a Catalyst switch, such as the detection of a loopback, UDLD failure, or a broadcast storm. By default, manual intervention by an administrator is necessary to restore the interface to working order; this can be done by issuing shutdown followed by no shutdown on the interface. The idea behind requiring administrative action is so that a human engineer can intercede, assess, and (ideally) correct the issue. However, some configurations may be prone to accidental violations, and a steady recurrence of these can amount to a huge time sink for the administrative staff.

This is where errdisable autorecovery can be of great assistance. We can configure the switch to automatically re-enable any error-disabled interfaces

after a specified timeout period. This gives the offending issue a chance to be cleared by the user (for example, by removing an unapproved device) without the need for administrative intervention.

Reference: <http://packetlife.net/blog/2009/sep/14/errdisable-autorecovery/>

## QUESTION 21

A network engineer deployed a switch that operates the LAN base feature set and decides to use the SDM VLAN template. The SDM template is causing the CPU of the switch to spike during peak working hours. What is the root cause of this issue?

- A. The VLAN receives additional frames from neighboring switches.
- B. The SDM VLAN template causes the MAC address-table to overflow.
- C. The VLAN template disables routing in hardware.
- D. The switch needs to be rebooted before the SDM template takes effect.

**Correct Answer: C**

**Section: Layer 2 Technologies**

**Explanation**

### Explanation/Reference:

Explanation:

SDM Template Notes:

All templates are predefined. There is no way to edit template category individual values.

The switch reload is required to use a new SDM template.

The ACL merge algorithm, as opposed to the original access control entries (ACEs) configured by the user, generate the number of TCAM entries listed for security and QoS ACEs.

The first eight lines (up to Security ACEs) represent approximate hardware boundaries set when a template is used. If the boundary is exceeded, all processing overflow is sent to the CPU which can have a major impact on the performance of the switch. Choosing the VLAN template will actually disable routing (number of entry for unicast or multicast route is zero) in hardware.

Reference: <http://www.cisco.com/c/en/us/support/docs/switches/catalyst-3750-series-switches/44921-sw-database-3750ss-44921.html>

## QUESTION 22

An access switch has been configured with an EtherChannel port. After configuring SPAN to monitor this port, the network administrator notices that not all traffic is being replicated to the management server. What is a cause for this issue?

- A. VLAN filters are required to ensure traffic mirrors effectively.
- B. SPAN encapsulation replication must be enabled to capture EtherChannel destination traffic.
- C. The port channel can be used as a SPAN source, but not a destination.
- D. RSPAN must be used to capture EtherChannel bidirectional traffic.

**Correct Answer: C**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

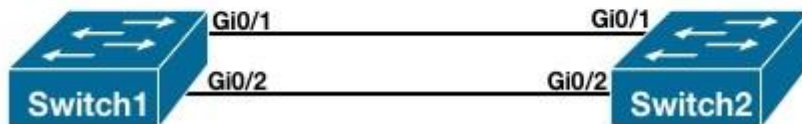
Explanation:

A source port or EtherChannel is a port or EtherChannel monitored for traffic analysis. You can configure both Layer 2 and Layer 3 ports and EtherChannels as SPAN sources. SPAN can monitor one or more source ports or EtherChannels in a single SPAN session. You can configure ports or EtherChannels in any VLAN as SPAN sources. Trunk ports or EtherChannels can be configured as sources and mixed with nontrunk sources. A port-channel interface (an EtherChannel) can be a SPAN source, but not a destination. Reference: <http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst6500/ios/12-2SX/configuration/guide/book/span.html#wp1040905>

**QUESTION 23**

Refer to the exhibit.

<pre>hostname Switch1 &lt;output omitted&gt; ! port-channel load-balance dst-ip ! interface GigabitEthernet0/1 channel-group 10 mode active ! interface GigabitEthernet0/2 channel-group 10 mode passive !</pre>	<pre>hostname Switch2 &lt;output omitted&gt; ! port-channel load-balance src-mac ! interface GigabitEthernet0/1 channel-group 10 mode passive ! interface GigabitEthernet0/2 channel-group 10 mode active !</pre>
--	---



What is the result of the configuration?

- A. The EtherChannels would not form because the load-balancing method must match on the devices.
- B. The EtherChannels would form and function properly even though the load-balancing and EtherChannel modes do not match.
- C. The EtherChannels would form, but network loops would occur because the load-balancing methods do not match.
- D. The EtherChannels would form and both devices would use the dst-ip load-balancing method because Switch1 is configured with EtherChannel mode active.

**Correct Answer:** B

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

An etherchannel will form if one end is active and the other is passive. The table below summarizes the results for LACP channel establishment based on the configuration of each side of a link:

LACP Channel Establishment  
S1 S2 Established?

On On Yes

Active/Passive Active Yes

On/Active/Passive Not Configured No

On Active No

Passive/On Passive No

Load balancing can only be configured globally. As a result, all channels (manually configured, PagP, or LACP) use the same load-balancing. This is true for the switch globally, although each switch involved in the etherchannel can have non matching parameters for load balancing. Reference: <http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst4500/12-2/54sg/configuration/guide/config/channel.html#wp1020804>

## QUESTION 24

A network engineer tries to configure storm control on an EtherChannel bundle. What is the result of the configuration?

- A. The storm control settings will appear on the EtherChannel, but not on the associated physical ports.
- B. The configuration will be rejected because storm control is not supported for EtherChannel.
- C. The storm control configuration will be accepted, but will only be present on the physical interfaces.
- D. The settings will be applied to the EtherChannel bundle and all associated physical interfaces.

**Correct Answer:** D

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

After you configure an EtherChannel, any configuration that you apply to the port-channel interface affects the EtherChannel; any configuration that you apply to the physical interfaces affects only the interface where you apply the configuration. Storm Control is an exception to this rule. For example, you

cannot configure Storm Control on some of the members of an EtherChannel; Storm Control must be configured on all or none of the ports. If you configure Storm Control on only some of the ports, those ports will be dropped from the EtherChannel interface (put in suspended state). Therefore, you should configure Storm Control at the EtherChannel Interface level, and not at the physical interface level. Reference: <http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst4500/12-2/31sg/configuration/guide/conf/channel.html>

## QUESTION 25

What is the function of NSF?

- A. forward traffic simultaneously using both supervisors
- B. forward traffic based on Cisco Express Forwarding
- C. provide automatic failover to back up supervisor in VSS mode
- D. provide nonstop forwarding in the event of failure of one of the member supervisors

**Correct Answer: D**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

VSS is network system virtualization technology that pools multiple Cisco Catalyst 6500 Series Switches into one virtual switch, increasing operational efficiency, boosting nonstop communications, and scaling system bandwidth capacity to 1.4 Tbps. Switches would operate as a single logical virtual switch called a virtual switching system 1440 (VSS1440). VSS formed by two Cisco Catalyst 6500 Series Switches with the Virtual Switching Supervisor 720-10GE. In a VSS, the data plane and switch fabric with capacity of 720 Gbps of supervisor engine in each chassis are active at the same time on both chassis, combining for an active 1400-Gbps switching capacity per VSS. Only one of the virtual switch members has the active control plane. Both chassis are kept in sync with the inter-chassis Stateful Switchover (SSO) mechanism along with Nonstop Forwarding (NSF) to provide nonstop communication even in the event of failure of one of the member supervisor engines or chassis.

Reference: <http://ciscorouterswitch.over-blog.com/article-cisco-catalyst-6500-series-vss-1440-124536783.html>

## QUESTION 26

After UDLD is implemented, a Network Administrator noticed that one port stops receiving UDLD packets. This port continues to reestablish until after eight failed retries. The port then transitions into the errdisable state. Which option describes what causes the port to go into the errdisable state?

- A. Normal UDLD operations that prevent traffic loops.
- B. UDLD port is configured in aggressive mode.
- C. UDLD is enabled globally.
- D. UDLD timers are inconsistent.

**Correct Answer: B**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

With UDLD aggressive mode enabled, when a port on a bidirectional link that has a UDLD neighbor relationship established stops receiving UDLD packets, UDLD tries to reestablish the connection with the neighbor. After eight failed retries, the port is disabled. Reference: <http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst6500/ios/12-2SX/configuration/guide/book/udld.html>

**QUESTION 27**

After reviewing UDLD status on switch ports, an engineer notices that the." Which statement describes what this indicates about the status of the port?

- A. The port is fully operational and no known issues are detected.
- B. The bidirectional status of "unknown" indicates that the port will go into the disabled state because it stopped receiving UDLD packets from its neighbor.
- C. UDLD moved into aggressive mode after inconsistent acknowledgements were detected.
- D. The UDLD port is placed in the "unknown" state for 5 seconds until the next UDLD packet is received on the interface.

**Correct Answer: A**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

By default, UDLD is disabled on all interfaces. We can enable UDLD globally on the device, or individually on specific interfaces with the command `udld port`. This enables UDLD in normal mode.

It would be prohibitively difficult to coordinate the configuration of UDLD on both ends of a link at the same time, so when UDLD is first enabled and does not detect a neighbor the link state is considered unknown, which is not necessarily an error condition. The port will remain operational during this time.

When UDLD is finally enabled on the other end, the status will transition to bidirectional.

Reference: <http://packetlife.net/blog/2011/mar/7/udld/>

**QUESTION 28**

Pilot testing of the new switching infrastructure finds that when the root port is lost, STP immediately replaces the root port with an alternative root port. Which spanning-tree technology is used to accomplish backup root port selection?

- A. PVST+
- B. PortFast
- C. BackboneFast
- D. UplinkFast
- E. Loop Guard
- F. UDLD

**Correct Answer: D**

**Section: Layer 2 Technologies**

## Explanation

### Explanation/Reference:

Explanation:

If a switch loses connectivity, it begins using the alternate paths as soon as the spanning tree selects a new root port. By enabling UplinkFast with the spanning-tree uplinkfast global configuration command, you can accelerate the choice of a new root port when a link or switch fails or when the spanning tree reconfigures itself. The root port transitions to the forwarding state immediately without going through the listening and learning states, as it would with the normal spanning-tree procedures.

UplinkFast provides fast convergence after a direct link failure and achieves load balancing between redundant Layer 2 links using uplink groups. An uplink group is a set of Layer 2 interfaces (per VLAN), only one of which is forwarding at any given time. Specifically, an uplink group consists of the root port (which is forwarding) and a set of blocked ports, except for self-looping ports. The uplink group provides an alternate path in case the currently forwarding link fails.

Reference: [http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst2960/software/release/12-2\\_55\\_se/configuration/guide/scg\\_2960/swstpopt.html](http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst2960/software/release/12-2_55_se/configuration/guide/scg_2960/swstpopt.html)

### QUESTION 29

A network engineer must adjust the STP interface attributes to influence root port selection. Which two elements are used to accomplish this? (Choose two.)

- A. port-priority
- B. cost
- C. forward-timers
- D. link type
- E. root guard

**Correct Answer:** AB

**Section:** Layer 2 Technologies

**Explanation**

### Explanation/Reference:

Explanation:

Spanning tree forces redundant data paths into a standby (blocked) state. If a network segment in the spanning tree fails and a redundant path exists, the spanning-tree algorithm recalculates the spanning-tree topology and activates the standby path. Switches send and receive spanning-tree frames, called bridge protocol data units (BPDUs), at regular intervals. The switches do not forward these frames but use them to construct a loop-free path. BPDUs contain information about the sending switch and its ports, including switch and MAC addresses, switch priority, port priority, and path cost. Spanning tree uses this information to elect the root switch and root port for the switched network and the root port and designated port for each switched segment. When two ports on a switch are part of a loop, the spanning-tree port priority and path cost settings control which port is put in the forwarding state and which is put in the blocking state. The spanning-tree port priority value represents the location of a port in the network topology and how well it is located to pass traffic. The path cost value represents the media speed.

Reference:

[http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3750x\\_3560x/software/release/12-2\\_55\\_se/configuration/guide/3750xscg/swstp.html](http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3750x_3560x/software/release/12-2_55_se/configuration/guide/3750xscg/swstp.html)

### QUESTION 30

A network engineer must set the load balance method on an existing port channel. Which action must be done to apply a new load balancing method?

- A. Configure the new load balancing method using port-channel load-balance.
- B. Adjust the switch SDM back to "default".
- C. Ensure that IP CEF is enabled globally to support all load balancing methods.
- D. Upgrade the PFC to support the latest load balancing methods.

**Correct Answer:** A

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Example:

EtherChannel balances the traffic load across the links in a channel through the reduction of part of the binary pattern that the addresses in the frame form to a numerical value that selects one of the links in the channel. EtherChannel load balancing can use MAC addresses or IP addresses, source or destination addresses, or both source and destination addresses. The mode applies to all EtherChannels that are configured on the switch. You configure the load balancing and forwarding method with use of the port-channel load-balance {dst-ip | dst-mac | src-dst-ip | src-dst-mac | src-ip | src-mac} global configuration command. Reference: <http://www.cisco.com/c/en/us/support/docs/lan-switching/etherchannel/12023-4.html>

## QUESTION 31

Refer to the exhibit.

```
Switch#sh int g0/12
GigabitEthernet0/23 is up, line protocol is down (monitoring)
  Hardware is C6k 1000Mb 802.3, address is 001c.f9d4.7500 (bia
  001c.f9d4.750)
  MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
    Reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full-duplex, 1000Mb/s
```

A network engineer investigates a recent network failure and notices that one of the interfaces on the switch is still down. What is causing the line protocol on this interface to be shown as down?

- A. There is a layer 1 physical issue.
- B. There is a speed mismatch on the interface.
- C. The interface is configured as the target of the SPAN session.

- D. The interface is configured as the source of the SPAN session.
- E. There is a duplex mismatch on the interface.

**Correct Answer: C**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

With the SAPN destination port, the state of the destination port is up/down by design. The interface shows the port in this state in order to make it evident that the port is currently not usable as a production port. This is the normal operational state for SPAN destinations.

Reference:

[http://www.cisco.com/en/US/products/hw/switches/ps708/products\\_tech\\_note09186a008015c61\\_2.shtml](http://www.cisco.com/en/US/products/hw/switches/ps708/products_tech_note09186a008015c61_2.shtml)

### QUESTION 32

While doing network discovery using Cisco Discovery Protocol, it is found that rapid error tracking is not currently enabled. Which option must be enabled to allow for enhanced reporting mechanisms using Cisco Discovery Protocol?

- A. Cisco Discovery Protocol version 2
- B. Cisco IOS Embedded Event Manager
- C. logging buffered
- D. Cisco Discovery Protocol source interface
- E. Cisco Discovery Protocol logging options

**Correct Answer: A**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

· CDP Version 1 -- This is the first version of CDP which was used for the discovery of Cisco devices in the network. This version is mainly used for backward compatibility. · CDP Version 2 -- This is the most recent version of CDP which has enhanced features such as rapid reporting mechanism, which is used to track down errors and minimize costly downtime. It allows you to track instances even if the native VLAN ID or port duplex states do not match between connecting devices. This is the default version on all switches.

Reference:

[http://sbkb.cisco.com/CiscoSB/GetArticle.aspx?docid=0ed03cbac49b446ab390a657917d817c\\_Cisco\\_Discovery\\_Protocol\\_CDP\\_\\_Properties\\_Settings\\_on\\_Sx500\\_S.xml&pid=2&converted=0](http://sbkb.cisco.com/CiscoSB/GetArticle.aspx?docid=0ed03cbac49b446ab390a657917d817c_Cisco_Discovery_Protocol_CDP__Properties_Settings_on_Sx500_S.xml&pid=2&converted=0)

### QUESTION 33

Which technique allows specific VLANs to be strictly permitted by the administrator?

- A. VTP pruning

- B. transparent bridging
- C. trunk allowed VLANs
- D. VLAN access-list
- E. L2P tunneling

**Correct Answer:** C

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

By default, a trunk port sends traffic to and receives traffic from all VLANs. All VLAN IDs, 1 to 4094, are allowed on each trunk. However, you can remove VLANs from the allowed list, preventing traffic from those VLANs from passing over the trunk. To restrict the traffic a trunk carries, use the switchport trunk allowed vlan remove vlan-list interface configuration command to remove specific VLANs from the allowed list.

Reference:

[http://www.cisco.com/en/US/docs/switches/lan/catalyst3550/software/release/12.1\\_13\\_ea1/configuration/guide/swvlan.html](http://www.cisco.com/en/US/docs/switches/lan/catalyst3550/software/release/12.1_13_ea1/configuration/guide/swvlan.html)

## QUESTION 34

For security reasons, the IT manager has prohibited users from dynamically establishing trunks with their associated upstream switch. Which two actions can prevent interface trunking? (Choose two.)

- A. Configure trunk and access interfaces manually.
- B. Disable DTP on a per interface basis.
- C. Apply BPDU guard and BPDU filter.
- D. Enable switchport block on access ports.

**Correct Answer:** AB

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

The Dynamic Trunking Protocol (DTP) is used to negotiate forming a trunk between two Cisco devices. DTP causes increased traffic, and is enabled by default, but may be disabled. To disable DTP, configure switchport nonegotiate. This prevents the interface from generating DTP frames. You can use this command only when the interface switchport mode is access or trunk. You must manually configure the neighboring interface as a trunk interface to establish a trunk link, otherwise the link will be a non-trunking link.

Reference: <http://www.ciscopress.com/articles/article.asp?p=2181837&seqNum=8>

## QUESTION 35

Which two protocols can be automatically negotiated between switches for trunking? (Choose two.)

- A. PPP
- B. DTP
- C. ISL
- D. HDLC
- E. DLCI
- F. DOT1Q

**Correct Answer:** CF

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

Switches such as the Catalyst 3550 that are capable of either 802.1Q or ISL trunking encapsulation, the switchport trunk encapsulation [dot1q | isl | negotiate] interface command must be used prior to the switchport mode trunk command.

Reference: <https://learningnetwork.cisco.com/servlet/JiveServlet/previewBody/14792-102-1-57313/Dynamic%20Trunking%20Protocol.PDF>

## QUESTION 36

A network is running VTPv2. After verifying all VTP settings, the network engineer notices that the new switch is not receiving the list of VLANs from the server. Which action resolves this problem?

- A. Reload the new switch.
- B. Restart the VTP process on the new switch.
- C. Reload the VTP server.
- D. Verify connected trunk ports.

**Correct Answer:** D

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

VTP should never need to have the switch reloaded or the VTP process to restart in order for it to work. The first thing that should be done is to verify that the trunk ports are connected and up.

## QUESTION 37

After configuring new data VLANs 1020 through 1030 on the VTP server, a network engineer notices that none of the VTP clients are receiving the updates. What is the problem?

- A. The VTP server must be reloaded.

- B. The VTP version number must be set to version 3.
- C. After each update to the VTP server, it takes up to 4 hours propagate.
- D. VTP must be stopped and restarted on the server.
- E. Another switch in the domain has a higher revision number than the server.

**Correct Answer: B**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

VTP version 3 supports these features that are not supported in version 1 or version 2:

- Enhanced authentication--You can configure the authentication as hidden or secret. When hidden, the secret key from the password string is saved in the VLAN database file, but it does not appear in plain text in the configuration. Instead, the key associated with the password is saved in hexadecimal format in the running configuration. You must reenter the password if you enter a takeover command in the domain. When you enter the secret keyword, you can directly configure the password secret key.
- Support for extended range VLAN (VLANs 1006 to 4094) database propagation. VTP versions 1 and 2 propagate only VLANs 1 to 1005. If extended VLANs are configured, you cannot convert from VTP version 3 to version 1 or 2.

Reference:

[http://www.cisco.com/en/US/docs/switches/lan/catalyst3560/software/release/12.2\\_52\\_se/configuration/guide/swvtp.html#wp1316856](http://www.cisco.com/en/US/docs/switches/lan/catalyst3560/software/release/12.2_52_se/configuration/guide/swvtp.html#wp1316856)

## QUESTION 38

A network engineer is extending a LAN segment between two geographically separated data centers. Which enhancement to a spanning-tree design prevents unnecessary traffic from crossing the extended LAN segment?

- A. Modify the spanning-tree priorities to dictate the traffic flow.
- B. Create a Layer 3 transit VLAN to segment the traffic between the sites.
- C. Use VTP pruning on the trunk interfaces.
- D. Configure manual trunk pruning between the two locations.

**Correct Answer: C**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

Pruning unnecessary VLANs from the trunk can be performed with one of two methods:

- Manual pruning of the unnecessary VLAN on the trunk--This is the best method, and it avoids the use of the spanning tree. Instead, the method runs the pruned VLAN on trunks.
- VTP pruning--Avoid this method if the goal is to reduce the number of STP instances. VTP- pruned VLANs on a trunk are still part of the spanning tree. Therefore, VTP-pruned VLANs do not reduce the number of spanning tree port instances.

Since the question asked for the choice that is an enhancement to the STP design, VTP pruning is the best choice.

Reference:

[http://www.cisco.com/en/US/tech/tk389/tk689/technologies\\_tech\\_note09186a0080890613.shtml](http://www.cisco.com/en/US/tech/tk389/tk689/technologies_tech_note09186a0080890613.shtml)

## QUESTION 39

For client server failover purposes, the application server team has indicated that they must not have the standard 30 second delay before their switchport enters a forwarding state. For their disaster recovery feature to operate successfully, they require the switchport to enter a forwarding state immediately. Which spanning-tree feature satisfies this requirement?

- A. Rapid Spanning-Tree
- B. Spanning-Tree Timers
- C. Spanning-Tree FastPort
- D. Spanning-Tree PortFast
- E. Spanning-Tree Fast Forward

**Correct Answer: D**

**Section: Layer 2 Technologies**

**Explanation**

### Explanation/Reference:

Explanation:

In order to allow immediate transition of the port into forwarding state, enable the STP PortFast feature. PortFast immediately transitions the port into STP forwarding mode upon linkup. The port still participates in STP. So if the port is to be a part of the loop, the port eventually transitions into STP blocking mode.

Example configuration:

Switch-C# configure terminal

Switch-C(config)# interface range fa0/3 - 24

Switch-C(config-if-range)# spanning-tree portfast

Reference:

[http://www.informit.com/library/content.aspx?b=CCNP\\_Studies\\_Switching&seqNum=36](http://www.informit.com/library/content.aspx?b=CCNP_Studies_Switching&seqNum=36)

## QUESTION 40

The network manager has requested that several new VLANs (VLAN 10, 20, and 30) are allowed to traverse the switch trunk interface. After the command switchport trunk allowed vlan 10,20,30 is issued, all other existing VLANs no longer pass traffic over the trunk. What is the root cause of the problem?

- A. The command effectively removed all other working VLANs and replaced them with the new VLANs.
- B. VTP pruning removed all unused VLANs.
- C. ISL was unable to encapsulate more than the already permitted VLANs across the trunk.
- D. Allowing additional VLANs across the trunk introduced a loop in the network.

**Correct Answer: A**

## Section: Layer 2 Technologies

### Explanation

#### Explanation/Reference:

Explanation:

The switchport trunk allowed vlan command will only allow the specified VLANs, and overwrite any others that were previously defined. You would also need to explicitly allow the other working VLANs to this configuration command, or use the issue the switchport trunk allowed vlan add vlan-list command instead to add these 3 VLANs to the other defined allowed VLANs.

Reference: <https://supportforums.cisco.com/document/11836/how-define-vlans-allowed-trunk-link>

#### QUESTION 41

When you design a switched network using VTPv2, how many VLANs can be used to carry user traffic?

- A. 1000
- B. 1001
- C. 1024
- D. 2048
- E. 4095
- F. 4096

**Correct Answer: B**

## Section: Layer 2 Technologies

### Explanation

#### Explanation/Reference:

Explanation:

VTP versions 1 and 2 Supports normal VLAN numbers (1-1001). Only VTP version 3 supports extended VLANs (1-4095).

Reference: <http://cciememo.blogspot.com/2012/11/difference-between-vtp-versions.html>

#### QUESTION 42

What does the command vlan dot1q tag native accomplish when configured under global configuration?

- A. All frames within the native VLAN are tagged, except when the native VLAN is set to 1.
- B. It allows control traffic to pass using the non-default VLAN.
- C. It removes the 4-byte dot1q tag from every frame that traverses the trunk interface(s).
- D. Control traffic is tagged.

**Correct Answer: D**

## Section: Layer 2 Technologies

### Explanation

**Explanation/Reference:**

Explanation:

The `vlan dot1q native` will tag all untagged frames, including control traffic, with the defined native VLAN.

**QUESTION 43**

A manager tells the network engineer to permit only certain VLANs across a specific trunk interface. Which option can be configured to accomplish this?

- A. allowed VLAN list
- B. VTP pruning
- C. VACL
- D. L2P tunneling

**Correct Answer:** A

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

When a trunk link is established, all of the configured VLANs are allowed to send and receive traffic across the link. VLANs 1 through 1005 are allowed on each trunk by default. However, VLAN traffic can be removed from the allowed list. This keeps traffic from the VLANs from passing over the trunk link.

Note: The allowed VLAN list on both the ends of the trunk link should be the same. For Integrated Cisco IOS Software based switches, perform these steps:

1. To restrict the traffic that a trunk carries, issue the `switchport trunk vlan-list` interface configuration command.

This removes specific VLANs from the allowed list.

Reference: <https://supportforums.cisco.com/document/11836/how-define-vlans-allowed-trunk-link>

**QUESTION 44**

Which command does a network engineer use to verify the spanning-tree status for VLAN 10?

- A. `switch# show spanning-tree vlan 10`
- B. `switch# show spanning-tree bridge`
- C. `switch# show spanning-tree brief`
- D. `switch# show spanning-tree summary`
- E. `switch# show spanning-tree vlan 10 brief`

**Correct Answer:** A

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:  
Command Description

show spanning-tree Displays information about the spanning-tree state.

Example output:  
SW2#show spanning-tree vlan 10

```
VLAN0010
Spanning tree enabled protocol rstp
Root ID Priority 24586
Address 0014.f2d2.4180
Cost 9
Port 216 (Port-channel21)
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
```

```
Bridge ID Priority 32778 (priority 32768 sys-id-ext 10)
Address 001c.57d8.9000
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 300 sec
```

```
Interface Role Sts Cost Prio.Nbr Type
-----
----- Po21 Root FWD 9 128.216 P2p
Po23 Altn BLK 9 128.232 P2p
```

Reference: [http://www.cisco.com/en/US/docs/ios/lanswitch/command/reference/lsw\\_s2.html](http://www.cisco.com/en/US/docs/ios/lanswitch/command/reference/lsw_s2.html)

## QUESTION 45

A new network that consists of several switches has been connected together via trunking interfaces. If all switches currently have the default VTP domain name "null", which statement describes what happens when a domain name is configured on one of the switches?

- A. The switch with the non-default domain name restores back to "null" upon reboot.
- B. Switches with higher revision numbers does not accept the new domain name.
- C. VTP summary advertisements are sent out of all ports with the new domain name.
- D. All other switches with the default domain name become VTP clients.

**Correct Answer: C**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

By default, a switch will have a domain name of NULL and no password. If the switch hears a VTP advertisement it will automatically learn the VTP

domain name, VLANs, and the configuration revision number.

Summary advertisements sent out every 300 seconds and every time a change occurs on the VLAN database. Contained in a summary advertisement:

- VTP version
- Domain name
- Configuration revision number
- Time stamp
- MD5 encryption hash code

Reference: <https://rowell.dionicio.net/configuring-cisco-vtp/>

## QUESTION 46

A network engineer is setting up a new switched network. The network is expected to grow and add many new VLANs in the future. Which Spanning Tree Protocol should be used to reduce switch resources and managerial burdens that are associated with multiple spanning-tree instances?

- A. RSTP
- B. PVST
- C. MST
- D. PVST+
- E. RPVST+

**Correct Answer: C**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

Multiple Spanning Tree (MST) extends the IEEE 802.1w RST algorithm to multiple spanning trees. The main purpose of MST is to reduce the total number of spanning-tree instances to match the physical topology of the network and thus reduce the CPU cycles of a switch.

PVRST+ runs STP instances for each VLAN and does not take into consideration the physical topology that might not require many different STP topologies. MST, on the other hand, uses a minimum number of STP instances to match the number of physical topologies present.

Figure 3-15 shows a common network design, featuring an access Switch A, connected to two

Building Distribution submodule Switches D1 and D2. In this setup, there are 1000 VLANs, and the network administrator typically seeks to achieve load balancing on the access switch uplinks

based on even or odd VLANs--or any other scheme deemed appropriate.

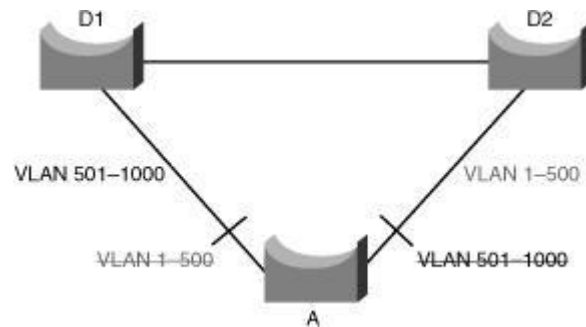


Figure 3-15: VLAN Load Balancing

Figure 3-15 illustrates two links and 1000 VLANs. The 1000 VLANs map to two MST instances. Rather than maintaining 1000 spanning trees, each switch needs to maintain only two spanning trees, reducing the need for switch resources.

Reference: [http://ciscodocuments.blogspot.com/2011/05/chapter-03-implementing-spanning-tree\\_19.html](http://ciscodocuments.blogspot.com/2011/05/chapter-03-implementing-spanning-tree_19.html)

## QUESTION 47

Which statement about the use of SDM templates in a Cisco switch is true?

- A. SDM templates are used to configure system resources in the switch to optimize support for specific features, depending on how the switch is used in the network.
- B. SDM templates are used to create Layer 3 interfaces (switch virtual interfaces) to permit hosts in one VLAN to communicate with hosts in another VLAN.
- C. SDM templates are used to configure ACLs that protect networks and specific hosts from unnecessary or unwanted traffic.
- D. SDM templates are used to configure a set of ACLs that allows the users to manage the flow of traffic handled by the route processor.
- E. SDM templates are configured by accessing the switch using the web interface.

**Correct Answer: A**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

You can use SDM templates to configure system resources in the switch to optimize support for specific features, depending on how the switch is used in the network. You can select a template to provide maximum system usage for some functions; for example, use the default template to balance resources, and use access template to obtain maximum ACL usage. To allocate hardware resources for different usages, the switch SDM templates prioritize system resources to optimize support for certain features.

Reference:

[http://www.cisco.com/en/US/docs/switches/lan/catalyst3750x\\_3560x/software/release/12.2\\_55\\_se/configuration/guide/swsdm.pdf](http://www.cisco.com/en/US/docs/switches/lan/catalyst3750x_3560x/software/release/12.2_55_se/configuration/guide/swsdm.pdf)

## QUESTION 48

A network engineer has just deployed a non-Cisco device in the network and wants to get information about it from a connected device. Cisco Discovery Protocol is not supported, so the open standard protocol must be configured. Which protocol does the network engineer configure on both devices to accomplish this?

- A. IRDP
- B. LLDP
- C. NDP
- D. LLTD

**Correct Answer: B**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

The Link Layer Discovery Protocol (LLDP) is a vendor-neutral link layer protocol in the Internet Protocol Suite used by network devices for advertising their identity, capabilities, and neighbors on an IEEE 802 local area network, principally wired Ethernet. LLDP performs functions similar to several proprietary protocols, such as the Cisco Discovery Protocol (CDP). Reference: [http://en.wikipedia.org/wiki/Link\\_Layer\\_Discovery\\_Protocol](http://en.wikipedia.org/wiki/Link_Layer_Discovery_Protocol)

## QUESTION 49

Which SDM template disables routing and supports the maximum number of unicast MAC addresses?

- A. VLAN
- B. access
- C. default
- D. routing

**Correct Answer: A**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

To allocate ternary content addressable memory (TCAM) resources for different usages, the switch SDM templates prioritize system resources to optimize support for certain features. You can select SDM templates to optimize these features:

- Access--The access template maximizes system resources for access control lists (ACLs) to accommodate a large number of ACLs.
- Default--The default template gives balance to all functions.
- Routing--The routing template maximizes system resources for IPv4 unicast routing, typically required for a router or aggregator in the center of a network.
- VLANs--The VLAN template disables routing and supports the maximum number of unicast MAC addresses. It would typically be selected for a Layer 2 switch.

Reference:

[http://www.cisco.com/en/US/docs/switches/lan/catalyst3560/software/release/12.2\\_55\\_se/configuration/guide/swsdm.pdf](http://www.cisco.com/en/US/docs/switches/lan/catalyst3560/software/release/12.2_55_se/configuration/guide/swsdm.pdf)

## QUESTION 50

Which SDM template is the most appropriate for a Layer 2 switch that provides connectivity to a large number of clients?

- A. VLAN
- B. default
- C. access
- D. routing

**Correct Answer: A**

**Section: Layer 2 Technologies**

**Explanation**

### Explanation/Reference:

Explanation:

To allocate ternary content addressable memory (TCAM) resources for different usages, the switch SDM templates prioritize system resources to optimize support for certain features. You can select SDM templates to optimize these features:

- Access--The access template maximizes system resources for access control lists (ACLs) to accommodate a large number of ACLs.
- Default--The default template gives balance to all functions.
- Routing--The routing template maximizes system resources for IPv4 unicast routing, typically required for a router or aggregator in the center of a network.
- VLANs--The VLAN template disables routing and supports the maximum number of unicast MAC addresses (clients). It would typically be selected for a Layer 2 switch.

Reference:

[http://www.cisco.com/en/US/docs/switches/lan/catalyst3560/software/release/12.2\\_55\\_se/configuration/guide/swsdm.pdf](http://www.cisco.com/en/US/docs/switches/lan/catalyst3560/software/release/12.2_55_se/configuration/guide/swsdm.pdf)

## QUESTION 51

In a Cisco switch, what is the default period of time after which a MAC address ages out and is discarded?

- A. 100 seconds
- B. 180 seconds
- C. 300 seconds
- D. 600 seconds

**Correct Answer: C**

## Section: Layer 2 Technologies

### Explanation

#### Explanation/Reference:

Explanation:

To configure the aging time for all MAC addresses, perform this task:

Command Purpose

Step 1 switch# configure terminal  
Enters configuration mode.

Step 2 switch(config)# mac address-table aging time seconds [vlan\_id] Specifies the time before an entry ages out and is discarded from the MAC address table. The range is from time seconds [vlan 0 to 1000000; the default is 300 seconds. Entering vlan\_id] the value 0 disables the MAC aging. If a VLAN is not specified, the aging specification applies to all VLANs.

Reference:

<http://www.cisco.com/en/US/docs/switches/datacenter/nexus5000/sw/configuration/guide/cli/MACAddress.html>

### QUESTION 52

If a network engineer applies the command mac-address-table notification mac-move on a Cisco switch port, when is a syslog message generated?

- A. A MAC address or host moves between different switch ports.
- B. A new MAC address is added to the content-addressable memory.
- C. A new MAC address is removed from the content-addressable memory.
- D. More than 64 MAC addresses are added to the content-addressable memory.

**Correct Answer: A**

## Section: Layer 2 Technologies

### Explanation

#### Explanation/Reference:

Explanation:

mac-address-table notification mac-move

To enable MAC-move notification, use the mac-address-table notification mac-move command in global configuration mode. To disable MAC-move notification, use the no form of this command.

mac-address-table notification mac-move [counter [syslog]] no mac-address-table notification mac-move [counter [syslog]] Syntax Description

counter (Optional) Specifies the MAC-move counter feature. syslog (Optional) Specifies the syslogging facility when the MAC-move notification detects the first instance of the MAC move.

Usage Guidelines

MAC-move notification generates a syslog message whenever a MAC address or host moves between different switch ports.  
Reference: [http://www.cisco.com/en/US/docs/ios/lanswitch/command/reference/lsw\\_m1.html](http://www.cisco.com/en/US/docs/ios/lanswitch/command/reference/lsw_m1.html)

## QUESTION 53

Which option is a possible cause for an errdisabled interface?

- A. routing loop
- B. cable unplugged
- C. STP loop guard
- D. security violation

**Correct Answer: D**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

There are various reasons for the interface to go into errdisable. The reason can be:

Duplex mismatch

Port channel misconfiguration

BPDU guard violation

UniDirectional Link Detection (UDLD) condition

Late-collision detection

Link-flap detection

Security violation

Port Aggregation Protocol (PAgP) flap

Layer 2 Tunneling Protocol (L2TP) guard

DHCP snooping rate-limit

Incorrect GBIC / Small Form-Factor Pluggable (SFP) module or cable

Address Resolution Protocol (ARP) inspection

Inline power

Reference:

[http://www.cisco.com/en/US/tech/tk389/tk621/technologies\\_tech\\_note09186a00806cd87b.shtml](http://www.cisco.com/en/US/tech/tk389/tk621/technologies_tech_note09186a00806cd87b.shtml)

## QUESTION 54

What is the default value for the errdisable recovery interval in a Cisco switch?

- A. 30 seconds
- B. 100 seconds
- C. 300 seconds
- D. 600 seconds

**Correct Answer: C**

**Section: Layer 2 Technologies**

**Explanation**

### Explanation/Reference:

Explanation:

After you fix the root problem, the ports are still disabled if you have not configured errdisable recovery on the switch. In this case, you must reenoble the ports manually. Issue the shutdown command and then the no shutdown interface mode command on the associated interface in order to manually reenoble the ports.

The errdisable recovery command allows you to choose the type of errors that automatically reenoble the ports after a specified amount of time. The show errdisable recovery command shows the default error-disable recovery state for all the possible conditions.

cat6knative#show errdisable recovery

ErrDisable Reason Timer Status

```
-----  
udld Disabled  
bpduguard Disabled  
security-violatio Disabled  
channel-misconfig Disabled  
pagp-flap Disabled  
dtp-flap Disabled  
link-flap Disabled  
l2ptguard Disabled  
psecure-violation Disabled  
gbic-invalid Disabled  
dhcp-rate-limit Disabled  
mac-limit Disabled  
unicast-flood Disabled  
arp-inspection Disabled
```

Timer interval: 300 seconds

Interfaces that will be enabled at the next timeout:

Note: The default timeout interval is 300 seconds and, by default, the timeout feature is disabled.

Reference:

[http://www.cisco.com/en/US/tech/tk389/tk621/technologies\\_tech\\_note09186a00806cd87b.shtml](http://www.cisco.com/en/US/tech/tk389/tk621/technologies_tech_note09186a00806cd87b.shtml)

## QUESTION 55

Which statement about LLDP-MED is true?

- A. LLDP-MED is an extension to LLDP that operates between endpoint devices and network devices.
- B. LLDP-MED is an extension to LLDP that operates only between network devices.
- C. LLDP-MED is an extension to LLDP that operates only between endpoint devices.
- D. LLDP-MED is an extension to LLDP that operates between routers that run BGP.

**Correct Answer:** A

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

LLDP for Media Endpoint Devices (LLDP-MED) is an extension to LLDP that operates between endpoint devices such as IP phones and network devices such as switches. It specifically provides support for voice over IP (VoIP) applications and provides additional TLVs for capabilities discovery, network policy, Power over Ethernet, and inventory management.

Reference:

[http://www.cisco.com/en/US/docs/switches/metro/me3400/software/release/12.2\\_58\\_se/configuration/guide/swlldp.pdf](http://www.cisco.com/en/US/docs/switches/metro/me3400/software/release/12.2_58_se/configuration/guide/swlldp.pdf)

## QUESTION 56

Which statement about Cisco devices learning about each other through Cisco Discovery Protocol is true?

- A. Each device sends periodic advertisements to multicast address 01:00:0C:CC:CC:CC.
- B. Each device broadcasts periodic advertisements to all of its neighbors.
- C. Each device sends periodic advertisements to a central device that builds the network topology.
- D. Each device sends periodic advertisements to all IP addresses in its ARP table.

**Correct Answer:** A

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

Cisco devices send periodic CDP announcements to the multicast destination address 01-00-0c-cc-cc-cc, out each connected network interface. These

multicast packets may be received by Cisco switches and other networking devices that support CDP into their connected network interface.

Reference: <http://network.spravcesite.net/subdom/network/index.php?id=cdp>

## QUESTION 57

Which option lists the information that is contained in a Cisco Discovery Protocol advertisement?

- A. native VLAN IDs, port-duplex, hardware platform
- B. native VLAN IDs, port-duplex, memory errors
- C. native VLAN IDs, memory errors, hardware platform
- D. port-duplex, hardware platform, memory errors

**Correct Answer: A**

**Section: Layer 2 Technologies**

**Explanation**

### Explanation/Reference:

Explanation:

Type-Length-Value fields (TLVs) are blocks of information embedded in CDP advertisements. Table 21 summarizes the TLV definitions for CDP advertisements.

Table 21 Type-Length-Value Definitions for CDPv2  
TLV Definition

Device-ID TLV Identifies the device name in the form of a character string.

Address TLV Contains a list of network addresses of both receiving and sending devices.

Port-ID TLV Identifies the port on which the CDP packet is sent.

Capabilities TLV Describes the functional capability for the device in the form of a device type, for example, a switch.

Version TLV Contains information about the software release version on which the device is running.

Platform TLV Describes the hardware platform name of the device, for example, Cisco 4500.

IP Network Prefix Contains a list of network prefixes to which the sending device can TLV forward IP packets. This information is in the form of the interface protocol and port number, for example, Eth 1/0.

VTP Management Advertises the system's configured VTP management domain name- Domain TLV string. Used by network operators to verify VTP domain configuration in adjacent network nodes.

Native VLAN TLV Indicates, per interface, the assumed VLAN for untagged packets on the interface. CDP learns the native VLAN for an interface. This feature is implemented only for interfaces that support the IEEE 802.1Q protocol.

Full/Half Duplex Indicates status (duplex configuration) of CDP broadcast interface. TLV Used by network operators to diagnose connectivity problems between adjacent network elements.

Reference:

[http://www.cisco.com/en/US/docs/ios/12\\_2/configfun/configuration/guide/fcf015.html](http://www.cisco.com/en/US/docs/ios/12_2/configfun/configuration/guide/fcf015.html)

## QUESTION 58

Which option describes a limitation of LLDP?

- A. LLDP cannot provide information about VTP.
- B. LLDP does not support TLVs.
- C. LLDP can discover only Windows servers.
- D. LLDP can discover up to two devices per port.

**Correct Answer: A**

**Section: Layer 2 Technologies**

**Explanation**

### Explanation/Reference:

Explanation:

LLDP Versus Cisco Discovery Protocol TLV Comparison

Function Description LLDP TLV Cisco Discovery Protocol TLV

IP network prefix support-Used to send the net- No IP Network Prefix work prefix and used for ODR TLV

Hello piggybacking-Can be used to piggy back No Protocol Hello TLV hello messages from other protocols

Maximum-transmission-unit (MTU) support- No MTU TLV  
Specifies the size of the MTU

External port support-Used to identify the card No External Port-ID TLV  
terminating the fiber in the case of wavelength-  
division multiplexing (WDM)

VTP management support No VTP Management  
Domain TLV

Port unidirectional mode-Used in fiber, where No Port UniDirectional the connection may be unidirectional Mode TLV

Management address Management Management-

Address TLV AddressTLV

Allows for organizational unique TLVs Yes No

Reference:

[http://www.cisco.com/en/US/technologies/tk652/tk701/technologies\\_white\\_paper0900aecd804c\\_d46d.html](http://www.cisco.com/en/US/technologies/tk652/tk701/technologies_white_paper0900aecd804c_d46d.html)

## QUESTION 59

Which statement about the UDLD protocol is true?

- A. UDLD is a Cisco-proprietary Layer 2 protocol that enables devices to monitor the physical status of links and detect unidirectional failures.
- B. UDLD is a Cisco-proprietary Layer 2 protocol that enables devices to advertise their identity, capabilities, and neighbors on a local area network.
- C. UDLD is a standardized Layer 2 protocol that enables devices to monitor the physical status of links and detect unidirectional failures.
- D. UDLD is a standardized Layer 2 protocol that enables devices to advertise their identity, capabilities, and neighbors on a local area network.

**Correct Answer:** A

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

The Cisco-proprietary UDLD protocol monitors the physical configuration of the links between devices and ports that support UDLD. UDLD detects the existence of unidirectional links. When a unidirectional link is detected, UDLD puts the affected port into the errdisabled state and alerts the user.

Reference:

<http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SX/configuration/guide/udld.html>

## QUESTION 60

Which option lists the modes that are available for configuring UDLD on a Cisco switch?

- A. normal and aggressive
- B. active and aggressive
- C. normal and active
- D. normal and passive
- E. normal and standby

**Correct Answer:** A

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

The Cisco-proprietary UDLD protocol monitors the physical configuration of the links between devices and ports that support UDLD. UDLD detects the existence of unidirectional links. When a unidirectional link is detected, UDLD puts the affected port into the errdisabled state and alerts the user. UDLD can operate in either normal or aggressive mode.

Reference:

<http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SX/configuration/guide/udld.html>

## QUESTION 61

What is the default interval at which Cisco devices send Cisco Discovery Protocol advertisements?

- A. 30 seconds
- B. 60 seconds
- C. 120 seconds
- D. 300 seconds

**Correct Answer: B**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

Cisco Discovery Protocol is a Layer 2, media-independent, and network-independent protocol that networking applications use to learn about nearby, directly connected devices. Cisco Discovery Protocol is enabled by default. Each device configured for Cisco Discovery Protocol advertises at least one address at which the device can receive messages and sends periodic advertisements (messages) to the well-known multicast address 01:00:0C:CC:CC:CC. Devices discover each other by listening at that address. They also listen to messages to learn when interfaces on other devices are up or go down.

Advertisements contain time-to-live information, which indicates the length of time a receiving device should hold Cisco Discovery Protocol information before discarding it. Advertisements supported and configured in Cisco software are sent, by default, every 60 seconds. Reference: <http://www.cisco.com/en/US/docs/ios-xml/ios/cdp/configuration/15-mt/nm-cdp-discover.html>

## QUESTION 62

Which VTP mode is needed to configure an extended VLAN, when a switch is configured to use VTP versions 1 or 2?

- A. transparent
- B. client
- C. server
- D. Extended VLANs are only supported in version 3 and not in versions 1 or 2.

**Correct Answer: D**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

VTP version 1 and version 2 support VLANs 1 to 1000 only. Extended-range VLANs are supported only in VTP version 3. If converting from VTP version 3 to VTP version 2, VLANs in the range 1006 to 4094 are removed from VTP control.

Reference:

<http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SX/configuration/guide/vtp.html>

**QUESTION 63**

What is the size of the VLAN field inside an 802.1q frame?

- A. 8-bit
- B. 12-bit
- C. 16-bit
- D. 32-bit

**Correct Answer: B**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

The VLAN field is a 12-bit field specifying the VLAN to which the frame belongs. The hexadecimal values of 0x000 and 0xFFFF are reserved. All other values may be used as VLAN identifiers, allowing up to 4,094 VLANs

Reference: [http://en.wikipedia.org/wiki/IEEE\\_802.1Q](http://en.wikipedia.org/wiki/IEEE_802.1Q)

**QUESTION 64**

What is the maximum number of VLANs that can be assigned to an access switchport without a voice VLAN?

- A. 0
- B. 1
- C. 2
- D. 1024

**Correct Answer: B**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

A standard (non-voice VLAN port) access switch port can belong to only a single VLAN. If more than one VLAN is needed, the port should be configured

as a trunk port.

#### QUESTION 65

Refer to the exhibit.

```
Interface GigabitEthernet1/0/1
switchport access vlan 10
switchport trunk encapsulation dot1q
switchport mode trunk
switchport voice vlan 11
spanning-tree portfast
!
```

Which option shows the expected result if a show vlan command is issued?

A.

Switch#sh vlan			
VLAN	Name	Status	Ports
1	default	active	Gi1/0/2, Gi1/0/3, Gi1/0/4 Gi1/0/5, Gi1/0/6, Gi1/0/7 Gi1/0/8, Gi1/0/9, Gi1/0/10 Gi1/0/11, Gi1/0/12, Gi1/0/13 Gi1/0/14, Gi1/0/15, Gi1/0/16 Gi1/0/17, Gi1/0/18, Gi1/0/19 Gi1/0/20, Gi1/0/21, Gi1/0/22 Gi1/0/23, Gi1/0/24
10	Data	active	
11	Voice	active	
1002	fddi-default	act/unsup	
1003	token-ring-default	act/unsup	
1004	fddinet-default	act/unsup	
1005	trnet-default	act/unsup	

B. Switch#sh vlan

VLAN	Name	Status	Ports
1	default	active	Gi1/0/2, Gi1/0/3, Gi1/0/4 Gi1/0/5, Gi1/0/6, Gi1/0/7 Gi1/0/8, Gi1/0/9, Gi1/0/10 Gi1/0/11, Gi1/0/12, Gi1/0/13 Gi1/0/14, Gi1/0/15, Gi1/0/16 Gi1/0/17, Gi1/0/18, Gi1/0/19 Gi1/0/20, Gi1/0/21, Gi1/0/22 Gi1/0/23, Gi1/0/24
10	Data	active	Gi1/0/1
11	voice	active	Gi1/0/1
1002	fddi-default	act/unsup	
1003	token-ring-default	act/unsup	
1004	fddinet-default	act/unsup	
1005	trnet-default	act/unsup	

C. Switch#sh vlan

VLAN	Name	Status	Ports
1	default	active	Gi1/0/1, Gi1/0/2, Gi1/0/3 Gi1/0/4, Gi1/0/5, Gi1/0/6 Gi1/0/7, Gi1/0/8, Gi1/0/9 Gi1/0/10, Gi1/0/11, Gi1/0/12 Gi1/0/13, Gi1/0/14, Gi1/0/15 Gi1/0/16, Gi1/0/17, Gi1/0/18 Gi1/0/19, Gi1/0/20, Gi1/0/21 Gi1/0/22, Gi1/0/23, Gi1/0/24
10	Data	active	
11	voice	active	Gi1/0/1
1002	fddi-default	act/unsup	
1003	token-ring-default	act/unsup	
1004	fddinet-default	act/unsup	
1005	trnet-default		

D. Switch#sh vlan

VLAN	Name	Status	Ports
1	default	active	Gi1/0/2, Gi1/0/3, Gi1/0/4 Gi1/0/5, Gi1/0/6, Gi1/0/7 Gi1/0/8, Gi1/0/9, Gi1/0/10 Gi1/0/11, Gi1/0/12, Gi1/0/13 Gi1/0/14, Gi1/0/15, Gi1/0/16 Gi1/0/17, Gi1/0/18, Gi1/0/19 Gi1/0/20, Gi1/0/21, Gi1/0/22 Gi1/0/23, Gi1/0/24
10	Data	active	Gi1/0/1
11	voice	active	
1002	fddi-default	act/unsup	
1003	token-ring-default	act/unsup	
1004	fddinet-default	act/unsup	
1005	trnet-default	act/unsup	

- A. Exhibit A  
B. Exhibit B  
C. Exhibit C

D. Exhibit D

**Correct Answer:** A

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

In this case, the port has been configured both as a trunk and as a switchport in data vlan 10. Obviously, a port can not be both, so even though Cisco IOS will accept both, the port will actually be used as a trunk, ignoring the switchport access VLAN 10 command.

## QUESTION 66

Which statement about Cisco Discovery Protocol configuration on a Cisco switch is true?

- A. CDP is enabled by default and can be disabled globally with the command no cdp run.
- B. CDP is disabled by default and can be enabled globally with the command cdp enable.
- C. CDP is enabled by default and can be disabled globally with the command no cdp enable.
- D. CDP is disabled by default and can be enabled globally with the command cdp run.

**Correct Answer:** A

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

CDP is enabled on your router by default, which means the Cisco IOS software will receive CDP information. CDP also is enabled on supported interfaces by default. To disable CDP on an interface, use the no cdp enable interface configuration command. To disable it globally, use the no cdp run command.

Reference:

[http://www.cisco.com/en/US/docs/ios/12\\_2/configfun/command/reference/frf015.html#wp10175](http://www.cisco.com/en/US/docs/ios/12_2/configfun/command/reference/frf015.html#wp10175)

## QUESTION 67

Which feature is automatically enabled when a voice VLAN is configured, but not automatically disabled when a voice VLAN is removed?

- A. portfast
- B. port-security
- C. spanning tree
- D. storm control

**Correct Answer:** A

**Section:** Layer 2 Technologies

## Explanation

### Explanation/Reference:

Explanation:

Voice VLAN Configuration Guidelines

- You should configure voice VLAN on switch access ports.
- The voice VLAN should be present and active on the switch for the IP phone to correctly communicate on the voice VLAN. Use the show vlan privileged EXEC command to see if the VLAN is present (listed in the display).
- The Port Fast feature is automatically enabled when voice VLAN is configured. When you disable voice VLAN, the Port Fast feature is not automatically disabled.

Reference:

[http://www.cisco.com/en/US/docs/switches/lan/catalyst2950/software/release/12.1\\_22\\_ea11x/configuration/guide/swvoip.html](http://www.cisco.com/en/US/docs/switches/lan/catalyst2950/software/release/12.1_22_ea11x/configuration/guide/swvoip.html)

### QUESTION 68

In which portion of the frame is the 802.1q header found?

- A. within the Ethernet header
- B. within the Ethernet payload
- C. within the Ethernet FCS
- D. within the Ethernet source MAC address

**Correct Answer: A**

**Section: Layer 2 Technologies**

**Explanation**

### Explanation/Reference:

Explanation:

Frame format



Insertion of 802.1Q tag in an Ethernet frame

802.1Q does not encapsulate the original frame. Instead, for Ethernet frames, it adds a 32-bit field between the source MAC address and the EtherType/length fields of the original frame Reference: [http://en.wikipedia.org/wiki/IEEE\\_802.1Q](http://en.wikipedia.org/wiki/IEEE_802.1Q)

### QUESTION 69

Which VLAN range is eligible to be pruned when a network engineer enables VTP pruning on a switch?

- A. VLANs 1-1001
- B. VLANs 1-4094
- C. VLANs 2-1001
- D. VLANs 2-4094

**Correct Answer: C**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

VTP pruning should only be enabled on VTP servers, all the clients in the VTP domain will automatically enable VTP pruning. By default, VLANs 2-1001 are pruning eligible, but VLAN 1 can't be pruned because it's an administrative VLAN. Both VTP versions 1 and 2 supports pruning.

Reference: <http://www.orbit-computer-solutions.com/VTP-Pruning.php>

## QUESTION 70

Which feature must be enabled to eliminate the broadcasting of all unknown traffic to switches that are not participating in the specific VLAN?

- A. VTP pruning
- B. port-security
- C. storm control
- D. bpdguard

**Correct Answer: A**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

VTP ensures that all switches in the VTP domain are aware of all VLANs. However, there are occasions when VTP can create unnecessary traffic. All unknown unicasts and broadcasts in a VLAN are flooded over the entire VLAN. All switches in the network receive all broadcasts, even in situations in which few users are connected in that VLAN. VTP pruning is a feature that you use in order to eliminate or prune this unnecessary traffic. Reference:

[http://www.cisco.com/c/en/us/support/docs/lan-switching/vtp/10558-21.html#vtp\\_pruning](http://www.cisco.com/c/en/us/support/docs/lan-switching/vtp/10558-21.html#vtp_pruning)

## QUESTION 71

Refer to the exhibit.

```
Switch1 (config)#vlan 10
VTP vlan configuration not allowed when device is in CLIENT mode.
Switch1#show interfaces trunk
Switch1#
```

The users in an engineering department that connect to the same access switch cannot access the network. The network engineer found that the engineering VLAN is missing from the database. Which action resolves this problem?

- A. Disable VTP pruning and disable 802.1q.
- B. Update the VTP revision number.
- C. Change VTP mode to server and enable 802.1q.
- D. Enable VTP pruning and disable 802.1q.

**Correct Answer: C**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

Only VTP servers can add new VLANs to the switched network, so to enable vlan 10 on this switch you will first need to change the VTP mode from client to server. Then, you will need to enable 802.1Q trunking to pass this new VLAN along to the other switches.

**QUESTION 72**

Refer to the exhibit.

Company A# show vtp status

**VTP Version : 2**  
**Configuration Revision : 0**  
**Maximum VLANs supported locally: 1005**  
**Number of existing VLANs : 9**  
**VTP Operating Mode : Server**  
**VTP Domain Name : company**  
**VTP Pruning Mode : Disabled**  
**VTP V2 Mode : Disabled**  
**VTP Traps Generation : Disabled**

Company B# show vtp status

**VTP Version : 2**  
**Configuration Revision : 2**  
**Maximum VLANs supported locally: 1005**  
**Number of existing VLANs : 42**  
**VTP Operating Mode : Server**  
**VTP Domain Name : company**  
**VTP Pruning Mode : Disabled**  
**VTP V2 Mode : Disabled**  
**VTP Traps Generation : Disable**

The network switches for two companies have been connected and manually configured for the required VLANs, but users in company A are not able to access network resources in company B when DTP is enabled. Which action resolves this problem?

- A. Delete vlan.dat and ensure that the switch with lowest MAC address is the VTP server.
- B. Disable DTP and document the VTP domain mismatch.
- C. Manually force trunking with switchport mode trunk on both switches.
- D. Enable the company B switch with the vtp mode server command.

**Correct Answer: C**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

Since the number of existing VLANs differ on the switches (9 on A and 42 on B) we know that there is a problem with VTP or the trunking interfaces. The VTP domain names do match and they are both VTP servers so there are no issues there. The only viable solution is that there is a DTP issues and so you must instead manually configure the trunk ports between these two switches so that the VLAN information can be sent to each switch.

## QUESTION 73

A network engineer must implement Ethernet links that are capable of transporting frames and IP traffic for different broadcast domains that are mutually isolated. Consider that this is a multivendor environment. Which Cisco IOS switching feature can be used to achieve the task?

- A. PPP encapsulation with a virtual template
- B. Link Aggregation Protocol at the access layer
- C. dot1q VLAN trunking
- D. Inter-Switch Link

**Correct Answer: C**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

Here the question asks for transporting frames and IP traffic for different broadcast domains that are mutually isolated which is basically a long way of saying VLANs so trunking is needed to carry VLAN information. There are 2 different methods for trunking, 802.1Q and ISL. Of these, only 802.1Q is supported by multiple vendors since ISL is a Cisco proprietary protocol.

## QUESTION 74

Which statement about using native VLANs to carry untagged frames is true?

- A. Cisco Discovery Protocol version 2 carries native VLAN information, but version 1 does not.
- B. Cisco Discovery Protocol version 1 carries native VLAN information, but version 2 does not.
- C. Cisco Discovery Protocol version 1 and version 2 carry native VLAN information.
- D. Cisco Discovery Protocol version 3 carries native VLAN information, but versions 1 and 2 do not.

**Correct Answer: A**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

Cisco Discovery Protocol (CDP) version 2 passes native VLAN information between Cisco switches. If you have a native VLAN mismatch, you will see CDP error messages on the console output.

Reference: <http://www.ciscopress.com/articles/article.asp?p=29803&seqNum=3>

**QUESTION 75**

Refer to the exhibit.

```
SW-1#sh logging
%SPANTREE-SP-2-RECV_PVID_ERR: Received BPDU with inconsistent peer
Vlan id 1 on GigabitEthernet11/2 VLAN2013.
%SPANTREE-SP-2-BLOCK_PVID_PEER: Blocking GigabitEthernet11/2 on
VLAN0001. Inconsistent peer vlan.
```

A multilayer switch has been configured to send and receive encapsulated and tagged frames. VLAN 2013 on the multilayer switch is configured as the native VLAN. Which option is the cause of the spanning-tree error?

- A. VLAN spanning-tree in SW-2 is configured.
- B. spanning-tree bpdud-filter is enabled.
- C. 802.1q trunks are on both sides, both with native VLAN mismatch.
- D. VLAN ID 1 should not be used for management traffic because its unsafe.

**Correct Answer: C**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Here we see that the native VLAN has been configured as 2013 on one switch, but 1 (the default native VLAN) on the other switch. If you use 802.1Q trunks, you must ensure that you choose a common native VLAN for each port in the trunk. Failure to do this causes Cisco switches to partially shut down the trunk port because having mismatched native VLANs can result in spanning-tree loops. Native VLAN mismatches are detected via spanning tree and Cisco Discovery Protocol (CDP), not via DTP messages. If spanning tree detects a native VLAN mismatch, spanning tree blocks local native VLAN traffic and the remote switch native VLAN traffic on the trunk; however, the trunk still remains up for other VLANs.

Reference:

[http://www.informit.com/library/content.aspx?b=CCNP\\_Studies\\_Switching&seqNum=25](http://www.informit.com/library/content.aspx?b=CCNP_Studies_Switching&seqNum=25)

**QUESTION 76**

A network engineer must improve bandwidth and resource utilization on the switches by stopping the inefficient flooding of frames on trunk ports where the frames are not needed.

Which Cisco IOS feature can be used to achieve this task?

- A. VTP pruning
- B. access list
- C. switchport trunk allowed VLAN
- D. VLAN access-map

**Correct Answer:** A

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

Cisco advocates the benefits of pruning VLANs in order to reduce unnecessary frame flooding. The vtp pruning command prunes VLANs automatically, which stops the inefficient flooding of frames where they are not needed.

Reference: <http://www.cisco.com/c/en/us/support/docs/switches/catalyst-6500-series-switches/24330-185.html>

## QUESTION 77

Which action allows a network engineer to limit a default VLAN from being propagated across all trunks?

- A. Upgrade to VTP version 3 for advanced feature set support.
- B. Enable VTP pruning on the VTP server.
- C. Manually prune default VLAN with switchport trunk allowed vlans remove.
- D. Use trunk pruning vlan 1.

**Correct Answer:** C

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

Manually pruning the default VLAN (1) can only be done with the switchport trunk allowed vlans remove command. VLAN 1 is not VTP pruning eligible so it cannot be done via VTP pruning. The trunk pruning vlan 1 option is not a valid command.

## QUESTION 78

What is required for a LAN switch to support 802.1q Q-in-Q encapsulation?

- A. Support less than 1500 MTU
- B. Support 1504 MTU or higher
- C. Support 1522 layer 3 IP and IPX packet
- D. Support 1547 MTU only

**Correct Answer:** B

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

The default system MTU for traffic on Catalyst switches is 1500 bytes. Because the 802.1Q tunneling (Q-in-Q) feature increases the frame size by 4 bytes when the extra tag is added, you must configure all switches in the service-provider network to be able to process maximum frames by increasing the switch system MTU size to at least 1504 bytes.

Explanation:

[http://www.cisco.com/en/US/docs/switches/lan/catalyst3550/software/release/12.1\\_13\\_ea1/configuration/guide/swtunnel.html](http://www.cisco.com/en/US/docs/switches/lan/catalyst3550/software/release/12.1_13_ea1/configuration/guide/swtunnel.html)

## QUESTION 79

Refer to the exhibit.

```
3512xl(config)#int fastEthernet 0/1
3512xl(config-if)#switchport mode trunk
3512xl(config-if)#switchport trunk encapsulation dot1q
```

How many bytes are added to each frame as a result of the configuration?

- A. 4-bytes except the native VLAN
- B. 8-bytes except the native VLAN
- C. 4-bytes including native VLAN
- D. 8-bytes including native VLAN

**Correct Answer:** A

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

In 802.1Q trunking, all VLAN packets are tagged on the trunk link, except the native VLAN. A VLAN tag adds 4 bytes to the frame. Two bytes are used for the tag protocol identifier (TPID), the other two bytes for tag control information (TCI).

## QUESTION 80

A network engineer configured a fault-tolerance link on Gigabit Ethernet links G0/1, G0/2, G0/3, and G0/4 between two switches using Ethernet port-channel. Which action allows interface G0/1 to always actively forward traffic in the port-channel?

- A. Configure G0/1 as half duplex and G0/2 as full duplex.
- B. Configure LACP port-priority on G0/1 to 1.
- C. Configure LACP port-priority on G0/1 to 65535.
- D. LACP traffic goes through G0/4 because it is the highest interface ID.

**Correct Answer:** B

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

A LACP port priority is configured on each port using LACP. The port priority can be configured automatically or through the CLI. LACP uses the port priority with the port number to form the port identifier. The port priority determines which ports should be put in standby mode when there is a hardware limitation that prevents all compatible ports from aggregating. The higher the number, the lower the priority. The valid range is from 1 to 65535. The default is 32768.

Reference:

[http://www.cisco.com/c/en/us/td/docs/ios/12\\_2sb/feature/guide/gigeth.html#wp1081491](http://www.cisco.com/c/en/us/td/docs/ios/12_2sb/feature/guide/gigeth.html#wp1081491)

## QUESTION 81

Which statement about the use of PAgP link aggregation on a Cisco switch that is running Cisco IOS Software is true?

- A. PAgP modes are off, auto, desirable, and on. Only the combinations auto-desirable, desirable- desirable, and on-on allow the formation of a channel.
- B. PAgP modes are active, desirable, and on. Only the combinations active-desirable, desirable- desirable, and on-on allow the formation of a channel.
- C. PAgP modes are active, desirable, and on. Only the combinations active-active, desirable- desirable, and on-on allow the formation of a channel.
- D. PAgP modes are off, active, desirable, and on. Only the combinations auto-auto, desirable- desirable, and on-on allow the formation of a channel.

**Correct Answer:** A

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

PAgP modes are off, auto, desirable, and on. Only the combinations auto-desirable, desirable- desirable, and on-on will allow a channel to be formed.

The PAgP modes are explained below.

1. on: PAgP will not run. The channel is forced to come up.
2. off: PAgP will not run. The channel is forced to remain down.
3. auto: PAgP is running passively. The formation of a channel is desired; however, it is not initiated.
4. desirable: PAgP is running actively. The formation of a channel is desired and initiated.

Only the combinations of auto-desirable, desirable-desirable, and on-on will allow a channel to be formed. If a device on one side of the channel does not support PAgP, such as a router, the device on the other side must have PAgP set to on.

Reference: <http://www.cisco.com/c/en/us/support/docs/switches/catalyst-2900-xl-series-switches/21041-131.html>

**QUESTION 82**

Refer to the exhibit.

```

SW1#show etherchannel summary
Flags: D - down P - in port-channel
I - stand-alone s - suspended
H - Hot-standby (LACP only)
R - Layer3 S - Layer2
U - in use f - failed to allocate aggregator
u - unsuitable for bundling
w - waiting to be aggregated
d - default port
Number of channel-groups in use: 3
Number of aggregators: 3
Group  Port-channel  Protocol    Ports
-----+-----+-----+-----
12      Po12 (SU)        -           Fa0/13(P) Fa0/14(P) Fa0/15(P)
13      Po13 (SU)        -           Fa0/16(P) Fa0/17(P) Fa0/18(P)
14      Po14 (SU)        -           Fa0/19(P) Fa0/20(P) Fa0/21(P)

SW1#show interface trunk
Port Mode Encapsulation Status Native vlan
Po12 desirable n-isl trunking 1
Po13 desirable n-isl trunking 1
Po14 desirable n-isl trunking 1
Port Vlans allowed on trunk
Po12 1-4094
Po13 1-4094
Po14 1-4094

```

Which EtherChannel negotiation protocol is configured on the interface f0/13 f0/15?

A. Link Combination Control Protocol

- B. Port Aggregation Protocol
- C. Port Combination Protocol
- D. Link Aggregation Control Protocol

**Correct Answer:** B

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

PAgP modes are off, auto, desirable, and on. Only the combinations auto-desirable, desirable-desirable, and on-on will allow a channel to be formed. .

1. on: PAgP will not run. The channel is forced to come up.
2. off: PAgP will not run. The channel is forced to remain down.
3. auto: PAgP is running passively. The formation of a channel is desired; however, it is not initiated.
4. desirable: PAgP is running actively. The formation of a channel is desired and initiated.

The Link Aggregate Control Protocol (LACP) trunking supports four modes of operation:

On: The link aggregation is forced to be formed without any LACP negotiation. In other words, the switch neither sends the LACP packet nor processes any inbound LACP packet. This is similar to the on state for PAgP.

Off: The link aggregation is not formed. We do not send or understand the LACP packet. This is similar to the off state for PAgP.

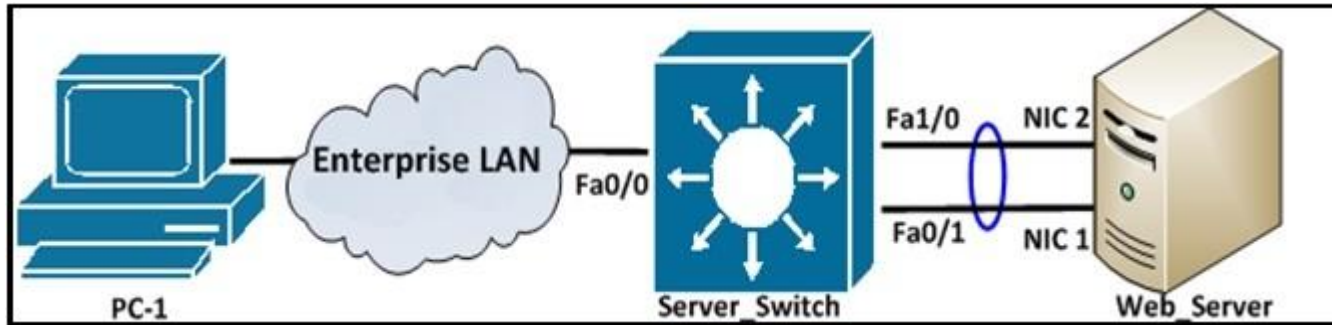
Passive: The switch does not initiate the channel but does understand inbound LACP packets. The peer (in active state) initiates negotiation (when it sends out an LACP packet) which we receive and answer, eventually to form the aggregation channel with the peer. This is similar to the auto mode in PAgP.

Active: We can form an aggregate link and initiate the negotiation. The link aggregate is formed if the other end runs in LACP active or passive mode. This is similar to the desirable mode of PAgP.

In this example, we see that fa 0/13, fa0/14, and fa0/15 are all in Port Channel 12, which is operating in desirable mode, which is only a PAgP mode.

## **QUESTION 83**

Refer to the exhibit.



Users of PC-1 experience slow connection when a webpage is requested from the server. To increase bandwidth, the network engineer configured an EtherChannel on interfaces Fa1/0 and Fa0/1 of the server farm switch, as shown here:

```
Server_Switch#sh etherchannel load-balance
EtherChannel Load-Balancing Operational State (src-mac):
Non-IP: Source MAC address
IPv4: Source MAC address
IPv6: Source IP address
Server_Switch#
```

However, traffic is still slow. Which action can the engineer take to resolve this issue?

- A. Disable EtherChannel load balancing.
- B. Upgrade the switch IOS to IP services image.
- C. Change the load-balance method to dst-mac.
- D. Contact Cisco TAC to report a bug on the switch.

**Correct Answer: C**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

Since this traffic is coming from PC-1, the source MAC address will always be that of PC-1, and since the load balancing method is source MAC, traffic will only be using one of the port channel links. The load balancing method should be changed to destination MAC, since the web server has two NICs traffic will be load balanced across both MAC addresses.

#### QUESTION 84

Which statement is true about Layer 2 security threats?

- A. MAC spoofing, in conjunction with ARP snooping, is the most effective counter-measure against reconnaissance attacks that use Dynamic ARP Inspection to determine vulnerable attack points.
- B. DHCP snooping sends unauthorized replies to DHCP queries.
- C. ARP spoofing can be used to redirect traffic to counter Dynamic ARP Inspection.
- D. MAC spoofing attacks allow an attacking device to receive frames intended for a different network host.

**Correct Answer:** D

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

First of all, MAC spoofing is not an effective counter-measure against any reconnaissance attack; it IS an attack! Furthermore, reconnaissance attacks don't use dynamic ARP inspection (DAI); DAI is a switch feature used to prevent attacks.

Reference: Layer 2 Security Features on Cisco Catalyst Layer 3 Fixed Configuration Switches Configuration Example ([http://www.cisco.com/en/US/products/hw/switches/ps5023/products\\_configuration\\_example09186a00807c4101.shtml](http://www.cisco.com/en/US/products/hw/switches/ps5023/products_configuration_example09186a00807c4101.shtml))

## QUESTION 85

A network engineer changed the port speed and duplex setting of an existing EtherChannel bundle that uses the PAgP protocol. Which statement describes what happens to all ports in the bundle?

- A. PAgP changes the port speed and duplex for all ports in the bundle.
- B. PAgP drops the ports that do not match the configuration.
- C. PAgP does not change the port speed and duplex for all ports in the bundle until the switch is rebooted.
- D. PAgP changes the port speed but not the duplex for all ports in the bundle.

**Correct Answer:** A

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

PAgP aids in the automatic creation of EtherChannel links. PAgP packets are sent between EtherChannel-capable ports in order to negotiate the formation of a channel. Some restrictions are deliberately introduced into PAgP. The restrictions are:

- PAgP does not form a bundle on ports that are configured for dynamic VLANs. PAgP requires that all ports in the channel belong to the same VLAN or are configured as trunk ports. When a bundle already exists and a VLAN of a port is modified, all ports in the bundle are modified to match that VLAN.
- PAgP does not group ports that operate at different speeds or port duplex. If speed and duplex change when a bundle exists, PAgP changes the port speed and duplex for all ports in the bundle.
- PAgP modes are off, auto, desirable, and on. Only the combinations auto-desirable, desirable- desirable, and on-on allow the formation of a channel. The device on the other side must have PAgP set to on if a device on one side of the channel does not support PAgP, such as a router. Reference: <http://www.cisco.com/c/en/us/support/docs/lan-switching/etherchannel/12023-4.html>

**QUESTION 86**

Which statement about using EtherChannel on Cisco IOS switches is true?

- A. A switch can support up to eight compatibly configured Ethernet interfaces in an EtherChannel. The EtherChannel provides full-duplex bandwidth up to 800 Mbps only for Fast EtherChannel or 8 Gbps only for Gigabit EtherChannel.
- B. A switch can support up to 10 compatibly configured Ethernet interfaces in an EtherChannel. The EtherChannel provides full-duplex bandwidth up to 1000 Mbps only for Fast EtherChannel or 8 Gbps only for Gigabit EtherChannel.
- C. A switch can support up to eight compatibly configured Ethernet interfaces in an EtherChannel. The EtherChannel provides full-duplex bandwidth up to 800 Mbps only for Fast EtherChannel or 16 Gbps only for Gigabit EtherChannel.
- D. A switch can support up to 10 compatibly configured Ethernet interfaces in an EtherChannel. The EtherChannel provides full-duplex bandwidth up to 1000 Mbps only for Fast EtherChannel or 10 Gbps only for Gigabit EtherChannel.

**Correct Answer:** A

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

An EtherChannel consists of individual Fast Ethernet or Gigabit Ethernet links bundled into a single logical link. The EtherChannel provides full-duplex bandwidth up to 800 Mbps (Fast EtherChannel) or 8 Gbps (Gigabit EtherChannel) between your switch and another switch or host. Each EtherChannel can consist of up to eight compatibly configured Ethernet interfaces. All interfaces in each EtherChannel must be the same speed, and all must be configured as either Layer 2 or Layer 3 interfaces.

Reference: <http://www.cisco.com/c/en/us/support/docs/lan-switching/etherchannel/12023-4.html>

**QUESTION 87**

Refer to the exhibit.

**S1# show etherchannel summary**

**Flags: D - down      P - bundled in port-channel**

**I - stand-alone s - suspended**

**H - Hot-standby (LACP only)**

**R - Layer3      S - Layer2**

**U - in use      f - failed to allocate aggregator**

**M - not in use, minimum links not met**

**u - unsuitable for bundling**

**w - waiting to be aggregated**

**d - default port**

**Number of channel-groups in use: 1**

**Number of aggregators:      1**

**Group Port-channel Protocol Ports**

Group	Port-channel	Protocol	Ports
1	Po1(SU)	LACP	Fa0/13(P) Fa0/14(P) Fa0/15(P)

Which statement about switch S1 is true?

- A. Physical port Fa0/13, Fa0/14, and Fa0/15 successfully formed a Layer 2 port-channel interface using an open standard protocol.
- B. Logical port Fa0/13, Fa0/14, and Fa0/15 successfully formed a Layer 2 physical port-channel interface using a Cisco proprietary protocol.
- C. Physical port Fa0/13, Fa0/14, and Fa0/15 successfully formed a Layer 3 port-channel interface using a Cisco proprietary protocol.
- D. Logical port Fa0/13, Fa0/14, and Fa0/15 successfully formed a Layer 3 physical port-channel interface using an open standard protocol.

**Correct Answer: A**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

These three ports show that they are in Port Channel 1, and the (SU) means they are in use and operating at layer 2. The protocol used for this port channel shows as LACP, which is a standards based protocol, as opposed to PAgP, which is Cisco proprietary.

## QUESTION 88

What happens on a Cisco switch that runs Cisco IOS when an RSTP-configured switch receives 802.1d BPDU?

- A. 802.1d does not understand RSTP BPDUs because they are different versions, but when a RSTP switch receives an 802.1d BPDU, it responds with an 802.1d BPDU and eventually the two switches run 802.1d to communicate.
- B. 802.1d understands RSTP BPDUs because they are the same version, but when a RSTP switch receives a 802.1d BPDU, it responds with a 802.1d BPDU and eventually the two switches run 802.1d to communicate.
- C. 802.1d does not understand RSTP BPDUs because they are different versions, but when a RSTP switch receives a 802.1d BPDU, it does not respond with a 802.1d BPDU.
- D. 802.1d understands RSTP BPDUs because they are the same version, but when a RSTP switch receives a 802.1d BPDU, it does not respond with a 802.1d BPDU and eventually the two switches run 802.1d to communicate.

**Correct Answer: A**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

For backward compatibility with 802.1D switches, RSTP selectively sends 802.1D configuration BPDUs and TCN BPDUs on a per-port basis.

When a port is initialized, the migrate-delay timer is started (specifies the minimum time during which RSTP BPDUs are sent), and RSTP BPDUs are sent. While this timer is active, the switch processes all BPDUs received on that port and ignores the protocol type. If the switch receives an 802.1D BPDU after the port migration-delay timer has expired, it assumes that it is connected to an 802.1D switch and starts using only 802.1D BPDUs.

However, if the RSTP switch is using 802.1D BPDUs on a port and receives an RSTP BPDU after the timer has expired, it restarts the timer and starts using RSTP BPDUs on that port. Reference: <http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst6500/ios/12-2SX/configuration/guide/book/spanntree.html>

## QUESTION 89

A network engineer is trying to deploy a PC on a network. The engineer observes that when the PC is connected to the network, it takes 30 to 60 seconds for the PC to see any activity on the network interface card. Which Layer 2 enhancement can be used to eliminate this delay?

- A. Configure port duplex and speed to auto negotiation.
- B. Configure port to duplex full and speed 1000.
- C. Configure spanning-tree portfast.
- D. Configure no switchport.

**Correct Answer: C**

**Section: Layer 2 Technologies**

## Explanation

### Explanation/Reference:

Explanation:

When first powered on, each port goes through 4 states to ensure that there are no physical loops in the layer 2 broadcast domain. These steps are outlined as follows. With the initial version of spanning tree, this process could take from 30-60 seconds. 1.Blocking - A port that would cause a switching loop, no user data is sent or received but it may go into forwarding mode if the other links in use were to fail and the spanning tree algorithm determines the port may transition to the forwarding state. BPDU data is still received in blocking state.

2.Listening - The switch processes BPDUs and awaits possible new information that would cause it to return to the blocking state.

3.Learning - While the port does not yet forward frames (packets) it does learn source addresses from frames received and adds them to the filtering database (switching database)

4.Forwarding - A port receiving and sending data, normal operation. STP still monitors incoming BPDUs that would indicate it should return to the blocking state to prevent a loop.

STP PortFast causes a Layer 2 LAN interface configured as an access port to enter the forwarding state immediately, bypassing the listening and learning states. Reference: <http://net.cmed.us/Home/ethernet-and-ip/spanning-tree-protocol>

### QUESTION 90

When two MST instances (MST 1 and MST 2) are created on a switch, what is the total number of spanning-tree instances running on the switch?

- A. 1
- B. 2
- C. 3
- D. 4

**Correct Answer: C**

**Section: Layer 2 Technologies**

**Explanation**

### Explanation/Reference:

Explanation:

Unlike other spanning tree protocols, in which all the spanning tree instances are independent, MST establishes and maintains IST, CIST, and CST spanning trees:

.

An IST is the spanning tree that runs in an MST region.

Within each MST region, MST maintains multiple spanning tree instances. Instance 0 is a special instance for a region, known as the IST. All other MST instances are numbered from 1 to 4094. In the case for this question, there will be the 2 defined MST instances, and the special 0 instance, for a total of 3 instances.

The IST is the only spanning tree instance that sends and receives BPDUs. All of the other spanning tree instance information is contained in MSTP

records (M-records), which are encapsulated within MST BPDUs. Because the MST BPDU carries information for all instances, the number of BPDUs that need to be processed to support multiple spanning tree instances is significantly reduced.

All MST instances within the same region share the same protocol timers, but each MST instance has its own topology parameters, such as root bridge ID, root path cost, and so forth. By default, all VLANs are assigned to the IST.

An MST instance is local to the region; for example, MST instance 1 in region A is independent of MST instance 1 in region B, even if regions A and B are interconnected.

- A CIST is a collection of the ISTs in each MST region.

- The CST interconnects the MST regions and single spanning trees. Reference: <http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst6500/ios/12-2SX/configuration/guide/book/spantree.html>

## **QUESTION 91**

Refer to the exhibit.

```

SW1#show spanning-tree vlan 1
VLAN0001
Spanning tree enabled protocol ieee
Root ID Priority 1
Address 001b.bbbb.dddd
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Bridge ID Priority 1 (priority 0 sys-id-ext 1)
Address 001b.bbbb.dddd

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 300

Interface  Role  Sts   Cost  Prio.Nbr  Type
-----
Fa0/1      Desg  FWD   19    128.15    P2p
Fa0/2      Desg  FWD   19    128.16    P2p
Fa0/3      Desg  FWD   19    128.17    P2p
Fa0/4      Desg  FWD   19    128.18    P2p
Fa0/5      Desg  FWD   19    128.19    P2p
Fa0/6      Desg  FWD   19    128.19    P2p

```

Why would the switch be considered as a root bridge?

- A. The bridge priority is 1 and all ports are forwarding.
- B. The switch priority for VLAN 1 and the macro specifies "This Bridge is the root".
- C. The bridge priority is 128.19 and all ports are forwarding.
- D. The switch priority value is zero, it has the lowest priority value for VLAN 1.

**Correct Answer:** D

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

For priority, the range is 0 to 61440 in increments of 4096; the default is 32768. The lower the number, the more likely the switch will be chosen as the

root switch.

Reference:

[http://www.cisco.com/en/US/docs/switches/lan/catalyst2950/software/release/12.1\\_9\\_ea1/configuration/guide/swstp.html#wp1020666](http://www.cisco.com/en/US/docs/switches/lan/catalyst2950/software/release/12.1_9_ea1/configuration/guide/swstp.html#wp1020666)

## QUESTION 92

Refer to the exhibit.

```
Switch# Show run
interface FastEthernet0/13
spanning-tree cost 1000
!
interface FastEthernet0/14
spanning-tree cost 1000
!
interface FastEthernet0/15
spanning-tree cost 1000
!
interface FastEthernet0/20
spanning-tree cost 2
!
interface FastEthernet0/21
spanning-tree cost 1
```

All ports are members of VLAN 10. Considering the default cost of upstream bridges to the root bridge is equal, which option will be the new root port for VLAN 10?

- A. interface f0/13
- B. interface f0/14
- C. interface f0/15
- D. interface f0/21

**Correct Answer:** D

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

Root Port election on each bridge

Each (non-Root) bridge has exactly one Root Port, which represents the best path to the Root Bridge.

- o Total Path Cost to root - lowest prevails (local Root Port cost added upon receipt of Configuration BPDUs on that port, from the direction of Root Bridge)

- o Connected Bridge ID - lowest prevails

- o Connected Port ID (Port Priority + Port#) - lowest prevails

- o Local Port ID - lowest prevails

In this case, fa0/21 has the lowest cost, so it will be the root port.

Reference:

[https://community.extremenetworks.com/extreme/topics/802\\_1d\\_spanning\\_tree\\_election\\_rules](https://community.extremenetworks.com/extreme/topics/802_1d_spanning_tree_election_rules)

## QUESTION 93

Which statement describes what happens when a port configured with root guard receives a superior BPDU?

- A. The port goes into errdisabled state and stops forwarding traffic.
- B. The port goes into BPDU-inconsistent state and stops forwarding traffic.
- C. The port goes into loop-inconsistent state and stops forwarding traffic.
- D. The port goes into root-inconsistent state and stops forwarding traffic.

**Correct Answer:** D

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

The root guard ensures that the port on which root guard is enabled is the designated port. Normally, root bridge ports are all designated ports, unless two or more ports of the root bridge are connected together. If the bridge receives superior STP Bridge Protocol Data Units (BPDUs) on a root guard-enabled port, root guard moves this port to a root-inconsistent STP state. This root-inconsistent state is effectively equal to a listening state. No traffic is forwarded across this port. In this way, the root guard enforces the position of the root bridge.

Reference:

[http://www.cisco.com/en/US/tech/tk389/tk621/technologies\\_tech\\_note09186a00800ae96b.shtml](http://www.cisco.com/en/US/tech/tk389/tk621/technologies_tech_note09186a00800ae96b.shtml)

## QUESTION 94

What is the maximum number of 10 Gigabit Ethernet connections that can be utilized in an EtherChannel for the virtual switch link?

- A. 4
- B. 6
- C. 8
- D. 12

**Correct Answer:** C

**Section:** Layer 2 Technologies

## Explanation

### Explanation/Reference:

Explanation:

The VSS is made up of the following:

- Virtual switch members: Cisco Catalyst 6500 Series Switches (up to two switches with initial release) deployed with the Virtual Switching Supervisor 720 10GE
- Virtual switch link (VSL): 10 Gigabit Ethernet connections (up to eight using EtherChannel) between the virtual switch members.

Reference:

[http://www.cisco.com/en/US/prod/collateral/switches/ps5718/ps9336/prod\\_qas0900aecd806ed74\\_b.html](http://www.cisco.com/en/US/prod/collateral/switches/ps5718/ps9336/prod_qas0900aecd806ed74_b.html)

### QUESTION 95

Which statement describes what happens if all VSL connections between the virtual switch members are lost?

- A. Both virtual switch members cease to forward traffic.
- B. The VSS transitions to the dual active recovery mode, and both virtual switch members continue to forward traffic independently.
- C. The virtual switch members reload.
- D. The VSS transitions to the dual active recovery mode, and only the new active virtual switch continues to forward traffic.

**Correct Answer: D**

**Section: Layer 2 Technologies**

**Explanation**

### Explanation/Reference:

Explanation:

Q. What happens if all VSL connections between the virtual switch members are lost? A. VSLs can be configured with up to eight links between the two switches across any combination of line cards or supervisor ports to provide a high level of redundancy. If for some rare reason all VSL connections are lost between the virtual switch members leaving both the virtual switch members up, the VSS will transition to the dual active recovery mode. The dual active state is detected rapidly (subsecond) by any of the following three methods:

- Enhancement to PAgP used in MEC with connecting Cisco switches
- L3 Bidirectional Forwarding Detection (BFD) configuration on a directly connected link (besides VSL) between virtual switch members or through an L2 link through an access layer switch
- L2 Fast-Hello Dual-Active Detection configuration on a directly connected link (besides VSL) between virtual switch members (supported with 12.2(33) SXI)

In the dual active recovery mode, all interfaces except the VSL interfaces are in an operationally shut down state in the formerly active virtual switch member. The new active virtual switch continues to forward traffic on all links.

Reference:

[http://www.cisco.com/en/US/prod/collateral/switches/ps5718/ps9336/prod\\_qas0900aecd806ed74\\_b.html](http://www.cisco.com/en/US/prod/collateral/switches/ps5718/ps9336/prod_qas0900aecd806ed74_b.html)

### QUESTION 96

Which statement describes what happens when a switch enters dual active recovery mode?

- A. The switch shuts down and waits for the VSL link to be restored before sending traffic.

- B. All interfaces are shut down in the formerly active virtual switch member, but the new active virtual switch forwards traffic on all links.
- C. The switch continues to forward traffic out all links and enables spanning tree on VSL link and all other links to prevent loops.
- D. The VSS detects which system was last in active state and shuts down the other switch.

**Correct Answer:** B

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

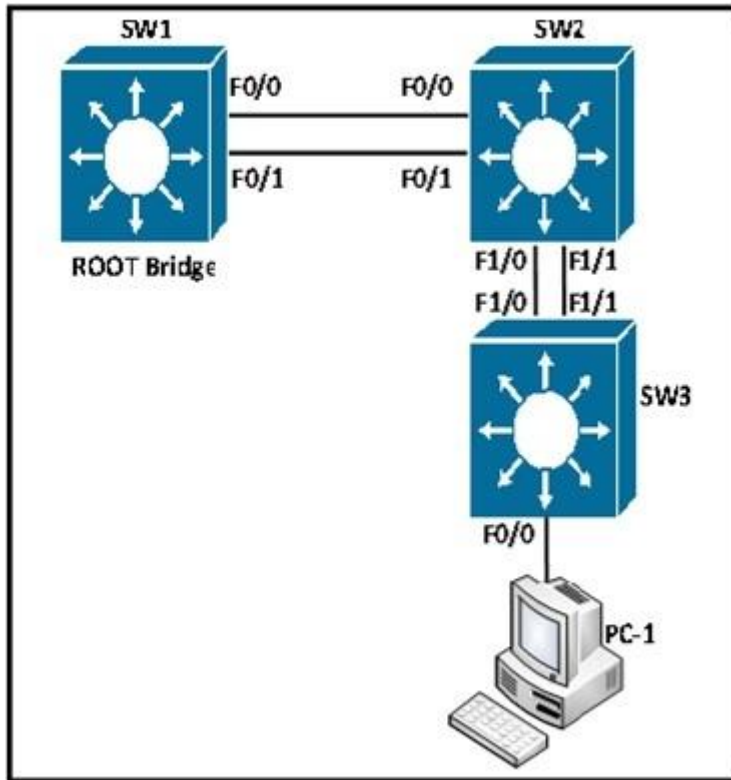
In the dual active recovery mode, all interfaces except the VSL interfaces are in an operationally shut down state in the formerly active virtual switch member. The new active virtual switch continues to forward traffic on all links.

Reference:

[http://www.cisco.com/en/US/prod/collateral/switches/ps5718/ps9336/prod\\_gas0900aecd806ed74\\_b.html](http://www.cisco.com/en/US/prod/collateral/switches/ps5718/ps9336/prod_gas0900aecd806ed74_b.html)

## **QUESTION 97**

Refer to the exhibit.



f1/0 and f1/1 have the same end-to-end path cost to the designated bridge. Which action is needed to modify the Layer 2 spanning-tree network so that traffic for PC1 VLAN from switch SW3 uses switchport f1/1 as a primary port?

- A. Modify the spanning-tree port-priority on SW1 f1/1 to 0 and f1/0 to 16.
- B. Modify the spanning-tree port-priority on SW1 f1/1 to 16 and f1/0 to 0.
- C. Modify the spanning-tree port-priority on SW2 f1/1 to 0 and f1/0 to 16.
- D. Modify the spanning-tree port-priority on SW2 f1/1 to 16 and f1/0 to 0.

**Correct Answer: C**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Explanation:

If a loop occurs, STP considers port priority when selecting a LAN port to put into the forwarding state. You can assign higher priority values to LAN ports

that you want STP to select first and lower priority values to LAN ports that you want STP to select last. If all LAN ports have the same priority value, STP puts the LAN port with the lowest LAN port number in the forwarding state and blocks other LAN ports. The possible priority range is 0 through 240 (default 128), configurable in increments of 16. A lower path cost represents higher-speed transmission and is preferred.

Reference:

[http://www.cisco.com/en/US/docs/switches/lan/catalyst2950/software/release/12.1\\_9\\_ea1/configuration/guide/swstp.html#wp1105354](http://www.cisco.com/en/US/docs/switches/lan/catalyst2950/software/release/12.1_9_ea1/configuration/guide/swstp.html#wp1105354)

## QUESTION 98

Which command creates a login authentication method named "login" that will primarily use RADIUS and fail over to the local user database?

- A. (config)# aaa authentication login default radius local
- B. (config)# aaa authentication login login radius local
- C. (config)# aaa authentication login default local radius
- D. (config)# aaa authentication login radius local

**Correct Answer: B**

**Section: Infrastructure Security**

**Explanation**

**Explanation/Reference:**

Explanation:

In the command `aaa authentication login login radius local` the second login is the name of the AAA method. It also lists radius first then local, so it will primarily use RADIUS for authentication and fail over to the local user database only if the RADIUS server is unreachable.

## QUESTION 99

A network engineer configured an Ethernet switch using these commands.

```
Switchone(config) # Spanning-tree portfast bpduguard default
```

Which statement about the spanning-tree portfast feature on the switch is true?

- A. If an interface is enabled for portfast receives BPDU, the port goes through the spanning-tree listening, learning, and forwarding states.
- B. If an interface is enabled for portfast receives BPDU, the port does not go through the spanning-tree listening, learning, and forwarding states.
- C. If an interface is enabled for portfast receives BPDU, the port is shut down immediately.
- D. If an interface is enabled for portfast receives BPDU, the port goes into the spanning-tree inconsistent state.

**Correct Answer: A**

**Section: Layer 2 Technologies**

**Explanation**

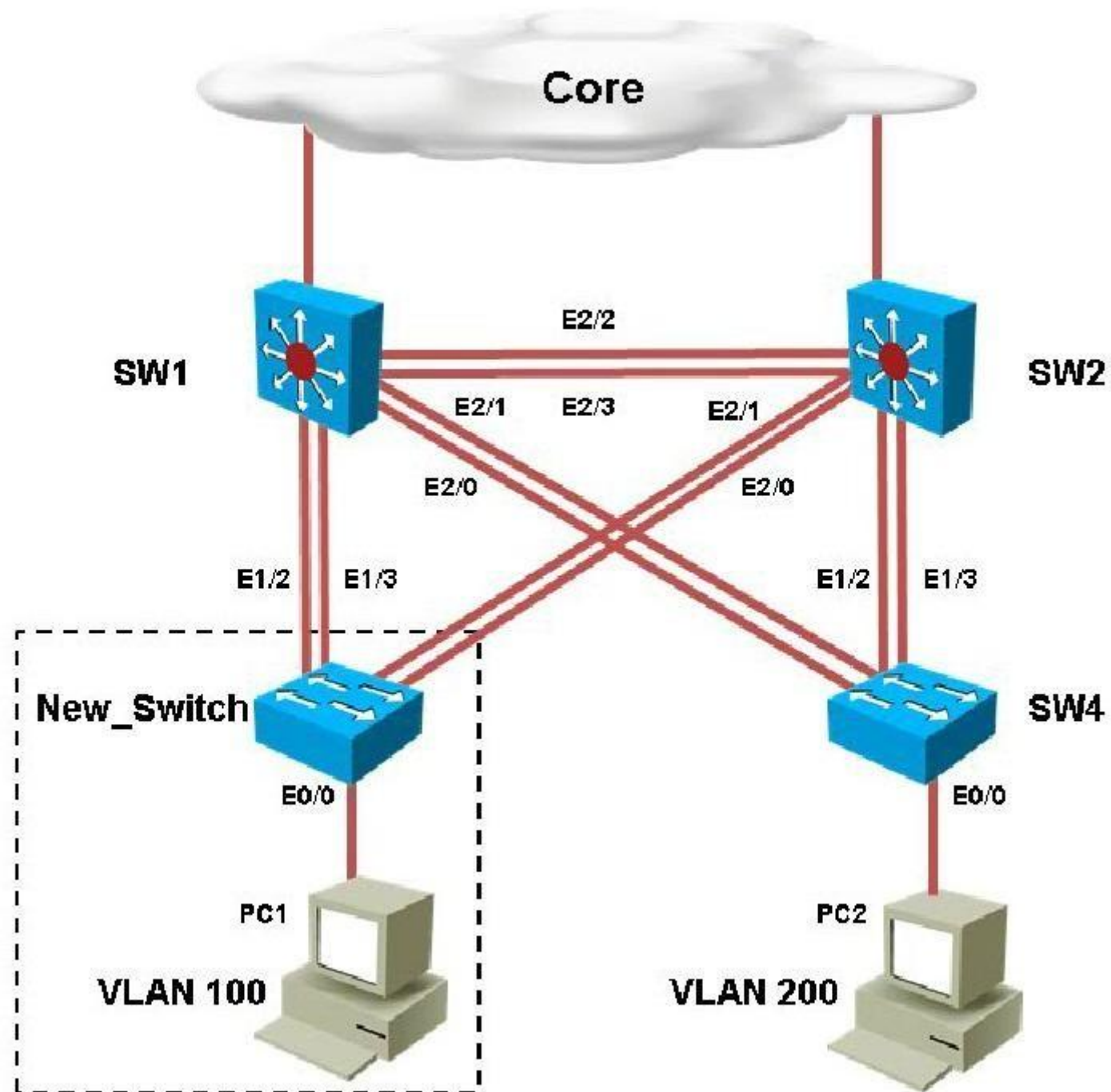
**Explanation/Reference:**

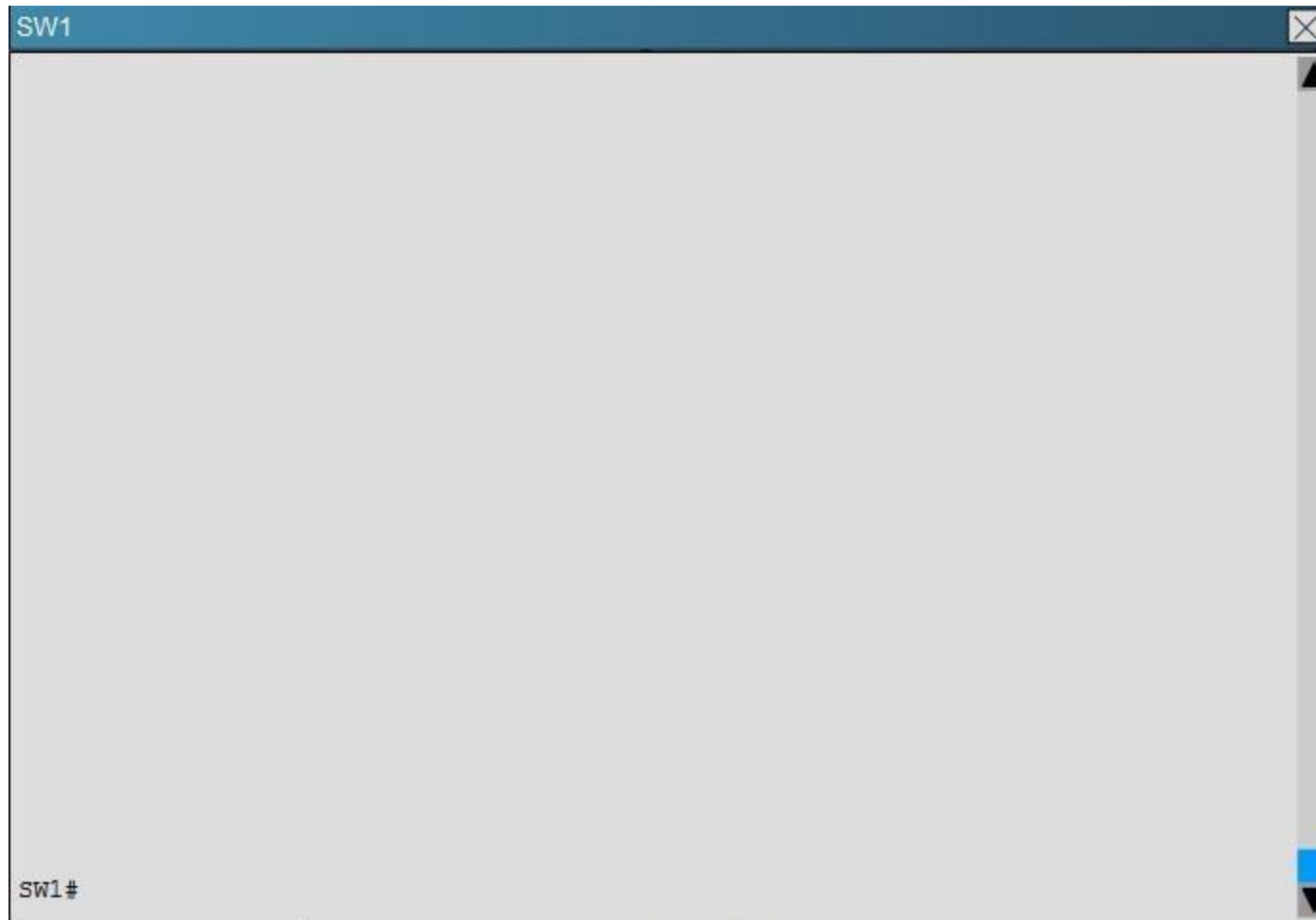
Explanation:

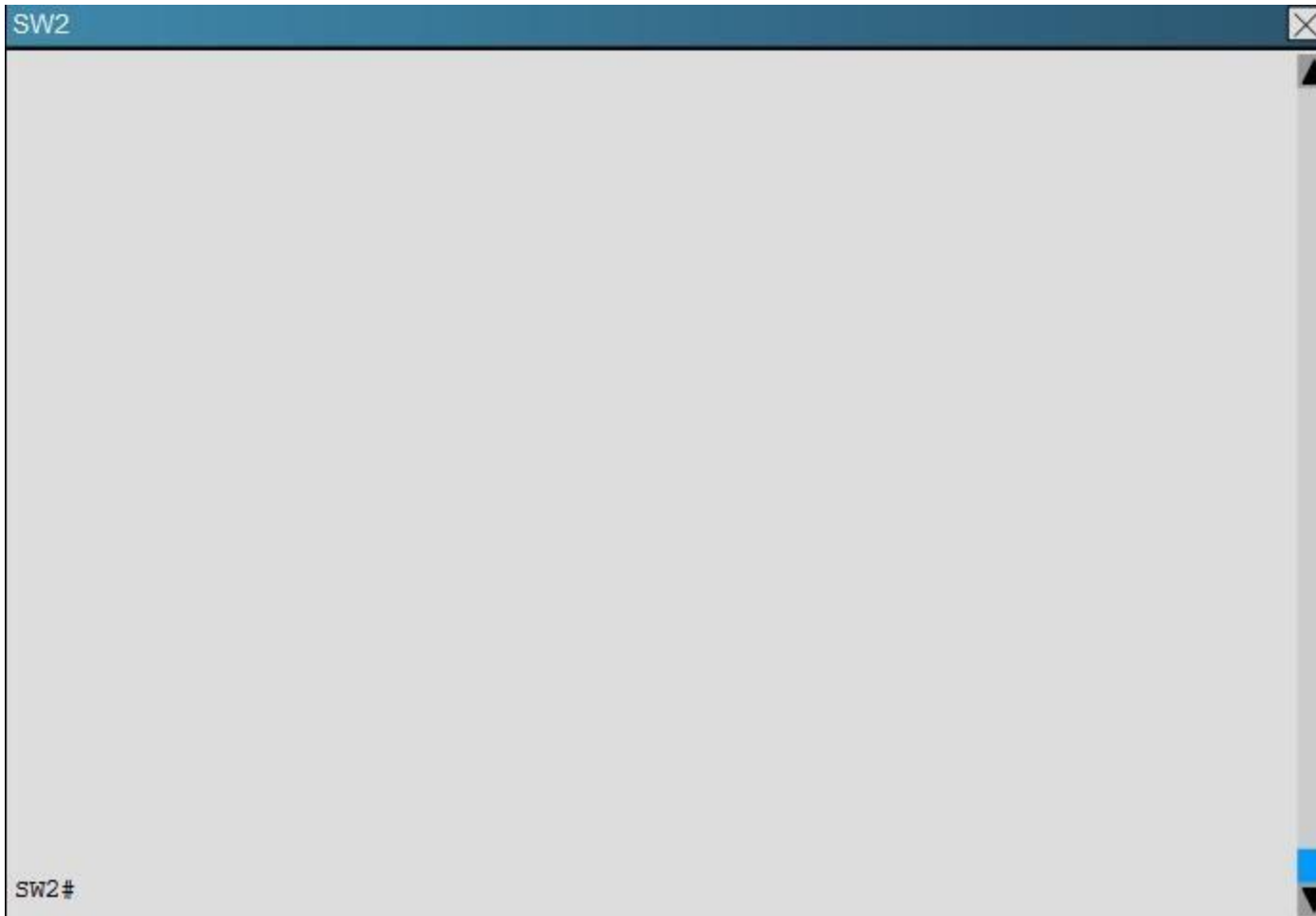
STP PortFast causes a Layer 2 LAN interface configured as an access port to enter the forwarding state immediately, bypassing the listening and learning states. However, the Spanning-tree portfast bpdupfilter default command specifies that if a BPDU is received on that port, then the default action of STP of listening, learning, and forwarding states should be used.

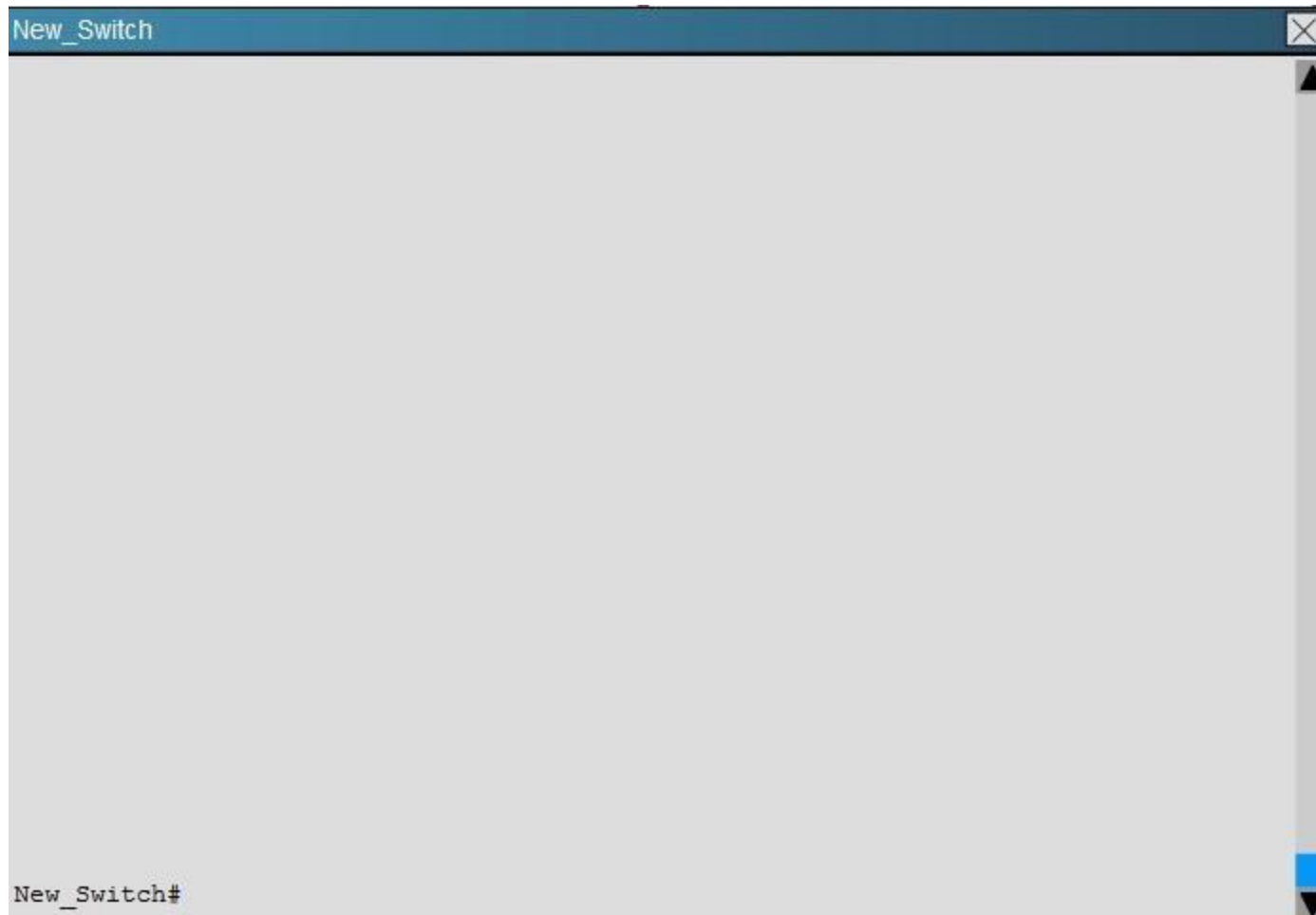
## **QUESTION 100**

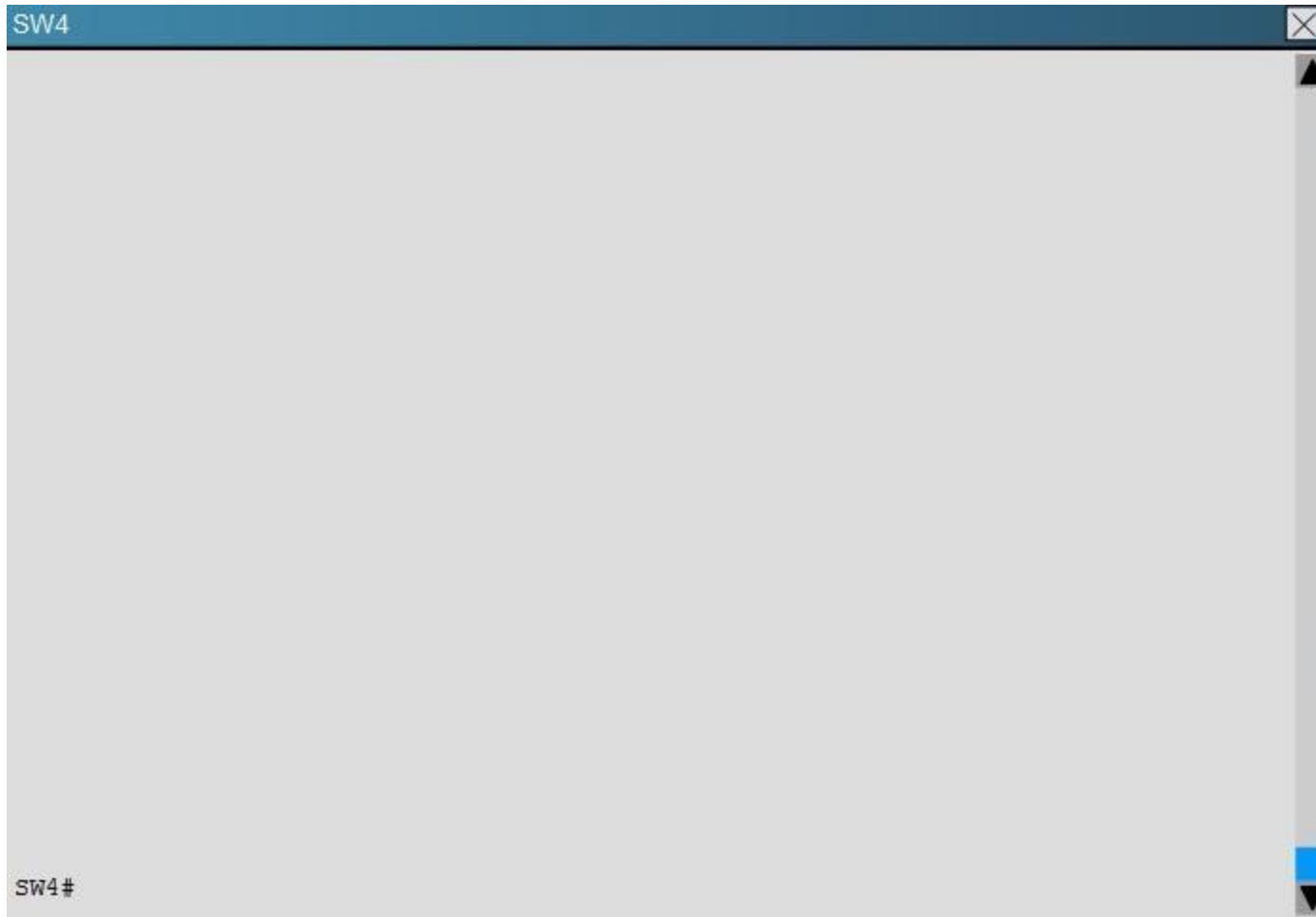
You have been asked to install and configure a new switch in a customer network. Use the console access to the existing and new switches to configure and verify correct device configuration.











You are connecting the New\_Switch to the LAN topology; the switch has been partially configured and you need to complete the rest of configuration to enable PC1 communication with PC2. Which of the configuration is correct?

- ☐ vtp domain CCNP\_TEST  
vtp password cisco123  
vtp version 3  
vtp mode server  
int e0/0  
switchport mode access  
switchport access vlan 100
- ☐ vtp domain CCNP\_TEST  
vtp password cisco123  
vtp version 3  
vtp mode client  
int e0/0  
switchport mode access  
switchport access vlan 200
- ☐ vtp domain CCNP\_TEST  
vtp password cisco123  
vtp version 2  
vtp mode client  
int e0/0  
switchport mode access  
switchport access vlan 100
- ☐ vtp domain CCNP  
vtp password cisco  
vtp version 3  
vtp mode client  
int e0/0  
switchport mode access  
switchport access vlan 100
- ☐ vtp domain CCNP  
vtp password cisco  
vtp version 2  
vtp mode transparent  
int e0/0  
switchport mode access  
switchport access vlan 200

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

**Correct Answer:** D

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

Within any VTP, the VTP domain name must match. So, step one is to find the correct VTP name on the other switches. Logging in to SW1 and using the show vtp status command we see this:

## SW1

```
SW1#show vtp status
VTP Version capable      : 1 to 3
VTP version running      : 3
VTP Domain Name          : CCNP
VTP Pruning Mode         : Enabled
VTP Traps Generation     : Disabled
Device ID                : aabb.cc00.2500
```

## Feature VLAN:

```
-----
```

```
VTP Operating Mode       : Server
Number of existing VLANs : 8
Number of existing extended VLANs : 0
Maximum VLANs supported locally : 4096
Configuration Revision   : 11
Primary ID               : aabb.cc00.2b00
Primary Description      : SW1
MD5 digest               : 0xA2 0xFA 0x6E 0x8D 0xD0 0xDE 0x5A 0xEF
                        : 0xE3 0x65 0x9A 0xF7 0x03 0xBF 0xBA 0x10
```

## Feature MST:

So we know that the VTP domain must be CCNP. This leaves only choice D and E. We also see from the topology diagram that eth 0/0 of the new switch connects to a PC in VLAN 100, so we know that this port must be an access port in VLAN 100, leaving only choice D as correct. Note that the

VTP versions supported in this network are 1, 2, 3 so either VTP version 2 or 3 can be configured on the new switch.

## QUESTION 101

Which statement about restrictions for multichassis LACP is true?

- A. It is available only on a Cisco Catalyst 6500 Series chassis.
- B. It does not support 1Gb links.
- C. Converting a port channel to mLACP can cause a service disruption.
- D. It is not available in VSS.

**Correct Answer: C**

**Section: Layer 2 Technologies**

**Explanation**

### Explanation/Reference:

Explanation:

When configuring mLACP for Server Access, follow these guidelines and restrictions:

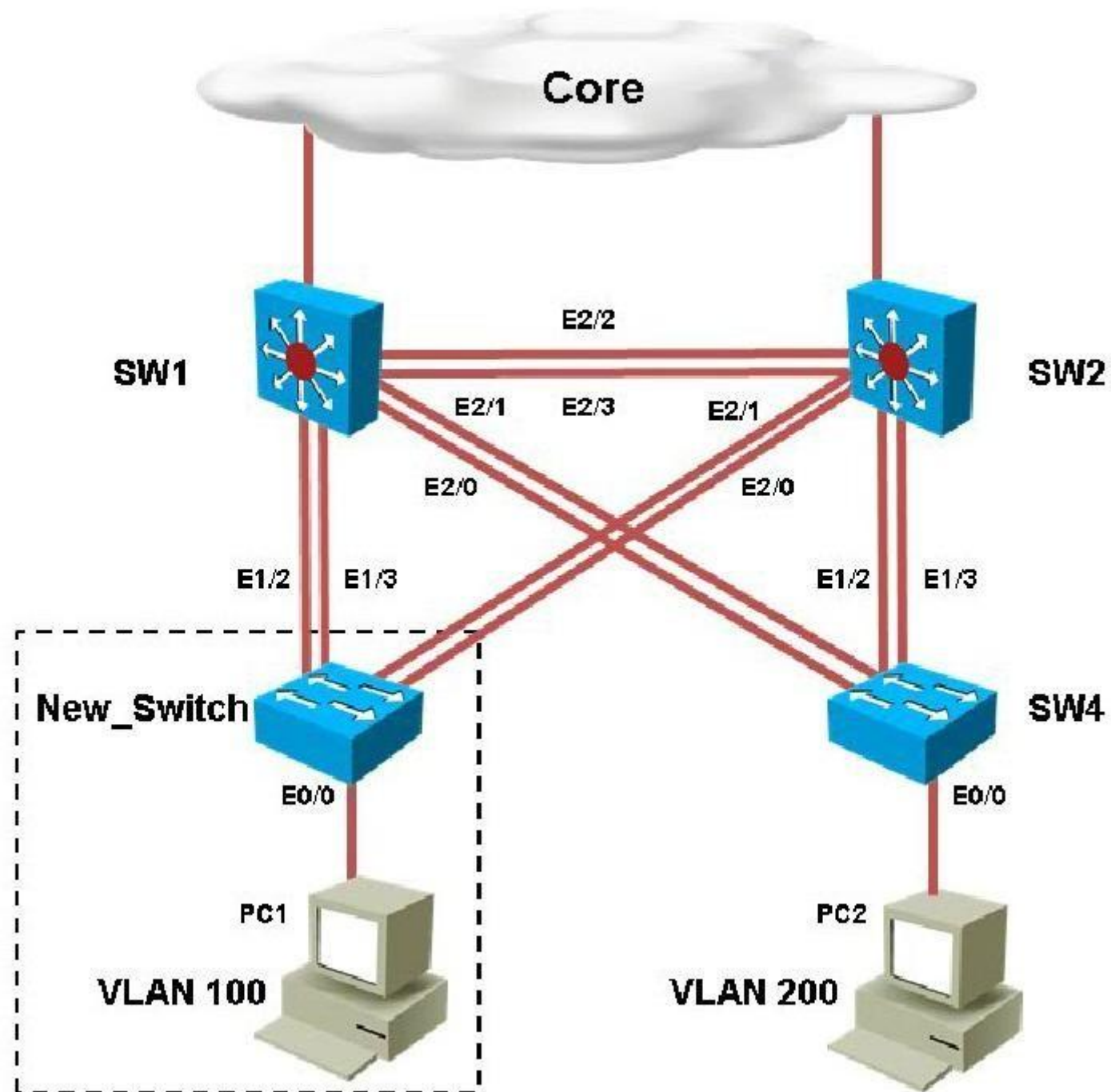
- PFC3A mode does not support the mLACP for server access feature.
- VSS mode does not support the mLACP for server access feature.
- No more than 100 VLANs can be active on a switch configured as a PoA.
- mLACP does not support half-duplex links.
- mLACP does not support multiple neighbors.
- Converting a port channel to mLACP can cause a service disruption.
- The DHD system priority must be lower (higher numerically) than the PoA system priority.

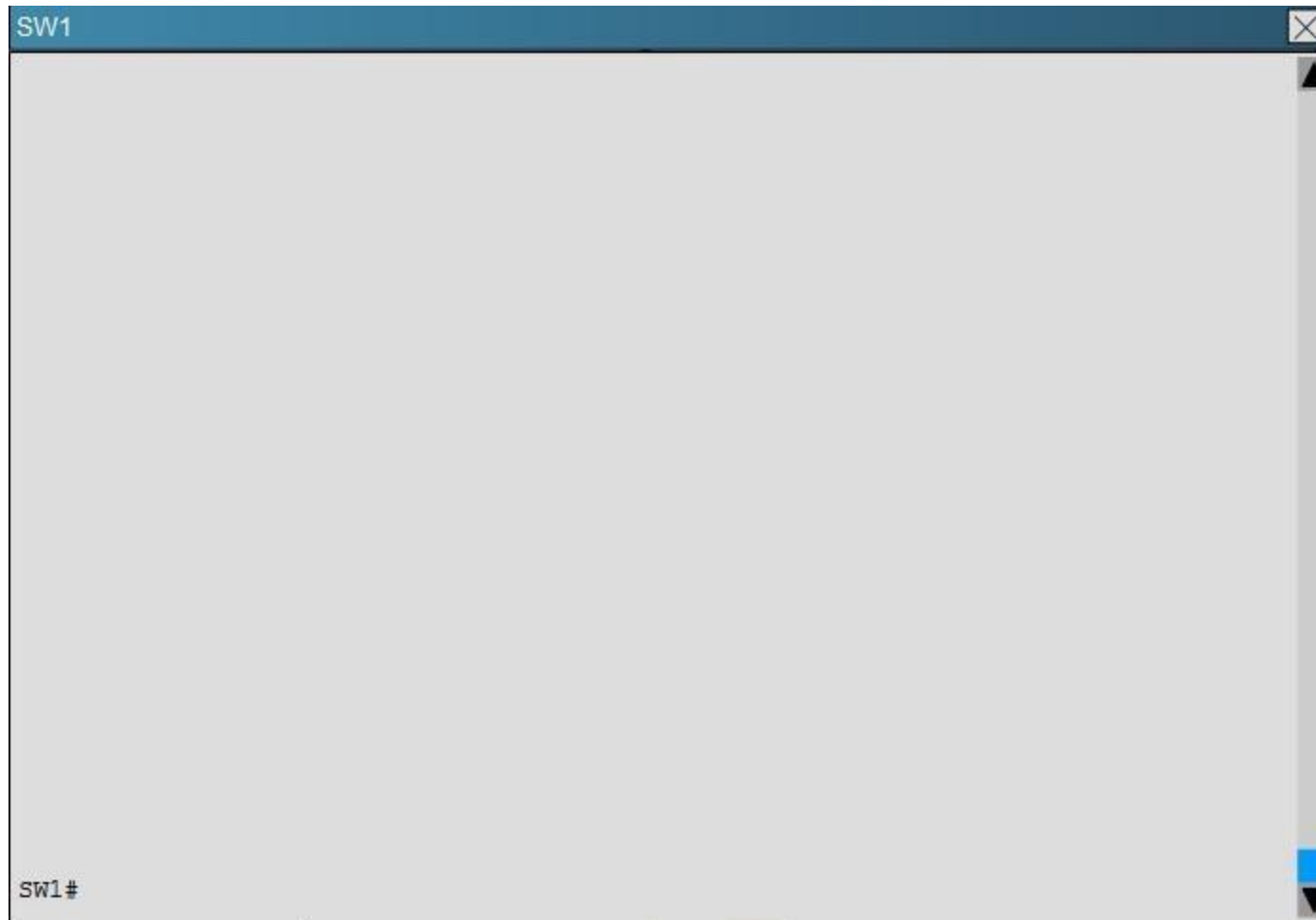
Reference:

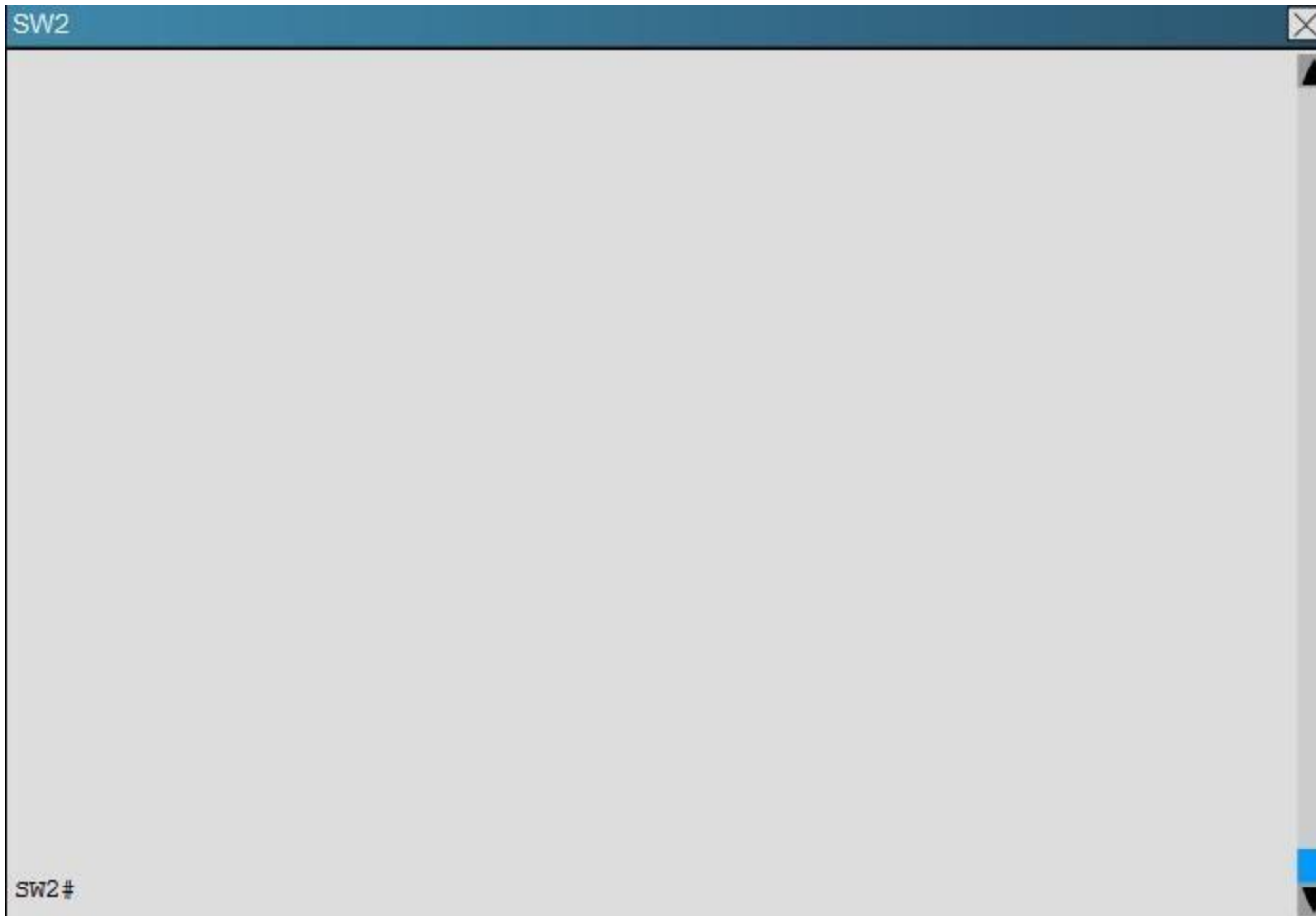
[http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SX/configuration/guide/mla\\_cp\\_server\\_support.html](http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SX/configuration/guide/mla_cp_server_support.html)

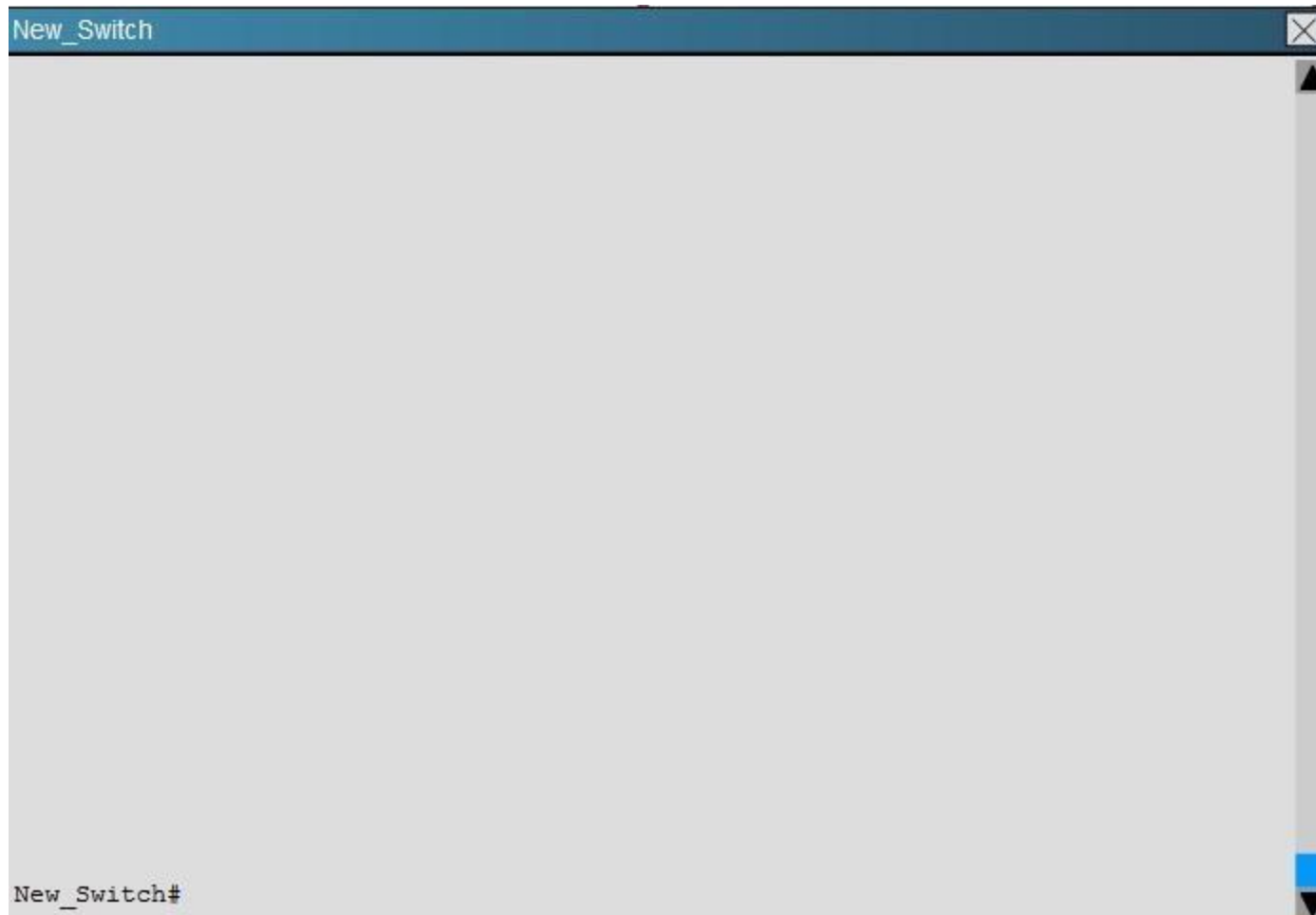
## QUESTION 102

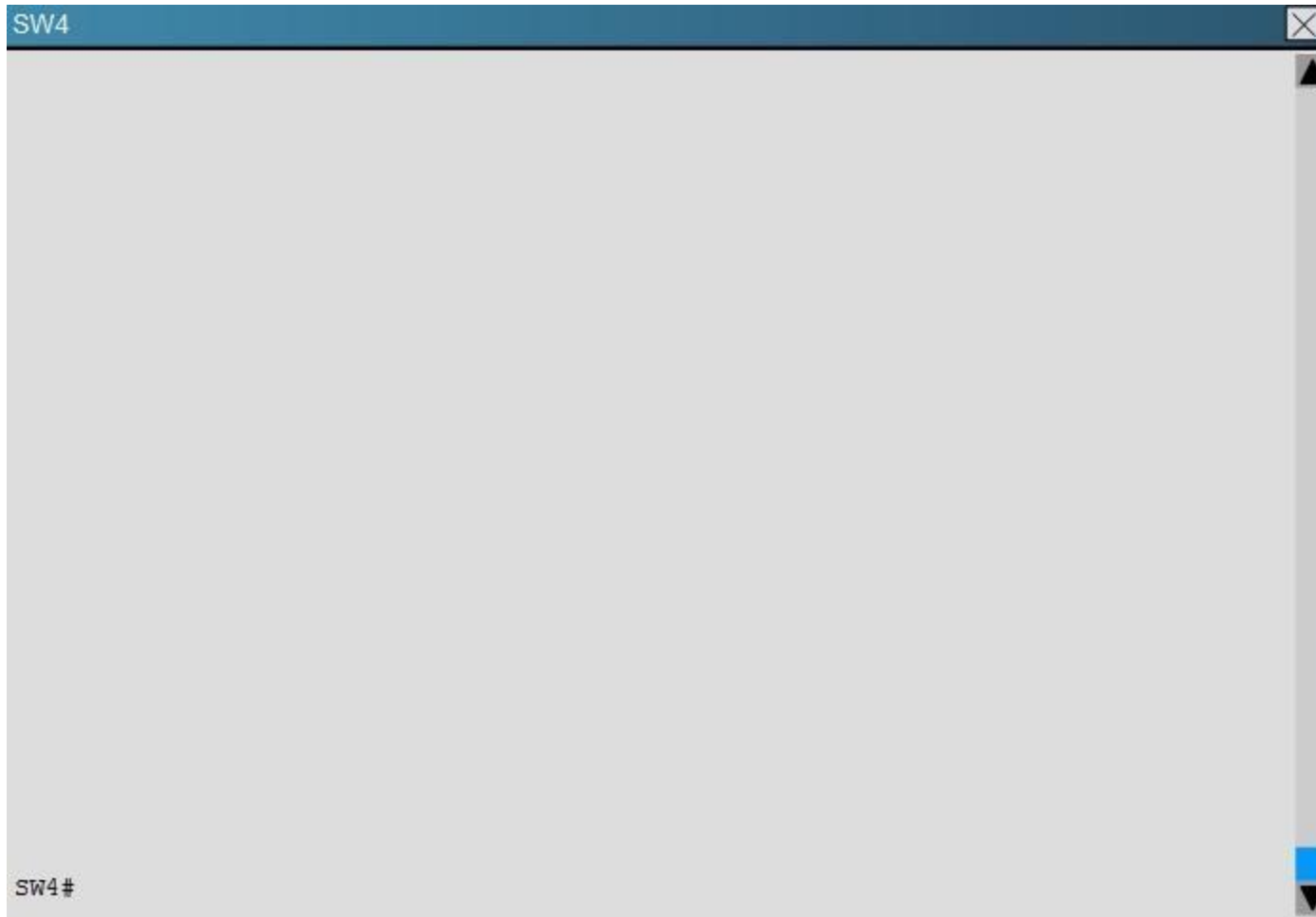
You have been asked to install and configure a new switch in a customer network. Use the console access to the existing and new switches to configure and verify correct device configuration.











Refer to the configuration. For which configured VLAN are untagged frames sent over trunk between SW1 and SW2?

- A. VLAN1
- B. VLAN 99
- C. VLAN 999
- D. VLAN 40
- E. VLAN 50
- F. VLAN 200

G. VLAN 300

**Correct Answer:** B

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

The native VLAN is used for untagged frames sent along a trunk. By issuing the show interface trunk command on SW1 and SW2 we see the native VLAN is 99.

SW1

```
SW1#show interfaces trunk
```

Port	Mode	Encapsulation	Status	Native vlan
Et1/2	on	802.1q	trunking	99
Et1/3	on	802.1q	trunking	99
Et2/0	on	802.1q	trunking	99
Et2/1	on	802.1q	trunking	99
Et2/2	on	802.1q	trunking	99
Et2/3	on	802.1q	trunking	99

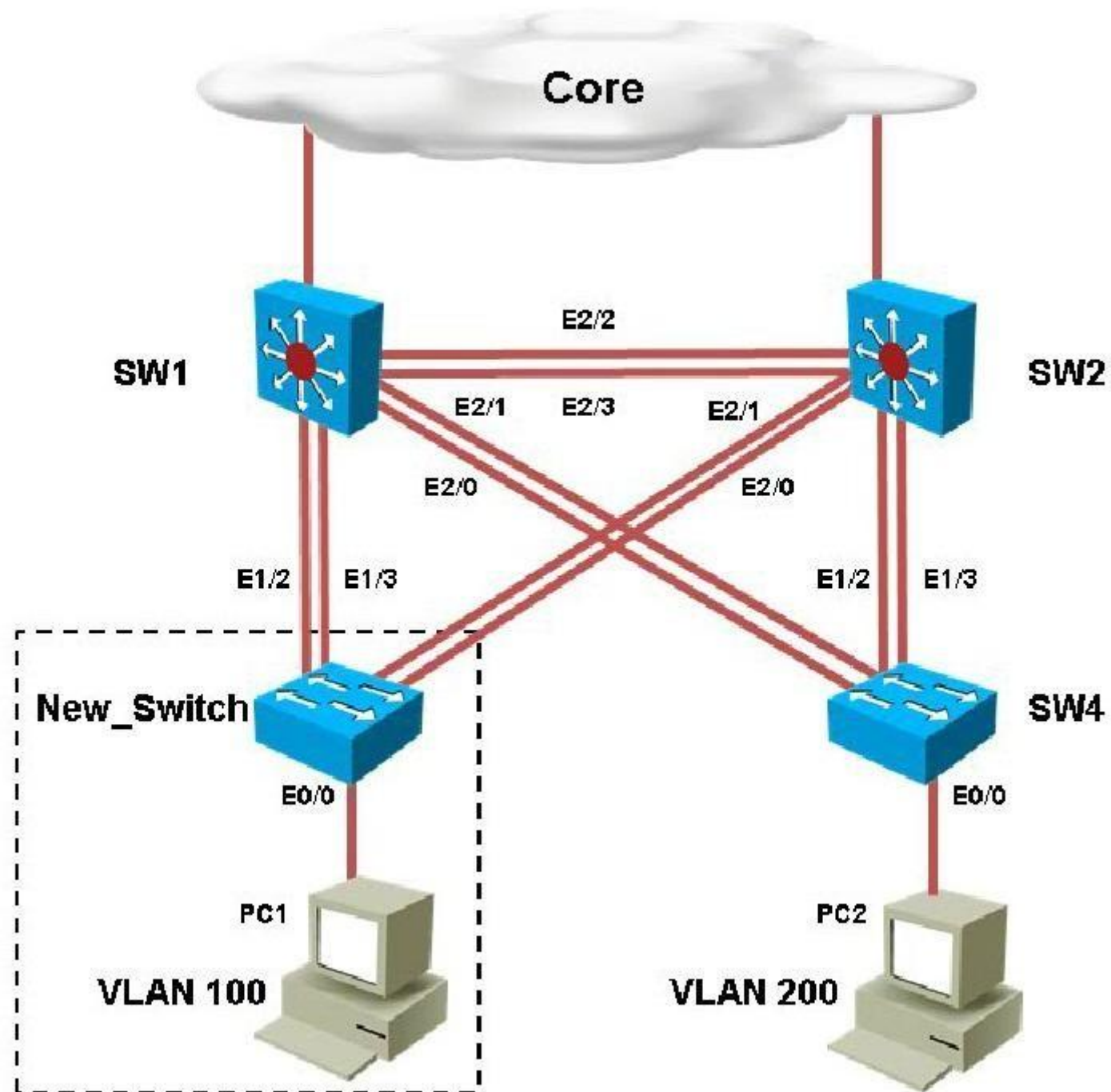
## SW2

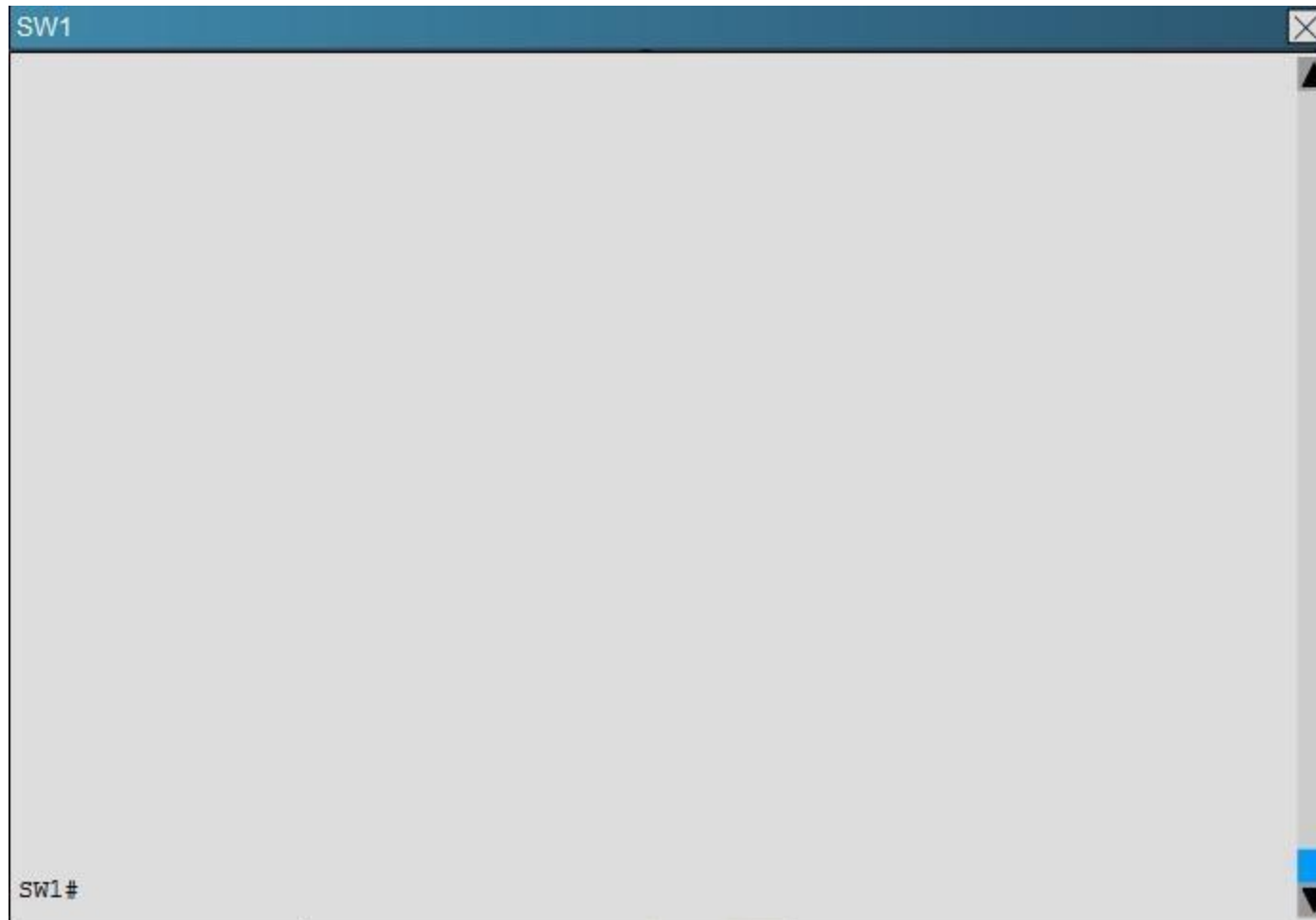
```
SW2#show interfaces trunk
```

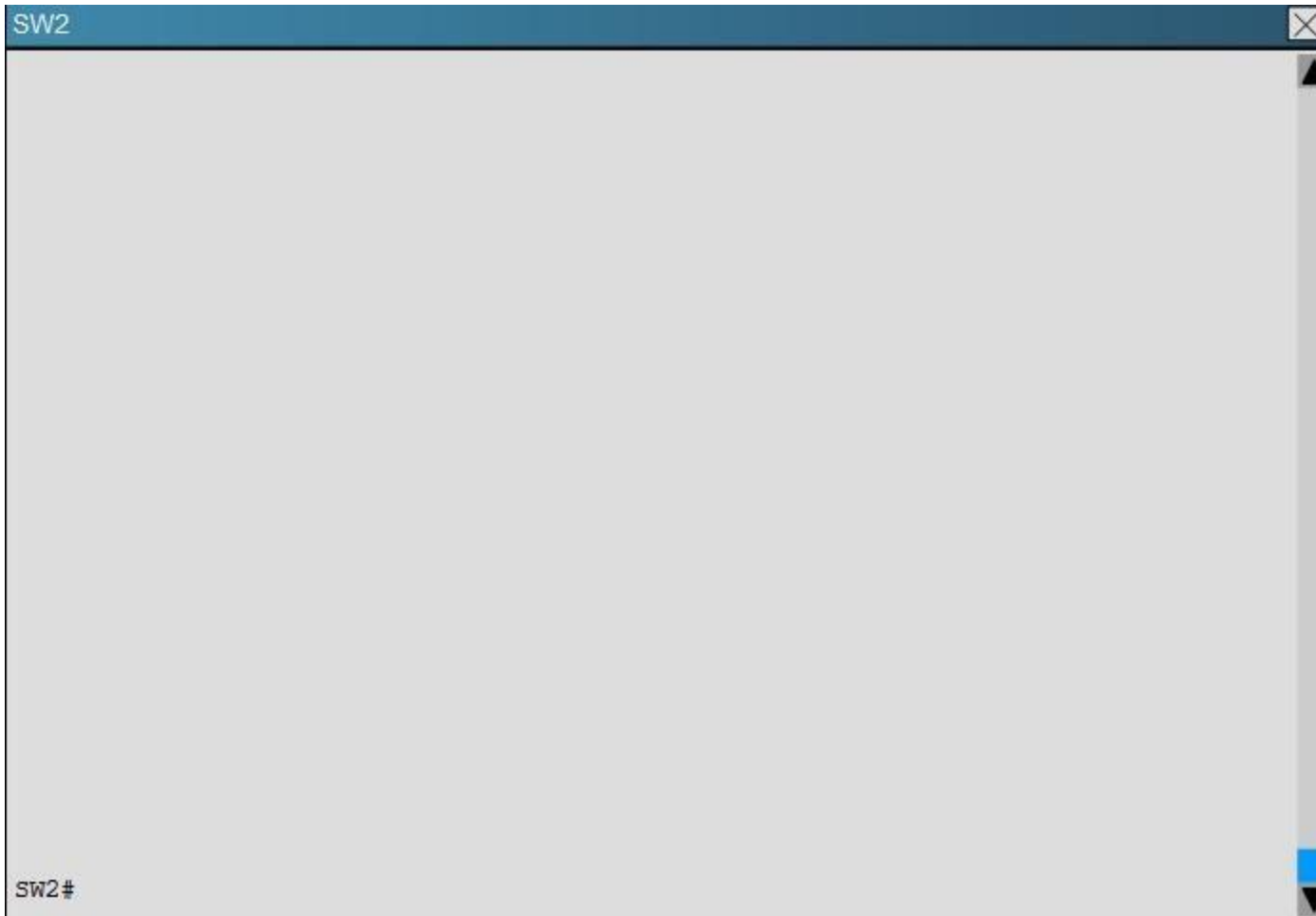
Port	Mode	Encapsulation	Status	Native vlan
Et1/2	on	802.1q	trunking	99
Et1/3	on	802.1q	trunking	99
Et2/0	on	802.1q	trunking	99
Et2/1	on	802.1q	trunking	99
Et2/2	on	802.1q	trunking	99
Et2/3	on	802.1q	trunking	99

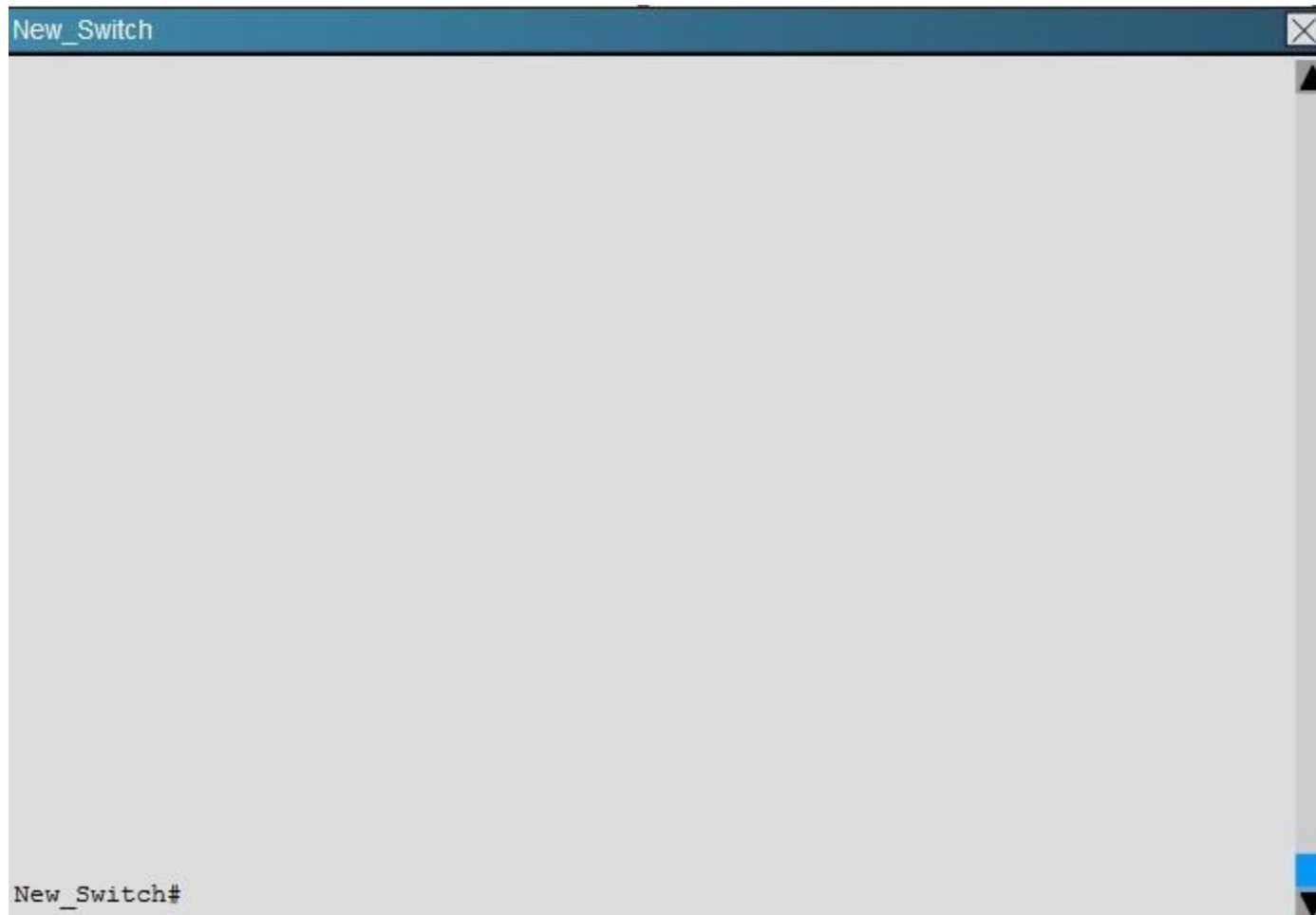
**QUESTION 103**

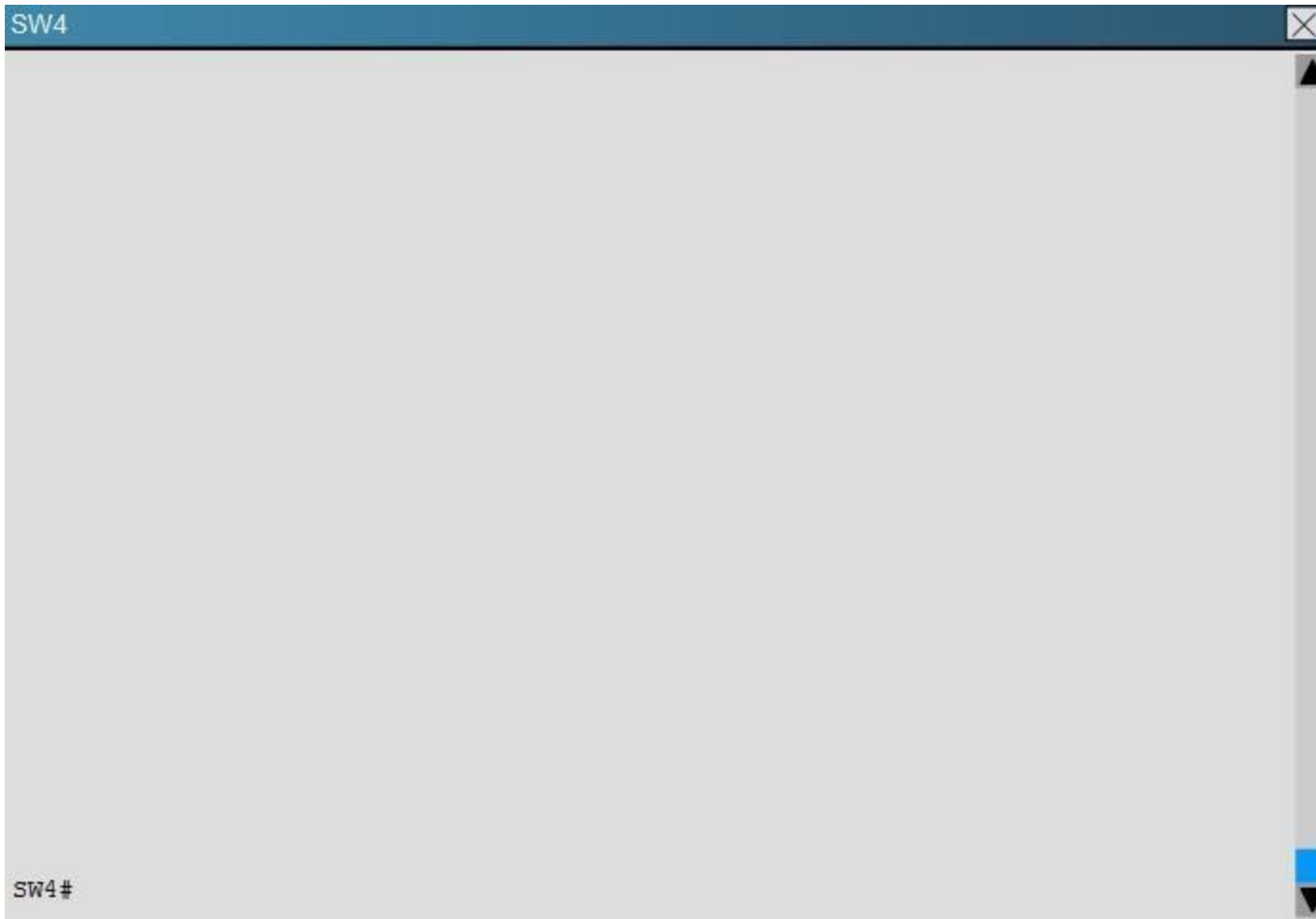
You have been asked to install and configure a new switch in a customer network. Use the console access to the existing and new switches to configure and verify correct device configuration.











You are adding new VLANs. VLAN500 and VLAN600 to the topology in such way that you need to configure SW1 as primary root for VLAN 500 and secondary for VLAN 600 and SW2 as primary root for VLAN 600 and secondary for VLAN 500. Which configuration step is valid?

- A. Configure VLAN 500 & VLAN 600 on both SW1 & SW2
- B. Configure VLAN 500 and VLAN 600 on SW1 only
- C. Configure VLAN 500 and VLAN 600 on SW2 only
- D. Configure VLAN 500 and VLAN 600 on SW1 ,SW2 and SW4
- E. On SW2; configure vtp mode as off and configure VLAN 500 and VLAN 600; configure back to vtp server mode.

**Correct Answer:** A

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

By issuing the show vtp status command on SW1, SW2, and SW4 we see that both SW1 and SW2 are operating in VTP server mode, but SW4 is a client, so we will need to add both VLANs to SW1 and SW2.

## SW1

```
SW1#show vtp status
VTP Version capable      : 1 to 3
VTP version running      : 3
VTP Domain Name          : CCNP
VTP Pruning Mode         : Enabled
VTP Traps Generation     : Disabled
Device ID                : aabb.cc00.2500
```

## Feature VLAN:

-----

```
VTP Operating Mode       : Server
Number of existing VLANs : 8
Number of existing extended VLANs : 0
Maximum VLANs supported locally : 4096
Configuration Revision   : 11
Primary ID               : aabb.cc00.2b00
Primary Description      : SW1
MD5 digest               : 0xA2 0xFA 0x6E 0x8D 0xD0 0xDE 0x5A 0xEF
                        : 0xE3 0x65 0x9A 0xF7 0x03 0xBF 0xBA 0x10
```

## SW2

```
SW2#show vtp status
VTP Version capable      : 1 to 3
VTP version running      : 3
VTP Domain Name          : CCNP
VTP Pruning Mode         : Enabled
VTP Traps Generation     : Disabled
Device ID                 : aabb.cc00.2600
```

## Feature VLAN:

-----

```
VTP Operating Mode       : Server
Number of existing VLANs : 8
Number of existing extended VLANs : 0
Maximum VLANs supported locally : 4096
Configuration Revision   : 11
Primary ID                : aabb.cc00.2b00
Primary Description       : SW1
MD5 digest                : 0xA2 0xFA 0x6E 0x8D 0xD0 0xDE 0x5A 0xEF
                          0xE3 0x65 0x9A 0xF7 0x03 0xBF 0xBA 0x10
```

## SW4

```
SW4#show vtp status
VTP Version capable      : 1 to 3
VTP version running      : 3
VTP Domain Name          : CCNP
VTP Pruning Mode         : Enabled
VTP Traps Generation     : Disabled
Device ID                : aabb.cc00.2800
```

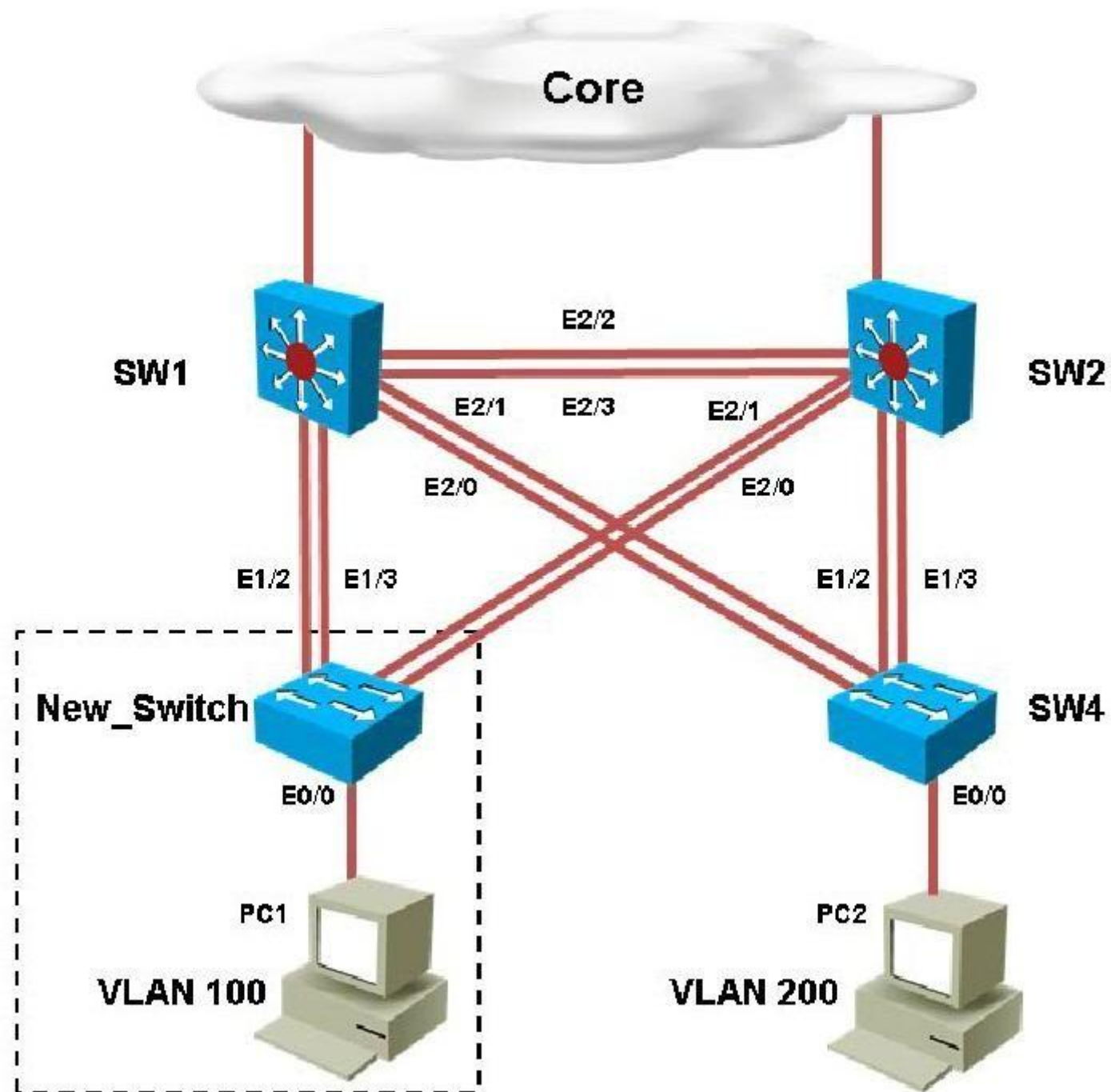
## Feature VLAN:

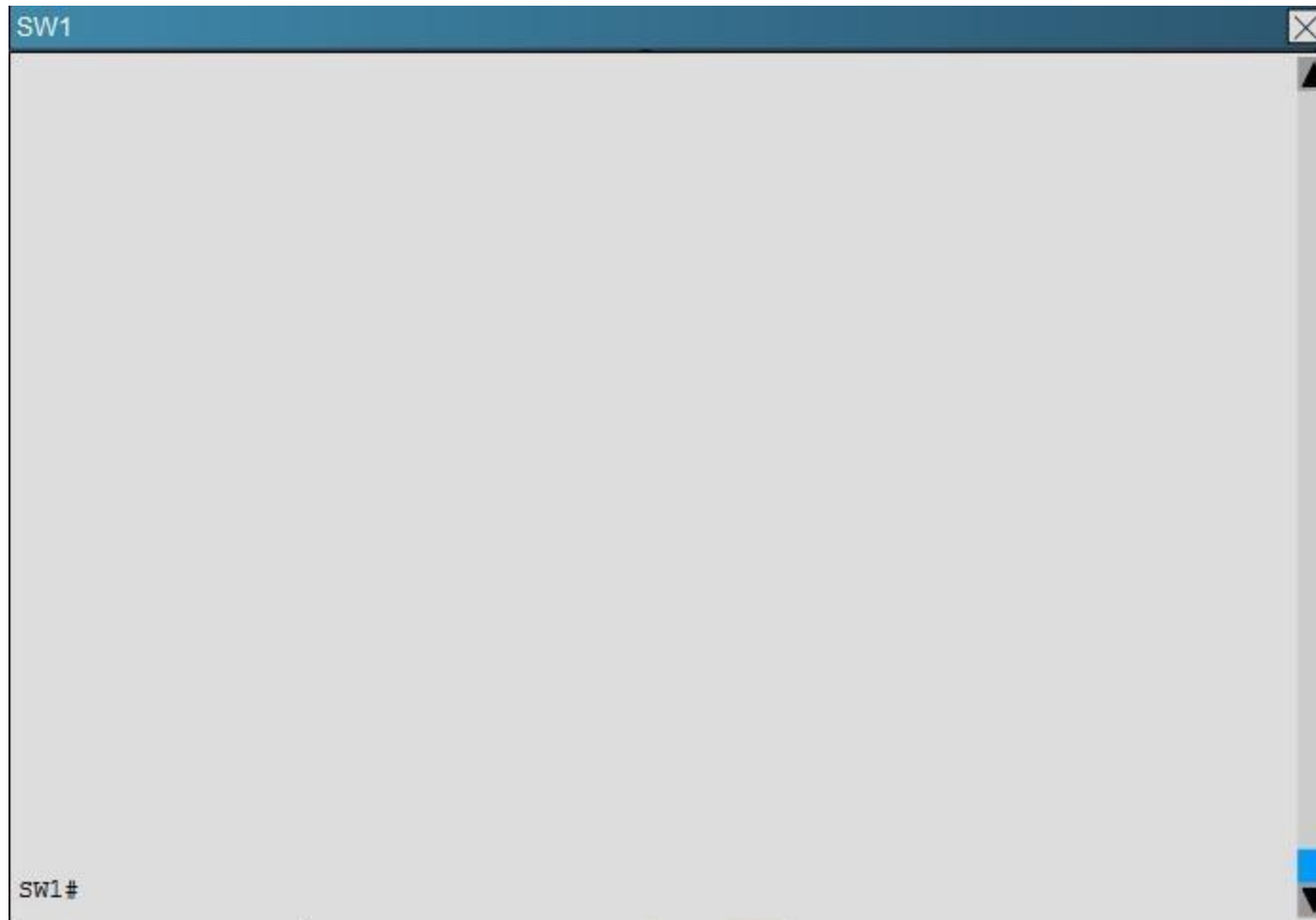
-----

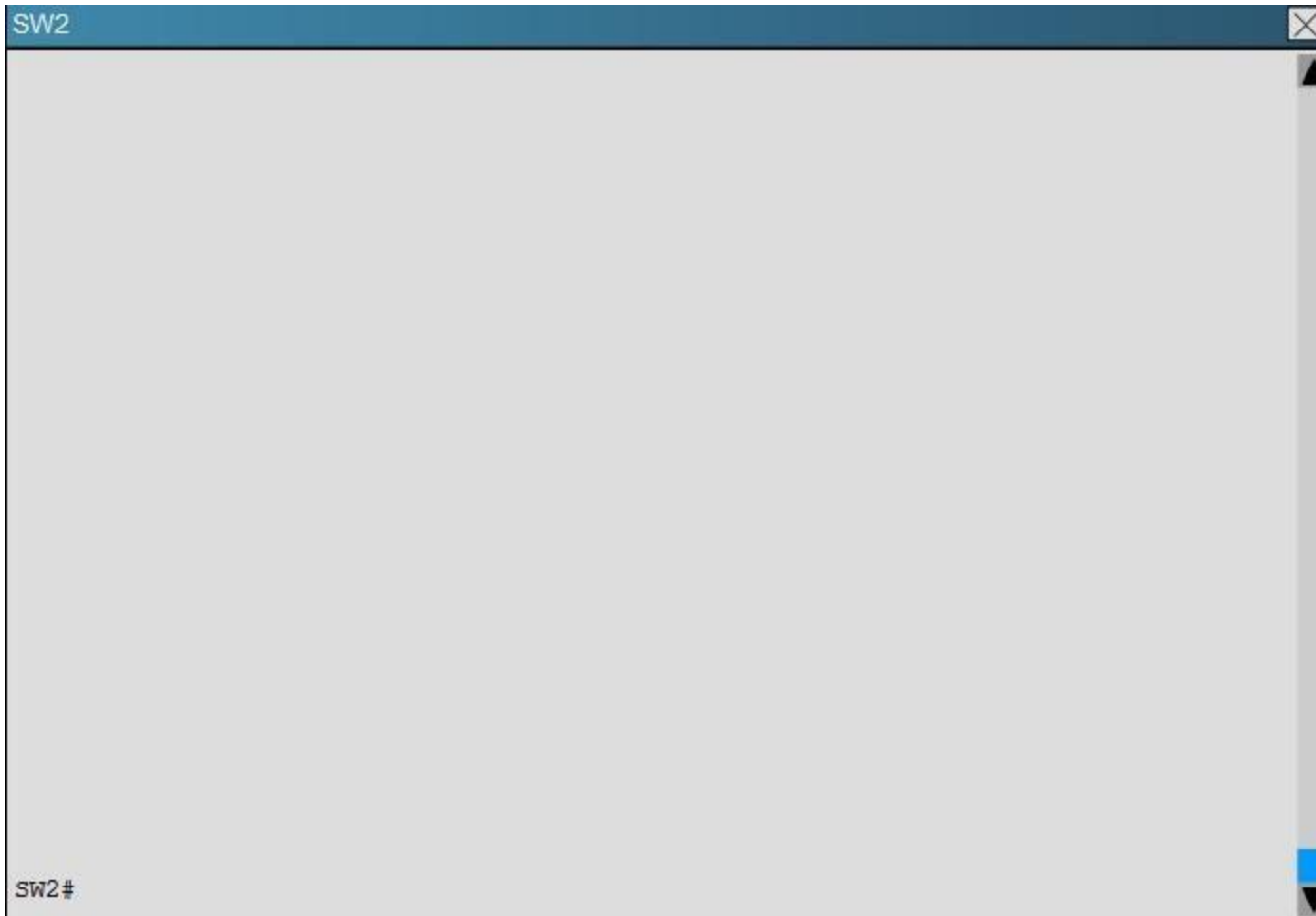
```
VTP Operating Mode       : Client
Number of existing VLANs : 8
Number of existing extended VLANs : 0
Maximum VLANs supported locally : 4096
Configuration Revision   : 11
Primary ID               : aabb.cc00.2b00
Primary Description      : SW1
MD5 digest               : 0xA2 0xFA 0x6E 0x8D 0xD0 0xDE 0x5A 0xEF
                        : 0xE3 0x65 0x9A 0xF7 0x03 0xBF 0xBA 0x10
```

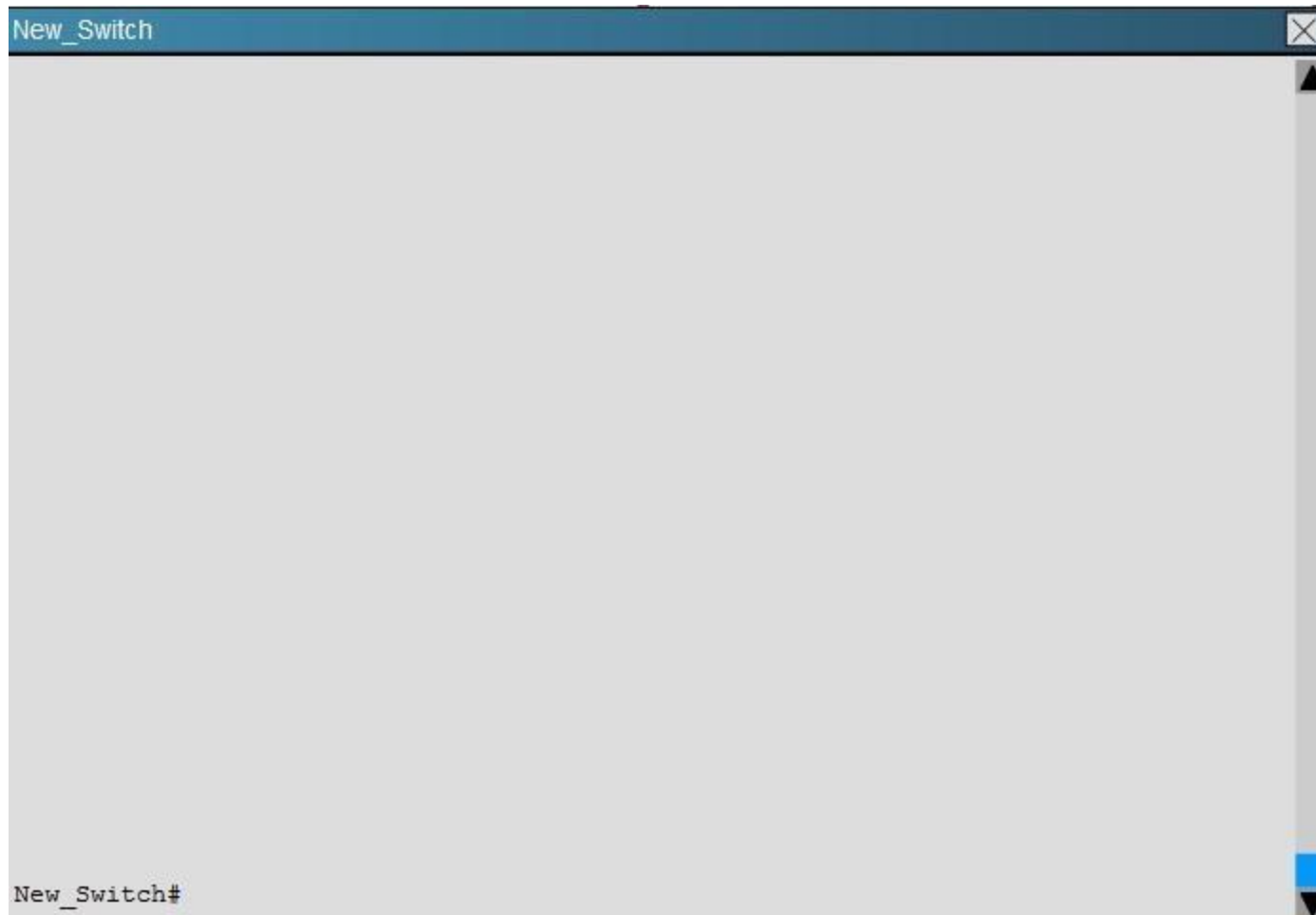
**QUESTION 104**

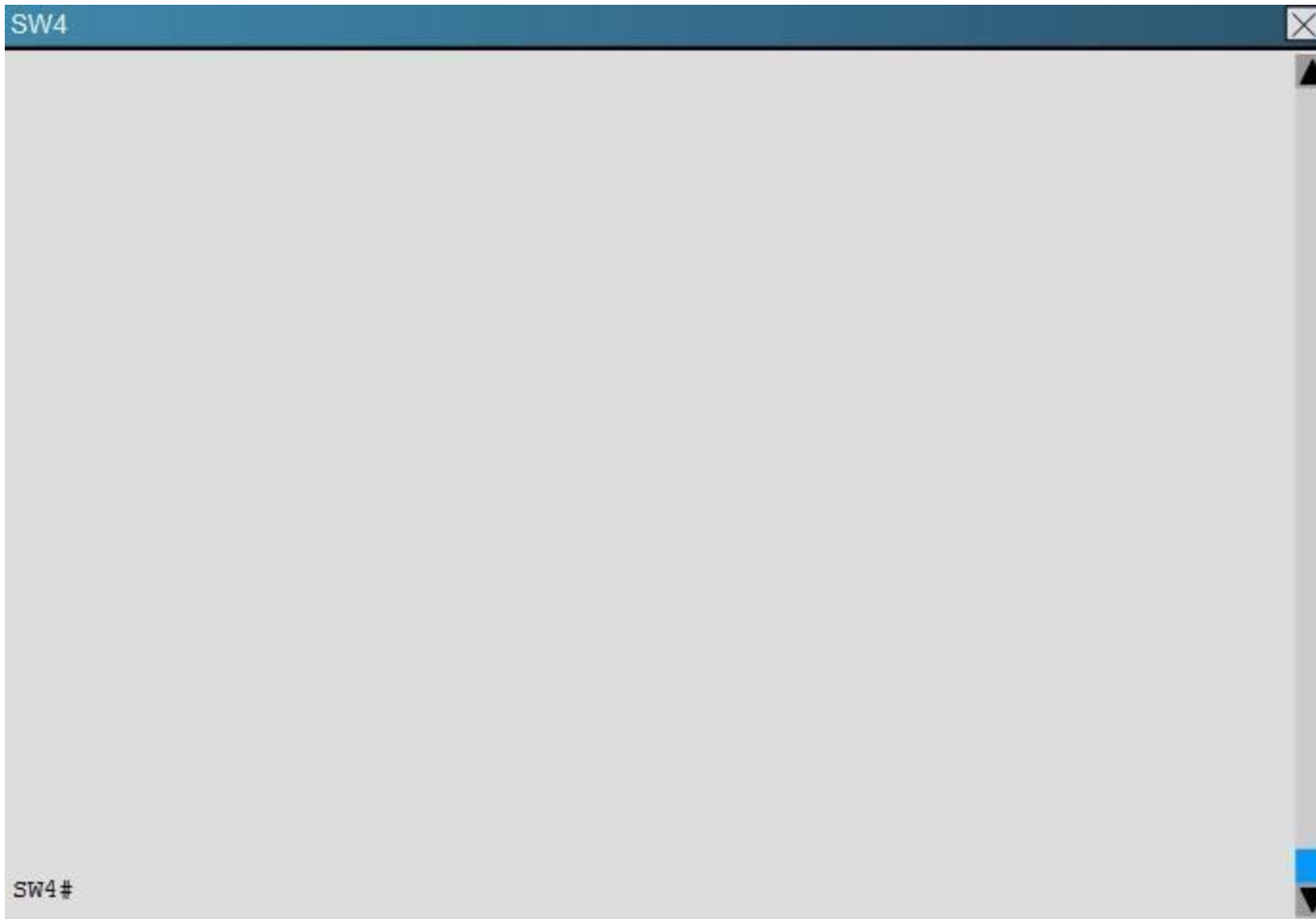
You have been asked to install and configure a new switch in a customer network. Use the console access to the existing and new switches to configure and verify correct device configuration.











Examine the VTP configuration. You are required to configure private VLANs for a new server deployment connecting to the SW4 switch. Which of the following configuration steps will allow creating private VLANs?

- A. Disable VTP pruning on SW1 only
- B. Disable VTP pruning on SW2 only
- C. Disable VTP pruning on SW4 only
- D. Disable VTP pruning on SW2, SW4 and New\_Switch
- E. Disable VTP pruning on New\_Switch and SW4 only.

**Correct Answer:** C

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

Explanation:

To create private VLANs, you will need to only disable pruning on the switch that contains the private VLANs. In this case, only SW4 will connect to servers in a private VLAN.

Topic 2, Infrastructure Security

## QUESTION 105

A Cisco Catalyst switch that is prone to reboots continues to rebuild the DHCP snooping database. What is the solution to avoid the snooping database from being rebuilt after every device reboot?

- A. A DHCP snooping database agent should be configured.
- B. Enable DHCP snooping for all VLANs that are associated with the switch.
- C. Disable Option 82 for DHCP data insertion.
- D. Use IP Source Guard to protect the DHCP binding table entries from being lost upon rebooting.
- E. Apply ip dhcp snooping trust on all interfaces with dynamic addresses.

**Correct Answer:** A

**Section:** Infrastructure Security

**Explanation**

**Explanation/Reference:**

Explanation:

Minimum DHCP Snooping Configuration

The minimum configuration steps for the DHCP snooping feature are as follows:

1. Define and configure the DHCP server.

2. Enable DHCP snooping on at least one VLAN.

By default, DHCP snooping is inactive on all VLANs.

3. Ensure that DHCP server is connected through a trusted interface. By default, the trust state of all interfaces is untrusted.

4. Configure the DHCP snooping database agent.

This step ensures that database entries are restored after a restart or switchover.

5. Enable DHCP snooping globally.

The feature is not active until you complete this step.

Reference:

<http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SX/configuration/guide/sno odhcp.html#wp1090479>

## QUESTION 106

Which portion of AAA looks at what a user has access to?

- A. authorization
- B. authentication
- C. accounting
- D. auditing

**Correct Answer: A**

**Section: Infrastructure Security**

**Explanation**

**Explanation/Reference:**

Explanation:

AAA consists of the following three elements:

Authentication: Identifies users by login and password using challenge and response methodology before the user even gains access to the network.

Depending on your security options, it can also support encryption. Authorization: After initial authentication, authorization looks at what that authenticated user has access to do. RADIUS or TACACS+ security servers perform authorization for specific privileges by defining attribute-value (AV) pairs, which would be specific to the individual user rights. In the Cisco IOS, you can define AAA authorization with a named list or authorization method.

Accounting: The last "A" is for accounting. It provides a way of collecting security information that you can use for billing, auditing, and reporting. You can use accounting to see what users do once they are authenticated and authorized. For example, with accounting, you could get a log of when users logged in and when they logged out.

Reference: <http://www.techrepublic.com/blog/data-center/what-is-aaa-and-how-do-you-configure-it-in-the-cisco-ios/>

## QUESTION 107

A server with a statically assigned IP address is attached to a switch that is provisioned for DHCP snooping. For more protection against malicious attacks, the network team is considering enabling dynamic ARP inspection alongside DHCP snooping. Which solution ensures that the server maintains network reachability in the future?

- A. Disable DHCP snooping information option.
- B. Configure a static DHCP snooping binding entry on the switch.
- C. Trust the interface that is connected to the server with the ip dhcp snooping trust command.
- D. Verify the source MAC address of all untrusted interfaces with ip dhcp snooping verify mac-address command.

**Correct Answer: B**

**Section: Infrastructure Security**

**Explanation**

**Explanation/Reference:**

Explanation:

Dynamic ARP inspection is a security feature that validates ARP packets in a network. It intercepts, logs, and discards ARP packets with invalid IP-to-MAC address bindings. This capability protects the network from certain man-in-the-middle attacks. Dynamic ARP inspection ensures that only valid ARP requests and responses are relayed. The switch performs these activities:

·Intercepts all ARP requests and responses on untrusted ports ·Verifies that each of these intercepted packets has a valid IP-to-MAC address binding

before updating the local ARP cache or before forwarding the packet to the appropriate destination.

- Drops invalid ARP packets

Dynamic ARP inspection determines the validity of an ARP packet based on valid IP-to-MAC address bindings stored in a trusted database, the DHCP snooping binding database. This database is built by DHCP snooping if DHCP snooping is enabled on the VLANs and on the switch. If the ARP packet is received on a trusted interface, the switch forwards the packet without any checks. On untrusted interfaces, the switch forwards the packet only if it is valid. To ensure network reachability to the server, configure a static DHCP snooping binding entry on the switch.

Reference: [http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3750/software/release/12-2\\_55\\_se/configuration/guide/scg3750/swdynarp.html](http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3750/software/release/12-2_55_se/configuration/guide/scg3750/swdynarp.html)

## QUESTION 108

A network engineer wants to ensure Layer 2 isolation of customer traffic using a private VLAN. Which configuration must be made before the private VLAN is configured?

- A. Disable VTP and manually assign VLANs.
- B. Ensure all switches are configured as VTP server mode.
- C. Configure VTP Transparent Mode.
- D. Enable VTP version 3.

**Correct Answer: C**

**Section: Infrastructure Security**

**Explanation**

### Explanation/Reference:

Explanation:

You must configure VTP to transparent mode before you can create a private VLAN. Private VLANs are configured in the context of a single switch and cannot have members on other switches. Private VLANs also carry TLVs that are not known to all types of Cisco switches. Reference: <http://www.ciscopress.com/articles/article.asp?p=29803&seqNum=6>

## QUESTION 109

DHCP snooping and IP Source Guard have been configured on a switch that connects to several client workstations. The IP address of one of the workstations does not match any entries found in the DHCP binding database. Which statement describes the outcome of this scenario?

- A. Packets from the workstation will be rate limited according to the default values set on the switch.
- B. The interface that is connected to the workstation in question will be put into the errdisabled state.
- C. Traffic will pass accordingly after the new IP address is populated into the binding database.
- D. The packets originating from the workstation are assumed to be spoofed and will be discarded.

**Correct Answer: D**

**Section: Infrastructure Security**

**Explanation**

### Explanation/Reference:

Explanation:

The IP source binding table has bindings that are learned by DHCP snooping or are manually configured (static IP source bindings). An entry in this table has an IP address, its associated MAC address, and its associated VLAN number. The switch uses the IP source binding table only when IP source guard is enabled.

You can configure IP source guard with source IP address filtering, or with source IP and MAC address filtering. When IP source guard is enabled with this option, IP traffic is filtered based on the source IP address. The switch forwards IP traffic when the source IP address matches an entry in the DHCP snooping binding database or a binding in the IP source binding table. When IP source guard is enabled with this option, IP traffic is filtered based on the source IP and MAC addresses. The switch forwards traffic only when the source IP and MAC addresses match an entry in the IP source binding table. If there is no match, the packets are assumed to be spoofed and will be discarded.

Reference: <http://www.cisco.com/c/en/us/support/docs/switches/catalyst-3750-series-switches/72846-layer2-secftrs-catl3fixed.html#ipsourceguard>

## QUESTION 110

A DHCP configured router is connected directly to a switch that has been provisioned with DHCP snooping. IP Source Guard with the ip verify source port-security command is configured under the interfaces that connect to all DHCP clients on the switch. However, clients are not receiving an IP address via the DHCP server. Which option is the cause of this issue?

- A. The DHCP server does not support information option 82.
- B. The DHCP client interfaces have storm control configured.
- C. Static DHCP bindings are not configured on the switch.
- D. DHCP snooping must be enabled on all VLANs, even if they are not utilized for dynamic address allocation.

**Correct Answer: A**

**Section: Infrastructure Security**

**Explanation**

**Explanation/Reference:**

Explanation:

When you enable both IP Source Guard and Port Security, using the ip verify source port-security interface configuration command, there are two caveats:

·The DHCP server must support option 82, or the client is not assigned an IP address. ·The MAC address in the DHCP packet is not learned as a secure address. The MAC address of the DHCP client is learned as a secure address only when the switch receives non-DHCP data traffic.

Reference: [http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3550/software/release/12-2\\_25\\_see/configuration/guide/3550SCG/swdhcp82.html#wp1069615](http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3550/software/release/12-2_25_see/configuration/guide/3550SCG/swdhcp82.html#wp1069615)

## QUESTION 111

While troubleshooting a network outage, a network engineer discovered an unusually high level of broadcast traffic coming from one of the switch interfaces. Which option decreases consumption of bandwidth used by broadcast traffic?

- A. storm control
- B. SDM routing
- C. Cisco IOS parser

- D. integrated routing and bridging
- E. Dynamic ARP Inspection

**Correct Answer:** A

**Section:** Infrastructure Security

**Explanation**

**Explanation/Reference:**

Explanation:

Storm control prevents traffic on a LAN from being disrupted by a broadcast, multicast, or unicast storm on a port. A LAN storm occurs when packets flood the LAN, creating excessive traffic and degrading network performance. Errors in the protocol-stack implementation, mistakes in network configuration, or users issuing a denial-of-service attack can cause a storm. Storm control is configured for the switch as a whole but operates on a per-port basis. By default, storm control is disabled.

Storm control uses rising and falling thresholds to block and then restore the forwarding of broadcast, unicast, or multicast packets. You can also set the switch to shut down the port when the rising threshold is reached.

Reference: [http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst2950/software/release/12-1\\_22ea/SCG/scg/swtrafc.html](http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst2950/software/release/12-1_22ea/SCG/scg/swtrafc.html)

## QUESTION 112

A switch is added into the production network to increase port capacity. A network engineer is configuring the switch for DHCP snooping and IP Source Guard, but is unable to configure ip verify source under several of the interfaces. Which option is the cause of the problem?

- A. The local DHCP server is disabled prior to enabling IP Source Guard.
- B. The interfaces are configured as Layer 3 using the no switchport command.
- C. No VLANs exist on the switch and/or the switch is configured in VTP transparent mode.
- D. The switch is configured for sdm prefer routing as the switched database management template.
- E. The configured SVIs on the switch have been removed for the associated interfaces.

**Correct Answer:** B

**Section:** Infrastructure Security

**Explanation**

**Explanation/Reference:**

Explanation:

IP source guard is a security feature that restricts IP traffic on nonrouted, Layer 2 interfaces by filtering traffic based on the DHCP snooping binding database and on manually configured IP source bindings. You can use IP source guard to prevent traffic attacks caused when a host tries to use the IP address of its neighbor.

You can enable IP source guard when DHCP snooping is enabled on an untrusted interface. After IP source guard is enabled on an interface, the switch blocks all IP traffic received on the interface, except for DHCP packets allowed by DHCP snooping. A port access control list (ACL) is applied to the interface. The port ACL allows only IP traffic with a source IP address in the IP source binding table and denies all other traffic.

The IP source binding table has bindings that are learned by DHCP snooping or are manually configured (static IP source bindings). An entry in this table has an IP address, its associated MAC address, and its associated VLAN number. The switch uses the IP source binding table only when IP source guard is enabled.

IP source guard is supported only on Layer 2 ports, including access and trunk ports. You can configure IP source guard with source IP address filtering or with source IP and MAC address filtering.

Reference: [http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3550/software/release/12-2\\_25\\_see/configuration/guide/3550SCG/swdhcp82.html#wp1069615](http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3550/software/release/12-2_25_see/configuration/guide/3550SCG/swdhcp82.html#wp1069615)

## QUESTION 113

The command storm-control broadcast level 75 65 is configured under the switch port connected to the corporate mail server. In which three ways does this command impact the traffic? (Choose three.)

- A. SNMP traps are sent by default when broadcast traffic reaches 65% of the lower-level threshold.
- B. The switchport is disabled when unicast traffic reaches 75% of the total interface bandwidth.
- C. The switch resumes forwarding broadcasts when they are below 65% of bandwidth.
- D. Only broadcast traffic is limited by this particular storm control configuration.
- E. Multicast traffic is dropped at 65% and broadcast traffic is dropped at 75% of the total interface bandwidth.
- F. The switch drops broadcasts when they reach 75% of bandwidth.

**Correct Answer:** CDF

**Section:** Infrastructure Security

**Explanation**

**Explanation/Reference:**

Explanation:

storm-control Configure broadcast, multicast, or unicast storm control. By de- {broadcast | multicast} fault, storm control is disabled.

| unicast} level {level

The keywords have these meanings:

[level-low] | pps pps

[pps-low]}

.

For level, specify the rising threshold level for broadcast, multicast, or unicast traffic as a percentage (up to two decimal places) of the bandwidth. The port blocks traffic when the rising threshold is reached. The range is 0.00 to 100.00.

.

(Optional) For level-low, specify the falling threshold level as a percentage (up to two decimal places) of the bandwidth. This value must be less than or equal to the rising suppression value. The port forwards traffic when traffic drops below this level. If you do not configure a falling suppression level, it is set to the rising suppression level. The range is 0.00 to 100.00.

In this case, the broadcast keyword was used so only broadcast traffic is limited. Reference: [http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3550/software/release/12-2\\_25\\_see/configuration/guide/3550SCG/swtrafc.html](http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3550/software/release/12-2_25_see/configuration/guide/3550SCG/swtrafc.html)

## QUESTION 114

The network monitoring application alerts a network engineer of a client PC that is acting as a rogue DHCP server. Which two commands help trace this

PC when the MAC address is known? (Choose two.)

- A. switch# show mac address-table
- B. switch# show port-security
- C. switch# show ip verify source
- D. switch# show ip arp inspection
- E. switch# show mac address-table address <mac address>

**Correct Answer:** AE

**Section:** Infrastructure Security

**Explanation**

**Explanation/Reference:**

Explanation:

These two commands will show the MAC address table, including the switch port that the particular host is using. Here is an example output:

Switch> show mac-address-table

Dynamic Addresses Count: 9

Secure Addresses (User-defined) Count: 0

Static Addresses (User-defined) Count: 0

System Self Addresses Count: 41

Total MAC addresses: 50

Non-static Address Table:

Destination Address Address Type VLAN Destination Port

----- 0010.0de0.e289 Dynamic 1 FastEthernet0/1

0010.7b00.1540 Dynamic 2 FastEthernet0/5

0010.7b00.1545 Dynamic 2 FastEthernet0/5

## QUESTION 115

After port security is deployed throughout an enterprise campus, the network team has been overwhelmed with port reset requests. They decide to configure the network to automate the process of re-enabling user ports. Which command accomplishes this task?

- A. switch(config)# errdisable recovery interval 180
- B. switch(config)# errdisable recovery cause psecure-violation
- C. switch(config)# switchport port-security protect
- D. switch(config)# switchport port-security aging type inactivity
- E. switch(config)# errdisable recovery cause security-violation

**Correct Answer:** B

**Section:** Infrastructure Security

**Explanation**

**Explanation/Reference:**

Explanation:

When a secure port is in the error-disabled state, you can bring it out of this state automatically by configuring the errdisable recovery cause psecure-violation global configuration command or you can manually reenble it by entering the shutdown and no shut down interface configuration commands. This is the default mode. If a port is in per-VLAN errdisable mode, you can also use clear errdisable interface name vlan range command to re-enable the VLAN on the port. You can also customize the time to recover from the specified error disable cause (default is 300 seconds) by entering the errdisable recovery interval interval command. Reference: [http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst4500/12-2/53SG/configuration/config/port\\_sec.pdf](http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst4500/12-2/53SG/configuration/config/port_sec.pdf)

**QUESTION 116**

Which command globally enables AAA on a device?

- A. aaa new-model
- B. aaa authentication
- C. aaa authorization
- D. aaa accounting

**Correct Answer:** A

**Section:** Infrastructure Security

**Explanation**

**Explanation/Reference:**

Explanation:

To configure AAA authentication, enable AAA by using the aaa new-model global configuration command. AAA features are not available for use until you enable AAA globally by issuing the aaa new-model command.

Reference:

[http://www.cisco.com/c/en/us/td/docs/ios/12\\_2/security/configuration/guide/fsecur\\_c/scfathen.html](http://www.cisco.com/c/en/us/td/docs/ios/12_2/security/configuration/guide/fsecur_c/scfathen.html)

**QUESTION 117**

Which AAA Authorization type includes PPP, SLIP, and ARAP connections?

- A. network
- B. IP mobile
- C. EXEC
- D. auth-proxy

**Correct Answer:** A

**Section:** Infrastructure Security

**Explanation**

**Explanation/Reference:**

Explanation:

Method lists for authorization define the ways that authorization will be performed and the sequence in which these methods will be performed. A method list is simply a named list describing the authorization methods to be queried (such as RADIUS or TACACS+), in sequence. Method lists enable you to designate one or more security protocols to be used for authorization, thus ensuring a backup system in case the initial method fails. Cisco IOS software uses the first method listed to authorize users for specific network services; if that method fails to respond, the Cisco IOS software selects the next method listed in the method list. This process continues until there is successful communication with a listed authorization method, or all methods defined are exhausted.

Method lists are specific to the authorization type requested:

- Auth-proxy--Applies specific security policies on a per-user basis. For detailed information on the authentication proxy feature, refer to the chapter "Configuring Authentication Proxy" in the "Traffic Filtering and Firewalls" part of this book.
- Commands--Applies to the EXEC mode commands a user issues. Command authorization attempts authorization for all EXEC mode commands, including global configuration commands, associated with a specific privilege level.
- EXEC--Applies to the attributes associated with a user EXEC terminal session.
- Network--Applies to network connections. This can include a PPP, SLIP, or ARAP connection.
- Reverse Access--Applies to reverse Telnet sessions.

When you create a named method list, you are defining a particular list of authorization methods for the indicated authorization type.

Reference:

[http://www.cisco.com/c/en/us/td/docs/ios/12\\_2/security/configuration/guide/fsecur\\_c/scfathor.html](http://www.cisco.com/c/en/us/td/docs/ios/12_2/security/configuration/guide/fsecur_c/scfathor.html)

**QUESTION 118**

Which private VLAN access port belongs to the primary VLAN and can communicate with all interfaces, including the community and isolated host ports?

- A. promiscuous port
- B. isolated port
- C. community port
- D. trunk port

**Correct Answer:** A

**Section:** Infrastructure Security

**Explanation**

**Explanation/Reference:**

Explanation:

The types of private VLAN ports are as follows:

- Promiscuous--A promiscuous port belongs to the primary VLAN. The promiscuous port can communicate with all interfaces, including the community and isolated host ports, that belong to those secondary VLANs associated to the promiscuous port and associated with the primary VLAN. You can have several promiscuous ports in a primary VLAN. Each promiscuous port can have several secondary VLANs, or no secondary VLANs, associated to that port. You can associate a secondary VLAN to more than one promiscuous port, as long as the promiscuous port and secondary VLANs are within the same primary VLAN. You may want to do this for load-balancing or redundancy purposes. You can also have secondary VLANs that are not associated to any promiscuous port.
- Isolated--An isolated port is a host port that belongs to an isolated secondary VLAN. This port has complete isolation from other ports within the same

private VLAN domain, except that it can communicate with associated promiscuous ports. Private VLANs block all traffic to isolated ports except traffic from promiscuous ports. Traffic received from an isolated port is forwarded only to promiscuous ports. You can have more than one isolated port in a specified isolated VLAN. Each port is completely isolated from all other ports in the isolated VLAN. -Community--A community port is a host port that belongs to a community secondary VLAN. Community ports communicate with other ports in the same community VLAN and with associated promiscuous ports. These interfaces are isolated from all other interfaces in other communities and from all isolated ports within the private VLAN domain.

Reference:

<http://www.cisco.com/c/en/us/td/docs/switches/datacenter/nexus5000/sw/configuration/guide/cli/CLIConfigurationGuide/PrivateVLANs.html>

## QUESTION 119

Which authentication service is needed to configure 802.1x?

- A. RADIUS with EAP Extension
- B. TACACS+
- C. RADIUS with CoA
- D. RADIUS using VSA

**Correct Answer:** A

**Section:** Infrastructure Security

**Explanation**

### Explanation/Reference:

Explanation:

With 802.1x, the authentication server--performs the actual authentication of the client. The authentication server validates the identity of the client and notifies the switch whether or not the client is authorized to access the LAN and switch services. Because the switch acts as the proxy, the authentication service is transparent to the client. The Remote Authentication Dial-In User Service (RADIUS) security system with Extensible Authentication Protocol (EAP) extensions is the only supported authentication server.

Reference: [http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst2940/software/release/12-1\\_19\\_ea1/configuration/guide/2940scg\\_1/sw8021x.pdf](http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst2940/software/release/12-1_19_ea1/configuration/guide/2940scg_1/sw8021x.pdf)

## QUESTION 120

Refer to the exhibit.

```
username cisco password cisco
!
aaa new-model
radius-server host 10.1.1.50 auth-port 1812 key C1sc0123
aaa authentication login default group radius local line
aaa authentication logging NO_AUTH none
!
line vty 0 15
login authentication default
password linepass
line console 0
login authentication NO_AUTH
```

Which login credentials are required when connecting to the console port in this output?

- A. none required
- B. username cisco with password cisco
- C. no username with password linepass
- D. login authentication default

**Correct Answer:** A

**Section:** Infrastructure Security

**Explanation**

**Explanation/Reference:**

Explanation:

Here the console has been configured with the NO\_AUTH name, which lists none as the authentication method. None means no authentication, meaning that credentials are not required and all sessions are allowed access immediately.

## QUESTION 121

Which type of information does the DHCP snooping binding database contain?

- A. untrusted hosts with leased IP addresses
- B. trusted hosts with leased IP addresses
- C. untrusted hosts with available IP addresses
- D. trusted hosts with available IP addresses

**Correct Answer:** A

**Section:** Infrastructure Security

**Explanation**

**Explanation/Reference:**

Explanation:

DHCP snooping is a security feature that acts like a firewall between untrusted hosts and trusted DHCP servers. The DHCP snooping feature performs the following activities:

- Validates DHCP messages received from untrusted sources and filters out invalid messages.
- Rate-limits DHCP traffic from trusted and untrusted sources.
- Builds and maintains the DHCP snooping binding database, which contains information about untrusted hosts with leased IP addresses.
- Utilizes the DHCP snooping binding database to validate subsequent requests from untrusted hosts.

Reference: <http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst6500/ios/12-2SX/configuration/guide/book/snoodhcp.pdf>

## QUESTION 122

Refer to the exhibit.

```
username cisco password cisco
!
aaa new-model
radius-server host 10.1.1.50 auth-port 1812 key C1sc0123
aaa authentication login default group radius local line
aaa authentication logging NO_AUTH none
!
line vty 0 15
login authentication default
password linepass
line console 0
login authentication NO_AUTH
```

When a network administrator is attempting an SSH connection to the device, in which order does the device check the login credentials?

- A. RADIUS server, local username, line password
- B. RADIUS server, line password, local username
- C. Line password, local username, RADIUS server
- D. Line password, RADIUS server, local username

**Correct Answer:** A

**Section:** Infrastructure Security

## Explanation

### Explanation/Reference:

Explanation:

SSH sessions use the vty lines, where the configured authentication method is named default. The AAA default login preference is stated in order from first to last, so here the aaa authentication login default group radius local line means to use RADIUS first, then if that fails use the local user database. Finally, if that fails use the line password.

### QUESTION 123

Which switch feature determines validity based on IP-to-MAC address bindings that are stored in a trusted database?

- A. Dynamic ARP Inspection
- B. storm control
- C. VTP pruning
- D. DHCP snooping

**Correct Answer:** A

**Section:** Infrastructure Security

### Explanation

### Explanation/Reference:

Explanation:

Dynamic ARP inspection determines the validity of an ARP packet based on valid IP-to-MAC address bindings stored in a trusted database, the DHCP snooping binding database. This database is built by DHCP snooping if DHCP snooping is enabled on the VLANs and on the switch. If the ARP packet is received on a trusted interface, the switch forwards the packet without any checks. On untrusted interfaces, the switch forwards the packet only if it is valid. Reference: <http://www.cisco.com/c/en/us/support/docs/switches/catalyst-3750-series-switches/72846-layer2-secftrs-cat13fixed.html>

### QUESTION 124

Which command is needed to enable DHCP snooping if a switchport is connected to a DHCP server?

- A. ip dhcp snooping trust
- B. ip dhcp snooping
- C. ip dhcp trust
- D. ip dhcp snooping information

**Correct Answer:** A

**Section:** Infrastructure Security

### Explanation

### Explanation/Reference:

Explanation:

When configuring DHCP snooping, follow these guidelines:

- DHCP snooping is not active until you enable the feature on at least one VLAN, and enable DHCP globally on the switch.
- Before globally enabling DHCP snooping on the switch, make sure that the devices acting as the DHCP server and the DHCP relay agent are configured and enabled.
- If a Layer 2 LAN port is connected to a DHCP server, configure the port as trusted by entering the "ip dhcp snooping trust" interface configuration command.
- If a Layer 2 LAN port is connected to a DHCP client, configure the port as untrusted by entering the no ip dhcp snooping trust interface configuration command.

Reference: <http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst6500/ios/12-2SX/configuration/guide/book/snoodhcp.html>

## QUESTION 125

Which private VLAN can have only one VLAN and be a secondary VLAN that carries unidirectional traffic upstream from the hosts toward the promiscuous ports and the gateway?

- A. isolated VLAN
- B. primary VLAN
- C. community VLAN
- D. promiscuous VLAN

**Correct Answer:** A

**Section:** Infrastructure Security

**Explanation**

### Explanation/Reference:

Explanation:

Understanding Primary, Isolated, and Community Private VLANs Primary VLANs and the two types of secondary VLANs (isolated and community) have these characteristics:

- Primary VLAN-- The primary VLAN carries traffic from the promiscuous ports to the host ports, both isolated and community, and to other promiscuous ports.
- Isolated VLAN --An isolated VLAN is a secondary VLAN that carries unidirectional traffic upstream from the hosts toward the promiscuous ports. You can configure multiple isolated VLANs in a private VLAN domain; all the traffic remains isolated within each one. Each isolated VLAN can have several isolated ports, and the traffic from each isolated port also remains completely separate.

- Community VLAN--A community VLAN is a secondary VLAN that carries upstream traffic from the community ports to the promiscuous port and to other host ports in the same community. You can configure multiple community VLANs in a private VLAN domain. The ports within one community can communicate, but these ports cannot communicate with ports in any other community or isolated VLAN in the private VLAN.

Reference:

<http://www.cisco.com/c/en/us/td/docs/switches/datacenter/nexus5000/sw/configuration/guide/cli/CLIConfigurationGuide/PrivateVLANs.html>

## QUESTION 126

Which database is used to determine the validity of an ARP packet based on a valid IP-to-MAC address binding?

- A. DHCP snooping database
- B. dynamic ARP database
- C. dynamic routing database

D. static ARP database

**Correct Answer:** A

**Section:** Infrastructure Security

**Explanation**

**Explanation/Reference:**

Explanation:

Information About Dynamic ARP Inspection

DAI is used to validate ARP requests and responses as follows:

- Intercepts all ARP requests and responses on untrusted ports.
- Verifies that a packet has a valid IP-to-MAC address binding before updating the ARP cache or forwarding the packet.
- Drops invalid ARP packets.

DAI can determine the validity of an ARP packet based on valid IP-to-MAC address bindings stored in a DHCP snooping binding database. This database is built by DHCP snooping when it is enabled on the VLANs and on the device. It may also contain static entries that you have created.

Reference:

[http://www.cisco.com/c/en/us/td/docs/switches/datacenter/nexus1000/hyperv/sw/5\\_2\\_1\\_s\\_m\\_1\\_5\\_2/troubleshooting/configuration/guide/n1000v\\_troubleshooting/n1000v\\_trouble\\_19dhcp.html](http://www.cisco.com/c/en/us/td/docs/switches/datacenter/nexus1000/hyperv/sw/5_2_1_s_m_1_5_2/troubleshooting/configuration/guide/n1000v_troubleshooting/n1000v_trouble_19dhcp.html)

## QUESTION 127

When IP Source Guard with source IP filtering is enabled on an interface, which feature must be enabled on the access VLAN for that interface?

- A. DHCP snooping
- B. storm control
- C. spanning-tree portfast
- D. private VLAN

**Correct Answer:** A

**Section:** Infrastructure Security

**Explanation**

**Explanation/Reference:**

Explanation:

IP Source Guard Configuration Guidelines

- You can configure static IP bindings only on nonrouted ports. If you enter the ip source binding mac-address vlan vlan-id ip-address interface interface-id global configuration command on a routed interface, this error message appears:

Static IP source binding can only be configured on switch port. · When IP source guard with source IP filtering is enabled on an interface, DHCP snooping must be enabled on the access VLAN for that interface.

- If you are enabling IP source guard on a trunk interface with multiple VLANs and DHCP snooping is enabled on all the VLANs, the source IP address filter is applied on all the VLANs.
- You can enable this feature when 802.1x port-based authentication is enabled. Reference: [http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst2960x/software/15-0\\_2\\_EX/security/configuration\\_guide/b\\_sec\\_152ex\\_2960-x\\_cg/b\\_sec\\_152ex\\_2960-x\\_cg\\_chapter\\_01110.html](http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst2960x/software/15-0_2_EX/security/configuration_guide/b_sec_152ex_2960-x_cg/b_sec_152ex_2960-x_cg_chapter_01110.html)

**QUESTION 128**

Which switch feature prevents traffic on a LAN from being overwhelmed by continuous multicast or broadcast traffic?

- A. storm control
- B. port security
- C. VTP pruning
- D. VLAN trunking

**Correct Answer:** A

**Section:** Infrastructure Security

**Explanation**

**Explanation/Reference:**

Explanation:

A traffic storm occurs when packets flood the LAN, which creates excessive traffic and degrades network performance. The traffic storm control feature prevents LAN ports from being disrupted by a broadcast, multicast, or unicast traffic storm on physical interfaces from either mistakes in network configurations or from users issuing a DoS attack. Reference: <http://3c3cc.com/c/en/us/td/docs/routers/7600/ios/122SR/configuration/guide/swcg/dos.pdf>

**QUESTION 129**

A network engineer configures port security and 802.1x on the same interface. Which option describes what this configuration allows?

- A. It allows port security to secure the MAC address that 802.1x authenticates.
- B. It allows port security to secure the IP address that 802.1x authenticates.
- C. It allows 802.1x to secure the MAC address that port security authenticates.
- D. It allows 802.1x to secure the IP address that port security authenticates.

**Correct Answer:** A

**Section:** Infrastructure Security

**Explanation**

**Explanation/Reference:**

Explanation:

802.1X and Port Security

You can configure port security and 802.1X on the same interfaces. Port security secures the MAC addresses that 802.1X authenticates. 802.1X processes packets before port security processes them, so when you enable both on an interface, 802.1X is already preventing inbound traffic on the interface from unknown MAC addresses.

Reference: [http://www.cisco.com/c/en/us/td/docs/switches/datacenter/sw/4\\_1/nx-os/security/configuration/guide/sec\\_nx-os-cfg/sec\\_portsec.html](http://www.cisco.com/c/en/us/td/docs/switches/datacenter/sw/4_1/nx-os/security/configuration/guide/sec_nx-os-cfg/sec_portsec.html)

**QUESTION 130**

Which command would a network engineer apply to error-disable a switchport when a packet- storm is detected?

- A. router(config-if)#storm-control action shutdown
- B. router(config-if)#storm-control action trap
- C. router(config-if)#storm-control action error
- D. router(config-if)#storm-control action enable

**Correct Answer:** A

**Section:** Infrastructure Security

**Explanation**

**Explanation/Reference:**

Explanation:

Configuring the Traffic Storm Control Shutdown Mode

To configure the traffic storm control shutdown mode on an interface, perform this task:

Command Purpose

Step 1 Router(config)# interface Selects an interface to configure.

{{type slot/port} | {port-  
channel number}}

Step 2 Router(config-if)# storm-control (Optional) Configures traffic storm control to action shutdown error-disable ports when a traffic storm occurs.

.

Enter the no storm-control action shut-  
down command to revert to the default action  
(drop).

.

Use the error disable detection and recov-  
ery feature, or the shutdown and no shut-  
down commands to reenable ports.

Reference: <http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst6500/ios/12-2SX/configuration/guide/book/storm.html>

## QUESTION 131

Which feature describes MAC addresses that are dynamically learned or manually configured, stored in the address table, and added to the running configuration?

- A. sticky
- B. dynamic

- C. static
- D. secure

**Correct Answer: A**

**Section: Infrastructure Security**

**Explanation**

**Explanation/Reference:**

Explanation:

With port security, you can configure MAC addresses to be sticky. These can be dynamically learned or manually configured, stored in the address table, and added to the running configuration. If these addresses are saved in the configuration file, the interface does not need to dynamically relearn them when the switch restarts. Although sticky secure addresses can be manually configured, it is not recommended.

Reference: [http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst4500/12-2/25ew/configuration/guide/conf/port\\_sec.pdf](http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst4500/12-2/25ew/configuration/guide/conf/port_sec.pdf)

## QUESTION 132

On which interface can port security be configured?

- A. static trunk ports
- B. destination port for SPAN
- C. EtherChannel port group
- D. dynamic access point

**Correct Answer: A**

**Section: Infrastructure Security**

**Explanation**

**Explanation/Reference:**

Explanation:

Port Security and Port Types

You can configure port security only on Layer 2 interfaces. Details about port security and different types of interfaces or ports are as follows:

·Access ports--You can configure port security on interfaces that you have configured as Layer 2 access ports. On an access port, port security applies only to the access VLAN. ·Trunk ports--You can configure port security on interfaces that you have configured as Layer 2 trunk ports. VLAN maximums are not useful for access ports. The device allows VLAN maximums only for VLANs associated with the trunk port.

·SPAN ports--You can configure port security on SPAN source ports but not on SPAN destination ports.

·Ethernet Port Channels--Port security is not supported on Ethernet port channels. Reference: [http://www.cisco.com/c/en/us/td/docs/switches/datacenter/sw/4\\_1/nx-os/security/configuration/guide/sec\\_nx-os-cfg/sec\\_portsec.html](http://www.cisco.com/c/en/us/td/docs/switches/datacenter/sw/4_1/nx-os/security/configuration/guide/sec_nx-os-cfg/sec_portsec.html)

## QUESTION 133

When you configure private VLANs on a switch, which port type connects the switch to the gateway router?

- A. promiscuous

- B. community
- C. isolated
- D. trunked

**Correct Answer:** A

**Section:** Infrastructure Security

**Explanation**

**Explanation/Reference:**

Explanation:

There are mainly two types of ports in a Private VLAN: Promiscuous port (P-Port) and Host port. Host port further divides in two types Isolated port (I-Port) and Community port (C-port). Promiscuous port (P-Port): The switch port connects to a router, firewall or other common gateway device. This port can communicate with anything else connected to the primary or any secondary VLAN. In other words, it is a type of a port that is allowed to send and receive frames from any other port on the VLAN.

Host Ports:

- o Isolated Port (I-Port): Connects to the regular host that resides on isolated VLAN. This port communicates only with P-Ports.

- o Community Port (C-Port): Connects to the regular host that resides on community VLAN. This port communicates with P-Ports and ports on the same community VLAN.

Reference: [http://en.wikipedia.org/wiki/Private\\_VLAN](http://en.wikipedia.org/wiki/Private_VLAN)

**QUESTION 134**

**SIMULATION**

SWITCH.com is an IT company that has an existing enterprise network comprised of two layer 2 only switches; DSW1 and ASW1. The topology diagram indicates their layer 2 mapping. VLAN 20 is a new VLAN that will be used to provide the shipping personnel access to the server. Corporate policies do not allow layer 3 functionality to be enabled on the switches. For security reasons, it is necessary to restrict access to VLAN 20 in the following manner:

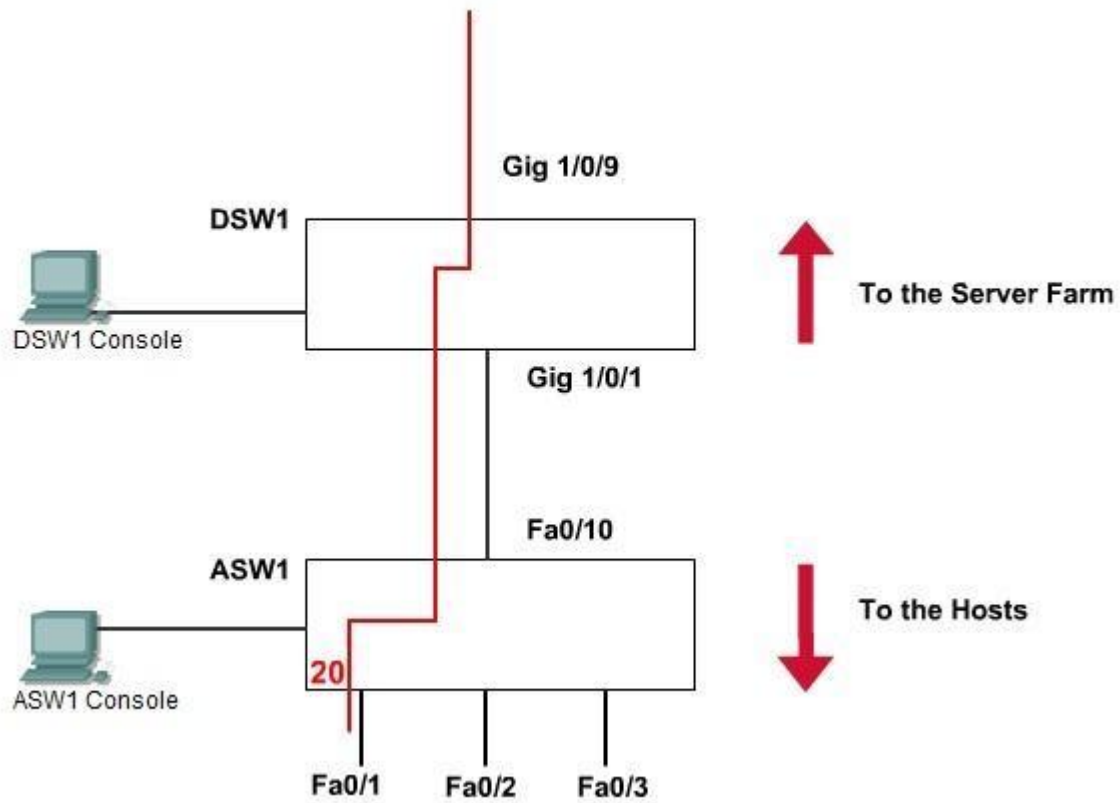
- Users connecting to VLAN 20 via portF0/1 on ASW1 must be authenticated before they are given access to the network. Authentication is to be done via a Radius server:

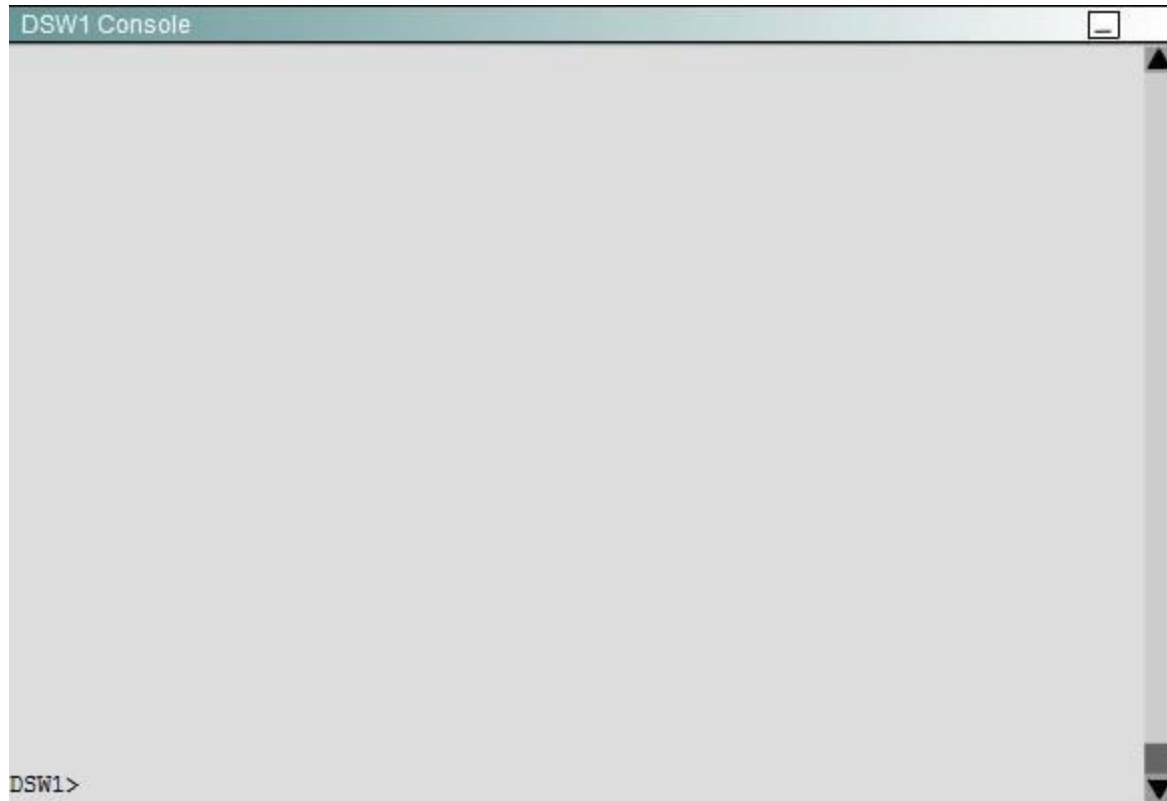
- Radius server host: 172.120.40.46

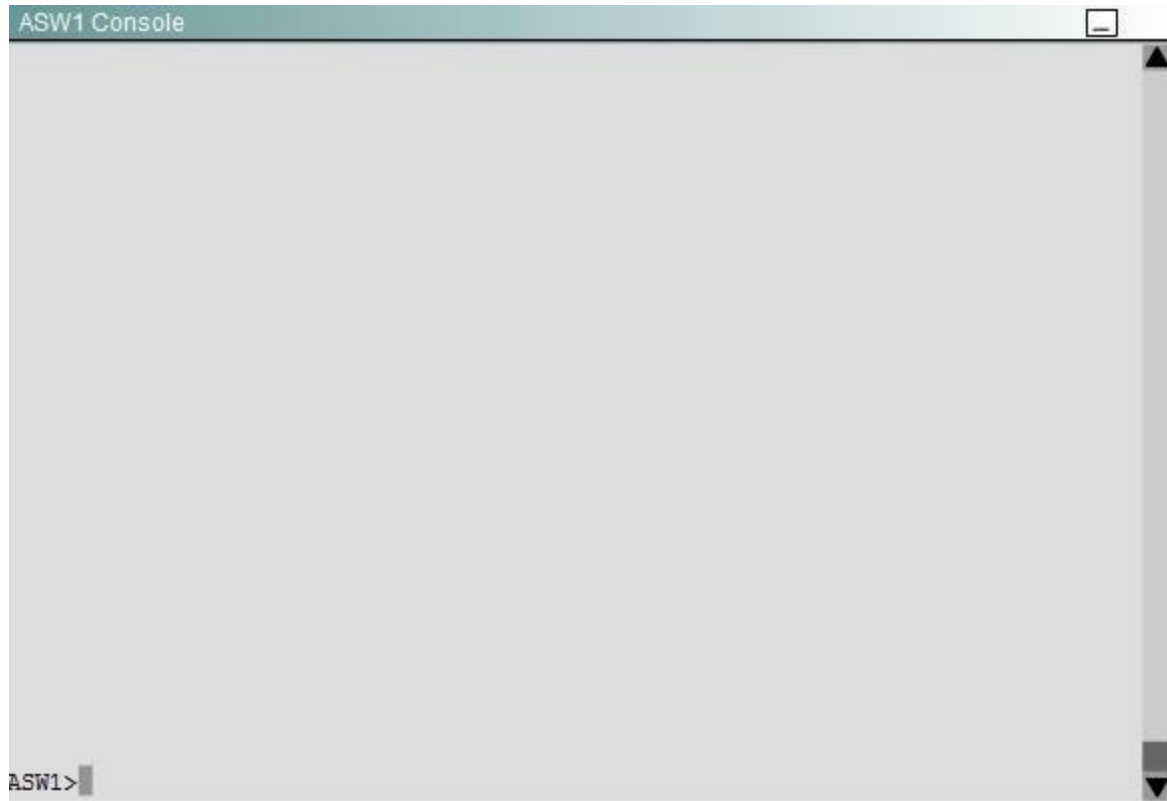
- Radius key: rad123

- Authentication should be implemented as close to the host as possible. · Devices on VLAN 20 are restricted to the subnet of 172.120.40.0/24. ·

- Packets from devices in the subnet of 172.120.40.0/24 should be allowed on VLAN 20. · Packets from devices in any other address range should be dropped on VLAN 20. · Filtering should be implemented as close to the serverfarm as possible. The Radius server and application servers will be installed at a future date. You have been tasked with implementing the above access control as a pre-condition to installing the servers. You must use the available IOS switch features.







- A.
- B.
- C.
- D.

**Correct Answer:**

**Section: Infrastructure Security**

**Explanation**

**Explanation/Reference:**

Answer: The configuration:

Step1: Console to ASW1 from PC console 1

```
ASW1(config)#aaa new-model
```

```
ASW1(config)#radius-server host 172.120.39.46 key rad123
```

```
ASW1(config)#aaa authentication dot1x default group radius
```

```
ASW1(config)#dot1x system-auth-control
```

```
ASW1(config)#inter fastEthernet 0/1
```

```
ASW1(config-if)#switchport mode access
```

```
ASW1(config-if)#dot1x port-control auto
```

```
ASW1(config-if)#exit
```

```
ASW1#copy run start
```

Step2: Console to DSW1 from PC console 2

```
DSW1(config)#ip access-list standard 10
```

```
DSW1(config-ext-nacl)#permit 172.120.40.0 0.0.0.255
```

```
DSW1(config-ext-nacl)#exit
```

```
DSW1(config)#vlan access-map PASS 10
```

```
DSW1(config-access-map)#match ip address 10
```

```
DSW1(config-access-map)#action forward
```

```
DSW1(config-access-map)#exit
```

```
DSW1(config)#vlan access-map PASS 20
```

```
DSW1(config-access-map)#action drop
```

```
DSW1(config-access-map)#exit
```

```
DSW1(config)#vlan filter PASS vlan-list 20
```

```
DSW1#copy run start
```

Topic 3, Infrastructure Services

**QUESTION 135**

When you configure a private VLAN, which type of port must you configure the gateway router port as?

- A. promiscuous port
- B. isolated port
- C. community port
- D. access port

**Correct Answer: A**

**Section: Infrastructure Security**

**Explanation**

**Explanation/Reference:**

Explanation:

There are mainly two types of ports in a Private VLAN: Promiscuous port (P-Port) and Host port. Host port further divides in two types Isolated port (I-Port) and Community port (C-port). Promiscuous port (P-Port): The switch port connects to a router, firewall or other common gateway device. This port can communicate with anything else connected to the primary or any secondary VLAN. In other words, it is a type of a port that is allowed to send and receive frames from any other port on the VLAN.

Host Ports:

- o Isolated Port (I-Port): Connects to the regular host that resides on isolated VLAN. This port communicates only with P-Ports.

- o Community Port (C-Port): Connects to the regular host that resides on community VLAN. This port communicates with P-Ports and ports on the same community VLAN.

Reference: [http://en.wikipedia.org/wiki/Private\\_VLAN](http://en.wikipedia.org/wiki/Private_VLAN)

**QUESTION 136**

Which configuration command ties the router hot standby priority to the availability of its interfaces?

- A. standby group
- B. standby priority
- C. backup interface
- D. standby track

**Correct Answer: D**

**Section: Infrastructure Services**

**Explanation**

**Explanation/Reference:**

Explanation:

The standby track interface configuration command ties the router hot standby priority to the availability of its interfaces and is useful for tracking interfaces that are not configured for HSRP. When a tracked interface fails, the hot standby priority on the device on which tracking has been configured decreases by 10. If an interface is not tracked, its state changes do not affect the hot standby priority of the configured device. For each interface

configured for hot standby, you can configure a separate list of interfaces to be tracked.

Reference:

[http://www.cisco.com/en/US/docs/switches/lan/catalyst3550/software/release/12.1\\_19\\_ea1/configuration/guide/swhsrp.html](http://www.cisco.com/en/US/docs/switches/lan/catalyst3550/software/release/12.1_19_ea1/configuration/guide/swhsrp.html)

## QUESTION 137

What is the default HSRP priority?

- A. 50
- B. 100
- C. 120
- D. 1024

**Correct Answer: B**

**Section: Infrastructure Services**

**Explanation**

**Explanation/Reference:**

Explanation:

standby [group- Set a priority value used in choosing the active router. The number] priority priority range is 1 to 255; the default priority is 100. The highest [preempt [delay delay]] number represents the highest priority.

- --The group number to which (Optional) group-number the command applies.

- --Select so that when the local router (Optional) preempt has a higher priority than the active router, it assumes control as the active router.

- --Set to cause the local router to postpone taking over the active role for the shown number of seconds. The range is 0 to 36000 (1 hour); the default is 0 (no delay before taking over).

Use the no form of the command to restore the default values.

Reference:

[http://www.cisco.com/en/US/docs/switches/lan/catalyst3550/software/release/12.1\\_19\\_ea1/configuration/guide/swhsrp.html#wp1044327](http://www.cisco.com/en/US/docs/switches/lan/catalyst3550/software/release/12.1_19_ea1/configuration/guide/swhsrp.html#wp1044327)

## QUESTION 138

Which option is a benefit of using VSS?

- A. reduces cost
- B. simplifies configuration
- C. provides two independent supervisors with two different control planes
- D. removes the need for a First Hop Redundancy Protocol

**Correct Answer:** D

**Section:** Infrastructure Services

**Explanation**

**Explanation/Reference:**

Explanation: First Hop Redundancy Protocols (FHRPs) such as VRRP and HSRP were designed to allow for a highly available first IP route hop for host systems. FHRPs allow two (or more) distinct routers to share a common IP address providing a redundant Layer-3 default gateway for end nodes. The VSS system creates a single logical router at Layer 3. This VSS routing instance fulfills this first-hop role without the need for a dedicated protocol. The VSS IP route is highly available due to MEC and the resiliency of the VSS system. VSS eliminates the need for FHRP at the aggregation layer of the data center.

Reference:

[http://www.cisco.com/en/US/docs/solutions/Enterprise/Data\\_Center/vssdc\\_integrate.html](http://www.cisco.com/en/US/docs/solutions/Enterprise/Data_Center/vssdc_integrate.html)

## QUESTION 139

What is the default amount by which the hot standby priority for the router is decremented or incremented when the interface goes down or comes back up?

- A. 1
- B. 5
- C. 10
- D. 15

**Correct Answer:** C

**Section:** Infrastructure Services

**Explanation**

**Explanation/Reference:**

Explanation:

The standby track interface configuration command ties the router hot standby priority to the availability of its interfaces and is useful for tracking interfaces that are not configured for HSRP. When a tracked interface fails, the hot standby priority on the device on which tracking has been configured decreases by 10. If an interface is not tracked, its state changes do not affect the hot standby priority of the configured device. For each interface configured for hot standby, you can configure a separate list of interfaces to be tracked.

Reference:

[http://www.cisco.com/en/US/docs/switches/lan/catalyst3550/software/release/12.1\\_19\\_ea1/configuration/guide/swhsrp.html](http://www.cisco.com/en/US/docs/switches/lan/catalyst3550/software/release/12.1_19_ea1/configuration/guide/swhsrp.html)

## QUESTION 140

What is the maximum number of virtual MAC addresses that GLBP allows per group?

- A. 2
- B. 4
- C. 6
- D. 8

**Correct Answer: B**

**Section: Infrastructure Services**

**Explanation**

**Explanation/Reference:**

Explanation:

GLBP Virtual MAC Address Assignment

A GLBP group allows up to four virtual MAC addresses per group. The AVG is responsible for assigning the virtual MAC addresses to each member of the group. Other group members request a virtual MAC address after they discover the AVG through hello messages. Gateways are assigned the next MAC address in sequence. A virtual forwarder that is assigned a virtual MAC address by the AVG is known as a primary virtual forwarder. Other members of the GLBP group learn the virtual MAC addresses from hello messages. A virtual forwarder that has learned the virtual MAC address is referred to as a secondary virtual forwarder.

Reference:

[http://www.cisco.com/en/US/docs/ios/12\\_2t/12\\_2t15/feature/guide/ft\\_glbp.html#wp1039651](http://www.cisco.com/en/US/docs/ios/12_2t/12_2t15/feature/guide/ft_glbp.html#wp1039651)

## QUESTION 141

Which gateway role is responsible for answering ARP requests for the virtual IP address in GLBP?

- A. active virtual forwarder
- B. active virtual router
- C. active virtual gateway
- D. designated router

**Correct Answer: C**

**Section: Infrastructure Services**

**Explanation**

**Explanation/Reference:**

Explanation:

GLBP Active Virtual Gateway

Members of a GLBP group elect one gateway to be the active virtual gateway (AVG) for that group. Other group members provide backup for the AVG in the event that the AVG becomes unavailable. The AVG assigns a virtual MAC address to each member of the GLBP group. Each gateway assumes responsibility for forwarding packets sent to the virtual MAC address assigned to it by the AVG. These gateways are known as active virtual forwarders (AVFs) for their virtual MAC address.

The AVG is responsible for answering Address Resolution Protocol (ARP) requests for the virtual IP address. Load sharing is achieved by the AVG replying to the ARP requests with different virtual MAC addresses.

Reference: [http://www.cisco.com/en/US/docs/ios/12\\_2t/12\\_2t15/feature/guide/ft\\_glbp.html](http://www.cisco.com/en/US/docs/ios/12_2t/12_2t15/feature/guide/ft_glbp.html)

## QUESTION 142

Which VRRP router is responsible for forwarding packets that are sent to the IP addresses of the virtual router?

- A. virtual router master
- B. virtual router backup
- C. virtual router active
- D. virtual router standby

**Correct Answer:** A

**Section:** Infrastructure Services

**Explanation**

### Explanation/Reference:

Explanation:

VRRP Definitions

**VRRP Router** A router running the Virtual Router Redundancy Protocol. It may participate in one or more virtual routers.

**Virtual Router** An abstract object managed by VRRP that acts as a default router for hosts on a shared LAN. It consists of a Virtual Router Identifier and a set of associated IP address(es) across a common LAN. A VRRP Router may backup one or more virtual routers.

**IP Address Owner** The VRRP router that has the virtual router's IP address(es) as real interface address(es). This is the router that, when up, will respond to packets addressed to one of these IP addresses for ICMP pings, TCP connections, etc.

**Primary IP Address** An IP address selected from the set of real interface addresses. One possible selection algorithm is to always select the first address. VRRP advertisements are always sent using the primary IP address as the source of the IP packet.

**Virtual Router Master** The VRRP router that is assuming the responsibility of forwarding packets sent to the IP address(es) associated with the virtual

router, and answering ARP requests for these IP addresses. Note that if the IP address owner is available, then it will always become the Master.

Reference: <http://www.ietf.org/rfc/rfc3768.txt>

## QUESTION 143

Which command correctly configures standby tracking for group 1 using the default decrement priority value?

- A. standby 1 track 100
- B. standby 1 track 100 decrement 1
- C. standby 1 track 100 decrement 5
- D. standby 1 track 100 decrement 20

**Correct Answer:** A

**Section:** Infrastructure Services

**Explanation**

**Explanation/Reference:**

Explanation:

The default decrement value for HSRP standby tracking is 10. There is no need to explicitly state the value if the desired value is the default value.

## QUESTION 144

Which command configures an HSRP group to become a slave of another HSRP group?

- A. standby slave
- B. standby group track
- C. standby follow
- D. standby group backup

**Correct Answer:** C

**Section:** Infrastructure Services

**Explanation**

**Explanation/Reference:**

Explanation:

Perform this task to configure multiple HSRP client groups. The standby follow command configures an HSRP group to become a slave of another HSRP group.

HSRP client groups follow the master HSRP with a slight, random delay so that all client groups do not change at the same time.

Reference: [http://www.cisco.com/en/US/docs/ios-xml/ios/ipapp\\_fhrp/configuration/15-mt/fhp-hsrp-mgo.html](http://www.cisco.com/en/US/docs/ios-xml/ios/ipapp_fhrp/configuration/15-mt/fhp-hsrp-mgo.html)

**QUESTION 145**

Refer to the exhibit.

**%GLBP-4-DUPADDR: Duplicate address**

Which option describes the reason for this message in a GLBP configuration?

- A. Unavailable GLBP active forwarder
- B. Incorrect GLBP IP address
- C. HSRP configured on same interface as GLBP
- D. Layer 2 loop

**Correct Answer: D**

**Section: Infrastructure Services**

**Explanation**

**Explanation/Reference:**

Explanation:

This section provides information you can use to troubleshoot your configuration.

%GLBP-4-DUPADDR: Duplicate address

The error message indicates a possible layer2 loop and STP configuration issues. In order to resolve this issue, issue the show interface command to verify the MAC address of the interface. If the MAC address of the interface is the same as the one reported in the error message, then it indicates that this router is receiving its own hello packets sent. Verify the spanning-tree topology and check if there is any layer2 loop. If the interface MAC address is different from the one reported in the error message, then some other device with a MAC address reports this error message.

Note: GLBP members communicate between each other through hello messages sent every 3 seconds to the multicast address 224.0.0.102 and User Datagram Protocol (UDP) port 3222 (source and destination). When configuring the multicast boundary command, permit the Multicast address by permit 224.0.0.0 15.255.255.255.

Reference:

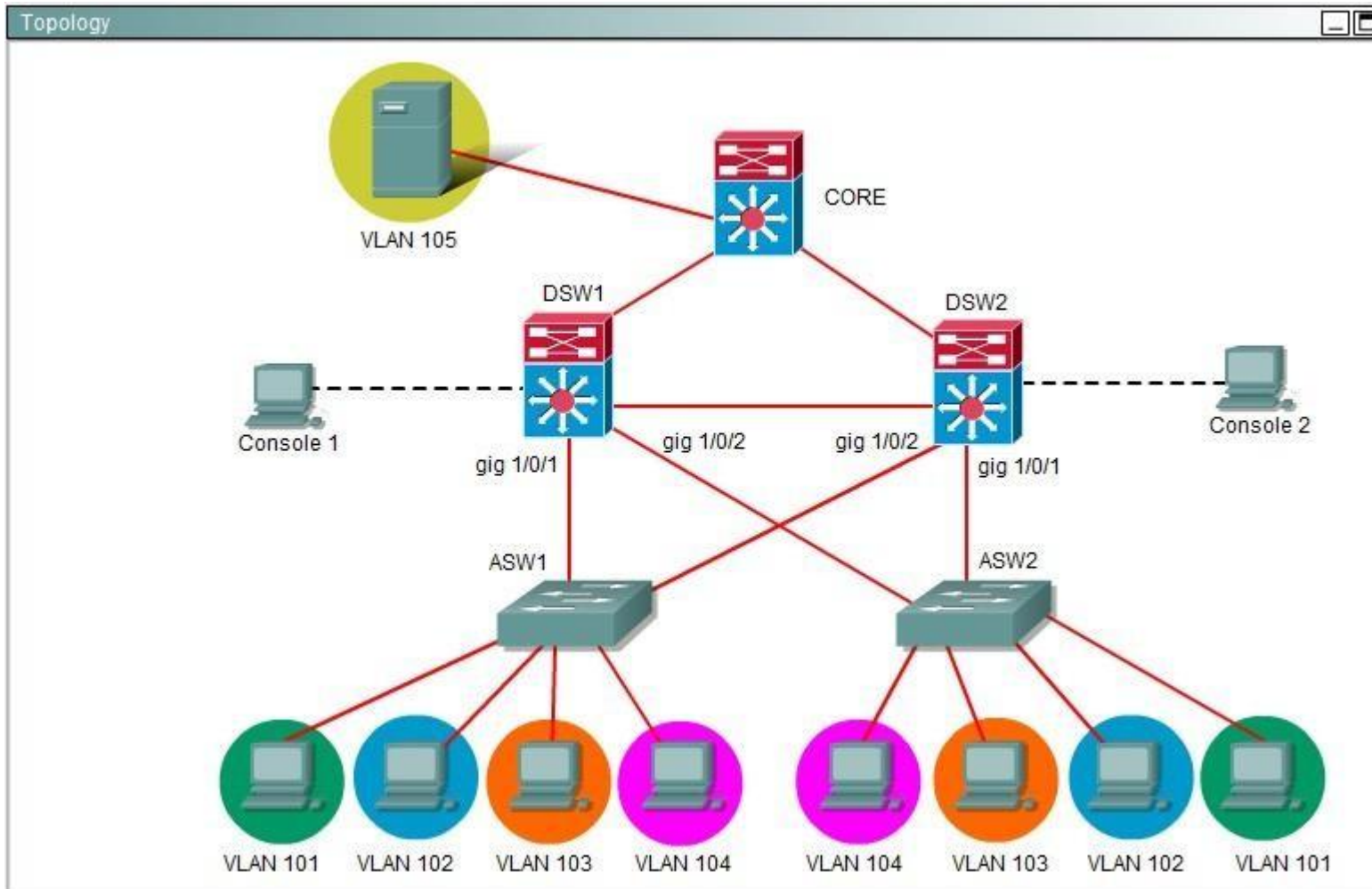
[http://www.cisco.com/en/US/products/hw/switches/ps708/products\\_configuration\\_example0918\\_6a00807d2520.shtml#dr](http://www.cisco.com/en/US/products/hw/switches/ps708/products_configuration_example0918_6a00807d2520.shtml#dr)

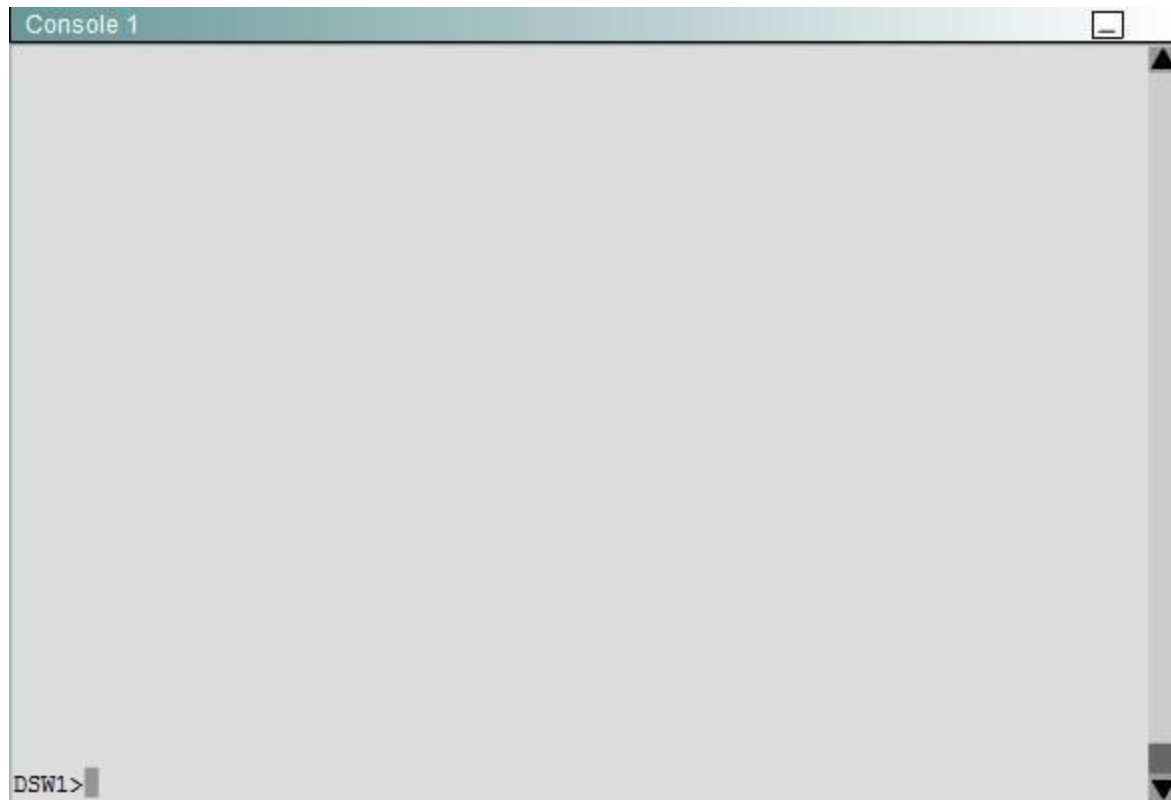
**QUESTION 146**

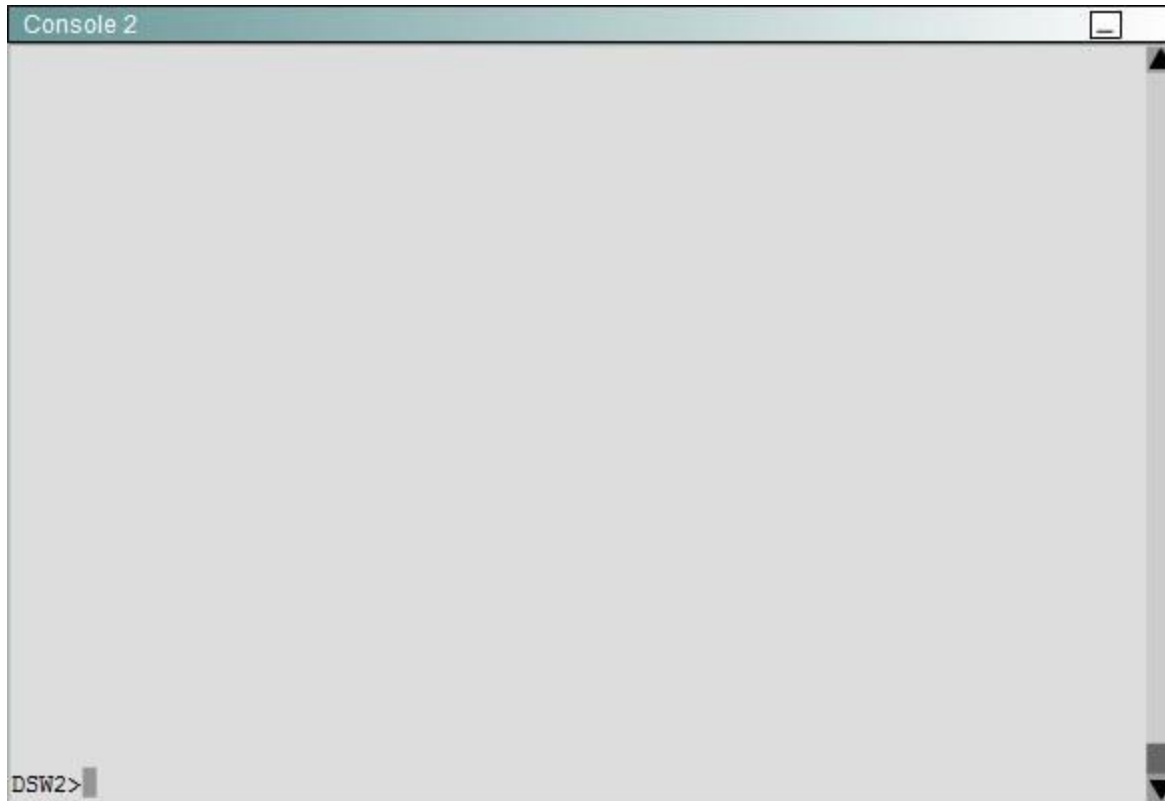
Ferris Plastics, Inc. is a medium sized company, with an enterprise network (access, distribution and core switches) that provides LAN connectivity from user PCs to corporate servers. The distribution switches are configured to use HSRP to provide a high availability solution.

- DSW1 -primary device for VLAN 101 VLAN 102 and VLAN 105
- DSW2 - primary device for VLAN 103 and VLAN 104
- A failure of GigabitEthernet1/0/1 on primary device should cause the primary device to release its status as the primary device, unless GigabitEthernet1/0/1 on backup device has also failed.

Troubleshooting has identified several issues. Currently all interfaces are up. Using the running configurations and show commands, you have been asked to investigate and respond to the following question.







During routine maintenance, GigabitEthernet1/0/1 on DSW1 was shut down. All other interfaces were up. DSW2 became the active HSRP device for VLAN 101 as desired. However, after GigabitEthernet1/0/1 on DSW1 was reactivated, DSW1 did not become the active router for VLAN 101 as desired. What needs to be done to make the group for VLAN 101 function properly?

- A. Enable preempt in the VLAN 101 HSRP group on DSW1.
- B. Disable preempt in the VLAN 101 HSRP group on DSW2's.
- C. In the VLAN 101 HSRP group on DSW1, decrease the priority value to a value that is less than the priority value configured in the VLAN 101 HSRP group on DSW2.
- D. Decrease the decrement value in the track command for the VLAN 101 HSRP group on DSW1 to a value less than the value in the track command for the VLAN 101 HSRP group on DSW2.

**Correct Answer: A**

**Section: Infrastructure Services**

**Explanation**

**Explanation/Reference:**

Explanation:

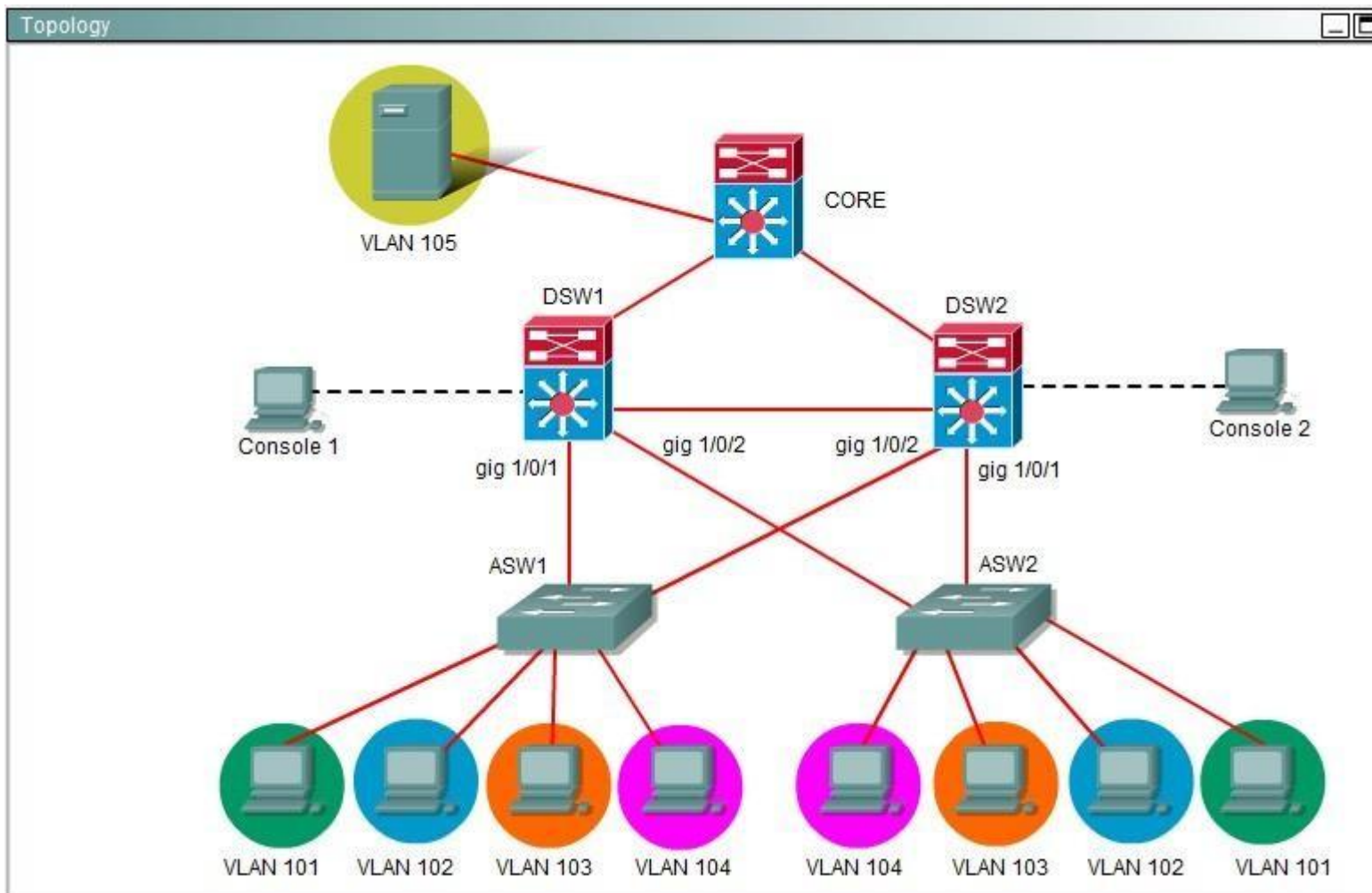
<pre>interface Vlan101 ip address 192.168.101.1 255.255.255.0 standby 1 ip 192.168.101.254 standby 1 priority 200 standby 1 track GigabitEthernet1/0/1 55 !</pre>	<pre>interface Vlan101 ip address 192.168.101.2 255.255.255.0 standby 1 ip 192.168.101.254 standby 1 priority 150 standby 1 preempt standby 1 track GigabitEthernet1/0/1</pre>
---	--

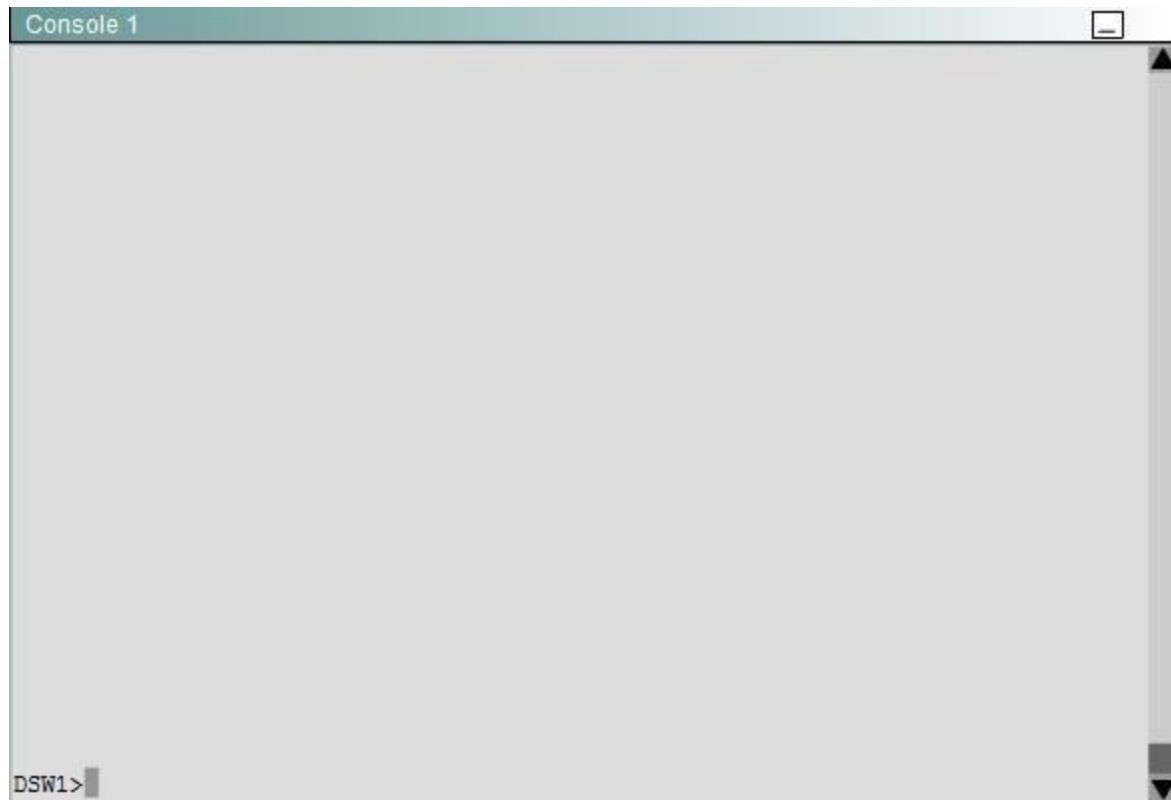
**QUESTION 147**

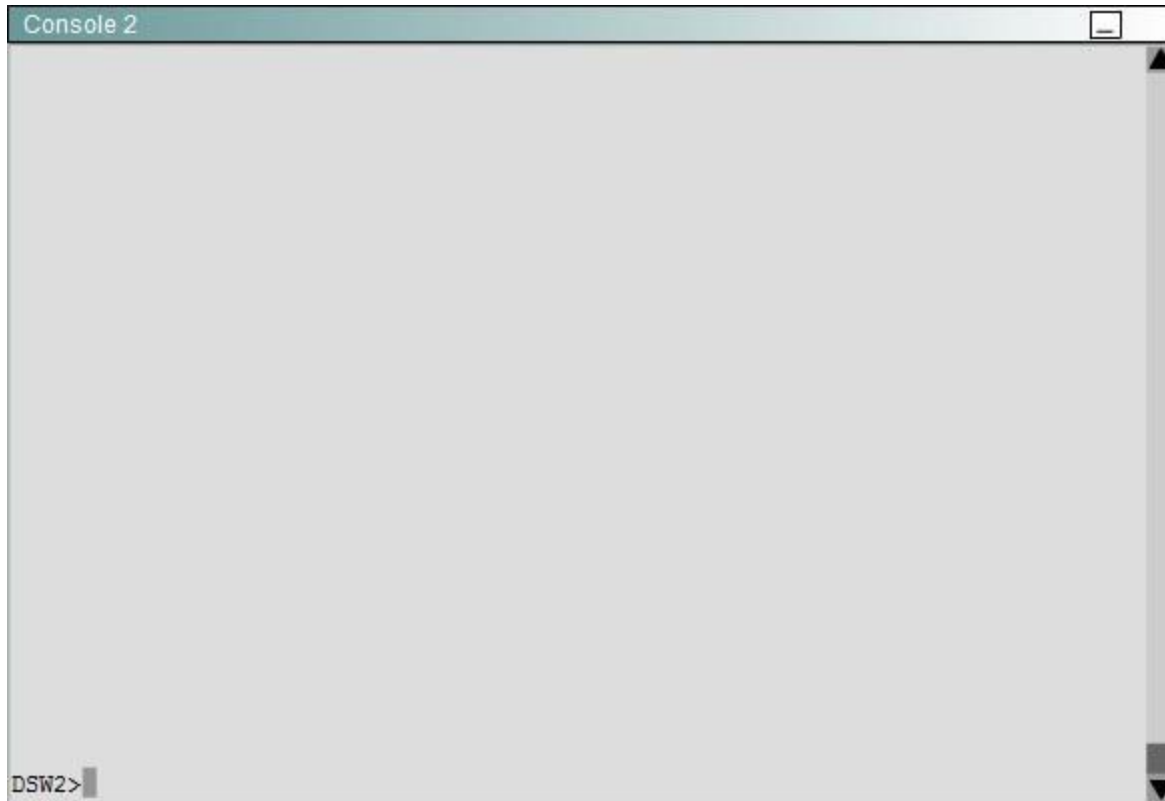
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- DSW1 -primary device for VLAN 101 VLAN 102 and VLAN 105
- DSW2 - primary device for VLAN 103 and VLAN 104
- A failure of GigabitEthernet1/0/1 on primary device should cause the primary device to release its status as the primary device, unless GigabitEthernet1/0/1 on backup device has also failed.

Troubleshooting has identified several issues. Currently all interfaces are up. Using the running configurations and show commands, you have been asked to investigate and respond to the following question.







During routine maintenance, it became necessary to shut down the GigabitEthernet1/0/1 interface on DSW1. All other interfaces were up. During this time, DSW1 remained the active device for the VLAN 102 HSRP group. You have determined that there is an issue with the decrement value in the track command for the VLAN 102 HSRP group. What needs to be done to make the group function properly?

- A. The decrement value on DSW1 should be greater than 5 and less than 15.
- B. The decrement value on DSW1 should be greater than 9 and less than 15.
- C. The decrement value on DSW1 should be greater than 11 and less than 19.
- D. The decrement value on DSWTs should be greater than 190 and less than 200.
- E. The decrement value on DSWTs should be greater than 195 and less than 205.

**Correct Answer: C**

**Section: Infrastructure Services**

**Explanation**

**Explanation/Reference:**

Explanation:

```
interface Vlan102
ip address 192.168.102.1 255.255.255.0
standby 2 ip 192.168.102.254
standby 2 priority 200
standby 2 preempt
standby 2 track GigabitEthernet1/0/1 5
!
interface Vlan102
ip address 192.168.102.2 255.255.255.0
standby 2 ip 192.168.102.254
standby 2 priority 190
standby 2 preempt
standby 2 track GigabitEthernet1/0/1
```

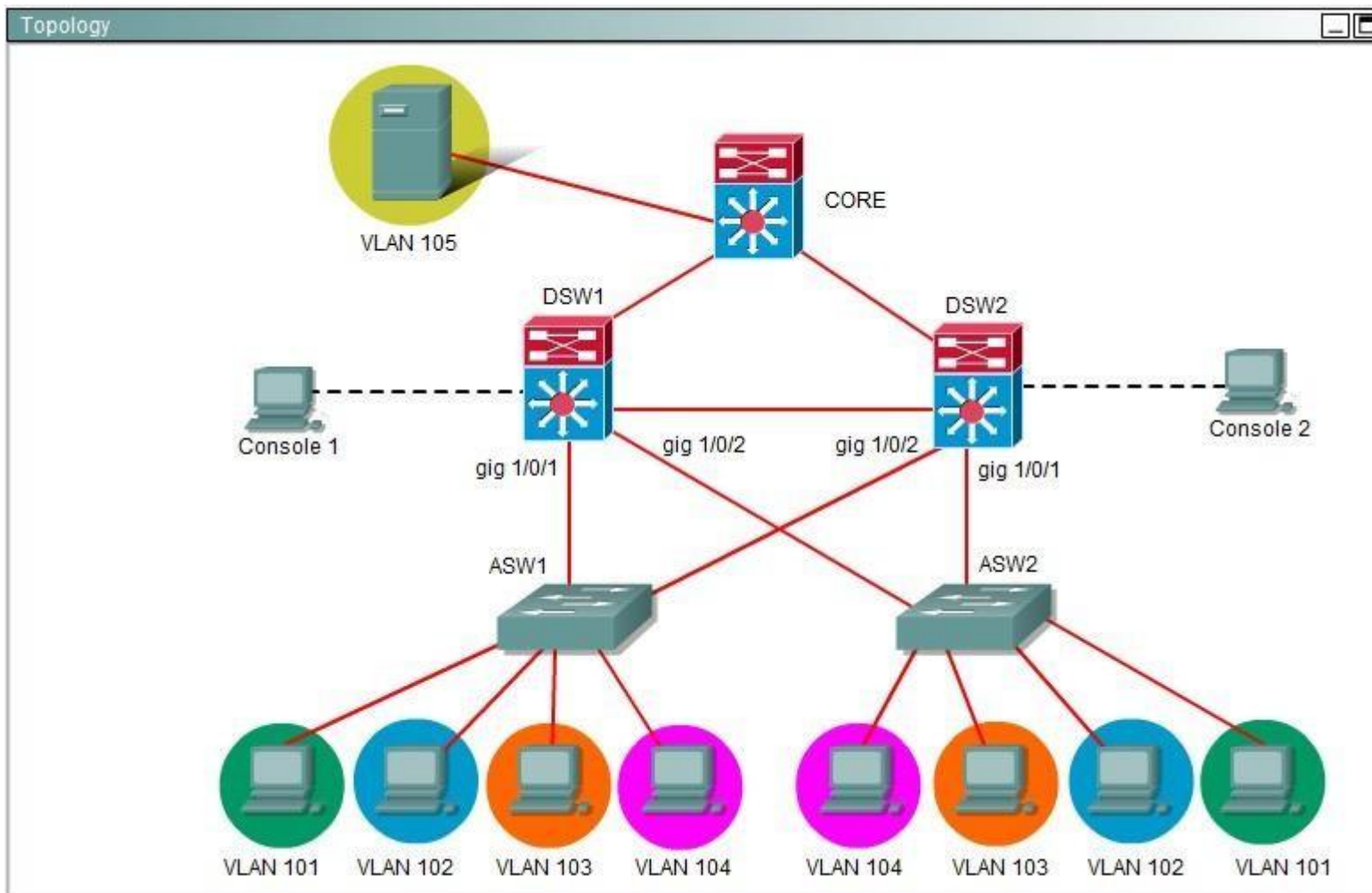
Use "show run" command to show. The left Vlan102 is console1 of DS1. Priority value is 200, we should decrement value in the track command from 11 to 18. Because  $200 - 11 = 189 < 190$  (priority of Vlan102 on DS2).

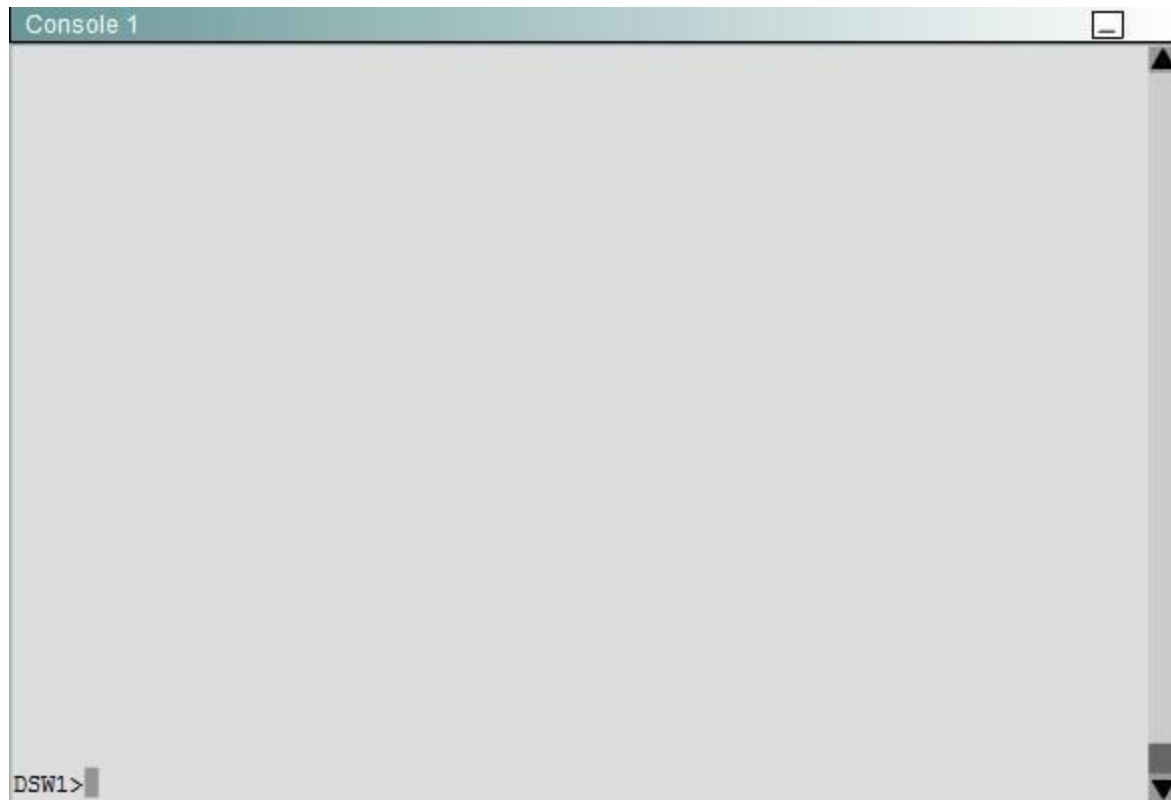
**QUESTION 148**

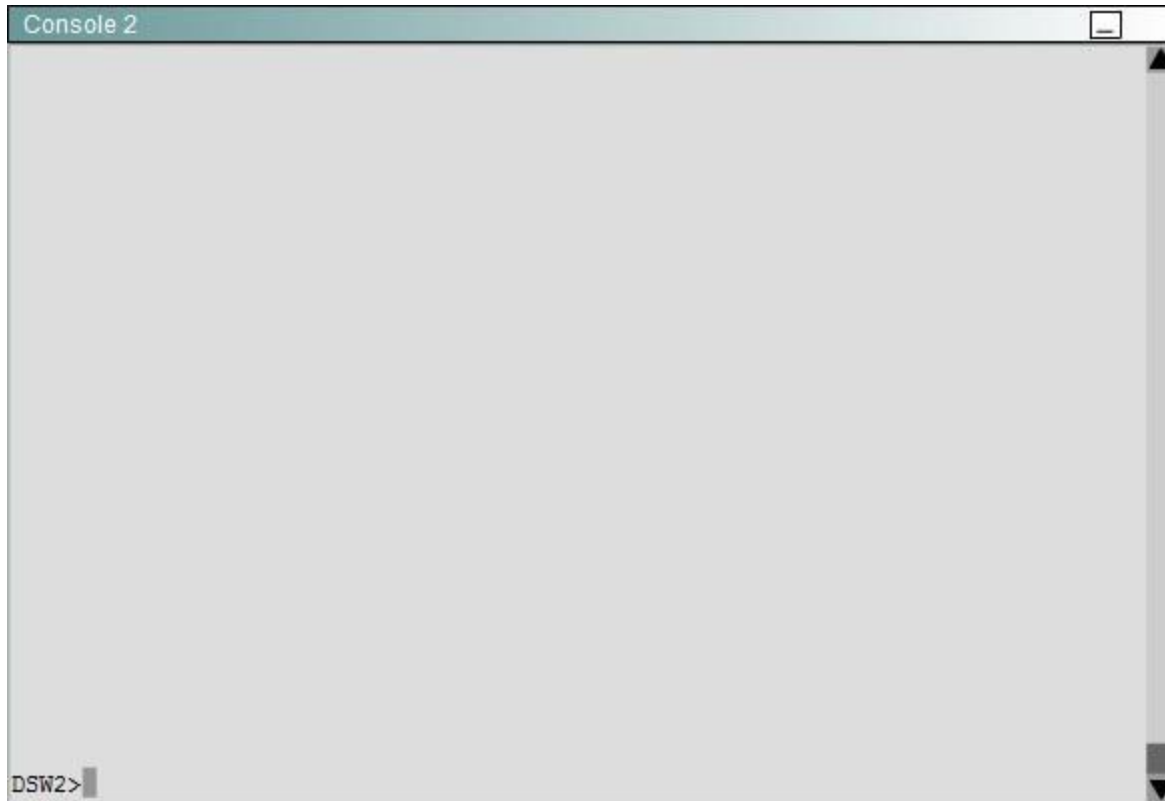
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- DSW1 -primary device for VLAN 101 VLAN 102 and VLAN 105
- DSW2 - primary device for VLAN 103 and VLAN 104
- A failure of GigabitEthernet1/0/1 on primary device should cause the primary device to release its status as the primary device, unless GigabitEthernet1/0/1 on backup device has also failed.

Troubleshooting has identified several issues. Currently all interfaces are up. Using the running configurations and show commands, you have been asked to investigate and respond to the following question.







All interfaces are active. DSW2 has not become the active device for the VLAN 103 HSRP group. As related to the VLAN 103 HSRP group, what can be done to make the group function properly?

- A. On DSW1, disable preempt.
- B. On DSW1, decrease the priority value to a value less than 190 and greater than 150.
- C. On DSW2, increase the priority value to a value greater 200 and less than 250.
- D. On DSW2, increase the decrement value in the track command to a value greater than 10 and less than 50.

**Correct Answer: C**

**Section: Infrastructure Services**

**Explanation**

**Explanation/Reference:**

Explanation:

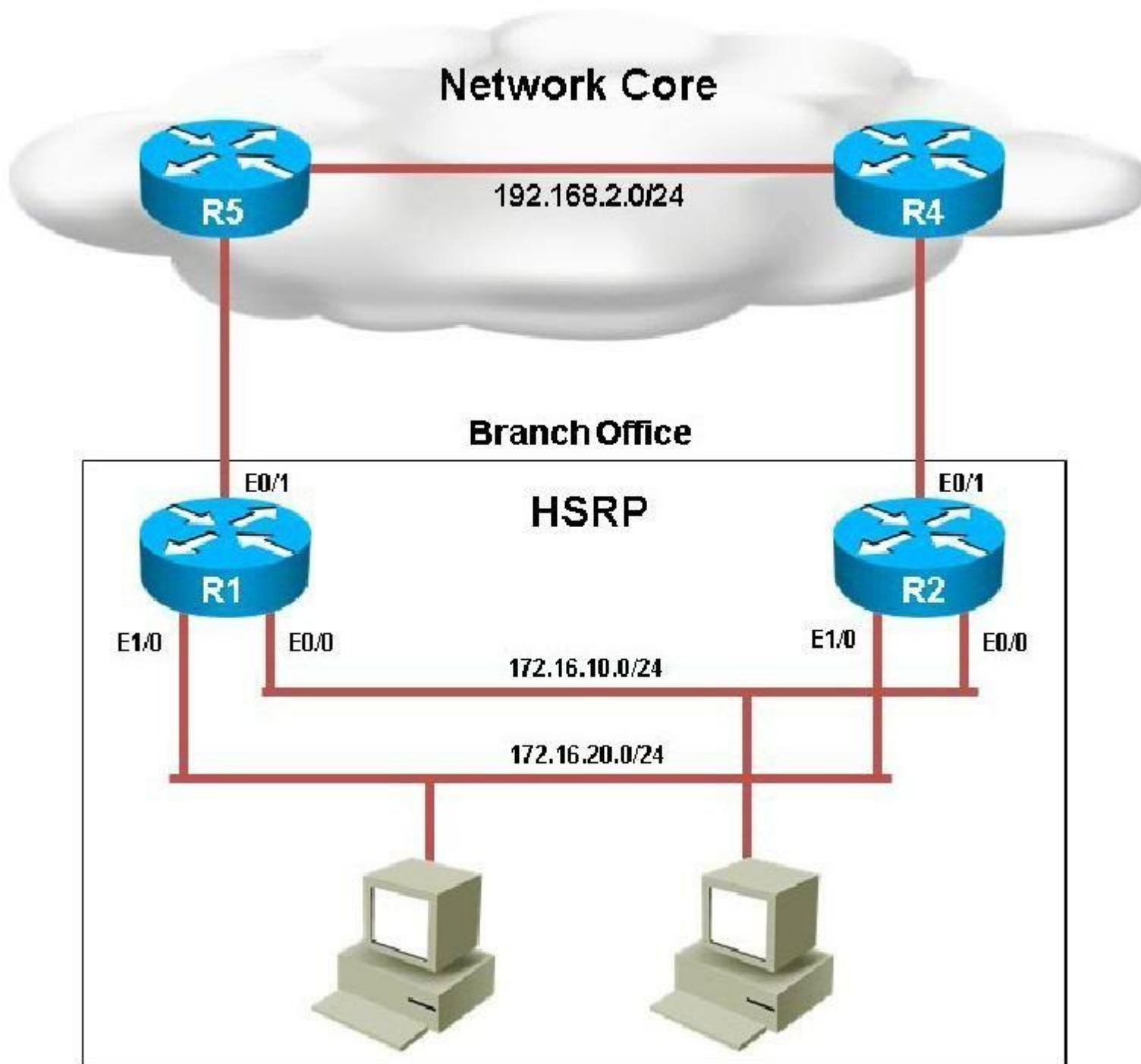
From the output shown below of the HSRP status of DSW2, we see that the active router has a priority of 200, while the local priority is 190. We need to increase the priority of DSW2 to greater than 200, but it should be less than 250 so that if the gig 1/0/1 interface goes down, DSW1 will become active. DSW2 is configured to decrement the priority by 50 if this interface goes down, so the correct answer is to increase the priority to more than 200, but less than 250.

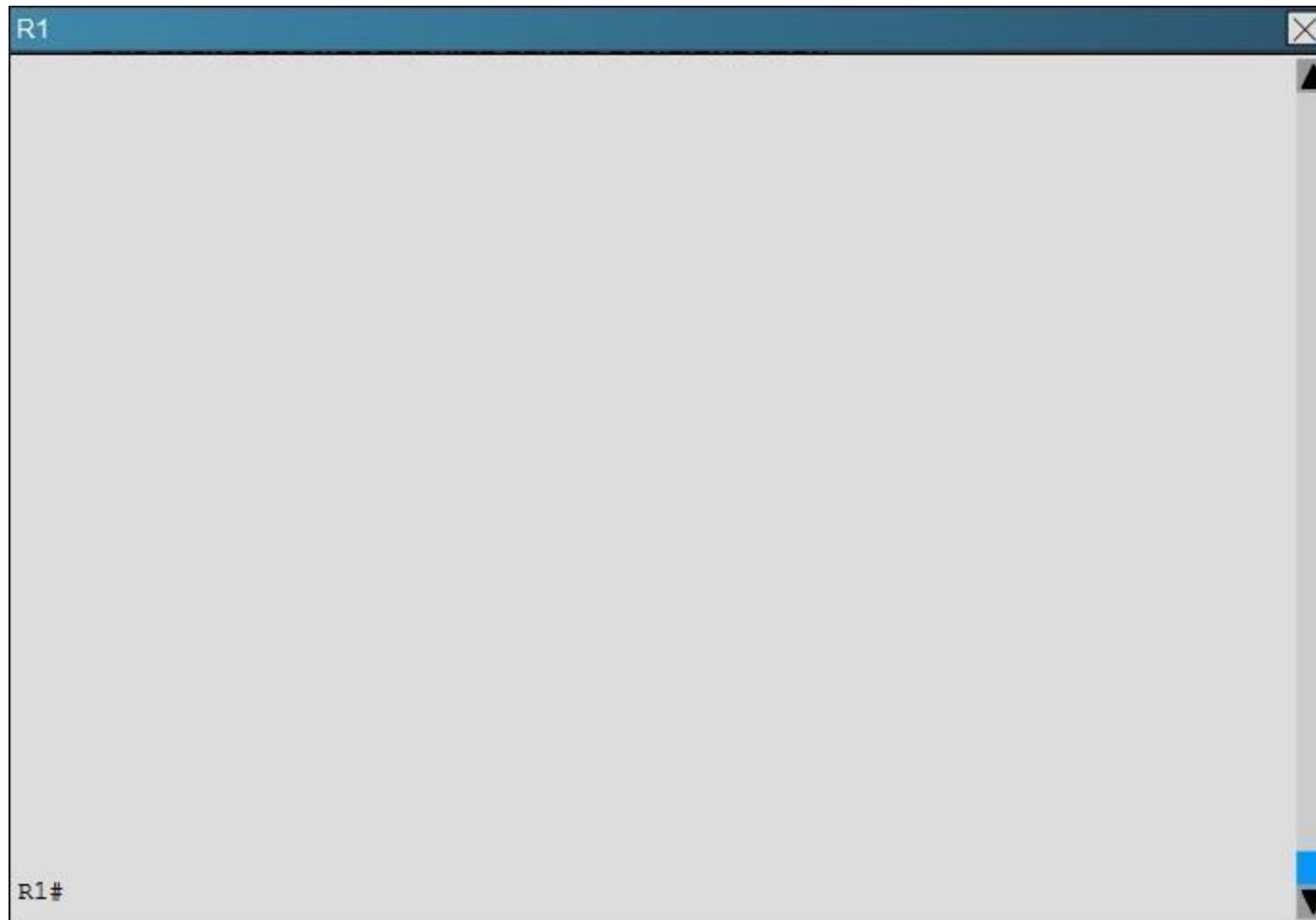
## Console 2

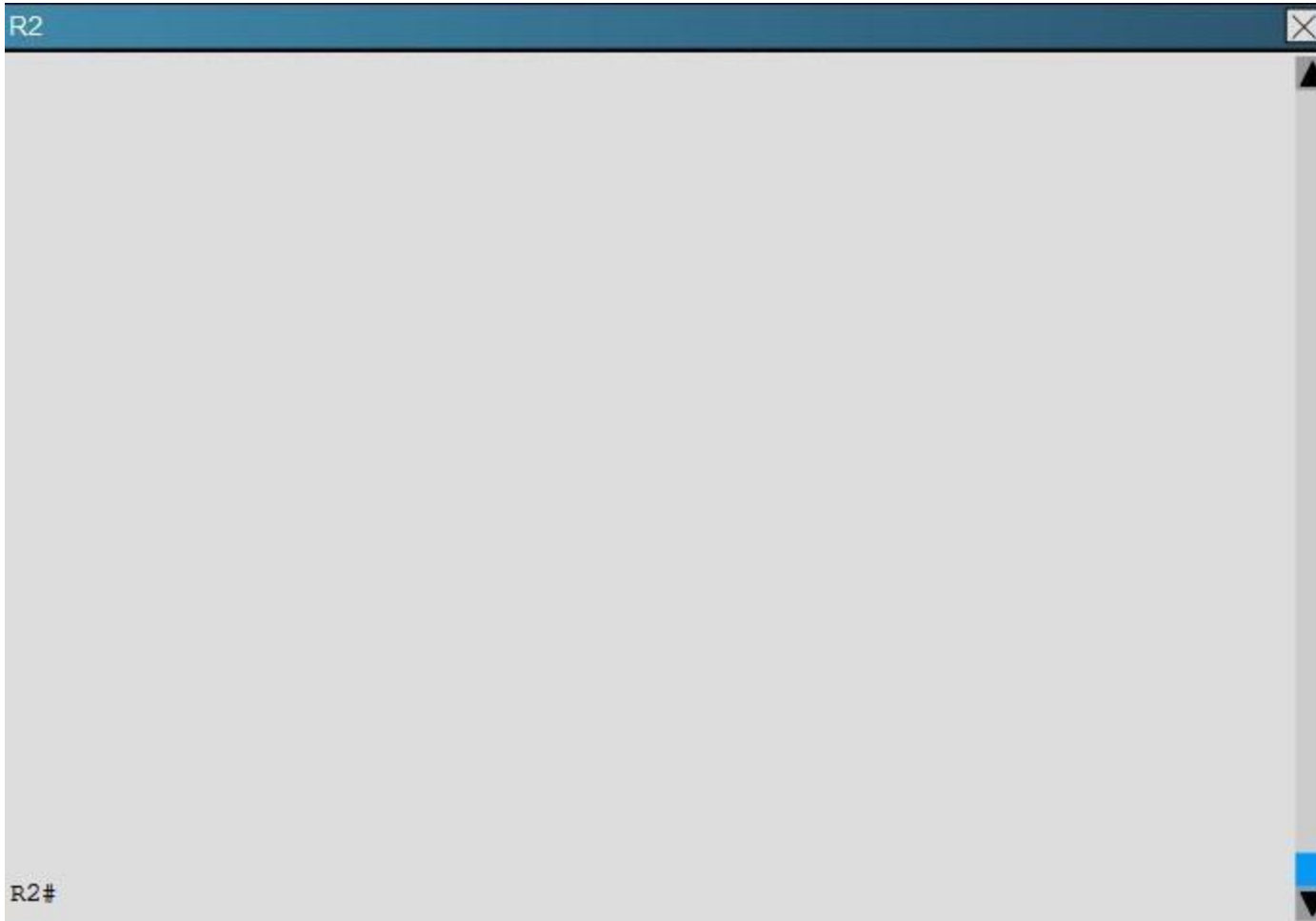
```
Standby router is local
Priority 190 (configured 190)
  Track interface GigabitEthernet1/0/1 state Up decrement 10
IP redundancy name is "hsrp-Vl102-2" (default)
Vlan103 - Group 3
State is Standby
  4 state changes, last state change 02:58:25
Virtual IP address is 192.168.103.254
Active virtual MAC address is 0000.0c07.ac03
  Local virtual MAC address is 0000.0c07.ac03 (v1 default)
Hello time 3 sec, hold time 10 sec
  Next hello sent in 0.315 secs
Preemption enabled
Active router is 192.168.103.1, priority 200 (expires in 9.454 sec)
Standby router is local
Priority 190 (configured 190)
  Track interface GigabitEthernet1/0/1 state Up decrement 50
IP redundancy name is "hsrp-Vl103-3" (default)
```

QUESTION 149

Your customer has asked you to come in and verify the operation of routers R1 and R2 which are configured to use HSRP. They have questions about how these two devices will perform in the event of a device failure.







Refer to the exhibit. If router R1 interface Ethernet0/0 goes down and recovers, which of the statement regarding HSRP priority is true?

- A. The interface will have the priority decremented by 40 for HSRP group 1.
- B. The interface will have the priority decremented by 60 for HSRP group 1
- C. The interface will have its current priority incremented by 40 for HSRP group 1
- D. The interface will have its current priority incremented by 60 for HSRP group 1
- E. The interface will default to the a priority of 100 for HSRP group 1

**Correct Answer: C**

## Section: Infrastructure Services

### Explanation

#### Explanation/Reference:

Explanation:

Here is the HSRP configuration seen on R1:

```
R1
!
interface Ethernet0/0
  description Link to R2
  ip address 172.16.10.2 255.255.255.0
  standby 1 ip 172.16.10.254
  standby 1 priority 130
  standby 1 preempt delay reload 180
  standby 1 authentication cisco123
  standby 1 mac-address 4000.0000.0010
  standby 1 track 1 decrement 40
!
interface Ethernet0/1
```

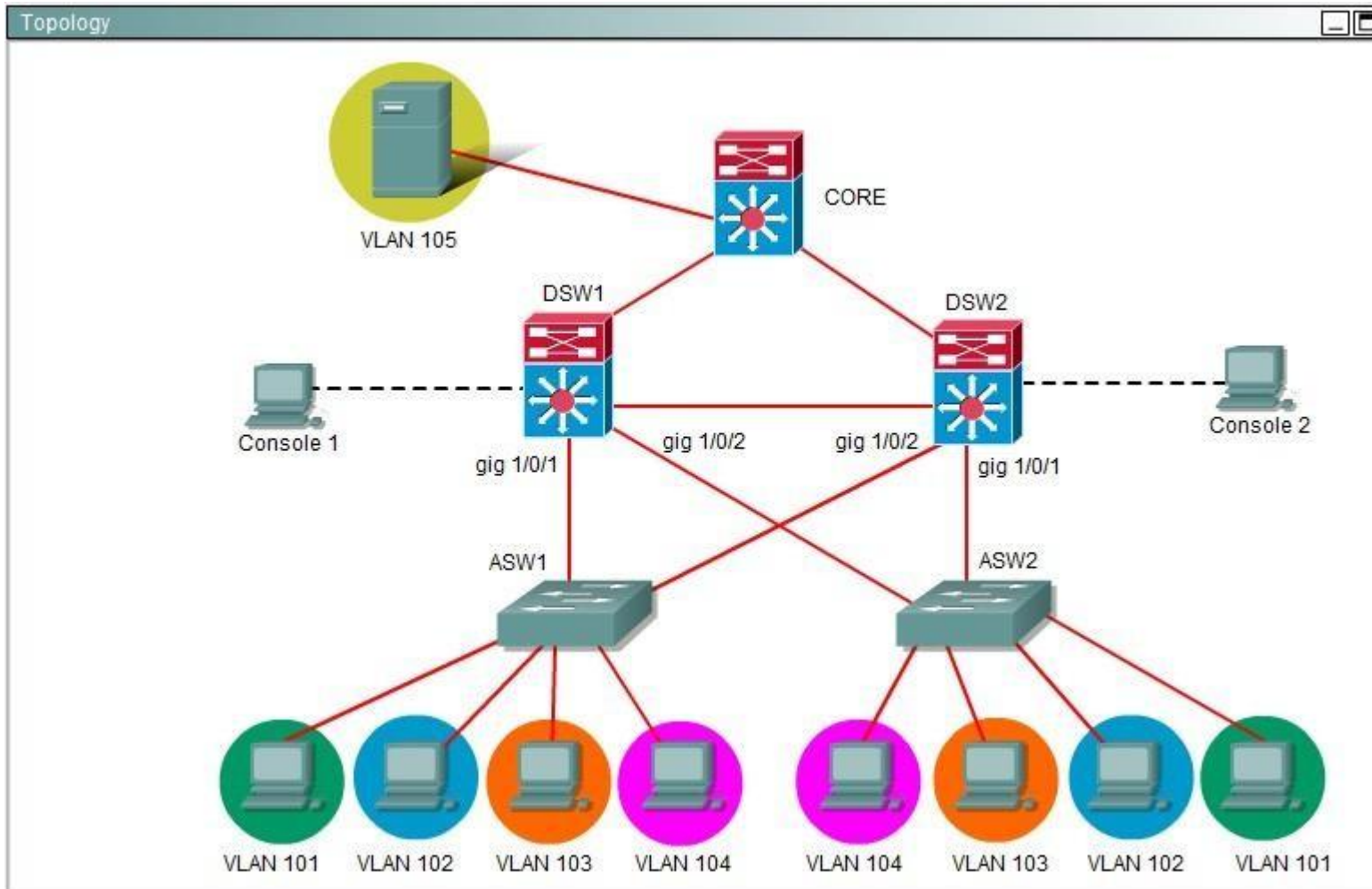
Here, when the Ethernet 0/0 interface goes down, the standby 1 track decrement command will lower the priority from 130 to 90. However, when it comes back up, it will then increment it by 40 back to 130 for HSRP group 1.

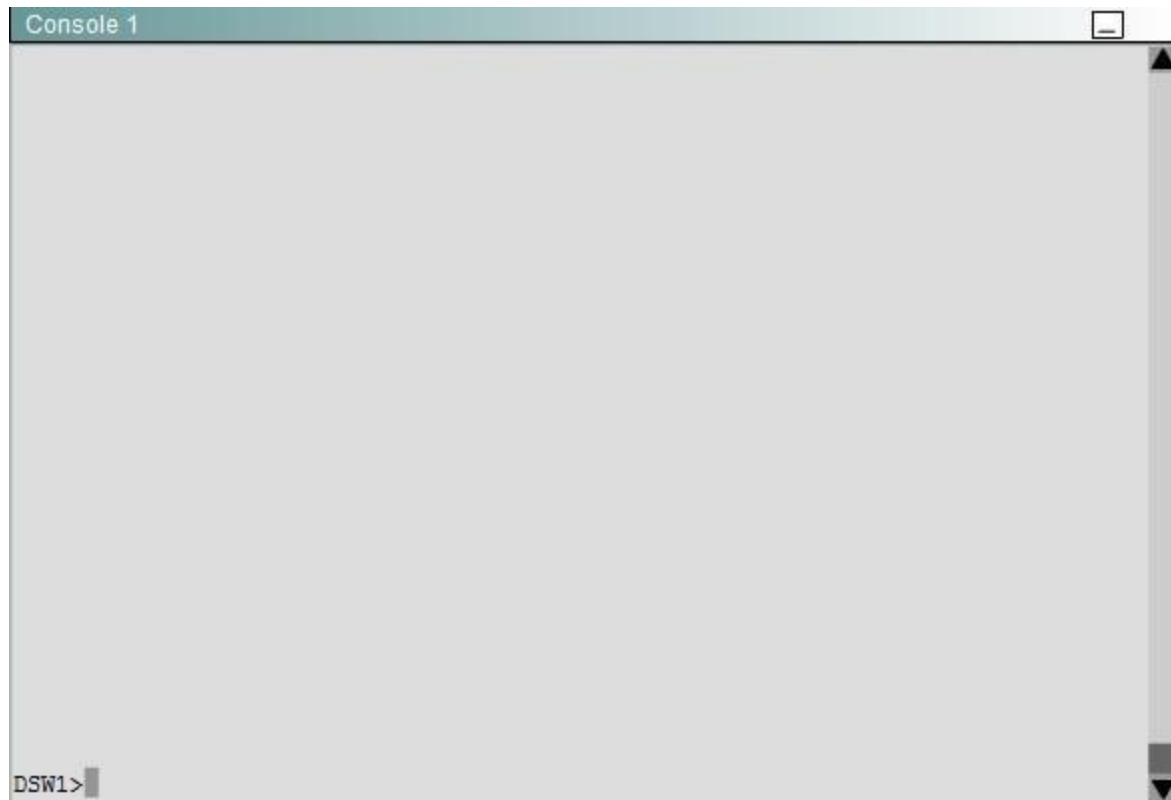
#### QUESTION 150

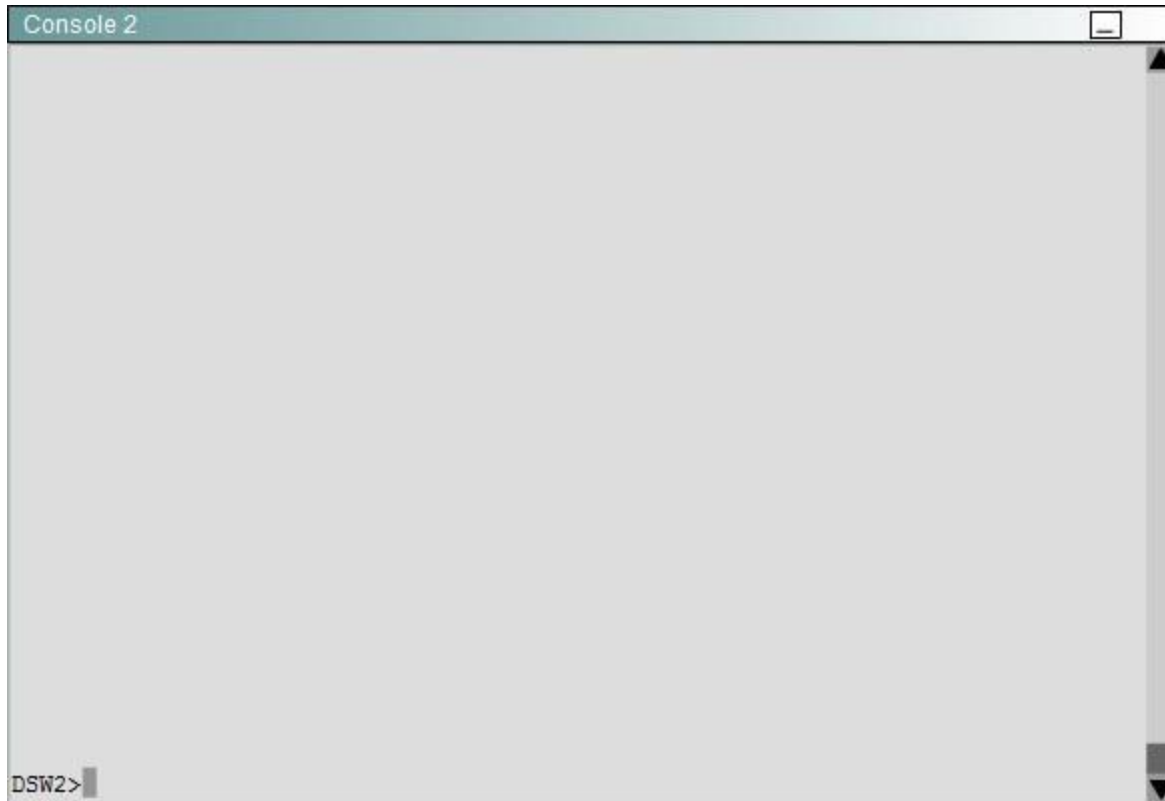
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- DSW1 -primary device for VLAN 101 VLAN 102 and VLAN 105
- DSW2 - primary device for VLAN 103 and VLAN 104
- A failure of GigabitEthernet1/0/1 on primary device should cause the primary device to release its status as the primary device, unless GigabitEthernet1/0/1 on backup device has also failed.

Troubleshooting has identified several issues. Currently all interfaces are up. Using the running configurations and show commands, you have been asked to investigate and respond to the following question.







During routine maintenance, it became necessary to shut down the GigabitEthernet1/0/1 interface on DSW1 and DSW2. All other interfaces were up. During this time, DSW1 became the active router for the VLAN 104HSRP group. As related to the VLAN 104HSRP group, what can to be done to make the group function properly?

- A. On DSW1, disable preempt.
- B. On DSW2 decrease the priority value to a value less than 150.
- C. On DSW1, increase the decrement value in the track command to a value greater than 6.
- D. On DSW1, decrease the decrement value in the track command to a value less than 1.

**Correct Answer: C**

**Section: Infrastructure Services**

**Explanation**

**Explanation/Reference:**

Explanation:

```

interface Vlan104
ip address 192.168.104.1 255.255.255.0
standby 4 ip 192.168.104.254
standby 4 priority 150
standby 4 preempt
standby 4 track GigabitEthernet1/0/1 1
interface Vlan104
ip address 192.168.104.2 255.255.255.0
standby 4 ip 192.168.104.254
standby 4 priority 200
standby 4 preempt
standby 4 track GigabitEthernet1/0/1 55

```

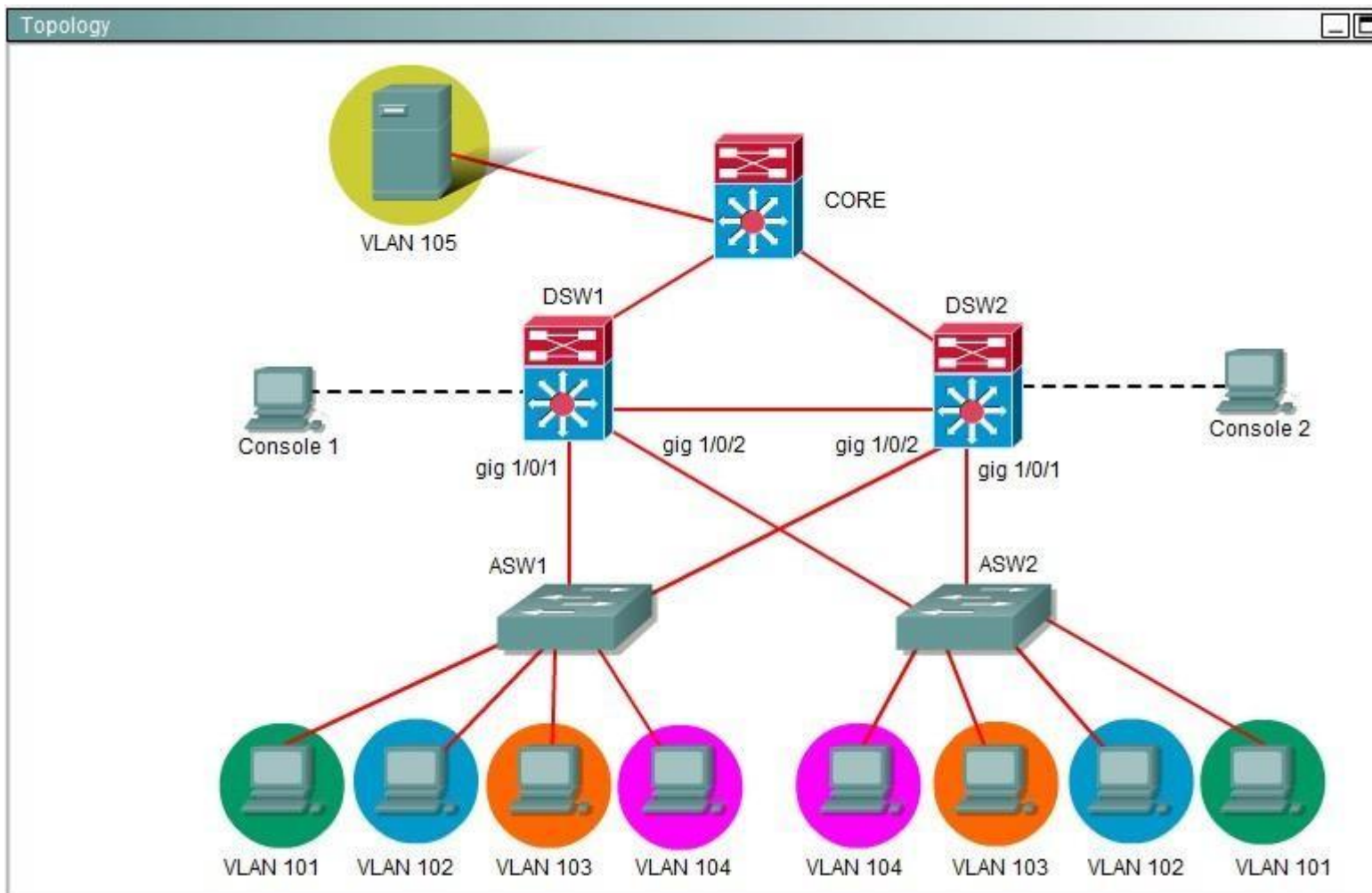
We should NOT disable preempt on DS1. By do that, you will make Vlan104's HSRP group fail function. Example: if we are disable preempt on DS1. It can not become active device when G1/0/1 on DS2 fail. In this question, G0/1/0 on DS1 & DS2 is shutdown. Vlan104 (left):  $150 - 1 = 149$ . Vlan104 (right):  $200 - 55 = 145$ . Result is priority  $149 > 145$  (Vlan104 on DS1 is active). If increase the decrement in the track value to a value greater than 6 ( $>$  or  $= 6$ ). Vlan104 (left):  $150 - 6 = 144$ . Result is priority  $144 < 145$  (vlan104 on DS2 is active).

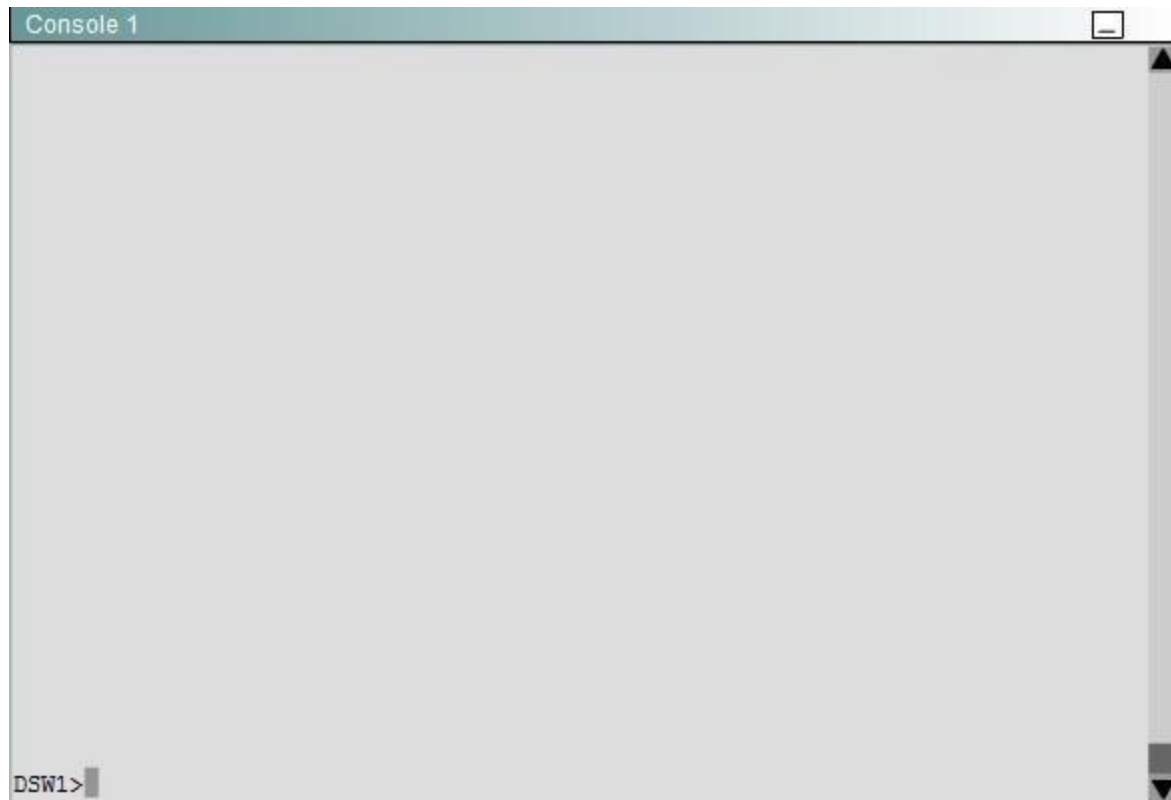
### QUESTION 151

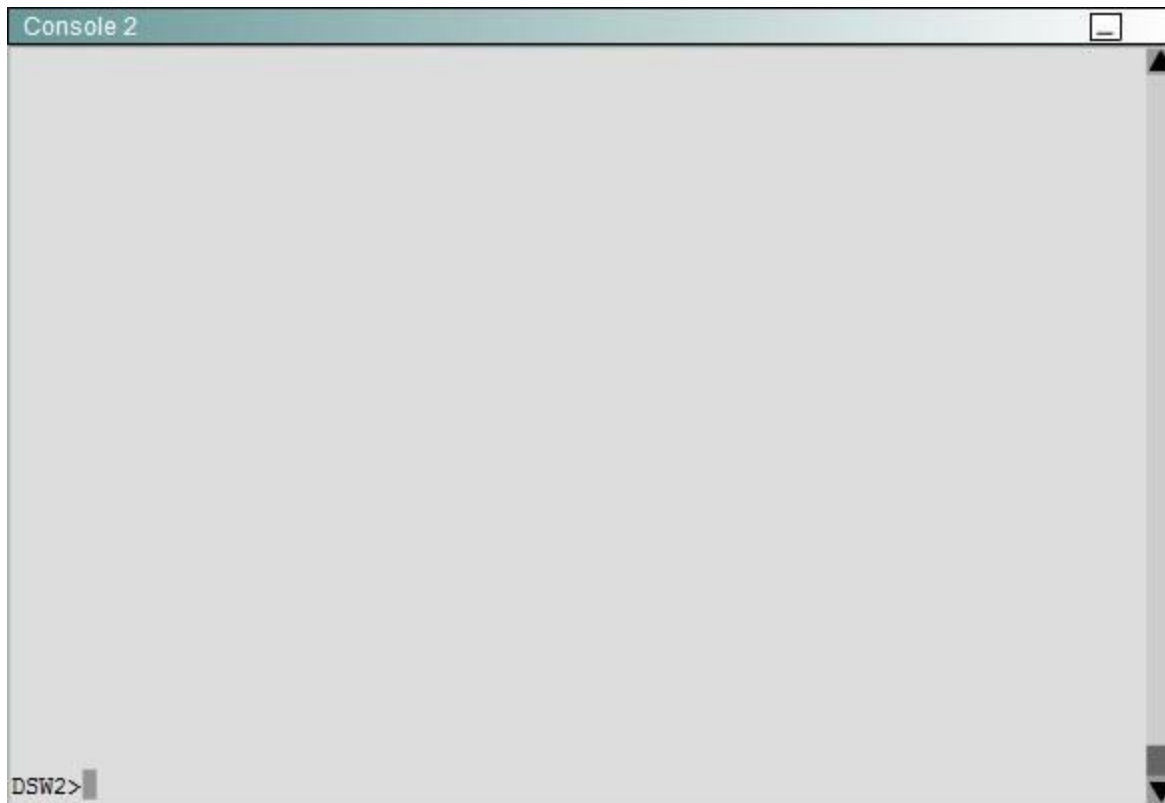
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- DSW1 -primary device for VLAN 101 VLAN 102 and VLAN 105
- DSW2 - primary device for VLAN 103 and VLAN 104
- A failure of GigabitEthernet1/0/1 on primary device should cause the primary device to release its status as the primary device, unless GigabitEthernet1/0/1 on backup device has also failed.

Troubleshooting has identified several issues. Currently all interfaces are up. Using the running configurations and show commands, you have been asked to investigate and respond to the following question.







What is the priority value of the VLAN 105 HSRP group on DSW2?

- A. 50
- B. 100
- C. 150
- D. 200

**Correct Answer:** B

**Section:** Infrastructure Services

**Explanation**

**Explanation/Reference:**

Explanation:

Use "show standby brief" command on console2. Very easy to see priority of Vlan105 is 100.

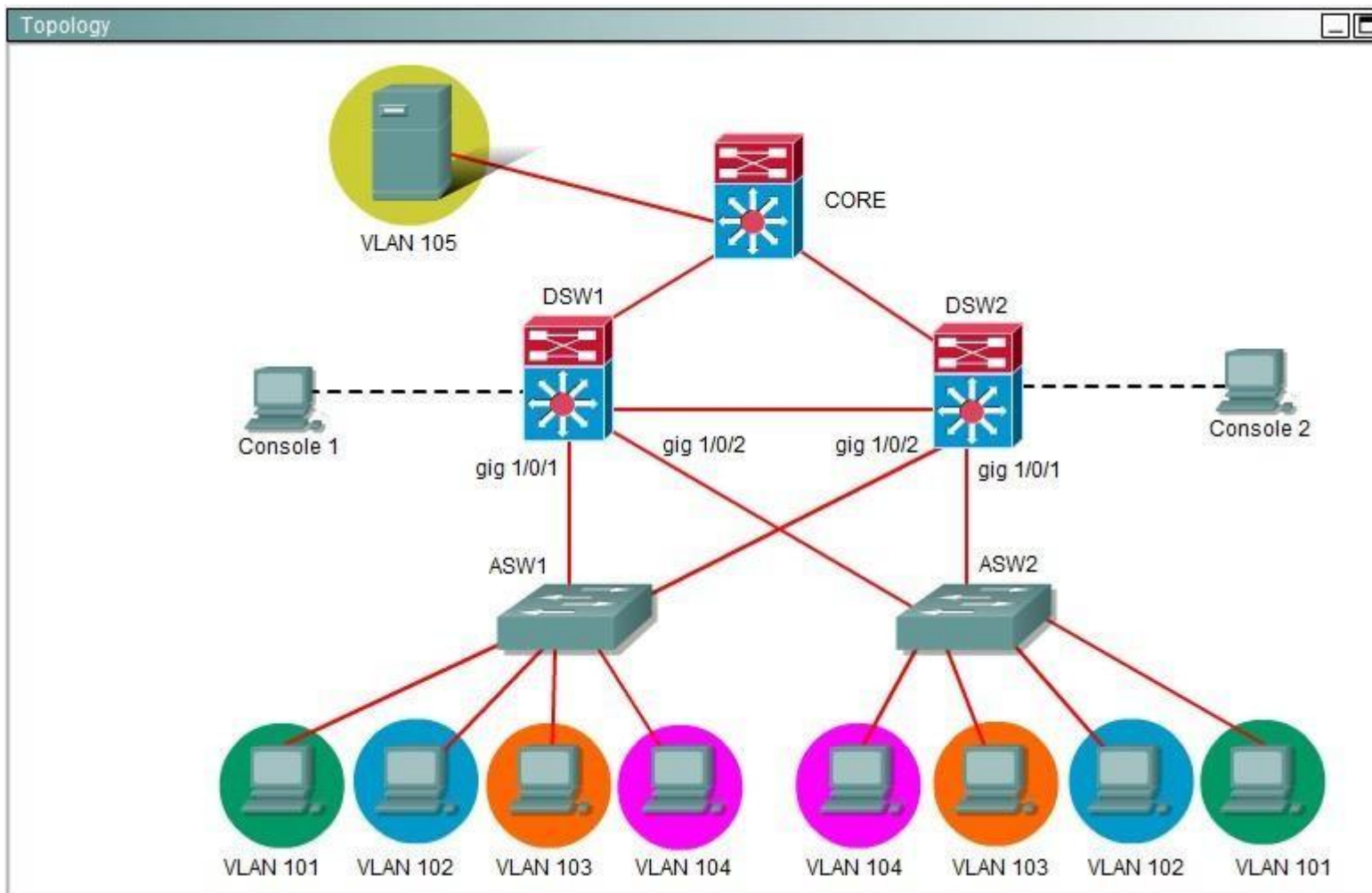
```
Vlan105 - Group 5
State is Active
 9 state changes, last state change 02:53:04
Virtual IP address is 192.168.105.254
Active virtual MAC address is 0000.0c07.ac05
  Local virtual MAC address is 0000.0c07.ac05 (vl default)
Hello time 3 sec, hold time 10 sec
  Next hello sent in 0.685 secs
Preemption enabled
Active router is local
Standby router is 192.168.105.2, priority 100 (expires in 8.406 sec)
Priority 150 (configured 150)
Track interface GigabitEthernet1/0/1 state Up decrement 55
IP redundancy name is "harp-Vl105-5" (default)
```

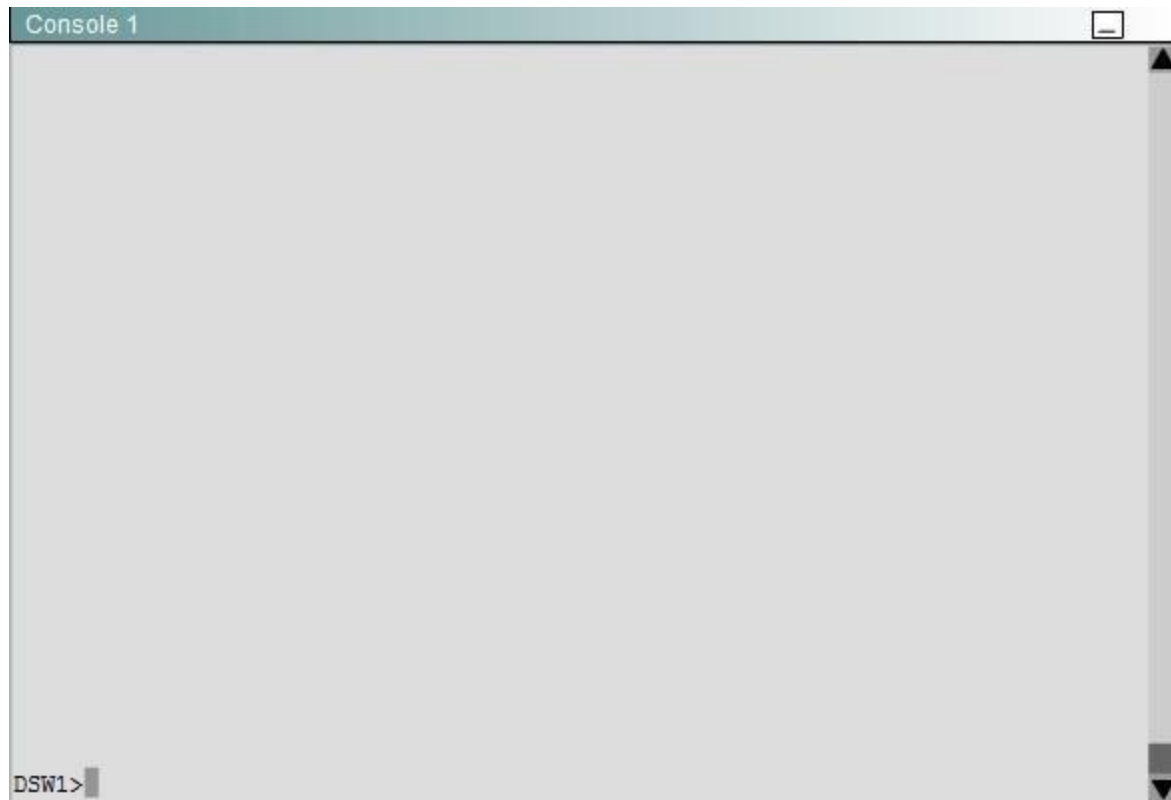
## QUESTION 152

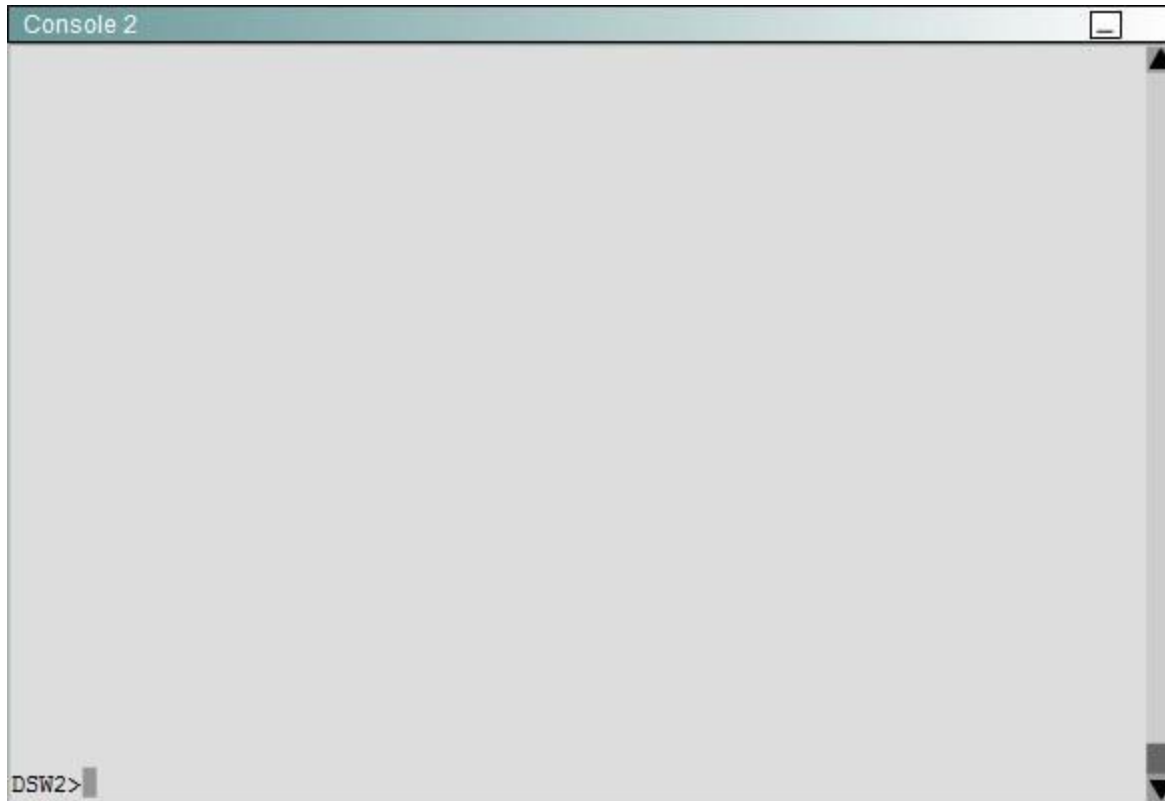
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- DSW1 -primary device for VLAN 101 VLAN 102 and VLAN 105
- DSW2 - primary device for VLAN 103 and VLAN 104
- A failure of GigabitEthernet1/0/1 on primary device should cause the primary device to release its status as the primary device, unless GigabitEthernet1/0/1 on backup device has also failed.

Troubleshooting has identified several issues. Currently all interfaces are up. Using the running configurations and show commands, you have been asked to investigate and respond to the following question.







If GigabitEthernet1/0/1 on DSW2 is shutdown, what will be the resulting priority value of the VLAN 105 HSRP group on router DSW2?

- A. 90
- B. 100
- C. 150
- D. 200

**Correct Answer:** A

**Section:** Infrastructure Services

**Explanation**

**Explanation/Reference:**

Explanation

As seen below, the current priority for VLAN 105 is 100, and the tracking feature for Gig 1/0/0 is enabled which will decrement the priority by 10 if this

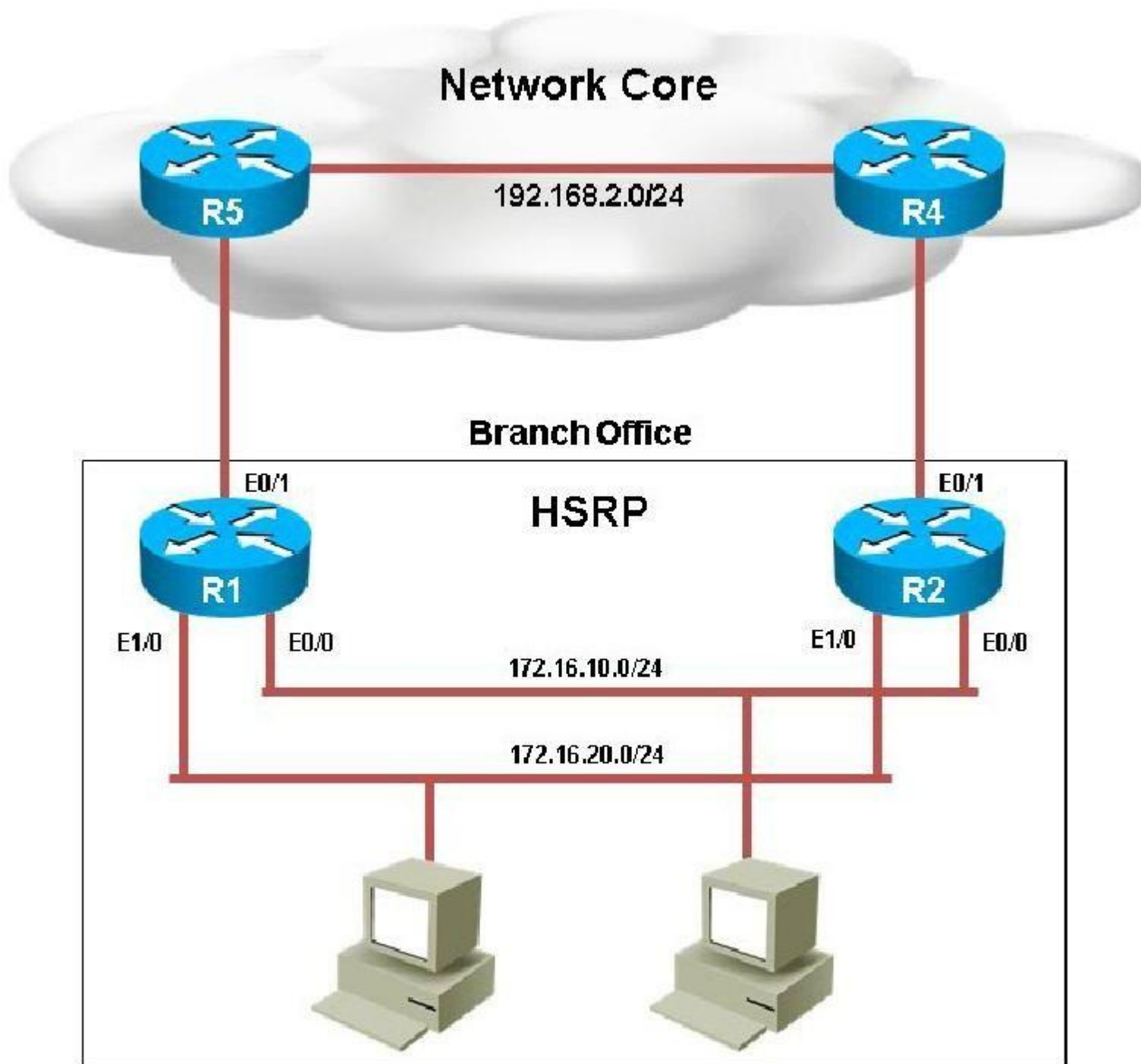
interface goes down for a priority value of 90.

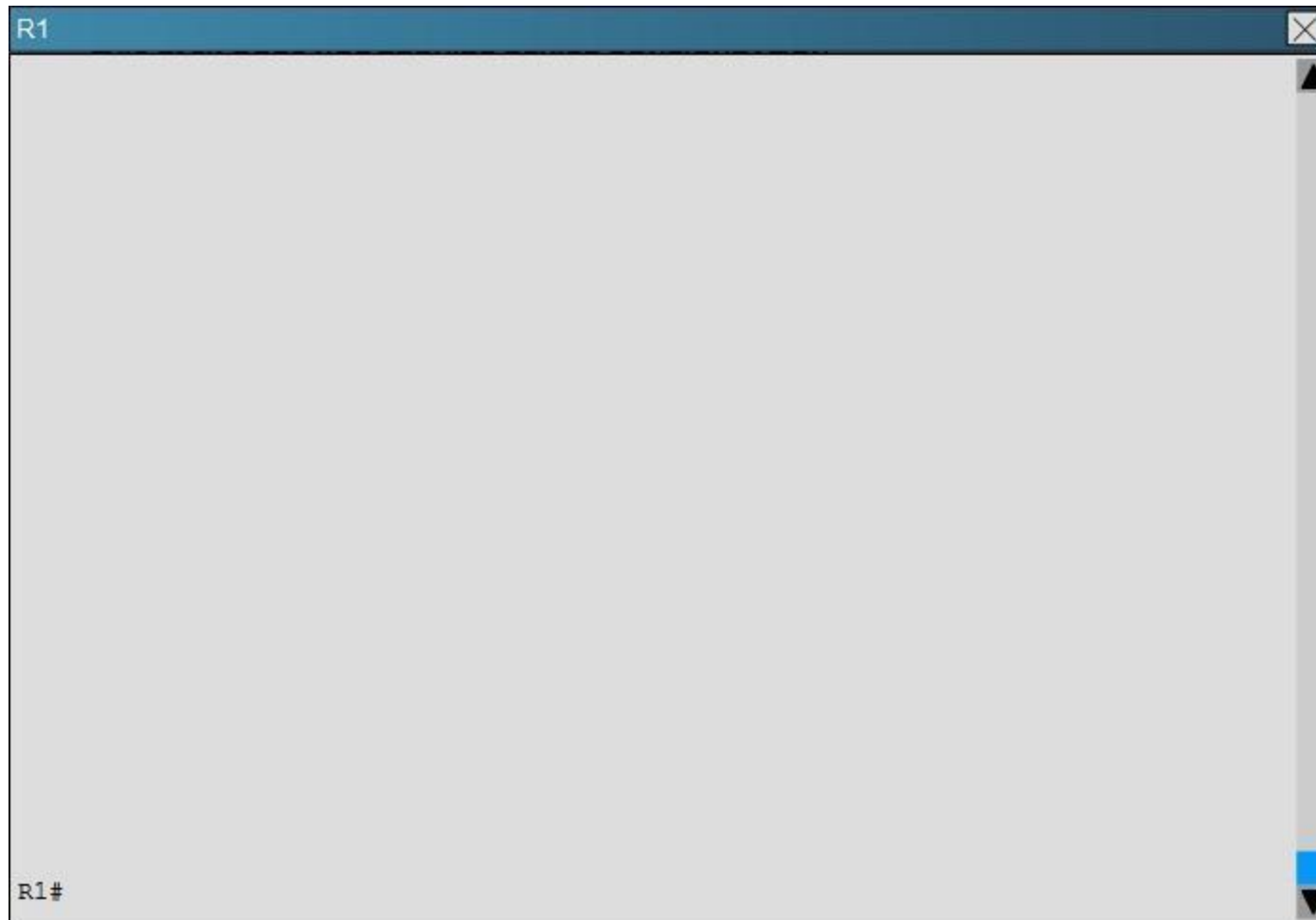
```
Vlan105 - Group 5
  State is Standby
    10 state changes, last state change 02:54:51
  Virtual IP address is 192.168.105.254
  Active virtual MAC address is 0000.0c07.ac05
    Local virtual MAC address is 0000.0c07.ac05 (v1 default)
  Hello time 3 sec, hold time 10 sec
    Next hello sent in 1.516 secs
  Preemption enabled
  Active router is 192.168.105.1, priority 150 (expires in 7.786 sec)
  Standby router is local
  Priority 100 (default 100)
    Track interface GigabitEthernet1/0/1 state Up decrement 10
  IP redundancy name is "hsrp-Vl105-5" (default)

DSW2#
```

## QUESTION 153

Your customer has asked you to come in and verify the operation of routers R1 and R2 which are configured to use HSRP. They have questions about how these two devices will perform in the event of a device failure.







What percentage of the outgoing traffic from the 172.16.10.0/24 subnet is being forwarded through R1?

- A. R1-0%
- B. R1-50 %, R2-50%
- C. R2-100%
- D. R1-100%

**Correct Answer: D**

**Section: Infrastructure Services**

**Explanation****Explanation/Reference:**

Explanation:

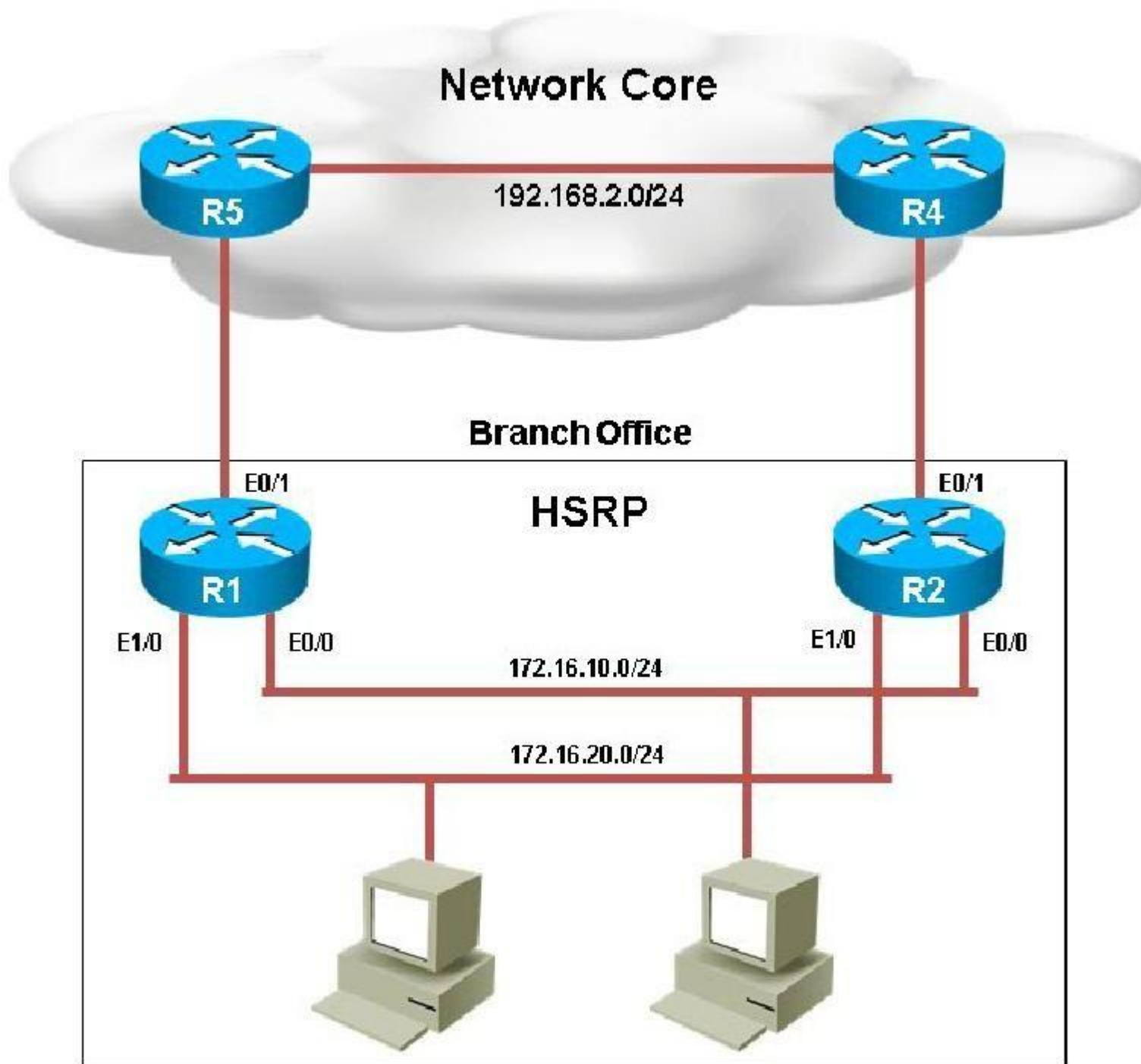
Based on the following output, we see that R1 is the active standby router for the Ethernet 0/0 link, so all outgoing traffic will be forwarded to R1.

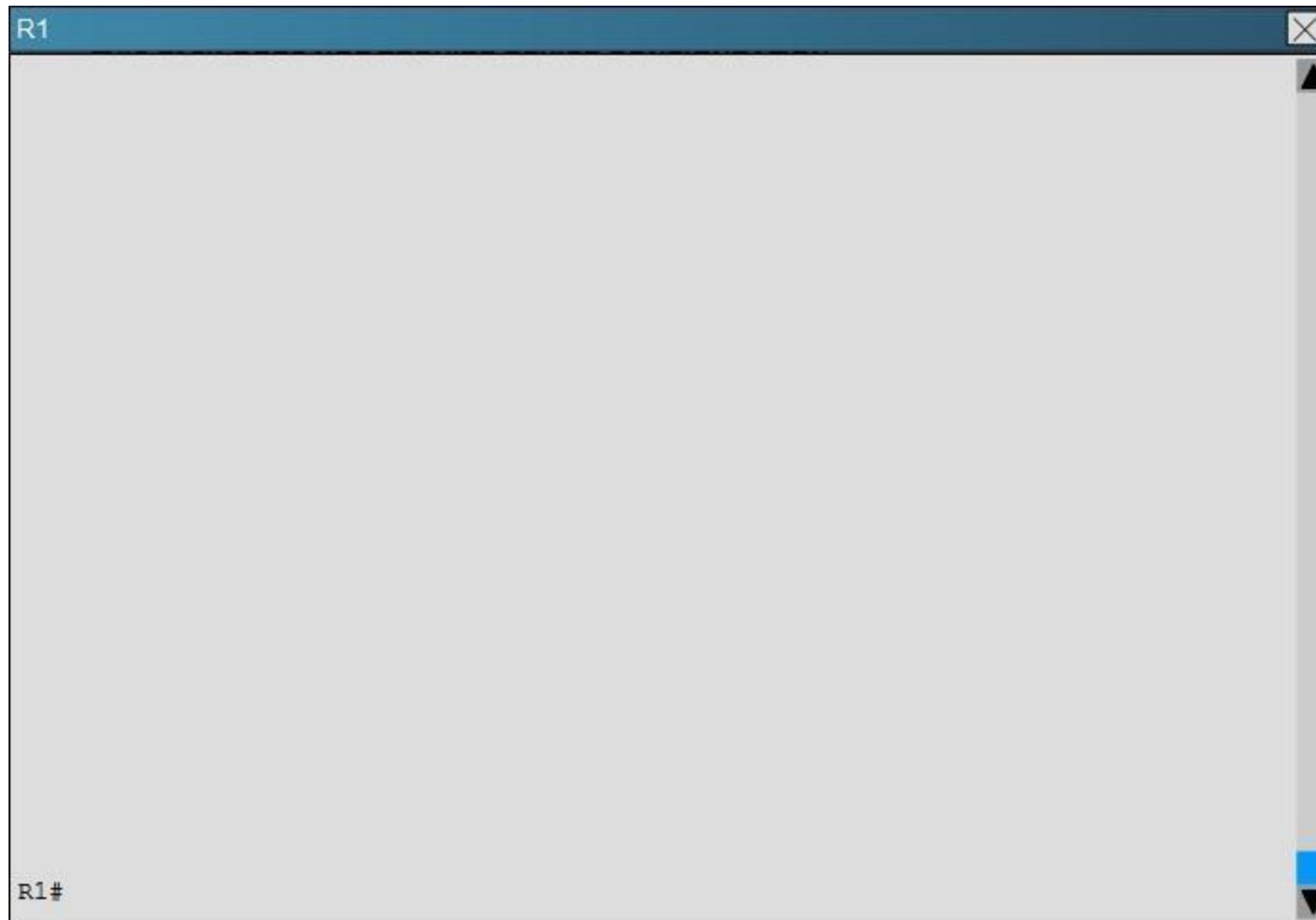
**R1**

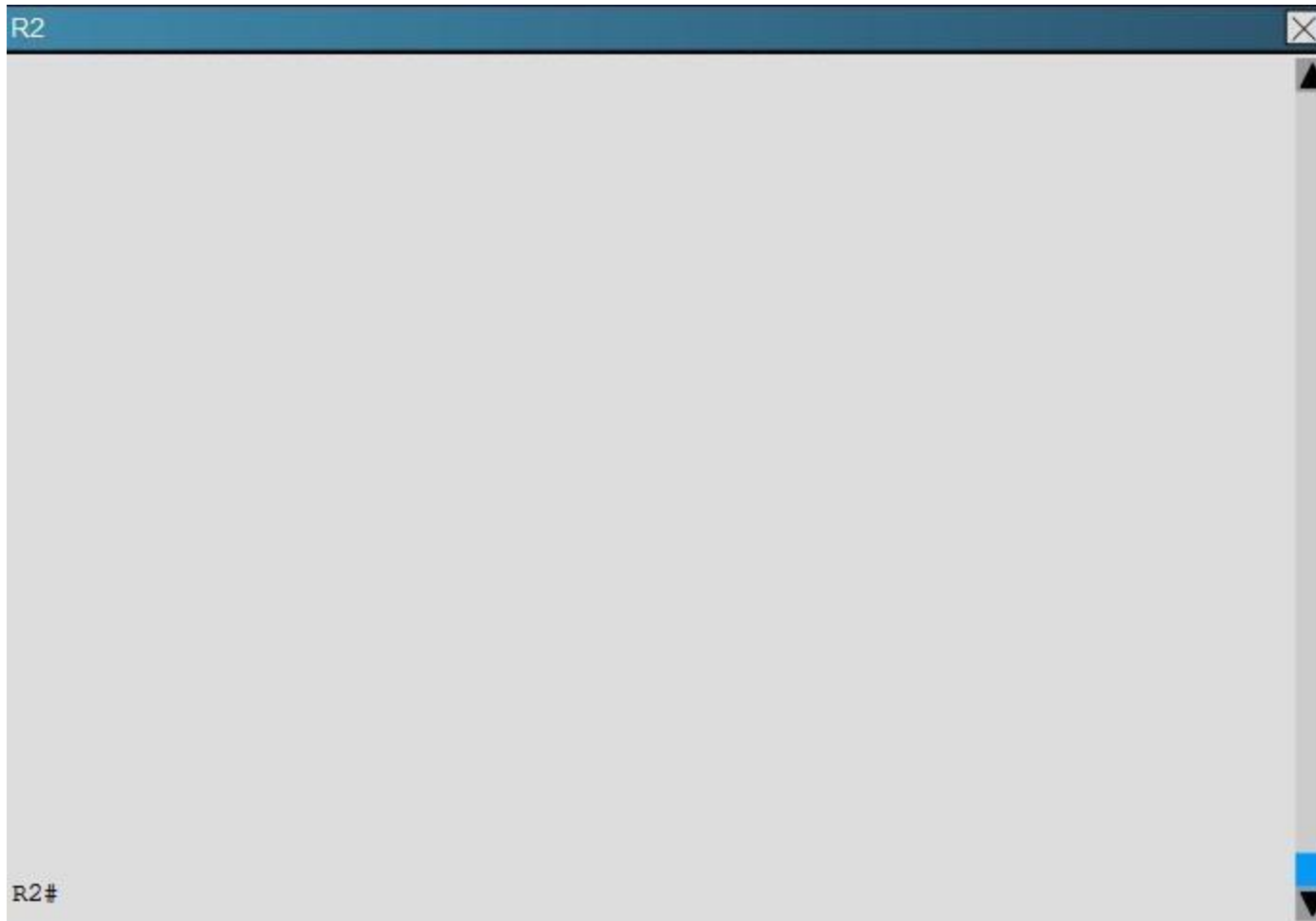
```
R1#show standby
Ethernet0/0 - Group 1
  State is Active
    2 state changes, last state change 00:05:01
  Virtual IP address is 172.16.10.254
  Active virtual MAC address is 4000.0000.0010 (MAC In Use)
    Local virtual MAC address is 4000.0000.0010 (cfgd)
  Hello time 3 sec, hold time 10 sec
    Next hello sent in 1.936 secs
  Authentication text, string "cisco123"
  Preemption enabled, delay reload 180 secs
  Active router is local
  Standby router is 172.16.10.1, priority 100 (expires in 10.464 sec)
  Priority 130 (configured 130)
    Track object 1 state Up decrement 40
  Group name is "hsrp-Et0/0-1" (default)
```

**QUESTION 154**

Your customer has asked you to come in and verify the operation of routers R1 and R2 which are configured to use HSRP. They have questions about how these two devices will perform in the event of a device failure.







What issue is causing Router R1 and R2 to both be displayed as the HSRP active router for group 2?

- A. The HSRP group number mismatch
- B. The HSRP group authentication is misconfigured
- C. The HSRP Hello packets are blocked
- D. The HSRP timers mismatch
- E. The HSRP group priorities are different

**Correct Answer: B**

## Section: Infrastructure Services

### Explanation

#### Explanation/Reference:

Explanation:

Based on the configuration output, we see that authentication is configured on R2, but not on R1:

R1

```
!  
interface Ethernet1/0  
  description Link to R2  
  ip address 172.16.20.2 255.255.255.0  
  standby 2 ip 172.16.20.254
```

```
!
```

**R2**

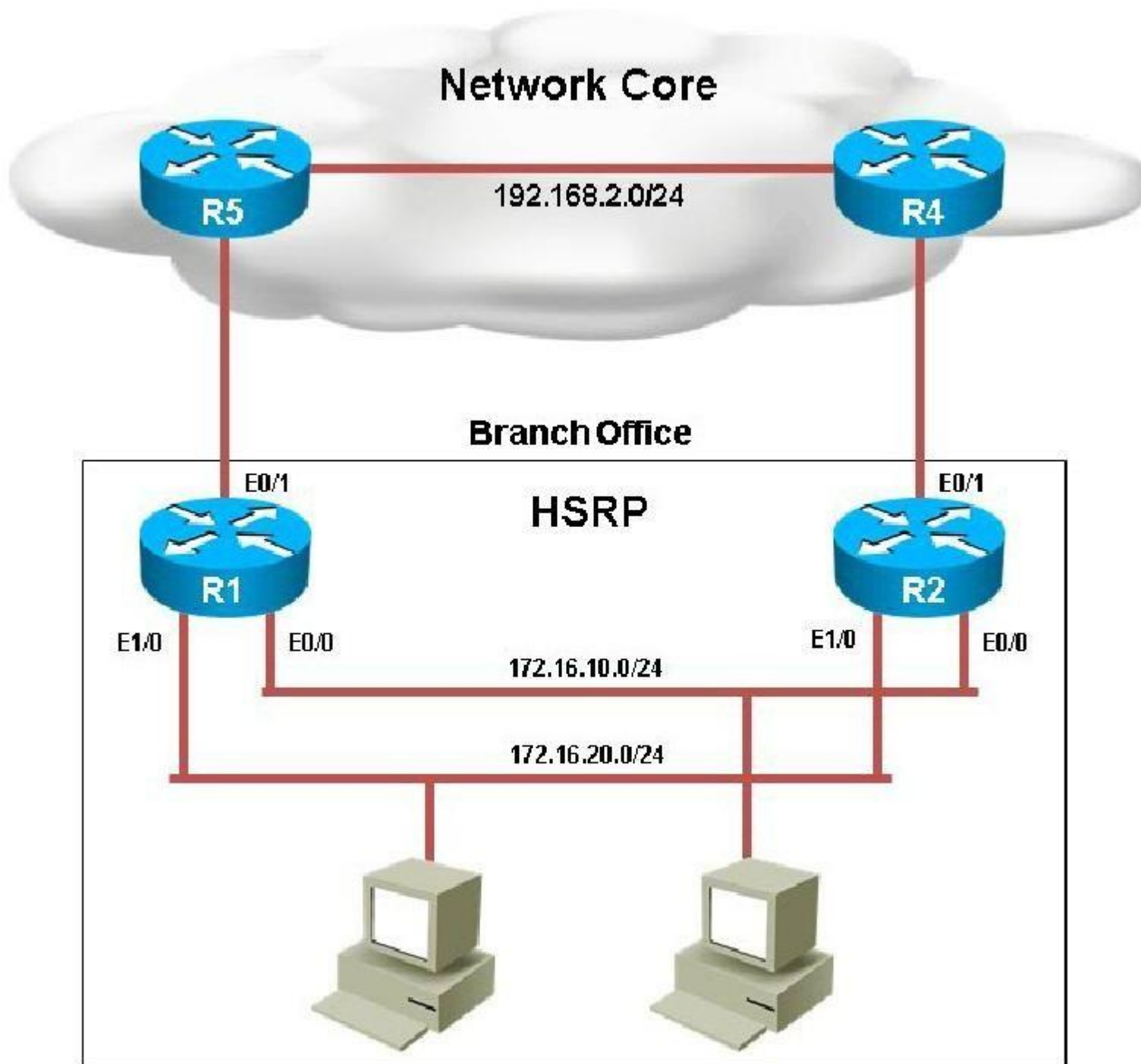
```
!  
interface Ethernet1/0  
  description Link to R1  
  ip address 172.16.20.1 255.255.255.0  
  standby 2 ip 172.16.20.254  
  standby 2 priority 130  
  standby 2 preempt delay reload 180  
  standby 2 authentication cisco123  
  standby 2 track 1 decrement 40  
!
```

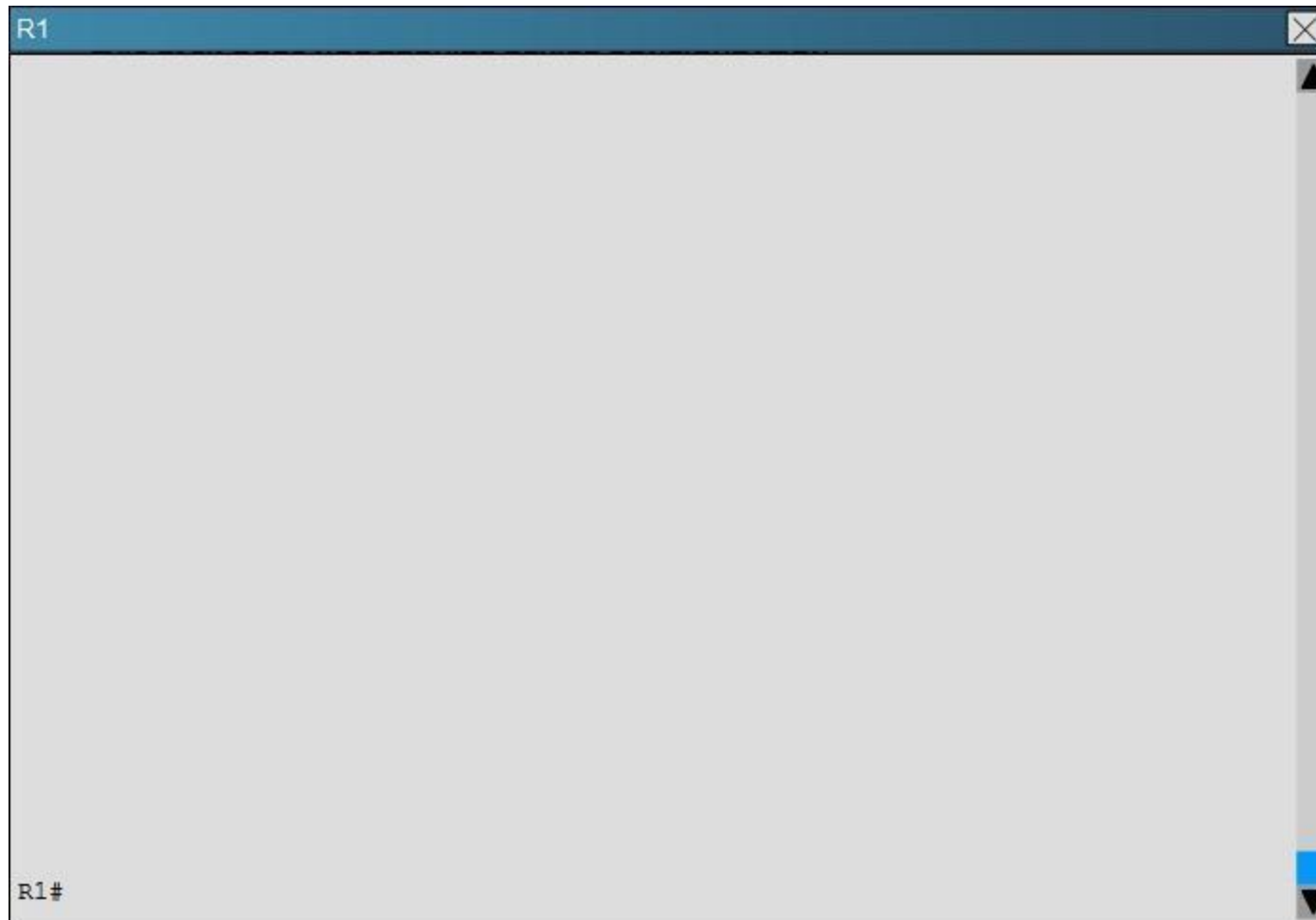
This can be further verified by issuing the show standby command on each router.

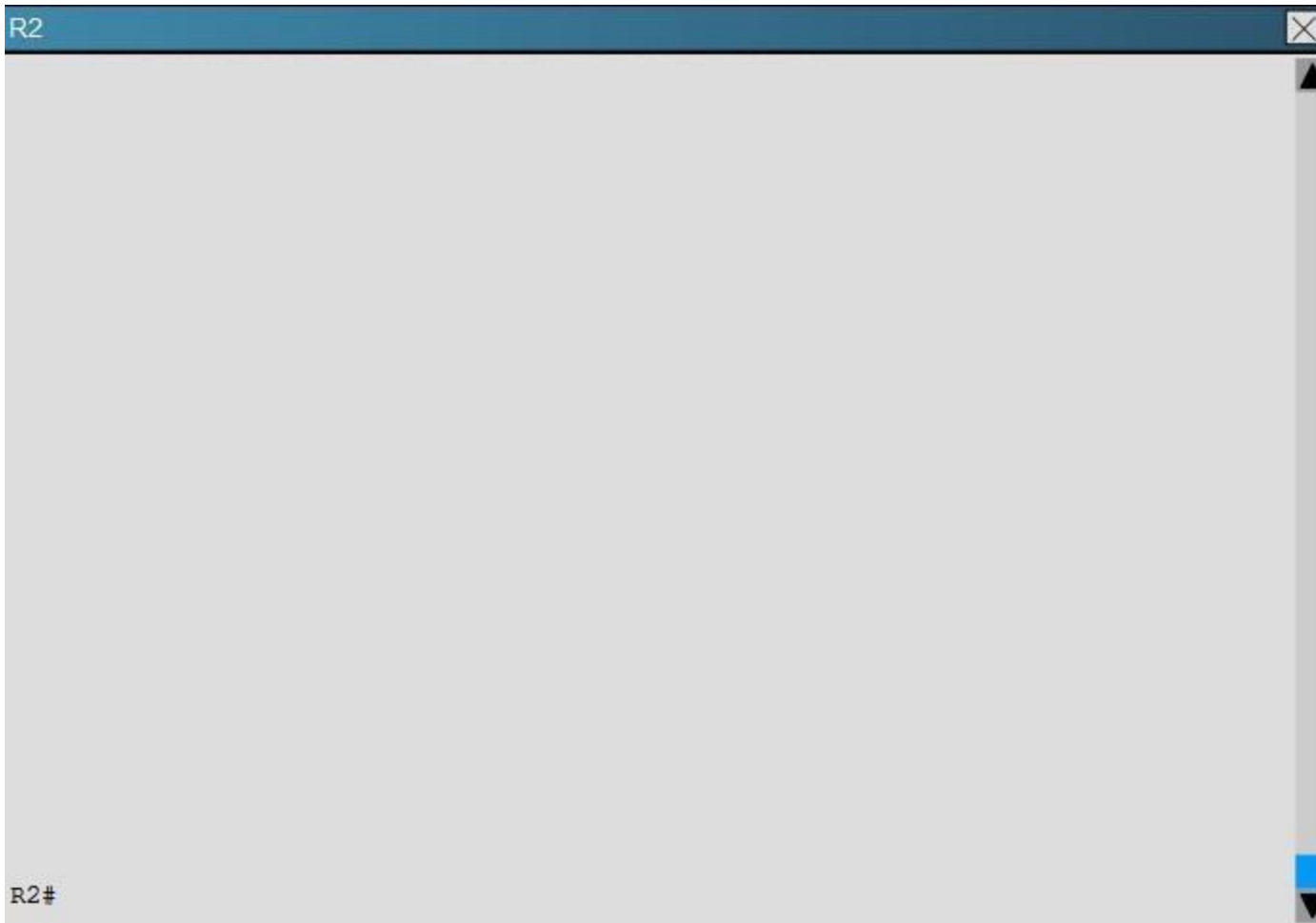
R1	R2
<pre> Ethernet1/0 - Group 2   State is Active     2 state changes, last state change 00:05:03   Virtual IP address is 172.16.20.254   Active virtual MAC address is 0000.0c07.ac02 (MAC In Use)     Local virtual MAC address is 0000.0c07.ac02 (v1 default)   Hello time 3 sec, hold time 10 sec     Next hello sent in 0.656 secs   Preemption disabled   Active router is local   Standby router is unknown   Priority 100 (default 100)   Group name is "hsrp-Et1/0-2" (default) R1# % Ambiguous command R1# </pre>	<pre> Ethernet1/0 - Group 2   State is Active     2 state changes, last state change 00:04:48   Virtual IP address is 172.16.20.254   Active virtual MAC address is 0000.0c07.ac02 (MAC In Use)     Local virtual MAC address is 0000.0c07.ac02 (v1 default)   Hello time 3 sec, hold time 10 sec     Next hello sent in 2.400 secs   Authentication text, string "cisco123"   Preemption enabled, delay reload 180 secs   Active router is local   Standby router is unknown   Priority 130 (configured 130)     Track object 1 state Up decrement 40   Group name is "hsrp-Et1/0-2" (default) R2# </pre>

## QUESTION 155

Your customer has asked you to come in and verify the operation of routers R1 and R2 which are configured to use HSRP. They have questions about how these two devices will perform in the event of a device failure.







What is the virtual mac-address of HSRP group 1?

- A. 0000.0c07.ac02
- B. 4000.0000.0010
- C. 0000.0c07.ac01
- D. 4000.0000.ac01
- E. 4000.0000.ac02
- F. 0000.0c07.0010

**Correct Answer:** B

**Section:** Infrastructure Services

**Explanation**

**Explanation/Reference:**

Explanation:

Issuing the show standby command on either router shows us that the virtual MAC used by HSRP group 1 is 4000.0000.0010.

## R1

```
R1#show standby
Ethernet0/0 - Group 1
  State is Active
    2 state changes, last state change 00:05:01
  Virtual IP address is 172.16.10.254
  Active virtual MAC address is 4000.0000.0010 (MAC In Use)
    Local virtual MAC address is 4000.0000.0010 (cfgd)
  Hello time 3 sec, hold time 10 sec
    Next hello sent in 1.936 secs
  Authentication text, string "cisco123"
  Preemption enabled, delay reload 180 secs
  Active router is local
  Standby router is 172.16.10.1, priority 100 (expires in 10.464 sec)
  Priority 130 (configured 130)
    Track object 1 state Up decrement 40
  Group name is "hsrp-Et0/0-1" (default)
```

## R2

```
R2#show standby
Ethernet0/0 - Group 1
  State is Standby
    1 state change, last state change 00:04:38
  Virtual IP address is 172.16.10.254
  Active virtual MAC address is 4000.0000.0010 (MAC Not In Use)
    Local virtual MAC address is 4000.0000.0010 (cfgd)
  Hello time 3 sec, hold time 10 sec
    Next hello sent in 0.128 secs
  Authentication text, string "cisco123"
  Preemption disabled
  Active router is 172.16.10.2, priority 130 (expires in 10.512 sec)
  Standby router is local
  Priority 100 (default 100)
  Group name is "hsrp-Et0/0-1" (default)
```

**QUESTION 156**

You have been tasked with configuring multilayer SwitchC, which has a partial configuration and has been attached to RouterC as shown in the topology diagram.

**You need to configure SwitchC so that Hosts H1 and H2 can successfully ping the server S1. Also SwitchC needs to be able to ping server S1.**

Due to administrative restrictions and requirements you should not add/delete vlans or create trunk links. Company policies forbid the use of static or default routing. All routes must be learned via EIGRP 65010 routing protocol.

You do not have access to RouterC. RouterC is correctly configured. No trunking has been configured on RouterC.

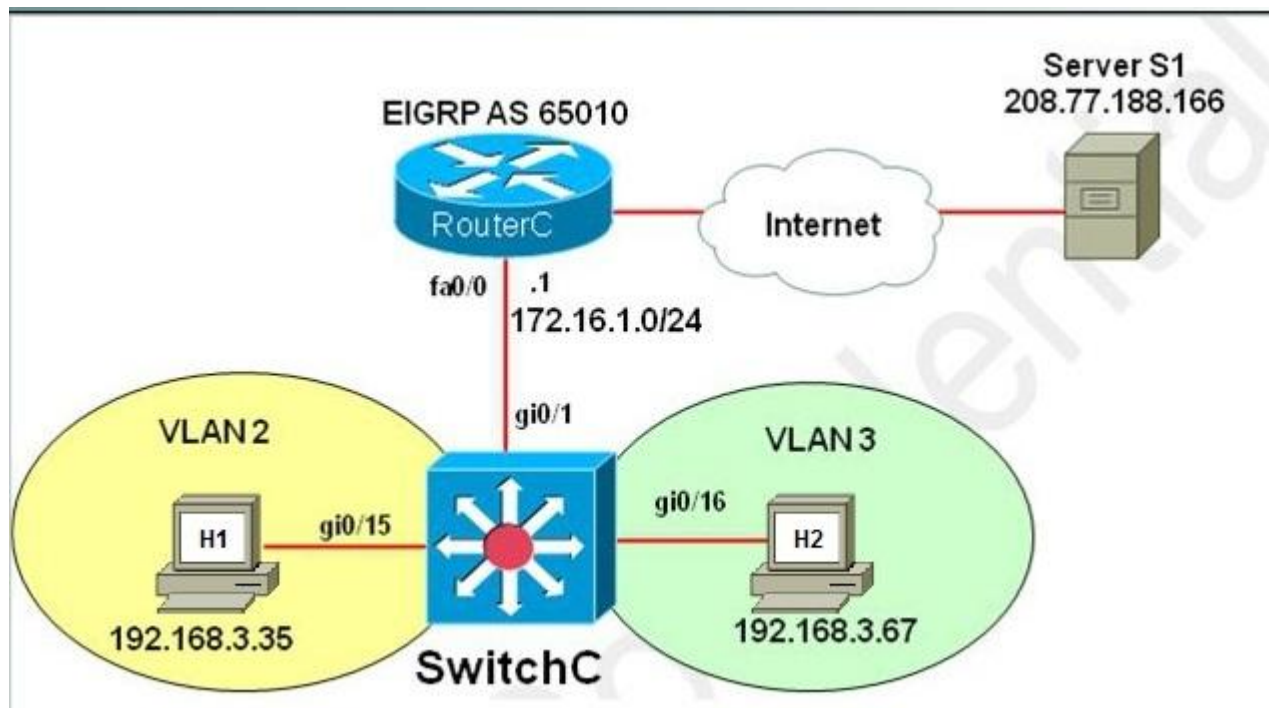
Routed interfaces should use the lowest host on a subnet when possible. The following subnets are available to implement this solution:

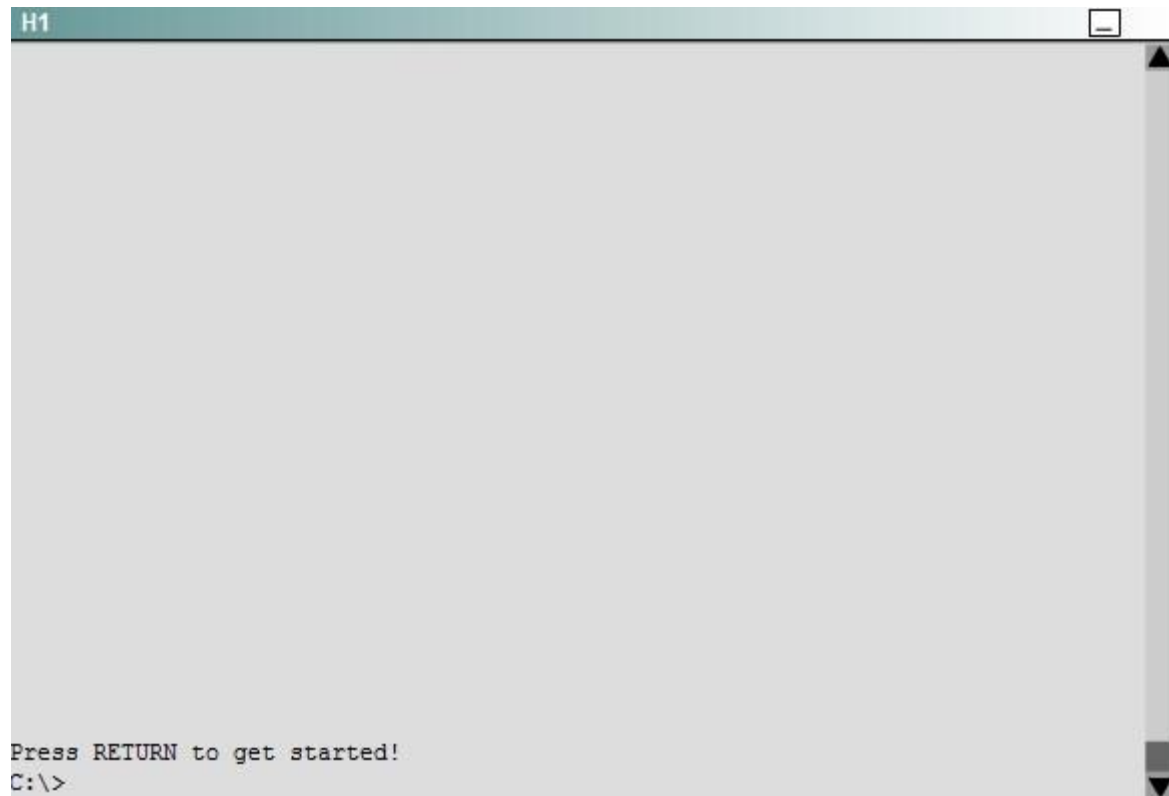
- 10.10.10.0/24
- 190.200.250.32/27
- 190.200.250.64/27

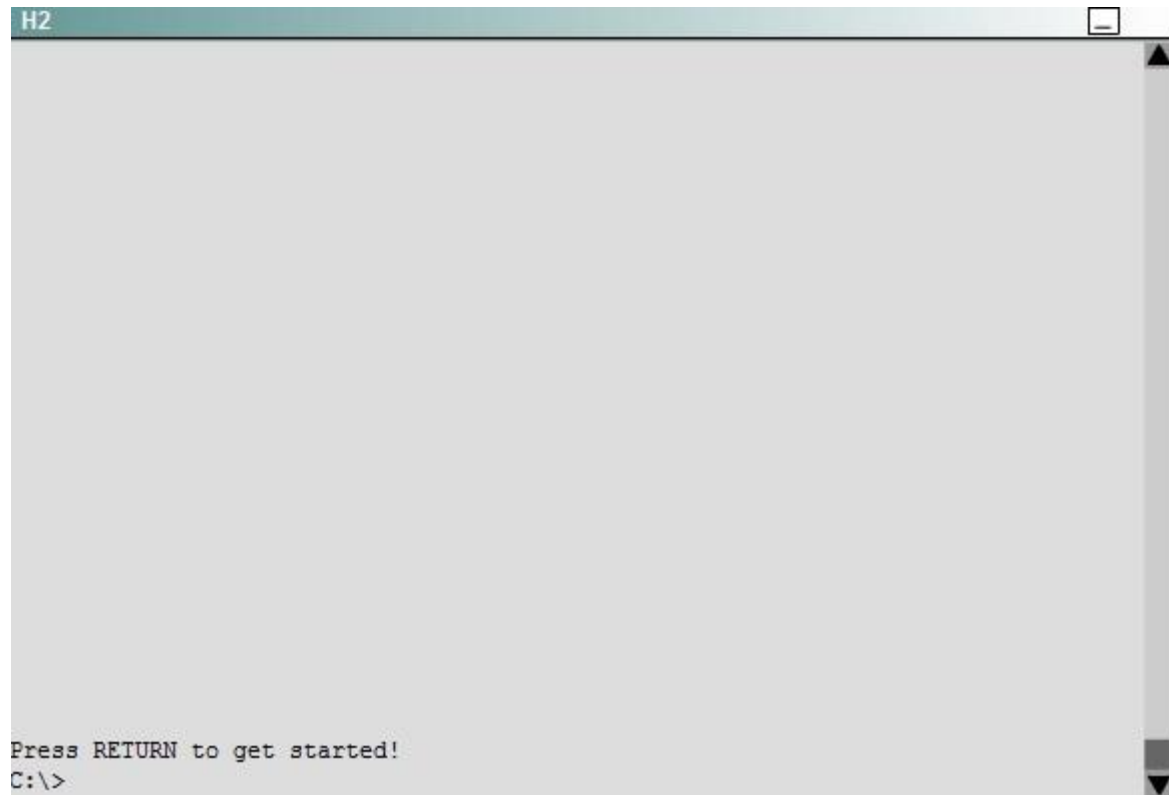
Hosts H1 and H2 are configured with the correct IP address and default gateway.  
SwitchC uses Cisco as the enable password.

Routing must only be enabled for the specific subnets shown in the diagram.

Note: Due to administrative restrictions and requirements you should not add or delete VLANs, changes VLAN port assignments or create trunks.  
Company policies forbid the use of static or default routing. All routes must be learned via the EIGRP routing protocol.







```

SwitchC
%LINK-3-UPDOWN: Interface GigabitEthernet0/22, changed state to administratively
down
%LINK-3-UPDOWN: Interface GigabitEthernet0/23, changed state to administratively
down
%LINK-3-UPDOWN: Interface GigabitEthernet0/24, changed state to administratively
down
%LINK-3-UPDOWN: Interface GigabitEthernet0/25, changed state to administratively
down
%LINK-3-UPDOWN: Interface GigabitEthernet0/26, changed state to administratively
down
%LINK-3-UPDOWN: Interface GigabitEthernet0/27, changed state to administratively
down
%LINK-3-UPDOWN: Interface GigabitEthernet0/28, changed state to administratively
down
%LINK-3-UPDOWN: Interface GigabitEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed stat
e to up
%LINK-3-UPDOWN: Interface GigabitEthernet0/16, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/16, changed sta
te to up
%LINK-3-UPDOWN: Interface GigabitEthernet0/15, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/15, changed sta
te to up
Press RETURN to get started!
SwitchC>

```

**Correct Answer:** There are two ways to configure interVLAN routing in this case: + Use RouterC as a “router on a stick” and SwitchC as a pure Layer2 switch. Trunking must be established between RouterC and SwitchC. + Only use SwitchC for interVLAN routing without using RouterC, SwitchC should be configured as a Layer 3 switch (which supports ip routing function as a router). No trunking requires. The question clearly states “No trunking has been configured on RouterC” so RouterC does not contribute to interVLAN routing of hosts H1 & H2 -> SwitchC must be configured as a Layer 3 switch with SVIs for interVLAN routing. We should check the default gateways on H1 & H2. Click on H1 and H2 and type the “ipconfig” command to get their default gateways. C:\>ipconfig We will get the default gateways as follows: Host1: + Default gateway: 190.200.250.33 Host2: + Default gateway: 190.200.250.65 Now we have enough information to configure SwitchC (notice the EIGRP AS in this case is 650) Note: VLAN2 and VLAN3 were created and gi0/10, gi0/11 interfaces were configured as access ports so we don't need to configure them in this sim. SwitchC# configure terminal SwitchC(config)# int gi0/1 SwitchC(config-if)#no switchport -> without using this command, the simulator does not let you assign IP address on Gi0/1 interface. SwitchC(config-if)# ip address 10.10.10.2 255.255.255.0 ->RouterC has used IP 10.10.10.1 so this is the lowest usable IP address. SwitchC

```
(config-if)# no shutdown SwitchC(config-if)# exit SwitchC(config)# int vlan 2 SwitchC(config-if)# ip address 190.200.250.33 255.255.255.224 SwitchC
(config-if)# no shutdown SwitchC(config-if)# int vlan 3 SwitchC(config-if)# ip address 190.200.250.65 255.255.255.224 SwitchC(config-if)# no shutdown
SwitchC(config-if)#exit SwitchC(config)# ip routing (Notice: MLS will not work without this command) SwitchC(config)# router eigrp 65010 SwitchC
(config-router)# network 10.10.10.0 0.0.0.255 SwitchC(config-router)# network 190.200.250.32 0.0.0.31 SwitchC(config-router)# network
190.200.250.64 0.0.0.31 NOTE: THE ROUTER IS CORRECTLY CONFIGURED, so you will not miss within it in the exam, also don't modify/delete any
port just do the above configuration. Also some reports said the "no auto-summary" command can't be used in the simulator, in fact it is not necessary
because the network 190.200.0.0/16 is not used anywhere else in this topology. In order to complete the lab, you should expect the ping to SERVER to
succeed from the MLS, and from the PCs as well. Also make sure you use the correct EIGRP AS number (in the configuration above it is 650 but it will
change when you take the exam) but we are not allowed to access RouterC so the only way to find out the EIGRP AS is to look at the exhibit above. If
you use wrong AS number, no neighbor relationship is formed between RouterC and SwitchC. In fact, we are pretty sure instead of using two commands
"network 190.200.250.32 0.0.0.31" and "network 190.200.250.64 0.0.0.31" we can use one simple command "network 190.200.0.0" because it is the
nature of distance vector routing protocol like EIGRP: only major networks need to be advertised; even without "no auto-summary" command the
network still works correctly. But in the exam the sim is just a flash based simulator so we should use two above commands, just for sure. But after
finishing the configuration, we can use "show run" command to verify, only the summarized network 190.200.0.0 is shown.
```

**Section: (none)**

**Explanation**

**Explanation/Reference:**

## QUESTION 157

A network engineer must set the load balance method on an existing port channel. Which action must be done to apply a new load balancing method?

- A. Configure the new load balancing method using port-channel load-balance.
- B. Adjust the switch SDM back to "default".
- C. Ensure that IP CEF is enabled globally to support all load balancing methods.
- D. Upgrade the PFC to support the latest load balancing methods.

**Correct Answer: A**

**Section: Layer 2 Technologies**

**Explanation**

**Explanation/Reference:**

Example:

EtherChannel balances the traffic load across the links in a channel through the reduction of part of the binary pattern that the addresses in the frame form to a numerical value that selects one of the links in the channel. EtherChannel load balancing can use MAC addresses or IP addresses, source or destination addresses, or both source and destination addresses. The mode applies to all EtherChannels that are configured on the switch. You configure the load balancing and forwarding method with use of the port-channel load-balance {dst-ip | dst-mac | src-dst-ip | src-dst-mac | src-ip | src-mac} global configuration command. Reference: <http://www.cisco.com/c/en/us/support/docs/lan-switching/etherchannel/12023-4.html>

## QUESTION 158

What is the default HSRP priority?

- A. 50
- B. 100
- C. 120
- D. 1024

**Correct Answer:** B

**Section:** Infrastructure Services

**Explanation**

**Explanation/Reference:**

Explanation:

standby [group- Set a priority value used in choosing the active router. The number] priority priority range is 1 to 255; the default priority is 100. The highest [preempt [delay delay]] number represents the highest priority.

· --The group number to which  
(Optional) group-number  
the command applies.

· --Select so that when the local router  
(Optional) preempt  
has a higher priority than the active router, it assumes control as the active router.

· --Set to cause the local router to post-  
(Optional) delay  
pone taking over the active role for the shown number of  
seconds. The range is 0 to 36000 (1 hour); the default is 0 (no delay before taking over).

Use the no form of the command to restore the default values.

Reference:

[http://www.cisco.com/en/US/docs/switches/lan/catalyst3550/software/release/12.1\\_19\\_ea1/configuration/guide/swhsrp.html#wp1044327](http://www.cisco.com/en/US/docs/switches/lan/catalyst3550/software/release/12.1_19_ea1/configuration/guide/swhsrp.html#wp1044327)

## QUESTION 159

You have just created a new VLAN on your network. What is one step that you should include in your VLAN-based implementation and verification plan?

- A. Verify that different native VLANs exist between two switches for security purposes.
- B. Verify that the VLAN was added on all switches with the use of the show vlan command.
- C. Verify that the switch is configured to allow for trunking on the switch ports.
- D. Verify that each switch port has the correct IP address space assigned to it for the new VLAN.

**Correct Answer:** B

**Section:** Infrastructure Services

**Explanation**

**Explanation/Reference:**

As part of verification plan you have to verify that the VLAN was added on all switches. The command show vlan can be used for this purpose.

Reference:

<http://www.ccnpguide.com/design-documentation/>

## QUESTION 160

During the implementation of a voice solution, which two required items are configured at an access layer switch that will be connected to an IP phone to provide VoIP communication? (Choose two.)

- A. allowed codecs
- B. untagged VLAN
- C. auxiliary VLAN
- D. Cisco Unified Communications Manager IP address

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Reference: <http://networkingnerd.net/2012/05/09/switchport-voice-vlan-post/>

## QUESTION 161

Which two characteristics apply to Cisco Catalyst 6500 Series Switch supervisor redundancy using NSF? (Choose two.)

- A. supported by RIPv2, OSPF, IS-IS, and EIGRP
- B. uses the FIB table
- C. supports IPv4 and IPv6 multicast
- D. prevents route flapping

**Correct Answer:** D

**Section:** Layer 2 Technologies

**Explanation**

**Explanation/Reference:**

A key element of NSF is packet forwarding. In a Cisco networking device, packet forwarding is provided by Cisco Express Forwarding (CEF). CEF maintains the FIB, and uses the FIB information that was current at the time of the switchover to continue forwarding packets during a switchover. This

feature reduces traffic interruption during the switchover.

During normal NSF operation, CEF on the active supervisor engine synchronizes its current FIB and adjacency databases with the FIB and adjacency databases on the redundant supervisor engine. Upon switchover of the active supervisor engine, the redundant supervisor engine initially has FIB and adjacency databases that are mirror images of those that were current on the active supervisor engine. For platforms with intelligent modules, the modules will maintain the current forwarding information over a switchover. For platforms with forwarding engines, CEF will keep the forwarding engine on the redundant supervisor engine current with changes that are sent to it by CEF on the active supervisor engine. The modules or forwarding engines will be able to continue forwarding after a switchover as soon as the interfaces and a data path are available.

As the routing protocols start to repopulate the RIB on a prefix-by-prefix basis, the updates will cause prefix-by-prefix updates to CEF, which it uses to update the FIB and adjacency databases. Existing and new entries will receive the new version ("epoch") number, indicating that they have been refreshed. The forwarding information is updated on the modules or forwarding engine during convergence. The supervisor engine signals when the RIB has converged. The software removes all FIB and adjacency entries that have an epoch older than the current switchover epoch. The FIB now represents the newest routing protocol forwarding information.

## QUESTION 162

Scenario:

You work for SWITCH.com. They have just added a new switch (SwitchB) to the existing network as shown in the topology diagram. RouterA is currently configured correctly and is providing the routing function for devices on SwitchA and SwitchB. SwitchA is currently configured correctly, but will need to be modified to support the addition of SwitchB. SwitchB has a minimal configuration. You have been tasked with completing the needed configuring of SwitchA and SwitchB. SwitchA and SwitchB use Cisco as the enable password.

### Configuration Requirements for SwitchA

The VTP and STP configuration modes on SwitchA should not be modified.

- SwitchA needs to be the root switch for vlans 11, 12, 13, 21, 22 and 23. All other vlans should be left at their default values.

### Configuration Requirements for SwitchB

- Vlan 21

Name: Marketing

will support two servers attached to fa0/9 and fa0/10

- Vlan 22

Name: Sales

will support two servers attached to fa0/13 and fa0/14

- Vlan 23

- o Name: Engineering

- o will support two servers attached to fa0/15 and fa0/16

- Access ports that connect to server should transition immediately to forwarding state upon detecting the connection of a device.

- SwitchB VTP mode needs to be the same as SwitchA.

- SwitchB must operate in the same spanning tree mode as SwitchA

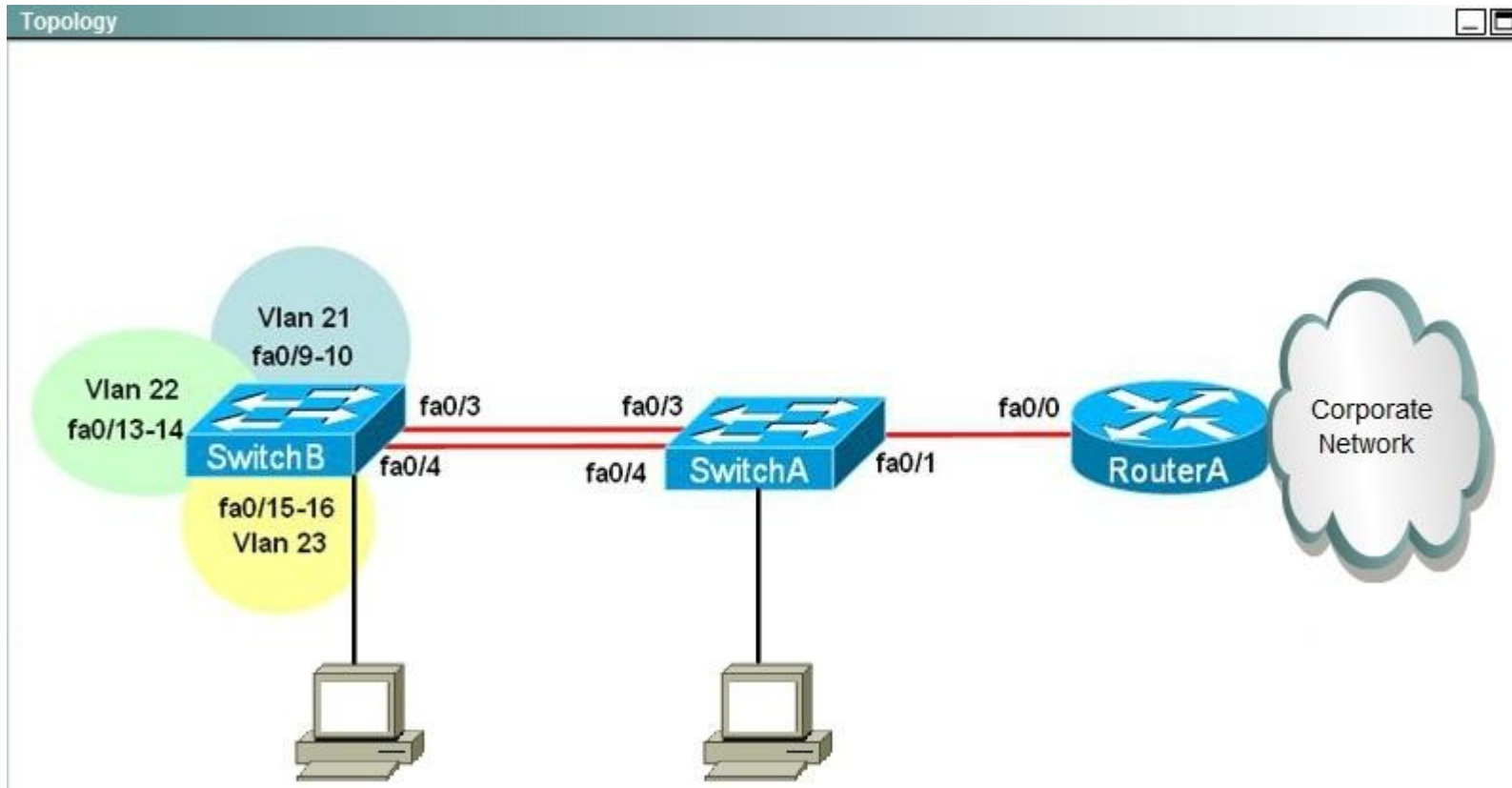
- No routing is to be configured on SwitchB

- Only the SVI vlan 1 is to be configured and it is to use address 192.168.1.11/24

### Inter-switch Connectivity Configuration Requirements

- For operational and security reasons trunking should be unconditional and Vlans 1, 21, 22 and 23 should be tagged when traversing the trunk link.

- The two trunks between SwitchA and SwitchB need to be configured in a mode that allows for the maximum use of their bandwidth for all vlans. This mode should be done with a non-proprietary protocol, with SwitchA controlling activation.
- Propagation of unnecessary broadcasts should be limited using manual pruning on this trunk link.



**Correct Answer:** Here are steps: hostname SWITCH\_B !! vlan 21 name Marketing vlan 22 name Sales vlan 23 name Engineering !! interface FastEthernet0/3 switchport trunk allowed vlan 1,21-23 channel-protocol lacp channel-group 1 mode passive switchport mode trunk ! interface FastEthernet0/4 switchport trunk allowed vlan 1,21-23 channel-protocol lacp channel-group 1 mode passive switchport mode trunk ! interface FastEthernet0/9 switchport access vlan 21 switchport mode access spanning-tree portfast ! interface FastEthernet0/10 switchport access vlan 21 switchport mode access spanning-tree portfast ! interface FastEthernet0/13 switchport access vlan 22 switchport mode access spanning-tree portfast ! ! interface FastEthernet0/14 switchport access vlan 22 switchport mode access spanning-tree portfast ! interface FastEthernet0/15 switchport access vlan 23 switchport mode access spanning-tree portfast ! interface FastEthernet0/16 switchport access vlan 23 switchport mode access spanning-tree portfast ! ! interface GigabitEthernet1/1 ! interface GigabitEthernet1/2 ! interface Port-channel 1 switchport mode trunk switchport trunk encapsulation dot1q spanning-tree allowed vlans 1,21-23 ! interface Vlan1 ip address 192.168.1.11 255.255.255.0 ! end SWITCH\_B(config)# hostname SWITCH\_A ! panning-tree vlan 11 root primary spanning-tree vlan 12 root primary spanning-tree vlan 13 root primary spanning-tree vlan 21 root primary spanning-

```
tree vlan 22 root primary spanning-tree vlan 23 root primary ! interface FastEthernet0/3 switchport trunk allowed vlan 1,21-23 channel-protocol lacp
channel-group 1 mode active switchport mode trunk ! interface FastEthernet0/4 switchport trunk allowed vlan 1,21-23 channel-protocol lacp channel-
group 1 mode active switchport mode trunk ! interface FastEthernet0/21 switchport access vlan 21 switchport mode access ! interface FastEthernet0/22
switchport access vlan 22 switchport mode access ! interface FastEthernet0/23 switchport access vlan 23 switchport mode access ! interface
GigabitEthernet1/1 ! interface GigabitEthernet1/2 ! interface Port-channel 1 ! interface Vlan1 no ip address shutdown ! ip default-gateway 192.168.1.1 !!
End
```

**Section: (none)**

**Explanation**

**Explanation/Reference:**

## QUESTION 163

What does the interface subcommand switchport voice vlan 222 indicate?

- A. The port is configured for both data and voice traffic.
- B. The port is fully dedicated to forwarding voice traffic.
- C. The port operates as an FXS telephony port.
- D. Voice traffic is directed to VLAN 222.

**Correct Answer: A**

**Section: Infrastructure Services**

**Explanation**

**Explanation/Reference:**

The interface subcommand:

Switch(config-if)# switchport voice vlan {vlan-id | dot1p | untagged | none}

is used to select the voice VLAN mode that will be used when PC is connected to the switch port through Cisco IP phone.

Reference:

[http://www.cisco.com/en/US/docs/switches/lan/catalyst3560/software/release/12.2\\_20\\_se/configuration/guide/swvoip.html](http://www.cisco.com/en/US/docs/switches/lan/catalyst3560/software/release/12.2_20_se/configuration/guide/swvoip.html)