

**200-105.exam.518q**

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**Cisco 200-105**

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**Interconnecting Cisco Networking Devices Part 2 (ICND2)**

**Exam A****QUESTION 1**

Which protocol authenticates connected devices before allowing them to access the LAN?

- A. 802.1d
- B. 802.11
- C. 802.1w
- D. 802.1x

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 2**

What is a difference between TACACS+ and RADIUS in AAA?

- A. Only TACACS+ allows for separate authentication.
- B. Only RADIUS encrypts the entire access-request packet.
- C. Only RADIUS uses TCP.
- D. Only TACACS+ couples authentication and authorization.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 3**

Which statement about the IP SLAs ICMP Echo operation is true?

- A. The frequency of the operation is specified in milliseconds.
- B. It is used to identify the best source interface from which to send traffic.
- C. It is configured in **enable** mode.

D. It is used to determine the frequency of ICMP packets

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 4**

Which type of interface can negotiate an IP address for a PPPoE client?

- A. Ethernet
- B. dialer
- C. serial
- D. Frame Relay

**Correct Answer:** B

**Section:** (none)

**Explanation**



**Explanation/Reference:**

Reference: <http://www.cisco.com/c/en/us/td/docs/ios-xml/ios/bbds/configuration/xr-3s/bba-pppoe-client.html#GUID-FFFC40B9-3F50-484A-92FF-7458E7E4FC47>

#### **QUESTION 5**

Which option is a benefit of switch stacking?

- A. It provides redundancy with no impact on resource usage.
- B. It simplifies adding and removing hosts.
- C. It supports better performance of high-needs applications.
- D. It provides higher port density with better resource usage.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 6**

What is the first step you perform to configure an SNMPv3 user?

- A. Configure server traps.
- B. Configure the server group.
- C. Configure the server host.
- D. Configure the remote engine ID.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 7**

Which spanning-tree feature places a port immediately into a forwarding state?

- A. BPDU guard
- B. PortFast
- C. loop guard
- D. UDLD
- E. UplinkFast



**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 8**

How can you disable DTP on a switch port?

- A. Configure the switch port as a trunk.
- B. Add an interface on the switch to a channel group.
- C. Change the operational mode to **static access**.
- D. Change the administrative mode to **access**.



**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 9**

If host Z needs to send data through router R1 to a storage server, which destination MAC address does host Z use to transmit packets?

- A. the host Z MAC address
- B. the MAC address of the interface on R1 that connects to the storage server
- C. the MAC address of the interface on R1 that connects to host Z.
- D. the MAC address of the storage server interface.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**



#### **QUESTION 10**

Which Cisco platform can verify ACLs?

- A. Cisco Prime Infrastructure
- B. Cisco Wireless LAN Controller
- C. Cisco APIC-EM
- D. Cisco IOS-XE

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 11**

Which statement about QoS default behavior is true?

- A. Ports are untrusted by default.
- B. VoIP traffic is passed without being tagged.
- C. Video traffic is passed with a well-known DSCP value of 46.
- D. Packets are classified internally with an environment.
- E. Packets that arrive with a tag are untagged at the edge of an administrative domain.

**Correct Answer:** A

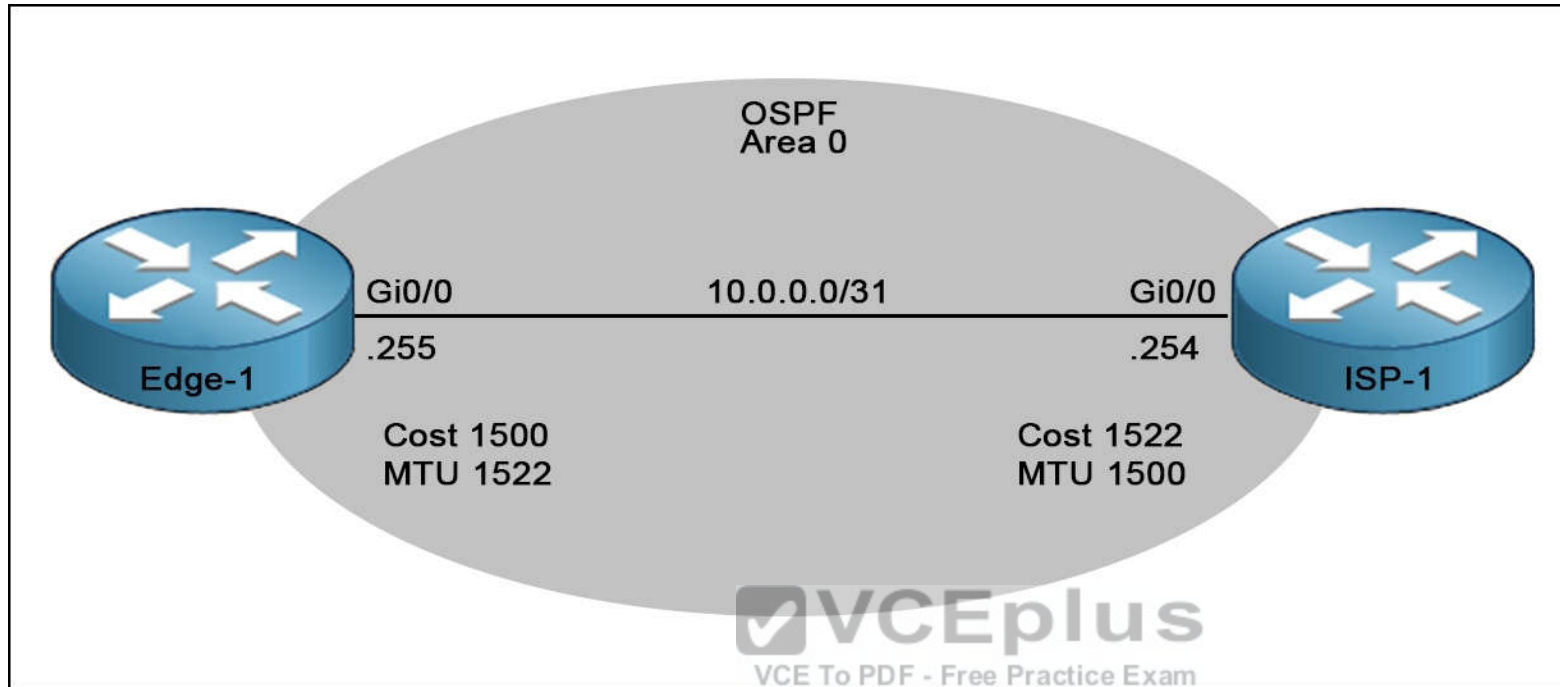
**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 12**

Refer to the exhibit.



Router edge-1 is unable to establish OSPF neighbor adjacency with router ISP-1. Which two configuration changes can you make on edge-1 to allow the two routers to establish adjacency? (Choose two.)

- A. Set the subnet mask on edge-1 to 255.255.255.252.
- B. Reduce the MTU on edge-1 to 1514.
- C. Set the OSPF cost on edge-1 to 1522.
- D. Reduce the MTU on edge-1 to 1500.
- E. Configure the **ip ospf mtu-ignore** command on the edge-1 Gi0/0 interface.

**Correct Answer:** DE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 13**

Which statement about MPLS is true?

- A. It operates in Layer 1.
- B. It operates between Layer 2 and Layer 3.
- C. It operates in Layer 3.
- D. It operates in Layer 2.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 14**

Which statement about named ACLs is true?

- A. They support standard and extended ACLs.
- B. They are used to filter usernames and passwords for Telnet and SSH.
- C. They are used to filter Layer 7 traffic.
- D. They support standard ACLs only.
- E. They are used to rate limit traffic destined to targeted networks.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 15**

Which two switch states are valid for 802.1w? (Choose two.)

- A. listening
- B. backup
- C. disabled
- D. learning

E. discarding

**Correct Answer:** DE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 16**

Which option is the benefit of implementing an intelligent DNS for a cloud computing solution?

- A. It reduces the need for a backup data center.
- B. It can redirect user requests to locations that are using fewer network resources.
- C. It enables the ISP to maintain DNS records automatically.
- D. It eliminates the need for a GSS.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**



#### **QUESTION 17**

Which identification number is valid for an extended ACL?

- A. 1
- B. 64
- C. 99
- D. 100
- E. 299
- F. 1099

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 18**

Which two pieces of information are provided by the **show controllers serial 0** command? (Choose two.)

- A. the type of cable that is connected to the interface
- B. the uptime of the interface
- C. the status of the physical layer of the interface
- D. the full configuration of the interface
- E. the interface's duplex settings

**Correct Answer:** AC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 19**

Which three options are the HSRP states for a router? (Choose three.)

- A. initialize
- B. learn
- C. secondary
- D. listen
- E. speak
- F. primary

**Correct Answer:** BDE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 20**

While you were troubleshooting a connection issue, a ping from one VLAN to another VLAN on the same switch failed. Which command verifies that IP routing is enabled on interfaces and the local VLANs are up?

- A. show ip interface brief
- B. show ip nat statistics
- C. show ip statistics
- D. show ip route

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 21**

Which feature can you use to monitor traffic on a switch by replicating it to another port or ports on the same switch?

- A. copy run start
- B. traceroute
- C. the ICMP Echo IP SLA
- D. SPAN

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 22**

What is a valid HSRP virtual MAC address?

- A. 0007.B400.AE01
- B. 0000.5E00.01A3
- C. 0007.5E00.B301
- D. 0000.0C07.AC15

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 23**

Which statement about switch access ports is true?

- A. They drop packets with 802.1Q tags
- B. A VLAN must be assigned to an access port before it is created.
- C. They can receive traffic from more than one VLAN with no voice support.
- D. By default, they carry traffic for VLAN 10.

**Correct Answer: B**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

**QUESTION 24**

What is the default VLAN on an access port?

- A. 0
- B. 1
- C. 10
- D. 1024

**Correct Answer: B**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

**QUESTION 25**

What are two enhancements that OSPFv3 supports over OSPFv2? (Choose two.)

- A. It can support multiple IPv6 subnets on a single link.
- B. It requires the use of ARP.



- C. It routes over links rather than over networks.
- D. It supports up to 2 instances of OSPFv3 over a common link.

**Correct Answer:** AC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 26**

Which two states are the port states when RSTP has converged? (Choose two.)

- A. forwarding
- B. discarding
- C. listening
- D. disabled
- E. learning

**Correct Answer:** AB

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 27**

Which process is associated with spanning-tree convergence?

- A. determining the path cost
- B. electing designated ports
- C. learning the sender bridge ID
- D. assigning the port ID

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 28**

Which option describes the purpose of traffic policing?

- A. It prioritizes routing protocol traffic.
- B. It remarks traffic that is below the CIR.
- C. It drops traffic that exceeds the CIR.
- D. It queues and then transmits traffic that exceeds the CIR.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 29**

Which type of topology is required by DMVPN?

- A. ring
- B. full mesh
- C. hub-and-spoke
- D. partial mesh

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 30**

What is the best way to verify that a host has a path to other hosts in different networks?

- A. Ping the loopback address.
- B. Ping the default gateway.
- C. Ping the local interface address.
- D. Ping the remote network.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 31

Which protocol supports sharing the VLAN configuration between two or more switches?

- A. multicast
- B. SIP
- C. VTP
- D. split-horizon

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**



### QUESTION 32

#### Scenario

Refer to the topology. Your company has connected the routers R1, R2, and R3 with serial links. R2 and R3 are connected to the switches SW1 and SW2, respectively. SW1 and SW2 are also connected to the routers R4 and R5.

The EIGRP routing protocol is configured.

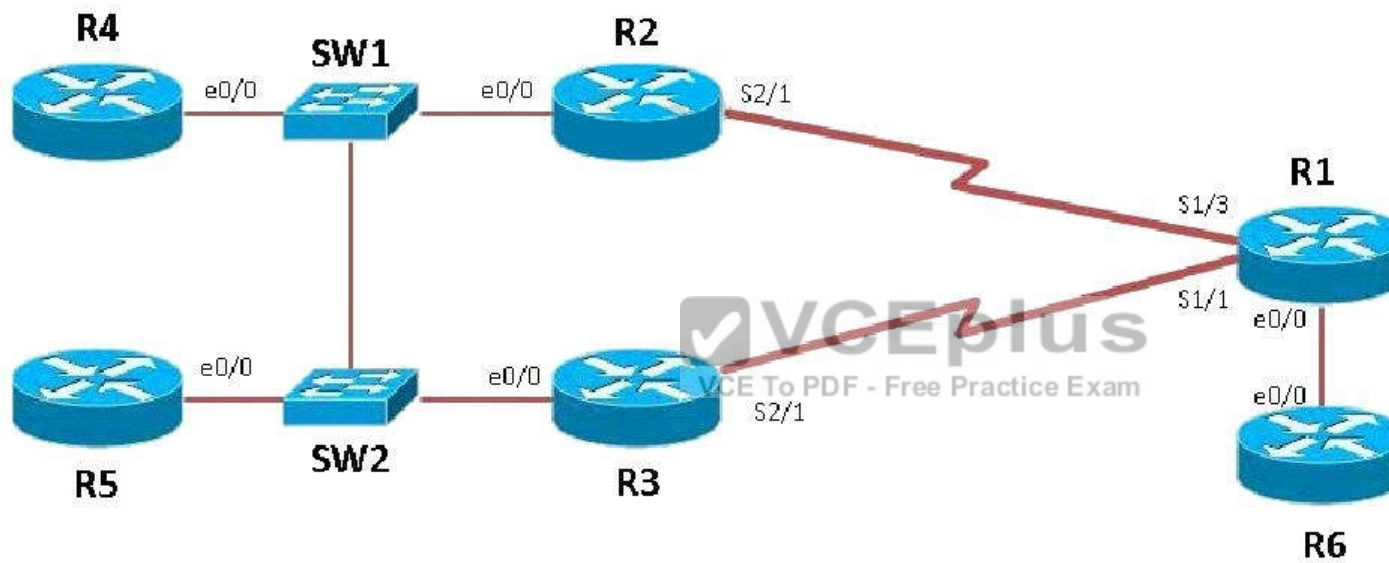
You are required to troubleshoot and resolve the EIGRP issues between the various routers. Use the appropriate **show** commands to troubleshoot the issues.

#### Instructions

- Enter the IOS commands on the device to verify the network operations and to find the answers for the multiple-choice questions.
- THIS TASK DOES NOT REQUIRE DEVICE CONFIGURATION.
- Click the device to gain access to the console of the device. No console or enable passwords are required.
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Topology

### EIGRP AS 1





















The loopback interfaces on R4 with the IP addresses of 10.4.4.4/32, 10.4.4.5/32, and 10.4.4.6/32 are not appearing in the routing table of R5.

Why are the interfaces missing?

- A. The interfaces are shutdown, so they are not being advertised.
- B. R4 has been incorrectly configured to be in another AS, so it does not peer with R5.
- C. Automatic summarization is enabled, so only the 10.0.0.0 network is displayed.
- D. The loopback addresses haven't been advertised, and the **network** command is missing on R4.

**Correct Answer: B**

**Section: (none)**

**Explanation**


**Explanation/Reference:**

Explanation:

For an EIGRP neighbor to form, the following must match:

- Neighbors must be in the same subnet
- K values
- AS numbers
- Authentication method and key strings

Here, we see that R4 is configured for EIGRP AS 2, when it should be AS 1.

R4	R5
<pre> ! interface Ethernet0/2   no ip address   shutdown ! interface Ethernet0/3   no ip address   shutdown ! ! router eigrp 2   network 10.4.4.4 0.0.0.0   network 10.4.4.5 0.0.0.0   network 10.4.4.6 0.0.0.0   network 192.168.123.0 ! ip forward-protocol nd ! ! no ip http server no ip http secure-server ! ! ! </pre> <p>--- More (18) --- </p>	<pre> interface Ethernet0/2   no ip address   shutdown ! interface Ethernet0/3   no ip address   shutdown ! ! router eigrp 1   network 10.5.5.5 0.0.0.0   network 10.5.5.55 0.0.0.0   network 10.10.10.0 0.0.0.255   network 192.168.123.0 ! ip forward-protocol nd ! ! no ip http server no ip http secure-server ! ! ! ! control-plane </pre>

### QUESTION 33

#### Scenario

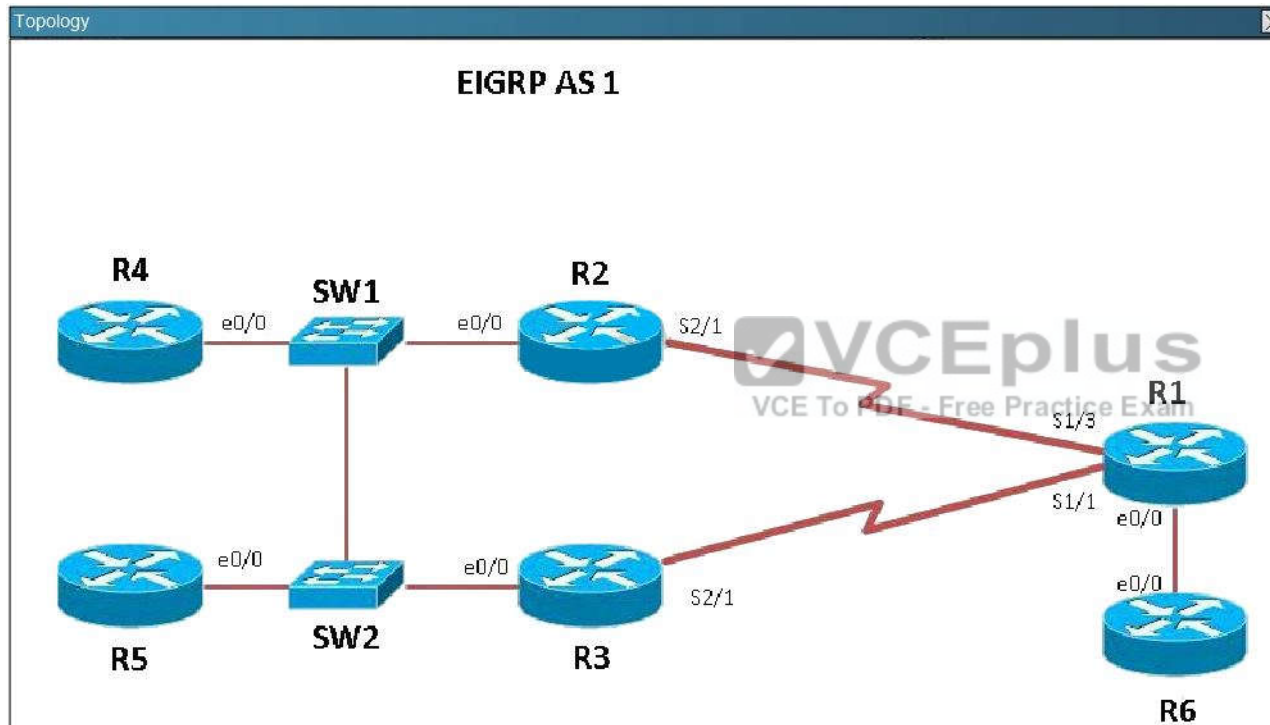
Refer to the topology. Your company has connected the routers R1, R2, and R3 with serial links. R2 and R3 are connected to the switches SW1 and SW2, respectively. SW1 and SW2 are also connected to the routers R4 and R5.

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Which path does traffic take from R1 to R5?

- A. The traffic goes through R2.
- B. The traffic goes through R3.
- C. The traffic is equally load-balanced over R2 and R3
- D. The traffic is unequally load-balanced over R2 and R3.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Using the "show ip int brief command" on R5 we can see the IP addresses assigned to this router. Then, using the "show ip route" command on R1 we can see that to reach

10.5.5.5 and 10.5.5.55 the preferred path is via Serial 1/3, which we see from the diagram is the link to R2.

R1

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B -  
 D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area  
 N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2  
 E1 - OSPF external type 1, E2 - OSPF external type 2  
 i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS L  
 ia - IS-IS inter area, \* - candidate default, U - per-user stat  
 o - ODR, P - periodic downloaded static route, H - NHRP, l - L  
 + - replicated route, % - next hop override

Gateway of last resort is not set

10.0.0.0/32 is subnetted, 5 subnets

C 10.1.1.1 is directly connected, Loopback0  
 D 10.2.2.2 [90/2297856] via 192.168.12.2, 00:37:12, Serial1/3  
 D 10.3.3.3 [90/2297856] via 192.168.13.3, 00:37:12, Serial1/1  
 D 10.5.5.5 [90/2323456] via 192.168.12.2, 00:37:12, Serial1/3  
 D 10.5.5.55 [90/2323456] via 192.168.12.2, 00:37:12, Serial1/3  
 192.168.12.0/24 is variably subnetted, 2 subnets, 2 masks  
 C 192.168.12.0/24 is directly connected, Serial1/3  
 L 192.168.12.1/32 is directly connected, Serial1/3  
 192.168.13.0/24 is variably subnetted, 2 subnets, 2 masks  
 C 192.168.13.0/24 is directly connected, Serial1/1  
 L 192.168.13.1/32 is directly connected, Serial1/1  
 192.168.16.0/24 is variably subnetted, 2 subnets, 2 masks

R1#



```

R5
!
!
no ip http server
no ip http secure-server
!
!
!
!
control-plane
!
R5#show ip int brief

```

Interface	IP-Address	OK?	Method	Status	Prot
Ethernet0/0	192.168.123.5	YES	NVRAM	up	up
Ethernet0/1	unassigned	YES	NVRAM	administratively down	down
Ethernet0/2	unassigned	YES	NVRAM	administratively down	down
Ethernet0/3	unassigned	YES	NVRAM	administratively down	down
Loopback0	10.5.5.5	YES	NVRAM	up	up
Loopback1	10.5.5.55	YES	NVRAM	up	up

```

R5#

```

#### QUESTION 34

##### Scenario

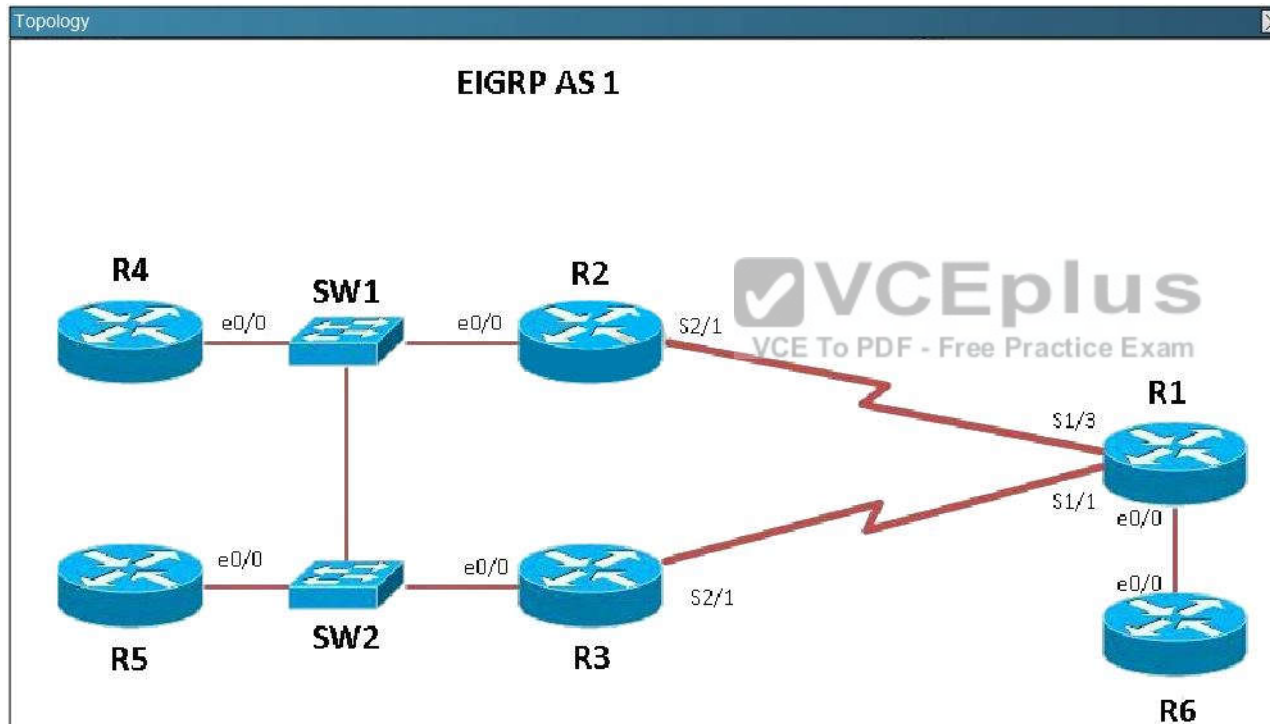
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The EIGRP routing protocol is configured.

You are required to troubleshoot and resolve the EIGRP issues between the various routers. Use the appropriate **show** commands to troubleshoot the issues.

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Router R6 does not form an EIGRP neighbor relationship correctly with router R1. What is the cause for this misconfiguration?

- A. The K values mismatch.
- B. The AS does not match.
- C. The **network** command is missing.
- D. The **passive-interface** command is enabled.

**Correct Answer:** C

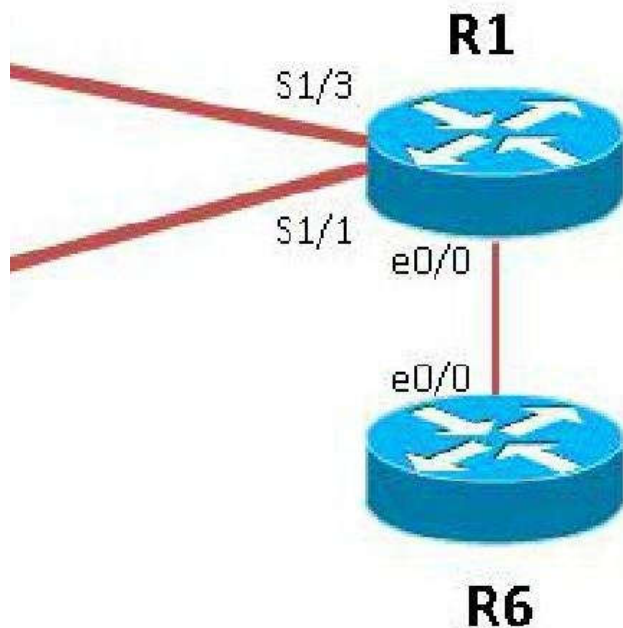
**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

The link from R1 to R6 is shown below:



As you can see, they are both using e0/0. The IP addresses are in the 192.168.16.0 network:

R1					
Interface	IP-Address	OK?	Method	Sta	
Ethernet0/0	192.168.16.1	YES	NVRAM	up	
Ethernet0/1	unassigned	YES	NVRAM	adm	
Ethernet0/2	unassigned	YES	NVRAM	adm	
Ethernet0/3	unassigned	YES	NVRAM	adm	
Serial1/0	unassigned	YES	NVRAM	adm	
Serial1/1	192.168.13.1	YES	NVRAM	up	
Serial1/2	unassigned	YES	NVRAM	up	
Serial1/3	192.168.12.1	YES	NVRAM	up	
Serial2/0	unassigned	YES	NVRAM	adm	
Serial2/1	unassigned	YES	NVRAM	up	
Serial2/2	unassigned	YES	NVRAM	adm	
R1#					

```

R6
R6#
R6#
R6#
R6#
R6#show ip int brief
Interface                IP-Address      OK? Method Status      Prot
ocol
Ethernet0/0              192.168.16.6    YES NVRAM    up          up
Ethernet0/1              unassigned      YES NVRAM    administratively down down
Ethernet0/2              unassigned      YES NVRAM    administratively down down
Ethernet0/3              unassigned      YES NVRAM    administratively down down
Serial1/0                unassigned      YES NVRAM    administratively down down
Serial1/1                unassigned      YES NVRAM    up          down
Serial1/2                unassigned      YES NVRAM    administratively down down
Serial1/3                unassigned      YES NVRAM    administratively down down
Loopback0                10.6.6.6        YES NVRAM    up          up
R6#
  
```

But when we look at the EIGRP configuration, the "network 192.168.16.0" command is missing on R6.

R1	R6
<pre> shutdown serial restart-delay 0 ! interface Serial2/1 no ip address serial restart-delay 0 ! interface Serial2/2 no ip address shutdown serial restart-delay 0 ! interface Serial2/3 no ip address shutdown serial restart-delay 0 ! ! router eigrp 1 network 192.168.12.0 network 192.168.13.0 network 192.168.16.0 ! ip forward-protocol nd </pre>	<pre> serial restart-delay 0 ! interface Serial1/1 no ip address serial restart-delay 0 ! interface Serial1/2 no ip address shutdown serial restart-delay 0 ! interface Serial1/3 no ip address shutdown serial restart-delay 0 ! ! router eigrp 1 network 10.6.6.6 0.0.0.0 ! ip forward-protocol nd ! no ip http server </pre>
R1#	R6#

## QUESTION 35

### Scenario

Refer to the topology. Your company has connected the routers R1, R2, and R3 with serial links. R2 and R3 are connected to the switches SW1 and SW2, respectively. SW1 and SW2 are also connected to the routers R4 and R5.

The EIGRP routing protocol is configured.

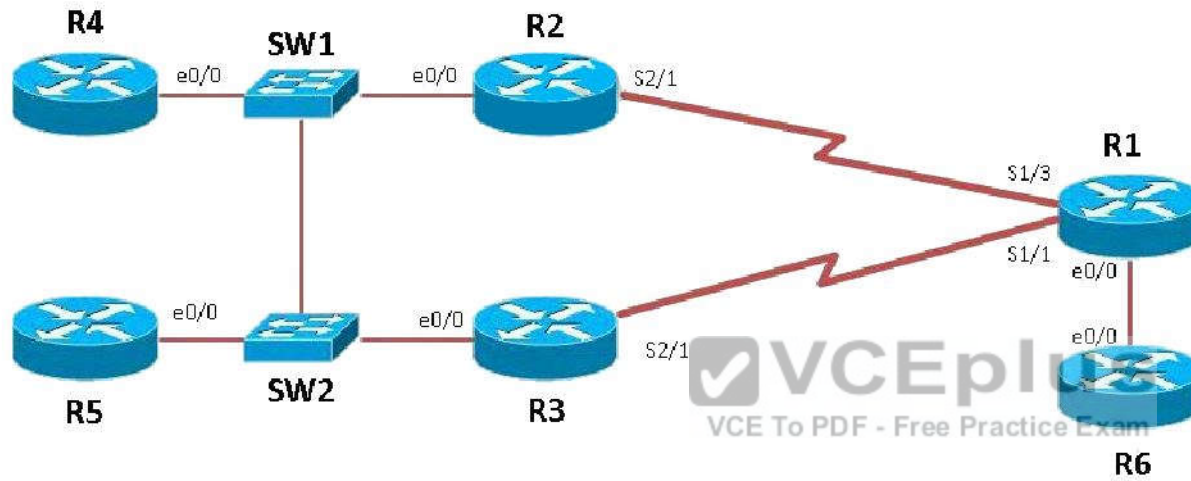
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### Instructions

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Topology

### EIGRP AS 1





















Study the following output taken on R1:

```
R1# Ping 10.5.5.55 source 10.1.1.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.5.5.55, timeout is 2 seconds:
Packet sent with a source address of 10.1.1.1
...
Success rate is 0 percent (0/5)
```

Why are the pings failing?

- A. The network statement is missing on R5.
- B. The loopback interface is shut down on R5.
- C. The network statement is missing on R1.
- D. The IP address that is configured on the Lo1 interface on R5 is incorrect.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

R5 does not have a route to the 10.1.1.1 network, which is the loopback0 IP address of R1. When looking at the EIGRP configuration on R1, we see that the 10.1.1.1 network statement is missing on R1.



```
R1
no ip address
serial restart-delay 0
!
interface Serial2/2
no ip address
shutdown
serial restart-delay 0
!
interface Serial2/3
no ip address
shutdown
serial restart-delay 0
!
!
router eigrp 1
network 192.168.12.0
network 192.168.13.0
network 192.168.16.0
!
ip forward-protocol nd
!
!
no ip http server
no ip http secure-server
R1#
```

**QUESTION 36**

Which option describes how a switch in rapid PVST+ mode responds to a topology change?

- A. It immediately deletes dynamic MAC addresses that were learned by all ports on the switch.
- B. It sets a timer to delete all MAC addresses that were learned dynamically by ports in the same STP instance.
- C. It sets a timer to delete dynamic MAC addresses that were learned by all ports on the switch.
- D. It immediately deletes all MAC addresses that were learned dynamically by ports in the same STP instance.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### **QUESTION 37**

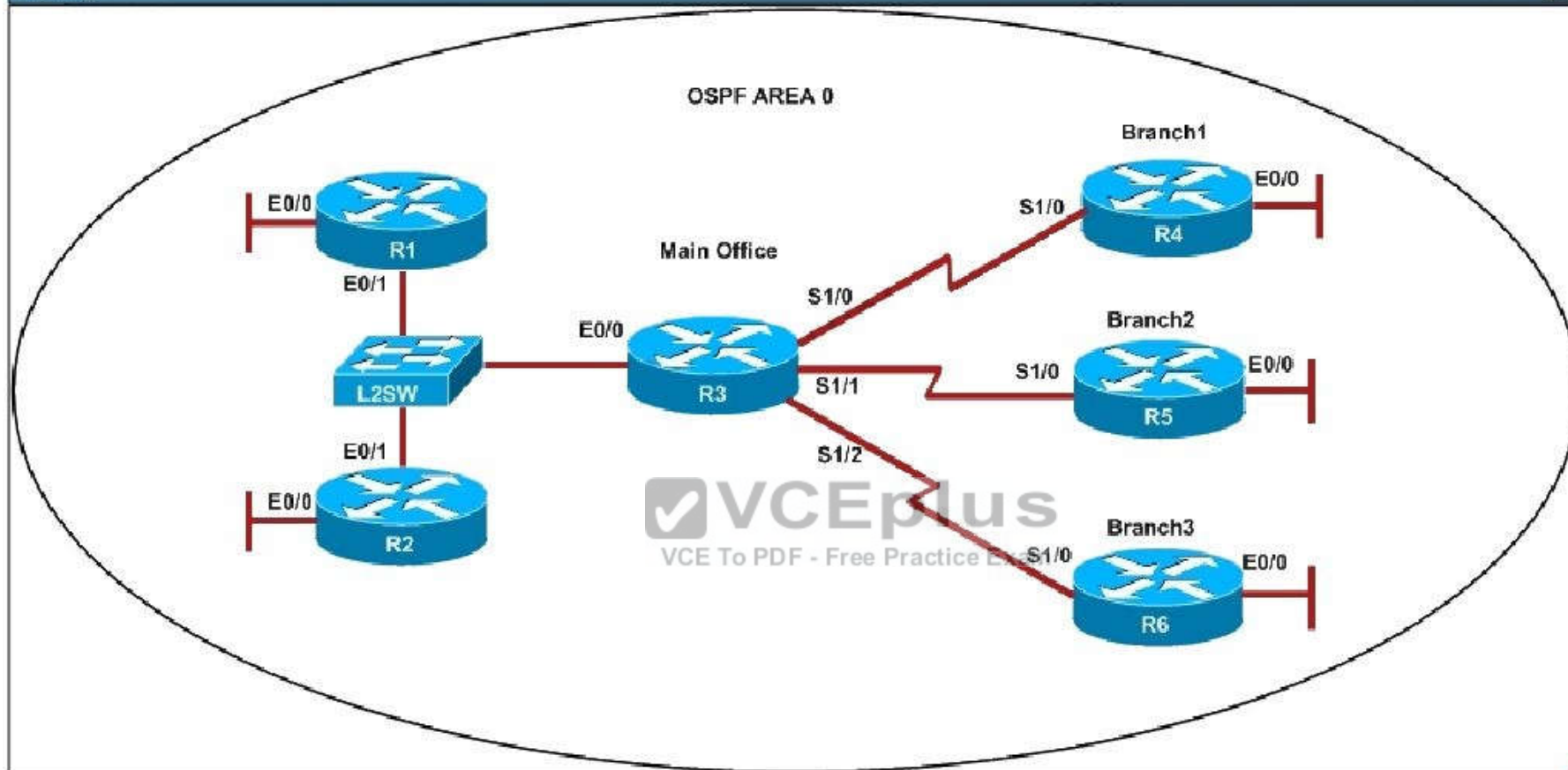
#### **Scenario**

Refer to the topology. Your company has decided to connect the main office with three other remote branch offices using point-to-point serial links. You are required to troubleshoot and resolve OSPF neighbor adjacency issues between the main office and the routers located in the remote branch offices. Use appropriate show commands to troubleshoot the issues and answer all four questions.

#### **Instructions**

- Enter Cisco IOS commands on the device to verify network operation and answer the multiple-choice questions.
- THIS TASK DOES NOT REQUIRE DEVICE CONFIGURATION.
- Click on the device to gain access to the console of the device. No console or enable passwords are required.
- To access the multiple-choice questions, click on the numbered boxes on the left of the top panel.
- There are four multiple-choice questions with this task. Be sure to answer all four questions before clicking the Next button.

Topology



















An OSPF neighbor adjacency is not formed between R3 in the main office and R4 the Branch1 office. What is causing the problem?

- A. There is an area ID mismatch.
- B. There is a Layer 2 issue; an encapsulation mismatch on serial links.
- C. There is an OSPF hello and dead interval mismatch.
- D. The R3 router ID is configured on R4.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

A show running-config command on R3 and R4 shows that R4 is incorrectly configured for area 2:

R3	R4
<pre> no ip address shutdown ! interface Ethernet0/2 no ip address shutdown ! interface Ethernet0/3 no ip address shutdown ! interface Serial1/0 description ***Connected to R4-Branch1 office*** ip address 10.10.240.1 255.255.255.252 encapsulation ppp ip ospf 3 area 0 serial restart-delay 0 ! interface Serial1/1 description ***Connected to R5-Branch2 office*** ip address 10.10.240.5 255.255.255.252 encapsulation ppp ip ospf hello-interval 50 ip ospf 3 area 0  ppp authentication chap           </pre>	<pre> ! interface Ethernet0/2 no ip address shutdown ! interface Ethernet0/3 no ip address shutdown ! interface Serial1/0 description ***Connected to R3-Main Branch office*** ip address 10.10.240.2 255.255.255.252 encapsulation ppp ip ospf 4 area 2 serial restart-delay 0 ! interface Serial1/1 no ip address shutdown serial restart-delay 0 ! interface Serial1/2 no ip address shutdown  --- More (37) ---           </pre>

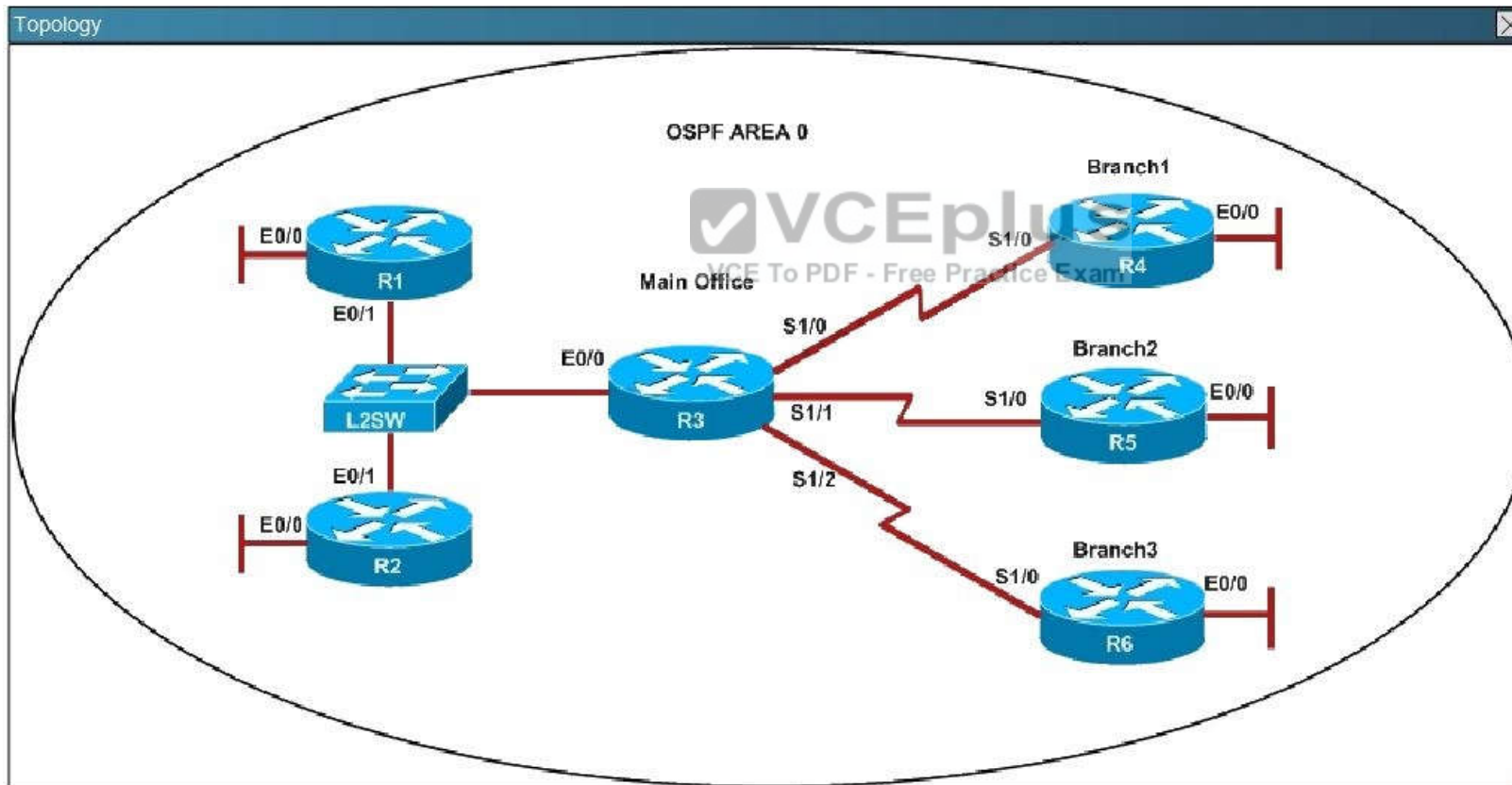
### QUESTION 38

#### Scenario

Refer to the topology. Your company has decided to connect the main office with three other remote branch offices using point-to-point serial links. You are required to troubleshoot and resolve OSPF neighbor adjacency issues between the main office and the routers located in the remote branch offices. Use appropriate show commands to troubleshoot the issues and answer all four questions.

#### Instructions

- Enter Cisco IOS commands on the device to verify network operation and answer the multiple-choice questions.
- THIS TASK DOES NOT REQUIRE DEVICE CONFIGURATION.
- Click on the device to gain access to the console of the device. No console or enable passwords are required.
- To access the multiple-choice questions, click on the numbered boxes on the left of the top panel.
- There are four multiple-choice questions with this task. Be sure to answer all four questions before clicking the Next button.



















An OSPF neighbor adjacency is not formed between R3 in the main office and R5 in the Branch2 office. What is causing the problem?

- A. There is an area ID mismatch.
- B. There is a PPP authentication issue; a password mismatch.
- C. There is an OSPF hello and dead interval mismatch.
- D. There is a missing network command in the OSPF process on R5.

**Correct Answer: C**

**Section: (none)**

**Explanation**

Explanation:

R3 R5

```
R3
Suppress hello for 0 neighbor(s)
Serial1/1 is up, line protocol is up
Internet Address 10.10.240.5/30, Area 0, Attached via Interface
Process ID 3, Router ID 192.168.3.3, Network Type POINT_TO_POINT
Topology-MTID      Cost        Disabled    Shutdown     Topology Name
   0                64          no         no           Base
Enabled by interface config, including secondary ip addresses
Transmit Delay is 1 sec, State POINT_TO_POINT
Timer intervals configured, Hello 50, Dead 200, Wait 200, Retransmit
oob-resync timeout 200
Hello due in 00:00:39
Supports Link-local Signaling (LLS)
Cisco NSF helper support enabled
IETF NSF helper support enabled
Index 4/4, flood queue length 0
Next 0x0(0)/0x0(0)
Last flood scan length is 0, maximum is 0
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 0, Adjacent neighbor count is 0
Suppress hello for 0 neighbor(s)
Serial1/0 is up, line protocol is up
Internet Address 10.10.240.1/30, Area 0, Attached via Interface
Process ID 3, Router ID 192.168.3.3, Network Type POINT_TO_POINT
Topology-MTID      Cost        Disabled    Shutdown     Topology Name
```

--- More (37) ---

```

R5
0          1          no          no          Base
Enabled by interface config, including secondary ip address
Loopback interface is treated as a stub Host
Serial1/0 is up, line protocol is up
Internet Address 10.10.240.6/30, Area 0, Attached via Inter
Process ID 5, Router ID 192.168.5.5, Network Type POINT_TO_P
Topology-MTID      Cost      Disabled      Shutdown      Topology
0          64          no          no          Base
Enabled by interface config, including secondary ip address
Transmit Delay is 1 sec, State POINT_TO_POINT
Timer intervals configured, Hello 10, Dead 40, Wait 40, Ret
oob-resync timeout 40
Hello due in 00:00:08
Supports Link-local Signaling (LLS)
Cisco NSF helper support enabled
IETF NSF helper support enabled
Index 3/3, flood queue length 0
Next 0x0(0)/0x0(0)
Last flood scan length is 0, maximum is 0
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 0, Adjacent neighbor count is 0
Suppress hello for 0 neighbor(s)
Ethernet0/0 is up, line protocol is up
Internet Address 172.16.114.1/24, Area 0, Attached via Inter

R5#

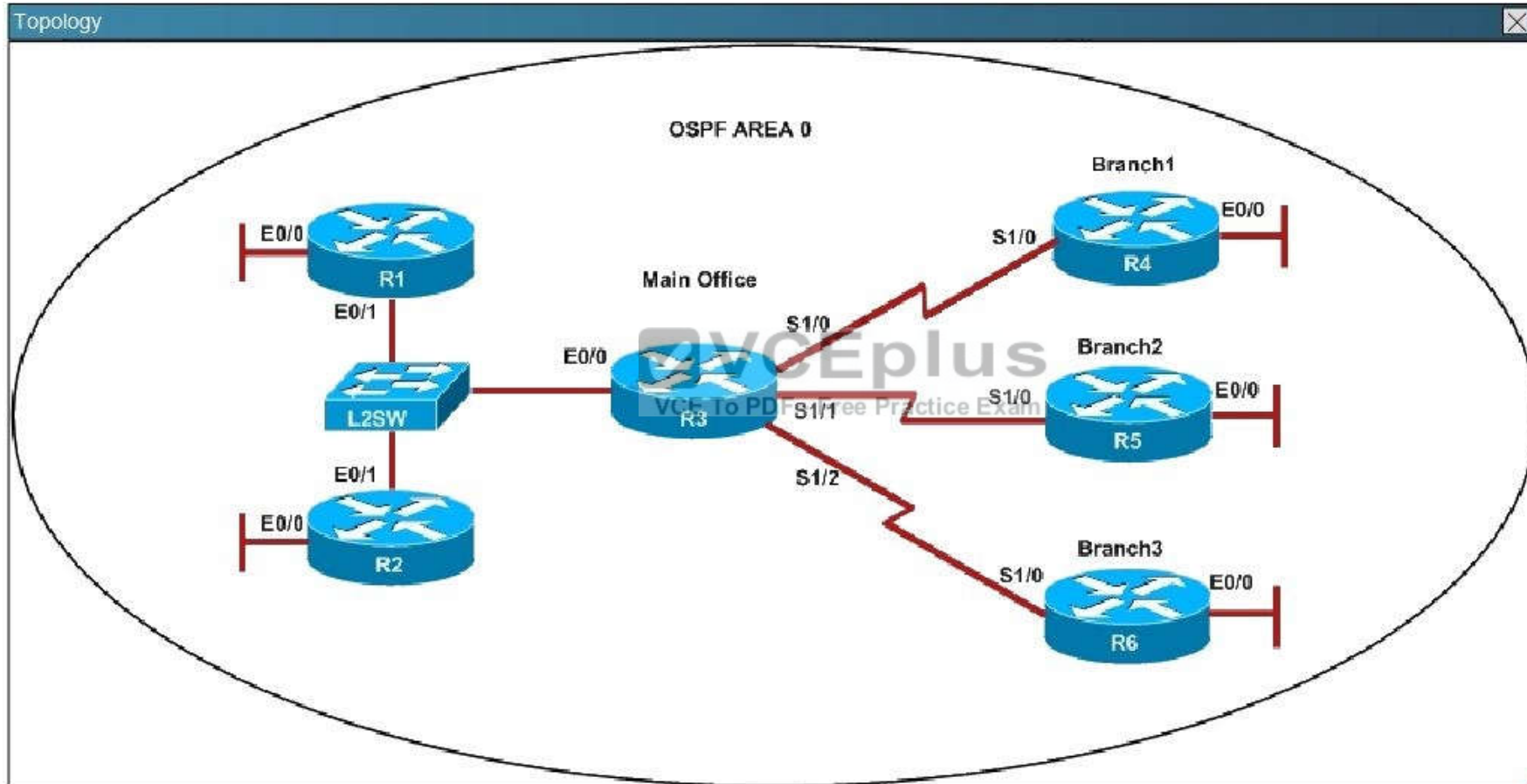
```

## Scenario

You are required to troubleshoot and resolve OSPF neighbor adjacency issues between the main office and the routers located in the remote branch offices.

### Instructions

- Enter Cisco IOS commands on the device to verify network operation and answer the multiple-choice questions.
- THIS TASK DOES NOT REQUIRE DEVICE CONFIGURATION.
- Click on the device to gain access to the console of the device. No console or enable passwords are required.
- To access the multiple-choice questions, click on the numbered boxes on the left of the top panel.
- There are four multiple-choice questions with this task. Be sure to answer all four questions before clicking the Next button.



















R1 does not form an OSPF neighbor adjacency with R2. Which option would fix the issue?

- A. R1 ethernet0/1 is shutdown. Configure the **no shutdown** command.
- B. R1 ethernet0/1 configured with a non-default OSPF hello interval of 25; configure **no ip ospf hello-interval 25**.
- C. R2 ethernet0/1 and R3 ethernet0/0 are configured with a non-default OSPF hello interval of 25; configure **no ip ospf hello-interval 25**.
- D. Enable OSPF for R1 ethernet0/1; configure **ip ospf 1 area 0** command under ethernet0/1.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Looking at the configuration of R1, we see that R1 is configured with a hello interval of 25 on interface Ethernet 0/1 while R2 is left with the default of 10 (not configured).

R1	R2
<pre> ! ! ! ! ! interface Loopback0   description ***Loopback***   ip address 192.168.1.1 255.255.255.255   ip ospf 1 area 0 ! interface Ethernet0/0   description ***Connected to R1-LAN***   ip address 10.10.110.1 255.255.255.0   ip ospf 1 area 0 ! interface Ethernet0/1   description ***Connected to L2SW***   ip address 10.10.230.1 255.255.255.0   ip ospf hello-interval 25   ip ospf 1 area 0 ! interface Ethernet0/2   no ip address   shutdown  --- More (35) --- </pre>	<pre> ! ! ! ! ! ! ! interface Loopback0   description ***Loopback***   ip address 192.168.2.2 255.255.255.255   ip ospf 2 area 0 ! interface Ethernet0/0   description ***Connected to R2-LAN***   ip address 10.10.120.1 255.255.255.0   ip ospf 2 area 0 ! interface Ethernet0/1   description ***Connected to L2SW***   ip address 10.10.230.2 255.255.255.0   ip ospf 2 area 0 ! interface Ethernet0/2   no ip address   shutdown  --- More (35) --- </pre>

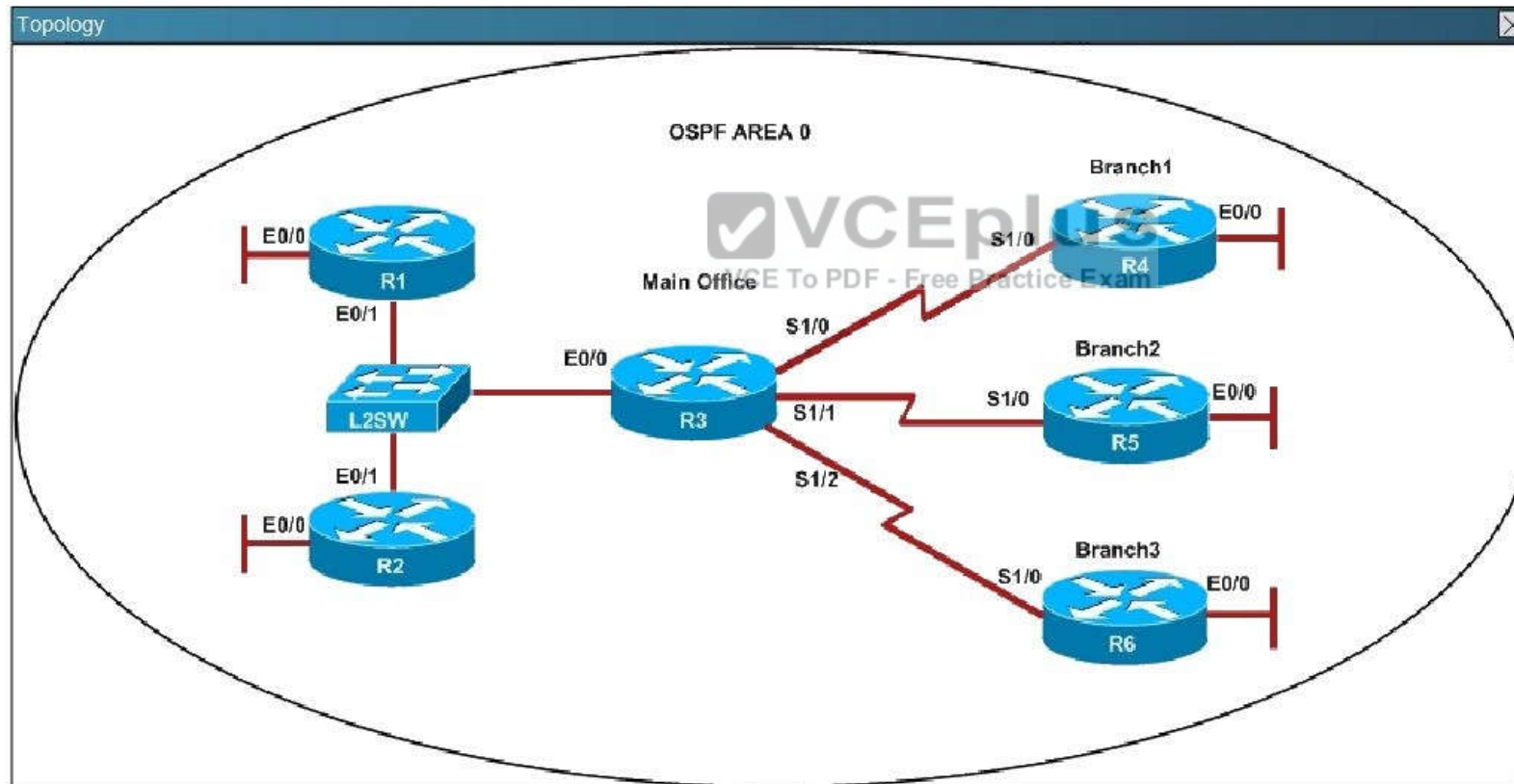
## QUESTION 40

### Scenario

Refer to the topology. Your company has decided to connect the main office with three other remote branch offices using point-to-point serial links. You are required to troubleshoot and resolve OSPF neighbor adjacency issues between the main office and the routers located in the remote branch offices. Use appropriate show commands to troubleshoot the issues and answer all four questions.

### Instructions

- Enter Cisco IOS commands on the device to verify network operation and answer the multiple-choice questions.
- THIS TASK DOES NOT REQUIRE DEVICE CONFIGURATION.
- Click on the device to gain access to the console of the device. No console or enable passwords are required.
- To access the multiple-choice questions, click on the numbered boxes on the left of the top panel.
- There are four multiple-choice questions with this task. Be sure to answer all four questions before clicking the Next button.



















An OSPF neighbor adjacency is not formed between R3 in the main office and R6 in the Branch3 office. What is causing the problem?

- A. There is an area ID mismatch.
- B. There is a PPP authentication issue; the username is not configured on R3 and R6.
- C. There is an OSPF hello and dead interval mismatch.
- D. The R3 router ID is configured on R6.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Using the show running-config command we see that R6 has been incorrectly configured with the same router ID as R3 under the router OSPF process.

R3	R6
<pre> ip address 10.10.240.5 255.255.255.252 encapsulation ppp ip ospf hello-interval 50 ip ospf 3 area 0 ppp authentication chap serial restart-delay 0 ! interface Serial1/2 description ***Connected to R6-Branch3 office*** ip address 10.10.240.9 255.255.255.252 encapsulation ppp ip ospf 3 area 0 ppp authentication chap serial restart-delay 0 ! interface Serial1/3 no ip address shutdown serial restart-delay 0 ! router ospf 3 router-id 192.168.3.3 ! ip forward-protocol nd ! </pre>	<pre> no ip address shutdown serial restart-delay 0 ! interface Serial1/2 no ip address shutdown serial restart-delay 0 ! interface Serial1/3 no ip address shutdown serial restart-delay 0 ! router ospf 6 router-id 192.168.3.3 ! ip forward-protocol nd ! ! no ip http server no ip http secure-server ! ! </pre>

**QUESTION 41**

You enter the **show ipv6 route** command on an OSPF device and the device displays a route. Which conclusion can you draw about the environment?

- A. OSPF is distributing IPv6 routes to BGP.
- B. The router is designated as an ABR.
- C. The router is designated as totally stubby.
- D. OSPFv3 is in use.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 42

Which configuration can you apply to enable encapsulation on a subinterface?

- A. interface FastEthernet 0/0  
encapsulation dot1Q 30  
ip address 10.1.1.30 255.255.255.0
- B. interface FastEthernet 0/0.30  
ip address 10.1.1.30 255.255.255.0
- C. interface FastEthernet 0/0.30  
description subinterface vlan 30
- D. interface FastEthernet 0/0.30  
encapsulation dot1Q 30  
ip address 10.1.1.30 255.255.255.0



**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 43

Which part of the PPPoE server configuration contains the information used to assign an IP address to a PPPoE client?

- A. virtual-template interface
- B. DHCP
- C. dialer interface

D. AAA authentication

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 44**

Which three statements are typical characteristics of VLAN arrangements? (Choose three.)

- A. VLANs cannot span multiple switches.
- B. VLANs typically decrease the number of collision domains.
- C. Connectivity between VLANs requires a Layer 3 device.
- D. Each VLAN uses a separate address space.
- E. A new switch has no VLANs configured.
- F. A switch maintains a separate bridging table for each VLAN.

**Correct Answer:** CDF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 45**

Which statement about slow inter-VLAN forwarding is true?

- A. The VLAN is experiencing slowness in the point-to-point collisionless connection.
- B. The VLANs are experiencing slowness because multiple devices are connected to the same hub.
- C. The local VLAN is working normally, but traffic to the alternate VLAN is forwarded slower than expected.
- D. The entire VLAN is experiencing slowness.
- E. The VLANs are experiencing slowness due to a duplex mismatch.

**Correct Answer:** E

**Section:** (none)

**Explanation**



**Explanation/Reference:**

**QUESTION 46**

Which version of SNMP first allowed user-based access?

- A. SNMPv3 with RBAC
- B. SNMPv3
- C. SNMPv1
- D. SNMPv2

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 47**

Which two circumstances can cause collision domain issues on VLAN domain? (Choose two.)

- A. duplex mismatches on Ethernet segments in the same VLAN
- B. multiple errors on switchport interfaces
- C. congestion on the switch inband path
- D. a failing NIC in an end device
- E. an overloaded shared segment

**Correct Answer:** CE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 48**

Which two components are used to identify a neighbor in a BGP configuration? (Choose two.)

- A. autonomous system number

- B. version number
- C. router ID
- D. subnet mask
- E. IP address

**Correct Answer:** AE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 49**

Which EIGRP for IPv6 command can you enter to view the link-local addresses of the neighbors of a device?

- A. show ipv6 eigrp 20 interfaces
- B. show ipv6 route eigrp
- C. show ipv6 eigrp neighbors
- D. show ip eigrp traffic

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 50**

What are two drawbacks of implementing a link-state routing protocol? (Choose two.)

- A. the sequencing and acknowledgment of link-state packets
- B. the high volume of link-state advertisements in a converged network
- C. the requirement for a hierarchical IP addressing scheme for optimal functionality
- D. the high demand on router resources to run the link-state routing algorithm
- E. the large size of the topology table listing all advertised routes in the converged network

**Correct Answer:** CD

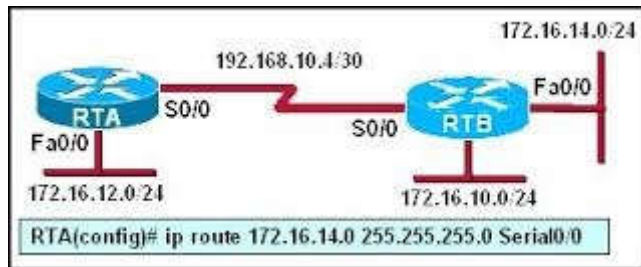
**Section:** (none)

## Explanation

## Explanation/Reference:

### QUESTION 51

Refer to the exhibit.



RTA is configured with a basic configuration. The link between the two routers is operational and no routing protocols are configured on either router. The line shown in the exhibit is then added to router RTA. Should interface Fa0/0 on router RTB shut down, what effect will the shutdown have on router RTA?

- A. A route to 172.16.14.0/24 will remain in the RTA routing table.
- B. Because router RTB will send a poison reverse packet to router RTA, RTA will remove the route.
- C. Router RTA will send an ICMP packet to attempt to verify the route.
- D. A packet to host 172.16.14.225 will be dropped by router RTA.

**Correct Answer:** A

**Section:** (none)

## Explanation

## Explanation/Reference:

### QUESTION 52

Which option describes a difference between EIGRP for IPv4 and IPv6?

- A. Only EIGRP for IPv6 advertises all connected networks.
- B. Only EIGRP for IPv6 requires a router ID to be configured under the routing process.
- C. AS numbers are configured in EIGRP but not in EIGRPv3.
- D. Only EIGRP for IPv6 is enabled in the global configuration mode.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 53**

Which component of the Cisco SDN solution serves as the centralized management system?

- A. Cisco OpenDaylight
- B. Cisco ACI
- C. Cisco APIC
- D. Cisco IWAN

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**



#### **QUESTION 54**

Which statement about DTP is true?

- A. It uses the native VLAN.
- B. It negotiates a trunk link after VTP has been configured.
- C. It uses desirable mode by default.
- D. It sends data on VLAN 1.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 55**

Refer to the exhibit.

Index	Load	Port	EC state	No of bits
0	36	Gi1/1	Active	3
1	84	Gi1/2	Active	3
2	16	Gi1/3	Active	2

While troubleshooting a switch, you executed the **show interface port-channel 1 etherchannel** command and it returned this output. Which information is provided by the Load value?

- A. the percentage of use of the link
- B. the preference of the link
- C. the session count of the link
- D. the number of source-destination pairs on the link

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 56

Which IEEE standard does PVST+ use to tunnel information?

- A. 802.1x
- B. 802.1q
- C. 802.1w
- D. 802.1s

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 57**

After you configure a new router to connect to a host through the GigabitEthernet0/0 port of the router, you log in to the router and observe that the new link is down. Which action corrects the problem?

- A. Use a crossover cable between the host and R1.
- B. Use a straight through cable between the host and R1.
- C. Configure the host to use R1 as the default gateway.
- D. Use a rollover cable between the host and R1.

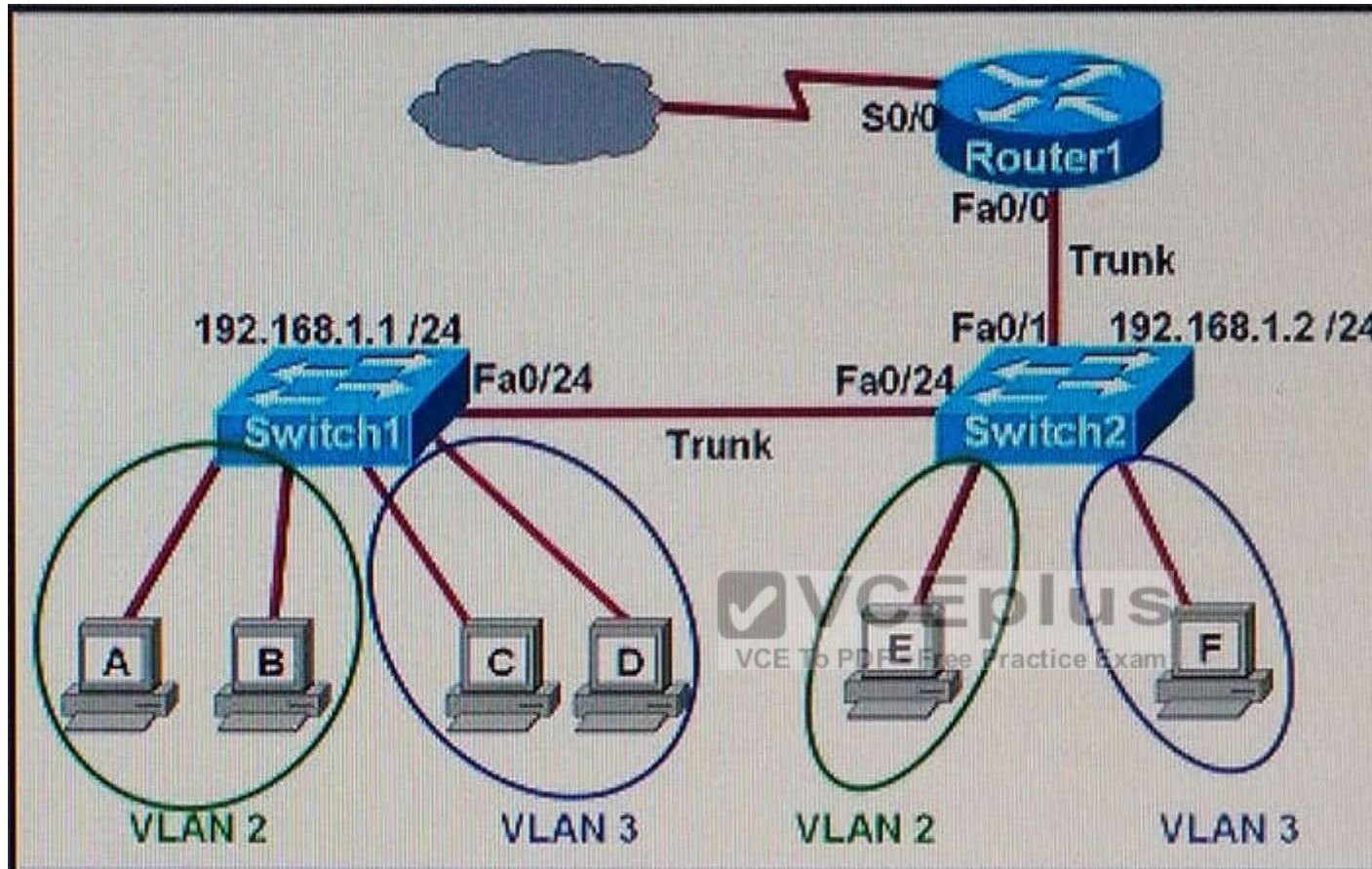
**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 58**



Refer to the exhibit. Which two statements are true about interVLAN routing in the topology that is shown in the exhibit? (Choose two.)

- A. Router1 and Switch2 should be connected via a crossover cable.
- B. The FastEthernet0/0 interface on Router1 must be configured with subinterfaces.
- C. Router1 needs more LAN interfaces to accommodate the VLANs that are shown in the exhibit.
- D. Host E and host F use the same IP gateway address.
- E. Router1 will *not* play a role in communications between host A and host D.
- F. The FastEthernet0/0 interface on Router1 and the FastEthernet0/1 interface on Switch2 trunk ports must be configured using the same encapsulation type.



**Correct Answer:** BF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 59**

Which two statements about the spanning-tree bridge ID are true? (Choose two.)

- A. It is composed of a 4-bit bridge priority and a 12-bit system ID extension.
- B. The bridge ID is transmitted in the IP header to elect the root bridge.
- C. The system ID extension is a value between 1 and 4095.
- D. It is composed of an 8-bit bridge priority and a 16-bit system ID extension.
- E. The bridge priority must be incremented in blocks of 4096.

**Correct Answer:** AE

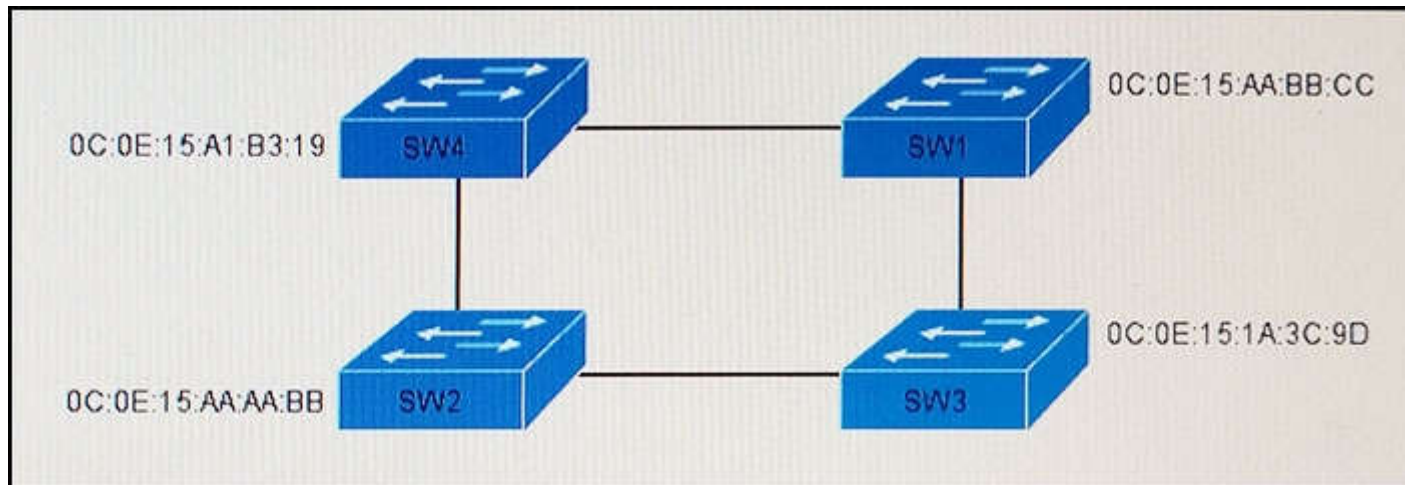
**Section:** (none)

**Explanation**

**Explanation/Reference:**



**QUESTION 60**





Refer to the exhibit. Which switch in this configuration becomes the root bridge?

- A. SW1
- B. SW2
- C. SW3
- D. SW4

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 61

Which three statements about HSRP operation are true? (Choose three.)

- A. HSRP supports only clear-text authentication.
- B. The HSRP virtual IP address must be on a different subnet than the routers' interfaces on the same LAN.
- C. The HSRP default timers are 3 second hello interval and a 10 second dead interval.
- D. The HSRP virtual IP address must be the same as one of the router's interface addresses on the LAN.
- E. The virtual IP address and virtual MAC address are active on the HSRP Master router.
- F. HSRP supports up to 255 groups per interface, enabling an administrative form of load balancing.

**Correct Answer:** CEF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 62

Which VLAN bridge priority value is assigned by the **set spantree root** command?

- A. 8192
- B. 16384
- C. 28672

D. 32768

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 63**

Which purpose of the **network** command in OSPF configuration mode is true?

- A. It defines a wildcard mask to identify the size of the network.
- B. It defines the area ID.
- C. It defines the network by its classful entry.
- D. It defines which networks are used for virtual links.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**



#### **QUESTION 64**

Which feature can validate address requests and filter out invalid messages?

- A. IP Source Guard
- B. port security
- C. DHCP snooping
- D. dynamic ARP inspection

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 65**

Which configuration enables OSPF for network 192.168.1.0/24?

- A. router ospf  
router-id 192.168.1.0
- B. router ospf 1  
network 192.168.1.0 255.255.255.0 area 0
- C. router ospf 1  
neighbor 192.168.1.0
- D. router ospf 1  
area 0 virtual-link 192.168.1.0

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 66**

Which command do you enter to view EIGRPv6 adjacencies?

- A. show ipv6 eigrp 1 interface
- B. show ipv6 route eigrp
- C. show ipv6 eigrp neighbors
- D. show running-configuration eigrp

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 67**

What is the default encapsulation type for Cisco WAN serial interfaces?

- A. GRE
- B. PPP

- C. Frame Relay
- D. IEEE 802.1Q
- E. HDLC

**Correct Answer:** E

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 68

Which three checks must you perform when troubleshooting EIGRPv6 adjacencies? (Choose three.)

- A. Verify that IPv6 enabled.
- B. Verify that the **network** command has been configured.
- C. Verify that auto summary is enabled.
- D. Verify that the interface is up.
- E. Verify that an IPv4 address has been configured.
- F. Verify that the router ID has been configured.



**Correct Answer:** ADF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 69

Which statement about VLAN configuration is true?

- A. The switch must be in config-vlan mode before you configure an extended VLAN.
- B. Dynamic inter-VLAN routing is supported on VLAN 2 through VLAN 4064.
- C. A switch in VTP transparent mode saves the VLAN database to the running configuration only.
- D. The switch must be in VTP server or transparent mode before you configure a VLAN.

**Correct Answer:** D

**Section:** (none)

**Explanation****Explanation/Reference:****QUESTION 70**

From which PPPoE server configuration does a PPPoE client get an IP address?

- A. AAA authentication
- B. DHCP
- C. dialer interface
- D. virtual-template interface

**Correct Answer:** D

**Section:** (none)

**Explanation****Explanation/Reference:****QUESTION 71**

Routers R1 and R2 are on the same network segment, and both routers use interface GigabitEthernet0/0. If R1 loses communication to R2, which two items should you check as you begin troubleshooting? (Choose two.)

- A. Verify that R2 is using 802.1q encapsulation.
- B. Verify that the GigabitEthernet0/0 interfaces on R1 and R2 are configured with the same subnet mask.
- C. Verify that the R1 GigabitEthernet0/0 interface is up and the line protocol is down.
- D. Verify that R1 and R2 both are using HDLC encapsulation.
- E. Verify that the R1 GigabitEthernet0/0 interface is up and the line protocol is up.

**Correct Answer:** BE

**Section:** (none)

**Explanation****Explanation/Reference:****QUESTION 72**

Which command do you enter to enable an interface to support PPPoE on a client?

- A. Dev1(config)# bba-group pppoe bba1
- B. Dev1(config-if)# pppoe-client dial-pool-number 1
- C. Dev1(config-if)# pppoe enable group bba1
- D. Dev1(config-if)# pppoe enable

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 73**

Which three options are types of slow VLAN connectivity? (Choose three.)

- A. slow broadcast domain connectivity
- B. slow routing domain connectivity
- C. slow default gateway connectivity
- D. slow application domain connectivity
- E. slow collision domain connectivity
- F. slow inter-VLAN connectivity

**Correct Answer:** ADE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 74**

Which value can you modify to configure a specific interface as the preferred forwarding interface?

- A. the VLAN priority
- B. the hello time
- C. the port priority
- D. the interface number

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 75

Which WAN technology uses labels to make decisions about data forwarding?

- A. Metro Ethernet
- B. Frame Relay
- C. MPLS
- D. ISDN
- E. VSAT

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**



#### QUESTION 76

Which two actions must you take to configure a PAgP EthernetChannel between two switches, S1 and S2? (Choose two.)

- A. Configure the **channel-group 1 mode auto** command on S1.
- B. Configure the **channel-group 1 mode desirable** command on S2.
- C. Configure the **channel-group 1 mode active** command on S2.
- D. Configure the **channel-group 1 mode on** command on S2.
- E. Configure the **channel-group 1 mode active** command on S1.

**Correct Answer:** AB

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 77**

Which command can you enter to assign an interface to the default VLAN?

- A. **Switch(config-if)# switchport access vlan 1**
- B. Switch(config-if)# switchport trunk native vlan 1
- C. Switch(config-if)# vlan 1
- D. Switch(config)# int vlan 1

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 78**

Which feature can you use to restrict SNMP queries to a specific OID tree?

- A. a server group
- B. **a view record**
- C. a community
- D. an access group



**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 79**

```
R1# show access-lists
Extended IP access list 175
10 deny tcp any any time-range nonworkhours (active)
20 permit tcp any any time-range workhours (inactive)
```



Refer to the exhibit. While you troubleshoot a connectivity issue to a PC behind R1, you enter the **show access-lists** command to generate this output. Which reason for the problem is most likely true?

- A. The **permit all** ACL entry on R1 is inactive.
- B. The ACL of R1 is misconfigured.
- C. A **deny all** ACL entry is currently active on R1.
- D. An implicit **deny** is causing R1 to block network traffic.

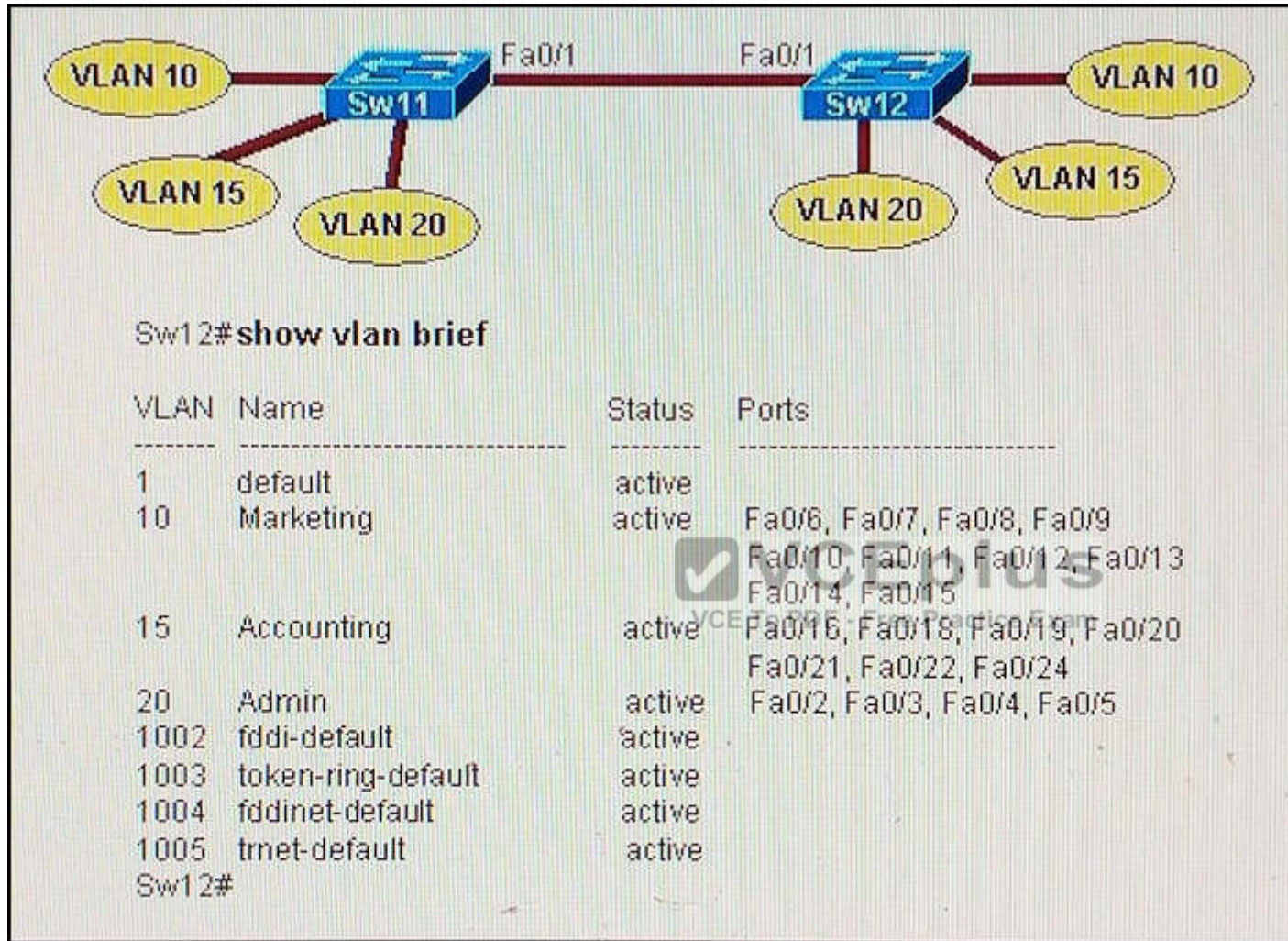
**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 80**



Refer to the exhibit. A technician has configured the FastEthernet0/1 interface on Sw11 as an access link in VLAN 1. Based on the output from the **show vlan brief** command issued on Sw12, what will be the result of making this change on Sw11?

- A. Hosts will not be able to communicate between the two switches.
- B. The hosts in all VLANs on the two switches will be able to communicate with each other.
- C. Only the hosts in VLAN 10 and VLAN 15 on the two switches will be able to communicate with each other.

D. Only the hosts in VLAN 1 on the two switches will be able to communicate with each other.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 81**

After you configure a GRE tunnel between two networks, the tunnel comes up normally, but workstations on each side of the tunnel cannot communicate. Which reason for the problem is most likely true?

- A. The tunnel source address is incorrect.
- B. The tunnel destination address is incorrect.
- C. The route between the networks is undefined.
- D. The IP MTU is incorrect.
- E. The distance configuration is missing.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 82**

Which type does a port become when it receives the best BPDU on a bridge?

- A. the backup port
- B. the root port
- C. the designated port
- D. the alternate port

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 83**

router#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP, D - EIGRP  
EX - EIGRP external, O - OSPF, IA - OSPF inter area, N1 - OSPF NSSA external type 1,  
N2 - OSPF NSSA external type 2, E1 - OSPF external type 1, E2 - OSPF external type 2,  
E - EGP, i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, \* - candidate default, U - per-user  
static route, o - ODR

Gateway of last resort is 192.168.4.1 to network 0.0.0.0

10.0.0.0/24 is subnetted, 3 subnets

C        10.0.2.0 is directly connected, Ethernet1  
D        10.0.3.0 [90/2195456] via 192.168.1.2, 00:03:01, Serial0  
D        10.0.4.0 [90/2195456] via 192.168.3.1, 00:03:01, Serial1  
C        192.168.1.0/24 is directly connected, Serial0  
D        192.168.2.0/24 [90/2681856] via 192.168.1.2, 00:03:01, Serial0  
             [90/2681856] via 192.168.3.1, 00:03:01, Serial1  
C        192.168.3.0/24 is directly connected, Serial1  
C        192.168.4.0/24 is directly connected, Serial2

Refer to the exhibit. How will the router handle a packet destined for 192.0.2.156?

- A. The router will forward the packet via either Serial0 or Serial1.
- B. The router will return the packet to its source.
- C. The router will forward the packet via Serial2.
- D. The router will drop the packet.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 84**

**Instructions**

- Enter Cisco IOS commands on device to verify network operation and answer for multiple-choice questions.
- **THIS TASK DOES NOT REQUIRE DEVICE CONFIGURATION.**
- Click the device icon to gain access to the console of the router. No console or enable passwords are required.
- To access the multiple-choice questions, click the numbered boxes on the left of the top panel.
- This task has **four** multiple-choice questions. Be sure to answer all four questions before clicking the Next button.

**Scenario**

You are implementing PPP over serial links between R1 router and branch offices. In Phase 1 you must implement and verify PPP and GRE tunnel configurations as mentioned in the topology. In Phase 2 your colleague is expected to do NAT and ISP configurations between R1 and ISP router.

Identify the issues that you encounter during PPP over serial links implementation.

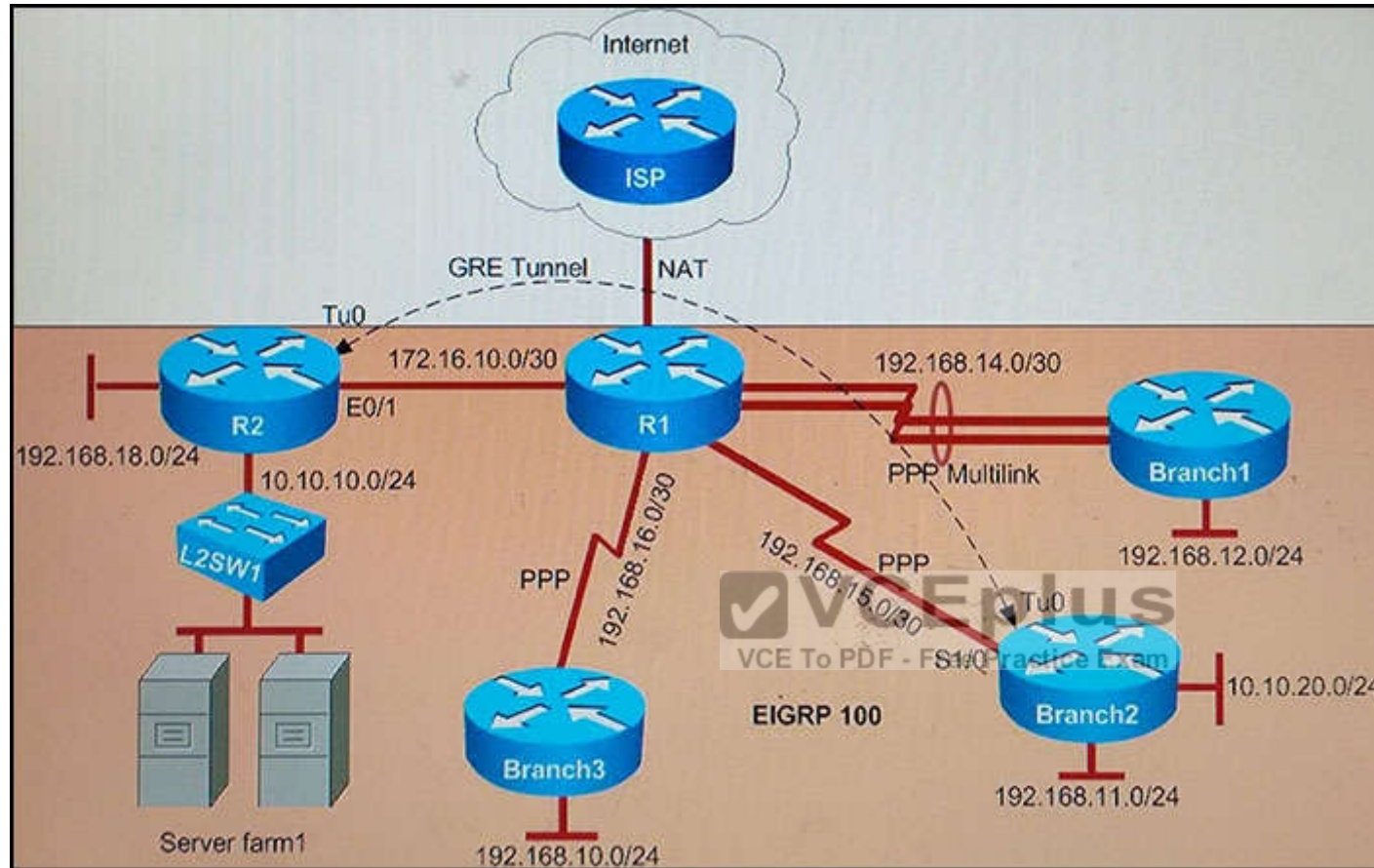
Routers Branch1, Branch2, and Branch3 connect to Router R1 in the main office over serial links.

PPP multilink implementation is recommended between R1 and Branch1 routers.

The GRE tunnel is configured between R2 and Branch2 routers, and traffic between Server farm1 10.10.10.0/24 network and Branch2 LAN 10.10.20.0/24 network, is routed over GRE tunnel using static route.

You have console access on R1, R2, Branch1, Branch2, and Branch3 devices. Use only show commands to troubleshoot the issues.





Why did Branch1 router lose WAN connectivity with R1 router?

- A. The IP address is misconfigured on PPP multilink interface on the Branch1 router.
- B. The PPP multilink group is misconfigured on the Branch1 serial interfaces.
- C. The PPP multilink group is misconfigured on the R1 serial interfaces.
- D. The Branch1 serial interfaces are placed in a shutdown condition.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

First we should check both routers with the "show ip interface brief" command. On R1:

```
R1#show ip interface brief
```

Interface	IP-Address	OK?	Method	Status	Protocol
Ethernet0/0	172.16.10.1	YES	manual	up	up
Ethernet0/1	203.1.1.2	YES	manual	up	up
Ethernet0/2	unassigned	YES	unset	administratively down	down
Ethernet0/3	unassigned	YES	unset	administratively down	down
Serial1/0	unassigned	YES	unset	up	up
Serial1/1	unassigned	YES	unset	up	up
Serial1/2	192.168.16.1	YES	manual	up	down
Serial1/3	192.168.15.1	YES	manual	up	up
<u>Multilink1</u>	<u>192.168.14.1</u>	YES	manual	up	up
NVI0	unassigned	NO	unset	up	up

On Branch1:

```
Branch2#show ip interface brief
```

Interface	IP-Address	OK?	Method	Status	Protocol
Ethernet0/0	10.10.20.1	YES	manual	up	up
Ethernet0/1	192.168.11.1	YES	manual	up	up
Ethernet0/2	unassigned	YES	unset	administratively down	down
Ethernet0/3	unassigned	YES	unset	administratively down	down
Serial1/0	192.168.15.2	YES	manual	up	up
Serial1/1	unassigned	YES	unset	administratively down	down
Serial1/2	unassigned	YES	unset	administratively down	down
Serial1/3	unassigned	YES	unset	administratively down	down
<u>Tunnel0</u>	<u>192.168.24.2</u>	YES	manual	up	up

We can see that although the Multilink1 interfaces are in "up/up" state but they are not in the same subnet. According to the IP address scheme shown on the topology we can deduce the Multilink interface on Branch1 has been misconfigured, it should be 192.168.14.2 instead.

## QUESTION 85

### Instructions

- Enter Cisco IOS commands on device to verify network operation and answer for multiple-choice questions.
- **THIS TASK DOES NOT REQUIRE DEVICE CONFIGURATION.**
- Click the device icon to gain access to the console of the router. No console or enable passwords are required.
- To access the multiple-choice questions, click the numbered boxes on the left of the top panel.
- This task has **four** multiple-choice questions. Be sure to answer all four questions before clicking the Next button.

### Scenario

You are implementing PPP over serial links between R1 router and branch offices. In Phase 1 you must implement and verify PPP and GRE tunnel configurations as mentioned in the topology. In Phase 2 your colleague is expected to do NAT and ISP configurations between R1 and ISP router.

Identify the issues that you encounter during PPP over serial links implementation.

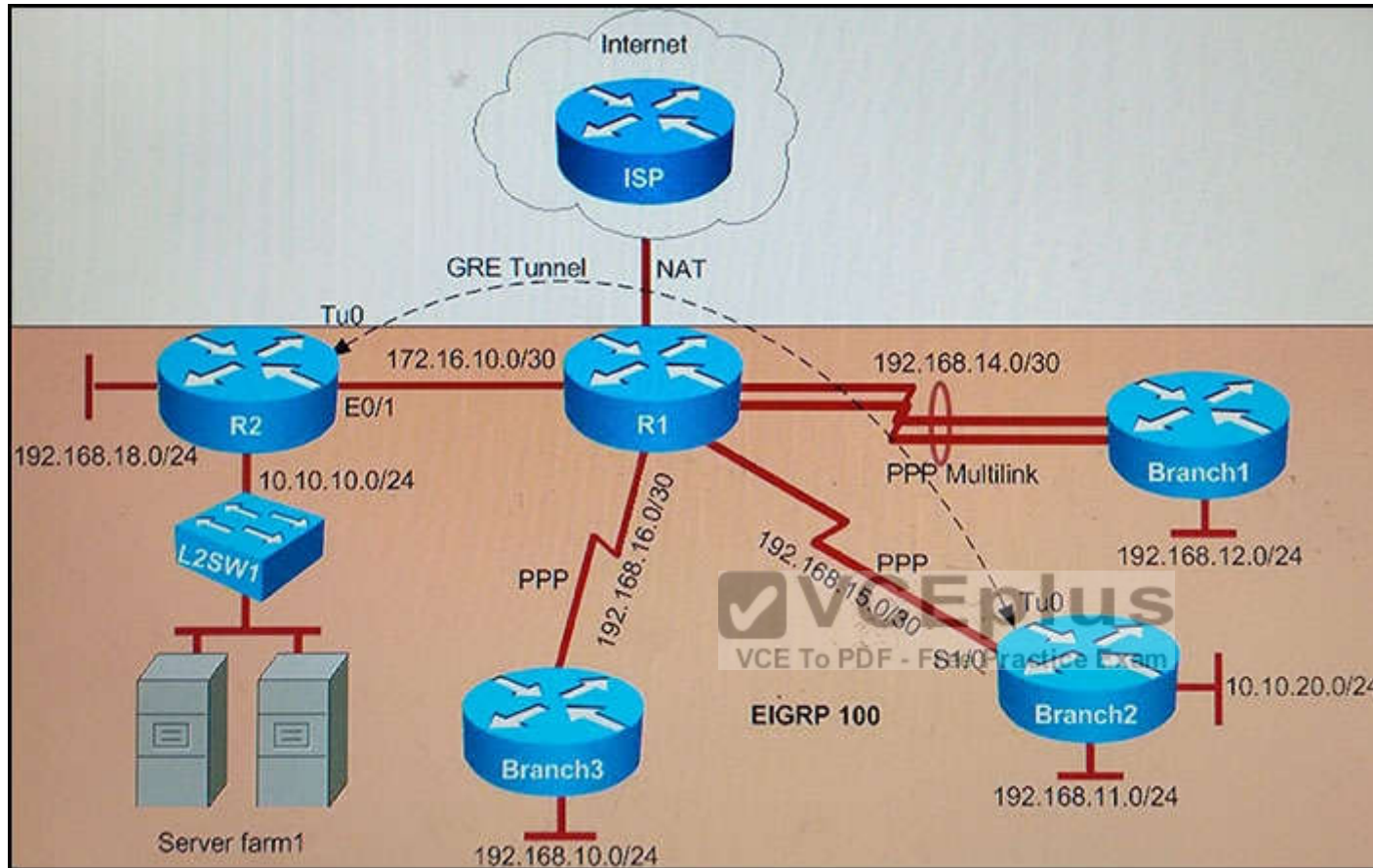
Routers Branch1, Branch2, and Branch3 connect to Router R1 in the main office over serial links.

PPP multilink implementation is recommended between R1 and Branch1 routers.

The GRE tunnel is configured between R2 and Branch2 routers, and traffic between Server farm1 10.10.10.0/24 network and Branch2 LAN 10.10.20.0/24 network, is routed over GRE tunnel using static route.

You have console access on R1, R2, Branch1, Branch2, and Branch3 devices. Use only show commands to troubleshoot the issues.





Why is the Branch2 network 10.10.20.0/24 unable to communicate with the Server farm1 network 10.10.10.0/24 over the GRE tunnel?

- A. The GRE tunnel destination is not configured on the R2 router.
- B. The GRE tunnel destination is not configured on the Branch2 router.
- C. The static route point to the tunnel0 interface that is misconfigured on the Branch2 router.
- D. The static route points to the tunnel0 interface that is misconfigured on the R2 router.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

The Branch2 network is communicating to the Server farm, which is connected to R2, via GRE Tunnel so we should check the GRE tunnel first to see if it is in “up/up” state with the “show ip interface brief” command on the two routers.

On Branch2:

```
Branch2#show ip interface brief
```

Interface	IP-Address	OK?	Method	Status	Protocol
Ethernet0/0	10.10.20.1	YES	manual	up	up
Ethernet0/1	192.168.11.1	YES	manual	up	up
Ethernet0/2	unassigned	YES	unset	administratively down	down
Ethernet0/3	unassigned	YES	unset	administratively down	down
Serial1/0	192.168.15.2	YES	manual	up	up
Serial1/1	unassigned	YES	unset	administratively down	down
Serial1/2	unassigned	YES	unset	administratively down	down
Serial1/3	unassigned	YES	unset	administratively down	down
Tunnel0	192.168.24.2	YES	manual	up	up

On R2:

```
R2#show ip interface brief
```

Interface	IP-Address	OK?	Method	Status	Protocol
Ethernet0/0	172.16.10.2	YES	manual	up	up
Ethernet0/1	10.10.10.1	YES	manual	up	up
Ethernet0/2	192.168.18.1	YES	manual	up	up
Ethernet0/3	unassigned	YES	unset	administratively down	down
Tunnel0	192.168.24.1	YES	manual	up	up

We see interfaces Tunnel0 at two ends are “up/up” which are good so we should check for the routing part on two routers with the “show running-config” command and pay attention to the static routing of each router. On Branch2 we see:

```
Branch2#show running-config  
<output omitted>  
ip route 10.10.10.0 255.255.255.0 192.168.24.10
```

The destination IP address for this static route is not correct. It should be 192.168.24.1 (Tunnel0's IP address of R2), not 192.168.24.10 -> Answer C is correct.

Note: You can use the "show ip route" command to check the routing configuration on each router but if the destination is not reachable (for example: we configure "ip route 10.10.10.0 255.255.255.0 192.168.24.10" on Branch2, but if 192.168.24.10 is unknown then Branch2 router will not display this routing entry in its routing table.

Note: The IP address or configuration may be different in the exam.

## QUESTION 86

### Instructions

- Enter Cisco IOS commands on device to verify network operation and answer for multiple-choice questions.
- **THIS TASK DOES NOT REQUIRE DEVICE CONFIGURATION.**
- Click the device icon to gain access to the console of the router. No console or enable passwords are required.
- To access the multiple-choice questions, click the numbered boxes on the left of the top panel.
- This task has **four** multiple-choice questions. Be sure to answer all four questions before clicking the Next button.

### Scenario

You are implementing PPP over serial links between R1 router and branch offices. In Phase 1 you must implement and verify PPP and GRE tunnel configurations as mentioned in the topology. In Phase 2 your colleague is expected to do NAT and ISP configurations between R1 and ISP router.

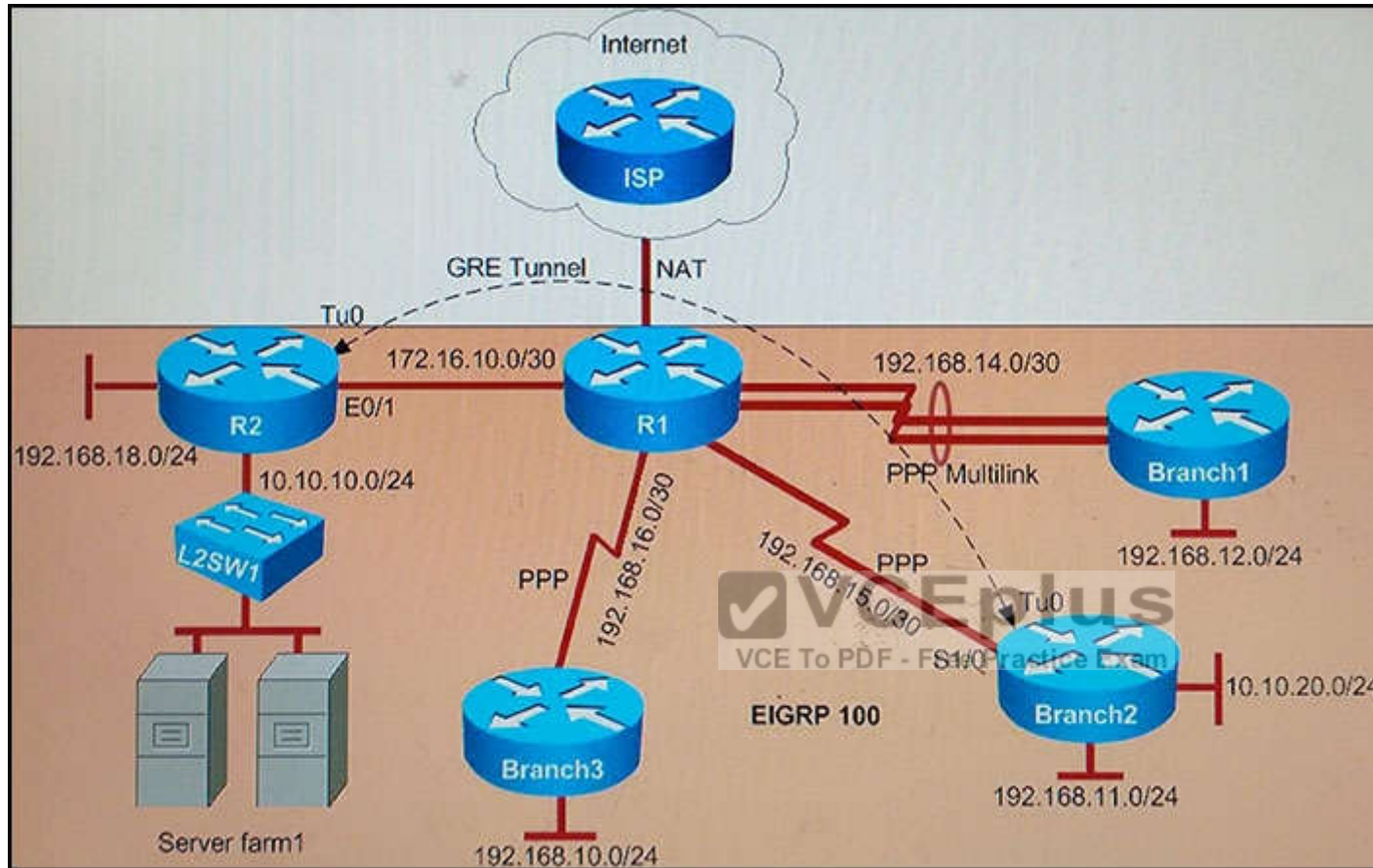
Identify the issues that you encounter during PPP over serial links implementation.

Routers Branch1, Branch2, and Branch3 connect to Router R1 in the main office over serial links.

PPP multilink implementation is recommended between R1 and Branch1 routers.

The GRE tunnel is configured between R2 and Branch2 routers, and traffic between Server farm1 10.10.10.0/24 network and Branch2 LAN 10.10.20.0/24 network, is routed over GRE tunnel using static route.

You have console access on R1, R2, Branch1, Branch2, and Branch3 devices. Use only show commands to troubleshoot the issues.



Why has the Branch3 router lost connectivity with R1?

Use only **show** commands to troubleshoot because usage of the **debug** command is restricted on the Branch3 and R1 routers.

- A. A PPP chap hostname mismatch is noticed between Branch3 and R1.
- B. A PPP chap password mismatch is noticed between Branch3 and R1.
- C. PPP encapsulation is not configured on Branch3.
- D. The PPP chap hostname and PPP chap password commands are missing on the Branch3 router.

**Correct Answer:** A

**Section:** (none)



## Explanation

### Explanation/Reference:

Explanation:

First we should check Branch3 (and R1) with the “show ip interface brief” command to find any Layer1/Layer 2 issue.

```
Branch3# show ip interface brief
```

Interface	IP-Address	OK?	Method	Status	Protocol
Ethernet0/0	192.168.10.1	YES	manual	up	up
Ethernet0/1	unassigned	YES	unset	administratively down	down
Ethernet0/2	unassigned	YES	unset	administratively down	down
Ethernet0/3	unassigned	YES	unset	administratively down	down
Serial1/0	192.168.16.2	YES	manual	up	down
Serial1/1	unassigned	YES	unset	administratively down	down
Serial1/2	unassigned	YES	unset	administratively down	down
Serial1/3	unassigned	YES	unset	administratively down	down

We see the interfaces connecting between them are in “up/down” states which indicates an Layer 2 issue so we should check the configuration of these interfaces carefully with the “show running-config” command and pay attention to these interfaces:

```
R1#show running-config
```

```
<output omitted>
```

```
interface Serial1/2
```

```
ip address 192.168.16.1 255.255.255.252
```

```
ip nat inside
```

```
ip virtual-reassembly in
```

```
encapsulation ppp
```

```
ppp authentication chap
```

```
serial restart-delay 0
```

and on Branch3:

```
Branch3# show running-config
<output omitted>
interface Serial1/0
 ip address 192.168.16.2 255.255.255.252
 encapsulation ppp
 ppp chap hostname Branch_3
 ppp chap password 0 Branch3_Secret!
 serial restart-delay 0
```

We learn from above config is R1 is using CHAP to authenticate Branch3 router (via the “ppp authentication chap” command on R1). Branch3 router is sending CHAP hostname “Branch\_3” and CHAP password “Branch3\_Secret!” to R1 to be authenticated. Therefore we should check if R1 has already been configured with such username and password or not with the “show running-config” command on R1:

```
R1#show running-config
<output omitted>
username Branch2 password 0 Branch2_Secret!
username Branch3 password 0 Branch3_Secret!
```

On R1 we see the configured username is “Branch3”, not “Branch\_3” so the usernames here are mismatched and this is the problem -> Answer A is correct.

## QUESTION 87

### Instructions

- Enter Cisco IOS commands on device to verify network operation and answer for multiple-choice questions.
- **THIS TASK DOES NOT REQUIRE DEVICE CONFIGURATION.**
- Click the device icon to gain access to the console of the router. No console or enable passwords are required.
- To access the multiple-choice questions, click the numbered boxes on the left of the top panel.
- This task has **four** multiple-choice questions. Be sure to answer all four questions before clicking the Next button.

### Scenario

You are implementing PPP over serial links between R1 router and branch offices. In Phase 1 you must implement and verify PPP and GRE tunnel configurations as mentioned in the topology. In Phase 2 your colleague is expected to do NAT and ISP configurations between R1 and ISP router.

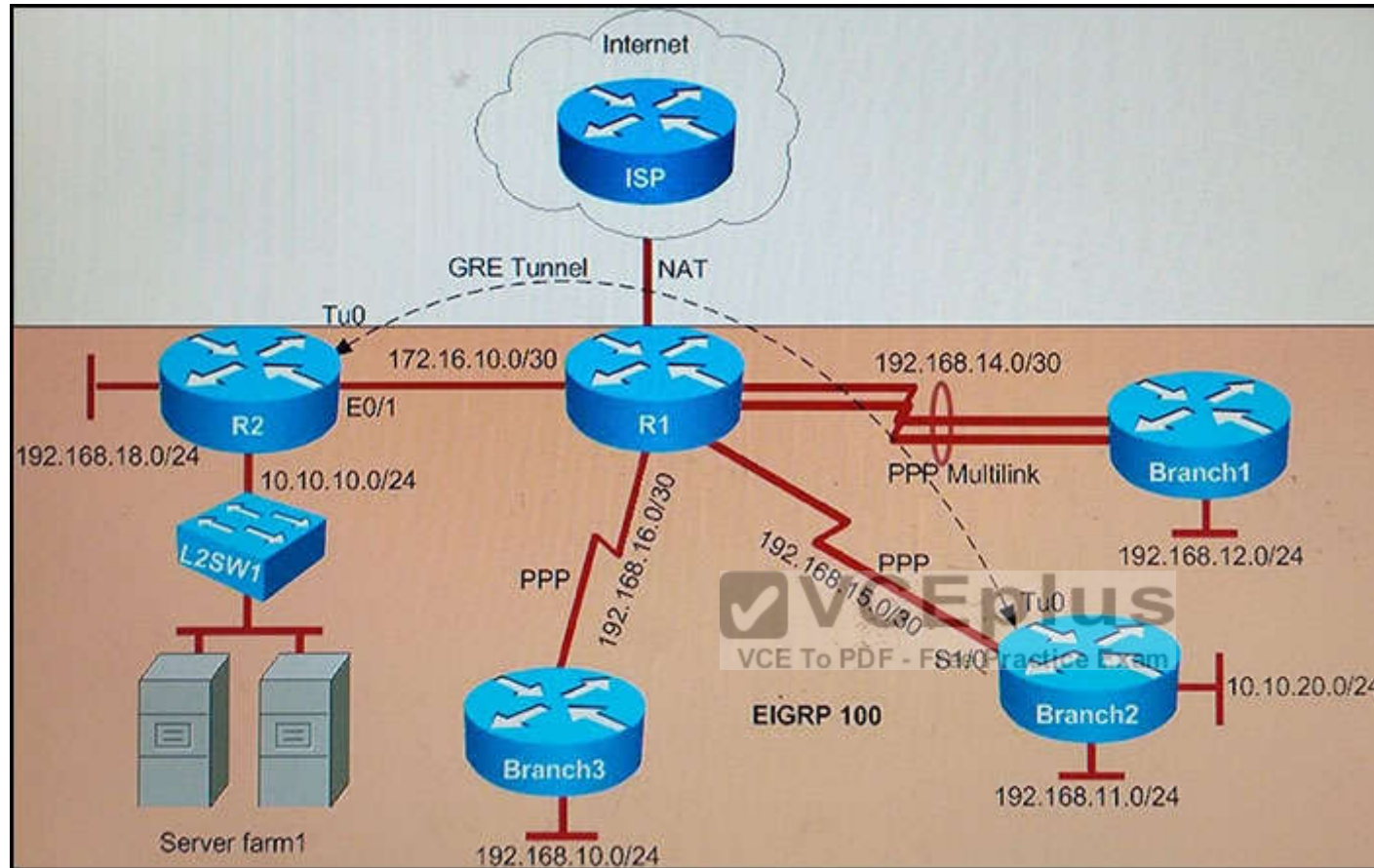
Identify the issues that you encounter during PPP over serial links implementation.

Routers Branch1, Branch2, and Branch3 connect to Router R1 in the main office over serial links.

PPP multilink implementation is recommended between R1 and Branch1 routers.

The GRE tunnel is configured between R2 and Branch2 routers, and traffic between Server farm1 10.10.10.0/24 network and Branch2 LAN 10.10.20.0/24 network, is routed over GRE tunnel using static route.

You have console access on R1, R2, Branch1, Branch2, and Branch3 devices. Use only show commands to troubleshoot the issues.



Which statement about the router configurations is correct?

- A. PPP PAP is authentication configured between Branch2 and R1.
- B. Tunnel keepalives are not configured for the tunnel0 interface on Branch2 and R2.
- C. The Branch2 LAN network 192.168.11.0/24 is not advertised into the EIGRP network.
- D. The Branch3 LAN network 192.168.10.0/24 is not advertised into the EIGRP network.
- E. PPP CHAP authentication is configured between Branch1 and R1.

**Correct Answer: D**

**Section: (none)**

**Explanation****Explanation/Reference:**

Explanation:

When we check Branch3 router we notice that “network 192.168.10.0” command is missing under “router eigrp 100” making answer D correct.

```
Branch3#show running-config
<output omitted>
!
router eigrp 100
network 192.168.16.0
!
```

**QUESTION 88**

Which three options are the HSRP states for a router? (Choose four.)

- A. standby
- B. speak
- C. listen
- D. learn
- E. primary
- F. secondary



**Correct Answer:** ABCD

**Section:** (none)

**Explanation****Explanation/Reference:**

Reference: <http://www.cisco.com/c/en/us/support/docs/ip/hot-standby-router-protocol-hsrp/10583-62.html#anc16>

**QUESTION 89**

What are two enhancements that OSPFv3 supports over OSPFv2? (Choose two.)

- A. It supports up to 2 instances of OSPFv3 over a common link.
- B. It can support multiple IPv6 subnets on a single link.
- C. It routes over links rather than over networks.
- D. It requires the use of ARP.



E. It supports IPv6 with MD5 authentication.

**Correct Answer:** BC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 90**

Which VLAN bridge priority value will make a switch as root for a given VLAN from the below options by the spanning-tree vlan vlan-id root command?

- A. 16384
- B. 8192
- C. 28672
- D. 32768

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**



#### **QUESTION 91**

What is the default encapsulation type for Cisco WAN serial interfaces?

- A. Frame Relay
- B. HDLC
- C. PPP
- D. SDLC

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

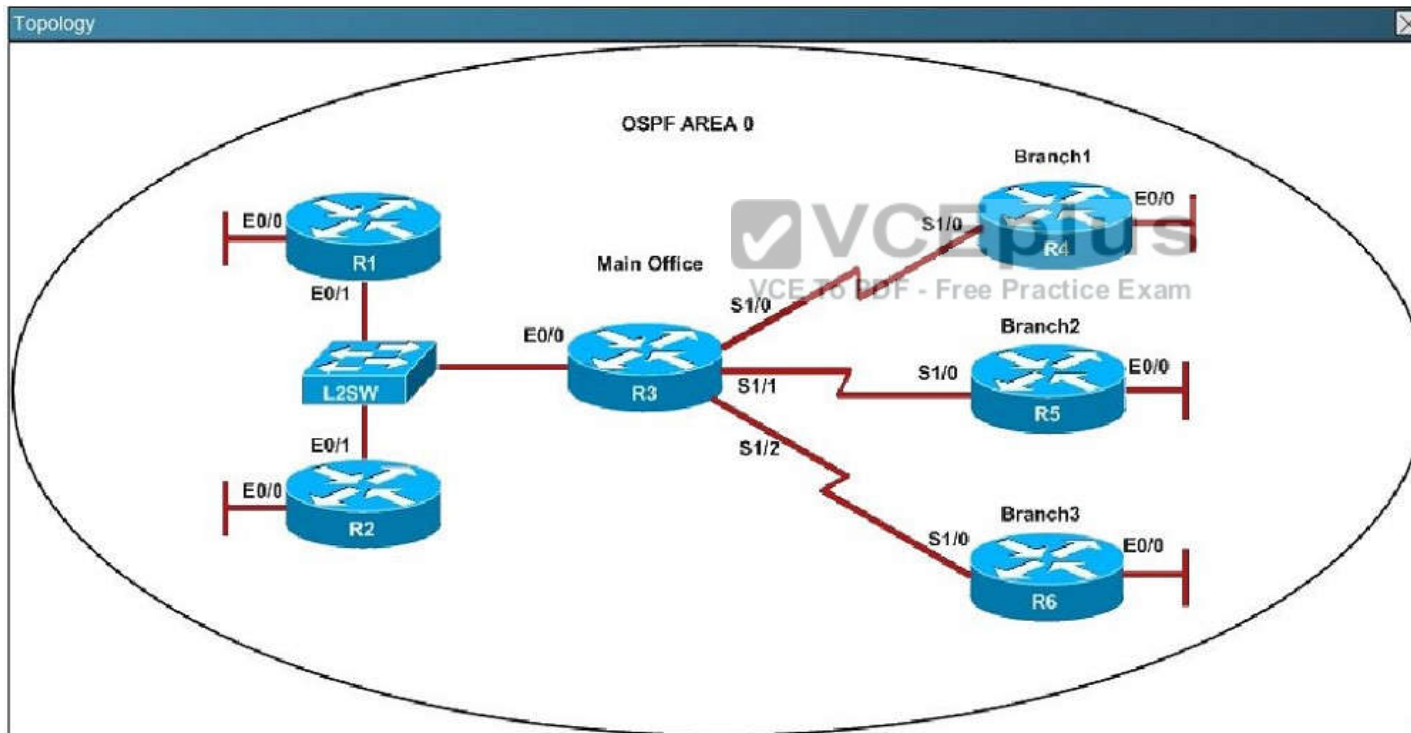
## QUESTION 92

### Scenario

Refer to the topology. Your company has decided to connect the main office with three other remote branch offices using point-to-point serial links. You are required to troubleshoot and resolve OSPF neighbor adjacency issues between the main office and the routers located in the remote branch offices. Use appropriate show commands to troubleshoot the issues and answer all four questions.

### Instructions

- Enter Cisco IOS commands on the device to verify network operation and answer the multiple-choice questions.
- THIS TASK DOES NOT REQUIRE DEVICE CONFIGURATION.
- Click on the device to gain access to the console of the device. No console or enable passwords are required.
- To access the multiple-choice questions, click on the numbered boxes on the left of the top panel.
- There are four multiple-choice questions with this task. Be sure to answer all four questions before clicking the Next button.



```
R1# show running-config
interface Loopback0
description ***Loopback***
ip address 192.168.1.1 255.255.255.255
ip ospf 1 area 0
!
interface Ethernet0/0
description **Connected to R1-LAN**
ip address 10.10.110.1 255.255.255.0
ip ospf 1 area 0
!
interface Ethernet0/1
description **Connected to L2SW**
ip address 10.10.230.1 255.255.255.0
ip ospf hello-interval 25
ip ospf 1 area 0
!
log-adjacency-changes
```

```
R2# show running-config
R2
!
interface Loopback0
description **Loopback**
ip address 192.168.2.2 255.255.255.255
ip ospf 2 area 0
!
interface Ethernet0/0
description **Connected to R2-LAN**
ip address 10.10.120.1 255.255.255.0
ip ospf 2 area 0
!
interface Ethernet0/1
description **Connected to L2SW**
ip address 10.10.230.2 255.255.255.0
ip ospf 2 area 0
!
router ospf 2
log-adjacency-changes
```

```
R3# show running-config
R3
username R6 password CISCO36
!
interface Loopback0
description **Loopback**
ip address 192.168.3.3 255.255.255.255
ip ospf 3 area 0
!
interface Ethernet0/0
description **Connected to L2SW**
ip address 10.10.230.3 255.255.255.0
ip ospf 3 area 0
!
interface Serial1/0
description **Connected to R4-Branch1 office**
ip address 10.10.240.1 255.255.255.252
encapsulation ppp
ip ospf 3 area 0
!
interface Serial1/1
description **Connected to R5-Branch2 office**
ip address 10.10.240.5 255.255.255.252
encapsulation ppp
ip ospf hello-interval 50
ip ospf 3 area 0
!
interface Serial1/2
description **Connected to R6-Branch3 office**
ip address 10.10.240.9 255.255.255.252
encapsulation ppp
ip ospf 3 area 0
ppp authentication chap
!
router ospf 3
router-id 192.168.3.3
!
```

```
R4# show running-config
R4
!
interface Loopback0
description **Loopback**
ip address 192.168.4.4 255.255.255.255
ip ospf 4 area 2
!
interface Ethernet0/0
ip address 172.16.113.1 255.255.255.0
ip ospf 4 area 2
!
interface Serial1/0
description **Connected to R3-Main Branch office**
ip address 10.10.240.2 255.255.255.252
encapsulation ppp
ip ospf 4 area 2
!
router ospf 4
log-adjacency-changes
```

```
R5# show running-config
R5
!
interface Loopback0
description **Loopback**
ip address 192.168.5.5 255.255.255.255
ip ospf 5 area 0
!
interface Ethernet0/0
ip address 172.16.114.1 255.255.255.0
ip ospf 5 area 0
!
interface Serial1/0
description **Connected to R3-Main Branch office**
ip address 10.10.240.6 255.255.255.252
encapsulation ppp
ip ospf 5 area0
!
router ospf 5
log-adjacency-changes
```

```
R6# show running-config
R6
username R3 password CISCO36
!
interface Loopback0
description **Loopback**
ip address 192.168.6.6 255.255.255.255
ip ospf 6 area 0
!
interface Ethernet0/0
ip address 172.16.115.1 255.255.255.0
ip ospf 6 area 0
!
interface Serial1/0
description **Connected to R3-Main Branch office**
ip address 10.10.240.10 255.255.255.252
encapsulation ppp
ip ospf 6 area 0
ppp authentication chap
!
router ospf 6
router-id 192.168.3.3
!
```



An OSPF neighbor adjacency is not formed between R3 in the main office and R6 in the Branch3 office. What is causing the problem?

- A. There is an area ID mismatch.
- B. There is a PPP authentication issue; the username is not configured on R3 and R6.
- C. There is an OSPF hello and dead interval mismatch.
- D. The R3 router ID is configured on R6.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**



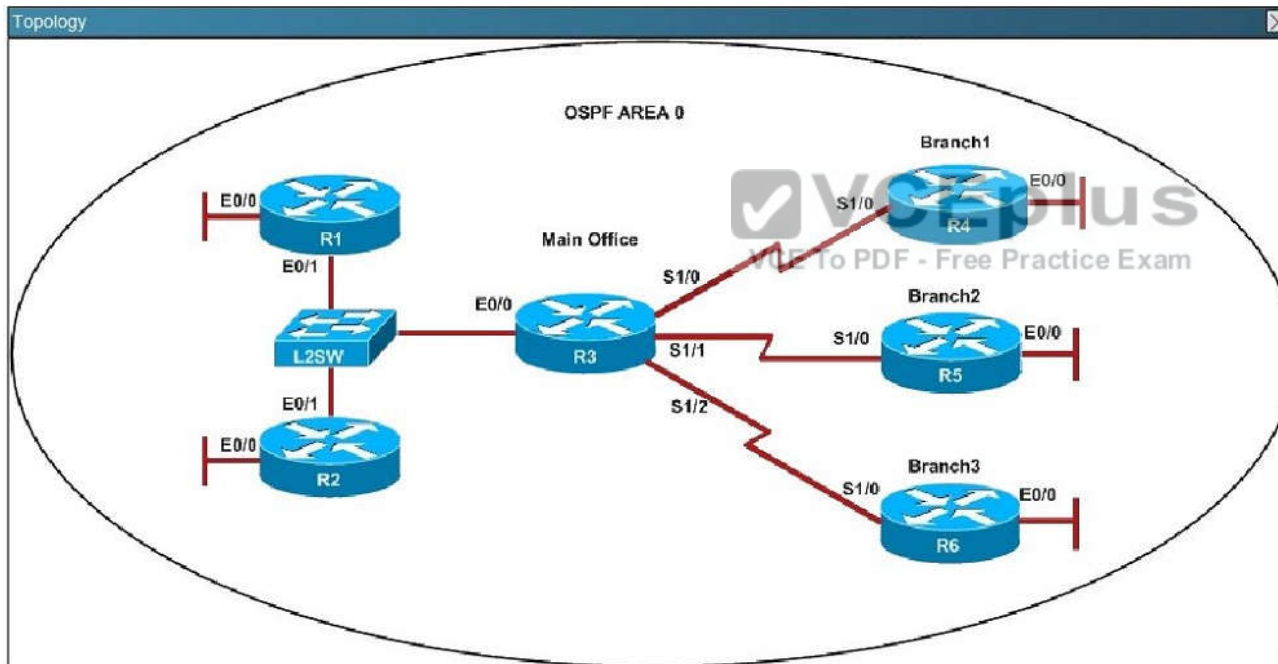
### QUESTION 93

#### Scenario

Refer to the topology. Your company has decided to connect the main office with three other remote branch offices using point-to-point serial links. You are required to troubleshoot and resolve OSPF neighbor adjacency issues between the main office and the routers located in the remote branch offices. Use appropriate show commands to troubleshoot the issues and answer all four questions.

#### Instructions

- Enter Cisco IOS commands on the device to verify network operation and answer the multiple-choice questions.
- THIS TASK DOES NOT REQUIRE DEVICE CONFIGURATION.
- Click on the device to gain access to the console of the device. No console or enable passwords are required.
- To access the multiple-choice questions, click on the numbered boxes on the left of the top panel.
- There are four multiple-choice questions with this task. Be sure to answer all four questions before clicking the Next button.



```
R1# show running-config
interface Loopback0
description ***Loopback***
ip address 192.168.1.1 255.255.255.255
ip ospf 1 area 0
!
interface Ethernet0/0
description **Connected to R1-LAN**
ip address 10.10.110.1 255.255.255.0
ip ospf 1 area 0
!
interface Ethernet0/1
description **Connected to L2SW**
ip address 10.10.230.1 255.255.255.0
ip ospf hello-interval 25
ip ospf 1 area 0
!
log-adjacency-changes
```

```
R2# show running-config
R2
!
interface Loopback0
description **Loopback**
ip address 192.168.2.2 255.255.255.255
ip ospf 2 area 0
!
interface Ethernet0/0
description **Connected to R2-LAN**
ip address 10.10.120.1 255.255.255.0
ip ospf 2 area 0
!
interface Ethernet0/1
description **Connected to L2SW**
ip address 10.10.230.2 255.255.255.0
ip ospf 2 area 0
!
router ospf 2
log-adjacency-changes
```

```
R3# show running-config
R3
username R6 password CISCO36
!
interface Loopback0
description **Loopback**
ip address 192.168.3.3 255.255.255.255
ip ospf 3 area 0
!
interface Ethernet0/0
description **Connected to L2SW**
ip address 10.10.230.3 255.255.255.0
ip ospf 3 area 0
!
interface Serial1/0
description **Connected to R4-Branch1 office**
ip address 10.10.240.1 255.255.255.252
encapsulation ppp
ip ospf 3 area 0
!
interface Serial1/1
description **Connected to R5-Branch2 office**
ip address 10.10.240.5 255.255.255.252
encapsulation ppp
ip ospf hello-interval 50
ip ospf 3 area 0
!
interface Serial1/2
description **Connected to R6-Branch3 office**
ip address 10.10.240.9 255.255.255.252
encapsulation ppp
ip ospf 3 area 0
ppp authentication chap
!
router ospf 3
router-id 192.168.3.3
!
```

```
R4# show running-config
R4
!
interface Loopback0
description **Loopback**
ip address 192.168.4.4 255.255.255.255
ip ospf 4 area 2
!
interface Ethernet0/0
ip address 172.16.113.1 255.255.255.0
ip ospf 4 area 2
!
interface Serial1/0
description **Connected to R3-Main Branch office**
ip address 10.10.240.2 255.255.255.252
encapsulation ppp
ip ospf 4 area 2
!
router ospf 4
log-adjacency-changes
```

```
R5# show running-config
R5
!
interface Loopback0
description **Loopback**
ip address 192.168.5.5 255.255.255.255
ip ospf 5 area 0
!
interface Ethernet0/0
ip address 172.16.114.1 255.255.255.0
ip ospf 5 area 0
!
interface Serial1/0
description **Connected to R3-Main Branch office**
ip address 10.10.240.6 255.255.255.252
encapsulation ppp
ip ospf 5 area0
!
router ospf 5
log-adjacency-changes
```

```
R6# show running-config
R6
username R3 password CISCO36
!
interface Loopback0
description **Loopback**
ip address 192.168.6.6 255.255.255.255
ip ospf 6 area 0
!
interface Ethernet0/0
ip address 172.16.115.1 255.255.255.0
ip ospf 6 area 0
!
interface Serial1/0
description **Connected to R3-Main Branch office**
ip address 10.10.240.10 255.255.255.252
encapsulation ppp
ip ospf 6 area 0
ppp authentication chap
!
router ospf 6
router-id 192.168.3.3
!
```



R1 does not form an OSPF neighbor adjacency with R2. Which option would fix the issue?

- A. R1 ethernet0/1 is shutdown. Configure the **no shutdown** command.
- B. R1 ethernet0/1 configured with a non-default OSPF hello interval of 25; configure **no ip ospf hello-interval 25**.
- C. R2 ethernet0/1 and R3 ethernet0/0 are configured with a non-default OSPF hello interval of 25; configure **no ip ospf hello-interval 25**.
- D. Enable OSPF for R1 ethernet0/1; configure **ip ospf 1 area 0** command under ethernet0/1.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**



## QUESTION 94

### Scenario

Refer to the topology. Your company has decided to connect the main office with three other remote branch offices using point-to-point serial links. You are required to troubleshoot and resolve OSPF neighbor adjacency issues between the main office and the routers located in the remote branch offices. Use appropriate show commands to troubleshoot the issues and answer all four questions.

### Instructions

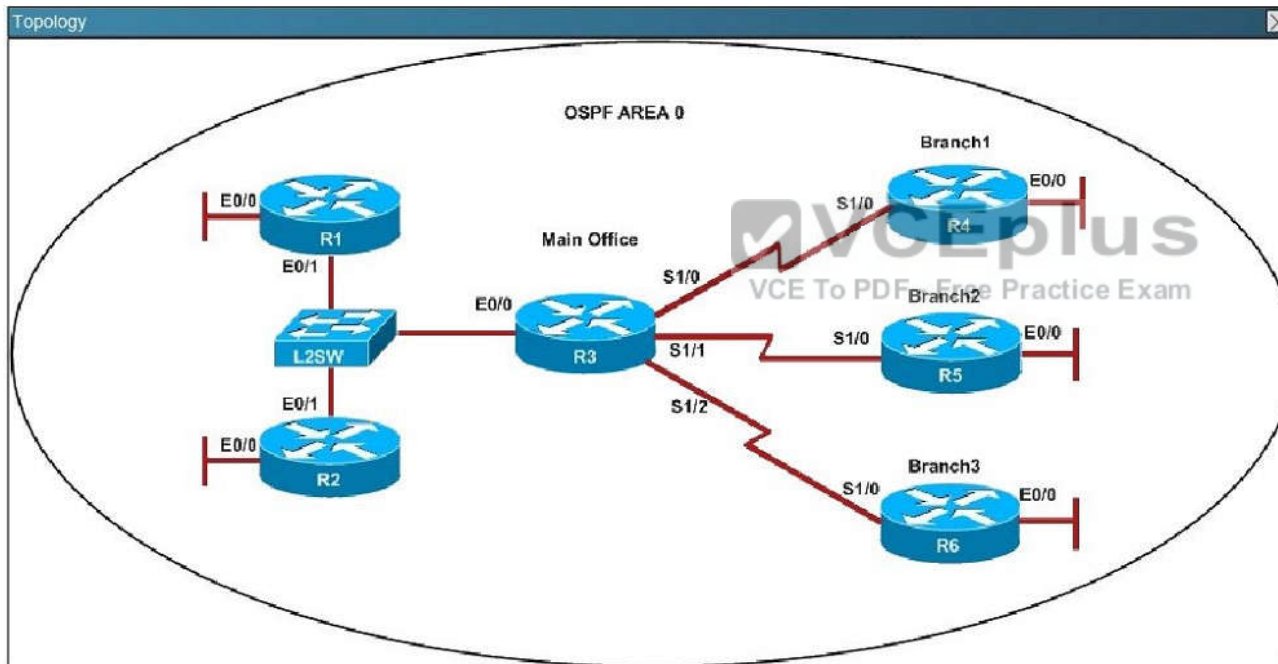
Enter Cisco IOS commands on the device to verify network operation and answer the multiple-choice questions.

**THIS TASK DOES NOT REQUIRE DEVICE CONFIGURATION.**

Click on the device to gain access to the console of the device. No console or enable passwords are required.

To access the multiple-choice questions, click on the numbered boxes on the left of the top panel.

There are four multiple-choice questions with this task. Be sure to answer all four questions before clicking the Next button.





```
R1# show running-config
interface Loopback0
description ***Loopback***
ip address 192.168.1.1 255.255.255.255
ip ospf 1 area 0
!
interface Ethernet0/0
description **Connected to R1-LAN**
ip address 10.10.110.1 255.255.255.0
ip ospf 1 area 0
!
interface Ethernet0/1
description **Connected to L2SW**
ip address 10.10.230.1 255.255.255.0
ip ospf hello-interval 25
ip ospf 1 area 0
!
log-adjacency-changes
```

```
R2# show running-config
R2
!
interface Loopback0
description **Loopback**
ip address 192.168.2.2 255.255.255.255
ip ospf 2 area 0
!
interface Ethernet0/0
description **Connected to R2-LAN**
ip address 10.10.120.1 255.255.255.0
ip ospf 2 area 0
!
interface Ethernet0/1
description **Connected to L2SW**
ip address 10.10.230.2 255.255.255.0
ip ospf 2 area 0
!
router ospf 2
log-adjacency-changes
```

```
R3# show running-config
R3
username R6 password CISCO36
!
interface Loopback0
description **Loopback**
ip address 192.168.3.3 255.255.255.255
ip ospf 3 area 0
!
interface Ethernet0/0
description **Connected to L2SW**
ip address 10.10.230.3 255.255.255.0
ip ospf 3 area 0
!
interface Serial1/0
description **Connected to R4-Branch1 office**
ip address 10.10.240.1 255.255.255.252
encapsulation ppp
ip ospf 3 area 0
!
interface Serial1/1
description **Connected to R5-Branch2 office**
ip address 10.10.240.5 255.255.255.252
encapsulation ppp
ip ospf hello-interval 50
ip ospf 3 area 0
!
interface Serial1/2
description **Connected to R6-Branch3 office**
ip address 10.10.240.9 255.255.255.252
encapsulation ppp
ip ospf 3 area 0
ppp authentication chap
!
router ospf 3
router-id 192.168.3.3
!
```

```
R4# show running-config
R4
!
interface Loopback0
description **Loopback**
ip address 192.168.4.4 255.255.255.255
ip ospf 4 area 2
!
interface Ethernet0/0
ip address 172.16.113.1 255.255.255.0
ip ospf 4 area 2
!
interface Serial1/0
description **Connected to R3-Main Branch office**
ip address 10.10.240.2 255.255.255.252
encapsulation ppp
ip ospf 4 area 2
!
router ospf 4
log-adjacency-changes
```

```
R5# show running-config
R5
!
interface Loopback0
description **Loopback**
ip address 192.168.5.5 255.255.255.255
ip ospf 5 area 0
!
interface Ethernet0/0
ip address 172.16.114.1 255.255.255.0
ip ospf 5 area 0
!
interface Serial1/0
description **Connected to R3-Main Branch office**
ip address 10.10.240.6 255.255.255.252
encapsulation ppp
ip ospf 5 area0
!
router ospf 5
log-adjacency-changes
```

```
R6# show running-config
R6
username R3 password CISCO36
!
interface Loopback0
description **Loopback**
ip address 192.168.6.6 255.255.255.255
ip ospf 6 area 0
!
interface Ethernet0/0
ip address 172.16.115.1 255.255.255.0
ip ospf 6 area 0
!
interface Serial1/0
description **Connected to R3-Main Branch office**
ip address 10.10.240.10 255.255.255.252
encapsulation ppp
ip ospf 6 area 0
ppp authentication chap
!
router ospf 6
router-id 192.168.3.3
!
```



An OSPF neighbor adjacency is not formed between R3 in the main office and R5 in the Branch2 office. What is causing the problem?

- A. There is an area ID mismatch.
- B. There is a PPP authentication issue; a password mismatch.
- C. There is an OSPF hello and dead interval mismatch.
- D. There is a missing network command in the OSPF process on R5.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

The "show ip ospf interface command on R3 and R5 shows that the hello and dead intervals do not match. They are 50 and 200 on R3 and 10 and 40 on R5.

**QUESTION 95**

What is the advantage of using a multipoint interface instead of point-to-point subinterfaces when configuring a Frame Relay hub in a hub-and-spoke topology?

- A. It avoids split-horizon issues with distance vector routing protocols.
- B. IP addresses can be conserved if VLSM is not being used for subnetting.
- C. A multipoint interface offers greater security compared to point-to-point subinterface configurations.
- D. The multiple IP network addresses required for a multipoint interface provide greater addressing flexibility over point-to-point configurations.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

you do not have to assign a separate subnet per sub-interface. If you're using a Class A network (10.x.x.x/8), you blow the whole network on a few connections (if you used VLSM, you could use a better mask, limit the addresses used). if you used 10.0.0.0/8, you would not be assigning the entire /8 to a single network. You would select a subnet mask for the network and then, you would have to use that mask with all subnets of the network. So if you chose a /24 mask, that would mean that you would have to use a /24 mask for even point-to-point links.

**QUESTION 96**

Which two statistics appear in show frame-relay map output? (Choose two.)

- A. the number of BECN packets that are received by the router
- B. the value of the local DLCI
- C. the number of FECN packets that are received by the router
- D. the status of the PVC that is configured on the router
- E. the IP address of the local router

**Correct Answer:** BD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Frame Relay Commands (map-class frame-relay through threshold ecn)

[http://www.cisco.com/en/US/docs/ios/12\\_2/wan/command/wrffr4.html#wp102934](http://www.cisco.com/en/US/docs/ios/12_2/wan/command/wrffr4.html#wp102934)

Examples

The following is sample output from the show frame-relay map command:

Router#show frame-relay map Serial 1 (administratively down): ip 10.108.177.177 dlci 177 (0xB1,0x2C10), static, broadcast, CISCO  
TCP/IP Header Compression (inherited), passive (inherited)

#### QUESTION 97

Which protocol is an open standard protocol framework that is commonly used in VPNs, to provide secure end-to-end communications?

- A. RSA
- B. L2TP
- C. IPsec
- D. PPTP

**Correct Answer:** C

**Section:** (none)

**Explanation**

#### **Explanation/Reference:**

Explanation:

Internet Protocol Security (IPsec) is a technology protocol suite for securing Internet Protocol (IP) communications by authenticating and/or encrypting each IP packet of a communication session. IPsec also includes protocols for establishing mutual authentication between agents at the beginning of the session and negotiation of cryptographic keys to be used during the session.

#### QUESTION 98

At which layer of the OSI model does PPP perform?

- A. Layer 2
- B. Layer 3
- C. Layer 4
- D. Layer 5

**Correct Answer:** A

**Section:** (none)

**Explanation**

#### **Explanation/Reference:**

Explanation:

Point-to-Point Protocol (PPP) is a data link protocol commonly used in establishing a direct connection between two networking nodes. It can provide connection authentication, transmission encryption (using ECP, RFC 1968), and compression.

#### QUESTION 99



The command show frame-relay map gives the following output:

```
Serial 0 (up): ip 192.168.151.4 dlci 122, dynamic, b  
roadcast, status defined, active
```

Which statements represent what is shown? (Choose three.)

- A. 192.168.151.4 represents the IP address of the remote router
- B. 192.168.151.4 represents the IP address of the local serial interface
- C. DLCI 122 represents the interface of the remote serial interface
- D. DLCI 122 represents the local number used to connect to the remote address
- E. broadcast indicates that a dynamic routing protocol such as RIP v1 can send packets across this PVC
- F. active indicates that the ARP process is working

**Correct Answer:** ADE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

[http://www.cisco.com/en/US/docs/ios/12\\_2/wan/command/reference/wrfr4.html#wp1029343](http://www.cisco.com/en/US/docs/ios/12_2/wan/command/reference/wrfr4.html#wp1029343)

Field	Description
Serial 1 (administratively down)	Identifies a Frame Relay interface and its status (up or down)
ip 131.108.177.177	Destination IP address
dlci 177 (0xB1, 0x2C10)	DLCI that identifies the logical connection being used to reach this interface. This value is displayed in three ways: its decimal value (177), its hexadecimal value (0xB1), and its value as it would appear on the wire (0x2C10)
static	Indicates whether this is a static or dynamic entry
CISCO	Indicates the encapsulation type for this map: either CISCO or IETF
TCP/IP Header Compression (inherited), passive (inherited)	Indicates whether the TCP/IP header compression characteristics were inherited from the interface or were explicitly configured for the IP map

#### QUESTION 100

What can be done to Frame Relay to resolve split-horizon issues? (Choose two.)

- A. Disable Inverse ARP.
- B. Create a full-mesh topology.
- C. Develop multipoint subinterfaces.
- D. Configure point-to-point subinterfaces.
- E. Remove the broadcast keyword from the frame-relay map command.

**Correct Answer:** BD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

IP split horizon checking is disabled by default for Frame Relay encapsulation to allow routing updates to go in and out of the same interface. An exception is the Enhanced Interior Gateway Routing Protocol (EIGRP) for which split horizon must be explicitly disabled. Certain protocols such as AppleTalk, transparent bridging, and Internetwork Packet Exchange (IPX) cannot be supported on partially meshed networks because they require split horizon to be enabled (a packet received on an interface cannot be transmitted over the same interface, even if the packet is received and transmitted on different virtual circuits). Configuring Frame Relay

subinterfaces ensures that a single physical interface is treated as multiple virtual interfaces. This capability allows you to overcome split horizon rules so packets received on one virtual interface can be forwarded to another virtual interface, even if they are configured on the same physical interface.

#### QUESTION 101

What are three reasons that an organization with multiple branch offices and roaming users might implement a Cisco VPN solution instead of point-to-point WAN links? (Choose three.)

- A. reduced cost
- B. better throughput
- C. broadband incompatibility
- D. increased security
- E. scalability
- F. reduced latency

**Correct Answer:** ADE

**Section:** (none)

**Explanation**

#### Explanation/Reference:

Explanation:

[http://www.cisco.com/en/US/products/ps5743/Products\\_Sub\\_Category\\_Home.html#~Benefits](http://www.cisco.com/en/US/products/ps5743/Products_Sub_Category_Home.html#~Benefits)

Enhance Productivity and Cut Costs

Cisco VPN solutions provide exceptional security through encryption and authentication technologies that protect data in transit from unauthorized access and attacks. A Cisco VPN helps you:

Use highly secure communications, with access rights tailored to individual users Quickly add new sites or users, without significantly expanding your existing infrastructure Improve productivity by extending corporate networks, applications, and collaboration tools Reduce communications costs while increasing flexibility

#### QUESTION 102

Which command is used to enable CHAP authentication, with PAP as the fallback method, on a serial interface?

- A. Router(config-if)# ppp authentication chap fallback ppp
- B. Router(config-if)# ppp authentication chap pap
- C. Router(config-if)# authentication ppp chap fallback ppp
- D. Router(config-if)# authentication ppp chap pap

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

The command "ppp authentication chap pap" command indicates the CHAP authentication is used first. If it fails or is rejected by other side then uses PAP instead. If you want to use PAP first (then CHAP) you can use the "ppp authentication pap chap" command  
[http://www.cisco.com/en/US/docs/ios/12\\_2/security/configuration/guide/scfathen.html](http://www.cisco.com/en/US/docs/ios/12_2/security/configuration/guide/scfathen.html)

**QUESTION 103**

What is the result of issuing the frame-relay map ip 192.168.1.2 202 broadcast command?

- A. defines the destination IP address that is used in all broadcast packets on DLCI 202
- B. defines the source IP address that is used in all broadcast packets on DLCI 202
- C. defines the DLCI on which packets from the 192.168.1.2 IP address are received
- D. defines the DLCI that is used for all packets that are sent to the 192.168.1.2 IP address

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

frame-relay map ip 192.168.1.2 202 command statically defines a mapping between a network layer address and a DLCI. The broadcast option allows multicast and broadcast packets to flow across the link.

The command frame-relay map ip 192.168.1.2 202 broadcast means to mapping the distal IP 192.168.1.2 202 to the local DLCI. When the "broadcast" keyword is included, it turns Frame Relay network as a broadcast network, which can forward broadcasts.

[http://www.cisco.com/en/US/docs/ios/wan/command/reference/wan\\_f2.html#wp1012264](http://www.cisco.com/en/US/docs/ios/wan/command/reference/wan_f2.html#wp1012264)

Field	Description
Serial 1 (administratively down)	Identifies a Frame Relay interface and its status (up or down)
ip 131.108.177.177	Destination IP address
dlci 177 (0xB1, 0x2C10)	DLCI that identifies the logical connection being used to reach this interface. This value is displayed in three ways: its decimal value (177), its hexadecimal value (0xB1), and its value as it would appear on the wire (0x2C10)
static	Indicates whether this is a static or dynamic entry
CISCO	Indicates the encapsulation type for this map: either CISCO or IETF
TCP/IP Header Compression (inherited), passive (inherited)	Indicates whether the TCP/IP header compression characteristics were inherited from the interface or were explicitly configured for the IP map

#### QUESTION 104

Which Layer 2 protocol encapsulation type supports synchronous and asynchronous circuits and has built-in security mechanisms?

- A. HDLC
- B. PPP
- C. X.25
- D. Frame Relay

**Correct Answer:** B

**Section:** (none)

**Explanation**

#### Explanation/Reference:

Explanation:

High-Level Data Link Control (HDLC) -HDLC is the default encapsulation type on point-to-point, dedicated links, and circuit-switched connections. It is used typically when communicating between two Cisco devices. It is a bit-oriented synchronous data link layer protocol.

Point-to-Point Protocol (PPP) -Provides router-to-router and host-to network connections over synchronous and asynchronous circuits. PPP was designed to work with several network layer protocols, such as IP, and IPX. PPP also has built in security mechanisms such as PAP and CHAP X.25/Link Access Procedure, Balanced (LAPB) -ITU-T standard that defines how connections between DTE and DCE are maintained for remote terminal access and computer communications

in public data networks. X.25 specifies LAPB, a data line layer protocol. X.25 is a predecessor to Frame Relay. Frame Relay -Industry standard, switched data link layer protocol that handles multiple virtual circuits. It is a next-generation to X.25 that is streamlined to eliminate some of the time-consuming processes (such as error correction and flow control) that were employed in X.25

Field	Description
Serial 1 (administratively down)	Identifies a Frame Relay interface and its status (up or down)
ip 131.108.177.177	Destination IP address
dlci 177 (0xB1, 0x2C10)	DLCI that identifies the logical connection being used to reach this interface. This value is displayed in three ways: its decimal value (177), its hexadecimal value (0xB1), and its value as it would appear on the wire (0x2C10)
static	Indicates whether this is a static or dynamic entry
CISCO	Indicates the encapsulation type for this map: either CISCO or IETF
TCP/IP Header Compression (inherited), passive (inherited)	Indicates whether the TCP/IP header compression characteristics were inherited from the interface or were explicitly configured for the IP map

#### QUESTION 105

Which encapsulation type is a Frame Relay encapsulation type that is supported by Cisco routers?

- A. IETF
- B. ANSI Annex D
- C. Q9333-A Annex A
- D. HDLC

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Cisco supports two Frame Relay encapsulation types: the Cisco encapsulation and the IETF Frame Relay encapsulation, which is in conformance with RFC 1490

and RFC 2427. The former is often used to connect two Cisco routers while the latter is used to connect a Cisco router to a non-Cisco router. You can test with your Cisco router when typing the command

Router(config-if)#encapsulation frame-relay? on a WAN link.

Note: Three LMI options are supported by Cisco routers are ansi, Cisco, and Q933a. They represent the ANSI Annex D, Cisco, and ITU Q933-A (Annex A) LMI types, respectively.

HDLC is a WAN protocol same as Frame-Relay and PPP so it is not a Frame Relay encapsulation type.

```
R1<config-if>#encapsulation frame-relay ?
  ietf    Use RFC1490/RFC242? encapsulation
  <cr>
```

#### QUESTION 106

The internetwork infrastructure of company XYZ consists of a single OSPF area as shown in the graphic. There is concern that a lack of router resources is impeding internetwork performance. As part of examining the router resources, the OSPF DRs need to be known. All the router OSPF priorities are at the default and the router IDs are shown with each router. Which routers are likely to have been elected as DR? (Choose two.)

- A. Corp-1
- B. Corp-2
- C. Corp-3
- D. Corp-4
- E. Branch-1
- F. Branch-2



**Correct Answer:** DF

**Section:** (none)

**Explanation**

#### Explanation/Reference:

Explanation:

There are 2 segments on the topology above which are separated by Corp-3 router.

Each segment will have a DR so we have 2 DRs.

To select which router will become DR they will compare their router-IDs. The router with highest (best) router-ID will become DR. The router-ID is chosen in the order below:

The highest IP address assigned to a loopback (logical) interface. If a loopback interface is not defined, the highest IP address of all active router's physical interfaces will be chosen.

In this question, the IP addresses of loopback interfaces are not mentioned so we will consider IP addresses of all active router's physical interfaces. Router Corp-4 (10.1.40.40) & Branch-2 (10.2.20.20) have highest "active" IP addresses so they will become DRs.



**QUESTION 107**

A network administrator needs to configure a serial link between the main office and a remote location. The router at the remote office is a non-Cisco router. How should the network administrator configure the serial interface of the main office router to make the connection?

- A. `Main(config)# interface serial 0/0`  
`Main(config-if)# ip address 172.16.1.1 255.255.255.252`  
`Main(config-if)# no shut`
- B. `Main(config)# interface serial 0/0`  
`Main(config-if)# ip address 172.16.1.1 255.255.255.252`  
`Main(config-if)# encapsulation ppp`  
`Main(config-if)# no shut`
- C. `Main(config)# interface serial 0/0`  
`Main(config-if)# ip address 172.16.1.1 255.255.255.252`  
`Main(config-if)# encapsulation frame-relay`  
`Main(config-if)# authentication chap`  
`Main(config-if)# no shut`
- D. `Main(config)# interface serial 0/0`  
`Main(config-if)# ip address 172.16.1.1 255.255.255.252`  
`Main(config-if)# encapsulation ietf`  
`Main(config-if)# no shut`

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Cisco High-Level Data Link Controller (HDLC) is the Cisco proprietary protocol for sending data over synchronous serial links using HDLC. So HDLC runs only in Cisco router. PPP is not proprietary protocol it's an open source every cisco router and non-cisco router understand the PPP protocol. So we need to configure the PPP protocol if connection is between cisco and non-cisco router.

**QUESTION 108**

Which PPP subprotocol negotiates authentication options?



- A. NCP
- B. ISDN
- C. SLIP
- D. LCP
- E. DLCI

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

A protocol that establishes, configures, and tests data link connections used by the PPP Link Control Protocol offers PPP encapsulation different options, including the following:

Authentication -options includes PAP and CHAP

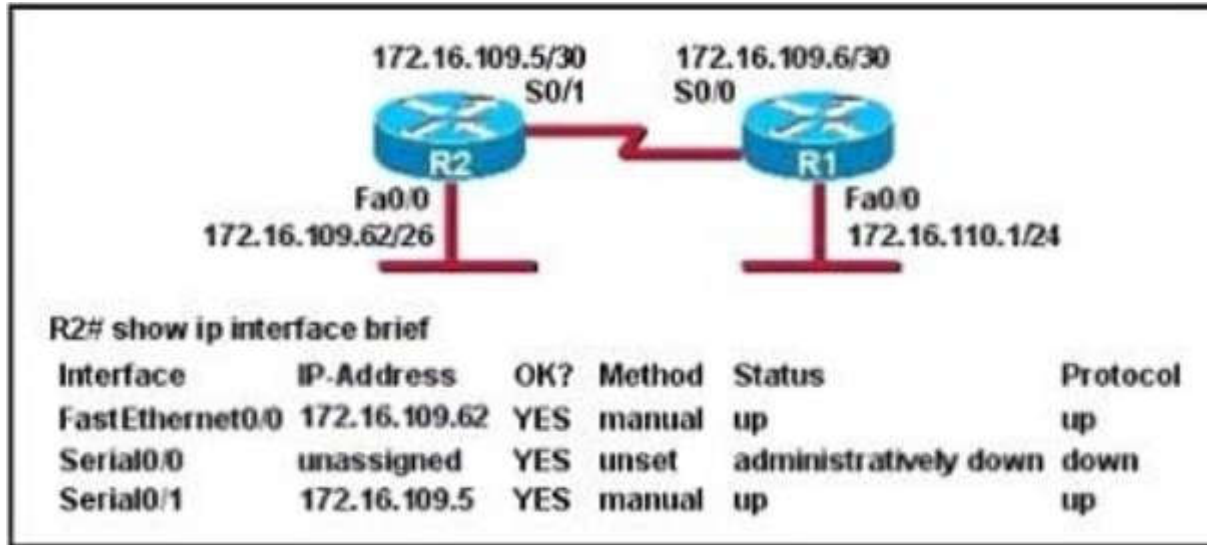
Compression -Data compression increases the throughput on a network link, by reducing the amount of data that must be transmitted. Error Detection -Quality and Magic numbers are used by PPP to ensure a reliable, loop-free data link.

Multilink -Supported in IOS 11.1 and later, multilink is supported on PPP links between Cisco routers. This splits the load for PPP over two or more parallel circuits and is called a bundle.

**QUESTION 109**

Refer to the exhibit.

Assuming that the entire network topology is shown, what is the operational status of the interfaces of R2 as indicated by the command output shown?



- A. One interface has a problem.
- B. Two interfaces have problems.
- C. The interfaces are functioning correctly.
- D. The operational status of the interfaces cannot be determined from the output shown.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

R2 has setup with two interface s0/1 and fa0/0 and both are interfaces configured with IP address and up. "show ip interface brief" showing the status of R2 interfaces.

#### QUESTION 110

Which two statements describe the process identifier that is used in the command to configure OSPF on a router? (Choose two.)

```
Router(config)# router ospf 1
```

- A. All OSPF routers in an area must have the same process ID.
- B. Only one process number can be used on the same router.

- C. Different process identifiers can be used to run multiple OSPF processes
- D. The process number can be any number from 1 to 65,535.
- E. Hello packets are sent to each neighbor to determine the processor identifier.

**Correct Answer:** CD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

We all know that the areas can be any number from 0 to 4.2 billion and 1 to 65,535 for the Process ID. The process ID is the ID of the OSPF process to which the interface belongs. The process ID is local to the router, and two OSPF neighboring routers can have different OSPF process IDs.

(This is not true of Enhanced Interior Gateway Routing Protocol [EIGRP], in which the routers need to be in the same autonomous system). Cisco IOS Software can run multiple OSPF processes on the same router, and the process ID merely distinguishes one process from the another. The process ID should be a positive integer.

**QUESTION 111**

Refer to the exhibit.

Given the output from the show ip eigrp topology command, which router is the feasible successor?

```
router#show ip eigrp topology 10.0.0.5 255.255.255.255
IP-EIGRP topology entry for 10.0.0.5/32  State is Passive, Query
origin flag is 1, 1 Successor(s), FD is 41152000
```

A. A. 10.1.0.3 (Serial0), from 10.1.0.3, Send flag is 0x0  
Composite metric is (46866176/46354176), Route is Internal  
Vector metric:  
Minimum bandwidth is 56 Kbit  
Total delay is 45000 microseconds  
Reliability is 255/255  
Load is 1/255  
Minimum MTU is 1500  
Hop count is 2

B. B. 10.0.0.2 (Serial0.1), from 10.0.0.2, Send flag is 0x0  
Composite metric is (53973248/128256), Route is Internal  
Vector metric:  
Minimum bandwidth is 48 Kbit  
Total delay is 25000 microseconds  
Reliability is 255/255  
Load is 1/255  
Minimum MTU is 1500  
Hop count is 1

- C. C. 10.1.0.1 (Serial0), from 10.1.0.1, Send flag is 0x0  
Composite metric is (46152000/41640000), Route is Internal  
Vector metric:  
Minimum bandwidth is 64 Kbit  
Total delay is 45000 microseconds  
Reliability is 255/255  
Load is 1/255  
Minimum MTU is 1500  
Hop count is 2
- D. D. 10.1.1.1 (Serial0.1), from 10.1.1.1, Send flag is 0x0  
Composite metric is (46763776/46251776), Route is External  
Vector metric:  
Minimum bandwidth is 56 Kbit  
Total delay is 41000 microseconds  
Reliability is 255/255  
Load is 1/255  
Minimum MTU is 1500  
Hop count is 2

**Correct Answer:** B  
**Section:** (none)  
**Explanation**

**Explanation/Reference:**

Explanation:

<http://networklessons.com/eigrp/eigrp-neighbor-and-topology-table-explained/>

To be the feasible successor, the Advertised Distance (AD) of that route must be less than the Feasible Distance (FD) of the successor. From the output of the "show ip eigrp topology 10.0.0.5 255.255.255.255" we learn that the FD of the successor is 41152000. Now we will mention about the answers, in the "Composite metric is (.../...)" statement the first parameter is the FD while the second parameter is the AD of that route. So we need to find out which route has the second parameter (AD) less than 41152000 -> only answer B satisfies this requirement with an AD of 128256.

**QUESTION 112**

Which three of these statements regarding 802.1Q trunking are correct? (Choose three.)

- A. 802.1Q native VLAN frames are untagged by default.
- B. 802.1Q trunking ports can also be secure ports.
- C. 802.1Q trunks can use 10 Mb/s Ethernet interfaces.
- D. 802.1Q trunks require full-duplex, point-to-point connectivity.
- E. 802.1Q trunks should have native VLANs that are the same at both ends.

**Correct Answer:** ACE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

CCNA Self-Study (ICND Exam): Extending Switched Networks with Virtual LANs

<http://www.ciscopress.com/articles/article.asp?p=102157&seqNum=2>

**QUESTION 113**

Which two options are valid WAN connectivity methods? (Choose two.)

- A. PPP
- B. WAP
- C. DSL
- D. L2TPv3
- E. Ethernet

**Correct Answer:** AC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

On each WAN connection, data is encapsulated into frames before it crosses the WAN link. The following are typical WAN protocols: 1. High-level Data Link Control (HDLC): The Cisco default encapsulation type on point-to-point connections, dedicated links, and circuit-switched connections. 2. PPP: Provides router-to-router and host-to-network connections over synchronous and asynchronous circuits. PPP was designed to work with several network layer protocols, including IP. 3. Frame-relay: A successor to X.25. This protocol is an industry-standard, switched data-link layer protocol that handles multiple virtual circuits

[http://en.wikipedia.org/wiki/Wide\\_area\\_network](http://en.wikipedia.org/wiki/Wide_area_network)

<http://www.ciscopress.com/articles/article.asp?p=102157&seqNum=2>

#### QUESTION 114

Refer to the exhibit.

Which WAN protocol is being used?

```
RouterA#show interface pos8/0/0
```

```
POS8/0/0 is up, line protocol is up
```

```
Hardware is Packet over Sonet
```

```
Keepalive set (10 sec)
```

```
Scramble disabled
```

```
LMI enq sent 2474988, LMI stat recvd 2474969, LMI upd recvd 0, DTE LMI up
```

```
Broadcast queue 0/256, broadcasts sent/dropped 25760668/0, interface broadcasts 25348176
```

```
Last input 00:00:00, output 00:00:00, output hang never
```

```
Last clearing of "show interface" counters 40w6d
```

```
5 minute input rate 0 bits/sec, 0 packets/sec
```

```
5 minute output rate 39000 bits/sec, 60 packets/sec
```

```
63153396 packets input, 4389121455 bytes, 0 no buffer
```

```
Received 0 broadcasts (0 IP multicast)
```

```
0 runs, 0 giants, 0 throttles
```

```
0 parity
```

```
44773 input errors, 39138 CRC, 0 frame, 0 overrun, 0 ignored, 27 abort
```

```
945596253 packets output, 62753244360 bytes, 0 underruns
```

```
0 output errors, 0 applique, 0 interface resets
```

```
0 output buffer failures, 0 output buffers swapped out
```

```
0 carrier transitions
```

A. ATM



- B. HDLC
- C. Frame Relay
- D. PPP

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

"Show interface pos8/0/0" command showing LMI enq sent which show frame-relay encapsulation enabled on this interface. Cisco supports three different Local Management Interface (LMI) types for Frame Relay: Cisco, ANSI Annex D, and Q933-A Annex A  
<http://www.ciscopress.com/articles/article.asp?p=170741&seqNum=3>

#### **QUESTION 115**

What occurs on a Frame Relay network when the CIR is exceeded?

- A. All TCP traffic is marked discard eligible.
- B. All UDP traffic is marked discard eligible and a BECN is sent.
- C. All TCP traffic is marked discard eligible and a BECN is sent.
- D. All traffic exceeding the CIR is marked discard eligible.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Committed information rate (CIR): The minimum guaranteed data transfer rate agreed to by the Frame Relay switch. Frames that are sent in excess of the CIR are marked as discard eligible (DE) which means they can be dropped if the congestion occurs within the Frame Relay network.

Note: In the Frame Relay frame format, there is a bit called Discard eligible (DE) bit that is used to identify frames that are first to be dropped when the CIR is exceeded.

#### **QUESTION 116**

What are two characteristics of Frame Relay point-to-point subinterfaces? (Choose two.)

- A. They create split-horizon issues.
- B. They require a unique subnet within a routing domain.
- C. They emulate leased lines.



- D. They are ideal for full-mesh topologies.
- E. They require the use of NBMA options when using OSPF.

**Correct Answer:** BC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

<http://www.ciscopress.com/articles/article.asp?p=170741&seqNum=5>

Configuring Frame Relay Subinterfaces

On partially meshed Frame Relay networks, the problem of split horizon can be overcome by using Frame Relay subinterfaces. Frame Relay provides a mechanism to allow a physical interface to be partitioned into multiple virtual interfaces. In a similar way, using subinterfaces allows a partially meshed network to be divided into a number of smaller, fully meshed point-to-point networks. Generally, each point-to-point subnetwork is assigned a unique network address. This allows packets received on one physical interface to be sent out from the same physical interface, albeit forwarded on VCs in different subinterfaces. There are two types of subinterfaces supported by Cisco routers: point-to-point and multipoint subinterfaces.

#### QUESTION 117

Which two statements about using the CHAP authentication mechanism in a PPP link are true? (Choose two.)

- A. CHAP uses a two-way handshake.
- B. CHAP uses a three-way handshake.
- C. CHAP authentication periodically occurs after link establishment.
- D. CHAP authentication passwords are sent in plaintext.
- E. CHAP authentication is performed only upon link establishment.
- F. CHAP has no protection from playback attacks.

**Correct Answer:** BC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Understanding and Configuring PPP CHAP Authentication

[http://www.cisco.com/en/US/tech/tk713/tk507/technologies\\_tech\\_note09186a00800b4131.shtml](http://www.cisco.com/en/US/tech/tk713/tk507/technologies_tech_note09186a00800b4131.shtml)

One-Way and Two-Way Authentication CHAP is defined as a one-way authentication method. However, you use CHAP in both directions to create a two-way authentication. Hence, with two-way CHAP, a separate three-way handshake is initiated by each side. In the Cisco CHAP implementation, by default, the called party must authenticate the calling party (unless authentication is completely turned off). Therefore, a one-way authentication initiated by the called party is the minimum possible authentication. However, the calling party can also verify the identity of the called party, and this results in a two-way authentication. One-way authentication is often required when you connect to non-Cisco devices.

**QUESTION 118**

Which command allows you to verify the encapsulation type (CISCO or IETF) for a Frame Relay link?

- A. show frame-relay lmi
- B. show frame-relay map
- C. show frame-relay pvc
- D. show interfaces serial

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

map will show frame relay encapsulation (cisco or ietf)

[http://www.cisco.com/en/US/docs/ios/12\\_2/wan/command/reference/wrfr4.html#wp1029343](http://www.cisco.com/en/US/docs/ios/12_2/wan/command/reference/wrfr4.html#wp1029343)

show frame-relay map" will show frame relay encapsulation type (CISCO or IETF)

Field	Description
Serial 1 (administratively down)	Identifies a Frame Relay interface and its status (up or down)
ip 131.108.177.177	Destination IP address
dlci 177 (0xB1, 0x2C10)	DLCI that identifies the logical connection being used to reach this interface. This value is displayed in three ways: its decimal value (177), its hexadecimal value (0xB1), and its value as it would appear on the wire (0x2C10)
static	Indicates whether this is a static or dynamic entry
CISCO	Indicates the encapsulation type for this map: either CISCO or IETF
TCP/IP Header Compression (inherited), passive (inherited)	Indicates whether the TCP/IP header compression characteristics were inherited from the interface or were explicitly configured for the IP map

**QUESTION 119**

What is the purpose of Inverse ARP?

- A. to map a known IP address to a MAC address
- B. to map a known DLCI to a MAC address
- C. to map a known MAC address to an IP address
- D. to map a known DLCI to an IP address
- E. to map a known IP address to a SPID
- F. to map a known SPID to a MAC address

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

<http://www.ciscopress.com/articles/article.asp?p=170741&seqNum=4>

Frame-Relay (a Layer 2 protocol) uses Inverse-Arp to map a known Layer 2 Address (DLCI) to a unknown Layer 3 Address.

Dynamic Mapping

Dynamic address mapping relies on the Frame Relay Inverse Address Resolution Protocol (Inverse ARP), defined by RFC 1293, to resolve a next hop network protocol address to a local DLCI value. The Frame Relay router sends out Inverse ARP requests on its Frame Relay PVC to discover the protocol address of the remote device connected to the Frame Relay network. The responses to the Inverse ARP requests are used to populate an address-to-DLCI mapping table on the Frame Relay router or access server. The router builds and maintains this address-to-DLCI mapping table, which contains all resolved Inverse ARP requests, including both dynamic and static mapping entries.

When data needs to be transmitted to a remote destination address, the router performs a lookup on its routing table to determine whether a route to that destination address exists and the next hop address or directly connected interface to use in order to reach that destination. Subsequently, the router consults its address-to-DLCI mapping table for the local DLCI that corresponds to the next hop address. Finally, the router places the frames targeted to the remote destination on its identified outgoing local DLCI. On Cisco routers, dynamic Inverse ARP is enabled by default for all network layer protocols enabled on the physical interface. Packets are not sent out for network layer protocols that are not enabled on the physical interface. For example, no dynamic Inverse ARP resolution is performed for IPX if ipx routing is not enabled globally and there is no active IPX address assigned to the interface. Because dynamic Inverse ARP is enabled by default, no additional Cisco IOS command is required to enable it on an interface.

Example 4-16 shows the output of the show frame-relay map privileged EXEC mode command.

The address-to-DLCI mapping table displays useful information. The output of the command shows that the next hop address 172.16.1.2 is dynamically mapped to the local DLCI 102, broadcast is enabled on the interface, and the interface's status is currently active.

NOTE

After enabling Frame Relay on the interface, the Cisco router does not perform Inverse ARP until IP routing is enabled on the router. By default, IP routing is enabled on a Cisco router. If IP routing has been turned off, enable IP routing with the ip routing command in the global configuration mode. After IP routing is enabled, the router performs Inverse ARP and begins populating the address-to-DLCI mapping table with resolved entries.

**QUESTION 120**

Refer to the exhibit.

A network associate has configured OSPF with the command:

```
City(config-router)# network 192.168.12.64 0.0.0.63 area 0
```

After completing the configuration, the associate discovers that not all the interfaces are participating in OSPF. Which three of the interfaces shown in the exhibit will participate in OSPF according to this configuration statement? (Choose three.)

**City#show ip interface brief**

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/0	192.168.12.48	YES	manual	up	up
FastEthernet0/1	192.168.12.65	YES	manual	up	up
Serial0/0	192.168.12.121	YES	manual	up	up
Serial0/1	unassigned	YES	unset	up	up
Serial0/1.102	192.168.12.125	YES	manual	up	up
Serial0/1.103	192.168.12.129	YES	manual	up	up
Serial0/1.104	192.168.12.133	YES	manual	up	up

City#

- A. FastEthernet0 /0
- B. FastEthernet0 /1
- C. Serial0/0
- D. Serial0/1.102
- E. Serial0/1.103
- F. Serial0/1.104

**Correct Answer:** BCD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

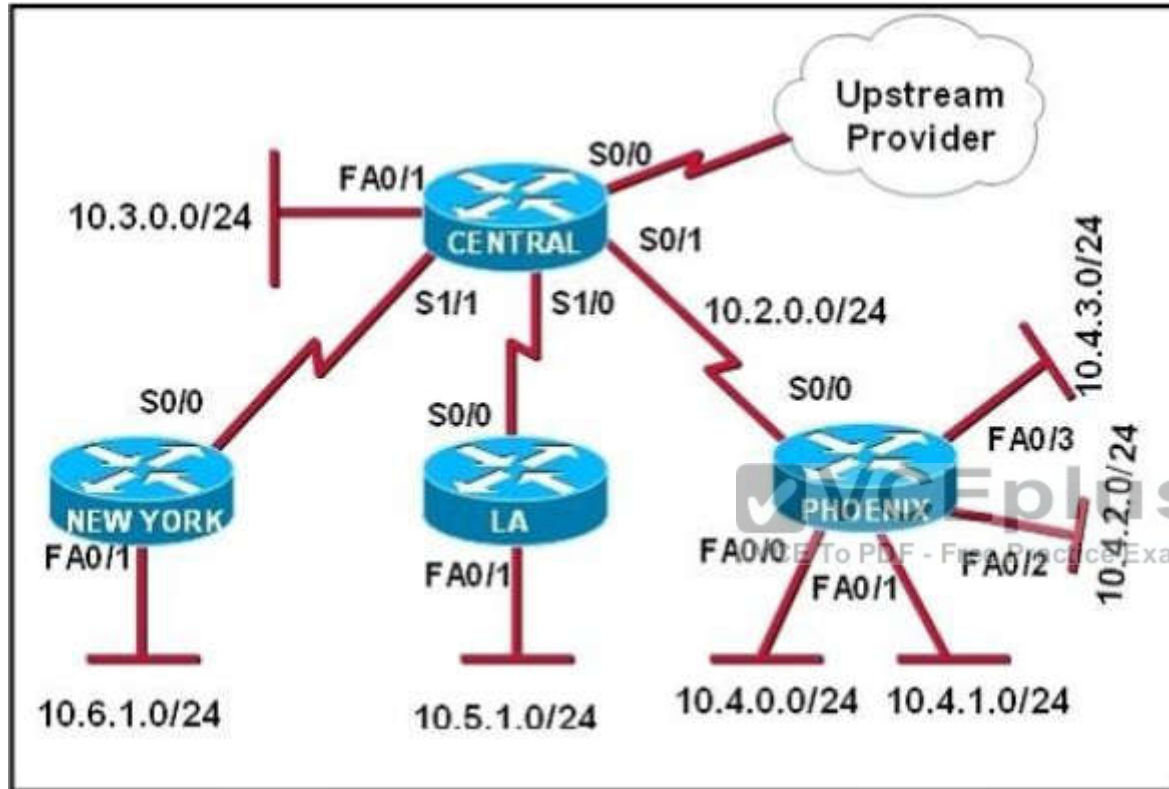
The "network 192.168.12.64 0.0.0.63 equals to network 192.168.12.64/26. This network has:

Increment: 64 (/26= 1111 1111.1111 1111.1111 1100 0000) Network address:192.168.12.64

Broadcast address: 192.168.12.127Therefore all interface in the range of this network will join OSPF -B C D are correct.

### QUESTION 121

Refer to the exhibit. The ABC Company has the internetwork in the exhibit. The administrator would like to reduce the size of the routing table on the Central router. Which partial routing table entry in the Central router represents a route summary that represents the LANs in Phoenix but no additional subnets?



- A. 10.0.0.0/22 is subnetted, 1 subnets  
D 10.0.0.0 [90/20514560] via 10.2.0.2, 6w0d, Serial0/1
- B. 10.0.0.0/28 is subnetted, 1 subnets  
D 10.2.0.0 [90/20514560] via 10.2.0.2, 6w0d, Serial0/1
- C. 10.0.0.0/30 is subnetted, 1 subnets  
D 10.2.2.0 [90/20514560] via 10.2.0.2, 6w0d, Serial0/1
- D. 10.0.0.0/22 is subnetted, 1 subnets  
D 10.4.0.0 [90/20514560] via 10.2.0.2, 6w0d, Serial0/1
- E. 10.0.0.0/28 is subnetted, 1 subnets

- D 10.4.4.0 [90/20514560] via 10.2.0.2, 6w0d, Serial0/1
- F. 10.0.0.0/30 is subnetted, 1 subnets
- D 10.4.4.4 [90/20514560] via 10.2.0.2, 6w0d, Serial0/1

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

All the above networks can be summarized to 10.0.0.0 network but the Q requires to "represent the LANs in Phoenix but no additional subnets" so we must summarize to 10.4.0.0 network. The Phoenix router has 4 subnets so we need to "move left" 2 bits of "/24-> /22 is the best choice -D is correct.

#### QUESTION 122

What information does a router running a link-state protocol use to build and maintain its topological database? (Choose two.)

- A. hello packets
- B. SAP messages sent by other routers
- C. LSAs from other routers
- D. beacons received on point-to-point links
- E. routing tables received from other link-state routers
- F. TTL packets from designated routers



**Correct Answer:** AC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

[http://www.cisco.com/en/US/tech/tk365/technologies\\_white\\_paper09186a0080094e9e.shtml](http://www.cisco.com/en/US/tech/tk365/technologies_white_paper09186a0080094e9e.shtml)

#### QUESTION 123

Which commands are required to properly configure a router to run OSPF and to add network 192.168.16.0/24 to OSPF area 0? (Choose two.)

- A. Router(config)# router ospf 0
- B. Router(config)# router ospf 1
- C. Router(config)# router ospf area 0
- D. Router(config-router)# network 192.168.16.0 0.0.0.255 0

- E. Router(config-router)# network 192.168.16.0 0.0.0.255 area 0  
F. Router(config-router)# network 192.168.16.0 255.255.255.0 area 0

**Correct Answer:** BE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

In the router ospf command, the ranges from 1 to 65535 so 0 is an invalid number -B is correct but A is not correct.

To configure OSPF, we need a wildcard in the "network" statement, not a subnet mask. We also need to assign an area to this process -E is correct.

#### QUESTION 124

Which type of EIGRP route entry describes a feasible successor?

- A. a backup route, stored in the routing table
- B. a primary route, stored in the routing table
- C. a backup route, stored in the topology table
- D. a primary route, stored in the topology table

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

[http://www.cisco.com/en/US/tech/tk365/technologies\\_tech\\_note09186a0080093f07.shtml](http://www.cisco.com/en/US/tech/tk365/technologies_tech_note09186a0080093f07.shtml)

Feasible Successors

A destination entry is moved from the topology table to the routing table when there is a feasible successor. All minimum cost paths to the destination form a set.

From this set, the neighbors that have an advertised metric less than the current routing table metric are considered feasible successors.

Feasible successors are viewed by a router as neighbors that are downstream with respect to the destination.

These neighbors and the associated metrics are placed in the forwarding table.

When a neighbor changes the metric it has been advertising or a topology change occurs in the network, the set of feasible successors may have to be re-evaluated. However, this is not categorized as a route recomputation. Feasible successor is a route whose Advertised Distance (AD) is less than the Feasible Distance (FD) of the current best path. A feasible successor is a backup route, which is not stored in the routing table but, stored in the topology table.

#### QUESTION 125

DRAG DROP

Drag each description on the left to the appropriate term on the right. Not all the descriptions are used.



Select and Place:

prevents invalid updates from looping the internetwork indefinitely	holddown timer
causes a routing protocol to advertise an infinite metric for a failed route	split horizon
prevents a router from improperly reinstating a route from a regular routing update	defining a maximum
prevents information about a route from being sent in the direction from which the route was learned	route poisoning
Prevents, via the use of logical subdivisions, routing updates from propagating the internetwork	triggered update
decreases convergence time by immediately sending route information in response to a topology change	

Correct Answer:



	prevents a router from improperly reinstating a route from a regular routing update
	prevents information about a route from being sent in the direction from which the route was learned
	prevents invalid updates from looping the internetwork indefinitely
	causes a routing protocol to advertise an infinite metric for a failed route
Prevents, via the use of logical subdivisions, routing updates from propagating the internetwork	decreases convergence time by immediately sending route information in response to a topology change

**Section: (none)**

**Explanation**

**Explanation/Reference:**

Explanation:

[http://www.cisco.com/en/US/tech/tk365/technologies\\_white\\_paper09186a0080094e9e.shtml](http://www.cisco.com/en/US/tech/tk365/technologies_white_paper09186a0080094e9e.shtml)

[http://www.cisco.com/en/US/docs/ios/12\\_2/iproute/command/reference/1rfospf.html](http://www.cisco.com/en/US/docs/ios/12_2/iproute/command/reference/1rfospf.html)

**QUESTION 126**

**DRAG DROP**

Drag the term on the left to its definition on the right. (Not all options are used.)

Select and Place:

holddown timer	A router learns from its neighbor that a route is down, and the router sends an update back to the neighbor with an infinite metric to that route
poison reverse	The packets flooded when a topology change occurs, causing network routers to update their topological databases and recalculate routes
count to infinity	This prevents sending information about a route back out the same interface that originally learned about the route
LSA	For a given period, this causes the router to ignore any updates with poorer metrics to a lost network
split horizon	

Correct Answer:

	poison reverse
	LSA
count to infinity	split horizon
	holddown timer
	

**Section: (none)**

**Explanation**

**Explanation/Reference:**

Explanation:

Poison reverse: A router learns from its neighbor that a route is down and the router sends an update back to the neighbor with an infinite metric to that route.

LSA: The packets flooded when a topology change occurs, causing network routers to update their topological databases and recalculate routes.

Split horizon: This prevents sending information about a route back out the same interface that originally learned about the route.

hold down timer: For a given period, this causes the router to ignore any updates with poorer metrics to a lost network.

**QUESTION 127**

**DRAG DROP**

Drag the description on the left to the routing protocol on the right. (Not all options are used.)

**Select and Place:**

	EIGRP
is vendor-specific	<input type="text"/>
uses cost as its metric	<input type="text"/>
uses hop count as its metric	<input type="text"/>
uses the Bellman-Ford algorithm	<input type="text"/>
elects a DR on each multi-access network	<input type="text"/>
has a default administrative distance of 90	<input type="text"/>

	OSPF
	<input type="text"/>
	<input type="text"/>

Correct Answer:

	<b>EIGRP</b>
	is vendor-specific
	has a default administrative distance of 90
uses hop count as its metric	
uses the Bellman-Ford algorithm	
	<b>OSPF</b>
	uses cost as its metric
	elects a DR on each multi-access network

Section: (none)

Explanation

Explanation/Reference:

#### QUESTION 128

DRAG DROP

Drag the Frame Relay acronym on the left to match its definition on the right. (Not all acronyms are used)

Select and Place:

CIR	a router is this type of device
DCE	the most common type of virtual circuit
DTE	provides status messages between DTE and DCE devices
LMI	identifies the virtual connection between the DTE and the switch
PVC	
SVC	
DLCI	

**Correct Answer:**

CIR	DTE
DCE	PVC
	LMI
	DLCI
SVC	

**Section: (none)**  
**Explanation**

**Explanation/Reference:**

Explanation:

Enhanced Interior Gateway Routing Protocol (EIGRP) is a Cisco proprietary routing protocol, so it is vendor-specific. By default, EIGRP internal routes have an administrative distance value of 90. OSPF uses cost as its metric. By default, the cost of an interface is calculated based on bandwidth with the formula  $\text{cost} = \frac{10^8}{\text{bandwidth}}$



10000 0000/bandwidth (in bps). OSPF elects a DR on each broadcast and no broadcast multi-access networks (like Ethernet and Frame Relay environments, respectively). It doesn't elect a DR on point-to-point link (like a serial WAN).

#### QUESTION 129

OSPF is configured using default classful addressing. With all routers and interfaces operational, how many networks will be in the routing table of R1 that are indicated to be learned by OSPF?

**Instructions**

This item contains several questions that you must answer. You can view these questions by clicking on the corresponding button to the left. Changing questions can be accomplished by clicking the numbers to the left of each question. In order to complete the questions, you will need to refer to the topology.

To gain access to the topology, click on the topology button at the bottom of the screen. When you have finished viewing the topology, you can return to your questions by clicking on the Questions button to the left.

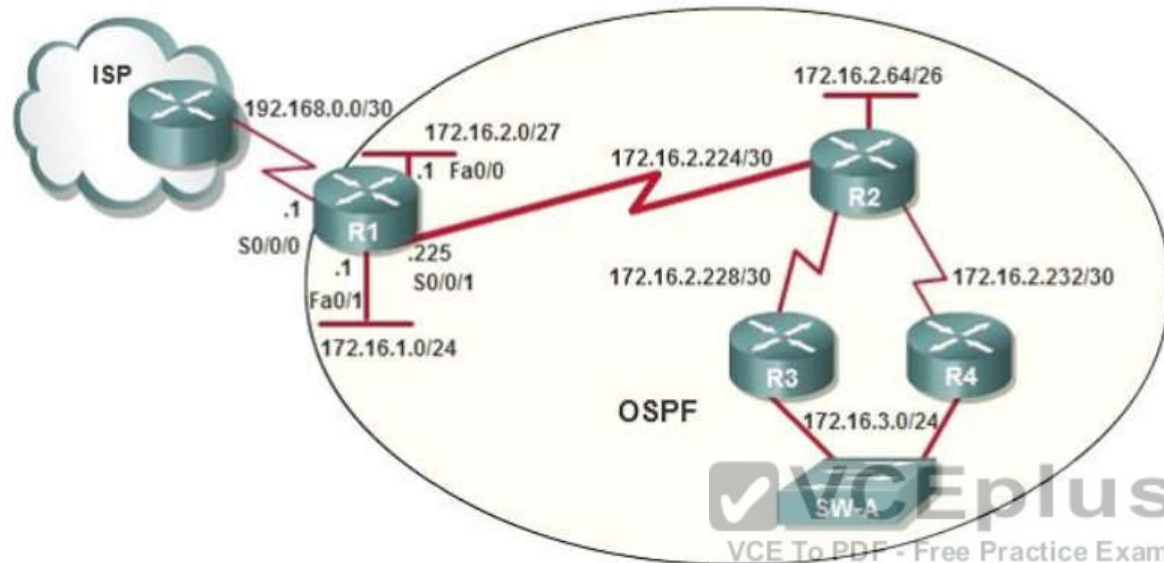
Each of the windows can be minimized by clicking on the [F]. You can also reposition a window by dragging it by the title bar.

**Scenario**

Refer to the topology. Using the information shown, answer the four questions shown on the Questions tab.



Topology



- A. 2
- B. 3
- C. 4
- D. 5
- E. 6
- F. 7

**Correct Answer: C**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

Explanation:

It already knows about its directly connected ones, only those not directly connected are "Learned by OSPF". OSPF as a link state routing protocol (deals with LSAs rather than routes) does not auto summarize (doesn't support "auto-summary"). So learned route by OSPF are followed 172.16.2.64/26

172.16.2.228/30  
172.16.2.232/30  
172.16.3.0/24

**QUESTION 130**

After the network has converged, what type of messaging, if any, occurs between R3 and R4?

**Instructions**

This item contains several questions that you must answer. You can view these questions by clicking on the corresponding button to the left. Changing questions can be accomplished by clicking the numbers to the left of each question. In order to complete the questions, you will need to refer to the topology.

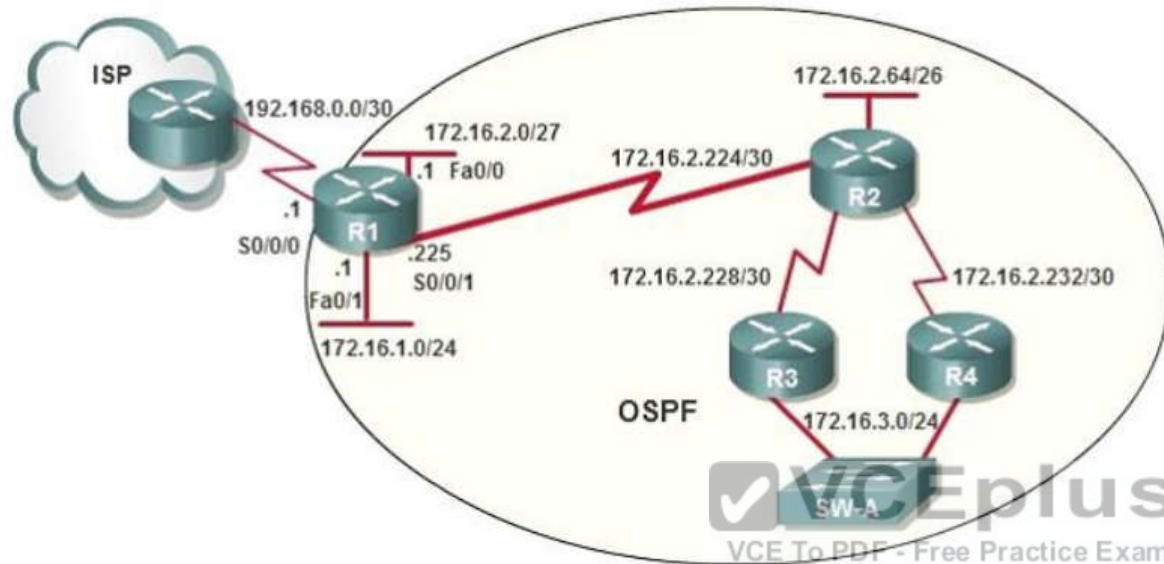
To gain access to the topology, click on the topology button at the bottom of the screen. When you have finished viewing the topology, you can return to your questions by clicking on the Questions button to the left.

Each of the windows can be minimized by clicking on the [F]. You can also reposition a window by dragging it by the title bar.

**Scenario**

Refer to the topology. Using the information shown, answer the four questions shown on the Questions tab.

Topology



- A. No messages are exchanged.
- B. Hellos are sent every 10 seconds.
- C. The full database from each router is sent every 30 seconds.
- D. The routing table from each router is sent every 60 seconds.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

HELLO messages are used to maintain adjacent neighbors so even when the network is converged, hellos are still exchanged. On broadcast and point-to-point links, the default is 10 seconds, on NBMA the default is 30 seconds.

**QUESTION 131**

### Instructions

This item contains several questions that you must answer. You can view these questions by clicking on the corresponding button to the left. Changing questions can be accomplished by clicking the numbers to the left of each question. In order to complete the questions, you will need to refer to the topology.

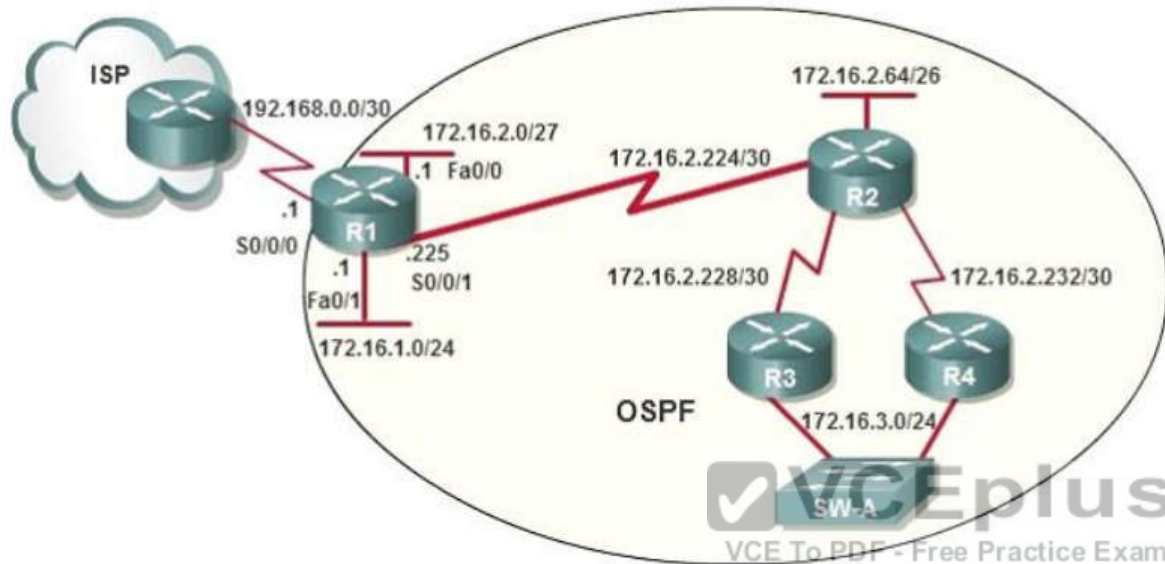
To gain access to the topology, click on the topology button at the bottom of the screen. When you have finished viewing the topology, you can return to your questions by clicking on the Questions button to the left.

Each of the windows can be minimized by clicking on the [-]. You can also reposition a window by dragging it by the title bar.

### Scenario

Refer to the topology. Using the information shown, answer the four questions shown on the Questions tab.

Topology



To allow or prevent load balancing to network 172.16.3.0/24, which of the following commands could be used in R2? (Choose two.)

- A. R2(config-if)#clock rate
- B. R2(config-if)#bandwidth
- C. R2(config-if)#ip ospf cost
- D. R2(config-if)#ip ospf priority
- E. R2(config-router)#distance ospf

**Correct Answer:** BC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

OSPF Cost

[http://www.cisco.com/en/US/tech/tk365/technologies\\_white\\_paper09186a0080094e9e.shtml#t6](http://www.cisco.com/en/US/tech/tk365/technologies_white_paper09186a0080094e9e.shtml#t6)

The cost (also called metric) of an interface in OSPF is an indication of the overhead required to send packets across a certain interface. The cost of an interface is inversely proportional to the bandwidth of that interface. A higher bandwidth indicates a lower cost. There is more overhead (higher cost) and time delays involved in crossing a 56k serial line than crossing a 10M Ethernet line. The formula used to calculate the cost is:

$$\text{cost} = 100000000 / \text{bandwidth in bps}$$

For example, it will cost  $10^8 / 10^7 = 10$  to cross a 10M Ethernet line and will cost  $10^8 / 1544000 = 64$  to cross a T1 line. By default, the cost of an interface is calculated based on the bandwidth; you can force the cost of an interface with the `ip ospf cost <value> interface` subconfiguration mode command.

### QUESTION 132

**Instructions**

This item contains several questions that you must answer. You can view these questions by clicking on the corresponding button to the left. Changing questions can be accomplished by clicking the numbers to the left of each question. In order to complete the questions, you will need to refer to the topology.

To gain access to the topology, click on the topology button at the bottom of the screen. When you have finished viewing the topology you can return to your questions by clicking on the Questions button to the left.

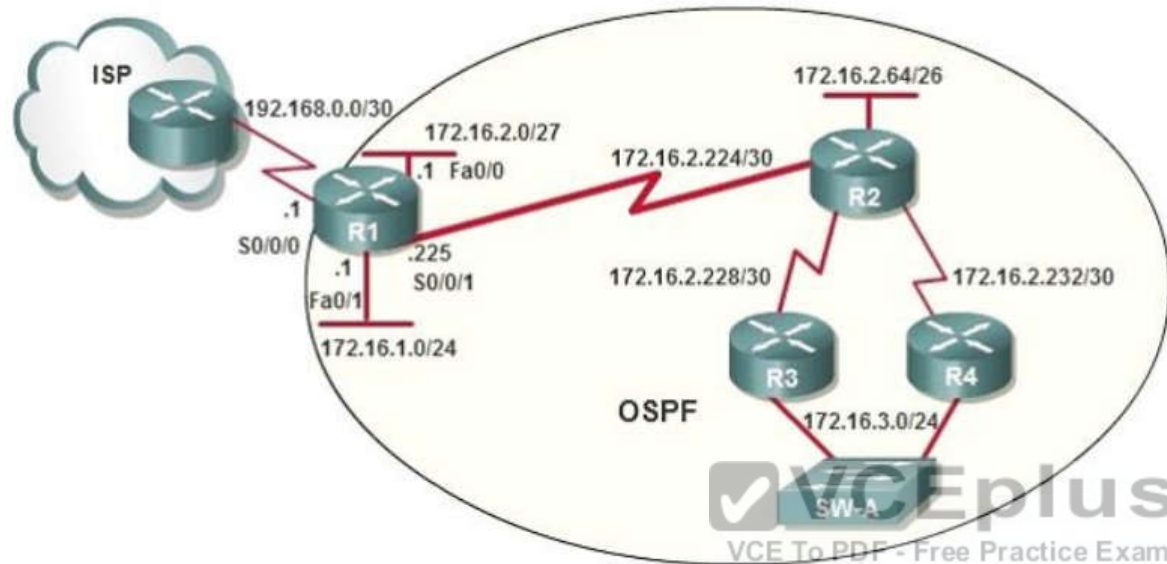
Each of the windows can be minimized by clicking on the [-]. You can also reposition a window by dragging it by the title bar.

**Scenario**

Refer to the topology. Using the information shown, answer the four questions shown on the Questions tab.



Topology



R1 is configured with the default configuration of OSPF.  
From the following list of IP addresses configured on R1, which address will the OSPF process select as the router ID?

- A. 192.168.0.1
- B. 172.16.1.1
- C. 172.16.2.1
- D. 172.16.2.225

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

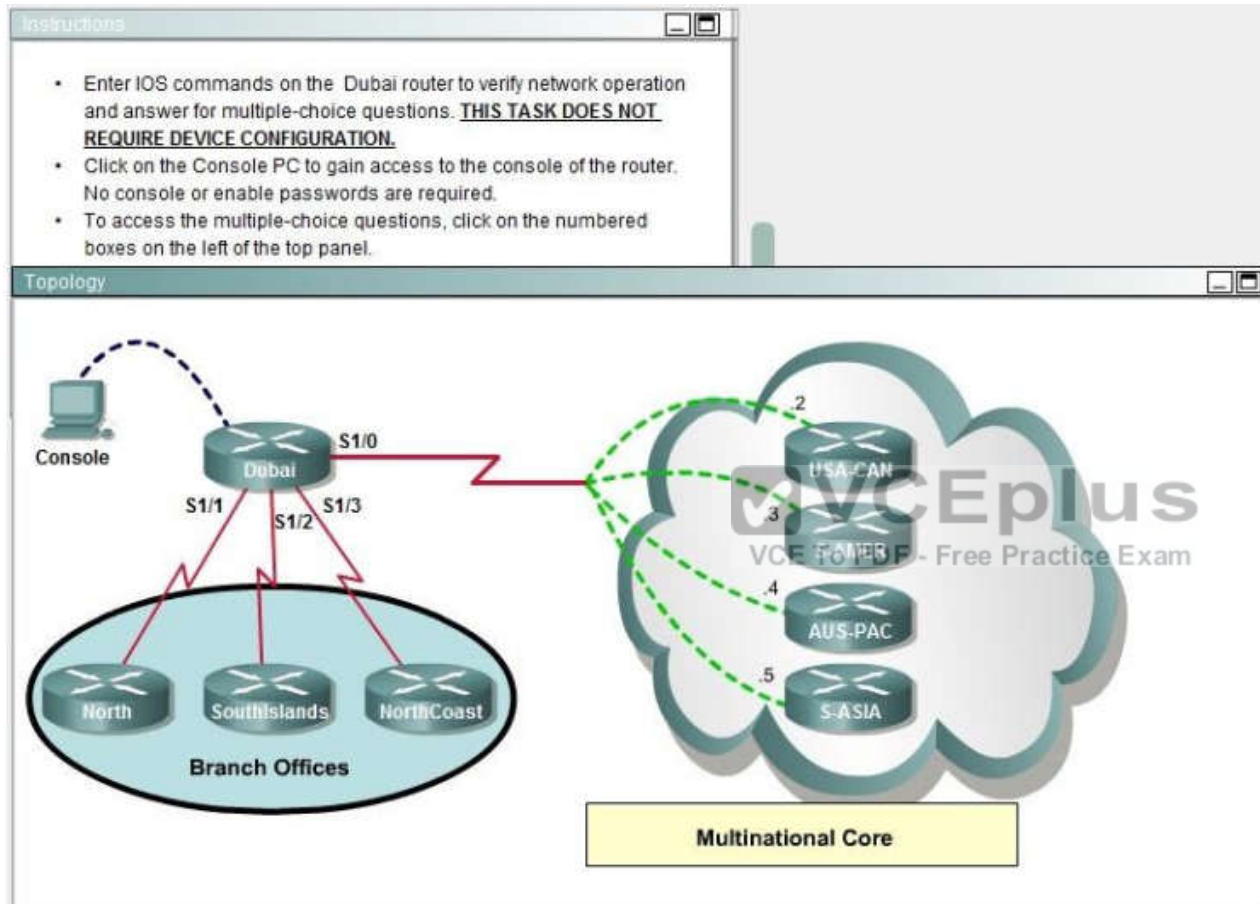
Explanation:

The Router ID (RID) is an IP address used to identify the router and is chosen using the following sequence:

- + The highest IP address assigned to a loopback (logical) interface.
- + If a loopback interface is not defined, the highest IP address of all active router's physical interfaces will be chosen.

+ The router ID can be manually assigned  
In this case, because a loopback interface is not configured so the highest active IP address 192.168.0.1 is chosen as the router ID.

### QUESTION 133





```
Dubai
```

```
%LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to administratively down
```

```
%LINK-3-UPDOWN: Interface Serial1/0, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to up
```

```
%LINK-3-UPDOWN: Interface Serial1/1, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to up
```

```
%LINK-3-UPDOWN: Interface Serial1/2, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2, changed state to up
```

```
%LINK-3-UPDOWN: Interface Serial1/3, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to up
```

```
Press RETURN to get started!
```

```
Dubai>
```

```
Dubai#sh frame-relay map
Serial1/0 (up): ip 172.30.0.2 dlci 825 (0x7B,0x1CB0), dynamic,
                broadcast,, status defined, active
Serial1/0 (up): ip 172.30.0.3 dlci 230 (0xEA,0x38A0), dynamic,
                broadcast,, status defined, active
Serial1/0 (up): ip 172.30.0.4 dlci 694 (0x159,0x5490), dynamic,
                broadcast,, status defined, active
Serial1/0 (up): ip 172.30.0.5 dlci 387 (0x1C8,0x7080), dynamic,
                broadcast,, status defined, active
```

```
Dubai#
```

```
interface FastEthernet0/0
```

```
no ip address
```

```
shutdown
```

```
!
```

```
interface Serial1/0
```

```
ip address 172.30.0.1 255.255.255.240
```

```
encapsulation frame-relay
```

```
no fair-queue
```

```
!
```

```
interface Serial1/1
```

```
ip address 192.168.0.1 255.255.255.252
```

```
!
```

```
interface Serial1/2
```

```
ip address 192.168.0.5 255.255.255.252
```

```
encapsulation ppp
```

```
!
```

```
interface Serial1/3
```

```
ip address 192.168.0.9 255.255.255.252
```

```
encapsulation ppp
```

```
ppp authentication chap
```

```
!
```

```
router rip
```

```
version 2
```

```
network 172.30.0.0
```

```
network 192.168.0.0
```

```
no auto-summary
```

```
!
```

```
line con 0
```

If required, what password should be configured on the DeepSouth router in the branch office to allow a connection to be established with the MidEast router?

- A. No password is required.
- B. Enable
- C. Secret
- D. Telnet
- E. Console

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

In the diagram, DeepSouth is connected to Dubai's S1/2 interface and is configured as follows:

Interface Serial1/2

IP address 192.168.0.5 255.255.255.252

Encapsulation PPP; Encapsulation for this interface is PPP

Check out the following Cisco Link:

[http://www.cisco.com/en/US/tech/tk713/tk507/technologies\\_configuration\\_example09186a0080094333.shtml#configuringauseernamefromtheroutersname](http://www.cisco.com/en/US/tech/tk713/tk507/technologies_configuration_example09186a0080094333.shtml#configuringauseernamefromtheroutersname)

Here is a snip of an example:

Network Diagram

If Router 1 initiates a call to Router 2, Router 2 would challenge Router 1, but Router 1 would not challenge Router 2. This occurs because the ppp authentication chap calling command is configured on Router 1. This is an example of a unidirectional authentication. In this setup, the ppp chap hostname alias-r1 command is configured on Router 1. Router 1 uses "alias-r1" as its hostname for CHAP authentication instead of "r1." The Router 2 dialer map name should match Router 1's ppp chap hostname; otherwise, two B channels are established, one for each direction.



## Configurations

### Router 1

```

!
isdn switch-type basic-5ess
!
hostname r1
!
username r2 password 0 cisco

! -- Hostname of other router and shared secret
!

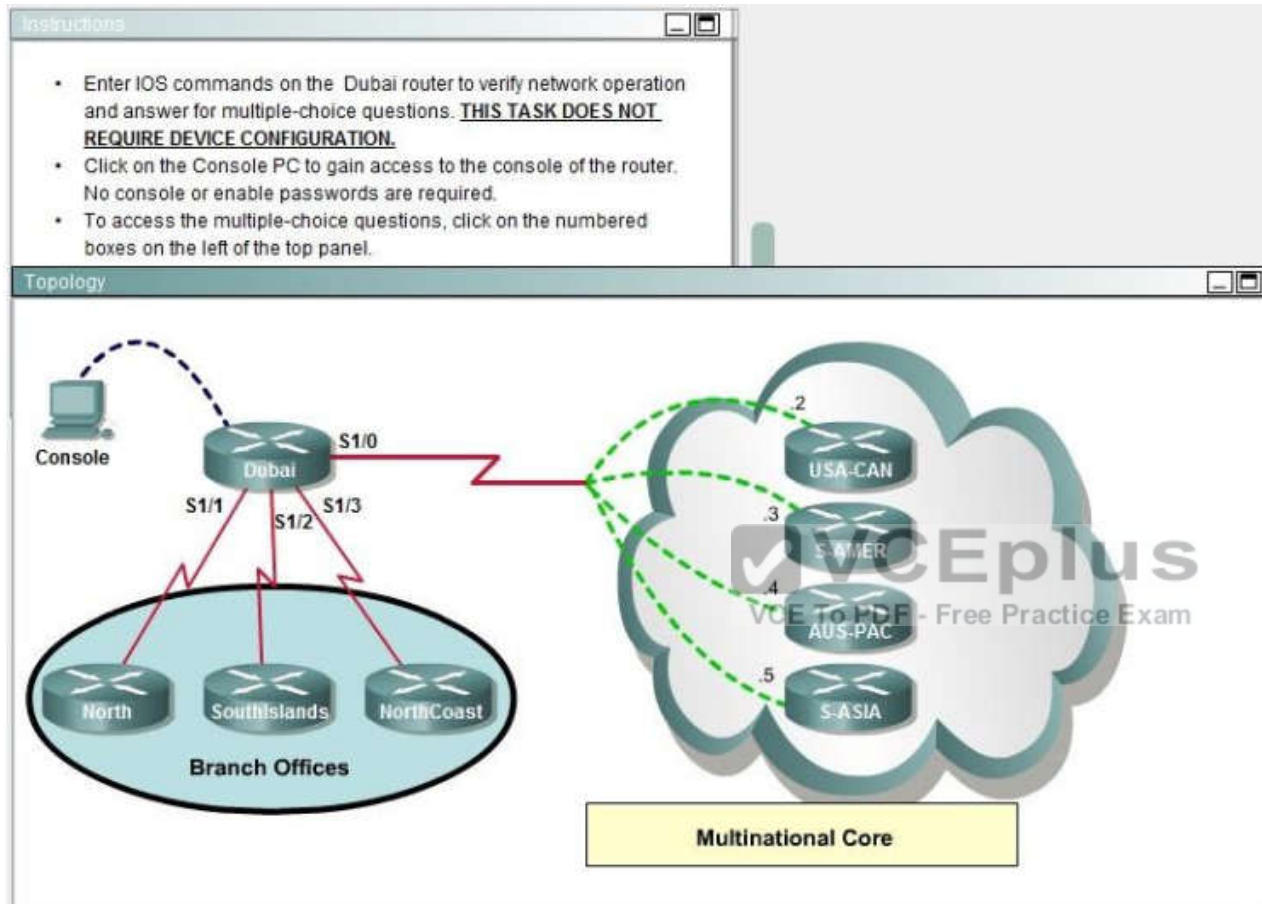
interface BRI0/0
 ip address 20.1.1.1 255.255.255.0
 no ip directed-broadcast
 encapsulation ppp
 dialer map ip 20.1.1.2 name r2 broadcast 5772222
 dialer-group 1
 isdn switch-type basic-5ess
 ppp authentication chap callin

! -- Authentication on incoming calls only

ppp chap hostname alias-r1

! -- Alternate CHAP hostname
  
```

### QUESTION 134



```
Dubai
```

```
%LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to administratively down
```

```
%LINK-3-UPDOWN: Interface Serial1/0, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to up
```

```
%LINK-3-UPDOWN: Interface Serial1/1, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to up
```

```
%LINK-3-UPDOWN: Interface Serial1/2, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2, changed state to up
```

```
%LINK-3-UPDOWN: Interface Serial1/3, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to up
```

```
Press RETURN to get started!
```

```
Dubai>
```



```
Dubai#sh frame-relay map
Serial1/0 (up): ip 172.30.0.2 dlci 825 (0x7B,0x1CB0), dynamic,
                broadcast,, status defined, active
Serial1/0 (up): ip 172.30.0.3 dlci 230 (0xEA,0x38A0), dynamic,
                broadcast,, status defined, active
Serial1/0 (up): ip 172.30.0.4 dlci 694 (0x159,0x5490), dynamic,
                broadcast,, status defined, active
Serial1/0 (up): ip 172.30.0.5 dlci 387 (0x1C8,0x7080), dynamic,
                broadcast,, status defined, active
```

```
Dubai#
```

```
interface FastEthernet0/0
```

```
no ip address
```

```
shutdown
```

```
!
```

```
interface Serial1/0
```

```
ip address 172.30.0.1 255.255.255.240
```

```
encapsulation frame-relay
```

```
no fair-queue
```

```
!
```

```
interface Serial1/1
```

```
ip address 192.168.0.1 255.255.255.252
```

```
!
```

```
interface Serial1/2
```

```
ip address 192.168.0.5 255.255.255.252
```

```
encapsulation ppp
```

```
!
```

```
interface Serial1/3
```

```
ip address 192.168.0.9 255.255.255.252
```

```
encapsulation ppp
```

```
ppp authentication chap
```

```
!
```

```
router rip
```

```
version 2
```

```
network 172.30.0.0
```

```
network 192.168.0.0
```

```
no auto-summary
```

```
!
```

```
line con 0
```

What would be the destination Layer 2 address in the frame header for a frame that is being forwarded by Dubai to the host address of 172.30.4.4?

- A. 825
- B. 230
- C. 694
- D. 387

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

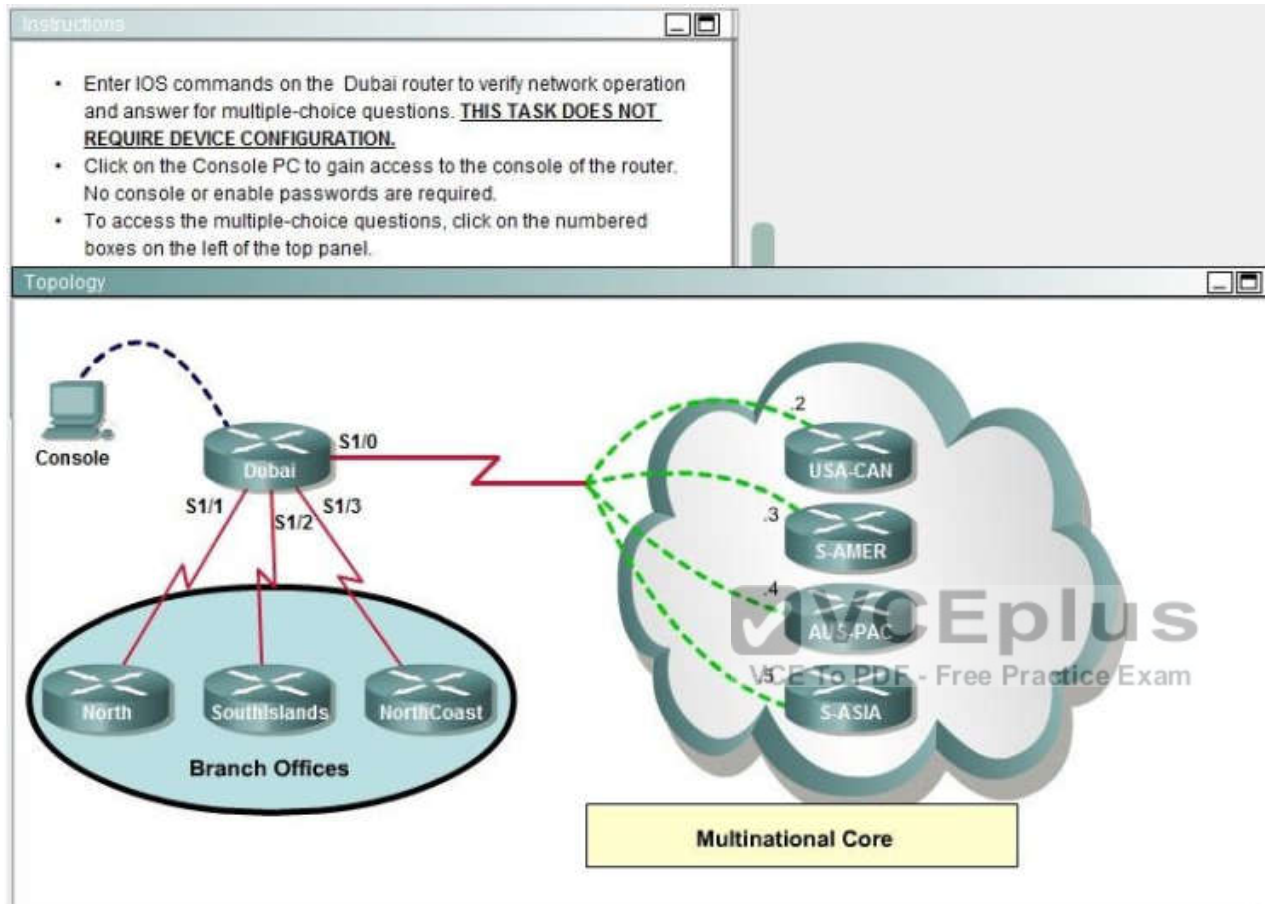
Explanation:

According to command output 172.30.4.4 is using the 694 dlc value.

[http://www.cisco.com/en/US/docs/ios/12\\_2/wan/command/reference/wrffr4.html#wp1029343](http://www.cisco.com/en/US/docs/ios/12_2/wan/command/reference/wrffr4.html#wp1029343)

**QUESTION 135**





```
Dubai

%LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to administratively down
%LINK-3-UPDOWN: Interface Serial1/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to up
%LINK-3-UPDOWN: Interface Serial1/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to up
%LINK-3-UPDOWN: Interface Serial1/2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2, changed state to up
%LINK-3-UPDOWN: Interface Serial1/3, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to up
Press RETURN to get started!
Dubai>
```

```
Dubai#sh frame-relay map
Serial1/0 (up): ip 172.30.0.2 dlci 825 (0x7B,0x1CB0), dynamic,
                broadcast,, status defined, active
Serial1/0 (up): ip 172.30.0.3 dlci 230 (0xEA,0x38A0), dynamic,
                broadcast,, status defined, active
Serial1/0 (up): ip 172.30.0.4 dlci 694 (0x159,0x5490), dynamic,
                broadcast,, status defined, active
Serial1/0 (up): ip 172.30.0.5 dlci 387 (0x1C8,0x7080), dynamic,
                broadcast,, status defined, active
```

```
Dubai#
```

```
interface FastEthernet0/0
```

```
no ip address
```

```
shutdown
```

```
!
```

```
interface Serial1/0
```

```
ip address 172.30.0.1 255.255.255.240
```

```
encapsulation frame-relay
```

```
no fair-queue
```

```
!
```

```
interface Serial1/1
```

```
ip address 192.168.0.1 255.255.255.252
```

```
!
```

```
interface Serial1/2
```

```
ip address 192.168.0.5 255.255.255.252
```

```
encapsulation ppp
```

```
!
```

```
interface Serial1/3
```

```
ip address 192.168.0.9 255.255.255.252
```

```
encapsulation ppp
```

```
ppp authentication chap
```

```
!
```

```
router rip
```

```
version 2
```

```
network 172.30.0.0
```

```
network 192.168.0.0
```

```
no auto-summary
```

```
!
```

```
line con 0
```

Which connection uses the default encapsulation for serial interfaces on Cisco routers?

- A. The serial connection to the NorthCoast branch office.
- B. The serial connection to the North branch office.
- C. The serial connection to the Southlands branch office.
- D. The serial connection to the Multinational Core.

**Correct Answer:** B

**Section:** (none)

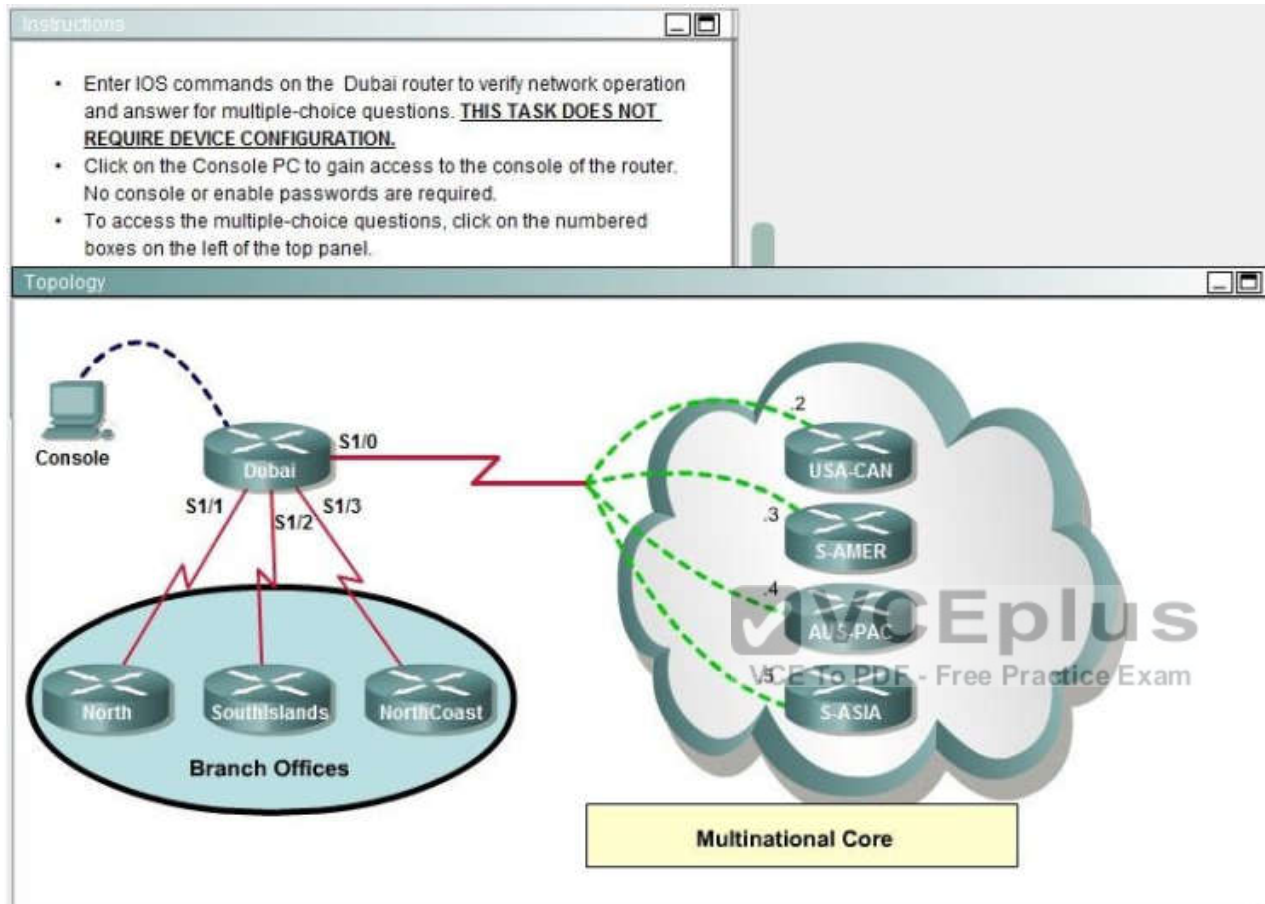
**Explanation**

**Explanation/Reference:**

Explanation:

Cisco default encapsulation is HDLC which is by default enabled on all cisco router. If we want to enable other encapsulation protocol (PPP,X.25 etc) we need to define in interface setting. But here except s1/1 all interface defined by other encapsulation protocol so we will assume default encapsulation running on s1/1 interface and s1/1 interface connected with North.

**QUESTION 136**



```
Dubai

%LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to administratively down
%LINK-3-UPDOWN: Interface Serial1/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to up
%LINK-3-UPDOWN: Interface Serial1/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to up
%LINK-3-UPDOWN: Interface Serial1/2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2, changed state to up
%LINK-3-UPDOWN: Interface Serial1/3, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to up
Press RETURN to get started!
Dubai>
```



```
Dubai#sh frame-relay map
Serial1/0 (up): ip 172.30.0.2 dlci 825 (0x7B,0x1CB0), dynamic,
                broadcast,, status defined, active
Serial1/0 (up): ip 172.30.0.3 dlci 230 (0xEA,0x38A0), dynamic,
                broadcast,, status defined, active
Serial1/0 (up): ip 172.30.0.4 dlci 694 (0x159,0x5490), dynamic,
                broadcast,, status defined, active
Serial1/0 (up): ip 172.30.0.5 dlci 387 (0x1C8,0x7080), dynamic,
                broadcast,, status defined, active
```

```
Dubai#
```

```
interface FastEthernet0/0
```

```
no ip address
```

```
shutdown
```

```
!
```

```
interface Serial1/0
```

```
ip address 172.30.0.1 255.255.255.240
```

```
encapsulation frame-relay
```

```
no fair-queue
```

```
!
```

```
interface Serial1/1
```

```
ip address 192.168.0.1 255.255.255.252
```

```
!
```

```
interface Serial1/2
```

```
ip address 192.168.0.5 255.255.255.252
```

```
encapsulation ppp
```

```
!
```

```
interface Serial1/3
```

```
ip address 192.168.0.9 255.255.255.252
```

```
encapsulation ppp
```

```
ppp authentication chap
```

```
!
```

```
router rip
```

```
version 2
```

```
network 172.30.0.0
```

```
network 192.168.0.0
```

```
no auto-summary
```

```
!
```

```
line con 0
```

- A. frame-relay map ip 172.30.0.3 825 broadcast
- B. frame-relay map ip 172.30.0.3 230 broadcast
- C. frame-relay map ip 172.30.0.3 694 broadcast
- D. frame-relay map ip 172.30.0.3 387 broadcast

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

frame-relay map ip 172.30.0.3 230 broadcast 172.30.0.3 is S-AMER router ip address and its configure on 230 dlci value. Check "show frame-relay map " output in the diagram.

### QUESTION 137

#### SIMULATION

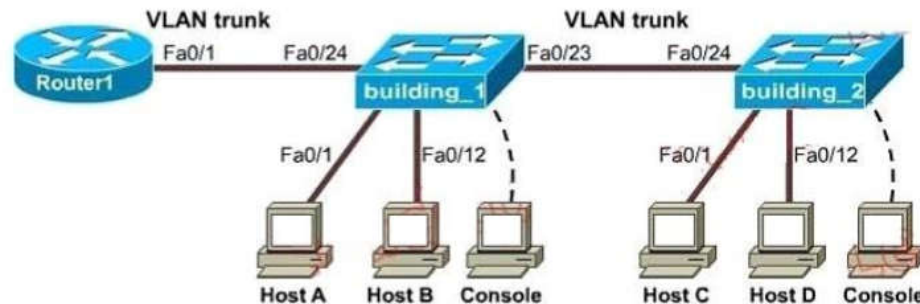
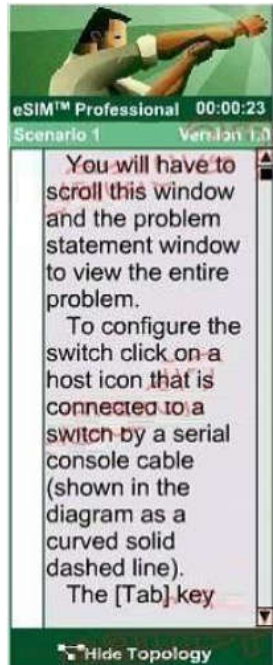
Lab -VTP Configuration

A new switch is being added to the River Campus LAN. You will work to complete this process by first configuring the building\_210 switch with an IP address and default gateway. For the switch host address, you should use the last available IP address on the management subnet. In addition, the switch needs to be configured to be in the same VTP domain as the building\_100 switch and also needs to be configured as a VTP client. Assume that the IP configuration and VTP configuration on building\_100 are complete and correct.

The configuration of the router is not accessible for this exercise. You must accomplish the following tasks:

Determine and configure the IP host address of the new switch.  
Determine and configure the default gateway of the new switch.  
Determine and configure the correct VTP domain name for the new switch.  
Configure the new switch as a VTP client.





**Correct Answer:** Please see explanation

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Here are the Steps for this Lab Solution:

The question states we can't access the router so we can only get required information from switch building\_1. Click on the PC connected with switch building\_1 (through a console line) to access switch building\_1s CLI. On this switch use the show running-config command:

```
building_1#show running-config
```

Next use the show vtp status command to learn about the vtp domain on this switch

```
building_1#show vtp status
```

(Notice: the IP address, IP default-gateway and VTP domain name might be different!!!) You should write down these 3 parameters carefully.

#### Configuring the new switch

+ Determine and configure the IP host address of the new switch The question requires "for the switch host address, you should use the last available IP address on the management subnet".

The building\_1 switch's IP address, which is 192.168.22.50 255.255.255.224, belongs to the management subnet.

Increment: 32 (because 224 = 1110 0000)

Network address:

192.168.22.32

Broadcast address: 192.168.22.63

-

>The last available IP address on the management subnet is 192.168.22.62 and it hasn't been used (notice that the IP address of Fa0/1 interface of the router is also the default gateway address 192.168.22.35).

Also notice that the management IP address of a switch should be configured in Vlan1 interface.

After it is configured, we can connect to it via telnet or SSH to manage it.

```
Switch2#configure terminal
```

```
Switch2(config)#interface Vlan1
```

```
Switch2(config-if)#ip address 192.168.22.62 255.255.255.224
```

```
Switch2(config-if)#no shutdown
```

+ Determine and configure the default gateway of the new switch The default gateway of this new switch is same as that of building\_1 switch, which is 192.168.22.35

```
Switch2(config-if)#exit
```

```
Switch2(config)#ip default-gateway 192.168.22.35
```

+ Determine and configure the correct VTP domain name for the new switch The VTP domain name shown on building\_1 switch is Cisco so we have to use it in the new switch (notice: the VTP domain name will be different in the exam and it is case sensitive so be careful) Switch2(config)# vtp domain Cisco

+ Configure the new switch as a VTP client

```
Switch2(config)#vtp mode client
```

We should check the new configuration with the "show running-config" & "show vtp status"; also try pinging from the new switch to the default gateway to make sure it works well.

Finally save the configuration

```
Switch2(config)#exit
```

```
Switch2#copy running-config startup-config
```

#### QUESTION 138 SIMULATION

### Lab -NAT

A network associate is configuring a router for the weaver company to provide internet access.

The ISP has provided the company six public IP addresses of 198.18.184.105 198.18.184.110.

The company has 14 hosts that need to access the internet simultaneously.

The hosts in the company LAN have been assigned private space addresses in the range of 192.168.100.17 -192.168.100.30.

The following have already been configured on the router

#### **Note:**

The following have already been configured on the router:

- The basic router configuration
- The appropriate interfaces have been configured for NAT inside and NAT outside
- The appropriate static routes have also been configured (since the company will be a stub network, no routing protocol will be required.)
- All passwords have been temporarily set to "Cisco"

The task is to complete the NAT configuration using all IP addresses assigned by the ISP to provide Internet access for the hosts in the weaver LAN. Functionality can be tested by clicking on the host provided for testing.

Configuration information:

Router name – Weaver

Inside global addresses – 198.18.184.105 – 198.18.184.110/29

Inside local addresses – 192.168.100.17 – 192.168.100.30/28

Number of inside hosts 14

**Correct Answer:** Please see explanation

**Section: (none)**

**Explanation**

#### **Explanation/Reference:**

Explanation:

The above named organization has 14 hosts that need to access the internet simultaneously but were provided with just 6 public IP addresses from 198.18.184.105 to 198.18.184.110/29.

In this case, you have to consider using NAT Overload (or PAT)

DoubleClick on the Weaver router to access the CLI

Router> enable

Router# configure terminal

First you should change the router's name to Weaver:

Router(config)#hostname Weaver

Create a NAT pool of global addresses to be allocated with their netmask:

Weaver(config)# ip nat pool mypool 198.18.184.105 198.18.184.110 netmask 255.255.255.248

Create a standard access control list that permits the addresses that are to be translated:

Weaver(config)#access-list 1 permit 192.168.100.16 0.0.0.15

Establish dynamic source translation, specifying the access list that was defined in the prior step:

```
Weaver(config)#ip nat inside source list 1 pool mypool overload
Finally, we should save all your work with the following command:
Weaver#copy running-config startup-config (Don't forget this)
Check your configuration by going to "Host for testing" and type:
C : \>ping 192.0.2.114
```

The ping should work well and you will be replied from 192.0.2.114

This command translates all source addresses that pass access list 1, which means a source address from 192.168.100.17 to 192.168.100.30, into an address from the pool named mypool (the pool contains addresses from 198.18.184.105 to 198.18.184.110) Overload keyword allows to map multiple IP addresses to a single registered IP address (many-to-one) by using different ports.

The question said that appropriate interfaces have been configured for NAT inside and NAT outside statements.

This is how to configure the NAT inside and NAT outside, just for your understanding:

```
Weaver(config)#interface fa0/0
Weaver(config-if)#ip nat inside
Weaver(config-if)#exit
Weaver(config)#interface s0/0
Weaver(config-if)#ip nat outside
Weaver(config-if)#end
```

### QUESTION 139

#### SIMULATION



#### Lab –OSPF

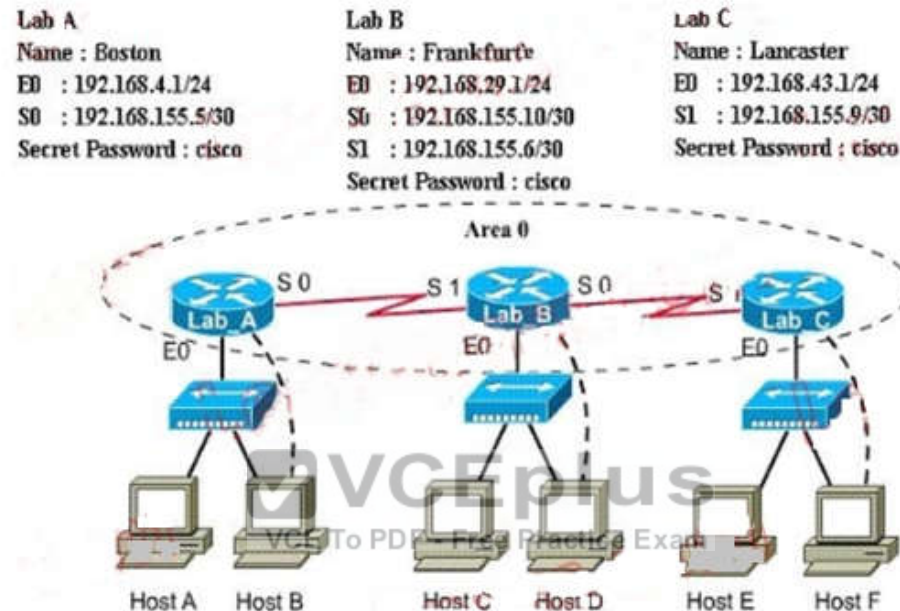
A sporting goods manufacturer has decided to network three (3) locations to improve efficiency in inventory control. The routers have been named to reflect the location: Boston, Frankfurt, Lancaster. The necessary networking has been completed at each location, and the routers have been configured with single area OSPF as the routing protocol. The Lancaster router was recently installed but connectivity is not complete because of incomplete routing tables. Identify and correct any problem you see in the configuration.

**Note: The OSPF process must be configured to allow interfaces in specific subnets to participate in the routing process.**

**Note: The OSPF process must be configured to allow interfaces in specific subnets to participate in the routing process**

Scenario 1 Version 1.0

You will have to scroll this window and the problem statement window to view the entire problem. Click on picture of host connected to a router by a serial console cable shown in the diagram as a dotted line and select the CiscoTerminal option to configure the router. If you



**Correct Answer:** Please see explanation

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

The question mentioned Boston router was not configured correctly or incomplete so we should check this router first. Click on PC-B to access the command line interface (CLI) of Boston router.

```
Boston>enable (type cisco as its password here)
Boston#show running-config
```

```
Boston#show running-config
```

```
<output omitted>
```

```
!
```

```
router ospf 2
```

```
log-adjacency-changes
```

```
network 192.168.4.0 0.0.0.255 area 0
```

```
network 192.168.155.0 0.0.0.3 area 0
```

```
!
```

```
<output omitted>
```

First, remember that the current OSPF Process ID is 2 because we will need it for later configuration. Next notice that in the second “network” command the network and wildcard mask are 192.168.155.0 and 0.0.0.3 which is equivalent to 192.168.155.0 255.255.255.252 in term of subnet mask. Therefore, this subnetwork’s range is from 192.168.155.0 to 192.168.155.3 but the ip address of s0/0 interface of Boston router is 192.168.155.5 which don’t belong to this range - > this is the reason why OSPF did not recognize s0 interface of Boston router as a part of area 0. So we need to find a subnetwork that s0 interface belongs to.

IP address of S0 interface: 192.168.155.5/30

Subnet mask:/30 = 1111 1111.1111 1111.1111 1111.1111 1100

Increment: 4

Network address (which IP address of s0 interface belongs to): 192.168.155.4 (because  $4 * 1 = 4 < 5$ )

Therefore, we must use this network instead of 192.168.155.0 network

```
Boston#configure terminal
```

```
Boston(config)#router ospf 2
```

```
Boston(config-router)#no network 192.168.155.0 0.0.0.3 area 0
```

```
Boston(config-router)#network 192.168.155.4 0.0.0.3 area 0
```

```
Boston(config-router)#end
```

```
Boston#copy running-config startup-config
```

Finally, you should issue a ping command from Boston router to Lancaster router to make sure it works well.

```
Boston#ping 192.168.43.1
```

**QUESTION 140**  
**SIMULATION****Lab -Access List Simulation**

A network associate is adding security to the configuration of the Corp1 router. The user on host C should be able to use a web browser to access financial information from the Finance Web Server. No other hosts from the LAN nor Core should be able to use a web browser to access this server. Since there are multiple resources for the corporation at this location including other resources on the Finance Web Server, all other traffic should be allowed.

**The task** is to create and apply an access-list with no more than three statements that will allow ONI Y host C web access to the Finance Web Server. No other hosts will have web access to the Finance Web Server. All other traffic is permitted.

**Access to the router CLI can be gained by clicking on the appropriate host.**

**All passwords have been temporarily set to "cisco".**

**The Core connection uses an IP address of 198.18.196.65**

**The computers in the Hosts LAN have been assigned addresses of 192.168.33.1 – 192.168.33.254.**

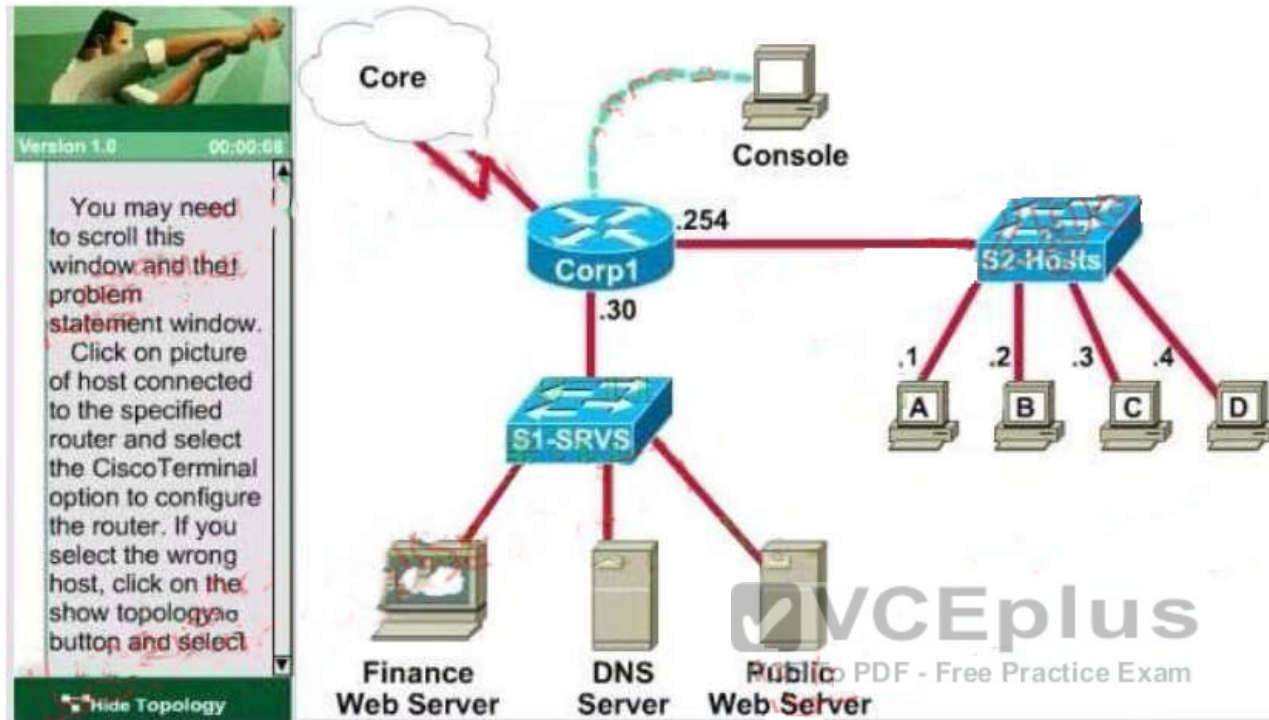
- host A 192.168.33.1
- host B 192.168.33.2
- host C 192.168.33.3
- host D 192.168.33.4



**The computers in the Hosts LAN have been assigned addresses of 172.22.242.17 – 172.22.242.30**

**The Finance Web Server is assigned an IP address of 172.22.242.23**





**Correct Answer:** See explanation

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:



```
Corp1#configure terminal
Corp1(config)#interface s1/0
Corp1(config-if)#ip add 198.18.196.65 255.255.255.252
Corp1(config-if)#end
Corp1>enable
Corp1#show running-config
Corp1#configure terminal
Corp1(config)#access-list 100 permit tcp host 192.168.33.3 host
172.22.242.23 eq 80
Corp1(config)#access-list 100 deny tcp any host 172.22.242.23 eq 80
Corp1(config)#access-list 100 permit ip any any
Corp1(config)#interface fa0/1
Corp1(config-if)#ip access-group 100 out
Corp1(config-if)#end
Corp1#copy running-config startup-config
```

#### Explanation:

Select the console on Corp1 router

#### Configuring ACL

```
Corp1>enable
Corp1#configure terminal
```



Comment: To permit only Host C (192. 168. 33. 3){source addr} to access finance server address (172. 22.242. 23){destination addr} on port number 80(web)  
Corp1(config)# access-list 100 permit tcp host 192.168.33.3 host 172.22.242.23 eq 80

Comment: To deny any source to access finance server address (172. 22. 242. 23) {destination addr} on port number 80 (web)  
Corp1(config)# access-list 100 deny tcp any host 172.22.242.23 eq 80

#### Comment:

To permit ip protocol from any source to access any destination because of the implicit deny any any statement at the end of ACL.

```
Corp1(config)# access-list 100 permit ip any any
```

#### Applying the ACL on the Interface

Comment: Check show ip interface brief command to identify the interface type and number by checking the IP address configured.

```
Corp1(config)#interface fa 0/1
```

If the ip address configured already is incorrect as well as the subnet mask. this should be corrected in order ACL to work type this commands at interface mode:  
no ip address 192. x. x. x 255. x. x. x (removes incorrect configured ip address and subnet mask) Configure correct IP Address and subnet mask:  
ip address 172. 22. 242. 30 255. 255. 255. 24  
0 (range of address specified going to server is given as 172. 22. 242. 17 172. 22. 242. 30)

Comment: Place the ACL to check for packets going outside the interface towards the finance web server.

```
Corp1(config-if)#ip access-group 100 out  
Corp1(config-if)#end
```

Important: To save your running config to startup before exit.  
Corp1#copy running-config startup-config

#### **Verifying the Configuration:**

Step1: Show ip interface brief command identifies the interface on which to apply access list.

Step2: Click on each host A, B, C & D. Host opens a web browser page, select address box of the web browser and type the ip address of finance web server (172. 22. 242. 23) to test whether it permits /deny access to the finance web Server.

#### **QUESTION 141** **SIMULATION**

Lab-CLI Configuration

## Instructions



To configure the router (**Gotha**) click on the console host icon that is connected to a router by a serial console cable (shown in the diagram as a dashed black line).

You can click on the buttons below to view the different windows.

Each of the windows can be minimized by clicking on the [-]. You can also reposition a window by dragging it by the title bar.

The "Tab" key and most commands that use the "Control" or "Escape" keys are not supported and are not necessary to complete this simulation. The **help** command does not display all commands of the help system.

### Scenario

Central Florida Widgets recently installed a new router in their Gotha office. Complete the network installation by performing the initial router configurations and configuring RIPv2 routing using the router command line interface (CLI) on the Gotha router.

Configure the router per the following requirements:

Name of the router is **Gotha**

Enable-secret password is **mi222ke**

The password to access user EXEC mode using the console is **G8tors1**

The password to allow telnet access to the router is **dun63lap**

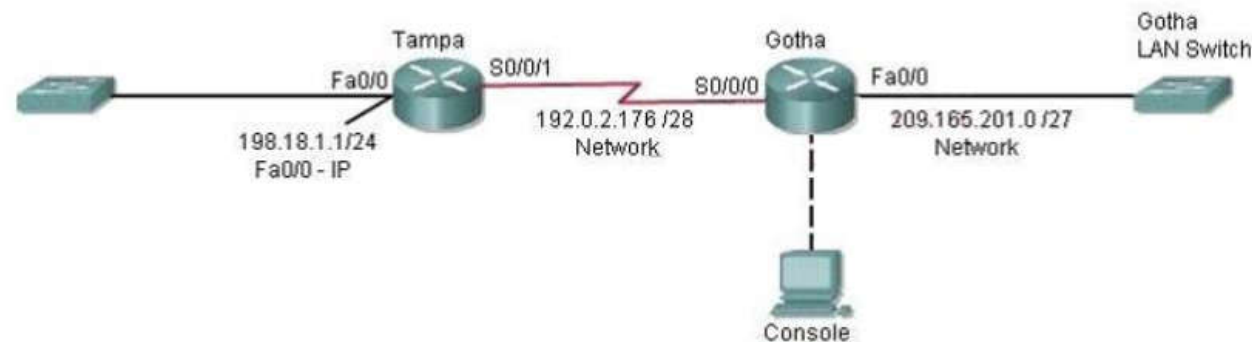
IPv4 addresses must be configured as follows:

Ethernet network **209.165.201.0 /27** - router has **fourth** assignable host address in subnet.

Serial network is **192.0.2.176 /28** - router has **last** assignable host address in the subnet.

Interfaces should be enabled.

Routing protocol is **RIPv2**.



### Attention:

In practical examinations, please note the following, the actual information will prevail.

1. Name of the router is xxx
2. Enable. secret password is xxx
3. Password in access user EXEC mode using the console is xxx

4. The password to allow telnet access to the router is xxx
5. IP information

**Correct Answer:** Please see explanation

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

```
Router>enable
Router#config terminal
Router(config)#hostname Gotha
Gotha(config)#enable secret mi222ke
Gotha(config)#line console 0
Gotha(config-line)#password
G8torslGotha(config-line)#exit
Gotha(config)#line vty 0 4
Gotha(config-line)#password dun63lap
Gotha(config-line)#login
Gotha(config-line)#exit
Gotha(config)#interface fa0/0
Gotha(config-if)#no shutdown
Gotha(config-if)#ip address 209.165.201.4 255.255.255.224
Gotha(config)#interface s0/0/0
Gotha(config-if)#ip address 192.0.2.190 255.255.255.240
Gotha(config-if)#no shutdown
Gotha(config-if)#exit
Gotha(config)#router rip
Gotha(config-router)#version 2
Gotha(config-router)#network 209.165.201.0
Gotha(config-router)#network 192.0.2.176
Gotha(config-router)#end
Gotha#copy run start
```



**QUESTION 142**

Which command displays the CHAP authentication process as it occurs between two routers?

- A. debug chap authentication
- B. debug authentication
- C. debug chap ppp
- D. debug ppp authentication

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 143**

A department decides to replace its hub with a Catalyst 2950 switch that is no longer needed by another department. To prepare the switch for installation, the network administrator has erased the startup configuration and reloaded the switch. However, PCs that are connected to the switch experience various connectivity problems. What is a possible cause of the problem?

- A. The VLAN database was not erased.
- B. The management VLAN is disabled.
- C. The running configuration should have been erased.
- D. The "mode" button was not pressed when the switch was reloaded.
- E. The switch was not configured with an IP address or a default gateway.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

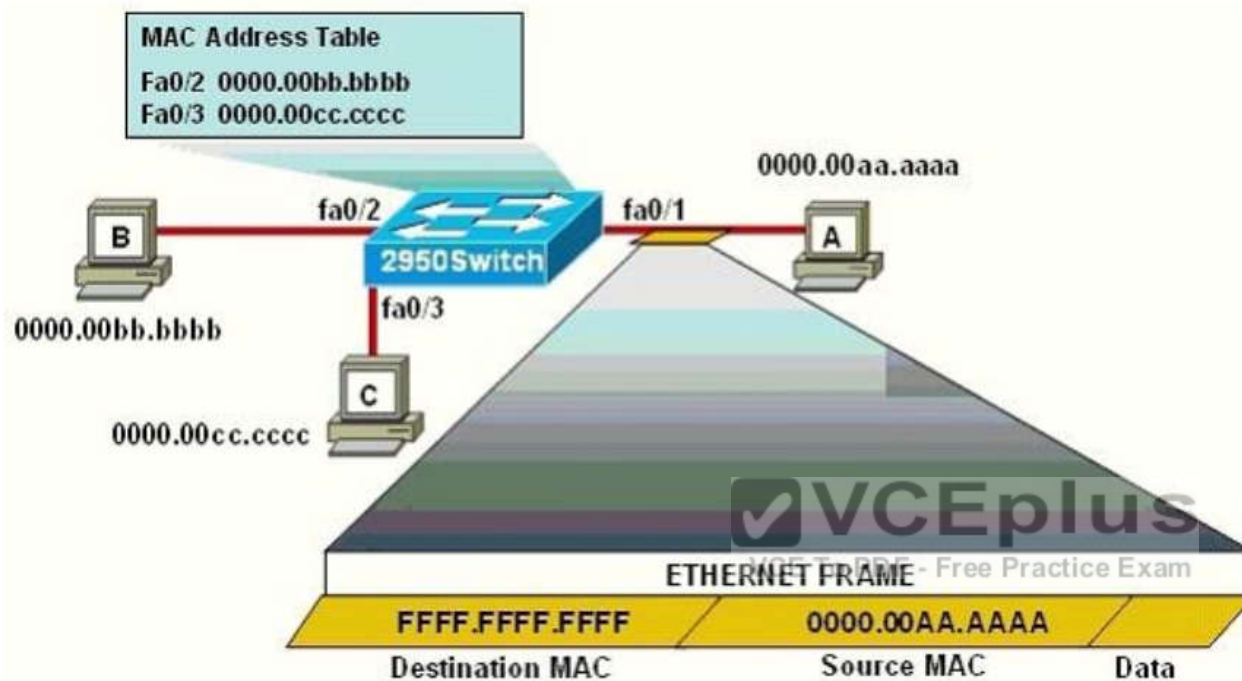
**QUESTION 144**

Refer to the exhibit. The following commands are executed on interface fa0/1 of 2950 Switch.

```
2950Switch(config-if)# switchport port-security
2950Switch(config-if)# switchport port-security mac-address sticky
2950Switch(config-if)# switchport port-security maximum 1
```



The Ethernet frame that is shown arrives on interface fa0/1.  
What two functions will occur when this frame is received by 2950Switch? (Choose two.)



- A. The MAC address table will now have an additional entry of fa0/1 FFFF.FFFF.FFFF.
- B. Only host A will be allowed to transmit frames on fa0/1.
- C. This frame will be discarded when it is received by 2950Switch.
- D. All frames arriving on 2950Switch with a destination of 0000.00aa.aaaa will be forwarded out fa0/1.
- E. Hosts B and C may forward frames out fa0/1 but frames arriving from other switches will not be forwarded out fa0/1.
- F. Only frames from source 0000.00bb.bbbb, the first learned MAC address of 2950Switch, will be forwarded out fa0/1.

**Correct Answer:** BD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**Explanation:**

The first command 2950Switch(config-if)#switchport port-security is to enable the port-security in a switch port.

In the second command 2950Switch(config-if)#switchport port-security mac-address sticky, we need to know the full syntax of this command is switchport port-security mac-address sticky [MAC]. The STICKY keyword is used to make the MAC address appear in the running configuration and you can save it for later use. If you do not specify any MAC addresses after the STICKY keyword, the switch will dynamically learn the attached MAC Address and place it into your running-configuration. In this case, the switch will dynamically learn the MAC address 0000.00aa.aaaa of host A and add this MAC address to the running configuration. In the last command 2950Switch(config-if)#switchport port-security maximum 1 you limited the number of secure MAC addresses to one and dynamically assigned it (because no MAC address is mentioned, the switch will get the MAC address of the attached MAC address to interface fa0/1), the workstation attached to that port is assured the full bandwidth of the port. Therefore, only host A will be allowed to transmit frames on fa0/1 -> B is correct.

After you have set the maximum number of secure MAC addresses for interface fa0/1, the secure addresses are included in the "Secure MAC Address" table (this table is similar to the Mac Address Table but you can only view it with the show port-security address command). So in this question, although you don't see the MAC address of host A listed in the MAC Address Table but frames with a destination of 0000.00aa.aaaa will be forwarded out of fa0/1 interface -> D is correct.

**QUESTION 145**

Which two statements describe characteristics of IPv6 unicast addressing? (Choose two.)

- A. Global addresses start with 2000::/3.
- B. Link-local addresses start with FE00::/12.
- C. Link-local addresses start with FF00::/10.
- D. There is only one loopback address and it is ::1.
- E. If a global address is assigned to an interface, then that is the only allowable address for the interface.

**Correct Answer:** AD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 146**

What are three features of the IPv6 protocol? (Choose three.)

- A. optional IPsec
- B. autoconfiguration
- C. no broadcasts
- D. complicated header
- E. plug-and-play
- F. checksums



**Correct Answer:** BCE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 147**

A router has two Fast Ethernet interfaces and needs to connect to four VLANs in the local network. How can you accomplish this task, using the fewest physical interfaces and without decreasing network performance?

- A. Use a hub to connect the four VLANs with a Fast Ethernet interface on the router.
- B. Add a second router to handle the VLAN traffic.
- C. Add two more Fast Ethernet interfaces.
- D. Implement a router-on-a-stick configuration.

**Correct Answer:** D

**Section:** (none)

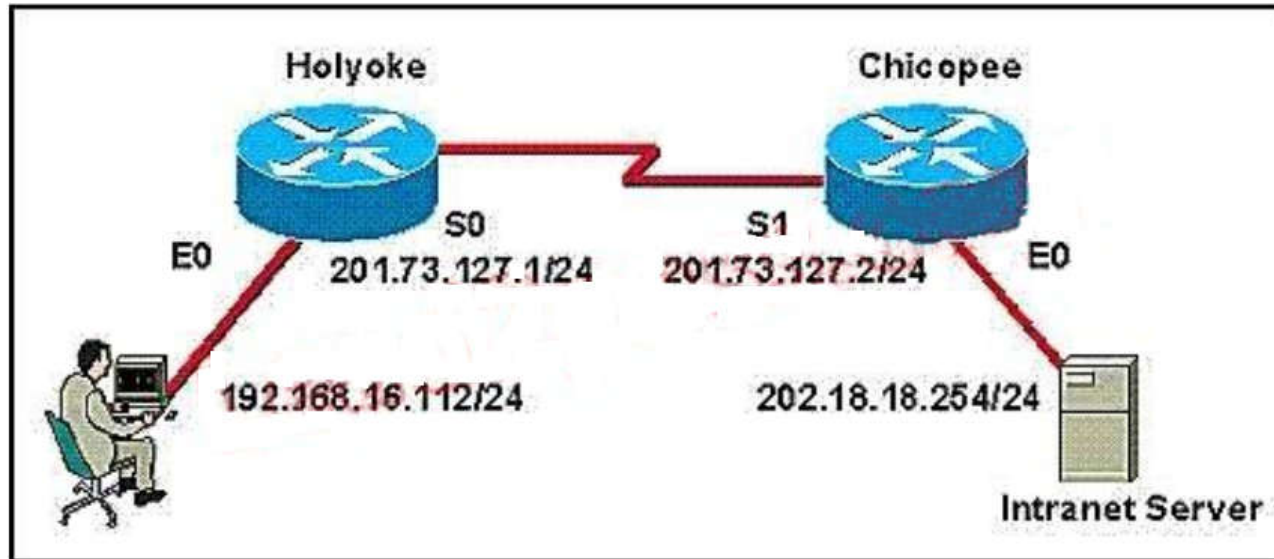
**Explanation**

**Explanation/Reference:**



**QUESTION 148**

Refer to the graphic. Users on the Holyoke router are unable to access the intranet server attached to interface E0 of the Chicopee router. Inspection of the routing table of the Holyoke router shows that an entry for the Chicopee E0 network is missing. Which command will configure the Holyoke router with a path to the intranet server network?



- A. Holyoke(config)# ip host Chicopee 201.73.127.2
- B. Holyoke(config)# ip host Chicopee 201.73.127.0 255.255.255.0
- C. Holyoke(config)# ip network 202.18.38.0
- D. Holyoke(config)# ip network 202.18.18.0 255.255.255.0
- E. Holyoke(config)# ip route 202.18.18.0 255.255.255.0 201.73.127.2
- F. Holyoke(config)# ip route 201.73.127.2 255.255.255.0 202.18.18.0

**Correct Answer:** E

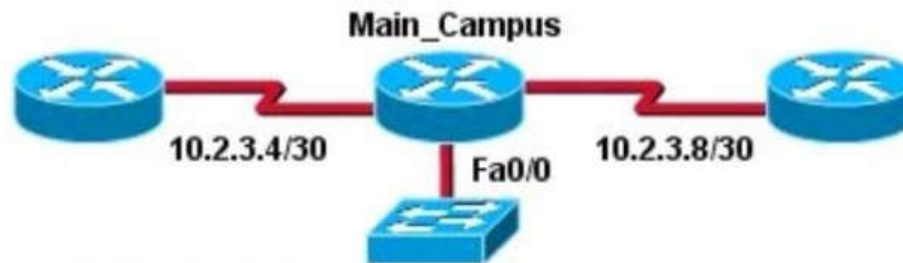
**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 149

Refer to the exhibit. What can be determined about the interfaces of the Main\_Campus router from the output shown?



Main\_Campus# show ip interface brief

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/0	unassigned	YES	unset	up	up
FastEthernet0/0.1	192.168.1.254	YES	manual	up	up
FastEthernet0/0.2	192.168.2.254	YES	manual	up	up
FastEthernet0/0.3	192.168.3.254	YES	manual	up	up
FastEthernet0/0.4	192.168.4.254	YES	manual	up	up
Serial0/0	10.2.3.5	YES	manual	up	up
Serial0/1	10.2.3.9	YES	manual	up	up

Main\_Campus#

- A. The LAN interfaces are configured on different subnets.
- B. Interface FastEthernet 0/0 is configured as a trunk.
- C. The Layer 2 protocol of interface Serial 0/1 is NOT operational.
- D. The router is a modular router with five FastEthernet interfaces.
- E. Interface FastEthernet 0/0 is administratively deactivated.

**Correct Answer: B**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

**QUESTION 150**

Select the action that results from executing these commands.

```
Switch(config-if)# switchport port-security  
Switch(config-if)# switchport port-security mac-address sticky
```

- A. A dynamically learned MAC address is saved in the startup-configuration file.
- B. A dynamically learned MAC address is saved in the running-configuration file.
- C. A dynamically learned MAC address is saved in the VLAN database.
- D. Statically configured MAC addresses are saved in the startup-configuration file if frames from that address are received.
- E. Statically configured MAC addresses are saved in the running-configuration file if frames from that address are received.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 151**

Which two of these statements are true of IPv6 address representation? (Choose two.)

- A. There are four types of IPv6 addresses: unicast, multicast, anycast, and broadcast.
- B. A single interface may be assigned multiple IPv6 addresses of any type.
- C. Every IPv6 interface contains at least one loopback address.
- D. The first 64 bits represent the dynamically created interface ID.
- E. Leading zeros in an IPv6 16 bit hexadecimal field are mandatory.

**Correct Answer:** BC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 152**

What Netflow component can be applied to an interface to track IPv4 traffic?

- A. flow monitor

- B. flow record
- C. flow sampler
- D. flow exporter

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

A flow monitor is essentially a NetFlow cache. The Flow Monitor has two major components the Flow Record and the Flow Exporter. The flow monitor can track both ingress and egress information. The flow record contains what information being tracked by NetFlow (i.e. IP address, ports, protocol...). The Flow exporter describes the NetFlow export. Flow monitors may be used to track IPv4 traffic, IPv6 traffic, multicast or unicast, MPLS, bridged traffic. Multiple Flow monitors can be created and attached to a specific physical or logical interface. Flow monitors can also include packet sampling information if sampling is required.

[http://www.cisco.com/c/en/us/products/collateral/ios-nx-os-software/flexible-netflow/prod\\_gas0900aecd804be091.html](http://www.cisco.com/c/en/us/products/collateral/ios-nx-os-software/flexible-netflow/prod_gas0900aecd804be091.html)

#### **QUESTION 153**

What are three benefits of GLBP? (Choose three.)

- A. GLBP supports up to eight virtual forwarders per GLBP group.
- B. GLBP supports clear text and MD5 password authentication between GLBP group members.
- C. GLBP is an open source standardized protocol that can be used with multiple vendors.
- D. GLBP supports up to 1024 virtual routers.
- E. GLBP can load share traffic across a maximum of four routers.
- F. GLBP elects two AVGs and two standby AVGs for redundancy.

**Correct Answer:** BDE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

[http://www.cisco.com/en/US/docs/ios/12\\_2s/feature/guide/fs\\_glb2.html](http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fs_glb2.html)

Load Sharing

You can configure GLBP in such a way that traffic from LAN clients can be shared by multiple routers, thereby sharing the traffic load more equitably among available routers. Multiple Virtual Routers GLBP supports up to 1024 virtual routers (GLBP groups) on each physical interface of a router, and up to four virtual forwarders per group.

Preemption

The redundancy scheme of GLBP enables you to preempt an active virtual gateway with a higher priority backup virtual gateway that has become available. Forwarder preemption works in a similar way, except that forwarder preemption uses weighting instead of priority and is enabled by default.

### Authentication

You can use a simple text password authentication scheme between GLBP group members to detect configuration errors. A router within a GLBP group with a different authentication string than other routers will be ignored by other group members.

[http://www.cisco.com/en/US/docs/switches/datacenter/sw/5\\_x/nx-s/unicast/configuration/guide/l3\\_glb.html](http://www.cisco.com/en/US/docs/switches/datacenter/sw/5_x/nx-s/unicast/configuration/guide/l3_glb.html)

### GLBP Authentication

GLBP has three authentication types:

MD5 authentication

Plain text authentication

No authentication

MD5 authentication provides greater security than plain text authentication. MD5 authentication allows each GLBP group member to use a secret key to generate a keyed MD5 hash that is part of the outgoing packet. At the receiving end, a keyed hash of an incoming packet is generated. If the hash within the incoming packet does not match the generated hash, the packet is ignored. The key for the MD5 hash can either be given directly in the configuration using a key string or supplied indirectly through a key chain. You can also choose to use a simple password in plain text to authenticate GLBP packets, or choose no authentication for GLBP.

### QUESTION 154

What command visualizes the general NetFlow data on the command line?

- A. show ip flow export
- B. show ip flow top-talkers
- C. show ip cache flow
- D. show mls sampling
- E. show mls netflow ip



**Correct Answer: C**

**Section: (none)**

**Explanation**

### Explanation/Reference:

Explanation:

The following is an example of how to visualize the NetFlow data using the CLI. There are three methods to visualize the data depending on the version of Cisco IOS Software. The traditional show command for NetFlow is "show ip cache flow" also available are two forms of top talker commands. One of the top talkers' commands uses a static configuration to view top talkers in the network and another command called dynamic top talkers allows real-time sorting and aggregation of NetFlow data. Also shown is a show MLS command to view the hardware cache on the Cisco Catalyst 6500 Series Switch.

The following is the original NetFlow show command used for many years in Cisco IOS Software.

Information provided includes packet size distribution; basic statistics about number of flows and export timer setting, a view of the protocol distribution statistics and the NetFlow cache. R3#show ip cache flow IP packet size distribution (469 total packets):1-32 64 96 128 160 192 224 256 288 320 352 384 416 448 480 .000 .968 .000 .031 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 512 544 576 1024 1536 2048 2560 3072 3584 4096 4608.000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 IP Flow Switching Cache, 278544 bytes 7 active, 4089 inactive, 261 added 1278 aged polls, 0 flow alloc failures Active flows timeout in 30 minutes. Inactive flows timeout in 15 seconds IP Sub Flow Cache, 25736 bytes 1 active, 1023 inactive, 38 added, 38 added to flow 0 alloc failures, 0 force free 1

chunk, 1 chunk added last clearing of statistics never Protocol Total Flows Packets Bytes Packets Active(Sec) Idle(Sec) -----Flows /Sec /Flow /Pkt /Sec/Flow /  
Flow TCP-WWW 71 0.0 1 40 0.1 1.3 1.2 TCP-BGP 35 0.0 1 40 0.0 1.3 1.2 TCP-other 108 0.1 1 40 0.1 1.3 1.2 UDP-other 37 0.0 1 52 0.0 0.0 15.4 ICMP 3 0.0 5  
100 0.0 0.0 15.3 Total: 254 0.2 1 42 0.4 1.1 3.5 (NetFlow cache below) SrcIfl SrcIPaddress DstIfl DstIPaddress Pr SrcP DstP Pkts Et1/0 172.16.10.2 Et0/0 172.16.1.84 06 0087 0087 1  
Et1/0 172.16.10.2 Et0/0 172.16.1.84 06 0050 0050 1  
Et1/0 172.16.10.2 Et0/0 172.16.1.85 06 0089 0089 1  
Et1/0 172.16.10.2 Et0/0 172.16.1.85 06 0050 0050 1  
Et1/0 172.16.10.2 Et0/0 172.16.1.86 06 00B3 00B3 1  
Et1/0 172.16.10.2 Et0/0 172.16.1.86 06 0185 0185 2  
[http://www.cisco.com/c/en/us/products/collateral/ios-nx-os-software/ios-netflow/prod\\_white\\_paper0900aecd80406232.html](http://www.cisco.com/c/en/us/products/collateral/ios-nx-os-software/ios-netflow/prod_white_paper0900aecd80406232.html)

### QUESTION 155

What are three reasons to collect Netflow data on a company network? (Choose three.)

- A. To identify applications causing congestion.
- B. To authorize user network access.
- C. To report and alert link up / down instances.
- D. To diagnose slow network performance, bandwidth hogs, and bandwidth utilization.
- E. To detect suboptimal routing in the network.
- F. To confirm the appropriate amount of bandwidth that has been allocated to each Class of Service.

**Correct Answer:** ADF

**Section:** (none)

**Explanation**

#### Explanation/Reference:

Explanation:

NetFlow facilitates solutions to many common problems encountered by IT professionals.

+ Analyze new applications and their network impact

Identify new application network loads such as VoIP or remote site additions.

+ Reduction in peak WAN traffic

Use NetFlow statistics to measure WAN traffic improvement from application-policy changes;  
understand who is utilizing the network and the network top talkers.

+ Troubleshooting and understanding network pain points

Diagnose slow network performance, bandwidth hogs and bandwidth utilization quickly with command line interface or reporting tools.

+ Detection of unauthorized WAN traffic

Avoid costly upgrades by identifying the applications causing congestion.

+ Security and anomaly detection

NetFlow can be used for anomaly detection and worm diagnosis along with applications such as Cisco CS-Mars.

+ Validation of QoS parameters

Confirm that appropriate bandwidth has been allocated to each Class of Service (CoS) and that no CoS is over-or under-subscribed.

[http://www.cisco.com/c/en/us/products/collateral/ios-nx-os-software/ios-netflow/prod\\_white\\_paper0900aecd80406232.html](http://www.cisco.com/c/en/us/products/collateral/ios-nx-os-software/ios-netflow/prod_white_paper0900aecd80406232.html)

#### QUESTION 156

What are three factors a network administrator must consider before implementing Netflow in the network? (Choose three.)

- A. CPU utilization
- B. where Netflow data will be sent
- C. number of devices exporting Netflow data
- D. port availability
- E. SNMP version
- F. WAN encapsulation

**Correct Answer:** ABC

**Section:** (none)

**Explanation**

#### Explanation/Reference:

Explanation:

NetFlow has a reputation for increasing CPU utilization on your network devices. Cisco's performance testing seems to indicate that newer hardware can accommodate this load pretty well, but you will still want to check it out before you turn on the feature. Some symptoms of high CPU utilization are very large jitter and increased delay. Services running on the device may also be affected.

Another thing to keep in mind is the amount of data you're going to be sending across the network.

Depending on how much traffic you have and how you configure it, the traffic can be substantial.

For example, you may not want to send NetFlow data from a datacenter switch to a NetFlow collector on the other side of a small WAN circuit. Also bear in mind that the flows from aggregating large numbers of devices can add up.

<http://searchenterprise.wan.techtarget.com/tip/How-the-NetFlow-protocol-monitors-your-WAN>

#### QUESTION 157

What are the benefit of using Netflow? (Choose three.)

- A. Network, Application & User Monitoring
- B. Network Planning
- C. Security Analysis
- D. Accounting/Billing

**Correct Answer:** ACD

**Section:** (none)

**Explanation**



**Explanation/Reference:**

Explanation:

NetFlow Definitions and Benefits

[http://www.cisco.com/en/US/products/sw/netmgts/ps1964/products\\_implementation\\_design\\_guide09186a00800d6a11.html#wp1030045](http://www.cisco.com/en/US/products/sw/netmgts/ps1964/products_implementation_design_guide09186a00800d6a11.html#wp1030045)

NetFlow traditionally enables several key customer applications including:

Network Monitoring--NetFlow data enables extensive near real time network monitoring capabilities. Flowbased analysis techniques may be utilized to visualize traffic patterns associated with individual routers and switches as well as on a network-wide basis (providing aggregate traffic or application based views) to provide proactive problem detection, efficient troubleshooting, and rapid problem resolution.

Application Monitoring and Profiling--NetFlow data enables network managers to gain a detailed, time based, view of application usage over the network. This information is used to plan, understand new services, and allocate network and application resources (e.g. Web server sizing and VoIP deployment) to responsively meet customer demands.

User Monitoring and Profiling--NetFlow data enables network engineers to gain detailed understanding of customer/user utilization of network and application resources. This information may then be utilized to efficiently plan and allocate access, backbone and application resources as well as to detect and resolve potential security and policy violations.

Network Planning--NetFlow can be used to capture data over a long period of time producing the opportunity to track and anticipate network growth and plan upgrades to increase the number of routing devices, ports, or higher-bandwidth interfaces. NetFlow services data optimizes network planning including peering, backbone upgrade planning, and routing policy planning. NetFlow helps to minimize the total cost of network operations while maximizing network performance, capacity, and reliability. NetFlow detects unwanted WAN traffic, validates bandwidth and Quality of Service (QOS) and allows the analysis of new network applications. NetFlow will give you valuable information to reduce the cost of operating your network.

Security Analysis--NetFlow identifies and classifies DDOS attacks, viruses and worms in real-time. Changes in network behavior indicate anomalies that are clearly demonstrated in NetFlow data. The data is also a valuable forensic tool to understand and replay the history of security incidents.

Accounting/Billing--NetFlow data provides fine-grained metering (e.g. flow data includes details such as IP addresses, packet and byte counts, timestamps, type-of-service and application ports, etc.) for highly flexible and detailed resource utilization accounting. Service providers may utilize the information for billing based on time-of-day, bandwidth usage, application usage, quality of service, etc. Enterprise customers may utilize the information for departmental charge-back or cost allocation for resource utilization.

NetFlow Data Warehousing and Data Mining--NetFlow data (or derived information) can be warehoused for later retrieval and analysis in support of proactive marketing and customer service programs (e.g. figure out which applications and services are being utilized by internal and external users and target them for improved service, advertising, etc.). In addition, NetFlow data gives Market Researchers access to the "who", "what", "where", and "how long" information relevant to enterprises and service providers.

**QUESTION 158**

What are the three things that the Netflow uses to consider the traffic to be in a same flow?

- A. IP address
- B. Interface name
- C. Port numbers
- D. L3 protocol type
- E. MAC address

**Correct Answer:** ACD

**Section:** (none)

**Explanation****Explanation/Reference:****QUESTION 159**

Which three are the components of SNMP? (Choose three)

- A. MIB
- B. SNMP Manager
- C. SysLog Server
- D. SNMP Agent
- E. Set

**Correct Answer:** ABD

**Section:** (none)

**Explanation****Explanation/Reference:****QUESTION 160**

What are the Popular destinations for syslog messages to be saved?

- A. Flash
- B. The logging buffer .RAM
- C. The console terminal
- D. Other terminals
- E. Syslog server

**Correct Answer:** BCE

**Section:** (none)

**Explanation****Explanation/Reference:****QUESTION 161**

Syslog was configured with a level 3 trap. Which 3 types of logs would be generated (Choose three)

- A. Emergencies
- B. Alerts
- C. Critical
- D. Errors
- E. Warnings

**Correct Answer:** ABC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 162

Which three statements about Syslog utilization are true? (Choose three.)

- A. Utilizing Syslog improves network performance.
- B. The Syslog server automatically notifies the network administrator of network problems.
- C. A Syslog server provides the storage space necessary to store log files without using router disk space.
- D. There are more Syslog messages available within Cisco IOS than there are comparable SNMP trap messages.
- E. Enabling Syslog on a router automatically enables NTP for accurate time stamping.
- F. A Syslog server helps in aggregation of logs and alerts.

**Correct Answer:** CDF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 163

A network administrator enters the following command on a router: logging trap 3. What are three message types that will be sent to the Syslog server? (Choose three.)

- A. informational
- B. emergency
- C. warning

- D. critical
- E. debug
- F. error

**Correct Answer:** BDF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 164**

What is the default Syslog facility level?

- A. local4
- B. local5
- C. local6
- D. local7

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**



#### **QUESTION 165**

What command instructs the device to timestamp Syslog debug messages in milliseconds?

- A. service timestamps log datetime localtime
- B. service timestamps debug datetime msec
- C. service timestamps debug datetime localtime
- D. service timestamps log datetime msec

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 166**

Refer to the exhibit. What is the cause of the Syslog output messages?

```
*Mar 01, 00:37:57.3737: %SYS-5-CONFIG_I: Configured from console by console
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down
%DUAL-5-NBRCHANGE: IP-EIGRP 1: Neighbor 10.10.11.2 (FastEthernet0/1) is down: interface down
```

- A. The EIGRP neighbor on Fa0/1 went down due to a failed link.
- B. The EIGRP neighbor connected to Fa0/1 is participating in a different EIGRP process, causing the adjacency to go down.
- C. A shut command was executed on interface Fa0/1, causing the EIGRP adjacency to go down.
- D. Interface Fa0/1 has become error disabled, causing the EIGRP adjacency to go down.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 167**

Which protocol can cause overload on a CPU of a managed device?

- A. Netflow
- B. WCCP
- C. IP SLA
- D. SNMP

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 168**

What is the alert message generated by SNMP agents called?

- A. TRAP
- B. INFORM
- C. GET
- D. SET

**Correct Answer:** AB

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 169**

Which three features are added in SNMPv3 over SNMPv2?

- A. Message Integrity
- B. Compression
- C. Authentication
- D. Encryption
- E. Error Detection

**Correct Answer:** ACD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 170**

What are three components that comprise the SNMP framework? (Choose three.)

- A. MIB
- B. agent
- C. set

- D. AES
- E. supervisor
- F. manager

**Correct Answer:** ABF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 171**

What SNMP message alerts the manager to a condition on the network?

- A. response
- B. get
- C. trap
- D. capture

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 172**

What authentication type is used by SNMPv2?

- A. HMAC-MD5
- B. HMAC-SHA
- C. CBC-DES
- D. community strings

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 173**

Which three statements about the features of SNMPv2 and SNMPv3 are true? (Choose three.)

- A. SNMPv3 enhanced SNMPv2 security features.
- B. SNMPv3 added the Inform protocol message to SNMP.
- C. SNMPv2 added the Inform protocol message to SNMP.
- D. SNMPv3 added the GetBulk protocol messages to SNMP.
- E. SNMPv2 added the GetBulk protocol message to SNMP.
- F. SNMPv2 added the GetNext protocol message to SNMP.

**Correct Answer:** ACE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 174**

What Cisco IOS feature can be enabled to pinpoint an application that is causing slow network performance?

- A. SNMP
- B. Netflow
- C. WCCP
- D. IP SLA

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Netflow can be used to diagnose slow network performance, bandwidth hogs and bandwidth utilization quickly with command line interface or reporting tools.

[http://www.cisco.com/c/en/us/products/collateral/ios-nx-os-software/ios-netflow/prod\\_white\\_paper0900aecd80406232.html](http://www.cisco.com/c/en/us/products/collateral/ios-nx-os-software/ios-netflow/prod_white_paper0900aecd80406232.html)

**QUESTION 175**

In a GLBP network, who is responsible for the arp request?



- A. AVF
- B. AVG
- C. Active Router
- D. Standby Router

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 176**

In GLBP, which router will respond to client ARP requests?

- A. The active virtual gateway will reply with one of four possible virtual MAC addresses.
- B. All GLBP member routers will reply in round-robin fashion.
- C. The active virtual gateway will reply with its own hardware MAC address.
- D. The GLBP member routers will reply with one of four possible burned in hardware addresses.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 177**

##### **SIMULATION**

Lab Simulation Question –EIGRP

CCNA.com has a small network that is using EIGRP as its IGP. All routers should be running an EIGRP AS number 12. Router MGT is also running static routing to the ISP.

CCNA.com has recently adding the ENG router. Currently, the ENG router does not have connectivity to the ISP router. All other interconnectivity and Internet access for the existing locations of the company are working properly.

**The task** is to identify the fault(s) and correct the router configuration(s) to provide full connectivity between the routers.

**Access to the router CLI can be gained by clicking on the appropriate host.**

All passwords on all routers are cisco.  
IP addresses are listed in the chart below.

**MGT**

Fa0/0-192.168.77.33  
S1/0-198.0.18.6  
S0/0-192.168.27.9  
S0/1-192.168.50.21

**ENG**

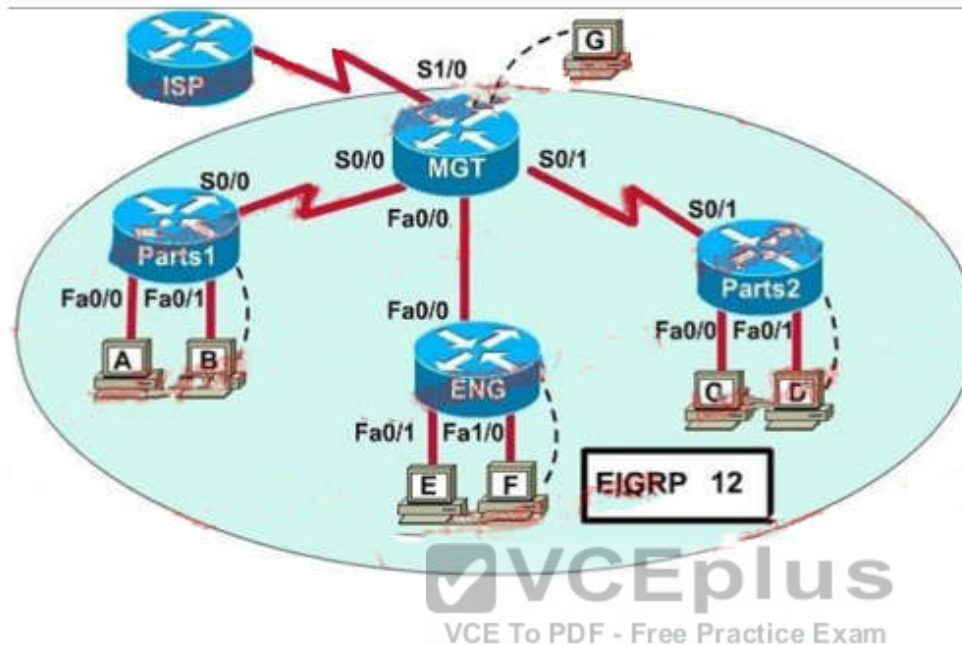
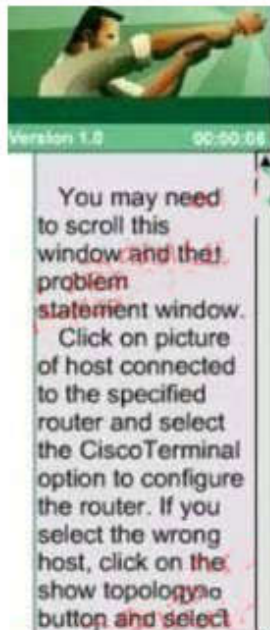
Fa0/0-192.168.77.34  
Fa1/0-192.168.12.17  
Fa0/1-192.168.12.1

**Parts1**

Fa0/0-192.168.12.33  
Fa0/1-192.168.12.49  
S0/0-192.168.27.10

**Parts2**

Fa0/0-192.168.12.65  
Fa0/1-192.168.12.81  
S0/1-192.168.50.22



**Correct Answer:** Please see explanation

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

First we should check the configuration of the ENG Router.

Click the console PC "F" and enter the following commands.

```
ENG> enable
Password: cisco
ENG# show running-config
```

Building configuration...

Current configuration: 770 bytes

!

version 12.2

```
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password
-
encryption
!
hostname ENG
!
enable secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0
!
interface FastEthernet0/0
ip address 192.168.77.34 255.255.255.252
duplex auto
speed auto
!
interface FastEthernet0/1
ip address 192.168.60.65 255.255.255.240
duplex auto
speed auto
!
interface FastEthernet1/0
ip address 192.168.60.81 255.255.255.240
duplex auto
speed auto
!
router eigrp 22
network 192.168.77.0
network 192.168.60.0
no auto
-
summary
!
ip classless
!
line con 0
line vty 0 4
login
!
end
ENG#
```



From the output above, we know that this router was wrongly configured with an autonomous number (AS) of 22. When the AS numbers among routers are

mismatched, no adjacency is formed.

(You should check the AS numbers on other routers for sure)

To solve this problem, we simply re-configure router ENG router with the following commands:

```
ENG# conf t
ENG(config)# no router eigrp 22
ENG(config)# router eigrp 222
ENG(config-router)# network 192.168.60.0
ENG(config-router)# network 192.168.77.0
ENG(config-router)# no auto-summary
ENG(config-router)# end
ENG# copy running-config startup-config
```

Second we should check the configuration of the MGT Router.

Click the console PC "G" and enter the following commands.

```
MGT> enable
Password: cisco
MGT# show running-config
```

Building configuration...

Current configuration : 1029 bytes

```
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname MGT
!
enable secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0
!
interface FastEthernet0/0
ip address 192.168.77.33 255.255.255.252
duplex auto
speed auto
!
interface Serial0/0
ip address 192.168.36.13 255.255.255.252
clock rate 64000
!
interface Serial0/1
ip address 192.168.60.25 255.255.255.252
```

```
clock rate 64000
!
interface Serial1/0
ip
address 198.0.18.6 255.255.255.252
!
interface Serial1/1
no ip address
shutdown
!
interface Serial1/2
no ip address
shutdown
!
interface Serial1/3
no ip address
shutdown
!
router eigrp 222
network 192.168.36.0
network 192.168.60.0
network
192.168.85.0
network 198.0.18.0
no auto
-
summary
!
ip classless
ip route 0.0.0.0 0.0.0.0 198.0.18.5
!
line con 0
line vty 0 4
login
!
end
MGT#
```



Notice that it is missing a definition to the network ENG. Therefore, we have to add it so that it can recognize ENG router

```
MGT# conf t
MGT(config)# router eigrp 222
MGT(config-router)# network 192.168.77.0
```

```
MGT(config-router)# end
MGT# copy running-config startup-config
```

Now the whole network will work well. You should check again with ping command from router ENG to other routers!

In Short:

### ENG Router

```
ENG>enable
Password: cisco ENG# conf t
ENG(config)# no router eigrp 22
ENG(config)# router eigrp 222
ENG(config-router)# network 192.168.60.0
ENG(config-router)# network 192.168.77.0
ENG(config-router)# no auto-summary
ENG(config-router)# end
ENG# copy running-config startup-config
```

### MGT Router

```
MGT>enable
Password: cisco MGT# conf t
MGT(config)# router eigrp 222
MGT(config-router)# network 192.168.77.0
MGT(config-router)# end
MGT# copy running-config startup-config
```



### Some Modification in Question

After adding ENG router, no routing updates are being exchanged between MGT and the new location. All other inter connectivity for the existing locations of the company are working properly.

But Internet connection for existing location including Remote1 and Remote2 networks are not working.

Faults Identified:

1. Incorrect Autonomous System Number configured in ENG router.
2. MGT router does not advertise route to the new router ENG.
3. Internet Connection is not working all stations.

We need to correct the above two configuration mistakes to have full connectivity

Steps:

1. ENG Router:

Change the Autonomous System Number of ENG

2. Perimeter Router: Add the network address of interface of Perimeter that link between MGT and ENG.
3. Perimeter Router: Add default route and default-network.

Check the IP Address of S1/0 interface of MGT Router using show running-config command.

(The interfaced used to connect to the ISP)

!

```
interface Serial1/0
```

```
ip address 198.0.18.6 255.255.255.252
```

!

For Internet sharing we have created a default route, and add default-network configuration. The IP address is 198.0.18.6/30. Then the next hop IP will be 198.0.18.5.

### ENG Router

```
ENG>enable
```

```
Password: cisco ENG# conf t
```

```
ENG(config)# no router eigrp 22
```

```
ENG(config)# router eigrp 222
```

```
ENG(config-router)# network 192.168.60.0
```

```
ENG(config-router)# network 192.168.77.0
```

```
ENG(config-router)# no auto-summary
```

```
ENG(config-router)# end
```

```
ENG# copy running-config startup-config
```

### MGT Router

```
MGT>enable
```

```
Password: cisco MGT# conf t
```

```
MGT(config)# router eigrp 222
```

```
MGT(config-router)# network 192.168.77.0
```

```
MGT(config-router)# exit
```

```
MGT(config)# ip route 0.0.0.0 0.0.0.0 198.0.18.5
```

```
MGT(config)# ip default-network 198.0.18.0
```

```
MGT(config)# exit
```

```
MGT# copy running-config startup-config
```

### Important:

If you refer the topology and IP chart, the MGT router uses Fa0/0 to connect ENG router, S0/0 used to connect Remote1, and S0/1 used to connect Remote2.

Refer to the command show running-config, the command #PASSIVE-INTERFACE <Interface Name> will deny EIGRP updates to specified interface. In that case we need to use #no passive-interface <Interface Name> to allow the routing updates to be passed to that interface. For example, when used the #show run command and we see the output like below.

!

```
router eigrp 22
```

```
network 192.168.77.0
```

```
network 192.168.60.0
```

```
passive-interface FastEthernet 0/0
```

```
passive-interface Serial 1/0
```



```
no auto-summary  
!
```

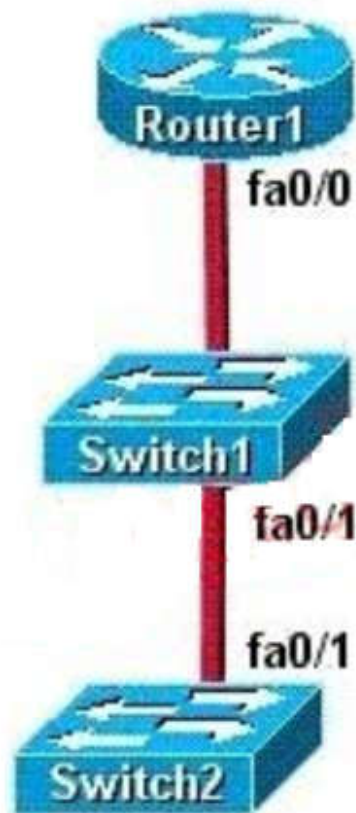
Then the command would be

```
MGT(config)#router eigrp 222  
MGT(config-router)#no passive-interface Fa0/0  
MGT(config-router)#end
```

Also MGT router connect to the ISP router using Serial 1/0. If you see passive-interface s1/0, then do not remove it using #no passive-interface s1/0 command.

#### **QUESTION 178**

Refer to the exhibit. How should the FastEthernet0/1 ports on the 2950 model switches that are shown in the exhibit be configured to allow connectivity between all devices?



**Router1**

**fa 0/0.1 192.168.1.1/24 VLAN 1**  
**fa 0/0.10 192.168.10.1/24 VLAN 10**  
**fa 0/0.20 192.168.20.1/24 VLAN 20**

**Switch1**

**IP address: 192.168.1.2/24**  
**Ports 3-12 VLAN 10**  
**Ports 13-24 VLAN 20**

**Switch2**

**IP address: 192.168.1.3/24**  
**Ports 2-12 VLAN 10**  
**Ports 13-24 VLAN 20**

- A. The ports only need to be connected by a crossover cable.
- B. SwitchX(config)# interface fastethernet 0/1  
SwitchX(config-if)# switchport mode trunk
- C. SwitchX(config)# interface fastethernet 0/1  
SwitchX(config-if)# switchport mode access  
SwitchX(config-if)# switchport access vlan 1

- D. SwitchX(config)# interface fastethernet 0/1  
SwitchX(config-if)# switchport mode trunk  
SwitchX(config-if)# switchport trunk vlan 1  
SwitchX(config-if)# switchport trunk vlan 10  
SwitchX(config-if)# switchport trunk vlan 20

**Correct Answer:** B

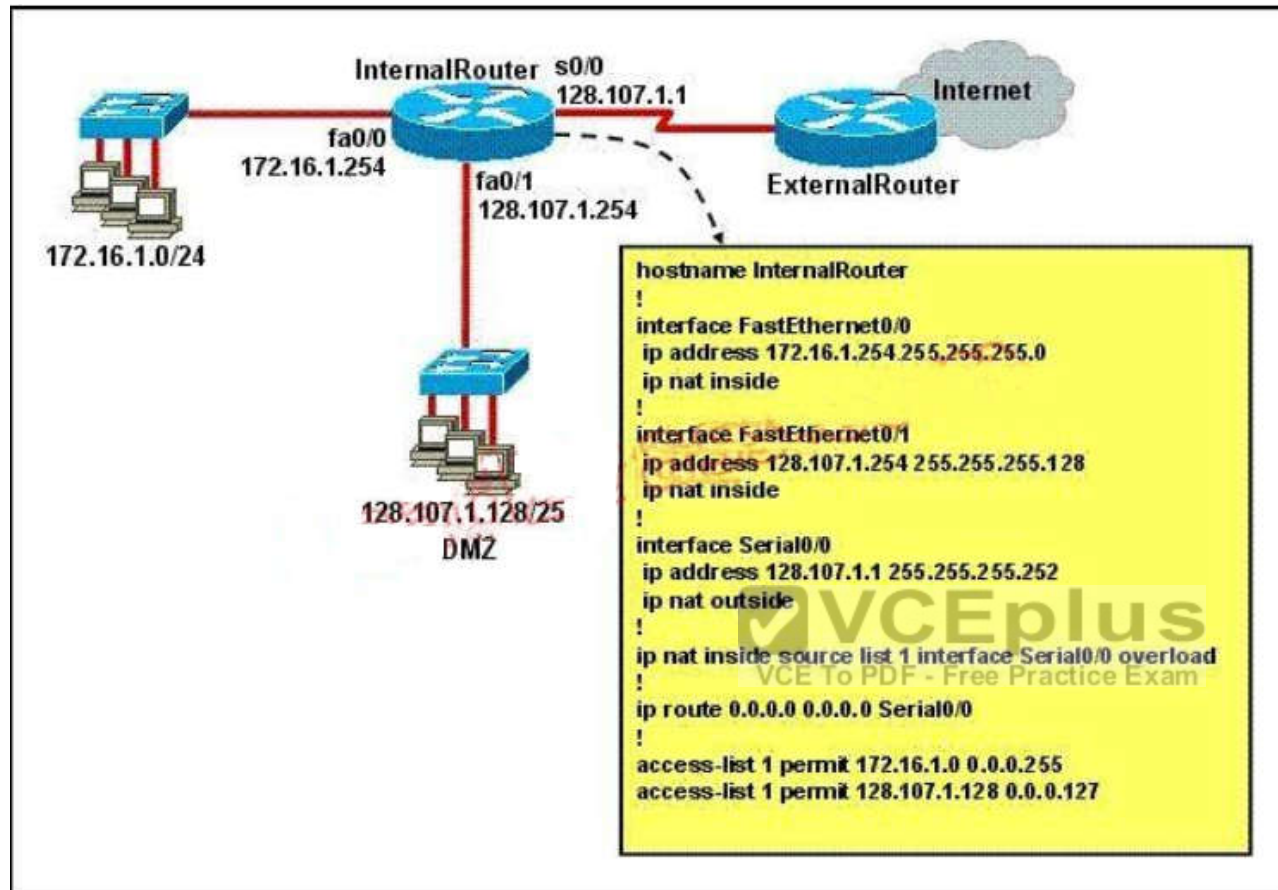
**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 179**

Refer to the exhibit. A junior network engineer has prepared the exhibited configuration file.  
What two statements are true of the planned configuration for interface fa0/1? (Choose two.)



- A. The two FastEthernet interfaces will require NAT configured on two outside serial interfaces.
- B. Address translation on fa0/1 is not required for DMZ Devices to access the Internet.
- C. The fa0/1 IP address overlaps with the space used by s0/0.
- D. The fa0/1 IP address is invalid for the IP subnet on which it resides.
- E. Internet hosts may not initiate connections to DMZ Devices through the configuration that is shown.

**Correct Answer:** BE

**Section:** (none)

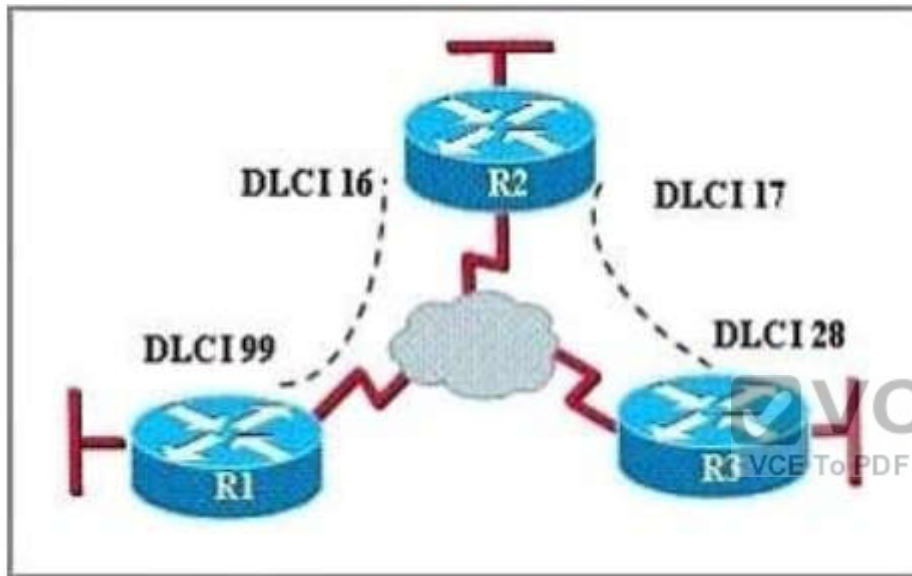
**Explanation**

**Explanation/Reference:**

**QUESTION 180**

Refer to the exhibit.

Which statement describes DLCI 17?



- A. DLCI 17 describes the ISDN circuit between R2 and R3.
- B. DLCI 17 describes a PVC on R2. It cannot be used on R3 or R1.
- C. DLCI 17 is the Layer 2 address used by R2 to describe a PVC to R3.
- D. DLCI 17 describes the dial-up circuit from R2 and R3 to the service provider.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

DLCI stands for Data Link Connection Identifier. DLCI values are used on Frame Relay interfaces to distinguish between different virtual circuits. DLCIs have local significance because, the identifier references the point between the local router and the local Frame Relay switch to which the DLCI is connected.

**QUESTION 181**

What is the default Local Management Interface frame type transmitted by a Cisco router on a Frame Relay circuit?

- A. Q933a
- B. B8ZS
- C. IETF
- D. Cisco
- E. ANSI

**Correct Answer:** D

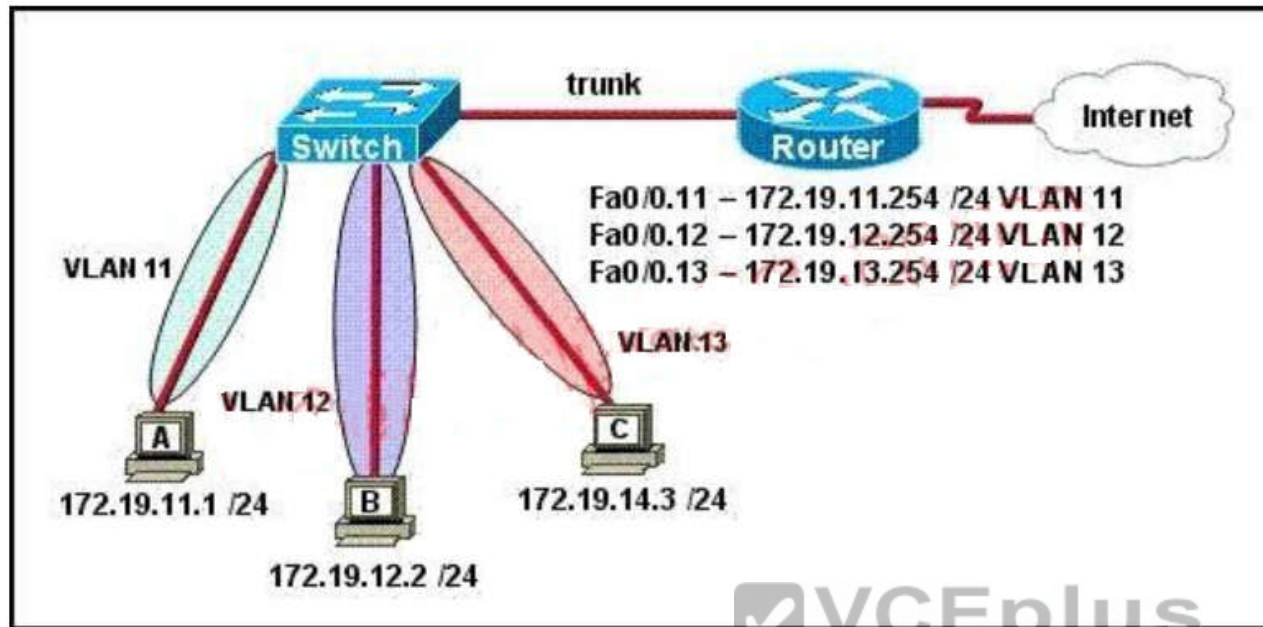
**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 182**

Refer to the exhibit. The network shown in the exhibit has just been installed. Host B can access the Internet, but it is unable to ping host C. What is the problem with this configuration?



- A. Host B should be in VLAN 13.
- B. The address of host C is incorrect.
- C. The gateway for host B is in a different subnet than the host is on.
- D. The switch port that sends VLAN 13 frames from the switch to the router is shut down.
- E. The switch port connected to the router is incorrectly configured as an access port.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 183

Which protocol provides a method of sharing VLAN configuration information between switches?

- A. VTP
- B. STP

- C. ISL
- D. 802.1Q
- E. VLSM

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Understanding VLAN Trunk Protocol (VTP)

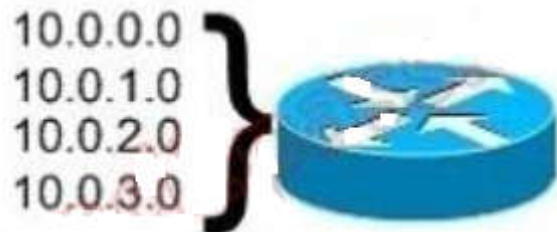
[http://www.cisco.com/en/US/tech/tk389/tk689/technologies\\_tech\\_note09186a0080094c52.shtml](http://www.cisco.com/en/US/tech/tk389/tk689/technologies_tech_note09186a0080094c52.shtml)

Introduction

VLAN Trunk Protocol (VTP) reduces administration in a switched network. When you configure a new VLAN on one VTP server, the VLAN is distributed through all switches in the domain. This reduces the need to configure the same VLAN everywhere. VTP is a Cisco-proprietary protocol that is available on most of the Cisco Catalyst series products.

#### QUESTION 184

Refer to the exhibit. What is the most appropriate summarization for these routes?



- A. 10.0.0.0 /21
- B. 10.0.0.0 /22
- C. 10.0.0.0 /23
- D. 10.0.0.0 /24

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**



**QUESTION 185**

The network administrator has been asked to give reasons for moving from IPv4 to IPv6.  
What are two valid reasons for adopting IPv6 over IPv4? (Choose two.)

- A. no broadcast
- B. change of source address in the IPv6 header
- C. change of destination address in the IPv6 header
- D. Telnet access does not require a password
- E. autoconfiguration
- F. NAT

**Correct Answer:** AE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Six Benefits Of IPv6

<http://www.networkcomputing.com/ipv6/six-benefits-of-ipv6/230500009>

With IPv6, everything from appliances to automobiles can be interconnected. But an increased number of IT addresses isn't the only advantage of IPv6 over IPv4. In honor of World IPv6 Day, here are six more good reasons to make sure your hardware, software, and services support IPv6.

**More Efficient Routing** IPv6 reduces the size of routing tables and makes routing more efficient and hierarchical. IPv6 allows ISPs to aggregate the prefixes of their customers' networks into a single prefix and announce this one prefix to the IPv6 Internet. In addition, in IPv6 networks, fragmentation is handled by the source device, rather than the router, using a protocol for discovery of the path's maximum transmission unit (MTU).

**More Efficient Packet Processing**

IPv6's simplified packet header makes packet processing more efficient. Compared with IPv4, IPv6 contains no IP-level checksum, so the checksum does not need to be recalculated at every router hop. Getting rid of the IP-level checksum was possible because most link-layer technologies already contain checksum and error-control capabilities. In addition, most transport layers, which handle end-to-end connectivity, have a checksum that enables error detection.

**Directed Data Flows** IPv6 supports multicast rather than broadcast. Multicast allows bandwidth-intensive packet flows (like multimedia streams) to be sent to multiple destinations simultaneously, saving network bandwidth.

**Disinterested hosts** no longer must process broadcast packets. In addition, the IPv6 header has a new field, named Flow Label, that can identify packets belonging to the same flow. **Simplified Network Configuration** Address auto-configuration (address assignment) is built in to IPv6. A router will send the prefix of the local link in its router advertisements. A host can generate its own IP address by appending its link-layer (MAC) address, converted into Extended Universal Identifier (EUI) 64-bit format, to the 64 bits of the local link prefix.

**Support For New Services**

By eliminating Network Address Translation (NAT), true end-to-end connectivity at the IP layer is restored, enabling new and valuable services. Peer-to-peer networks are easier to create and maintain, and services such as VoIP and Quality of Service (QoS) become more robust.

**Security** IPsec, which provides confidentiality, authentication and data integrity, is baked into in IPv6. Because of their potential to carry malware, IPv4 ICMP packets are often blocked by corporate firewalls, but ICMPv6, the implementation of the Internet Control Message Protocol for IPv6, may be permitted because IPsec can be applied to the ICMPv6 packets.

**QUESTION 186**

The network technician is planning to use the 255.255.255.224 subnet mask on the network. Which three valid IP addresses can the technician use for the hosts? (Choose three.)

- A. 172.22.243.127
- B. 172.22.243.190
- C. 172.22.243.191
- D. 192.168.1.160
- E. 10.17.64.34
- F. 10.16.33.98

**Correct Answer:** BEF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 187**

Which of these represents an IPv6 link-local address?

- A. FE80::380e:611a:e14f:3d69
- B. FE81::280f:512b:e14f:3d69
- C. FEFE:0345:5f1b::e14d:3d69
- D. FE08::280e:611a:f14f:3d69

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Understanding IPv6 Link Local Address

Reference:

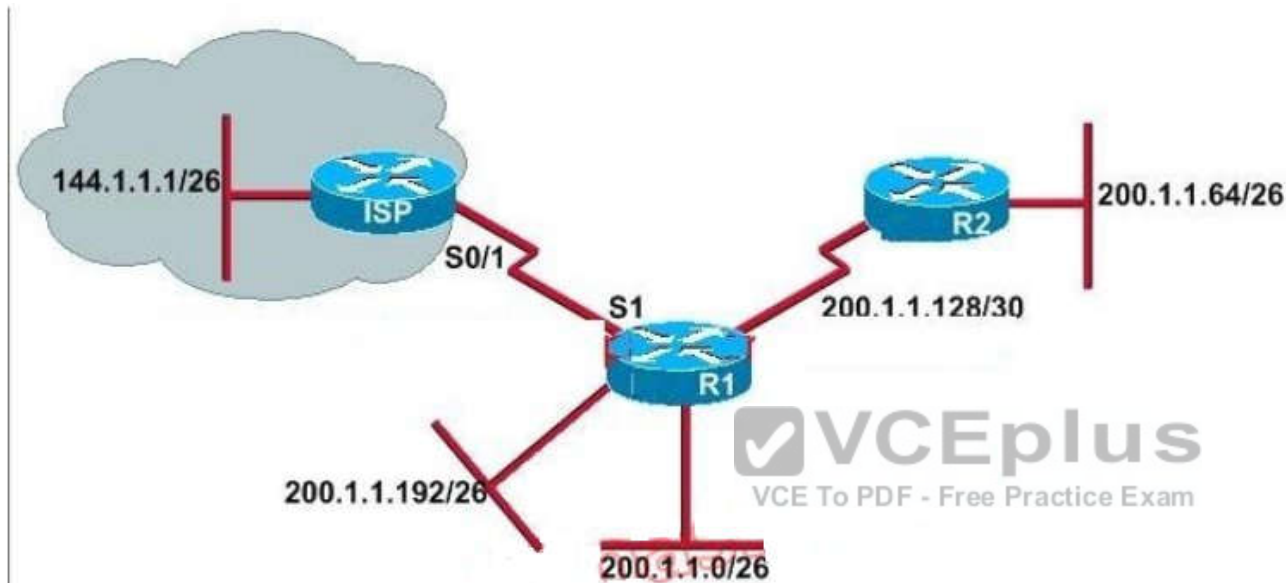
[http://www.cisco.com/en/US/tech/tk872/technologies\\_configuration\\_example09186a0080ba1d07.shtml](http://www.cisco.com/en/US/tech/tk872/technologies_configuration_example09186a0080ba1d07.shtml)

The purpose of this document is to provide an understanding of IPv6 Link-local address in a network. A link-local address is an IPv6 unicast address that can be automatically configured on any interface using the link-local prefix FE80::/10 (1111 1110 10) and the interface identifier in the modified EUI-64 format. Link-local addresses are not necessarily bound to the MAC address (configured in a EUI-64 format). Link-local addresses can also be manually configured in the FE80::/10

format using the ipv6 address link-local command.

#### QUESTION 188

Refer to the graphic and routing table for router R1. Based on the output of the R1# show ip route command and the information presented in the graphic, which of the following is a potential routing problem?



Gateways of last resort is 0.0.0.0 to network 0.0.0.0

- 200.1.1.0/24 is variably subnetted, 5 subnets, 3 masks
  - C 200.1.1.192/26 is directly connected, Loopback0
  - C 200.1.1.128/30 is directly connected, Serial0
  - D 200.1.1.64/26 [90/2195456] via 200.1.1.130, 00:02:15, Serial0
  - D 200.1.1.0/24 is a summary, 00:00:41, Null0
  - C 200.1.1.0/26 is directly connected, Ethernet0
  - 200.1.2.0/30 is subnetted, 1 subnets
  - C 200.1.2.4 is directly connected, Serial1
  - S\* 0.0.0.0/0 is directly connected, Serial1
- R1#

- A. the use of summarization for discontinuous networks
- B. the use of CIDR with a routing protocol that does not support it
- C. the use of VLSM with a routing protocol that does not support it
- D. the use of the no auto-summary command with a protocol that does not support summarization
- E. the use of the ip route 0.0.0.0 0.0.0.0 command with a routing protocol that does not support it

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 189

What are three characteristics of the OSPF routing protocol? (Choose three.)

- A. It converges quickly.
- B. OSPF is a classful routing protocol.
- C. It uses cost to determine the best route.
- D. It uses the DUAL algorithm to determine the best route.
- E. OSPF routers send the complete routing table to all directly attached routers.
- F. OSPF routers discover neighbors before exchanging routing information.



**Correct Answer:** ACF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 190

An administrator is troubleshooting a problem between routers that are using different versions of RIP. Which two commands would provide information about which version of RIP was being sent and received on an interface? (Choose two.)

- A. show ip protocols
- B. show ip route rip
- C. show interfaces

- D. debug rip routing
- E. debug ip rip

**Correct Answer:** AE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 191

Refer to the exhibit. You are connected to the router as user Mike.

Which command allows you to see output from the OSPF debug command?

**Router#show users**

Line	User	Host(s)	Idle	Location
*322 vty 0	Mike	idle	00:00:00	laptop

Interface	User	Mode	Idle	Peer Address
-----------	------	------	------	--------------

**Router#debug ip ospf events**

**OSPF events debugging is on**

**Router#**

- A. terminal monitor
- B. show debugging
- C. show sessions
- D. show ip ospf interface

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 192

Refer to the exhibit. Host A has tested connectivity to a remote network. What is the default gateway for host A?

```
PC>tracert 10.16.176.23
```

Tracing route to 10.16.176.23 over a maximum of 30 hops:

1	31 ms	31 ms	32 ms	172.16.182.1
2	62 ms	62 ms	62 ms	192.168.1.6
3	93 ms	93 ms	34 ms	192.168.1.10
4	125 ms	110 ms	125 ms	10.16.176.23

Trace complete

- A. 10.16.176.1
- B. 192.168.1.6
- C. 192.168.1.1
- D. 172.16.182.1

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**



### QUESTION 193

Refer to the exhibit. What is the result of setting the no login command?

```
Router#config1
Router(config)#line vty 0 4
Router(config-line)#passwordc1sc0
Router(config-line)#no login
```

- A. Both SSH and Telnet access is denied.
- B. Both SSH and Telnet access requires a password.
- C. Both SSH and Telnet access requires a new password at first login.
- D. There is a virtually limitless supply of IP addresses.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 194**

What does the "Inside Global" address represent in the configuration of NAT?

- A. the summarized address for all of the internal subnetted addresses
- B. the MAC address of the router used by inside hosts to connect to the Internet
- C. a globally unique, private IP address assigned to a host on the inside network
- D. a registered address that represents an inside host to an outside network

**Correct Answer:** D

**Section:** (none)

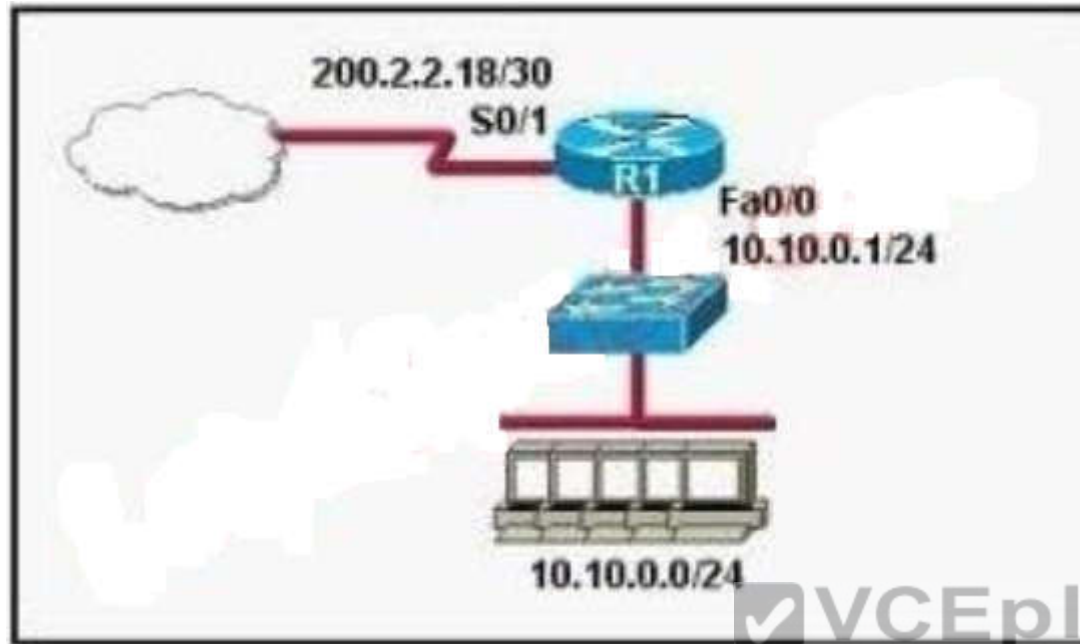
**Explanation**

**Explanation/Reference:**



**QUESTION 195**

Refer to the graphic. A company wants to use NAT in the network shown. Which commands will apply the NAT configuration to the proper interfaces? (Choose two.)



- A. R1(config)# interface serial0/1  
R1(config-if)# ip nat inside
- B. R1(config)# interface serial0/1  
R1(config-if)# ip nat outside
- C. R1(config)# interface fastethernet0/0  
R1(config-if)# ip nat inside
- D. R1(config)# interface fastethernet0/0  
R1(config-if)# ip nat outside
- E. R1(config)# interface serial0/1  
R1(config-if)# ip nat outside source pool 200.2.2.18255.255.255.252
- F. R1(config)# interface fastethernet0/0  
R1(config-if)# ip nat inside source 10.10.0.0 255.255.255.0



**Correct Answer:** BC

**Section:** (none)

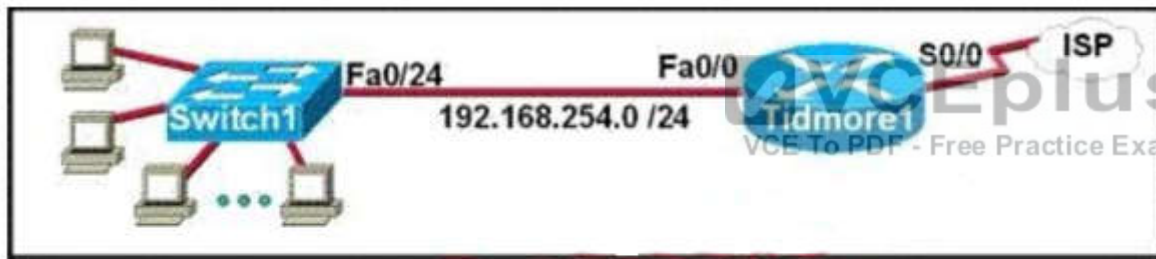
**Explanation**

**Explanation/Reference:**

**QUESTION 196**

Refer to the exhibit. A network technician enters the following lines into the router.

```
Tidmore1(config)# interface FastEthernet 0/0  
Tidmore1(config-if)# no ip access-group 106 in  
Tidmore1(config-if)# interface Serial 0/0  
Tidmore1(config-if)# ip access-group 106 out
```



```
access-list 106 permit ip host 192.168.254.7 any  
access-list 106 deny icmp 192.168.254.0 0.0.0.255 any echo  
access-list 106 permit ip any any  
interface Fa0/0  
    ip access-group 106 in
```

What is the effect of this configuration?

- A. The change has no effect on the packets being filtered.
- B. All traffic from the 192.168.254.0 LAN to the Internet is permitted.
- C. Web pages from the Internet cannot be accessed by hosts in the 192.168.254.0 LAN.
- D. No hosts in the 192.168.254.0 LAN except 192.168.254.7 can telnet to hosts on the Internet.

**Correct Answer:** A

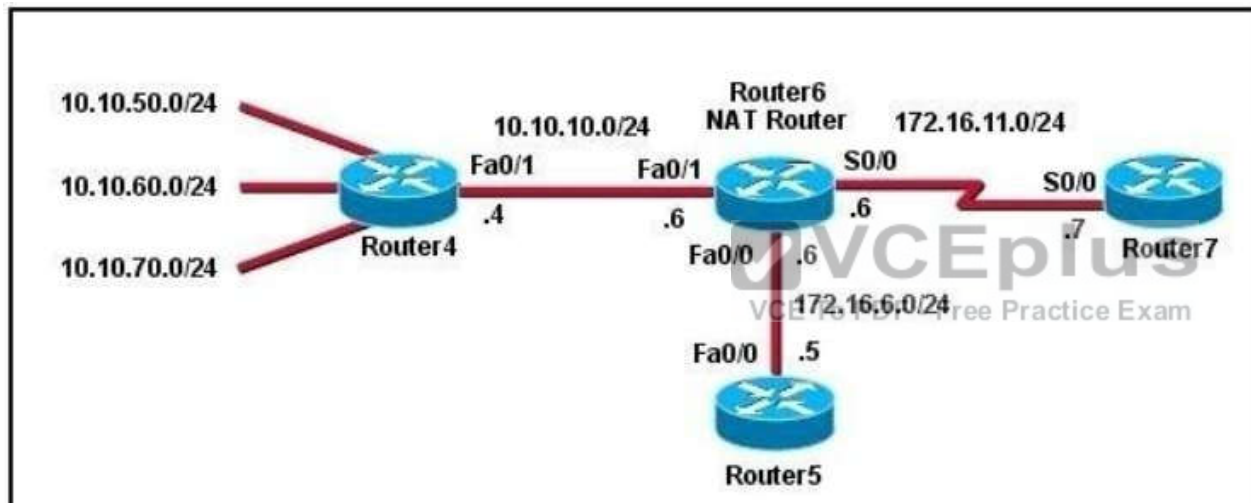
**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 197**

Refer to the exhibit. Router4 can ping Router5 (172.16.6.5), but not Router7 (172.16.11.7). There are no routing protocols running in any of the routers, and Router4 has Router6 as its default gateway. What can be done to address this problem?



Router-6# show running-configuration

<output omitted>

interface FastEthernet0/0

ip address 172.16.6.6 255.255.255.0

ip nat outside

interface FastEthernet0/1

ip address 10.10.10.6 255.255.255.0

ip nat inside

interface Serial0/0

ip address 172.16.11.6 255.255.255.0

ip nat outside

!

ip nat pool test 172.16.11.70 172.16.11.71 prefix-length 24

ip nat inside source static 10.10.10.4 172.16.6.14

ip nat inside source pool test

router-7# show ip route

<output omitted>

Gateway of last resort is not set

172.16.0.0/24 is subnetted, 4 subnets

C 172.16.11.0 is directly connected, Serial0/0



- A. Convert to static NAT.
- B. Convert to dynamic NAT.
- C. Add a static route in Router7 back to Router4.
- D. Change the inside and outside NAT commands.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 198

A network engineer wants to allow a temporary entry for a remote user with a specific username and password so that the user can access the entire network over

the Internet. Which ACL can be used?

- A. standard
- B. extended
- C. dynamic
- D. reflexive

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 199

A network administrator has configured access list 173 to prevent Telnet and ICMP traffic from reaching a server with the address of 192.168.13.26. Which commands can the administrator issue to verify that the access list is working properly? (Choose three.)

- A. Router# ping 192.168.13.26
- B. Router# debug access-list 173
- C. Router# show open ports 192.168.13.26
- D. Router# show access-lists
- E. Router# show ip interface



**Correct Answer:** ADE

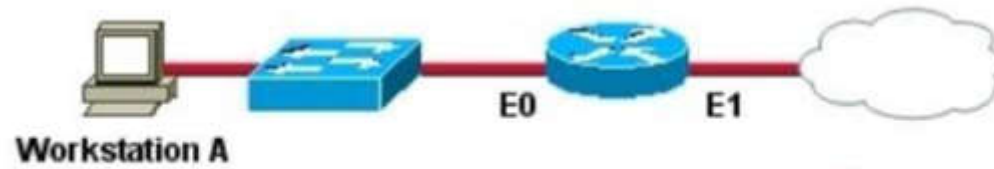
**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 200

Refer to the exhibit. Given the partial configuration shown in the exhibit, why do internal workstations on the 192.168.1.0 network fail to access the Internet?



```
interface Ethernet0
  ip address 192.168.1.1 255.255.255.0
!
interface Ethernet1
  ip address 10.0.1.1 255.255.255.252
!
ip nat inside source list 101 interface Ethernet1 overload
!
access-list 101 permit ip 192.168.1.0 0.0.0.255 any
```

- A. A NAT pool has not been defined.
- B. The wrong interface is overloaded.
- C. NAT has not been applied to the inside and outside interfaces.
- D. The access list has not been applied to the proper interface to allow traffic out of the internal network.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 201

Refer to the exhibit. Which route will be found in the routing table of the Main router?

```
Main#debug ip rip
RIP protocol debugging is on
Main#
*Mar 1 17:43:00.567: RIP: received v1 update from 192.168.255.21 on
Serial0/0
*Mar 1 17:43:00.571:    192.168.2.0 in 2 hops
*Mar 1 17:43:00.571:    192.168.255.16 in 1 hops
*Mar 1 17:43:41.419: RIP: received v1 update from 192.168.255.26 on
Serial0/1
*Mar 1 17:43:41.423:    192.168.2.0 in 1 hops
*Mar 1 17:43:41.427:    192.168.255.16 in 1 hops
*Mar 1 17:43:55.099: RIP: sending v1 update to 255.255.255.255 via
Serial0/0 (192.168.255.22)
*Mar 1 17:43:55.103: RIP: build update entries
*Mar 1 17:43:55.103: network 192.168.2.0 metric 2
*Mar 1 17:43:55.107: subnet 192.168.255.24 metric 1
*Mar 1 17:43:55.111: RIP: sending v1 update to 255.255.255.255 via
Serial0/1 (192.168.255.25)
*Mar 1 17:43:55.115: RIP: build update entries
*Mar 1 17:43:55.119: subnet 192.168.255.20 metric 1
```

- A. C 192.168.2.0 is directly connected, Serial0/1
- B. R 192.168.2.0/24 [120/1] via 192.168.255.26, 00:00:24, Serial0/0
- C. R 192.168.255.16 [120/1] via 192.168.255.26, 00:00:24, Serial0/1
- D. R 192.168.255.16 [120/2] via 192.168.255.21, 00:00:22, Serial0/0

**Correct Answer:** C

**Section:** (none)

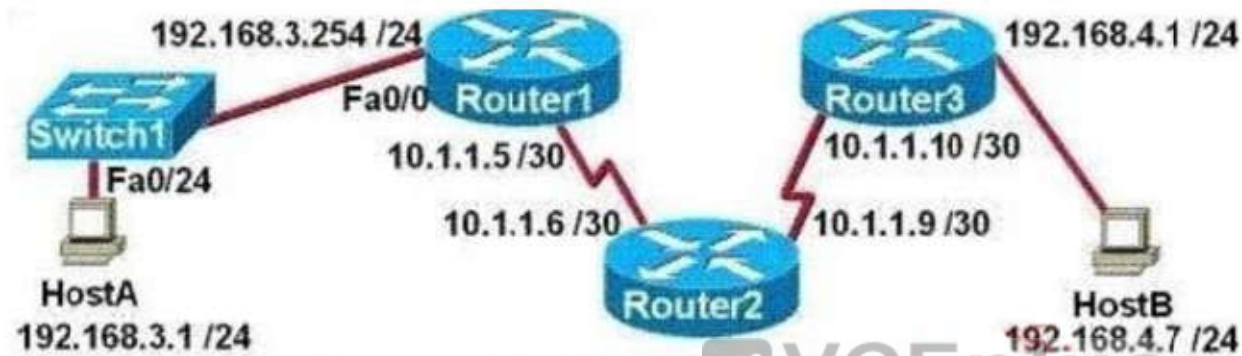
**Explanation**



Explanation/Reference:

### QUESTION 202

Refer to the exhibit. A technician is testing connection problems in the internetwork. What is the problem indicated by the output from HostA?



C:\>ping 192.168.3.254

Pinging 192.168.3.254 with 32 bytes of data:

Reply from 192.168.3.254: bytes=32 time=3ms TTL=255  
 Reply from 192.168.3.254: bytes=32 time=4ms TTL=255  
 Reply from 192.168.3.254: bytes=32 time=3ms TTL=255  
 Reply from 192.168.3.254: bytes=32 time=3ms TTL=255

C:\>tracert 192.168.4.7

Tracing route to 192.168.4.7 over a maximum of 30 hops

1 Destination host unreachable.

Trace complete.

- A. The routing on Router2 is not functioning properly.
- B. An access list is applied to an interface of Router3.
- C. The Fa0/24 interface of Switch1 is down.

D. The gateway address of HostA is incorrect or not configured.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 203

An organization is concerned that too many employees are wasting company time accessing the Internet. Which access list statement would stop World Wide Web access for employees on the range of subnets from 172.16.8.0/24 to 172.16.11.0/24?

- A. access-list 103 deny tcp 172.16.8.0 0.0.0.3 any eq 80
- B. access-list 103 deny tcp 172.16.8.0 0.0.3.255 any eq 80
- C. access-list 103 deny http 172.16.8.0 0.0.7.255 any
- D. access-list 103 deny tcp any 172.16.8.0 0.0.3.255 eq 80
- E. access-list 103 deny tcp 172.16.8.0 0.0.11.255 any eq 80

**Correct Answer:** B

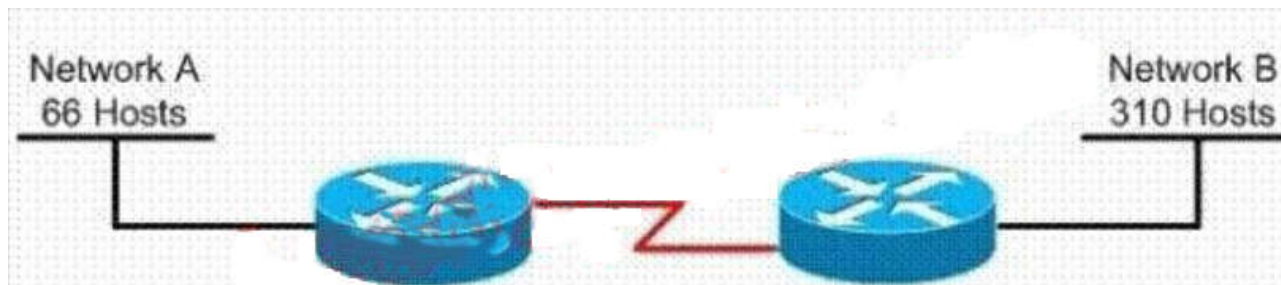
**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 204

Refer to the exhibit. Which subnet mask will place all hosts on Network B in the same subnet with the least amount of wasted addresses?





- A. 255.255.255.0
- B. 255.255.254.0
- C. 255.255.252.0
- D. 255.255.248.0

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 205**

A switch is configured with all ports assigned to vlan 2 with full duplex FastEthernet to segment existing departmental traffic. What is the effect of adding switch ports to a new VLAN on the switch?

- A. More collision domains will be created.
- B. IP address utilization will be more efficient.
- C. More bandwidth will be required than was needed previously.
- D. An additional broadcast domain will be created.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 206**

Workstation A has been assigned an IP address of 192.0.2.24/28. Workstation B has been assigned an IP address of 192.0.2.100/28. The two workstations are connected with a straight-through cable. Attempts to ping between the hosts are unsuccessful. What are two things that could be attempted that would allow communications between the hosts? (Choose two.)

- A. Replace the straight-through cable with a crossover cable.
- B. Change the subnet mask of the hosts to /25.
- C. Change the subnet mask of the hosts to /26.
- D. Change the address of Workstation A to 192.0.2.15.
- E. Change the address of Workstation B to 192.0.2.111.

**Correct Answer:** AB

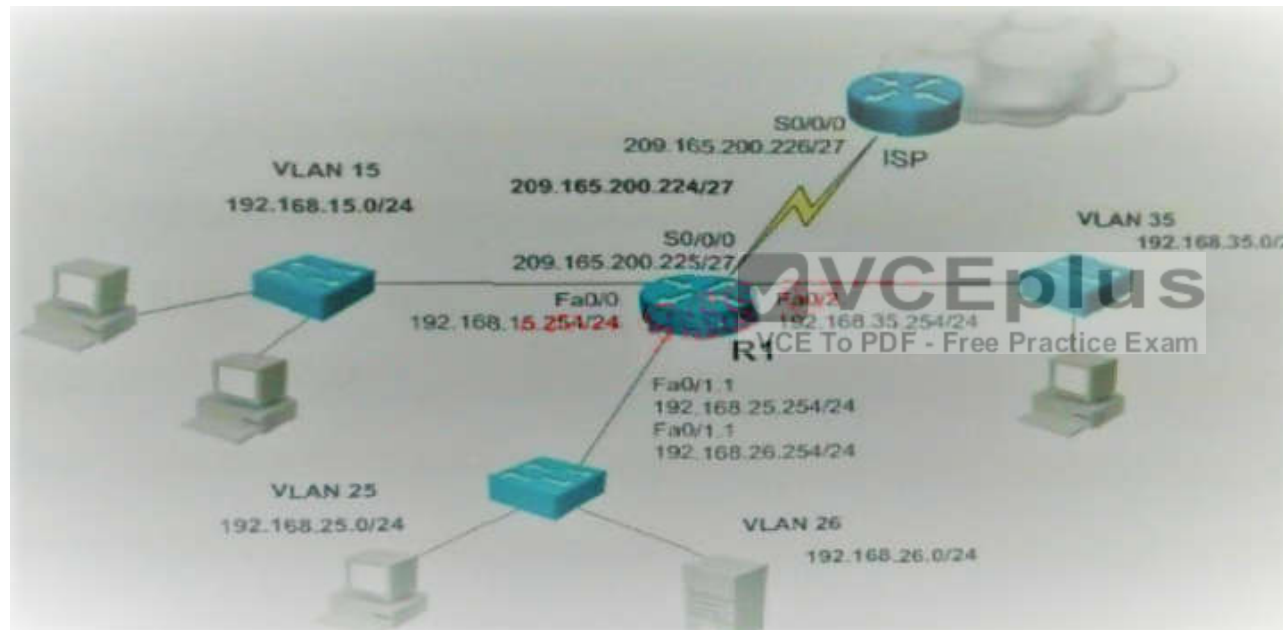
**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 207**

Refer to the exhibit. How many interfaces on R1 should be configured as ip nat inside to grant external access to the entire network?



- A. 1
- B. 3
- C. 4
- D. 5

**Correct Answer:** C

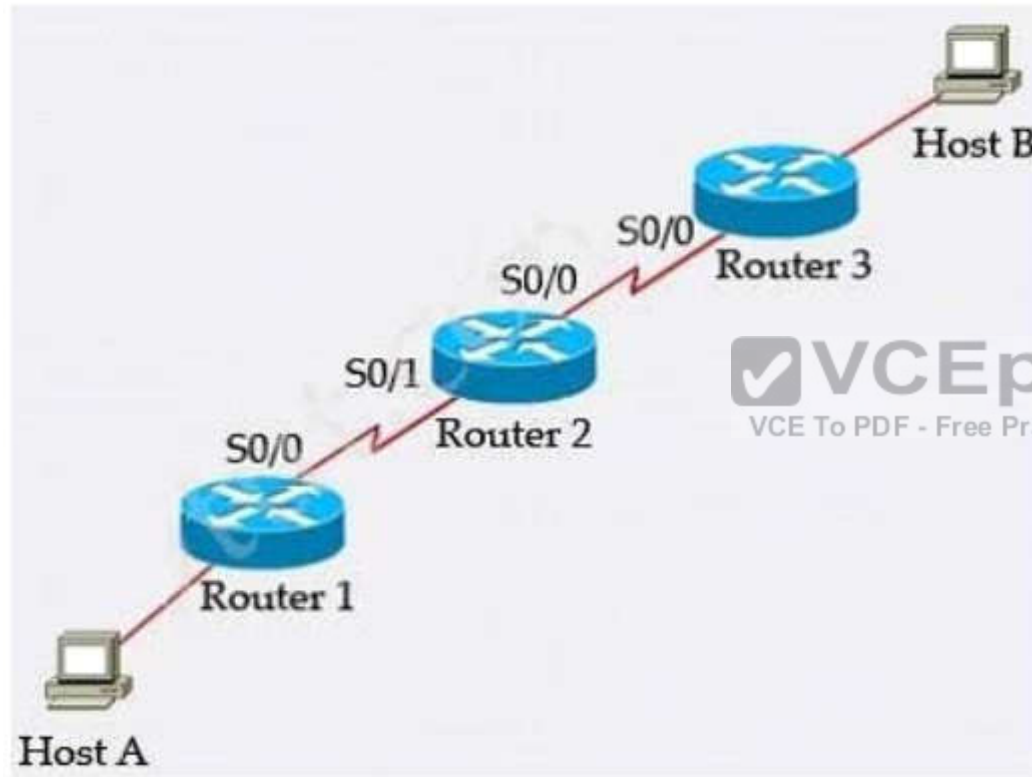
**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 208**

Refer to the exhibit. Host A pings interface S0/0 on router 3. What is the TTL value for that ping?



- A. 252
- B. 253
- C. 254
- D. 255

**Correct Answer:** B

**Section:** (none)

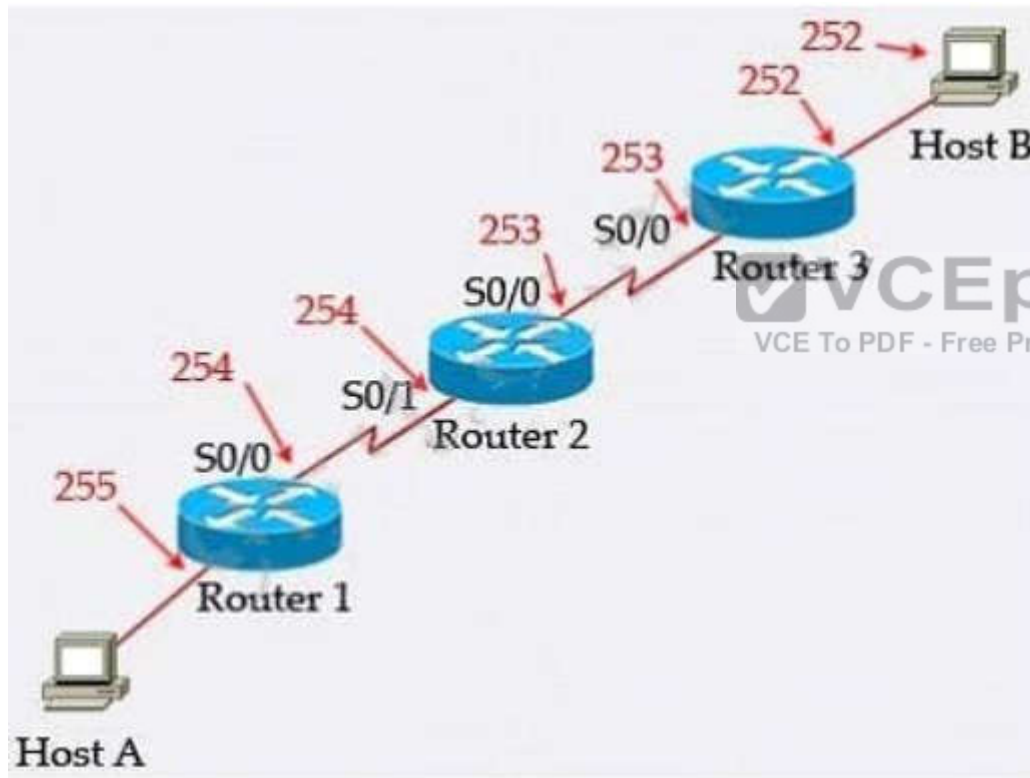
**Explanation**

**Explanation/Reference:**

Explanation:

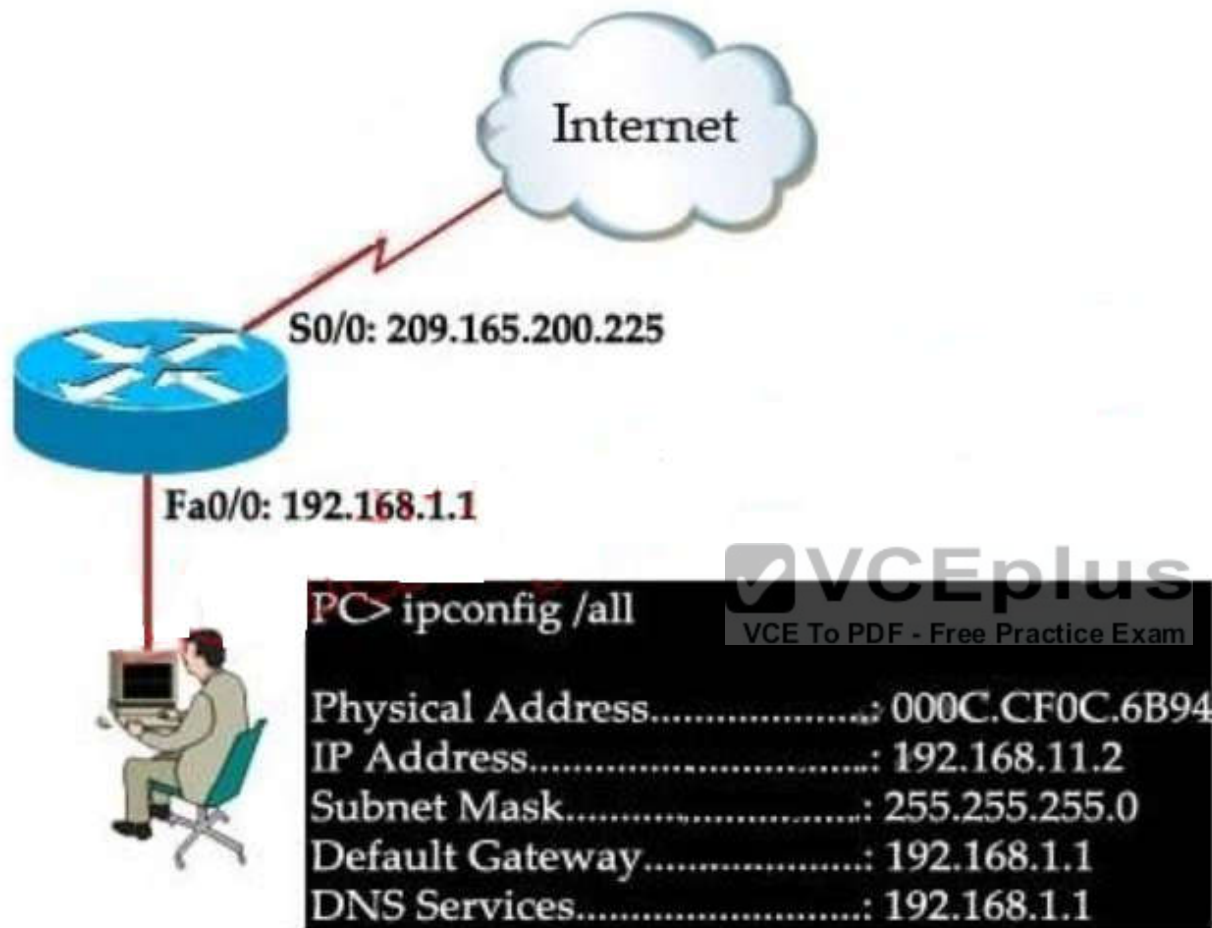
From the CCNA ICND2 Exam book: "Routers decrement the TTL by 1 every time they forward a packet; if a router decrements the TTL to 0, it throws away the packet. This prevents packets from rotating forever." I want to make it clear that before the router forwards a packet, the TTL is still remain the same. For example, in the topology above, pings to S0/1 and S0/0 of Router 2 have the same TTL.

The picture below shows TTL values for each interface of each router and for HostB. Notice that Host A initializes ICMP packet with a TTL of 255:



**QUESTION 209**

Refer to the exhibit. A network engineer is troubleshooting an Internet connectivity problem on the computer. What is causing the problem?



- A. incorrect subnet mask
- B. incorrect IP address
- C. wrong default gateway
- D. wrong DNS server

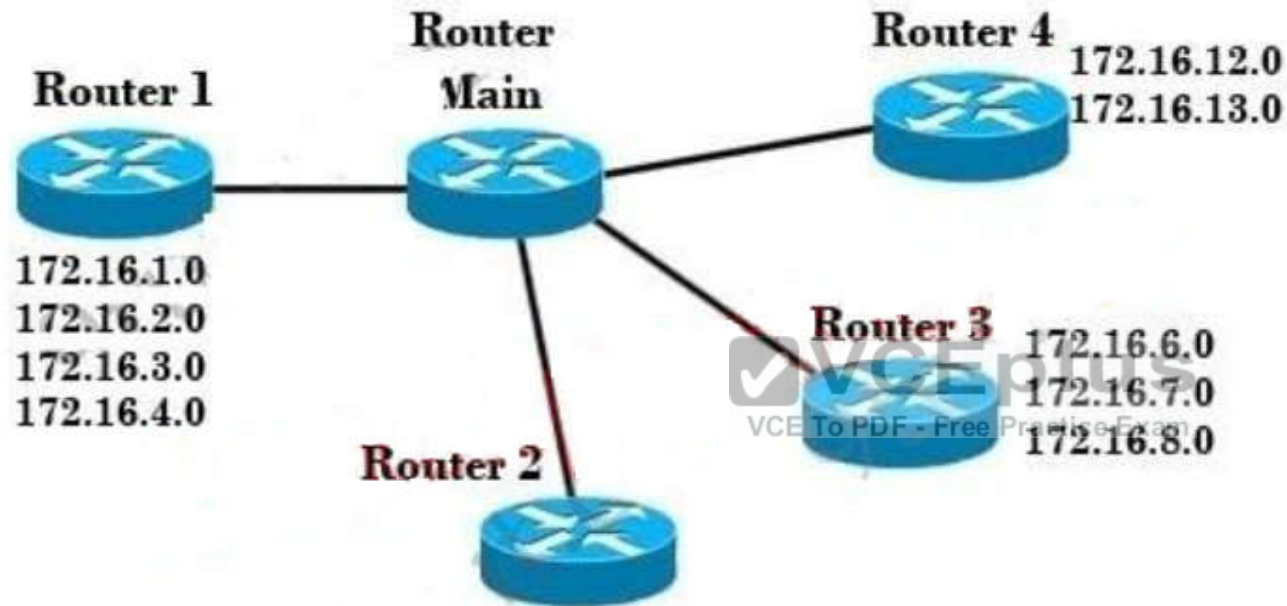
**Correct Answer:** B  
**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 210**

Refer to the exhibit. Which address range efficiently summarizes the routing table of the addresses for router Main?



- A. 172.16.0.0/21
- B. 172.16.0.0/20
- C. 172.16.0.0/16
- D. 172.16.0.0/18

**Correct Answer:** B

**Section:** (none)

**Explanation**

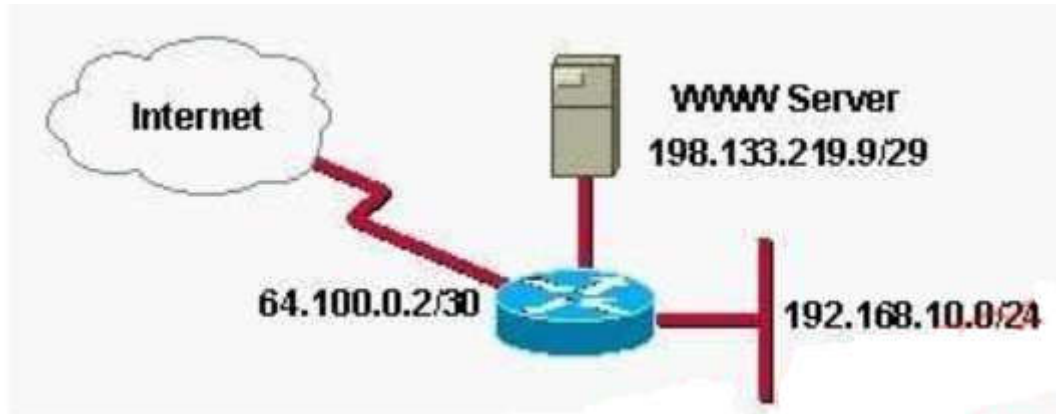
**Explanation/Reference:**

**QUESTION 211**

Refer to the exhibit. The router has been configured with these commands:

```
hostname Gateway
interface FastEthernet 0/0
ip address 198.133.219.14 255.255.255.248
no shutdown
interface FastEthernet 0/1
ip address 192.168.10.254 255.255.255.0
no shutdown
interface Serial 0/0
ip address 64.100.0.2 255.255.255.252
no
shutdown
ip route 0.0.0.0 0.0.0.0 64.100.0.1
```

What are the two results of this configuration? (Choose two.)



<output omitted>

Gateway of last resort is 64.100.0.1 to network 0.0.0.0

64.0.0.0/30 is subnetted, 1 subnets

C 64.100.0.0 is directly connected, Serial0/0

C 192.168.10.0/24 is directly connected, FastEthernet0/1

198.133.219.0/29 is subnetted, 1 subnets

C 198.133.219.8 is directly connected, FastEthernet 0/0

S\* 0.0.0.0/0[1/0] via 64.100.0.1

Gateway#

- A. The default route should have a next hop address of 64.100.0.3.
- B. Hosts on the LAN that is connected to FastEthernet 0/1 are using public IP addressing.
- C. The address of the subnet segment with the WWW server will support seven more servers.
- D. The addressing scheme allows users on the Internet to access the WWW server.
- E. Hosts on the LAN that is connected to FastEthernet 0/1 will not be able to access the Internet without address translation.

**Correct Answer:** DE

**Section:** (none)

**Explanation**

**Explanation/Reference:**



**QUESTION 212**

Refer to the exhibit. What can be concluded from the output of the debug command?

**Border# debug ip ospf events**

**OSPF events debugging is on**

**Border#**

**\*Nov 4 03:49:37.477: OSPF: Rcv hello from 10.10.3.3 area 0 from Serial0/3**

**192.168.255.18**

**\*Nov 4 03:49:37.481: OSPF: End of hello processing**

**\*Nov 4 03:49:37.641: OSPF: Rcv hello from 10.10.1.1 area 0 from Serial0/1**

**192.168.255.22**

**\*Nov 4 03:49:37.645: OSPF: Mismatched hello parameters from**

**192.168.255.22**

**\*Nov 4 03:49:37.645: OSPF: Dead R 40 C 56, Hello R 10 C 14**

- A. The output represents normal OSPF operation.
- B. The interfaces of two OSPF routers connected to the Border router are in the same subnet.
- C. The OSPF router connected to interface Serial0/1 has NOT formed a neighbor relationship with the Border router.
- D. A router is connected to interface Serial0/3 of the Border router. The OSPF router ID of the connected router is the IP address of the connected interface.

**Correct Answer: C**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

**QUESTION 213**

Refer to the output from the show running-config command in the exhibit. What should the administrator do to allow the workstations connected to the FastEthernet 0/0 interface to obtain an IP address?

R1-ABC# **show running-config**

Current configuration:

```
!  
version 12.1  
hostname ABC  
!  
ip subnet-zero  
ip name-server 192.16.1.1  
ip dhcp excluded-address 10.90.201.1  
!  
ip dhcp pool ABC_DHCP  
    network 10.90.201.0 255.255.255.0  
    default-router 10.90.201.1  
    dns-server 192.31.7.152  
!  
interface FastEthernet0/0  
    no ip directed-broadcast  
    ip nat inside  
!  
interface Serial0/0  
    description to ISP circuit ID ALDS1-3456AX4743-00  
    ip address 192.31.7.38 255.255.255.252  
    ip nat outside  
!  
ip nat inside source list 14 interface serial 0/0 overload  
ip classless  
ip route 0.0.0.0 0.0.0.0 192.31.7.37  
!  
access-list 14 permit 10.90.201.0 0.0.0.255  
<output omitted>
```

- A. Apply access-group 14 to interface FastEthernet 0/0.
- B. Add access-list 14 permit any any to the access list configuration.
- C. Configure the IP address of the FastEtherent 0/0 interface to 10.90.201.1.
- D. Add an interface description to the FastEthernet 0/0 interface configuration.

**Correct Answer:** C

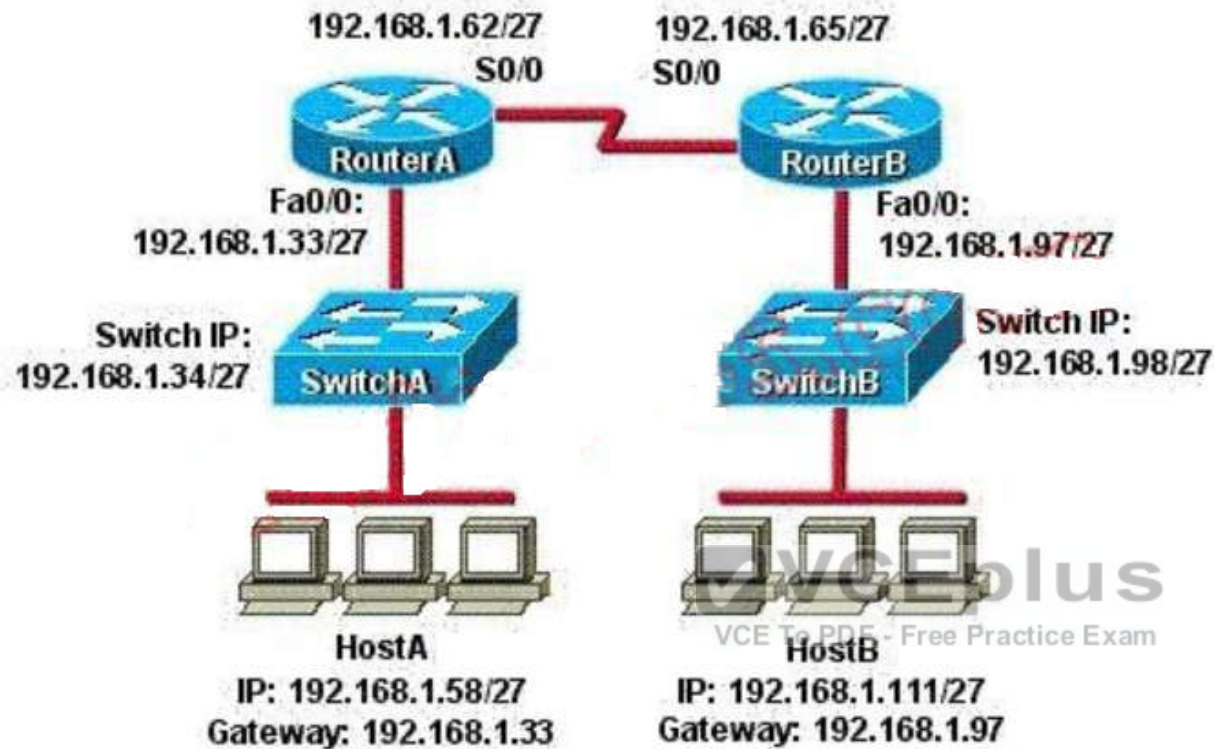
**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 214**

Refer to the exhibit. HostA cannot ping HostB. Assuming routing is properly configured, what could be the cause of this problem?



- A. HostA is not on the same subnet as its default gateway.
- B. The address of SwitchA is a subnet address.
- C. The Fa0/0 interface on RouterA is on a subnet that can't be used.
- D. The serial interfaces of the routers are not on the same subnet.
- E. The Fa0/0 interface on RouterB is using a broadcast address.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 215**

Which two data integrity algorithms are commonly used in VPN solutions? (Choose two.)

- A. DH1
- B. DH2
- C. HMAC-MD5
- D. HMAC-SHA-1
- E. RSA

**Correct Answer:** CD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 216**

What are three benefits of implementing VLANs? (Choose three.)

- A. A higher level of network security can be reached by separating sensitive data traffic from other network traffic.
- B. A more efficient use of bandwidth can be achieved allowing many physical groups to use the same network infrastructure.
- C. A more efficient use of bandwidth can be achieved allowing many logical networks to use the same network infrastructure.
- D. Broadcast storms can be mitigated by increasing the number of broadcast domains, thus reducing their size
- E. Broadcast storms can be mitigated by decreasing the number of broadcast domains, thus increasing their size.
- F. VLANs make it easier for IT staff to configure new logical groups, because the VLANs all belong to the same broadcast domain.
- G. Port-based VLANs increase switch-port use efficiency, thanks to 802.1Q trunks.

**Correct Answer:** ACD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 217**

Which three approaches can be used while migrating from an IPv4 addressing scheme to an IPv6 scheme. (Choose three.)

- A. enable dual-stack routing
- B. configure IPv6 directly
- C. configure IPv4 tunnels between IPv6 islands
- D. use proxying and translation to translate IPv6 packets into IPv4 packets
- E. statically map IPv4 addresses to IPv6 addresses
- F. use DHCPv6 to map IPv4 addresses to IPv6 addresses

**Correct Answer:** ACD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 218

What are two benefits of using NAT? (Choose two.)

- A. NAT facilitates end-to-end communication when IPsec is enabled.
- B. NAT eliminates the need to re-address all hosts that require external access.
- C. NAT conserves addresses through host MAC-level multiplexing.
- D. Dynamic NAT facilitates connections from the outside of the network.
- E. NAT accelerates the routing process because no modifications are made on the packets.
- F. NAT protects network security because private networks are not advertised.

**Correct Answer:** BF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 219

Which IEEE standard protocol is initiated as a result of successful DTP completion in a switch over Fast Ethernet?

- A. 802.3ad
- B. 802.1w
- C. 802.1D
- D. 802.1Q

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 220**

VLAN 3 is not yet configured on your switch. What happens if you set the switchport access vlan 3 command in interface configuration mode?

- A. The command is rejected.
- B. The port turns amber.
- C. The command is accepted and the respective VLAN is added to vlan.dat.
- D. The command is accepted and you must configure the VLAN manually.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**



**QUESTION 221**

When you are troubleshooting an ACL issue on a router, which command can help you to verify which interfaces are affected by the ACL?

- A. show ip access-lists
- B. show access-lists
- C. show interface
- D. show ip interface
- E. list ip interface

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 222**

Which name describes an IPv6 host-enabled tunneling technique that uses IPv4 UDP, does not require dedicated gateway tunnels, and can pass through existing IPv4 NAT gateways?

- A. manual 6to4
- B. dual stack
- C. dynamic
- D. Teredo

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 223**

Which IPv6 routing protocol uses multicast group FF02::9 to send updates?

- A. static
- B. RIPng
- C. OSPFv3
- D. IS-IS for IPv6

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 224**

On which options are standard access lists based?

- A. destination address and wildcard mask
- B. destination address and subnet mask
- C. source address and subnet mask
- D. source address and wildcard mask



**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 225**

Which device might be installed at a branch office to enable and manage an IPsec site-to-site VPN?

- A. Cisco IOS IPsec/SSL VPN Client
- B. Cisco Adaptive Security Appliance
- C. Cisco VPN Client
- D. ISDN terminal adapter

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**



**QUESTION 226**

Which command can be used from a PC to verify the connectivity between hosts that connect through a switch in the same LAN?

- A. ping address
- B. tracert address
- C. traceroute address
- D. arp address

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 227**

When using the CLI, which banner displays a message upon every connection that is made into the router?

- A. exec
- B. login
- C. motd
- D. slip-ppp

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 228**

Which IPv6 address is the all-router multicast group?

- A. FF02::1
- B. FF02::2
- C. FF02::3
- D. FF02::4



**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 229**

Refer to the exhibit. What does STATUS=ACTIVE refer to in the output of the show frame-relay pvc command?

R1# **show frame-relay pvc 202**

PVC Statistics for interface Serial1 (Frame Relay DTE)

DLCI = 202, DLCI USAGE = LOCAL, PVC STATUS = ACTIVE, INTERFACE = SERIAL0/0

input pkts 2878	output pkts 2879	in bytes 964143
out bytes 964641	dropped pkts 0	in pkts dropped 0
out pkts dropped 0	out bytes dropped 0	
in FECN pkts 0	in BECN pkts 0	out FECN pkts 0
out BECN pkts 0	in DE pkts 0	out DE pkts 0
out bcast pkts 2699	out bcast bytes 753021	

pvc create time 1d20h, last time pvc status changed 1d20h  
<output omitted>

- A. The PVC is experiencing congestion.
- B. The Frame Relay switch is correctly programmed with the DLCI and is operational.
- C. The router is actively broadcasting to establish a link to the Frame Relay switch.
- D. The router is connected to the local Frame Relay switch, but not to the far end device.

**Correct Answer:** B

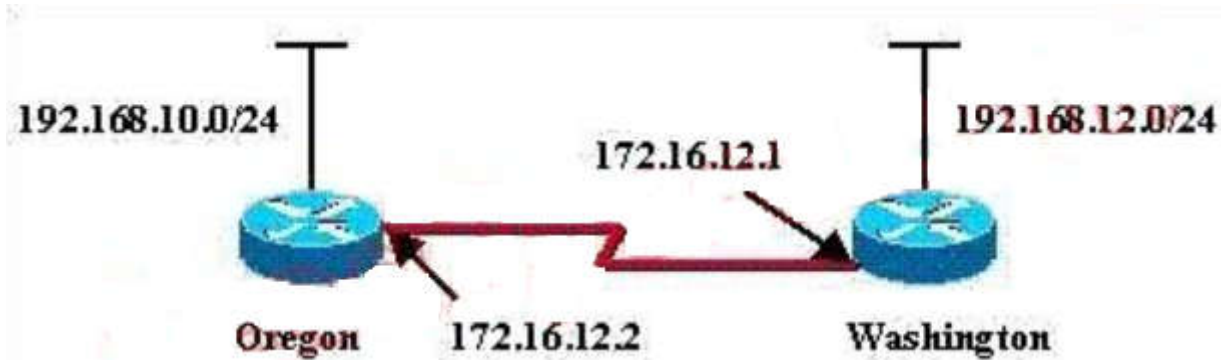
**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 230

The network administrator of the Oregon router adds the following command to the router configuration: ip route 192.168.12.0 255.255.255.0 172.16.12.1. What are the results of adding this command? (Choose two.)



- A. The command establishes a static route.
- B. The command invokes a dynamic routing protocol for 192.168.12.0.
- C. Traffic for network 192.168.12.0 is forwarded to 172.16.12.1.
- D. Traffic for all networks is forwarded to 172.16.12.1.
- E. This route is automatically propagated throughout the entire network.
- F. Traffic for network 172.16.12.0 is forwarded to the 192.168.12.0 network.

**Correct Answer:** AC

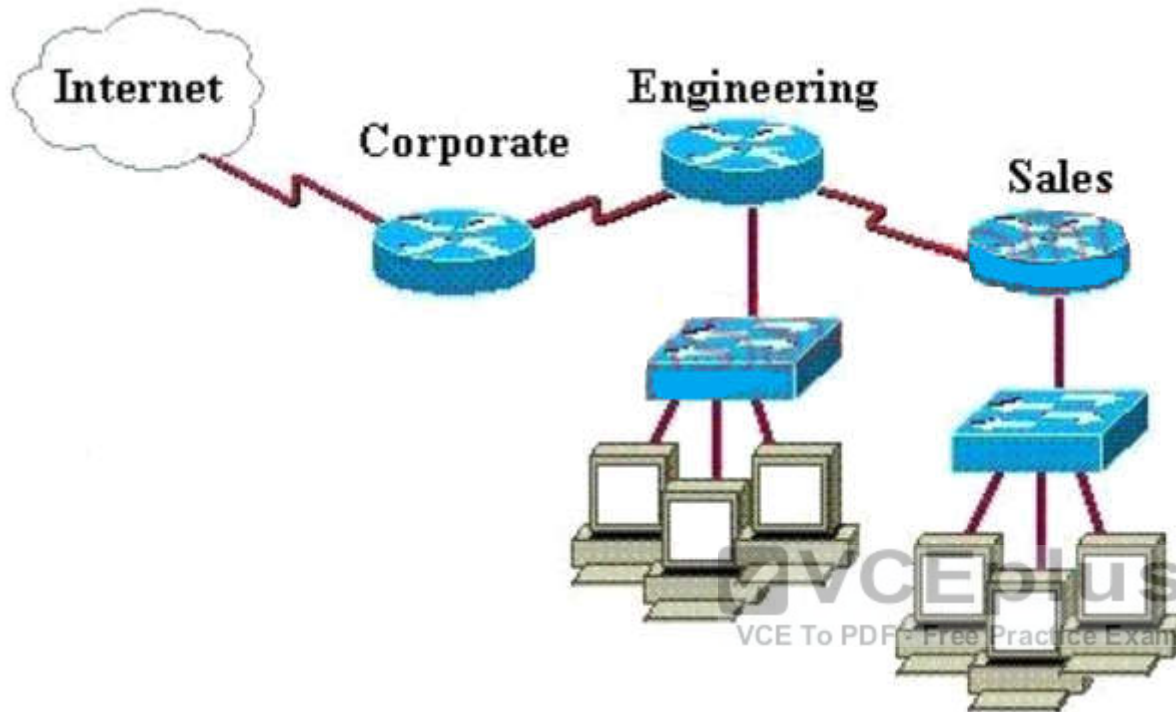
**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 231

A network administrator would like to implement NAT in the network shown in the graphic to allow inside hosts to use a private addressing scheme. Where should NAT be configured?



- A. Corporate router
- B. Engineering router
- C. Sales router
- D. all routers
- E. all routers and switches

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 232**

A network administrator must configure 200 switch ports to accept traffic from only the currently attached host devices. What would be the most efficient way to configure MAC-level security on all these ports?

- A. Visually verify the MAC addresses and then telnet to the switches to enter the switchport-port security mac-address command.
- B. Have end users e-mail their MAC addresses. Telnet to the switch to enter the switchport-port security mac-address command.
- C. Use the switchport port-security MAC address sticky command on all the switch ports that have end devices connected to them.
- D. Use show mac-address-table to determine the addresses that are associated with each port and then enter the commands on each switch for MAC address port-security.

**Correct Answer: C**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

#### **QUESTION 233**

Which IPv6 address is the equivalent of the IPv4 interface loopback address 127.0.0.1?

- A. ::1
- B. ::
- C. 2000::/3
- D. 0::/10

**Correct Answer: A**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

#### **QUESTION 234**

The network administrator is asked to configure 113 point-to-point links. Which IP addressing scheme best defines the address range and subnet mask that meet the requirement and waste the fewest subnet and host addresses?

- A. 10.10.0.0/16 subnetted with mask 255.255.255.252
- B. 10.10.0.0/18 subnetted with mask 255.255.255.252
- C. 10.10.1.0/24 subnetted with mask 255.255.255.252
- D. 10.10.0.0/23 subnetted with mask 255.255.255.252

E. 10.10.1.0/25 subnetted with mask 255.255.255.252

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 235**

Which address is the IPv6 all-RIP-routers multicast group address that is used by RIPng as the destination address for RIP updates?

- A. FF02::6
- B. FF02::9
- C. FF05::101
- D. FF02::A

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**



#### **QUESTION 236**

Which command shows your active Telnet connections?

- A. show cdp neighbors
- B. show session
- C. show users
- D. show vty logins

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 237**

Which component of VPN technology ensures that data is unaltered between the sender and recipient?

- A. encryption
- B. authentication
- C. key exchange
- D. data integrity

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 238**

What is the alternative notation for the IPv6 address B514:82C3:0000:0000:0029:EC7A:0000:EC72?

- A. B514 : 82C3 : 0029 : EC7A : EC72
- B. B514 : 82C3 :: 0029 : EC7A : EC72
- C. B514 : 82C3 : 0029 :: EC7A : 0000 : EC72
- D. B514 : 82C3 :: 0029 : EC7A : 0 : EC72



**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 239**

In which integration method is an IPv6 packet encapsulated within an IPv4 protocol?

- A. dual-stack
- B. proxy
- C. dot1q
- D. tunneling



**Correct Answer:** D

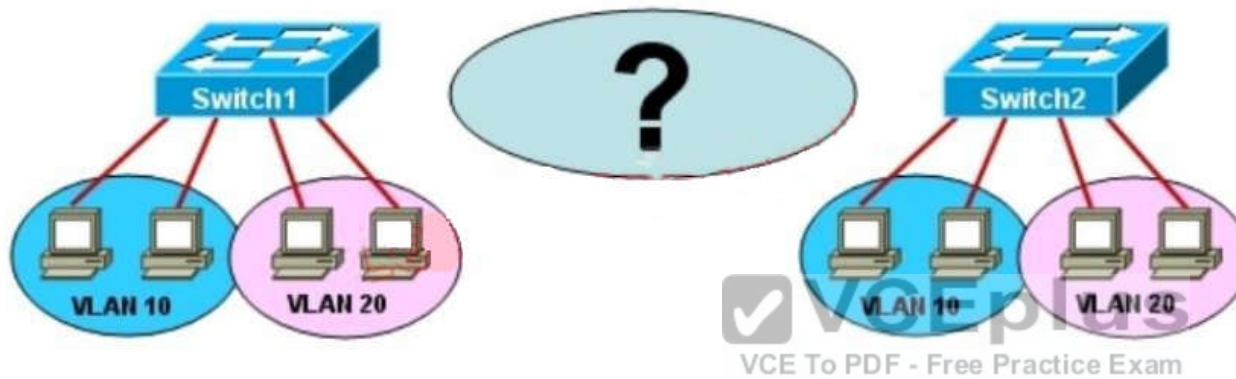
**Section:** (none)



**Explanation**

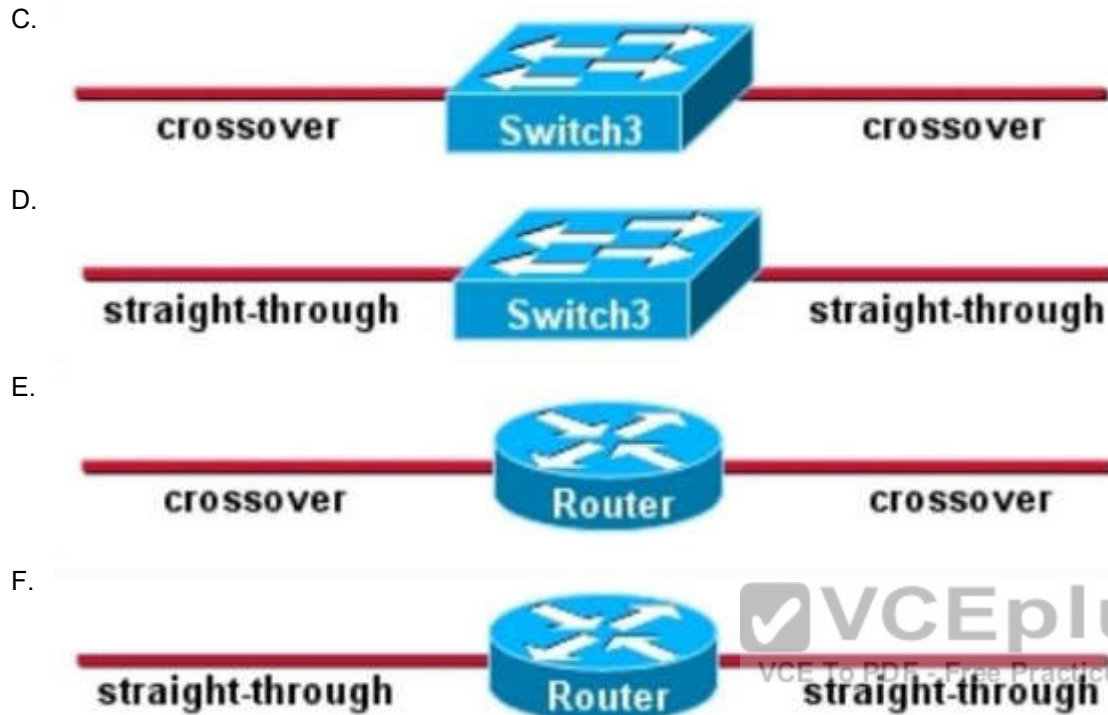
**Explanation/Reference:**

**QUESTION 240**

Refer to the exhibit. How should Switch1 and Switch2 be connected in order to allow full communication between all of the hosts?



- A.  crossover
- B.  crossover Bridge crossover



**Correct Answer:** F

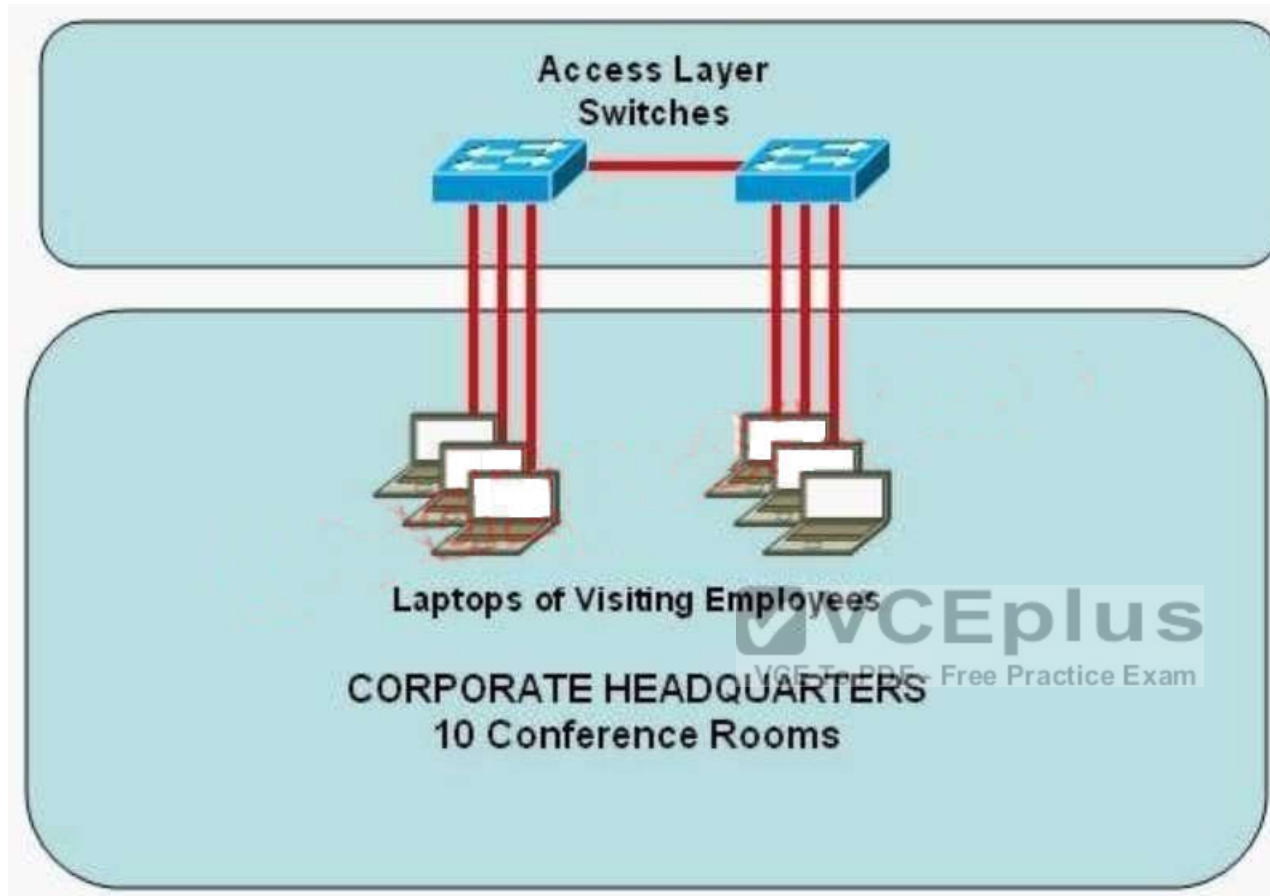
**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 241

Refer to the exhibit. Some 2950 series switches are connected to the conference area of the corporate headquarters network. The switches provide two to three jacks per conference room to host laptop connections for employees who visit the headquarters office. When large groups of employees come from other locations, the network administrator often finds that hubs have been connected to wall jacks in the conference area although the ports on the access layer switches were not intended to support multiple workstations.



What action could the network administrator take to prevent access by multiple laptops through a single switch port and still leave the switch functional for its intended use?

- A. Configure static entries in the switch MAC address table to include the range of addresses used by visiting employees.
- B. Configure an ACL to allow only a single MAC address to connect to the switch at one time.
- C. Use the `mac-address-table 1` global configuration command to limit each port to one source MAC address.
- D. Implement Port Security on all interfaces and use the `port-security maximum 1` command to limit port access to a single MAC address.
- E. Implement Port Security on all interfaces and use the `port-security mac-address sticky` command to limit access to a single MAC address.
- F. Implement Port Security at global configuration mode and use the `port-security maximum 1` command to allow each switch only one attached hub.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 242

Refer to the exhibit. Which two statements about the configuration of the switch interface are correct? (Choose two.)

```
SwitchA(config)# interface fa0/0
```

```
SwitchA(config-if)# switchport access vlan 2
```

- A. The switchport belongs only to VLAN 2.
- B. By default, all switch ports are members of VLAN 1005.
- C. Interface fa0/0 will be in both VLAN 1 (by default) and VLAN 2.
- D. The exhibit shows interface fa0/0 to be dynamically mapped to VLAN 2.
- E. A network host can be connected to this interface.

**Correct Answer:** AE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 243

Which three elements must be used when you configure a router interface for VLAN trunking? (Choose three.)

- A. one physical interface for each subinterface
- B. one IP network or subnet for each subinterface
- C. a management domain for each subinterface
- D. subinterface encapsulation identifiers that match VLAN tags
- E. one subinterface per VLAN
- F. subinterface numbering that matches VLAN tags

**Correct Answer:** BDE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 244

Which three statements about VTP features are true? (Choose three.)

- A. VTP works at Layer 3 of the OSI model and requires that a management VLAN IP address be configured.
- B. When properly configured, VTP minimizes VLAN misconfigurations and configuration inconsistencies.
- C. When properly configured, VTP maintains VLAN configuration consistency and accelerates trunk link negotiation.
- D. Each broadcast domain on a switch can have its own unique VTP domain.
- E. VTP pruning is used to increase available bandwidth in trunk links.
- F. To configure a switch to be part of two VTP domains, each domain must have its own passwords.
- G. Client, server, and transparent are valid VTP modes.

**Correct Answer:** BEG

**Section:** (none)

**Explanation**

**Explanation/Reference:**



#### QUESTION 245

Two switches are connected through a trunk link. Which two commands show that there is a native VLAN mismatch on that link? (Choose two.)

- A. show vlan brief
- B. show interface trunk
- C. show interface vlan
- D. show interface switchport
- E. show interface interface
- F. show switchport trunk

**Correct Answer:** BD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 246**

Which statement about IPv6 is true?

- A. Addresses are not hierarchical and are assigned at random.
- B. Only one IPv6 address can exist on a given interface.
- C. There are 2.7 billion addresses available.
- D. Broadcasts have been eliminated and replaced with multicasts.

**Correct Answer: D**

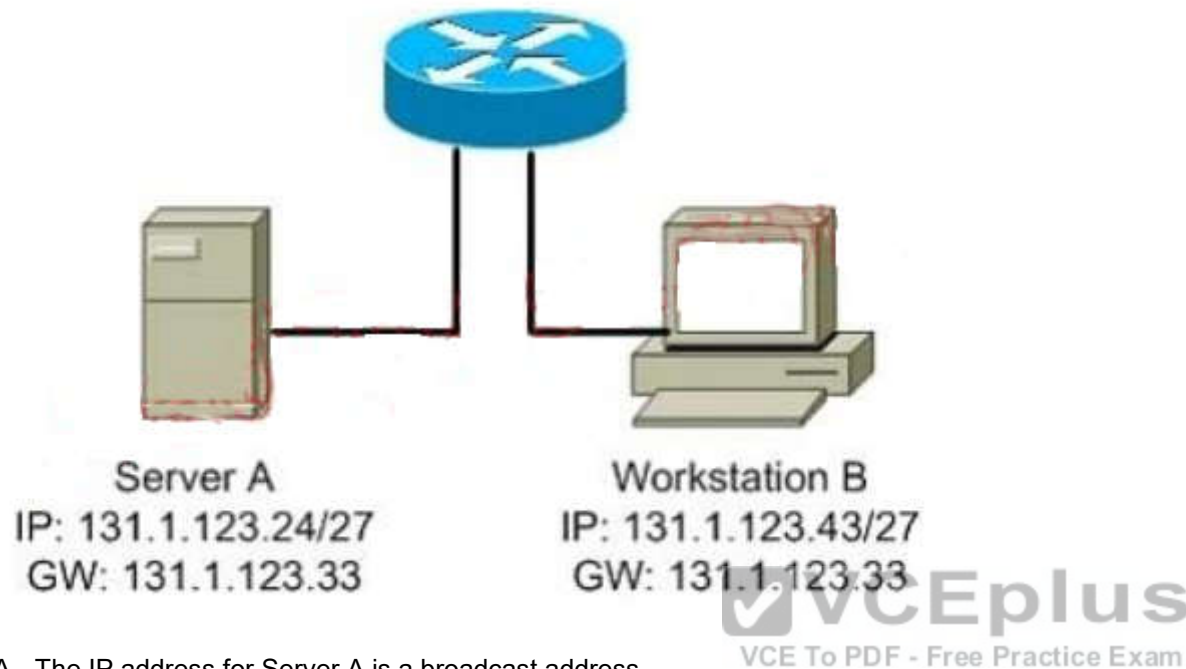
**Section: (none)**

**Explanation**

**Explanation/Reference:**

**QUESTION 247**

Refer to the exhibit. The user at Workstation B reports that Server A cannot be reached. What is preventing Workstation B from reaching Server A?



- A. The IP address for Server A is a broadcast address.
- B. The IP address for Workstation B is a subnet address.
- C. The gateway for Workstation B is not on the same subnet.
- D. The gateway for Server A is not on the same subnet.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 248

You have been asked to come up with a subnet mask that will allow all three web servers to be on the same network while providing the maximum number of subnets. Which network address and subnet mask meet this requirement?

- A. 192.168.252.0 255.255.255.252
- B. 192.168.252.8 255.255.255.248

- C. 192.168.252.8 255.255.255.252
- D. 192.168.252.16 255.255.255.240
- E. 192.168.252.16 255.255.255.252

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 249**

How does using the service password-encryption command on a router provide additional security?

- A. by encrypting all passwords passing through the router
- B. by encrypting passwords in the plain text configuration file
- C. by requiring entry of encrypted passwords for access to the device
- D. by configuring an MD5 encrypted key to be used by routing protocols to validate routing exchanges
- E. by automatically suggesting encrypted passwords for use in configuring the router

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 250**

In which circumstance are multiple copies of the same unicast frame likely to be transmitted in a switched LAN?

- A. during high traffic periods
- B. after broken links are re-established
- C. when upper-layer protocols require high reliability
- D. in an improperly implemented redundant topology
- E. when a dual ring topology is in use

**Correct Answer:** D

**Section:** (none)

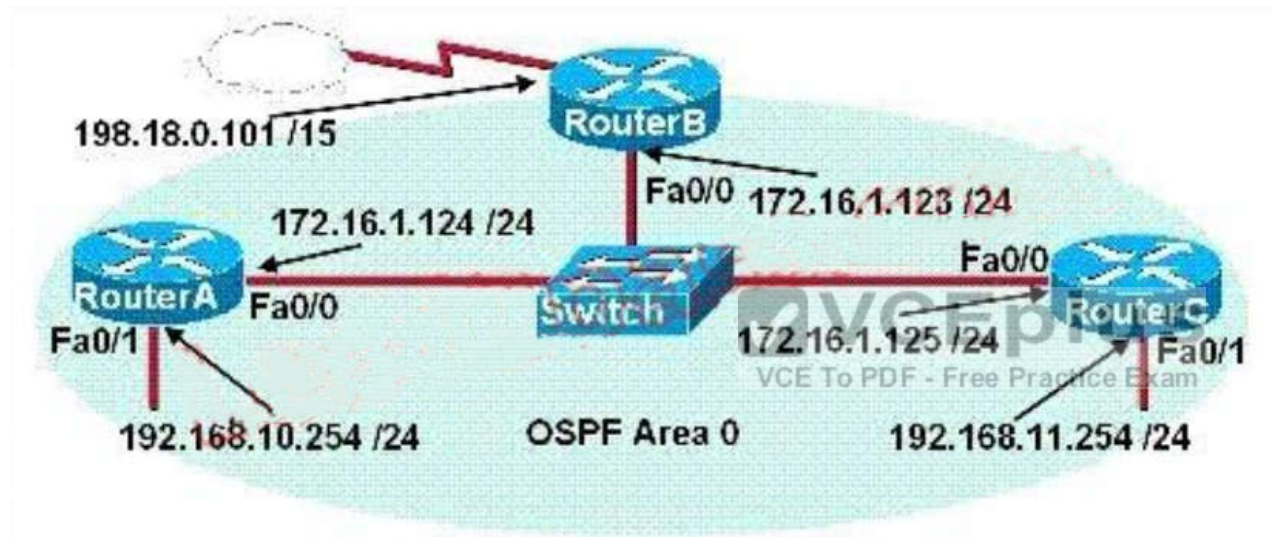


## Explanation

## Explanation/Reference:

### QUESTION 251

A network administrator is configuring the routers in the graphic for OSPF. The OSPF process has been started and the networks have been configured for Area 0 as shown in the diagram. The network administrator has several options for configuring RouterB to ensure that it will be preferred as the designated router (DR) for the 172.16.1.0 /24 LAN segment. What configuration tasks could be used to establish this preference? (Choose three.)



- A. Configure the priority value of the Fa0/0 interface of RouterB to a higher value than any other interface on the Ethernet network.
- B. Change the router id of Router B by assigning the IP address 172.16.1.130/24 to the Fa0/0 interface of RouterB.
- C. Configure a loopback interface on RouterB with an IP address higher than any IP address on the other routers.
- D. Change the priority value of the Fa0/0 interface of RouterB to zero.
- E. Change the priority values of the Fa0/0 interfaces of RouterA and RouterC to zero.
- F. No further configuration is necessary.

**Correct Answer:** ACE

**Section:** (none)

**Explanation**

**Explanation/Reference:****QUESTION 252**

When are packets processed by an inbound access list?

- A. before they are routed to an outbound interface
- B. after they are routed to an outbound interface
- C. before and after they are routed to an outbound interface
- D. after they are routed to an outbound interface but before being placed in the outbound queue

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:****QUESTION 253**

Which command can be used from a router to verify the Layer 3 path to a host?

- A. tracert address
- B. traceroute address
- C. telnet address
- D. ssh address

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:****QUESTION 254**

An access list has been designed to prevent Telnet traffic from the Graphics Department from reaching the HR server attached to the Eastfield router but allow Telnet traffic to other destinations. Given the following access list:

```
access-list 101 deny tcp any any eq 23
permit ip any any
```

On which router, interface, and in what direction should the access list be placed to most efficiently implement this list? (Choose three.)

- A. Westfield
- B. Eastfield
- C. e0
- D. s0
- E. in
- F. out

**Correct Answer:** BCF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 255

Which form of NAT maps multiple private IP addresses to a single registered IP address by using different ports?

- A. static NAT
- B. dynamic NAT
- C. overloading
- D. overlapping
- E. port loading

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 256

Unauthorized users have used Telnet to gain access to a company router. The network administrator wants to configure and apply an access list to allow Telnet access to the router, but only from the network administrator's computer. Which group of commands would be the best choice to allow only the IP address 172.16.3.3 to have Telnet access to the router?

- A. `access-list 101 permit tcp any host 172.16.3.3 eq telnet`  
`interface s0/0`  
`ip access-group 101 in`
- B. `access-list 3 permit host 172.16.3.3`  
`line vty 0 4`  
`access-class 3 in`
- C. `access-list 101 permit tcp any host 172.16.3.3 eq telnet`  
`access-list 101 permit ip any any`  
`interface s0/0`  
`ip access-group 101 in`
- D. `access-list 3 permit host 172.16.3.3`  
`line vty 0 4`  
`ip access-group 3 in`

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**



#### QUESTION 257

Refer to the exhibit. What command sequence will enable PAT from the inside to outside network?

```
ip nat pool isp-net 1.2.4.10 1.2.4.240 netmask 255.255.255.0
!
interface Ethernet 1
    description ISP Connection
    ip address 1.2.4.2 255.255.255.0
    ip nat outside
!
interface Ethernet 0
    description Ethernet to Firewall eth0
    ip address 10.10.0.1 255.255.255.0
    ip nat inside
!
access-list 1 permit 10.0.0.0 0.255.255.255
```

- A. (config) ip nat pool isp-net 1.2.4.2 netmask 255.255.255.0 overload
- B. (config-if) ip nat outside overload
- C. (config) ip nat inside source list 1 interface ethernet1 overload
- D. (config-if) ip nat inside overload

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 258

Which two statements about static NAT translations are true? (Choose two.)

- A. They allow connections to be initiated from the outside.
- B. They require no inside or outside interface markings because addresses are statically defined.
- C. They are always present in the NAT table.
- D. They can be configured with access lists, to allow two or more connections to be initiated from the outside.

**Correct Answer:** AC

**Section:** (none)

**Explanation****Explanation/Reference:****QUESTION 259**

A network administrator wants to ensure that only the server can connect to port Fa0/1 on a Catalyst switch. The server is plugged into the switch Fa0/1 port and the network administrator is about to bring the server online. What can the administrator do to ensure that only the MAC address of the server is allowed by switch port Fa0/1? (Choose two.)

- A. Configure port Fa0/1 to accept connections only from the static IP address of the server.
- B. Employ a proprietary connector type on Fa0/1 that is incompatible with other host connectors.
- C. Configure the MAC address of the server as a static entry associated with port Fa0/1.
- D. Bind the IP address of the server to its MAC address on the switch to prevent other hosts from spoofing the server IP address.
- E. Configure port security on Fa0/1 to reject traffic with a source MAC address other than that of the server.
- F. Configure an access list on the switch to deny server traffic from entering any port other than Fa0/1.

**Correct Answer:** CE

**Section:** (none)

**Explanation**

**Explanation/Reference:****QUESTION 260**

The company internetwork is subnetted using 29 bits. Which wildcard mask should be used to configure an extended access list to permit or deny access to an entire subnetwork?

- A. 255.255.255.224
- B. 255.255.255.248
- C. 0.0.0.224
- D. 0.0.0.8
- E. 0.0.0.7
- F. 0.0.0.3

**Correct Answer:** E

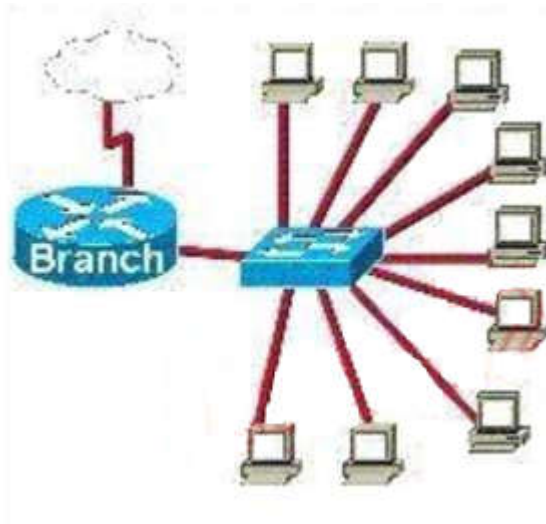
**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 261**

A router has been configured to provide the nine users on the branch office LAN with Internet access, as shown in the diagram. It is found that some of the users on the LAN cannot reach the Internet. Based on the topology and router output shown, which command should be issued on the router to correct the problem?



**Branch#show interfaces FastEthernet 0**

**FastEthernet0 is up, line protocol is up**

**Hardware address is 000c. ce8d. 8860**

**Internet address is 192.168.10.30/30**

**MTU 1500 bytes, BW 10000 Kbit,**

**DLY 1000 usec, reliability 255/255,**

**txload 1/255, rxload 1/255**

**Encapsulation ARPA, loopback not set**

**Keepalive set (10sec)**

**Half-duplex, 10Mb/s, 100BaseTX/FX**

**(... output omitted...)**

- A. Branch(config-if)# no shutdown
- B. Branch(config-if)# duplex full
- C. Branch(config-if)# no keepalive
- D. Branch(config-if)# ip address 192.168.10.30 255.255.255.240
- E. Branch(config-if)# bandwidth 100
- F. Branch(config-if)# encapsulation 802.3

**Correct Answer: D**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

**QUESTION 262**

What are three valid reasons to assign ports to VLANs on a switch? (Choose three.)

- A. to make VTP easier to implement
- B. to isolate broadcast traffic
- C. to increase the size of the collision domain
- D. to allow more devices to connect to the network
- E. to logically group hosts according to function
- F. to increase network security

**Correct Answer:** BEF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 263**

Which protocol provides a method of sharing VLAN configuration information between switches?

- A. VTP
- B. STP
- C. ISL
- D. 802.1Q
- E. VLSM

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Understanding VLAN Trunk Protocol (VTP)

[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)

Introduction

VLAN Trunk Protocol (VTP) reduces administration in a switched network. When you configure a new VLAN on one VTP server, the VLAN is distributed through all switches in the domain. This reduces the need to configure the same VLAN everywhere. VTP is a Cisco-proprietary protocol that is available on most of the Cisco Catalyst series products.



**QUESTION 264**

Refer to the exhibit. To what does the 128 refer in the router output O 168.12.240/30 [110/128] via 192.168.12.233,00:35:36, Serial 0?

ROUTER# show ip route

192.168.12.0/24 is variably subnetted, 9 subnets, 3 masks

- C 192.168.12.64/28 is directly connected, Loopback1
- C 192.168.12.32/28 is directly connected, Ethernet0
- C 192.168.12.48/28 is directly connected, Loopback0
- O 192.168.12.236/30 [1 10/128] via 192.168.12.233,00:35:36, Serial0
- C 192.168.12.232/30 is directly connected, Serial0
- O 192.168.12.245/32 [1 10/782] via 192.168.12.233,00:35:36, Serial0
- O 192.168.12.240/30 [1 10/128] via 192.168.12.233,00:35:36, Serial0
- O 192.168.12.253/32 [1 10/782] via 192.168.12.233,00:35:37, Serial0
- O 192.168.12.249/32 [1 10/782] via 192.168.12.233,00:35:37, Serial0

- A. OSPF cost
- B. OSPF priority
- C. OSPF hop count
- D. OSPF ID number
- E. OSPF administrative distance



**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 265**

Assuming the default switch configuration, which VLAN range can be added, modified, and removed on a Cisco switch?

- A. 1 through 1001
- B. 2 through 1001
- C. 1 through 1002

D. 2 through 1005

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 266**

The ROUTE company has a small network. The network consists of one switch and one router. The switch has been configured with two VLANs. The router has been configured as a router-on-a-stick to allow inter-VLAN routing. A trunk is configured to connect the switch to the router. What is the minimum number of router subinterfaces that are required for all the VLANs to communicate?

- A. zero
- B. one
- C. two
- D. three

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 267**

Identify the four valid IPv6 addresses. (Choose four.)

- A. ::
- B. ::192:168:0:1
- C. 2000::
- D. 2001:3452:4952:2837::
- E. 2002:c0a8:101::42
- F. 2003:dead:beef:4dad:23:46:bb:101

**Correct Answer:** ABEF

**Section:** (none)

**Explanation**

**Explanation/Reference:****QUESTION 268**

A network administrator receives an error message while trying to configure the Ethernet interface of a router with IP address 10.24.24.24/29. Which statement explains the reason for this issue?

- A. VLSM-capable routing protocols must be enabled first on the router.
- B. This address is a network address.
- C. This address is a broadcast address.
- D. The Ethernet interface is faulty.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:****QUESTION 269**

You are working in a data center environment and are assigned the address range 10.188.31.0/23. You are asked to develop an IP addressing plan to allow the maximum number of subnets with as many as 30 hosts each. Which IP address range meets these requirements?

- A. 10.188.31.0/26
- B. 10.188.31.0/25
- C. 10.188.31.0/28
- D. 10.188.31.0/27
- E. 10.188.31.0/29

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:****QUESTION 270**

Which IPv6 address is valid?

- A. 2001:0db8:0000:130F:0000:0000:08GC:140B
- B. 2001:0db8:0:130H::87C:140B
- C. 2031::130F::9C0:876A:130B
- D. 2031:0:130F::9C0:876A:130B

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 271**

Which protocol should be used to establish a secure terminal connection to a remote network device?

- A. ARP
- B. SSH
- C. Telnet
- D. WEP
- E. SNMPv1
- F. SNMPv2



**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 272**

What three pieces of information can be used in an extended access list to filter traffic? (Choose three.)

- A. protocol
- B. VLAN number
- C. TCP or UDP port numbers
- D. source switch port number
- E. source IP address and destination IP address

F. source MAC address and destination MAC address

**Correct Answer:** ACE

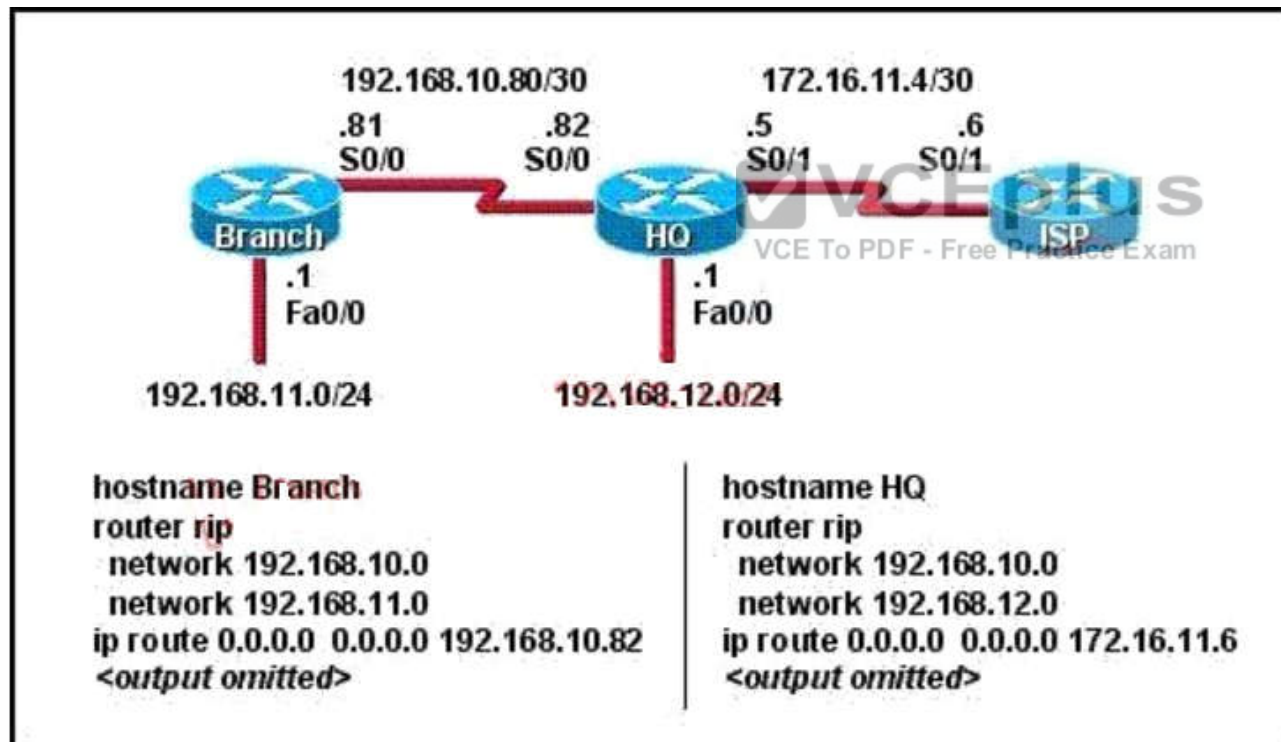
**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 273

Refer to the topology and partial router configurations shown in the exhibit. The network is fully operational and all routing tables are converged. Which route will appear in the output of the show ip route command issued on the Branch router?



A. S\* 0.0.0.0/0 [1/0] via 192.168.10.82

- B. R 172.16.11.4/30 [120/1] via 192.168.10.82, 00:00:22, Serial0/0
- C. R 192.168.10.80/30 [120/0] via 192.168.10.81, 00:00:22, Serial0/0
- D. R 192.168.11.0/24 [120/1] via 192.168.10.81, 00:00:22, Serial0/0
- E. C 192.168.12.0/24 is directly connected, FastEthernet0/0

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 274

Which router command can be used to verify the type of cable connected to interface serial 0/0?

- A. show running-config
- B. show controllers' serial 0/0
- C. show interfaces serial 0/0
- D. show ip interface serial 0/0

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 275

Which command is necessary to permit SSH or Telnet access to a Cisco switch that is otherwise configured for these vty line protocols?

- A. transport output all
- B. transport preferred all
- C. transport type all
- D. transport input all

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 276**

Refer to the exhibit. A network technician enters the following line into the router.

```
Tidmore1(config)# access-list 106 deny tcp 192.168.254.0 0.0.0.255 any eq www
```

What is the effect of this configuration?



```
access-list 106 permit ip host 192.168.254.7 any
access-list 106 deny icmp 192.168.254.0 0.0.0.255 any echo
access-list 106 permit ip any any
interface Fa0/0
  ip access-group 106 in
```

- A. The change has no effect on the packets being filtered.
- B. All traffic from the 192.168.254.0 LAN to the Internet is permitted.
- C. Web pages from the Internet cannot be accessed by hosts in the 192.168.254.0 LAN.
- D. No hosts in the 192.168.254.0 LAN except 192.168.254.7 can access web pages from the Internet.

**Correct Answer:** A

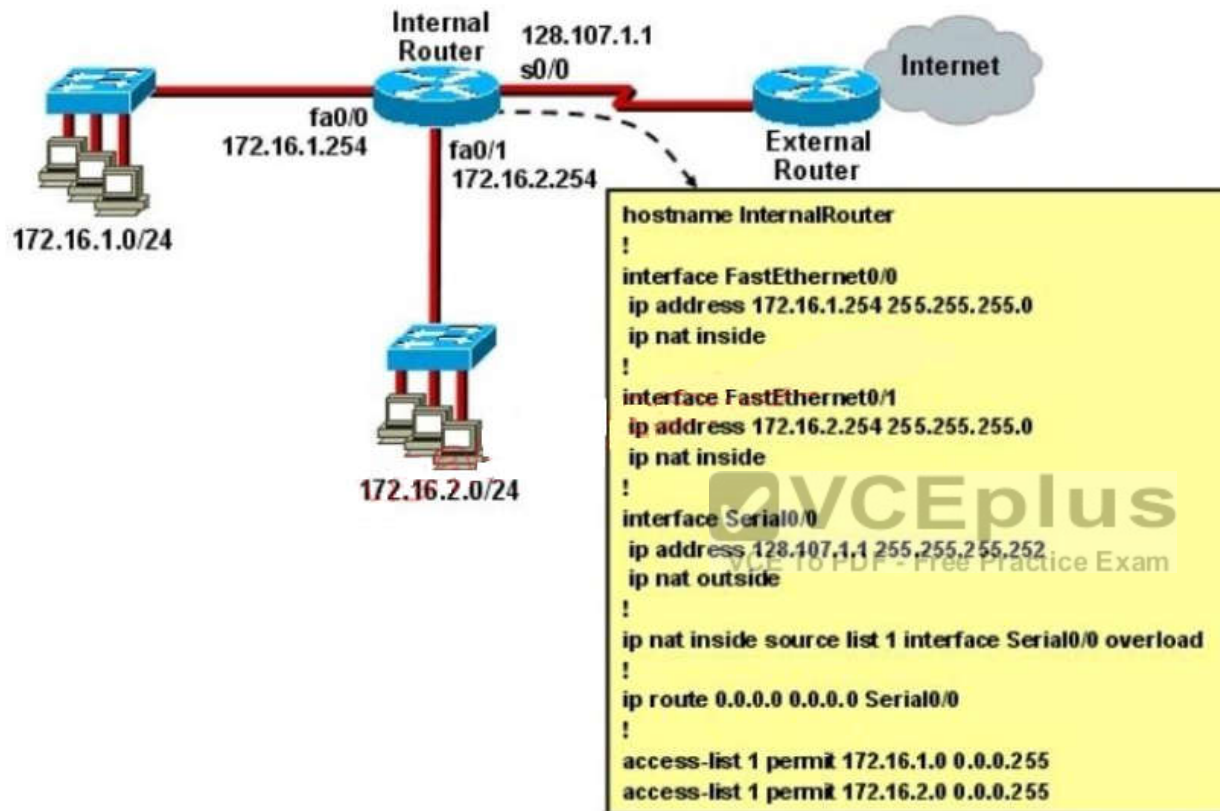
**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 277**

Refer to the exhibit. What statement is true of the configuration for this network?



- A. The configuration that is shown provides inadequate outside address space for translation of the number of inside addresses that are supported.
- B. Because of the addressing on interface FastEthernet0/1, the Serial0/0 interface address will not support the NAT configuration as shown.
- C. The number 1 referred to in the ip nat inside source command references access-list number 1.
- D. ExternalRouter must be configured with static routes to networks 172.16.1.0/24 and 172.16.2.0/24.

**Correct Answer: C**

**Section: (none)**

**Explanation**



**Explanation/Reference:****QUESTION 278**

Refer to the exhibit. Statements A, B, C, and D of ACL 10 have been entered in the shown order and applied to interface E0 inbound, to prevent all hosts (except those whose addresses are the first and last IP of subnet 172.21.1.128/28) from accessing the network. But as is, the ACL does not restrict anyone from the network. How can the ACL statements be re-arranged so that the system works as intended?

ACL 10

Statements are written in this order:

- A. permit any
- B. deny 172.21.1.128.0.0.0.15
- C. permit 172.21.1.129.0.0.0.0
- D. permit 172.21.1.142.0.0.0.0

- A. ACDB
- B. BADC
- C. DBAC
- D. CDBA



**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:****QUESTION 279**

A network administrator is configuring ACLs on a Cisco router, to allow traffic from hosts on networks 192.168.146.0, 192.168.147.0, 192.168.148.0, and 192.168.149.0 only. Which two ACL statements, when combined, are the best for accomplishing this task? (Choose two.)

- A. access-list 10 permit ip 192.168.146.0 0.0.1.255
- B. access-list 10 permit ip 192.168.147.0 0.0.255.255
- C. access-list 10 permit ip 192.168.148.0 0.0.1.255
- D. access-list 10 permit ip 192.168.149.0 0.0.255.255
- E. access-list 10 permit ip 192.168.146.0 0.0.0.255

F. access-list 10 permit ip 192.168.146.0 255.255.255.0

**Correct Answer:** AC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 280**

In which solution is a router ACL used?

- A. filtering packets that are passing through a router
- B. to change the default administrative distance of a route in the route table
- C. protecting a server from unauthorized access
- D. controlling path selection, based on the route metric

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**



#### **QUESTION 281**

Which IPsec security protocol should be used when confidentiality is required?

- A. MD5
- B. PSK
- C. AH
- D. ESP

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 282**

A network administrator needs to configure port security on a switch. Which two statements are true? (Choose two.)

- A. The network administrator can apply port security to dynamic access ports.
- B. The network administrator can apply port security to EtherChannels.
- C. When dynamic MAC address learning is enabled on an interface, the switch can learn new addresses, up to the maximum defined.
- D. The sticky learning feature allows the addition of dynamically learned addresses to the running configuration.
- E. The network administrator can configure static secure or sticky secure MAC addresses in the voice VLAN.

**Correct Answer:** CD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Follow these guidelines when configuring port security:

Port security can only be configured on static access ports, trunk ports, or 802.1Q tunnel ports.

A secure port cannot be a dynamic access port.

A secure port cannot be a destination port for Switched Port Analyzer (SPAN).

A secure port cannot belong to a Fast EtherChannel or Gigabit EtherChannel port group.

You cannot configure static secure or sticky secure MAC addresses on a voice VLAN.

When you enable port security on an interface that is also configured with a voice VLAN, you must set the maximum allowed secure addresses on the port to at least two.

If any type of port security is enabled on the access VLAN, dynamic port security is automatically enabled on the voice VLAN.

When a voice VLAN is configured on a secure port that is also configured as a sticky secure port, all addresses seen on the voice VLAN are learned as dynamic secure addresses, and all addresses seen on the access VLAN (to which the port belongs) are learned as sticky secure addresses.

The switch does not support port security aging of sticky secure MAC addresses.

The protect and restrict options cannot be simultaneously enabled on an interface

**QUESTION 283**

What are two characteristics of a switch that is configured as a VTP client? (Choose two.)

- A. If a switch that is configured to operate in client mode cannot access a VTP server, then the switch reverts to transparent mode.
- B. On switches that are configured to operate in client mode, VLANs can be created, deleted, or renamed locally.
- C. The local VLAN configuration is updated only when an update that has a higher configuration revision number is received.
- D. VTP advertisements are not forwarded to neighboring switches that are configured in VTP transparent mode.
- E. VTP client is the default VTP mode.
- F. When switches in VTP client mode are rebooted, they send a VTP advertisement request to the VTP servers.

**Correct Answer:** CF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

VLAN Trunking Protocol (VTP)

<http://archive.networknewz.com/2004/0317.html>

VTP Modes

**Server Mode** Once VTP is configured on a Cisco switch, the default mode used is Server Mode. In any given VTP management domain, at least one switch must be in Server Mode. When in Server Mode, a switch can be used to add, delete, and modify VLANs, and this information will be passed to all other switches in the VTP management domain. **Client Mode** When a switch is configured to use VTP Client Mode, it is simply the recipient of any VLANs added, deleted, or modified by a switch in Server Mode within the same management domain. A switch in VTP client mode cannot make any changes to VLAN information.

**Transparent Mode** A switch in VTP Transparent Mode will pass VTP updates received by switches in Server Mode to other switches in the VTP management domain, but will not actually process the contents of these messages. When individual VLANs are added, deleted, or modified on a switch running in transparent mode, the changes are local to that particular switch only, and are not passed to other switches in the VTP management domain.

#### **QUESTION 284**

Which two data link layers are supported by Cisco IOS Software for IPv6? (Choose two.)

- A. FDDI
- B. PPP
- C. NBMA
- D. Frame Relay SVC
- E. Frame Relay PVC



**Correct Answer:** BE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 285**

Which two commands correctly verify whether port security has been configured on port FastEthernet 0/12 on a switch? (Choose two.)

- A. SW1#show port-secure interface FastEthernet 0/12
- B. SW1#show switchport port-secure interface FastEthernet 0/12
- C. SW1#show running-config

- D. SW1#show port-security interface FastEthernet 0/12
- E. SW1#show switchport port-security interface FastEthernet 0/12

**Correct Answer:** CD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 286

Which two privileged mode Cisco IOS commands can be used to determine a Cisco router chassis serial number? (Choose two.)

- A. show diag
- B. show controllers
- C. show inventory
- D. show flash: filesys
- E. dir flash: | include chassis

**Correct Answer:** AC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 287

Which two are features of IPv6? (Choose two.)

- A. anycast
- B. broadcast
- C. multicast
- D. podcast
- E. allcast

**Correct Answer:** AC

**Section:** (none)

**Explanation**

**Explanation/Reference:****QUESTION 288**

Which three are characteristics of an IPv6 anycast address? (Choose three.)

- A. one-to-many communication model
- B. one-to-nearest communication model
- C. any-to-many communication model
- D. a unique IPv6 address for each device in the group
- E. the same address for multiple devices in the group
- F. delivery of packets to the group interface that is closest to the sending device

**Correct Answer:** BEF

**Section:** (none)

**Explanation**

**Explanation/Reference:****QUESTION 289**

Given an IP address 172.16.28.252 with a subnet mask of 255.255.240.0, what is the correct network address?

- A. 172.16.16.0
- B. 172.16.0.0
- C. 172.16.24.0
- D. 172.16.28.0

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:****QUESTION 290**

Which command helps a network administrator to manage memory by displaying flash memory and NVRAM utilization?

- A. show version
- B. show ram
- C. show flash:
- D. show file systems

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 291

Which pairing reflects a correct protocol-and-metric relationship?

- A. EIGRP and link cost
- B. OSPF and number of hops and reliability
- C. RIPv2 and number of hops
- D. IS-IS and delay and reliability

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 292

A network administrator needs to allow only one Telnet connection to a router. For anyone viewing the configuration and issuing the show run command, the password for Telnet access should be encrypted. Which set of commands will accomplish this task?

- A. service password-encryption  
access-list permit 192.168.1.0.0.0.0.255  
line vty0 4  
login  
password cisco  
access-class 1
- B. enable password secret  
line vty0

- login
- password cisco
- C. service password-encryption
- line vty0
- login
- password cisco
- D. service password-encryption
- line vty0 4
- login
- password cisco

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 293

Which set of commands is recommended to prevent the use of a hub in the access layer?

- A. 

```
switch(config-if)#switchport mode trunk
switch(config-if)#switchport port-security maximum 1
```
- B. 

```
switch(config-if)#switchport mode trunk
switch(config-if)#switchport port-security mac-address 1
```
- C. 

```
switch(config-if)#switchport mode access
switch(config-if)#switchport port-security maximum 1
```
- D. 

```
switch(config-if)#switchport mode access
switch(config-if)#switchport port-security mac-address 1
```

**Correct Answer:** C

**Section:** (none)

**Explanation**



**Explanation/Reference:**

**QUESTION 294**

Refer to the exhibit. A frame on VLAN 1 on switch S1 is sent to switch S2 where the frame is received on VLAN 2. What causes this behavior?



S1#show interface trunk

Port	Mode	Encapsulation	Status	Network vlan
Fa0/1	on	802.1q	inuking	1

Port Vans allowed a trunk

Fa0/1 1.1005

Port Vans allowed and active in management domain

Fa0/1 12

S2#show interface trunk

Port	Mode	Encapsulation	Status	Network vlan
Fa0/1	on	802.1q	inuking	2

Port Vans allowed a trunk

Fa0/1 1.1005

Port Vans allowed and active in management domain

Fa0/1 12

- A. trunk mode mismatches
- B. allowing only VLAN 2 on the destination
- C. native VLAN mismatches
- D. VLANs that do not correspond to a unique IP subnet

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 295**

Which command reveals the last method used to powercycle a router?

- A. show reload
- B. show boot
- C. show running-config
- D. show version

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**



**QUESTION 296**

Which two statements are characteristics of a distance vector routing protocol? (Choose two.)

- A. Each router has its own view of the topology.
- B. Updates are periodic and include the entire routing table.
- C. Routing updates are sent only after topology changes.
- D. Convergence is usually faster than with link state protocols.
- E. RIP is an example of distance vector routing protocols.
- F. The protocol can be useful in hub-and-spoke and hierarchical networks.

**Correct Answer:** BE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 297**

Which two Cisco IOS commands, used in troubleshooting, can enable debug output to a remote location? (Choose two.)

- A. terminal monitor
- B. logging host ip-address
- C. no logging console
- D. snmp-server enable traps syslog
- E. show logging | redirect flash: output.txt

**Correct Answer:** AB

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 298**

What is the default administrative distance of the OSPF routing protocol?

- A. 90
- B. 100
- C. 110
- D. 120
- E. 130
- F. 170

**Correct Answer:** C

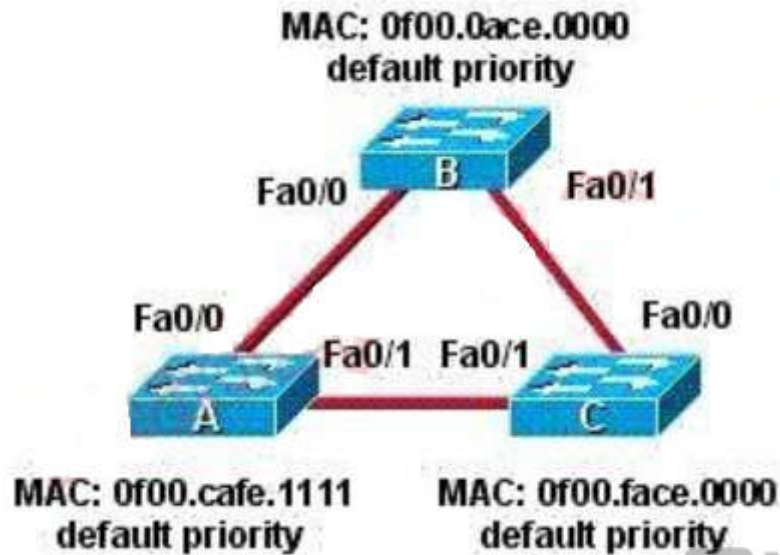
**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 299**

Refer to the topology shown in the exhibit. Which ports will be STP designated ports if all the links are operating at the same bandwidth? (Choose three.)



- A. Switch A -Fa0/0
- B. Switch A -Fa0/1
- C. Switch B -Fa0/0
- D. Switch B -Fa0/1
- E. Switch C -Fa0/0
- F. Switch C -Fa0/1

**Correct Answer:** BCD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 300

Which two statements about the OSPF Router ID are true? (Choose two.)

- A. It identifies the source of a Type 1 LSA.

- B. It should be the same on all routers in an OSPF routing instance.
- C. By default, the lowest IP address on the router becomes the OSPF Router ID.
- D. The router automatically chooses the IP address of a loopback as the OSPF Router ID.
- E. It is created using the MAC Address of the loopback interface.

**Correct Answer:** AD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

From the output of the "show ip ospf

database": r120#show ip ospf data

OSPF Router with ID (10.0.0.120) (Process ID

1) Next, who are the other routers in our area?

Router Link States (Area 1)

Link ID ADV Router Age Seq# Checksum Link count

10.0.0.111 10.0.0.111 600 0x8000023A 0x0092B3 1

10.0.0.112 10.0.0.112 1246 0x80000234 0x009CAC 1

10.0.0.113 10.0.0.113 148 0x8000022C 0x004399 3

10.0.0.120 10.0.0.120 152 0x80000240 0x0046CB 1

This tells us there are four routers in Area 1. The router with RID 10.0.0.113 has 3 links in Area 1, everyone else has only 1 link. Also the router will choose the highest loopback interface as its OSPF router ID (if available).

### QUESTION 301

What OSPF command, when configured, will include all interfaces into area 0?

- A. network 0.0.0.0 255.255.255.255 area 0
- B. network 0.0.0.0 0.0.0.0 area 0
- C. network 255.255.255.255 0.0.0.0 area 0
- D. network all-interfaces area 0

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Example 3-1 displays OSPF with a process ID of 1 and places all interfaces configured with an IP address in area 0. The network command network 0.0.0.0 255.255.255.255 area 0 dictates that you do not care what the IP address is, but if an IP address is enabled on any interface, place it in area 0.

Example 3-1 Configuring OSPF in a Single Area router ospf 1 network 0.0.0.0 255.255.255.255 area 0

### QUESTION 302

Refer to the exhibit. What address is a feasible successor?

```
R1#show ip eigrp topology
IP-EIGRP Topology Table for AS 100

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - Reply status

P 10.1.4.0/24, 1 successors, FD is 28160
    via Connected, FastEthernet0/0
P 10.1.2.0/24, 1 successors, FD is 28160
    via Connected, FastEthernet0/1
P 172.16.4.0/24, 1 successors, FD is 30720
    via 10.1.4.4 (30720/28160), FastEthernet0/0
    via 10.1.2.2 (30976/28416), FastEthernet0/1
P 172.16.3.0/24, 1 successors, FD is 28416
    via 10.1.2.2 (28416/25856), FastEthernet0/1
```

- A. 172.16.4.0
- B. 10.1.4.4
- C. 10.1.2.2
- D. 172.16.3.0

**Correct Answer:** C

**Section:** (none)

**Explanation**

#### Explanation/Reference:

Explanation:

The feasible condition states:

"To qualify as a feasible successor, a router must have an AD less than the FD of the current successor route".

In this case, we see 10.1.2.2 shows an AD less than the current successor of 10.1.4.4

### QUESTION 303

Refer to the exhibit. If the router Cisco returns the given output and has not had its router ID set manually, what value will OSPF use as its router ID?

```
Cisco#show ip interface brief
Interface                IP-Address      OK? Method Status      Protocol
FastEthernet0/0          192.168.1.1     YES manual up          up
FastEthernet0/1          172.16.1.1      YES manual up          up
Loopback0                 1.1.1.1         YES manual up          up
Loopback1                 2.2.2.2         YES manual up          up
Vlan1                     unassigned      YES unset  administratively down down
```

- A. 192.168.1.1
- B. 172.16.1.1
- C. 1.1.1.1
- D. 2.2.2.2

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

If a router-id is not configured manually in the OSPF routing process the router will automatically configure a router-id determined from the highest IP address of a logical interface (loopback interface) or the highest IP address of an active interface. If more than one loopback interfaces are configured, the router will compare the IP addresses of each of the interfaces and choose the highest IP address from the loopbacks.

#### QUESTION 304

Which statement describes VRRP object tracking?

- A. It monitors traffic flow and link utilization.
- B. It ensures the best VRRP router is the virtual router master for the group.
- C. It causes traffic to dynamically move to higher bandwidth links.
- D. It thwarts man-in-the-middle attacks.

**Correct Answer:** B



**Section: (none)**

**Explanation**

**Explanation/Reference:**

Explanation:

VRRP object tracking provides a way to ensure the best VRRP router is virtual router master for the group by altering VRRP priorities to the status of tracked objects such as interface or IP route states.

[http://www.cisco.com/c/en/us/td/docs/ios-xml/ios/ipapp\\_fhrp/configuration/xr-3s/fhrp-xr-3sbook/fhrp-vrrp.html](http://www.cisco.com/c/en/us/td/docs/ios-xml/ios/ipapp_fhrp/configuration/xr-3s/fhrp-xr-3sbook/fhrp-vrrp.html)

**QUESTION 305**

What are two benefits of using a single OSPF area network design? (Choose two.)

- A. It is less CPU intensive for routers in the single area.
- B. It reduces the types of LSAs that are generated.
- C. It removes the need for virtual links.
- D. It increases LSA response times.
- E. It reduces the number of required OSPF neighbor adjacencies.

**Correct Answer: BC**

**Section: (none)**

**Explanation**



**Explanation/Reference:**

Explanation:

OSPF uses a LSDB (link state database) and fills this with LSAs (link state advertisement).

The link types are as follows:

LSA Type 1: Router LSA

LSA Type 2: Network LSA

LSA Type 3: Summary LSA

LSA Type 4: Summary ASBR LSA

LSA Type 5: Autonomous system external LSA

LSA Type 6: Multicast OSPF LSA

LSA Type 7: Not-so-stubby area LSA

LSA Type 8: External attribute LSA for BGP

If all routers are in the same area, then many of these LSA types (Summary ASBR LSA, external LSA, etc) will not be used and will not be generated by any router. All areas in an Open Shortest Path First (OSPF) autonomous system must be physically connected to the backbone area (Area 0). In some cases, where this is not possible, you can use a virtual link to connect to the backbone through a non-backbone area. You can also use virtual links to connect two parts of a partitioned backbone through a non-backbone area. The area through which you configure the virtual link, known as a transit area, must have full routing information. The transit area cannot be a stub area. Virtual links are not ideal and should really only be used for temporary network solutions or migrations. However, if all locations are in a single OSPF area this is not needed.

**QUESTION 306**

What can cause two OSPF neighbors to be stuck in the EXSTART state?

- A. There is a low bandwidth connection between neighbors.
- B. The neighbors have different MTU settings.
- C. The OSPF interfaces are in a passive state.
- D. There is only layer one connectivity between neighbors.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 307**

What are the two default metrics used by EIGRP for route selection? (Choose two.)

- A. Bandwidth
- B. Delay
- C. Reliability
- D. Load
- E. MTU



**Correct Answer:** AB

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

EIGRP adds together weighted values of different network link characteristics in order to calculate a metric for evaluating path selection.

These characteristics include:

Delay (measured in 10s of microseconds)

Bandwidth (measured in kilobytes per second)

Reliability (in numbers ranging from 1 to 255; 255 being the most reliable) Load (in numbers ranging from 1 to 255; 255 being saturated) Various constants (K 1 through K 5) are able to be set by a user to produce varying routing behaviors.

However by default, only delay and bandwidth are used in the weighted formula to produce a single 32bit metric:

$$\left[ \left( K_1 \cdot \frac{K_2 \cdot \text{Bandwidth}}{\text{Bandwidth} + 256 - \text{Load}} + (K_3 \cdot \text{Delay}) \right) \frac{K_5}{K_4 + \text{Reliability}} \right] \cdot 256$$

Note: Default K values are: K1 = K3 = 1 and K2 = K4 = K5 = 0. When K5 is equal to 0 then [K5/( K4 + reliability)] is defined to be 1

Use of the default constants effectively reduces the formula above to:

[http://www.cisco.com/c/en/us/products/collateral/ios-nx-os-software/enhanced-interior-gateway-routing-protocol-eigrp/whitepaper\\_C11-720525.html](http://www.cisco.com/c/en/us/products/collateral/ios-nx-os-software/enhanced-interior-gateway-routing-protocol-eigrp/whitepaper_C11-720525.html)

### QUESTION 308

Which statement describes the process ID that is used to run OSPF on a router?

- A. It is globally significant and is used to represent the AS number.
- B. It is locally significant and is used to identify an instance of the OSPF database.
- C. It is globally significant and is used to identify OSPF stub areas.
- D. It is locally significant and must be the same throughout an area.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

The Process ID for OSPF on a router is only locally significant and you can use the same number on each router, or each router can have a different number -it just doesn't matter. The numbers you can use are from 1 to 65,535. Don't get this confused with area numbers, which can be from 0 to 4.2 billion.

### QUESTION 309

Refer to the exhibit. If the router R1 returns the given output and has not had its router ID set manually, what address will EIGRP use as its router ID?

R1# show ip interface brief

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/0	192.168.1.2	YES	manual	up	up
FastEthernet1/0	172.16.4.1	YES	manual	up	up
Serial2/0	192.168.10.2	YES	manual	up	up
Serial3/0	unassigned	YES	unset	administratively down	down
Loopback0	1.1.1.1	YES	manual	up	up

- A. 192.168.1.2
- B. 172.16.4.1
- C. 192.168.10.2
- D. 1.1.1.1

**Correct Answer:** D  
**Section:** (none)  
**Explanation**

**Explanation/Reference:**

Explanation:

The router ID is selected according to the following rules: manual configuration highest up/up loopback highest up/up physical interface

**QUESTION 310**

What are three values that must be the same within a sequence of packets for Netflow to consider them a network flow? (Choose three.)

- A. source IP address
- B. source MAC address
- C. egress interface
- D. ingress interface
- E. destination IP address
- F. IP next-hop

**Correct Answer:** ADE

**Section: (none)**

**Explanation**

**Explanation/Reference:**

Explanation:

Each packet that is forwarded within a router or switch is examined for a set of IP packet attributes. These attributes are the IP packet identity or fingerprint of the packet and determine if the packet is unique or similar to other packets.

Traditionally, an IP Flow is based on a set of 5 and up to 7 IP packet attributes. IP Packet attributes used by NetFlow:

IP source address

IP destination address

Source port

Destination port

Layer 3 protocol type

Class of Service

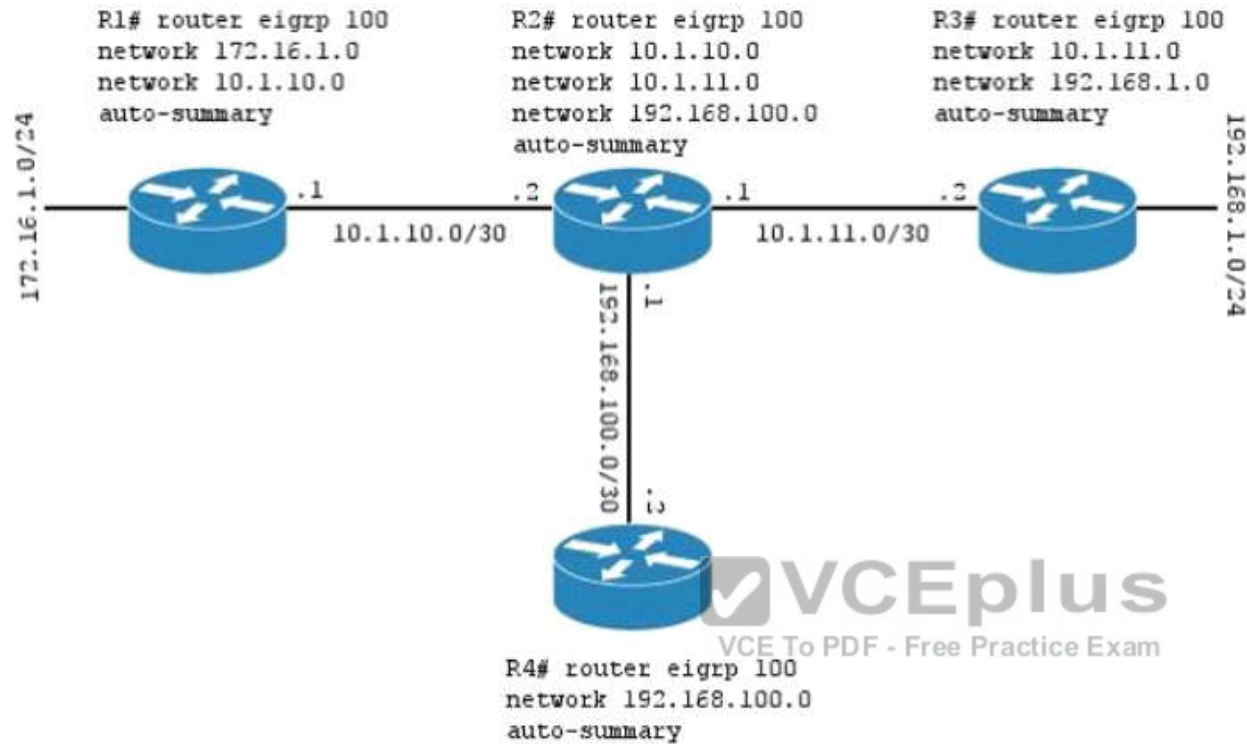
Router or switch interface

All packets with the same source/destination IP address, source/destination ports, protocol interface and class of service are grouped into a flow and then packets and bytes are tallied. This methodology of fingerprinting or determining a flow is scalable because a large amount of network information is condensed into a database of NetFlow information called the NetFlow cache.

[http://www.cisco.com/c/en/us/products/collateral/ios-nx-os-software/ios-netflow/prod\\_white\\_paper0900aecd80406232.html](http://www.cisco.com/c/en/us/products/collateral/ios-nx-os-software/ios-netflow/prod_white_paper0900aecd80406232.html)

**QUESTION 311**

Refer to the exhibit. Which three EIGRP routes will be present in the router R4's routing table? (Choose three.)



- A. 172.16.1.0/24
- B. 10.1.10.0/30
- C. 10.0.0.0/8
- D. 10.1.11.0/30
- E. 172.16.0.0/16
- F. 192.168.1.0/24

**Correct Answer:** CEF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

EIGRP performs an auto-summarization each time it crosses a border between two different major networks, so when R2 advertises the routes to R4 it will advertise only the summarized routes of 10.0.0.0/8 and 172.16.0.0/16, along with the 192.168.1.0/24 route coming from R3.

#### QUESTION 312

Which statement describes an EIGRP feasible successor route?

- A. A primary route, added to the routing table
- B. A backup route, added to the routing table
- C. A primary route, added to the topology table
- D. A backup route, added to the topology table

**Correct Answer:** D

**Section:** (none)

**Explanation**

#### Explanation/Reference:

Explanation:

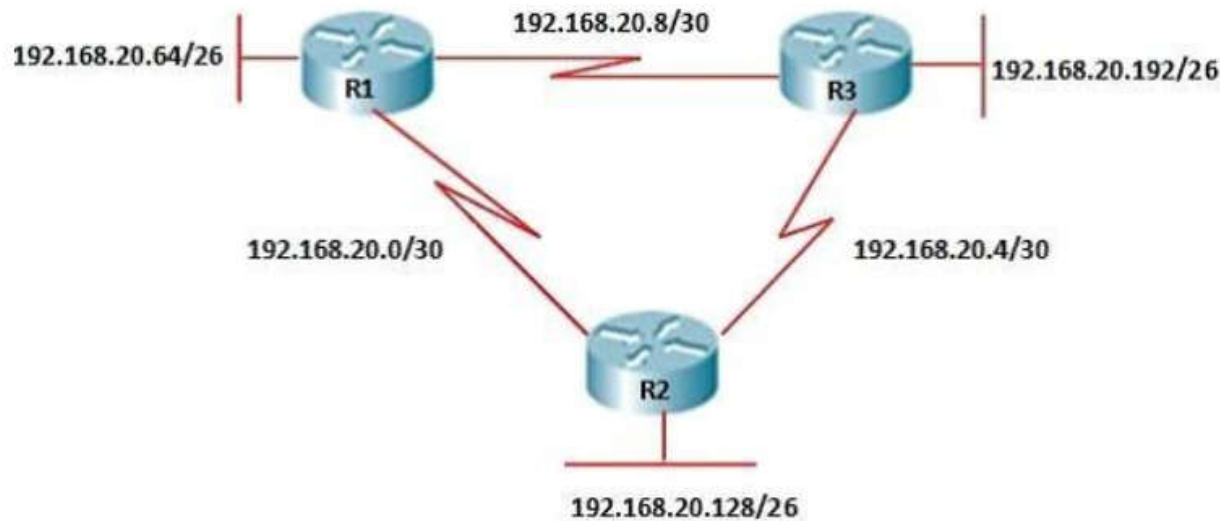
Two terms that appear often in the EIGRP world are "successor" and "feasible successor". A successor is the route with the best metric to reach a destination. That route is stored in the routing table. A feasible successor is a backup path to reach that same destination that can be used immediately if the successor route fails. These backup routes are stored in the topology table.

#### QUESTION 313

Refer to the exhibit. The company uses EIGRP as the routing protocol.

What path will packets take from a host on 192.168.10.192/26 network to a host on the LAN attached to router R1?

```
R3# show ip route
Gateway of last resort is not set
192.168.20.0/24 is variably subnetted, 6 subnets, 2 masks
D 192.168.20.64/26 [90/2195456] via 192.168.20.9, 00:03:31, Serial0/0
D 192.168.20.0/30 [90/2681856] via 192.168.20.9, 00:03:31, Serial0/0
C 192.168.20.4/30 is directly connected, Serial0/1
C 192.168.20.8/30 is directly connected, Serial0/0
C 192.168.20.192/26 is directly connected, FastEthernet0/0
D 192.168.20.128/26 [90/2195456] via 192.168.20.5, 00:03:31, Serial0/1
```



- A. The path of the packets will be R3 to R2 to R1
- B. The path of the packets will be R3 to R1 to R2
- C. The path of the packets will be both R3 to R2 to R1 and R3 to R1
- D. The path of the packets will be R3 to R1

**Correct Answer: D**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

Explanation:

EIGRP Questions

<http://www.9tut.net/icnd2/eigrp-questions>

<http://www.orbitco-ccna-pastquestions.com/CCNA---EIGRP-Common-Question.php>

Looking at the output display above, the LAN attached to router R1 belongs to 192.168.20.64/26 subnet and learned this network via 192.168.20.9 which will be an IP address in 192.168.20.8/30 sub-network. This means that packets destined for 192.168.20.64 will be routed from R3 to R1.

#### QUESTION 314

A router receives information about network 192.168.10.0/24 from multiple sources. What will the router consider the most reliable information about the path to that network?



- A. an OSPF update for network 192.168.0.0/16
- B. a static route to network 192.168.10.0/24
- C. a static route to network 192.168.10.0/24 with a local serial interface configured as the next hop
- D. a RIP update for network 192.168.10.0/24
- E. a directly connected interface with an address of 192.168.10.254/24
- F. a default route with a next hop address of 192.168.10.1

**Correct Answer:** E

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

What Is Administrative Distance?

[http://www.cisco.com/en/US/tech/tk365/technologies\\_tech\\_note09186a0080094195.shtml](http://www.cisco.com/en/US/tech/tk365/technologies_tech_note09186a0080094195.shtml)

Select the Best Path

Administrative distance is the first criterion that a router uses to determine which routing protocol to use if two protocols provide route information for the same destination. Administrative distance is a measure of the trustworthiness of the source of the routing information. Administrative distance has only local significance, and is not advertised in routing updates.

Note: The smaller the administrative distance value, the more reliable the protocol. For example, if a router receives a route to a certain network from both Open Shortest Path First (OSPF) (default administrative distance -110) and Interior Gateway Routing Protocol (IGRP) (default administrative distance -100), the router chooses IGRP because IGRP is more reliable.

This means the router adds the IGRP version of the route to the routing table.

Route Source	Default Distance Values
Connected interface	0
Static route	1
Enhanced Interior Gateway Routing Protocol (EIGRP) summary route	5
External Border Gateway Protocol (BGP)	20
Internal EIGRP	90
IGRP	100
OSPF	110
IS-IS	115
RIP	120
EGP	140
ODR	160
External EIGRP	170
Internal BGP	200
Unknown*	255

**QUESTION 315**

Users have been complaining that their Frame Relay connection to the corporate site is very slow. The network administrator suspects that the link is overloaded. Based on the partial output of the Router # show frame relay pvc command shown in the graphic, which output value indicates to the local router that traffic sent to the corporate site is experiencing congestion?

### PVC Statistics for interface Serial0 (Frame Relay DTE)

	Active	Inactive	Deleted	Static
Local	1	0	0	0
Switched	0	0	0	0
Unused	0	0	0	0

DLCI = 100, DLCI USAGE = LOCAL, PVC STATUS = ACTIVE, INTERFACE = Serial0

input pkts 1300      output pkts 1270      in bytes 22121000  
 out bytes 21802000      dropped pkts 4      in FECN pkts 147  
 in BECN pkts 192      out FECN pkts 259      out BECN pkts 214  
 in DE pkts 0      out DE pkts 0  
 out bcast pkts 107      out bcast bytes 19772  
 pvc create time 00:25:50, last time pvc status changed 00:25:40

- A. DLCI=100
- B. last time PVC status changed 00:25:40
- C. in BECN packets 192
- D. in FECN packets 147
- E. in DF packets 0

**Correct Answer:** C

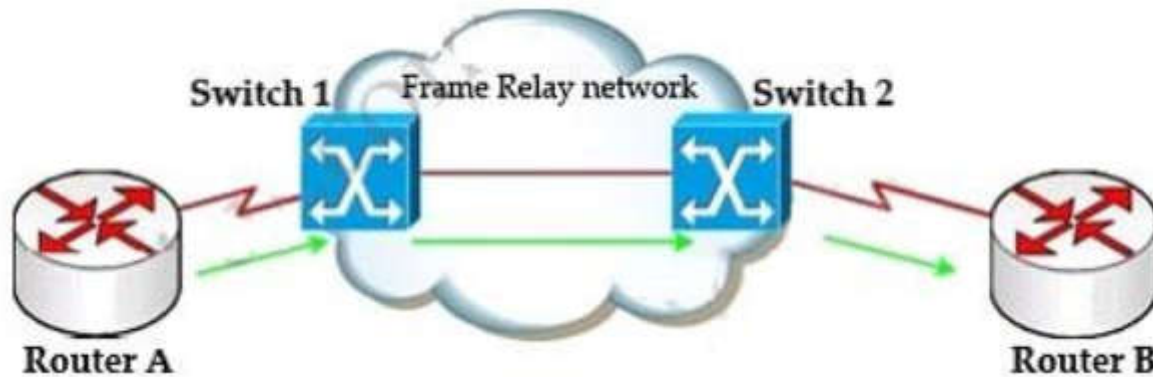
**Section:** (none)

**Explanation**

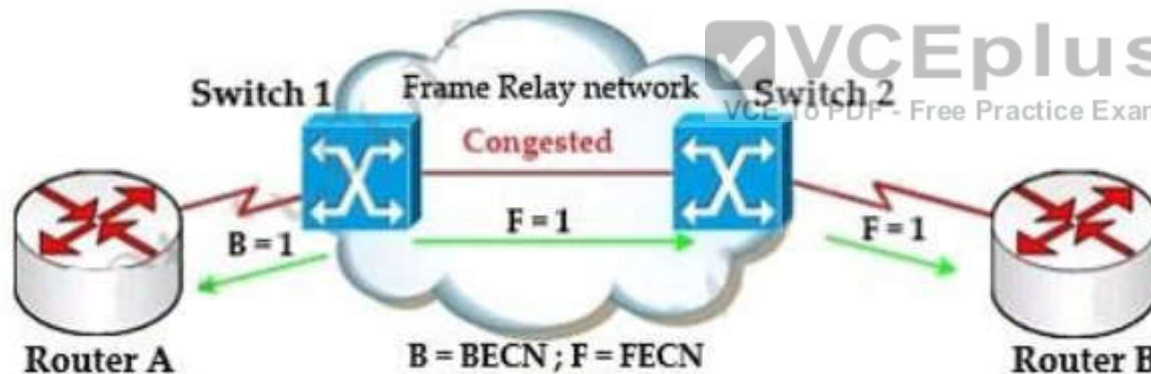
**Explanation/Reference:**

Explanation:

First we should grasp the concept of BECN & FECN through an example:



Suppose Router A wants to send data to Router B through a Frame Relay network. If the network is congested, Switch 1 (a DCE device) will set the FECN bit value of that frame to 1, indicating that frame experienced congestion in the path from source to destination. This frame is forwarded to Switch 2 and to Router B (with the FECN bit = 1). Switch 1 knows that the network is congesting so it also sends frames back to Router A with BECN bit set to 1 to inform that path through the network is congested.



In general, BECN is used on frames traveling away from the congested area to warn source devices that congestion has occurred on that path while FECN is used to alert receiving devices if the frame experiences congestion. BECN also informs the transmitting devices to slow down the traffic a bit until the network returns to normal state. The question asks "which output value indicates to the local router that traffic sent to the corporate site is experiencing congestion" which means it asks about the returned parameter which indicates congestion ->BECN.

#### QUESTION 316

Refer to the exhibit. What is the meaning of the term dynamic as displayed in the output of the show frame-relay map command shown?

**R1# show frame-relay map**

Serial0/0 (up): ip 172.16.3.1 dlci 100 (0x64, 0x1840), dynamic  
broadcast, status defined, active

- A. The Serial0/0 interface is passing traffic.
- B. The DLCI 100 was dynamically allocated by the router
- C. The Serial0/0 interface acquired the IP address of 172.16.3.1 from a DHCP server
- D. The DLCI 100 will be dynamically changed as required to adapt to changes in the Frame Relay cloud
- E. The mapping between DLCI 100 and the end station IP address 172.16.3.1 was learned through Inverse ARP

**Correct Answer:** E

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

The term dynamic indicates that the DLCI number and the remote router IP address 172.16.3.1 are learned via the Inverse ARP process. Inverse ARP is a technique by which dynamic mappings are constructed in a network, allowing a device such as a router to locate the logical network address and associate it with a permanent virtual circuit (PVC).

#### **QUESTION 317**

The command frame-relay map ip 10.121.16.8 102 broadcast was entered on the router. Which of the following statements is true concerning this command?

- A. This command should be executed from the global configuration mode.
- B. The IP address 10.121.16.8 is the local router port used to forward data.
- C. 102 is the remote DLCI that will receive the information.
- D. This command is required for all Frame Relay configurations.
- E. The broadcast option allows packets, such as RIP updates, to be forwarded across the PVC.

**Correct Answer:** E

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

The command frame-relay map ip 10.121.16.8 102 broadcast means to map the remote IP 10.121.16.8 to the local DLCI 102. When the "broadcast" keyword is included, it turns Frame Relay network as a broadcast network, which can forward broadcasts.

**QUESTION 318**

Refer to the exhibit. A packet with a source IP address of 192.168.2.4 and a destination IP address of 10.1.1.4 arrives at the AcmeB router. What action does the router take?

```
AcmeB# show ip route
```

```
! !
```

```
Gateway of last resort is not set
```

```
192.168.3.0/28 is variably subnetted, 6 subnets
```

- D 192.168.3.64 [90/20625671] via 192.168.0.6, 03:17:05, Serial0/01
- D 192.168.3.80 [90/20625671] via 192.168.0.6, 03:17:05, Serial0/1
- D 192.168.3.32 [90/20625671] via 192.168.9.2, 03:17:05, Serial0/0
- D 192.168.3.48 [90/20625671] via 192.168.9.2, 03:17:05, Serial0/0
- D 192.168.3.0 [90/30830] via 192.168.2.10, 03:17:05, FastEthernet0/0
- D 192.168.3.16 [90/175250] via 192.168.2.10, 03:17:06, FastEthernet0/0

```
192.168.9.0/30 is subnetted, 1 subnets
```

- C 192.168.9.0 is directly connected, Serial0/0

```
192.168.0.0/30 is subnetted, 1 subnets
```

- C 192.168.0.4 is directly connected, Serial0/1

```
192.168.2.0/30 is subnetted, 1 subnets
```

- C 192.168.2.8 is directly connected, FastEthernet0/0

```
AcmeB#
```

- A. forwards the received packet out the Serial0/0 interface
- B. forwards a packet containing an EIGRP advertisement out the Serial0/1 interface
- C. forwards a packet containing an ICMP message out the FastEthernet0/0 interface
- D. forwards a packet containing an ARP request out the FastEthernet0/1 interface

**Correct Answer:** C

**Section:** (none)

**Explanation**



**Explanation/Reference:**

Explanation:

<http://www.orbitco-ccna-pastquestions.com/CCNA---EIGRP-Common-Question.php>

Looking at the output above, there is no IP route for 10.1.1.4 address on AcmeB routing table.

If the router can no find a specific path in its routing table to a particular route, (In this case no path is found so AcmeB) the router will inform the source host with an ICMP message that the destination is unreachable and this will be through the same interface it has received the packet (interface Fa0/0 network 192.168.3.0/28 from the exhibit).

**QUESTION 319**

It has become necessary to configure an existing serial interface to accept a second Frame Relay virtual circuit. Which of the following are required to solve this? (Choose three)

- A. configure static frame relay map entries for each subinterface network.
- B. remove the ip address from the physical interface
- C. create the virtual interfaces with the interface command
- D. configure each subinterface with its own IP address
- E. disable split horizon to prevent routing loops between the subinterface networks
- F. encapsulate the physical interface with multipoint PPP

**Correct Answer:** BCD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

<http://www.orbit-computer-solutions.com/How-To-Configure-Frame-Relay-Subinterfaces.php>

Step to configure Frame Relay subinterfaces on a physical interface:

1. Remove any network layer address (IP) assigned to the physical interface. If the physical interface has an address, frames are not received by the local subinterfaces.
2. Configure Frame Relay encapsulation on the physical interface using the encapsulation frame-relay command.
3. For each of the defined PVCs, create a logical subinterface. Specify the port number, followed by a period (.) and the subinterface number. To make troubleshooting easier, it is suggested that the subinterface number matches the DLCI number.
4. Configure an IP address for the interface and set the bandwidth.
5. Configure the local DLCI on the subinterface using the frame-relay interface-dlci command.

Configuration Example:

```
R1>enable
R1#configure terminal
R1(config)#interface serial 0/0/0
R1(config-if)#no ip address
R1(config-if)#encapsulation frame-relay
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config-subif)#interface serial 0/0/0.102 point-to-point
R1(config-subif)#ip address 192.168.1.245 255.255.255.252
R1(config-subif)#frame-relay interface-dlci 102
R1(config-subif)#end
R1#copy running-config startup-config
```

**QUESTION 320**

Which feature does PPP use to encapsulate multiple protocols?

- A. NCP
- B. LCP
- C. IPCP
- D. IPXP

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

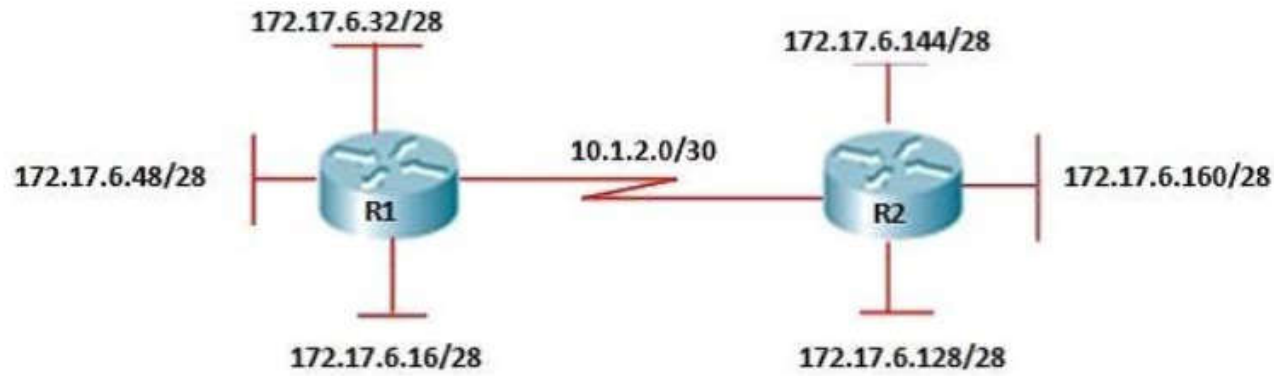
Explanation:

Network Core Protocol (NCP) is the component that encapsulates and configures multiple network layer protocols.

**QUESTION 321**

Refer to the exhibit. From R1, a network administrator is able to ping the serial interface of R2 but, unable to ping any of the subnets attached to RouterB. Based on the partial outputs in the exhibit, what could be the problem?





R1#show ip protocols  
Routing Protocols is "eigrp 501"

<output omitted>

Routing for Networks:

10.0.0.0

172.17.0.0

Routing Information Services:

Gateway	Distances	Last Update
(this router)	90	00:10:30
10.1.2.2	90	00:10:30

Distance: internal 90 external 170

R1#

R2#show ip protocols

Routing Protocols is "eigrp 501"

<output omitted>

Routing for Networks:

10.0.0.0

172.17.0.0

Routing Information Services:

Gateway	Distances	Last Update
(this router)	90	00:7:10
10.1.2.1	90	00:7:10

Distance: internal 90 external 170

R2#

R2#show ip route

<output omitted>

Gateway of last resort not set

172.17.0.0/16 is subnetted, 4 subnets, 2 masks

C 172.17.6.160/28 is directly connected, FastEthernet0/0

C 172.17.6.144/28 is directly connected, FastEthernet0/1

C 172.17.6.128/28 is directly connected, FastEthernet1/0

D 172.17.0.0/16 is a summary, 00:00:06, Null0

10.0.0.0/8 is a variable subnetted, 2 subnets, 2 masks

D 10.0.0.0/8 is a summary, 00:00:07, Null0

C 10.1.2.0/30 is directly connected, Serial0/0

R2#

- A. EIGRP does not support VLSM.
- B. The EIGRP network statements are incorrectly configured.
- C. The IP addressing on the serial interface of RouterA is incorrect.
- D. The routing protocol has summarized on the classful boundary.
- E. EIGRP has been configured with an invalid autonomous system number.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

<http://www.orbitco-ccna-pastquestions.com/CCNA---EIGRP-Common-Question.php>

If you look carefully at the R2 ip route, you will discover that the R2 does not learn any network from R1; this is because the routing protocol used here (EIGRP) performs auto summary when advertising routes to peers across a network. So in this case the address 172.17.0.0/26 is a summarized address. If the router was configured with no auto summary command, R2 LAN addresses would have been advertised and reached.

#### QUESTION 322

A network administrator is troubleshooting an EIGRP problem on a router and needs to confirm the IP addresses of the devices with which the router has established adjacency. The retransmit interval and the queue counts for the adjacent routers also need to be checked. What command will display the required information?

- A. Router# show ip eigrp adjacency
- B. Router# show ip eigrp topology
- C. Router#show ip eigrp interfaces
- D. Router#show ip eigrp neighbors

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Implementing EIGRP

<http://www.ciscopress.com/articles/article.asp?p=1171169&seqNum=3>

Below is an example of the show ip eigrp neighbors command. The retransmit interval (Smooth Round Trip Timer SRTT) and the queue counts (Q count, which shows the number of queued EIGRP packets) for the adjacent routers are listed:

```
R1#show ip eigrp neighbors
IP-EIGRP neighbors for process 1
H Address Interface Hold Uptime SRTT RTO Q Seq (sec) (ms) Cnt Num
0 10.10.10.2 Fa0/0 12 00:00:39 1282 5000 0 3
```

**QUESTION 323**

When a router undergoes the exchange protocol within OSPF, in what order does it pass through each state?

- A. exstart state > loading state > exchange state > full state
- B. exstart state > exchange state > loading state > full state
- C. exstart state > full state > loading state > exchange state
- D. loading state > exchange state > full state > exstart state

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

[http://www.cisco.com/en/US/tech/tk365/technologies\\_tech\\_note09186a0080093f0d.shtml](http://www.cisco.com/en/US/tech/tk365/technologies_tech_note09186a0080093f0d.shtml)

**QUESTION 324**

In the Frame Relay network, which IP addresses would be assigned to the interfaces with point-to-point PVCs?

- A. ~~DLCI 16 192.168.10.1/24~~  
~~DLCI 17 192.168.10.1/24~~  
~~DLCI 99 192.168.10.2/24~~  
~~DLCI 28 192.168.10.3/24~~
- B. ~~DLCI 16 192.168.10.1 /24~~  
~~DLCI 17 192.168.11.1/24~~  
~~DLCI 99 192.168.12.1/24~~  
~~DLCI 28 192.168.13.1/24~~

- C. DLCI 16 192.168.10.1/24  
DLCI 17 192.168.11.1/24  
DLCI 99 192.168.10.2/24  
DLCI 28 192.168.11.2/24
- D. DLCI 16 192.168.10.1/24  
DLCI 17 192.168.10.2/24  
DLCI 99 192.168.10.3/24  
DLCI 28 192.168.10.4/24

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

DLCI 16 and DLCI 19 need to act like a point-to-point link and will therefore need to be on the same network as will DLCI 17 and DLCI 28. With this information we can see that option "B" is the only option that has the corresponding DLCI's on the same network based on the ip addresses and subnetmask. Option "D" is incorrect because, this would put the same network on both interfaces of the R2 router. Option "A" is similar.

#### **QUESTION 325**

Refer to the exhibit. Why has this switch not been elected the root bridge for VLAN1?

```
Switch# show spanning-tree vlan 1
VLAN0001
  Spanning tree enabled protocol rstp
  Root ID    Priority    20481
             Address     0008.217a.5800
             Cost        38
             Port        1 (FastEthernet0/1)
             Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    32769 (priority 32768 sys-id-ext 1)
             Address     0008.205e.6600
             Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time   300
```

Interface	Role	Sts	Cost	Prio.Nbr	Type
Fa0/1	Root	FWD	19	128.1	P2p
Fa0/4	Desg	FWD	38	128.1	P2p
Fa0/11	Altn	BLK	57	128.1	P2p
Fa0/13	Desg	FWD	38	128.1	P2p

- A. It has more than one interface that is connected to the root network segment.
- B. It is running RSTP while the elected root bridge is running 802.1d spanning tree.
- C. It has a higher MAC address than the elected root bridge.
- D. It has a higher bridge ID than the elected root bridge.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

[http://www.cisco.com/en/US/tech/tk389/tk621/technologies\\_tech\\_note09186a008009482f.s.html](http://www.cisco.com/en/US/tech/tk389/tk621/technologies_tech_note09186a008009482f.s.html)

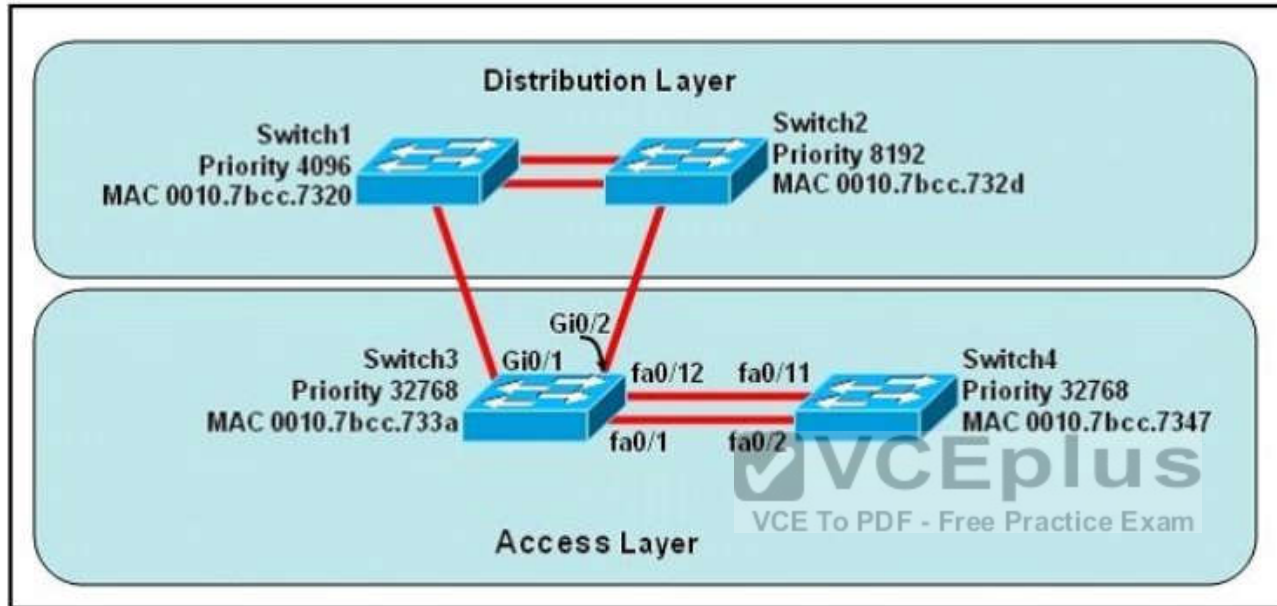
When a switch receives a BPDU, it first compares priority, the lower number wins. If a tie, compare MAC, the smaller one wins. Here Switch has 32769 priorities which is greater than 20481 so switch will not elect for root bridge. It says the bridge priority for Switch is 32769, and the root priority is 20481. Which means that



some other switch has the lower priority and won the election for VLAN 1.

#### QUESTION 326

Refer to the exhibit. At the end of an RSTP election process, which access layer switch port will assume the discarding role?



- A. Switch3, port fa0/1
- B. Switch3, port fa0/12
- C. Switch4, port fa0/11
- D. Switch4, port fa0/2
- E. Switch3, port Gi0/1
- F. Switch3, port Gi0/2

**Correct Answer: C**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

Explanation:

In this question, we only care about the Access Layer switches (Switch3 & 4). Switch 3 has a lower bridge ID than Switch 4 (because the MAC of Switch3 is smaller

than that of Switch4) so both ports of Switch3 will be in forwarding state. The alternative port will surely belong to Switch4. Switch4 will need to block one of its ports to avoid a bridging loop between the two switches. But how does Switch4 select its blocked port? Well, the answer is based on the BPDUs it receives from Switch3. A BPDU is superior than another if it has:

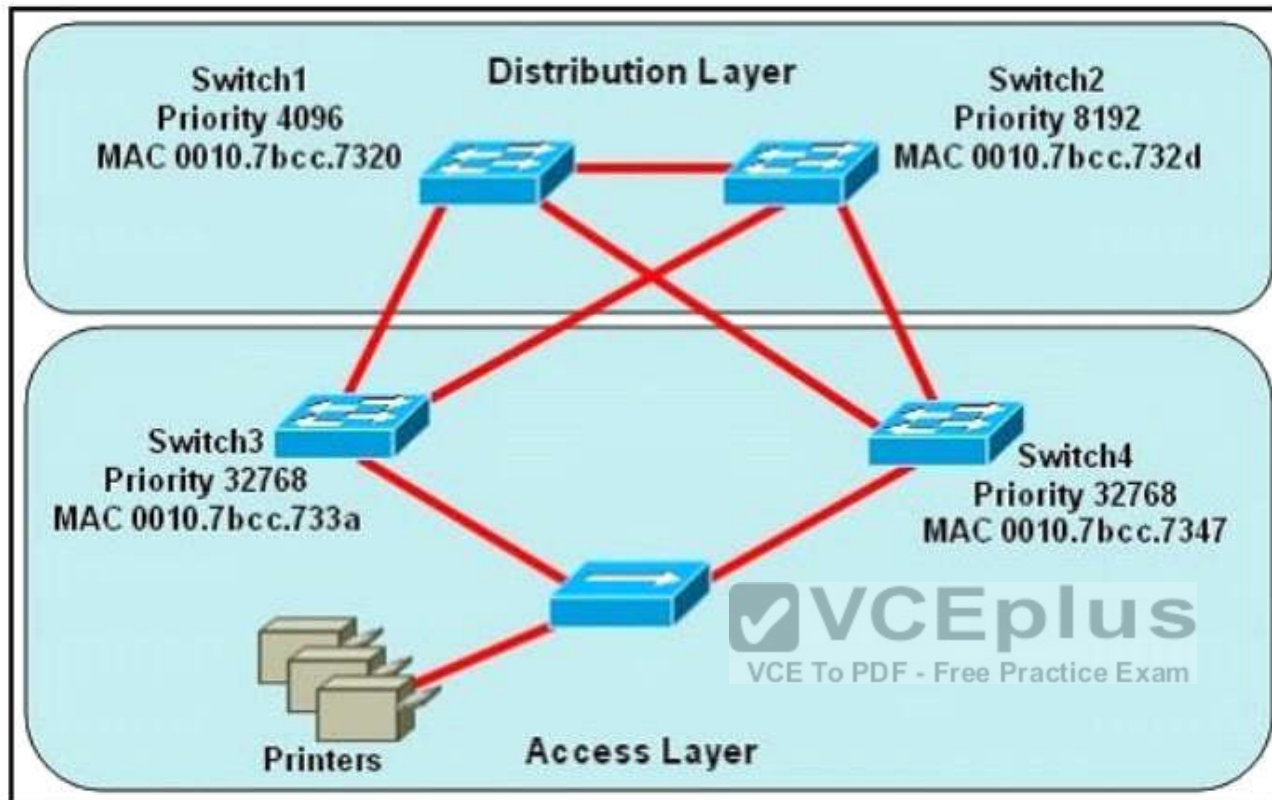
1. A lower Root Bridge ID
2. A lower path cost to the Root
3. A lower Sending Bridge ID
4. A lower Sending Port ID

These four parameters are examined in order. In this specific case, all the BPDUs sent by Switch3 have the same Root Bridge ID, the same path cost to the Root and the same Sending Bridge ID. The only parameter left to select the best one is the Sending Port ID (Port ID = port priority + port index). In this case the port priorities are equal because they use the default value, so Switch4 will compare port index values, which are unique to each port on the switch, and because Fa0/12 is inferior to Fa0/1, Switch4 will select the port connected with Fa0/1 (of Switch3) as its root port and block the other port -> Port fa0/11 of Switch4 will be blocked (discarding role).

#### **QUESTION 327**

Refer to the exhibit. Which switch provides the spanning-tree designated port role for the network segment that services the printers?





- A. Switch1
- B. Switch2
- C. Switch3
- D. Switch4

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

First, the question asks what switch services the printers, so it can be Switch 3 or Switch 4 which is connected directly to the Printers.

Designated port is a port that is in the forwarding state. All ports of the root bridge are designated ports. Switch 3 and Switch 4 has same priority so it will see on lowest MAC address and here switch 3 has lowest MAC address. So switch 3 segment will play a Designated port role. By comparing the MAC address of Switch 3 and Switch 4 we found that the MAC of Switch 3 is smaller. Therefore, the interface connected to the Printers of Switch 3 will become designated interface and the interface of Switch 4 will be blocked.

### QUESTION 328

Refer to the exhibit. Given the output shown from this Cisco Catalyst 2950, what is the reasons that interface FastEthernet 0/10 is not the root port for VLAN 2?

```
Switch# show spanning-tree interface fastethernet0/10
Vlan          Role Sts Cost      Prio.Nbr Type
-----
VLAN0001      Root FWD 19        128.1    P2p
VLAN0002      Altn BLK 19        128.2    P2p
VLAN0003      Root FWD 19        128.2    P2p
```

- A. This switch has more than one interface connected to the root network segment in VLAN 2.
- B. This switch is running RSTP while the elected designated switch is running 802.1d Spanning Tree.
- C. This switch interface has a higher path cost to the root bridge than another in the topology.
- D. This switch has a lower bridge ID for VLAN 2 than the elected designated switch.

**Correct Answer: C**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

Explanation:

These four parameters are examined in order to make root bridge, root port, designated port. Other switch has lowest Sending Bridge ID or Sending Port ID so vlan 2 is not the root port.

1. A lower Root Bridge ID
2. A lower path cost to the Root
3. A lower Sending Bridge ID
4. A lower Sending Port ID

### QUESTION 329

Which two of these statements regarding RSTP are correct? (Choose two.)

- A. RSTP cannot operate with PVST+.
- B. RSTP defines new port roles.
- C. RSTP defines no new port states.
- D. RSTP is a proprietary implementation of IEEE 802.1D STP.
- E. RSTP is compatible with the original IEEE 802.1D STP.

**Correct Answer:** BE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

[http://www.cisco.com/en/US/tech/tk389/tk621/technologies\\_white\\_paper09186a0080094cfa.shtml](http://www.cisco.com/en/US/tech/tk389/tk621/technologies_white_paper09186a0080094cfa.shtml)

Port Roles

The role is now a variable assigned to a given port. The root port and designated port roles remain, while the blocking port role is split into the backup and alternate port roles. The Spanning Tree Algorithm (STA) determines the role of a port based on Bridge Protocol Data Units (BPDUs).

In order to simplify matters, the thing to remember about a BPDU is there is always a method to compare any two of them and decide whether one is more useful than the other. This is based on the value stored in the BPDU and occasionally on the port on which they are received. This considered, the information in this section explains practical approaches to port roles.

Compatibility with 802.1D RSTP is able to interoperate with legacy STP protocols. However, it is important to note that the inherent fast convergence benefits of 802.1w are lost when it interacts with legacy bridges.

### QUESTION 330

Which port state is introduced by Rapid-PVST?

- A. learning
- B. listening
- C. discarding
- D. forwarding

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Spanning Tree from PVST+ to Rapid-PVST Migration Configuration Example

Reference 1:

[http://www.cisco.com/en/US/products/hw/switches/ps708/products\\_configuration\\_example09186a00807b0670.shtml](http://www.cisco.com/en/US/products/hw/switches/ps708/products_configuration_example09186a00807b0670.shtml)

Reference 2:

[http://www.cisco.com/en/US/tech/tk389/tk621/technologies\\_white\\_paper09186a0080094cfa.shtml](http://www.cisco.com/en/US/tech/tk389/tk621/technologies_white_paper09186a0080094cfa.shtml)

PVST+ is based on IEEE802.1D Spanning Tree Protocol (STP). But PVST+ has only 3 port states (discarding, learning and forwarding) while STP has 5 port states (blocking, listening, learning, forwarding and disabled). So discarding is a new port state in PVST+.

STP (802.1D) Port State	RSTP (802.1w) Port State	Is Port Included in Active Topology?	Is Port Learning MAC Addresses?
Disabled	Discarding	No	No
Blocking	Discarding	No	No
Listening	Discarding	Yes	No
Learning	Learning	Yes	Yes
Forwarding	Forwarding	Yes	Yes

#### Background Information

802.1D Spanning Tree Protocol (STP) has a drawback of slow convergence. Cisco Catalyst switches support three types of STPs, which are PVST+, rapid-PVST+ and MST.

PVST+ is based on IEEE802.1D standard and includes Cisco proprietary extensions such as BackboneFast, UplinkFast, and PortFast. Rapid-PVST+ is based on IEEE 802.1w standard and has a faster convergence than 802.1D. RSTP (IEEE 802.1w) natively includes most of the Cisco proprietary enhancements to the 802.1D Spanning Tree, such as BackboneFast and UplinkFast.

Rapid-PVST+ has these unique features:

Uses Bridge Protocol Data Unit (BPDU) version 2 which is backward compatible with the 802.1D STP, which uses BPDU version 0.

All the switches generate BPDUs and send out on all the ports every 2 seconds, whereas in 802.1D STP only the root bridge sends the configuration BPDUs.

Port Roles--Root port, designated port, alternate port and backup port.

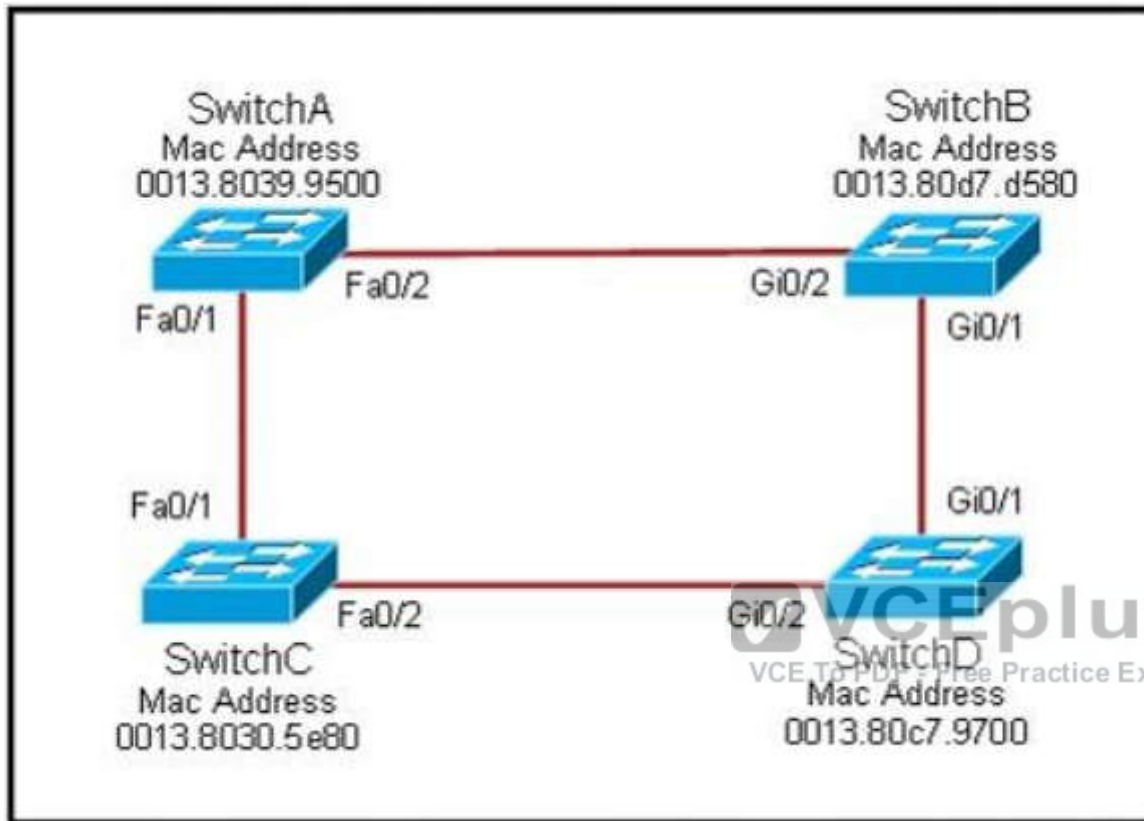
Port States--Discarding, Learning, and Forwarding.

Port Types--Edge Port (PortFast), Point-to-Point and Shared port.

Rapid-PVST uses RSTP to provide faster convergence. When any RSTP port receives legacy 802.1D BPDU, it falls back to legacy STP and the inherent fast convergence benefits of 802.1w are lost when it interacts with legacy bridges.

#### QUESTION 331

Refer to the exhibit. Each of these four switches has been configured with a hostname, as well as being configured to run RSTP. No other configuration changes have been made. Which three of these show the correct RSTP port roles for the indicated switches and interfaces? (Choose three.)



- A. SwitchA, Fa0/2, designated
- B. SwitchA, Fa0/1, root
- C. SwitchB, Gi0/2, root
- D. SwitchB, Gi0/1, designated
- E. SwitchC, Fa0/2, root
- F. SwitchD, Gi0/2, root

**Correct Answer:** ABF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

The question says "no other configuration changes have been made" so we can understand these switches have the same bridge priority. SwitchC has lowest MAC address so, it will become root bridge and 2 of its ports (Fa0/1 & Fa0/2) will be designated ports (DP). Because SwitchC is the root bridge the 2 ports nearest SwitchC on SwitchA (Fa0/1) and SwitchD (Gi0/2) will be rootports (RP) -> B and F are correct.

SwitchB must have a root port so which port will it choose? To answer this question, we need to know about STP cost and port cost.

In general, "cost" is calculated based on bandwidth of the link. The higher the bandwidth on a link, the lower the value of its cost. Below are the cost values you should memorize:

Link speed Cost SwitchB will choose the interface with lower cost to the root bridge as the root port so we must calculate the cost on interface Gi0/1 & Gi0/2 of SwitchB to the root bridge. This can be calculated from the "cost to the root bridge" of each switch because a switch always advertises its cost to the root bridge in its BPDU. The receiving switch will add its local port cost value to the cost in the BPDU. SwitchC advertises its cost to the root bridge with a value of 0. Switch D adds 4 (the cost value of 1Gbps link) and advertises this value (4) to SwitchB. SwitchB adds another 4 and learns that it can reach SwitchC via Gi0/1 port with a total cost of 8. The same process happens for SwitchA and SwitchB learns that it can reach SwitchC via Gi0/2 with a total cost of 23 -> Switch B chooses Gi0/1 as its root port.

Now our last task is to identify the port roles of the ports between SwitchA & SwitchB. It is rather easy as the MAC address of SwitchA is lower than that of SwitchB so Fa0/2 of SwitchA will be designated port while Gi0/2 of SwitchB will be alternative port.

**QUESTION 332**

Which three statements about RSTP are true? (Choose three.)

- A. RSTP significantly reduces topology reconverging time after a link failure.
- B. RSTP expands the STP port roles by adding the alternate and backup roles.
- C. RSTP port states are blocking, discarding, learning, or forwarding.
- D. RSTP provides a faster transition to the forwarding state on point-to-point links than STP does.
- E. RSTP also uses the STP proposal-agreement sequence.
- F. RSTP uses the same timer-based process as STP on point-to-point links.

**Correct Answer:** ABD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

[http://www.cisco.com/en/US/tech/tk389/tk621/technologies\\_white\\_paper09186a0080094cfa.shtml](http://www.cisco.com/en/US/tech/tk389/tk621/technologies_white_paper09186a0080094cfa.shtml)

Convergence

Cisco enhanced the original 802.1D specification with features such as Uplink Fast, Backbone Fast, and Port Fast to speed up the convergence time of a bridged network. The drawback is that these mechanisms are proprietary and need additional configuration.

Alternate and Backup Port Roles

These two port roles correspond to the blocking state of 802.1D. A blocked port is defined as not being the designated or root port. A blocked port receives a more useful BPDU than the one it sends out on its segment.

Remember that a port absolutely needs to receive BPDUs in order to stay blocked. RSTP introduces these two roles for this purpose.



### Rapid Transition to Forwarding State

Rapid transition is the most important feature introduced by 802.1w. The legacy STA passively waited for the network to converge before it turned a port into the forwarding state. The achievement of faster convergence was a matter of tuning the conservative default parameters (forward delay and max\_age timers) and often put the stability of the network at stake. The new rapid STP is able to actively confirm that a port can safely transition to the forwarding state without having to rely on any timer configuration. There is now a real feedback mechanism that takes place between RSTP-compliant bridges. In order to achieve fast convergence on a port, the protocol relies upon two new variables: edge ports and link type.

#### QUESTION 333

At which layer of the OSI model is RSTP used to prevent loops?

- A. physical
- B. data link
- C. network
- D. transport

**Correct Answer:** B

**Section:** (none)

**Explanation**

#### Explanation/Reference:

Explanation:

RSTP and STP operate on switches and are based on the exchange of Bridge Protocol Data Units (BPDUs) between switches. One of the most important fields in BPDUs is the Bridge Priority in which the MAC address is used to elect the Root Bridge, RSTP operates at Layer 2.

[http://www.cisco.com/en/US/tech/tk389/tk621/technologies\\_white\\_paper09186a0080094cfa.shtml](http://www.cisco.com/en/US/tech/tk389/tk621/technologies_white_paper09186a0080094cfa.shtml)

#### QUESTION 334

What is one benefit of PVST+?

- A. PVST+ supports Layer 3 load balancing without loops.
- B. PVST+ reduces the CPU cycles for all the switches in the network.
- C. PVST+ allows the root switch location to be optimized per VLAN.
- D. PVST+ automatically selects the root bridge location, to provide optimized bandwidth usage.

**Correct Answer:** C

**Section:** (none)

**Explanation**

#### Explanation/Reference:

Explanation:

Per VLAN Spanning Tree (PVST)

#### Introduction

[http://www.cisco.com/en/US/tech/tk389/tk621/tk846/tsd\\_technology\\_support\\_sub-protocol\\_home.html](http://www.cisco.com/en/US/tech/tk389/tk621/tk846/tsd_technology_support_sub-protocol_home.html)

Per VLAN Spanning Tree (PVST) maintains a spanning tree instance for each VLAN configured in the network. It means a switch can be the root bridge of a VLAN while another switch can be the root bridge of other VLANs in a common topology. For example, Switch 1 can be the root bridge for Voice data while Switch 2 can be the root bridge for Video data. If designed correctly, it can optimize the network traffic.

<http://www.ciscopress.com/articles/article.asp?p=102157&seqNum=4>

#### QUESTION 335

What are three characteristics of the OSPF routing protocol? (Choose three.)

- A. It converges quickly.
- B. OSPF is a classful routing protocol.
- C. It uses cost to determine the best route.
- D. It uses the DUAL algorithm to determine the best route.
- E. OSPF routers send the complete routing table to all directly attached routers.
- F. OSPF routers discover neighbors before exchanging routing information.

**Correct Answer:** ACF

**Section:** (none)

**Explanation**



#### Explanation/Reference:

Explanation:

Open Shortest Path First

Reference:

[http://docwiki.cisco.com/wiki/Open\\_Shortest\\_Path\\_First](http://docwiki.cisco.com/wiki/Open_Shortest_Path_First)

Additional OSPF features include equal-cost, multipath routing, and routing based on upper-layer type-of-service (TOS) requests.

TOS-based routing supports those upper-layer protocols that can specify particular types of service. An application, for example, might specify that certain data is urgent. If OSPF has high-priority links at its disposal, these can be used to transport the urgent datagram.

OSPF supports one or more metrics. If only one metric is used, it is considered to be arbitrary, and TOS is not supported. If more than one metric is used, TOS is optionally supported through the use of a separate metric (and, therefore, a separate routing table) for each of the eight combinations created by the three IP TOS bits (the delay, throughput, and reliability bits).

For example, if the IP TOS bits specify low delay, low throughput, and high reliability, OSPF calculates routes to all destinations based on this TOS designation. IP subnet masks are included with each advertised destination, enabling variable-length subnet masks. With variable-length subnet masks, an IP network can be broken into many subnets of various sizes. This provides network administrators with extra network-configuration flexibility.

#### QUESTION 336

Which statement is true, as relates to classful or classless routing?

- A. Classful routing protocols send the subnet mask in routing updates.



- B. RIPv1 and OSPF are classless routing protocols.
- C. Automatic summarization at classful boundaries can cause problems on discontinuous subnets.
- D. EIGRP and OSPF are classful routing protocols and summarize routes by default.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

RIPv1, RIPv2, IGRP, and EIGRP all auto-summarize classful boundaries by default (OSPF does not). To make discontinuous networks work, meaning you don't want classful boundaries to summarize, you need to turn off auto-summary.

<http://www.ciscopress.com/articles/article.asp?p=174107&seqNum=3>

#### QUESTION 337

Which parameter or parameters are used to calculate OSPF cost in Cisco routers?

- A. Bandwidth
- B. Bandwidth and Delay
- C. Bandwidth, Delay, and MTU
- D. Bandwidth, MTU, Reliability, Delay, and Load



**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

[http://www.cisco.com/en/US/tech/tk365/technologies\\_white\\_paper09186a0080094e9e.shtml#t6](http://www.cisco.com/en/US/tech/tk365/technologies_white_paper09186a0080094e9e.shtml#t6)

OSPF Cost

The cost (also called metric) of an interface in OSPF is an indication of the overhead required to send packets across a certain interface. The cost of an interface is inversely proportional to the bandwidth of that interface. A higher bandwidth indicates a lower cost. There is more overhead (higher cost) and time delays involved in crossing a 56k serial line than crossing a 10M Ethernet line. The formula used to calculate the cost is:

$$\text{Cost} = \frac{100000000}{\text{bandwidth in bps}}$$

For example, it will cost  $10^8 / 10^7 = 10$  to cross a 10M Ethernet line and will cost  $10^8 / 1544000 = 64$  to cross a T1 line. By default, the cost of an interface is calculated based on the bandwidth; you can force the cost of an interface with the `ip ospf cost <value> interface` sub configuration mode command.

#### QUESTION 338

Which statements are true about EIGRP successor routes? (Choose two.)

- A. A successor route is used by EIGRP to forward traffic to a destination.
- B. Successor routes are saved in the topology table to be used if the primary route fails.
- C. Successor routes are flagged as 'active' in the routing table.
- D. A successor route may be backed up by a feasible successor route.
- E. Successor routes are stored in the neighbor table following the discovery process.

**Correct Answer:** AD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Introduction to EIGRP

[http://www.cisco.com/en/US/tech/tk365/technologies\\_tech\\_note09186a0080093f07.shtml](http://www.cisco.com/en/US/tech/tk365/technologies_tech_note09186a0080093f07.shtml)

Feasible Successors

A destination entry is moved from the topology table to the routing table when there is a feasible successor. All minimum cost paths to the destination form a set.

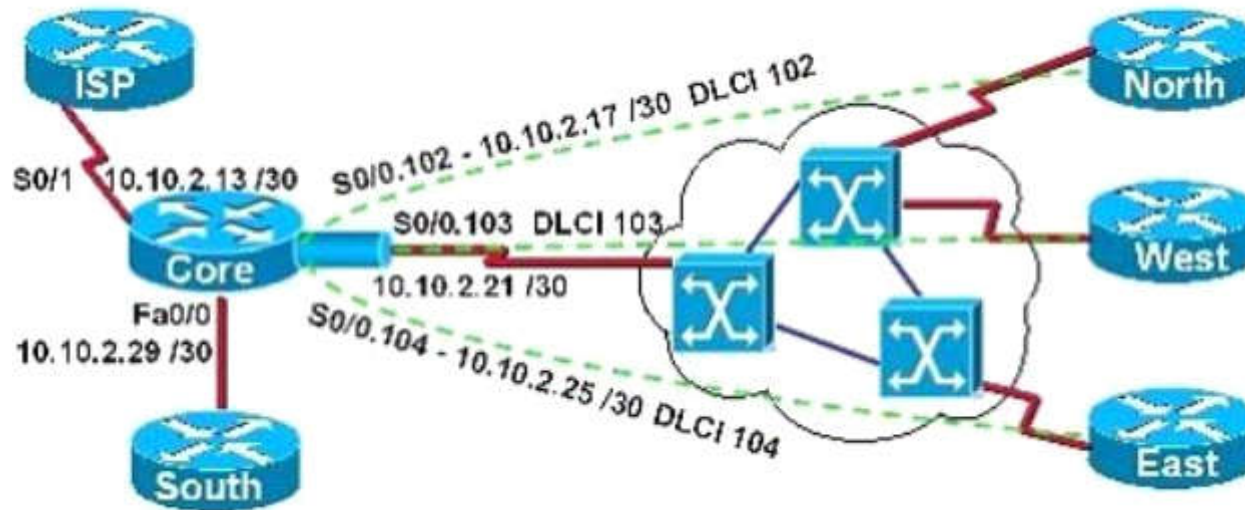
From this set, the neighbors that have an advertised metric less than the current routing table metric are considered feasible successors.

Feasible successors are viewed by a router as neighbors that are downstream with respect to the destination.

These neighbors and the associated metrics are placed in the forwarding table. When a neighbor changes the metric it has been advertising or a topology change occurs in the network, the set of feasible successors may have to be re-evaluated. However, this is not categorized as a route recomputation.

### QUESTION 339

Refer to the exhibit. The network associate is configuring OSPF on the Core router. All the connections to the branches should be participating in OSPF. The link to the ISP should NOT participate in OSPF and should only be advertised as the default route. What set of commands will properly configure the Core router?



- A. Core(config-router)# default-information originate  
Core(config-router)# network 10.0.0.0 0.255.255.255 area 0  
Core(config-router)# exit  
Core(config)# ip route 0.0.0.0 0.0.0.0 10.10.2.14
- B. Core(config-router)# default-information originate  
Core(config-router)# network 10.10.2.13 0.0.0.242 area 0  
Core(config-router)# exit  
Core(config)# ip route 0.0.0.0 0.0.0.0 10.10.2.14
- C. Core(config-router)# default-information originate  
Core(config-router)# network 10.10.2.16 0.0.0.15 area 0  
Core(config-router)# exit  
Core(config)# ip route 0.0.0.0 0.0.0.0 10.10.2.14
- D. Core(config-router)# default-information originate  
Core(config-router)# network 10.10.2.32 0.0.0.31 area 0  
Core(config-router)# exit  
Core(config)# ip route 0.0.0.0 0.0.0.0 10.10.2.14

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

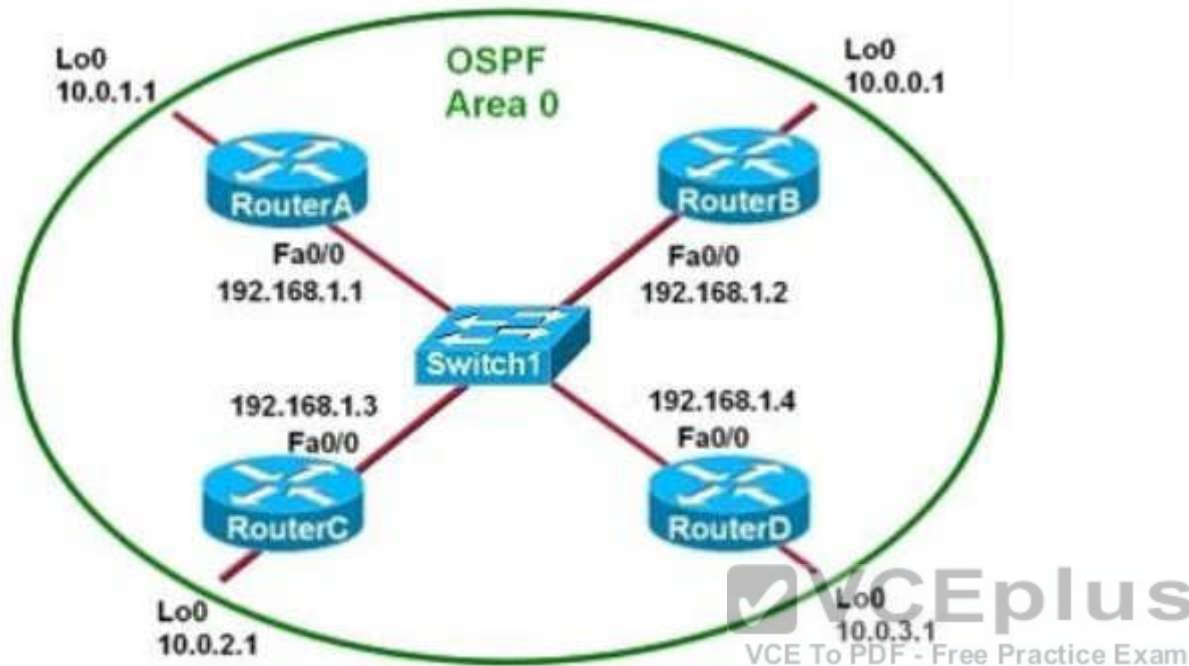
Explanation:

There are two ways to inject a default route into a normal area. 1. If the ASBR already has the default route in its routing table, you can advertise the existing 0.0.0.0/0 into the OSPF domain with the default-information originate router configuration command. 2. If the ASBR doesn't have a default route, you can add the keyword always to the default-information originate command (default-information originate always). This command will advertise a default route into the OSPF domain, regardless of whether it has a route to 0.0.0.0. Another benefit of adding always keyword is that it can add stability to the internetwork. For example, if the ASBR is learning a default route from another routing domain such as RIP and this route is flapping, then without the always keyword, each time the route flaps, the ASBR will send a new Type 5 LSA into the OSPF domain causing some instability inside the OSPF domain. With the always keyword, the ASBR will advertise the default inside the OSPF domain always. In the example shown here, only choice C is correct as the wildcard mask correctly specifies the 10.10.2.16 0.0.0.15 networks, which include all IP addresses in the 10.10.2.16-10.10.2.31 range. In this question we were told that the ISP link should NOT be configured for OSPF, making choice A incorrect.

[http://www.cisco.com/en/US/tech/tk365/technologies\\_configuration\\_example09186a00801ec9f0.shtml](http://www.cisco.com/en/US/tech/tk365/technologies_configuration_example09186a00801ec9f0.shtml)

**QUESTION 340**

Refer to the exhibit. Which two statements are true about the loopback address that is configured on RouterB? (Choose two.)



- A. It ensures that data will be forwarded by RouterB.
- B. It provides stability for the OSPF process on RouterB.
- C. It specifies that the router ID for RouterB should be 10.0.0.1.
- D. It decreases the metric for routes that are advertised from RouterB.
- E. It indicates that RouterB should be elected the DR for the LAN.

**Correct Answer:** BC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

A loopback interface never comes down even if the link is broken so it provides stability for the OSPF process (for example we use that loopback interface as the router-id) -B is correct.

The router-ID is chosen in the order below:

The highest IP address assigned to a loopback (logical) interface. If a loopback interface is not defined, the highest IP address of all active router's physical interfaces will be chosen. The loopback interface will be chosen as the router ID of RouterB-C is correct.

**QUESTION 341**

What is the default maximum number of equal-cost paths that can be placed into the routing table of a Cisco OSPF router?

- A. 2
- B. 4
- C. 16
- D. unlimited

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

4 is the default number of routes that OSPF will include in routing table if more than 4 equal cost routes exist for the same subnet. However, OSPF can include up to 16 equal cost routes in the routing table and perform load balancing amongst them. In order to configure this feature, you need to use the OSPF subcommand maximum-paths, i.e. maximum-paths 16.

**QUESTION 342**

Which parameter would you tune to affect the selection of a static route as a backup, when a dynamic protocol is also being used?

- A. hop count
- B. administrative distance
- C. link bandwidth
- D. link delay
- E. link cost

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

What Is Administrative Distance?

[http://www.cisco.com/en/US/tech/tk365/technologies\\_tech\\_note09186a0080094195.shtml](http://www.cisco.com/en/US/tech/tk365/technologies_tech_note09186a0080094195.shtml)

Administrative distance is the feature that routers use in order to select the best path.



Administrative distance defines the reliability of a routing protocol. Each routing protocol is prioritized in order of most to least reliable (believable) with the help of an administrative distance value. Lowest Administrative distance will be chosen first.

Route Source	Default Distance Values
Connected interface	0
Static route	1
Enhanced Interior Gateway Routing Protocol (EIGRP) summary route	5
External Border Gateway Protocol (BGP)	20
Internal EIGRP	90
IGRP	100
OSPF	110
Intermediate System-to-Intermediate System (IS-IS)	115
Routing Information Protocol (RIP)	120
Exterior Gateway Protocol (EGP)	140
On Demand Routing (ODR)	160
External EIGRP	170
Internal BGP	200
Unknown*	255

#### QUESTION 343

Which two are advantages of static routing when compared to dynamic routing? (Choose two.)

- A. Configuration complexity decreases as network size increases.
- B. Security increases because only the network administrator may change the routing table.

- C. Route summarization is computed automatically by the router.
- D. Routing tables adapt automatically to topology changes.
- E. An efficient algorithm is used to build routing tables, using automatic updates.
- F. Routing updates are automatically sent to neighbors.
- G. Routing traffic load is reduced when used in stub network links.

**Correct Answer:** BG

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

<http://www.ciscopress.com/articles/article.asp?p=24090&seqNum=6>

<http://www.ciscopress.com/articles/article.asp?p=24090>

#### **QUESTION 344**

Which command enables IPv6 forwarding on a Cisco router?

- A. ipv6 local
- B. ipv6 host
- C. ipv6 unicast-routing
- D. ipv6 neighbor



**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

<http://www.ciscopress.com/articles/article.asp?p=31948&seqNum=4>

The first step of enabling IPv6 on a Cisco router is the activation of IPv6 traffic forwarding to forward unicast IPv6 packets between network interfaces. By default, IPv6 traffic forwarding is disabled on Cisco routers.

The ipv6 unicast-routing command is used to enable the forwarding of IPv6 packets between interfaces on the router. The syntax for this command is as follows:

```
Router(config)#ipv6 unicast-routing
```

The ipv6 unicast-routing command is enabled on a global basis.

#### **QUESTION 345**

A router is running three routing processes: RIP, OSPF, and EIGRP, each configured with default characteristics. Each process learns a route to the same remote



network. If there are no static routes to the destination and none of the routes were redistributed, which route will be placed in the IP routing table?

- A. the route learned through EIGRP
- B. the route learned through OSPF
- C. the route learned through RIP
- D. the route with the lowest metric
- E. all three routes with the router load balancing

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:


[http://www.cisco.com/en/US/tech/tk365/technologies\\_tech\\_note09186a0080094195.shtml](http://www.cisco.com/en/US/tech/tk365/technologies_tech_note09186a0080094195.shtml)

Administrative distance is the feature that routers use in order to select the best path.

Administrative distance defines the reliability of a routing protocol. Each routing protocol is prioritized in order of most to least reliable (believable) with the help of an administrative distance value. Lowest Administrative distance will be chosen first.

#### QUESTION 346

Refer to the exhibit. Given the output for this command, if the router ID has not been manually set, what router ID will OSPF use for this router?



```
RouterD# show ip interface brief
Interface      IP-Address      OK? Method Status Protocol
FastEthernet0/0 192.168.5.3     YES manual  up      up
FastEthernet0/1 10.1.1.2        YES manual  up      up
Loopback0       172.16.5.1      YES NVRAM   up      up
Loopback1       10.154.154.1    YES NVRAM   up      up
```

- A. 10.1.1.2
- B. 10.154.154.1
- C. 172.16.5.1
- D. 192.168.5.3

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

CCNA Tutorial: The OSPF Router ID (RID)

<http://www.thebryantadvantage.com/CCNACertificationExamTutorialOSPFRouterIDRID.htm>

When determining the Router ID (RID) of an OSPF-enabled router, OSPF will always use the numerically highest IP address on the router's loopback interfaces, regardless of whether that loopback is OSPF-enabled.

What if there is no loopback?

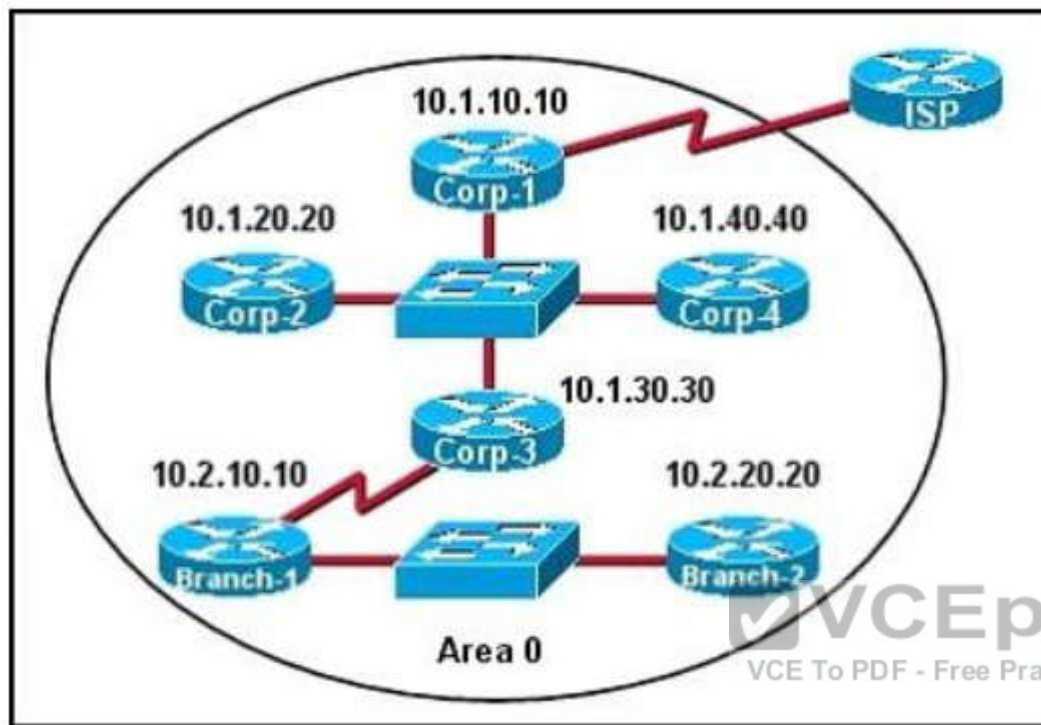
OSPF will then use the numerically highest IP address of the physical interfaces, regardless of whether that interface is OSPF-enabled.

**QUESTION 347**

The internetwork infrastructure of company XYZ consists of a single OSPF area as shown in the graphic. There is concern that a lack of router resources is impeding internetwork performance.

As part of examining the router resources, the OSPF DRs need to be known. All the router OSPF priorities are at the default and the router IDs are shown with each router.

Which routers are likely to have been elected as DR? (Choose two.)



- A. Corp-1
- B. Corp-2
- C. Corp-3
- D. Corp-4
- E. Branch-1
- F. Branch-2

**Correct Answer:** DF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

There are 2 segments on the topology above which are separated by Corp-3 router.

Each segment will have a DR so we have 2 DRs.

To select which router will become DR they will compare their router-IDs. The router with highest (best) router-ID will become DR. The router-ID is chosen in the order below:

The highest IP address assigned to a loopback (logical) interface.

If a loopback interface is not defined, the highest IP address of all active router's physical interfaces will be chosen.

In this question, the IP addresses of loopback interfaces are not mentioned so we will consider IP addresses of all active router's physical interfaces. Router Corp-4 (10.1.40.40) & Branch-2 (10.2.20.20) have highest "active" IP addresses so they will become DRs.

#### QUESTION 348

What does a router do if it has no EIGRP feasible successor route to a destination network and the successor route to that destination network is in active status?

- A. It routes all traffic that is addressed to the destination network to the interface indicated in the routing table.
- B. It sends a copy of its neighbor table to all adjacent routers.
- C. It sends a multicast query packet to all adjacent neighbors requesting available routing paths to the destination network.
- D. It broadcasts Hello packets to all routers in the network to re-establish neighbor adjacencies.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Introduction to EIGRP

Reference:

[http://www.cisco.com/en/US/tech/tk365/technologies\\_tech\\_note09186a0080093f07.shtml](http://www.cisco.com/en/US/tech/tk365/technologies_tech_note09186a0080093f07.shtml)

Feasible Successors

A destination entry is moved from the topology table to the routing table when there is a feasible successor. All minimum cost paths to the destination form a set.

From this set, the neighbors that have an advertised metric less than the current routing table metric are considered feasible successors.

Feasible successors are viewed by a router as neighbors that are downstream with respect to the destination.

These neighbors and the associated metrics are placed in the forwarding table.

When a neighbor changes the metric it has been advertising or a topology change occurs in the network, the set of feasible successors may have to be re-evaluated. However, this is not categorized as a route recomputation.

Route States

A topology table entry for a destination can have one of two states. A route is considered in the Passive state when a router is not performing a route recomputation. The route is in Active state when a router is undergoing a route recomputation. If there are always feasible successors, a route never has to go into Active state and avoids a route recomputation.

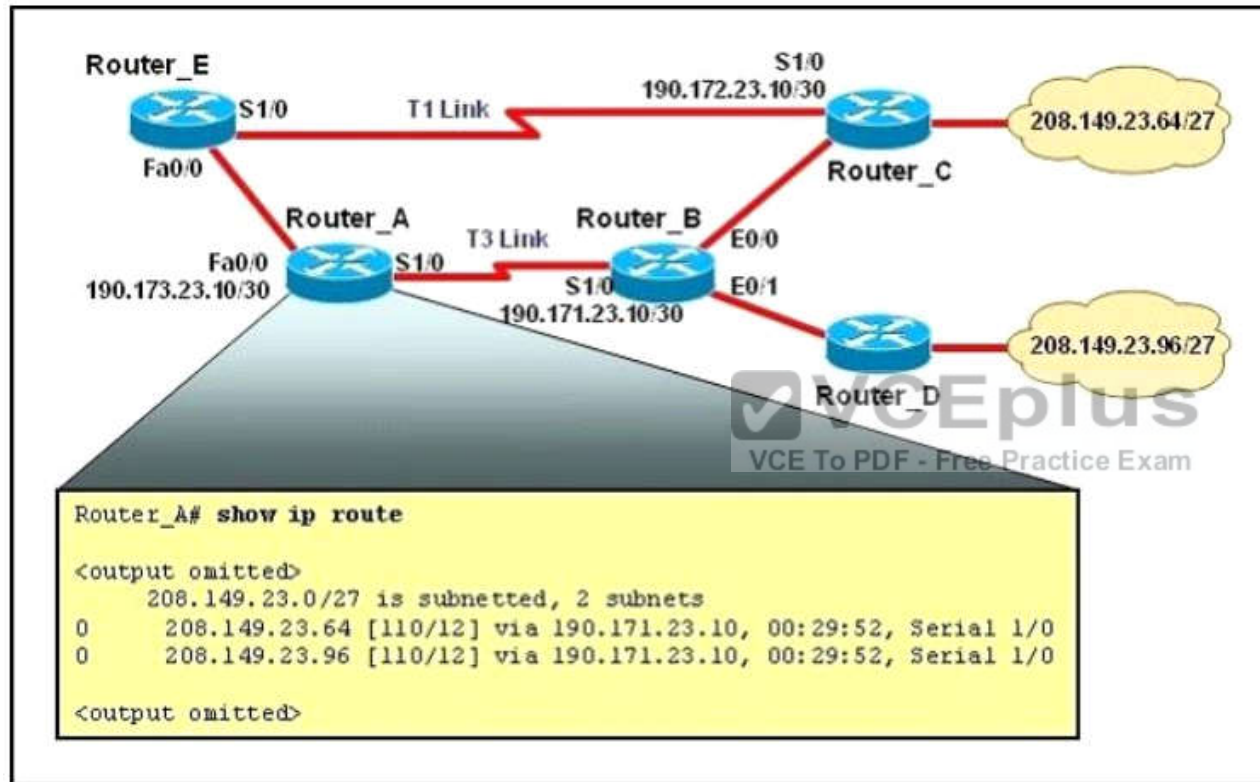
When there are no feasible successors, a route goes into Active state and a route recomputation occurs. A route recomputation commences with a router sending a query packet to all neighbors.

Neighboring routers can either reply if they have feasible successors for the destination or optionally return a query indicating that they are performing a route recomputation. While in Active state, a router cannot change the next-hop neighbor it is using to forward packets. Once all replies are received for a given query, the destination can transition to Passive state and a new successor can be selected.

When a link to a neighbor that is the only feasible successor goes down, all routes through that neighbor commence a route recomputation and enter the Active state.

#### QUESTION 349

Refer to the exhibit. The network is converged. After link-state advertisements are received from Router\_A, what information will Router\_E contain in its routing table for the subnets 208.149.23.64 and 208.149.23.96?



- A. O 208.149.23.64 [110/13] via 190.173.23.10, 00:00:07, FastEthernet 0/0 O 208.149.23.96 [110/13] via 190.173.23.10, 00:00:16, FastEthernet 0/0
- B. O 208.149.23.64 [110/1] via 190.172.23.10, 00:00:07, Serial 1/0 O 208.149.23.96 [110/3] via 190.173.23.10, 00:00:16, FastEthernet 0/0
- C. O 208.149.23.64 [110/13] via 190.172.23.10, 00:00:07, Serial 1/0 O 208.149.23.96 [110/13] via 190.172.23.10, 00:00:16, Serial 1/0 O 208.149.23.96 [110/13] via 190.173.23.10, 00:00:16, FastEthernet 0/0
- D. O 208.149.23.64 [110/3] via 190.172.23.10, 00:00:07, Serial 1/0 O 208.149.23.96 [110/3] via 190.172.23.10, 00:00:16, Serial 1/0

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Router\_E learns two subnets subnets 208.149.23.64 and 208.149.23.96 via Router\_A through FastEthernet interface. The interface cost is calculated with the formula  $108 / \text{Bandwidth}$ . For FastEthernet it is  $108 / 100 \text{ Mbps} = 108 / 100,000,000 = 1$ . Therefore, the cost is 12 (learned from Router\_A) + 1 = 13 for both subnets -B is not correct. The cost through T1 link is much higher than through T3 link (T1 cost =  $108 / 1.544 \text{ Mbps} = 64$ ; T3 cost =  $108 / 45 \text{ Mbps} = 2$ ) so surely OSPF will choose the path through T3 link -> Router\_E will choose the path from Router\_A through FastEthernet0/0, not Serial1/0 -C & D are not correct. In fact, we can quickly eliminate answers B, C and D because they contain at least one subnet learned from Serial1/0 -they are surely incorrect.

### QUESTION 350

Which command is used to display the collection of OSPF link states?

- A. show ip ospf link-state
- B. show ip ospf lsa database
- C. show ip ospf neighbors
- D. show ip ospf database

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

[http://www.cisco.com/en/US/docs/ios/iproute\\_ospf/command/iro\\_osp3.html#wp1\\_01217](http://www.cisco.com/en/US/docs/ios/iproute_ospf/command/iro_osp3.html#wp1_01217)

Examples

The following is sample output from the show ip ospf database command when no arguments or keywords are used:

Router# show ip ospf database

OSPF Router with id (192.168.239.66) (Process ID 300)



### Displaying Router Link States(Area 0.0.0.0)

Link ID	ADV Router	Age	Seq#	Checksum	Link count
172.16.21.6	172.16.21.6	1731	0x80002CFB	0x69BC	8
172.16.21.5	172.16.21.5	1112	0x800009D2	0xA2B8	5
172.16.1.2	172.16.1.2	1662	0x80000A98	0x4CB6	9
172.16.1.1	172.16.1.1	1115	0x800009B6	0x5F2C	1
172.16.1.5	172.16.1.5	1691	0x80002BC	0x2A1A	5
172.16.65.6	172.16.65.6	1395	0x80001947	0xEE1	4
172.16.241.5	172.16.241.5	1161	0x8000007C	0x7C70	1
172.16.27.6	172.16.27.6	1723	0x80000548	0x8641	4
172.16.70.6	172.16.70.6	1485	0x80000B97	0xEB84	6

### Displaying Net Link States(Area 0.0.0.0)

Link ID	ADV Router	Age	Seq#	Checksum
172.16.1.3	192.168.239.66	1245	0x800000EC	0x82E
172.16.240.0	172.16.241.5	1152	0x80000077	0x7A05
172.16.241.0	172.16.241.5	1152	0x80000070	0xAEB7
172.16.244.0	172.16.241.5	1152	0x80000071	0x95CB

**QUESTION 351**

What is the default administrative distance of OSPF?

- A. 90
- B. 100
- C. 110
- D. 120

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Default Distance Value Table

This table lists the administrative distance default values of the protocols that Cisco supports:





Route Source	Default Distance Values
Connected interface	0
Static route	1
Enhanced Interior Gateway Routing Protocol (EIGRP) summary route	5
External Border Gateway Protocol (BGP)	20
Internal EIGRP	90
IGRP	100
OSPF	110
Intermediate System-to-Intermediate System (IS-IS)	115
Routing Information Protocol (RIP)	120
Exterior Gateway Protocol (EGP)	140
On Demand Routing (ODR)	160
External EIGRP	170
Internal BGP	200
Unknown*	255

**QUESTION 352**

The following configuration is applied to a Layer 2 Switch:

```
interface fastethernet 0/4
switchport mode access
switchport port-security
switchport port-security mac-address 0000.1111.1111
switchport port-security maximum 2
switchport port-security
```

What is the result of the above configuration being applied to the switch?

- A. A host with a mac address of 0000.1111.1111 and up to two other hosts can connect to FastEthernet 0/4 simultaneously
- B. A host with a mac address of 0000.1111.1111 and one other host can connect to Fast Ethernet 0/4 simultaneously
- C. Violating addresses are dropped and no record of the violation is kept
- D. The switch can send an SNMP message to the network management station
- E. The port is effectively shutdown

**Correct Answer:** BD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

[http://www.cisco.com/en/US/docs/switches/lan/catalyst4500/12.2/20ewa/configuration/guide/port\\_sec.html](http://www.cisco.com/en/US/docs/switches/lan/catalyst4500/12.2/20ewa/configuration/guide/port_sec.html)



### QUESTION 353

Refer to the exhibit. Which of these correctly describes the results of port security violation of an unknown packet?

```
Switch(config)#interface fastethernet 0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport port-security
Switch(config-if)#switchport port-security maximum 3
Switch(config-if)#switchport port-security mac-address sticky
Switch(config-if)#end
```

- A. port enabled; unknown packets dropped; no SNMP or syslog messages
- B. port enabled; unknown packets dropped; SNMP or syslog messages
- C. port disabled; no SNMP or syslog messages
- D. port disabled; SNMP or syslog messages

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Configuring Port Security

<http://packetlife.net/blog/2010/may/3/port-security/>

We can view the default port security configuration with show port-security:

```
Switch# show port-security interface f0/13
Port Security          : Enabled
Port Status            : Secure-down
Violation Mode         : Shutdown
Aging Time             : 0 mins
Aging Type             : Absolute
SecureStatic Address Aging : Disabled
Maximum MAC Addresses  : 1
Total MAC Addresses    : 0
Configured MAC Addresses : 0
Sticky MAC Addresses   : 0
Last Source Address:Vlan : 0000.0000.0000:0
Security Violation Count : 0
```

<http://www.ciscopress.com/articles/article.asp?p=1722561>

Switchport Security Violations

The second piece of switchport port-security that must be understood is a security violation including what it is what causes it and what the different violation modes that exist. A switchport violation occurs in one of two situations:

When the maximum number of secure MAC addresses has been reached (by default, the maximum number of secure MAC addresses per switchport is limited to 1)

An address learned or configured on one secure interface is seen on another secure interface in the same VLAN

The action that the device takes when one of these violations occurs can be configured:

Protect--This mode permits traffic from known MAC addresses to continue to be forwarded while dropping traffic from unknown MAC addresses when over the allowed MAC address limit. When configured with this mode, no notification action is taken when traffic is dropped.

Restrict--This mode permits traffic from known MAC addresses to continue to be forwarded while dropping traffic from unknown MAC addresses when over the allowed MAC address limit. When configured with this mode, a syslog message is logged, a Simple Network Management Protocol (SNMP) trap is sent, and a violation counter is incremented when traffic is dropped.

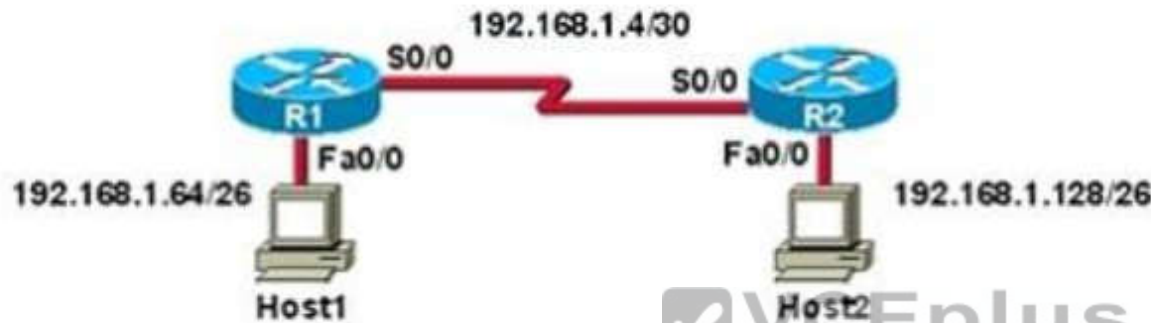
**Shutdown**--This mode is the default violation mode; when in this mode, the switch will automatically force the switchport into an error disabled (err-disable) state when a violation occurs. While in this state, the switchport forwards no traffic. The switchport can be brought out of this error disabled state by issuing the errdisable recovery cause CLI command or by disabling and re-enabling the switchport.

**Shutdown VLAN**--This mode mimics the behavior of the shutdown mode but limits the error disabled state the specific violating VLAN.

#### QUESTION 354

Refer to the exhibit. A technician pastes the configurations in the exhibit into the two new routers shown. Otherwise, the routers are configured with their default configurations. A ping from Host1 to Host2 fails, but the technician is able to ping the S0/0 interface of R2 from Host1.

The configurations of the hosts have been verified as correct. What is the cause of the problem?



#### Configuration for R1:

```
interface fa0/0
ip address 192.168.1.65 255.255.255.192
no shutdown
interface serial 0/0
ip address 192.168.1.5 255.255.255.252
no shutdown
```

#### Configuration for R2:

```
interface fa0/0
ip address 192.168.1.129 255.255.255.192
no shutdown
interface serial 0/0
ip address 192.168.1.6 255.255.255.252
no shutdown
ip route 192.168.1.64 255.255.255.192 s0/0
```

- A. The serial cable on R1 needs to be replaced.
- B. The interfaces on R2 are not configured properly.
- C. R1 has no route to the 192.168.1.128 network.
- D. The IP addressing scheme has overlapping subnetworks.
- E. The ip subnet-zero command must be configured on both routers.

**Correct Answer: C**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

Explanation:

Whenever a node needs to send data to another node on a network, it must first know where to send it. If the node cannot directly connect to the destination node, it has to send it via other nodes along a proper route to the destination node. A remote network is a network that can only be reached by sending the packet to another router. Remote networks are added to the routing table using either a dynamic routing protocol or by configuring static routes. Static routes are routes to networks that a network administrator manually configured. So R should have static route for the 192.168.1.128.

**QUESTION 355**

Refer to the exhibit.

What three actions will the switch take when a frame with an unknown source MAC address arrives at the interface? (Choose three.)

```
Switch# show port-security interface fa0/20
Port Security           : Enabled
Port Status             : Secure-up
Violation Mode          : Restrict
Aging Time              : 3 mins
Aging Type              : Inactivity
SecureStatic Address Aging : Disabled
Maximum MAC Addresses   : 2
Total MAC Addresses     : 2
Configured MAC Addresses : 0
Sticky MAC Addresses    : 2
Last Source Address:Vlan : 0009.7C10.8E8C:50
Security Violation Count : 1
```

- A. Send an SNMP trap.
- B. Send a syslog message.

- C. Increment the Security Violation counter.
- D. Forward the traffic.
- E. Write the MAC address to the startup-config.
- F. Shut down the port.

**Correct Answer:** ABC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Switchport Security Concepts and Configuration

<http://www.ciscopress.com/articles/article.asp?p=1722561>

Switchport Security Violations

The second piece of switchport port-security that must be understood is a security violation including what it is what causes it and what the different violation modes that exist. A switchport violation occurs in one of two situations:

When the maximum number of secure MAC addresses has been reached (by default, the maximum number of secure MAC addresses per switchport is limited to 1).

An address learned or configured on one secure interface is seen on another secure interface in the same VLAN.

The action that the device takes when one of these violations occurs can be configured:

Protect--This mode permits traffic from known MAC addresses to continue to be forwarded while dropping traffic from unknown MAC addresses when over the allowed MAC address limit. When configured with this mode, no notification action is taken when traffic is dropped.

Restrict--This mode permits traffic from known MAC addresses to continue to be forwarded while dropping traffic from unknown MAC addresses when over the allowed MAC address limit. When configured with this mode, a syslog message is logged, a Simple Network Management Protocol (SNMP) trap is sent, and a violation counter is incremented when traffic is dropped.

Shutdown--This mode is the default violation mode; when in this mode, the switch will automatically force the switchport into an error disabled (err-disable) state when a violation occurs. While in this state, the switchport forwards no traffic. The switchport can be brought out of this error disabled state by issuing the errdisable recovery cause CLI command or by disabling and re-enabling the switchport.

Shutdown VLAN--This mode mimics the behavior of the shutdown mode but limits the error disabled state the specific violating VLAN.

**QUESTION 356**

What does the frame-relay interface-dlci command configure?

- A. local DLCI on the subinterface
- B. remote DLCI on the main interface
- C. remote DLCI on the subinterface
- D. local DLCI on the main interface

**Correct Answer:** A

**Section:** (none)



## Explanation

### Explanation/Reference:

Explanation:

Frame Relay for ICND Exam

<http://www.ciscopress.com/articles/article.asp?p=100603&seqNum=3>

To assign a data-link connection identifier (DLCI) to a specified Frame Relay subinterface on the router or access server, or to assign a specific permanent virtual circuit (PVC) to a DLCI, or to apply a virtual template configuration for a PPP session, use the frame-relay interface-dlci interface configuration command.

Example 4-23 Example of frame-relay interface-dlci Command and the Output of show frame-relay map

R4(config)#interface s1/2.403 point-to-point

R4(config-subif)#frame-relay interface-dlci ?

<16-1007> Define a switched or locally terminated DLCI

R4(config-subif)#frame-relay interface-dlci 403 ?

cisco Use CISCO Encapsulation

ietf Use RFC1490/RFC2427 Encapsulation

ppp Use RFC1973 Encapsulation to support PPP over FR protocol Optional protocol information for remote end

<cr>

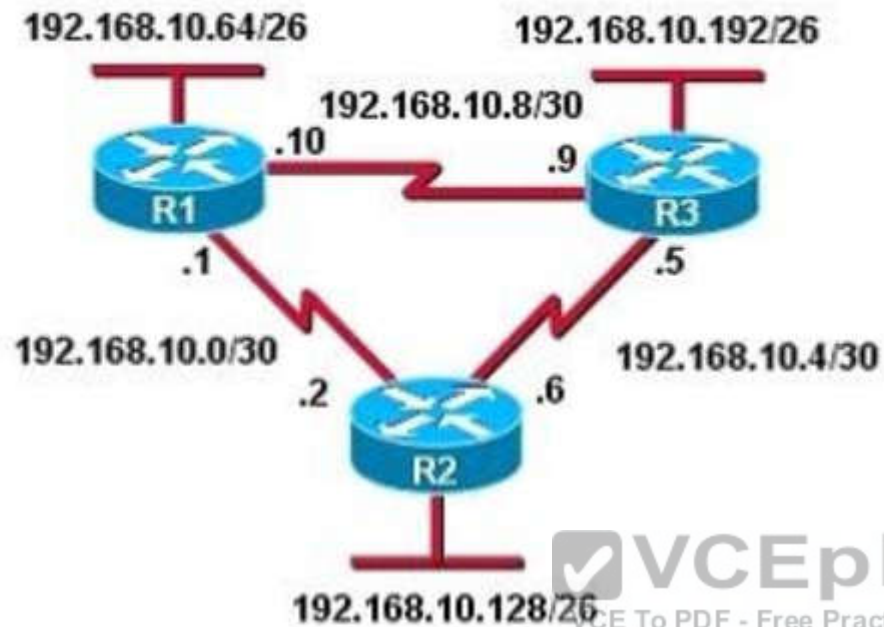
R4#show frame-relay map

Serial1/2.403 (up): point-to-point dlci, dlci 403(0xC9,0x3090), broadcast status defined, active

R4#

### QUESTION 357

Refer to the exhibit. Based on the exhibited routing table, how will packets from a host within the 192.168.10.192/26 LAN be forwarded to 192.168.10.1?



R3# **show ip route**

Gateway of last resort is not set

192.168.10.0/24 is variably subnetted, 6 subnets, 2 masks

- D 192.168.10.64/26 [90/2195456] via 192.168.10.9, 00:03:31, Serial0/0
- D 192.168.10.0/30 [90/2681856] via 192.168.10.9, 00:03:31, Serial0/0  
[90/2681856] via 192.168.10.5, 00:03:31, Serial0/1
- C 192.168.10.4/30 is directly connected, Serial 0/1
- C 192.168.10.8/30 is directly connected, Serial 0/0
- C 192.168.10.192/26 is directly connected, FastEthernet0/0
- D 192.168.10.128/26 [90/2195456] via 192.168.10.5, 00:03:31, Serial 0/1



- A. The router will forward packets from R3 to R2 to R1.
- B. The router will forward packets from R3 to R1 to R2.
- C. The router will forward packets from R3 to R2 to R1 AND from R3 to R1.
- D. The router will forward packets from R3 to R1.

**Correct Answer:** C

**Section:** (none)

**Explanation**

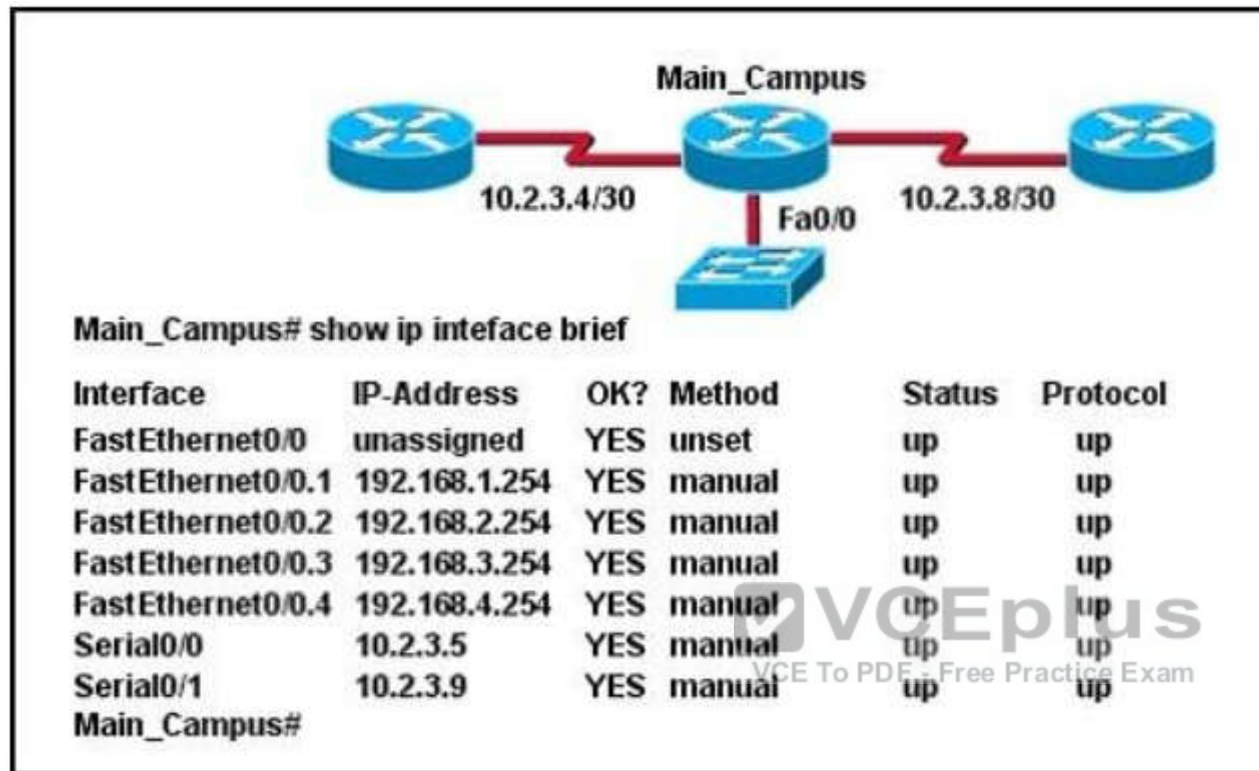
**Explanation/Reference:**

Explanation:

From the routing table we learn that network 192.168.10.0/30 is learned via 2 equal-cost paths (192.168.10.9 & 192.168.10.5) - traffic to this network will be load-balancing.

**QUESTION 358**

Refer to the exhibit. What information about the interfaces on the Main\_Campus router is true?



- A. The LAN interfaces are configured on different subnets.
- B. Interface FastEthernet 0/0 is configured as a trunk.
- C. The Layer 2 protocol of interface Serial 0/1 is NOT operational.
- D. The router is a modular router with five FastEthernet interfaces.
- E. Interface FastEthernet 0/0 is administratively deactivated.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

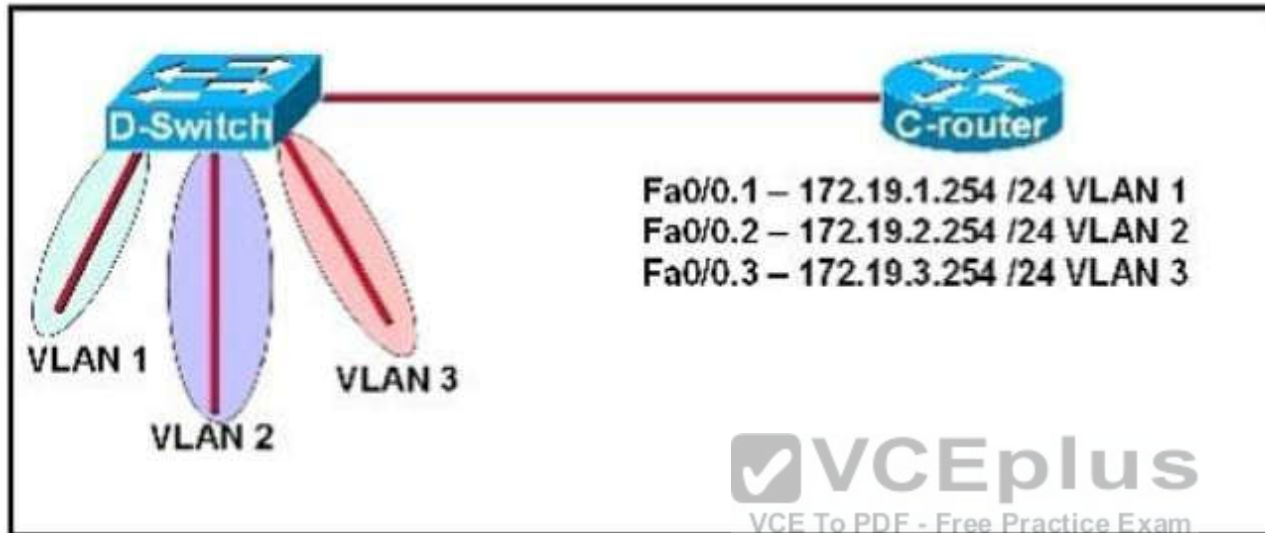
Explanation:

Interface fa0/0 breaks into sub interface and Main\_Campus router is connected with switch via fa0/0. Subinterfaces configured with different subnet mask so its

seem switch has multiple vlans and allow communication between vlan, router and inter-vlan we need to make a trunk port. So B will be the correct answer.

#### QUESTION 359

Refer to the exhibit. C-router is to be used as a "router-on-a-stick" to route between the VLANs. All the interfaces have been properly configured and IP routing is operational. The hosts in the VLANs have been configured with the appropriate default gateway. What is true about this configuration?



- A. These commands need to be added to the configuration:  
C-router(config)# router eigrp 123  
C-router(config-router)# network 172.19.0.0
- B. These commands need to be added to the configuration:  
C-router(config)# router ospf 1  
C-router(config-router)# network 172.19.0.0 0.0.3.255 area 0
- C. These commands need to be added to the configuration:  
C-router(config)# router rip  
C-router(config-router)# network 172.19.0.0
- D. No further routing configuration is required.

**Correct Answer: D**

**Section: (none)**

**Explanation**

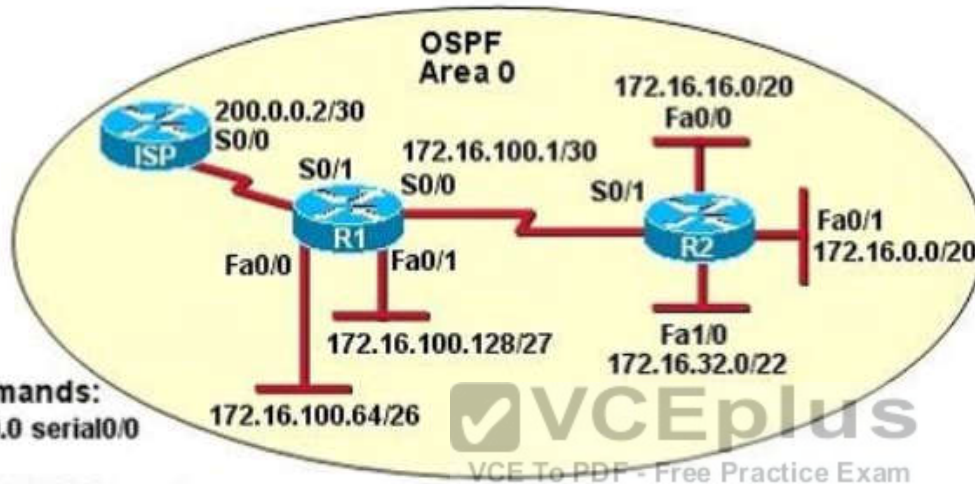
**Explanation/Reference:**

Explanation:

[http://www.cisco.com/en/US/tech/tk389/tk815/technologies\\_configuration\\_example09186a00800949fd.shtml](http://www.cisco.com/en/US/tech/tk389/tk815/technologies_configuration_example09186a00800949fd.shtml)  
<https://learningnetwork.cisco.com/servlet/JiveServlet/download/5669-2461/Router%20on%20a%20Stick.pdf>

### QUESTION 360

Refer to the exhibit. Assume that all router interfaces are operational and correctly configured. In addition, assume that OSPF has been correctly configured on router R2. How will the default route configured on R1 affect the operation of R2?



- A. Any packet destined for a network that is not directly connected to router R1 will be dropped.
- B. Any packet destined for a network that is not directly connected to router R2 will be dropped immediately.
- C. Any packet destined for a network that is not directly connected to router R2 will be dropped immediately because of the lack of a gateway on R1.
- D. The networks directly connected to router R2 will not be able to communicate with the 172.16.100.0, 172.16.100.128, and 172.16.100.64 subnetworks.
- E. Any packet destined for a network that is not referenced in the routing table of router R2 will be directed to R1. R1 will then send that packet back to R2 and a routing loop will occur.

**Correct Answer:** E

**Section:** (none)

**Explanation**

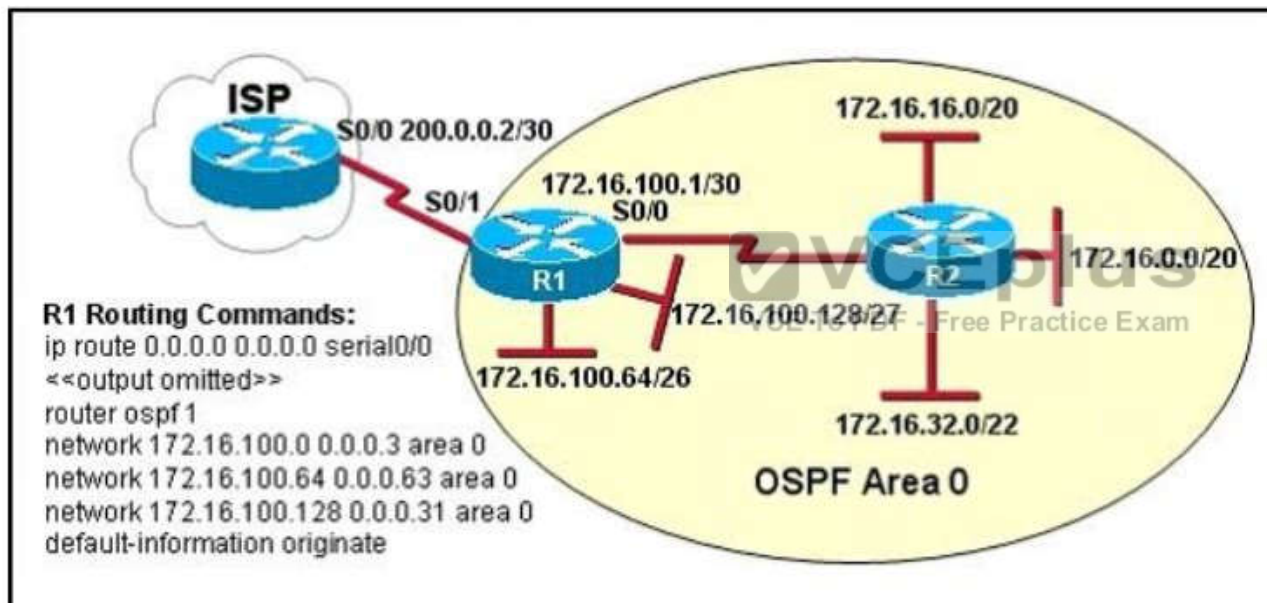
**Explanation/Reference:**

**Explanation:**

First, notice that the more-specific routes will always be favored over less-specific routes regardless of the administrative distance set for a protocol. In this case, because we use OSPF for three networks (172.16.100.0 0.0.0.3, 172.16.100.64 0.0.0.63, 172.16.100.128 0.0.0.31) so the packets destined for these networks will not be affected by the default route. The default route configured on R1 "ip route 0.0.0.0 0.0.0.0 serial0/0" will send any packet whose destination network is not referenced in the routing table of router R1 to R2, it doesn't drop anything so answers A, B and C are not correct. D is not correct too because these routes are declared in R1 and the question says that "OSPF has been correctly configured on router R2, so network directly connected to router R2 can communicate with those three subnetworks. As said above, the default route configured on R1 will send any packet destined for a network that is not referenced in its routing table to R2; R2 in turn sends it to R1 because it is the only way and a routing loop will occur.

**QUESTION 361**

Refer to the exhibit. Assume that all of the router interfaces are operational and configured correctly. How will router R2 be affected by the configuration of R1 that is shown in the exhibit?



- A. Router R2 will not form a neighbor relationship with R1.
- B. Router R2 will obtain a full routing table, including a default route, from R1.
- C. R2 will obtain OSPF updates from R1, but will not obtain a default route from R1.
- D. R2 will not have a route for the directly connected serial network, but all other directly connected networks will be present, as well as the two Ethernet networks connected to R1.

**Correct Answer: A**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

Explanation:

"ip route 0.0.0.0 0.0.0.0 serial0/0" is causing a loop. configuration is going to cause a loop and the link between R1 and R2 will be congested, OSPF will not perform relationship between them.

From its name, OSPF is a Link-State routing protocol, and the link state between R1 and R2 is simply down or something like that.

**QUESTION 362**

Refer to the exhibit. The show interfaces serial 0/1 command was issued on the R10-1 router.

Based on the output displayed which statement is correct?



```
R10-1# show interfaces serial 0/1
Serial0/1 is up, line protocol is up
Hardware is cxBus Serial
MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, reliability 255/255,
    txload 1/255, rxload 1/255
Encapsulation HDLC, crc 16, loopback not set
Keepalive set (10 sec)
Last input 00:00:09, output 00:00:07, output hang 5w2d
Last clearing of "show interface" counters 00:39:17
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/1000/64/0 (size/max total/threshold/drops)
    Conversations 0/1/256 (active/max active/max total)
    Reserved Conversations 0/0 (allocated/max allocated)
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
277 packets input, 16980 bytes, 0 no buffer
Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
277 packets output, 17106 bytes, 0 underruns
0 output errors, 0 collisions, 0 interface resets
0 output buffer failures, 0 output buffers swapped out
0 carrier transitions
RTS up, CTS up, DTR up, DCD up, DSR up
```

- A. The cable connected to the serial 0/1 interface of the R1-1 router is a DTE cable.
- B. The R10-1 router can ping the router interface connected to the serial 0/1 interface.
- C. The clock rate used for interface serial 0/1 of the R10-1 router is 1,544,000bits per second.
- D. The CSU used with the serial 0/1 interface of the R10-1 router has lost connection to the service provider.
- E. The interface of the remote router connected to the serial 0/1 interface of the R10-1 router is using the default serial interface encapsulation.

**Correct Answer:** E

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Cisco High-Level Data Link Controller (HDLC) is the Cisco proprietary protocol for Cisco HDLC is the default encapsulation type for the serial interfaces.

**QUESTION 363**

The output of the show frame-relay pvc command shows "PVC STATUS = INACTIVE". What does this mean?

- A. The PVC is configured correctly and is operating normally, but no data packets have been detected for more than five minutes.
- B. The PVC is configured correctly, is operating normally, and is no longer actively seeking the address of the remote router.
- C. The PVC is configured correctly, is operating normally, and is waiting for interesting traffic to trigger a call to the remote router.
- D. The PVC is configured correctly on the local switch, but there is a problem on the remote end of the PVC
- E. The PVC is not configured on the local switch.

**Correct Answer:** D

**Section:** (none)

**Explanation**



**Explanation/Reference:**

Explanation:

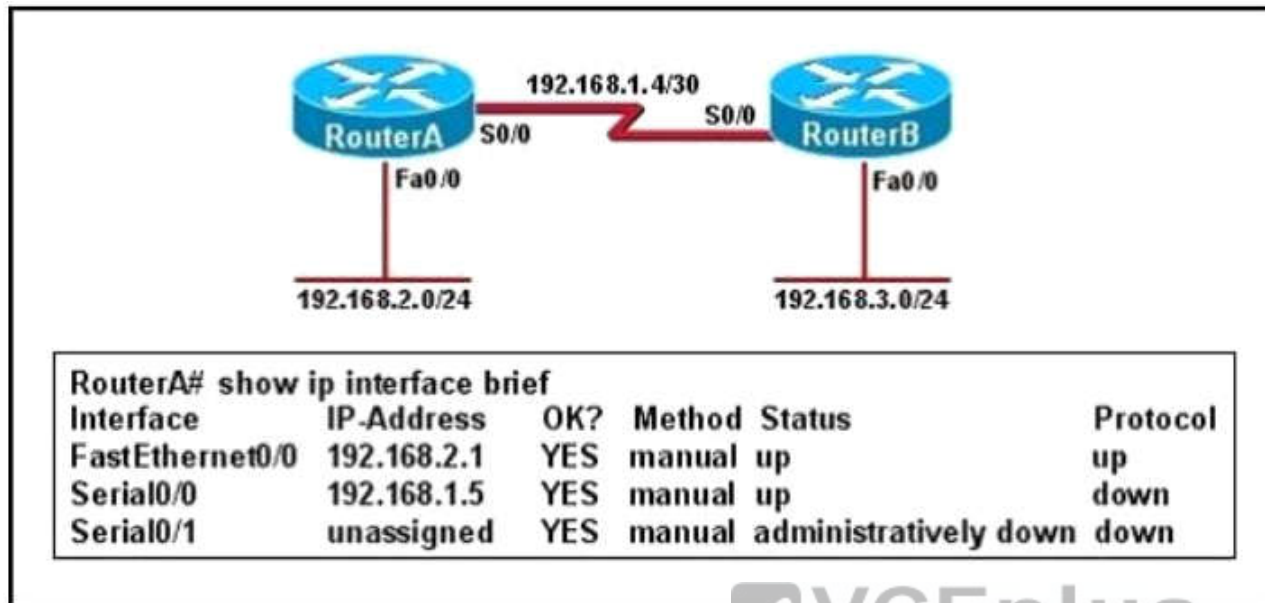
The PVC STATUS displays the status of the PVC. The DCE device creates and sends the report to the DTE devices. There are 4 statuses:

ACTIVE: the PVC is operational and can transmit data  
INACTIVE: the connection from the local router to the switch is working, but the connection to the remote router is not available  
DELETED: the PVC is not present and no LMI information is being received from the Frame Relay switch  
STATIC: the Local Management Interface (LMI) mechanism on the interface is disabled (by using the "no keepalive" command). This status is rarely seen.

**QUESTION 364**

Refer to the exhibit. Hosts in network 192.168.2.0 are unable to reach hosts in network 192.168.3.0. Based on the output from RouterA, what are two possible reasons for the failure? (Choose two.)





- A. The cable that is connected to S0/0 on RouterA is faulty.
- B. Interface S0/0 on RouterB is administratively down.
- C. Interface S0/0 on RouterA is configured with an incorrect subnet mask.
- D. The IP address that is configured on S0/0 of RouterB is not in the correct subnet.
- E. Interface S0/0 on RouterA is not receiving a clock signal from the CSU/DSU.
- F. The encapsulation that is configured on S0/0 of RouterB does not match the encapsulation that is configured on S0/0 of RouterA

**Correct Answer:** EF

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

[http://www.cisco.com/en/US/docs/routers/access/800/819/software/configuration/Guide/6ser\\_conf.html](http://www.cisco.com/en/US/docs/routers/access/800/819/software/configuration/Guide/6ser_conf.html)

### QUESTION 365

Refer to the exhibit. The output that is shown is generated at a switch. Which three statements are true? (Choose three.)

```
Switch# show spanning-tree vlan 30
VLAN0030
Spanning tree enabled protocol rstp
Root ID Priority 24606
Address 00d0.047b.2800
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Bridge ID Priority 24606 (priority 24576 sys-id-ext 30)
Address 00d0.047b.2800
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 300
```

Interface	Role	Sts	Cost	Prio.Nbr	Type
Fa1/1	Desg	FWD	4	128.1	p2p
Fa1/2	Desg	FWD	4	128.2	p2p
Fa5/1	Desg	FWD	4	128.257	p2p

- A. All ports will be in a state of discarding, learning, or forwarding.
- B. Thirty VLANs have been configured on this switch.
- C. The bridge priority is lower than the default value for spanning tree.
- D. All interfaces that are shown are on shared media.
- E. All designated ports are in a forwarding state.
- F. This switch must be the root bridge for all VLANs on this switch.

**Correct Answer:** ACE

**Section:** (none)

**Explanation**

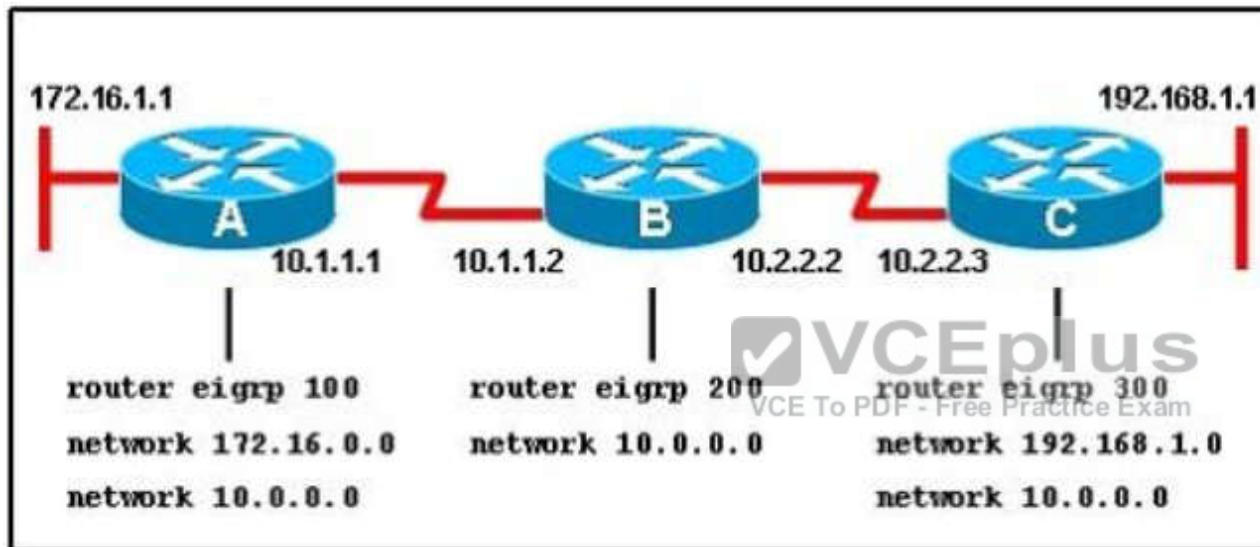
**Explanation/Reference:**

Explanation:

From the output, we see that all ports are in Designated role (forwarding state) -> A and E are correct.  
The command "show spanning-tree vlan 30" only shows us information about VLAN 30. We don't know how many VLANs exist in this switch -> B is not correct.  
The bridge priority of this switch is 24606 which is lower than the default value bridge priority 32768 -> C is correct.  
All three interfaces on this switch have the connection type "p2p", which means Point-to-point environment -not a shared media >; D is not correct.  
The only thing we can specify is this switch is the root bridge for VLAN 30 but we cannot guarantee it is also the root bridge for other VLANs -> F is not correct.

#### QUESTION 366

Refer to the exhibit. When running EIGRP, what is required for RouterA to exchange routing updates with RouterC?



- A. AS numbers must be changed to match on all the routers
- B. Loopback interfaces must be configured so a DR is elected
- C. The no auto-summary command is needed on Router A and Router C
- D. Router B needs to have two network statements, one for each connected network

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Here we required same autonomous system between router A,B,C. Routing updates always exchange between in same EIGRP autonomous system. You

can configure more than one EIGRP autonomous system on the same router. This is typically done at a redistribution point where two EIGRP autonomous systems are interconnected. Individual router interfaces should only be included within a single EIGRP autonomous system. Cisco does not recommend running multiple EIGRP autonomous systems on the same set of interfaces on the router. If multiple EIGRP autonomous systems are used with multiple points of mutual redistribution, it can cause discrepancies in the EIGRP topology table if correct filtering is not performed at the redistribution points. If possible, Cisco recommends you configure only one EIGRP autonomous system in any single autonomous system.  
[http://www.cisco.com/en/US/tech/tk365/technologies\\_tech\\_note09186a0080093f07.shtml](http://www.cisco.com/en/US/tech/tk365/technologies_tech_note09186a0080093f07.shtml)

**QUESTION 367**

Which term describes a spanning-tree network that has all switch ports in either the blocking or forwarding state?

- A. converged
- B. redundant
- C. provisioned
- D. spanned

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

Spanning Tree Protocol convergence (Layer 2 convergence) happens when bridges and switches have transitioned to either the forwarding or blocking state. When layer 2 is converged, root bridge is elected and all port roles (Root, Designated and Non-Designated) in all switches are selected.

**QUESTION 368**

What is the purpose of LCP?

- A. to perform authentication
- B. to negotiate control options
- C. to encapsulate multiple protocols
- D. to specify asynchronous versus synchronous

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

<http://www.ietf.org/rfc/rfc1661.txt>

In order to be sufficiently versatile to be portable to a wide variety of environments, PPP provides a Link Control Protocol (LCP). The LCP is used to automatically

agree upon the encapsulation format options, handle varying limits on sizes of packets, detect a looped-back link and other common misconfiguration errors, and terminate the link. Other optional facilities provided are authentication of the identity of its peer on the link, and determination when a link is functioning properly and when it is failing.

**QUESTION 369**

What can be done to secure the virtual terminal interfaces on a router? (Choose two.)

- A. Administratively shut down the interface.
- B. Physically secure the interface.
- C. Create an access list and apply it to the virtual terminal interfaces with the access-group command.
- D. Configure a virtual terminal password and login process.
- E. Enter an access list and apply it to the virtual terminal interfaces using the access-class command.

**Correct Answer:** DE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

It is a waste to administratively shut down the interface. Moreover, someone can still access the virtual terminal interfaces via other interfaces -> A is not correct.

We cannot physically secure a virtual interface because it is "virtual" -> B is not correct.

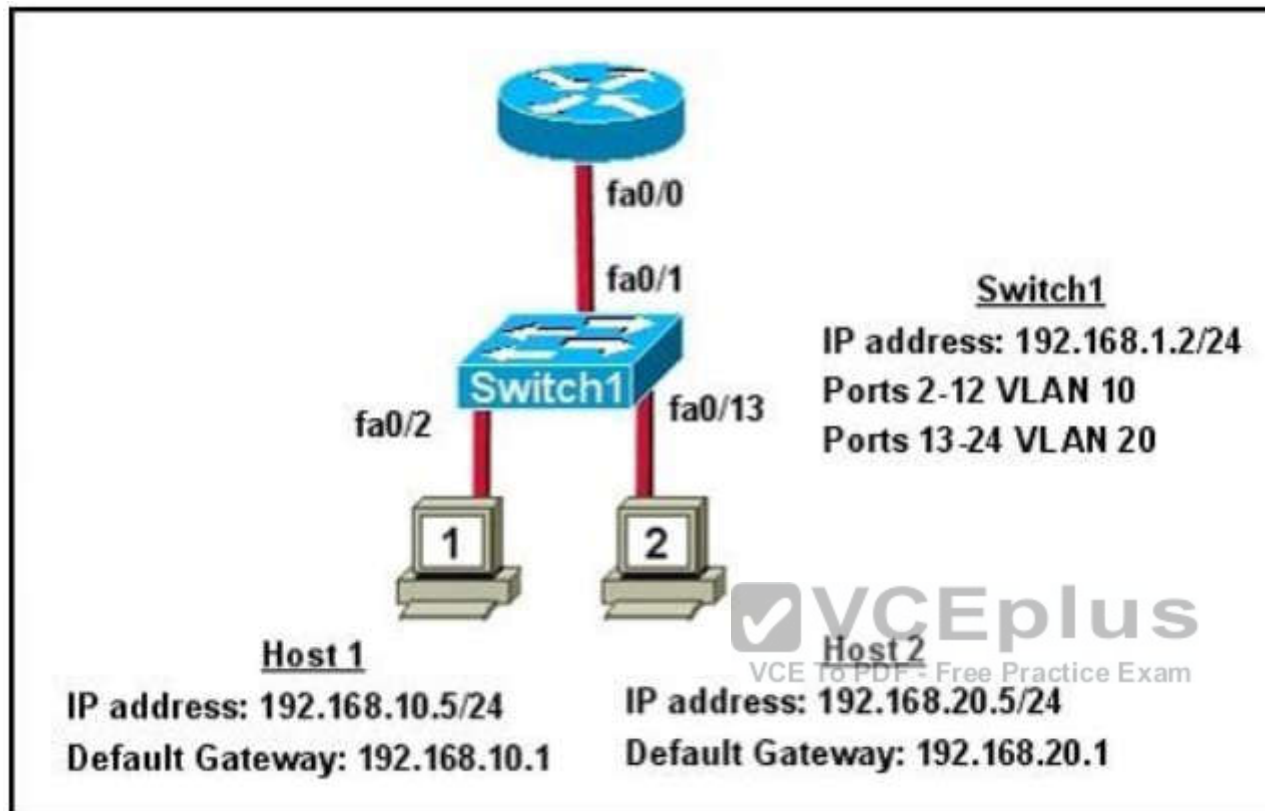
To apply an access list to a virtual terminal interface we must use the "access-class" command.

The "access-group" command is only used to apply an access list to a physical interface -> C is not correct; E is correct.

The simplest way to secure the virtual terminal interface is to configure a username & password to prevent unauthorized login -> D is correct.

**QUESTION 370**

Refer to the exhibit. What commands must be configured on the 2950 switch and the router to allow communication between host 1 and host 2? (Choose two.)



- A. Router(config)# interface fastethernet 0/0  
Router(config-if)# ip address 192.168.1.1 255.255.255.0  
Router(config-if)# no shut down



- B. Router(config)# interface fastethernet 0/0  
Router(config-if)# no shut down  
Router(config)# interface fastethernet 0/0.1  
Router(config-subif)# encapsulation dot1q 10  
Router(config-subif)# ip address 192.168.10.1 255.255.255.0  
Router(config)# interface fastethernet 0/0.2  
Router(config-subif)# encapsulation dot1q 20  
Router(config-subif)# ip address 192.168.20.1 255.255.255.0
- C. Router(config)# router eigrp 100  
Router(config-router)# network 192.168.10.0  
Router(config-router)# network 192.168.20.0
- D. Switch1(config)# vlan database  
Switch1(config-vlan)# vtp domain XYZ  
Switch1(config-vlan)# vtp server
- E. Switch1(config)# interface fastethernet 0/1  
Switch1(config-if)# switchport mode trunk
- F. Switch1(config)# interface vlan 1  
Switch1(config-if)# ip default-gateway 192.168.1.1

**Correct Answer:** BE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

[http://www.cisco.com/en/US/tech/tk389/tk815/technologies\\_configuration\\_example09186a00800949fd.shtml](http://www.cisco.com/en/US/tech/tk389/tk815/technologies_configuration_example09186a00800949fd.shtml)

<https://learningnetwork.cisco.com/servlet/JiveServlet/download/5669-2461/Router%20on%20a%20Stick.pdf>

#### **QUESTION 371**

What command is used to verify the DLCI destination address in a Frame Relay static configuration?

- A. show frame-relay pvc

- B. show frame-relay lmi
- C. show frame-relay map
- D. show frame relay end-to-end

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

This command is used to verify whether the frame-relay inverse-arp command resolved a remote IP address to a local DLCI. Use the show frame-relay map command to display the current map entries and information about the connections.

#### **QUESTION 372**

Which statement about access lists that are applied to an interface is true?

- A. You can place as many access lists as you want on any interface.
- B. You can apply only one access list on any interface.
- C. You can configure one access list, per direction, per Layer 3 protocol.
- D. You can apply multiple access lists with the same protocol or in different directions.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 373**

Which command enables RSTP on a switch?

- A. spanning-tree mode rapid-pvst
- B. spanning-tree uplinkfast
- C. spanning-tree backbonefast
- D. spanning-tree mode mst

**Correct Answer:** A

**Section:** (none)

**Explanation**



### Explanation/Reference:

#### QUESTION 374

Refer to the exhibit. Which statement is true?

```
SwitchA# show spanning-tree vlan 20
```

```
VLAN0020
```

```
Spanning tree enabled protocol rstp
```

```
Root ID      Priority      24596
Address      0017.596d.2a00
Cost         38
Port         11(FastEthernet0/10)
Hello Time    2 sec  Max Age 20 sec  Forward Delay 15 sec
```

```
Bridge ID    Priority      28692 (priority 28672 sys-id-ext 1)
Address      0017.596d.1580
Hello Time    2 sec  Max Age 20 sec  Forward Delay 15 sec
Aging Time    300
```

Interface	Role	Sts	Cost	Prio.Nbr	Type
Fa0/11	Root	FWD	19	128.11	P2p
Fa0/12	Altn	BLK	19	128.12	P2p

- A. The Fa0/11 role confirms that SwitchA is the root bridge for VLAN 20.
- B. VLAN 20 is running the Per VLAN Spanning Tree Protocol.
- C. The MAC address of the root bridge is 0017.596d.1580.
- D. SwitchA is not the root bridge, because not all the interface roles are designated.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 375**

What are OSPF's default hello and dead timers? (Choose two)

- A. The hello timer is 10 seconds.
- B. The hello timer is 60 seconds.
- C. The dead timer is 40 seconds.
- D. The dead timer is 120 seconds.
- E. The hello timer is 20 seconds.

**Correct Answer:** AC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 376**

Which interface counter can you use to diagnose a duplex mismatch problem?

- A. runts
- B. CRC errors
- C. no carrier
- D. late collisions
- E. deferred
- F. giants

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 377**

What is the maximum cost for hello and dead packets in OSPF? (Choose two)

- A. hello 10

- B. hello 60
- C. dead 40
- D. dead 120

**Correct Answer:** AC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 378**

Which WAN solution is secured by default?

- A. VPN
- B. DSL
- C. LCP
- D. PPP

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 379**

Which two statement about proxy ARP are true? (Choose two)

- A. It is supported on networks without ARP.
- B. It allows machines to spoof packets.
- C. It requires larger ARP tables.
- D. It reduces the amount of ARP traffic.

**Correct Answer:** BC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 380**

What is the minimum command to turn on encryption on SNMP?

- A. SNMPV3authpriv
- B. SMNPV3authnopriv
- C. SNMPV3noauthpriv
- D. SMNPV2authnopriv
- E. SNMPV2NOAUTHPRIV
- F. SNMPV2AUTHNOPRIV

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 381**

What about HSRP IP Address is true?

- A. If it's part of the LAN
- B. Part of all other networks
- C. Local to the interface
- D. Appears in the routing table
- E. Acts as default route for that interface

**Correct Answer:** E

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 382**

About statement of HDLC IP address.

- A. It is locally for the interface

- B. It became default route after network reduce
- C. It is in the same subnet address with other interfaces

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 383**

Disadvantages of using proxy ARP?

- A. It rewrites MAC in the database
- B. It can be used for DDos attack

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**



#### **QUESTION 384**

What type of attack is when trusted source replace mac tables with untrusted?

- A. DHCP snooping
- B. port snooping

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 385**

Which command should you enter to allow carrying voice, options:

- A. switchport

- B. switchport access
- C. switchport trunk
- D. switchport host

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 386**

Which three responses does TACAS+ give while querying. (Choose three)

- A. error
- B. accept
- C. continue
- D. persist
- E. fault

**Correct Answer:** ABC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 387**

What is the correct DSCP value used for voice traffic?

- A. Expedited Forwarding (EF), 46, 101110
- B. Assured Forwarding (AF) 31 011010
- C. Assured Forwarding (AF) 36 100110
- D. Expedited Forwarding (EF), 36, 101110

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 388**

What's DTP's default in a switch?

- A. ON
- B. OFF
- C. Dynamic Desirable
- D. Dynamic Auto

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 389**

Which routing protocols are compatible with stubs. (Choose two)

- A. OSPF
- B. EIGRP
- C. EGP
- D. BGP
- E. IS-IS
- F. RIP

**Correct Answer:** AB

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 390**

Which three commands must you enter to create a trunk that allows VLAN 20? (Choose three)

- A. Switch(config-if)#switchport mode dynamic auto
- B. Switch(config-if)#switchport mode trunk
- C. Switch(config-if)#switchport trunk allowed vlan 20
- D. Switch(config-if)#switchport mode dynamic desirable
- E. Switch(config-if)#switchport trunk encapsulation dot1q
- F. Switch(config-if)#switchport trunk native vlan 20

**Correct Answer:** BCE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 391

Which two statements about Ethernet standards are true? (Choose two)

- A. Ethernet is defined by IEEE standard 802.2.
- B. Ethernet is defined by IEEE standard 802.3.
- C. Ethernet 10BASE-T does not support full-duplex.
- D. When an Ethernet network uses CSMA/CD, it terminates transmission as soon as a collision occurs.
- E. When an Ethernet network uses CSMA/CA, it terminates transmission as soon as a collision occurs.

**Correct Answer:** BD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 392

Which three options are types of Layer 2 network attack? (Choose three)

- A. ARP attacks
- B. brute force attacks
- C. spoofing attacks
- D. DDOS attacks
- E. VLAN hopping



F. botnet attacks

**Correct Answer:** ACE

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 393**

Which three statements about DTP are true? (Choose three)

- A. It is enabled by default.
- B. It is a universal protocol.
- C. It is a proprietary protocol.
- D. It is disabled by default.
- E. It is a Layer 3-based protocol.
- F. It is a Layer 2-based protocol.

**Correct Answer:** ACF

**Section:** (none)

**Explanation**

**Explanation/Reference:**



#### **QUESTION 394**

How does a router handle an incoming packet whose destination network is missing from the Routing table?

- A. it discards the packet.
- B. it broadcasts the packet to each network on the router.
- C. it routes the packet to the default route.
- D. it broadcasts the packet to each interface on the router.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 395**

If you configure syslog messages without specifying the logging trap level, which log messages will the router send?

- A. error conditions only
- B. warning and error conditions only
- C. normal but significant conditions only
- D. all levels except debugging
- E. informational messages only

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 396**

Which feature facilitates the tagging of frames on a specific VLAN?

- A. Routing
- B. hairpinning
- C. switching
- D. encapsulation

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 397**

If primary and secondary root switches with priority 16384 both experience catastrophic losses, which tertiary switch can take over?

- A. a switch with priority 20480
- B. a switch with priority 8192
- C. a switch with priority 4096

D. a switch with priority 12288

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Explanation:

In my opinion the switch with the lowest priority becomes the Root so B seems the correct answer but the consensus is on ANSWER A. Can anyone explain this please. The answer is A because the other priorities are lower than root 16384. STP chooses priority first before mac address, so there can't be any switches with lower priority than the primary or secondary root switches. Otherwise they would have been the root to begin with.

#### **QUESTION 398**

Which WAN topology provides a direct connection from each site to all other sites on the network?

- A. single-homed
- B. full mesh
- C. point-to-point
- D. hub-and-spoke

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 399**

Which two options are primary responsibilities of the APIC-EM controller? (Choose two)

- A. It automates network actions between different device types.
- B. It provides robust asset management.
- C. It tracks license usage and Cisco IOS versions.
- D. It automates network actions between legacy equipment.
- E. It makes network functions programmable.

**Correct Answer:** AE

**Section:** (none)

**Explanation****Explanation/Reference:****QUESTION 400**

Which feature can you implement to reserve bandwidth for voip calls across the call path?

- A. PQ
- B. Round Robin
- C. CBWFQ
- D. RSPV

**Correct Answer:** D

**Section:** (none)

**Explanation****Explanation/Reference:****QUESTION 401**

Which protocol specified by RFC 2281 provides network redundancy for IP networks, ensuring that user traffic immediately and transparently recovers from first-hop failures in network edge devices or access circuits?

- A. ICMP
- B. IRDP
- C. HSRP
- D. STP

**Correct Answer:** C

**Section:** (none)

**Explanation****Explanation/Reference:****QUESTION 402**

Which of the following HSRP router states does an active router enter when it is preempted by a higher priority router?

- A. Active
- B. Speak
- C. Learn
- D. Listen
- E. Init
- F. Standby

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 403**

Which device classes are used over serial links? (Choose two)

- A. DCE
- B. DTE
- C. LCP
- D. HDLC
- E. PPP
- F. LMI



**Correct Answer:** AB

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 404**

For which two reasons might you choose chassis aggregation instead of stacking switches? (Choose two.)

- A. to avoid the use of a centralized configuration manager
- B. to avoid relying solely on Ethernet interfaces
- C. to allow hot-swapping modules
- D. to increase the number of devices in use

E. to increase the maximum port count

**Correct Answer:** CD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

