



Exam : 640-816

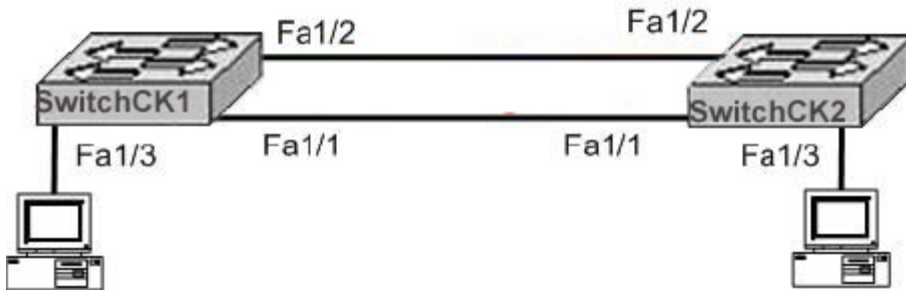
Title : Interconnecting Cisco Networking Devices Part 2

Ver : 03-03-2009

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**QUESTION 1:**

Switches CK1 and CK2 are connected as shown below:



Study the Exhibit carefully. Which ports could safely be configured with Port Fast?  
(Choose two)

- A. Switch CK1 - port Fa1/2
- B. Switch CK2 - port Fa1/2
- C. Switch CK1 - port Fa1/3
- D. Switch CK2 - port Fa1/3
- E. Switch CK1 - port Fa1/1
- F. None of the ports should use port fast

Answer: C, D

Explanation:

Using Port Fast:

1. Immediately brings an interface configured as an access or trunk port to the forwarding state from a blocking state, bypassing the listening and learning states
2. Normally used for single server/workstation can be enabled on a trunk

So, Port fast can only be enabled to a switch port attaching to workstation or a server

.Reference: <http://www.911networks.com/node/273>

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**QUESTION 2:**

You need to configure two Certkiller switches to exchange VLAN information.  
Which protocol provides a method of sharing VLAN configuration information  
between these two switches?

- A. STP
- B. 802.1Q
- C. VLSM
- D. ISL
- E. VTP
- F. HSRP
- G. None of the above

Answer: E

Explanation:

VLAN Trunking Protocol (VTP) is a Cisco proprietary Layer 2 messaging protocol that manages the addition, deletion, and renaming of VLANs on a network-wide basis.

Virtual Local Area Network (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. To do this VTP carries VLAN information to all the switches in a VTP domain. VTP advertisements can be sent over ISL, 802.1q, IEEE 802.10 and LANE trunks. VTP traffic is sent over the management VLAN (VLAN1), so all VLAN trunks must be configured to pass VLAN1. VTP is available on most of the Cisco Catalyst Family products.

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**QUESTION 3:**

Certkiller has implemented the use of the Virtual Trunking Protocol (VTP). Which statement below accurately describes a benefit of doing this?

- A. VTP will allow physically redundant links while preventing switching loops
- B. VTP will allow switches to share VLAN configuration information
- C. VTP will allow a single port to carry information to more than one VLAN
- D. VTP will allow for routing between VLANs
- E. None of the above

Answer: B

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**QUESTION 4:**

Two Certkiller switches are connected together as shown in the diagram below:

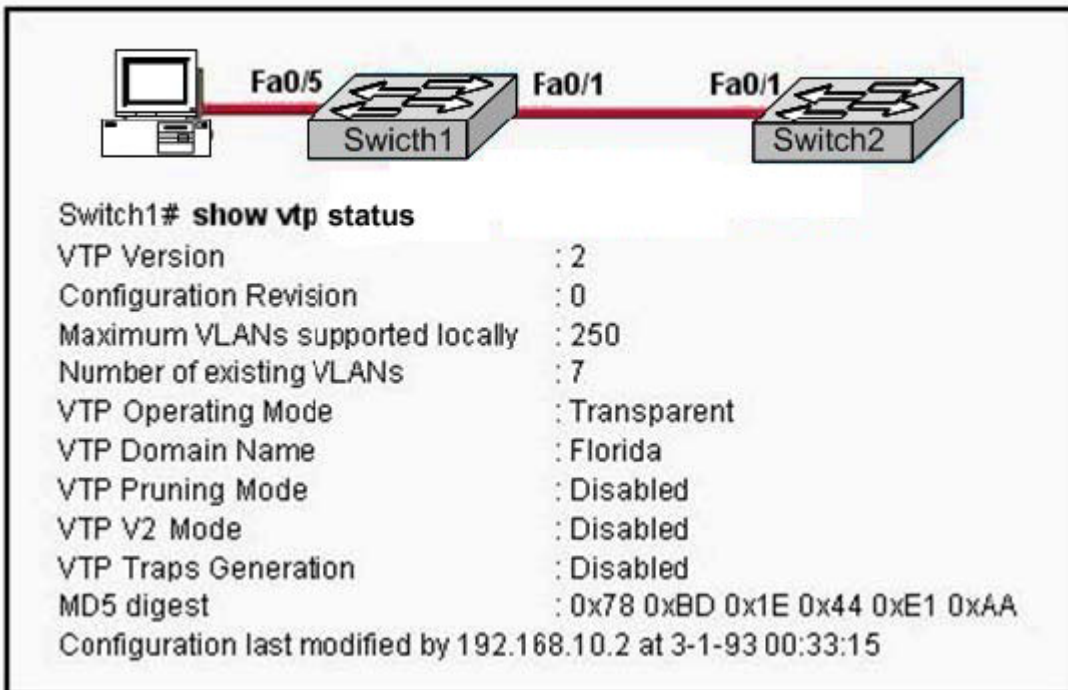


Exhibit:

Based on the information shown above, what will be the result of issuing the following commands:

Switch1(config)# interface fast Ethernet 0/5

Switch1(config-if)# switchport mode access

Switch1(config-if)# switchport access vlan 30

- A. The VLAN will be added to the database, but the VLAN information will not be passed on to the Switch2 VLAN database.
- B. The VLAN will be added to the database and VLAN 30 will be passed on as a VLAN to add to the Switch2 VLAN database.
- C. The VLAN will not be added to the database, but the VLAN 30 information will be passed on as a VLAN to the Switch2 VLAN database.
- D. The VLAN will not be added to the database, nor will the VLAN 30 information be passed on as a VLAN to the Switch2 VLAN database.
- E. None of the above

Answer: A

Explanation:

The three VTP modes are described below:

**Server:** This is the default for all Catalyst switches. You need at least one server in your VTP domain to propagate VLAN information throughout the domain. The switch must be in server mode to be able to create, add, or delete VLANs in a VTP domain. You must also change VTP information in server mode, and any change you make to a switch in server mode will be advertised to the entire VTP domain.

**Client:** In client mode, switches receive information from VTP servers; they also send

and receive updates, but they can't make any changes. Plus, none of the ports on a client switch can be added to a new VLAN before the VTP server notifies the client switch of the new VLAN. Here's a hint: if you want a switch to become a server, first make it a client so that it receives all the correct VLAN information, then change it to a server-much easier!

Transparent: Switches in transparent mode don't participate in the VTP domain, but they'll still forward VTP advertisements through any configured trunk links. These switches can't add and delete VLANs because they keep their own database-one they do not share with other switches. Transparent mode is really only considered locally significant.

In our example, the switch is configured for transparent mode. In transparent mode the local VLAN information can be created but that VLAN information will not be advertised to the other switch.

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### **QUESTION 5:**

A Certkiller switch is configured with all ports assigned to VLAN 2. In addition, all ports are configured as full-duplex Fast Ethernet. What is the effect of adding switch ports to a new VLAN on this switch?

- A. The additions will create more collisions domains.
- 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.
- E. The possibility that switching loops will occur will increase dramatically.

Answer: D

Explanation:

A VLAN is a group of hosts with a common set of requirements that communicate as if they were attached to the same wire, regardless of their physical location. A VLAN has the same attributes as a physical LAN, but it allows for end stations to be grouped together even if they are not located on the same LAN segment.

Networks that use the campus-wide or end-to-end VLANs logically segment a switched network based on the functions of an organization, project teams, or applications rather than on a physical or geographical basis. For example, all workstations and servers used by a particular workgroup can be connected to the same VLAN, regardless of their physical network connections or interaction with other workgroups. Network reconfiguration can be done through software instead of physically relocating devices. Cisco recommends the use of local or geographic VLANs that segment the network based on IP subnets. Each wiring closet switch is on its own VLAN or subnet and traffic between each switch is routed by the router. The reasons for the Distribution Layer 3 switch and examples of a larger network using both the campus-wide and local VLAN models will be discussed later.

A VLAN can be thought of as a broadcast domain that exists within a defined set of switches. Ports on a switch can be grouped into VLANs in order to limit unicast,

multicast, and broadcast traffic flooding. Flooded traffic originating from a particular VLAN is only flooded out ports belonging to that VLAN, including trunk ports, so a switch that connects to another switch will normally introduce an additional broadcast domain.

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**QUESTION 6:**

A new switch is installed in the Certkiller network. This switch is to be configured so that VLAN information will be automatically distributed to all the other Cisco Catalyst switches in the network.

Which of the conditions below have to be met in order for this to occur? (Choose all that apply).

- A. The switch that will share the VLAN information must be in the VTP Server mode.
- B. The switches must be in the same VTP domain.
- C. The switch that will share the VLAN information must be configured as the root bridge.
- D. The switches must be configured to use the same VTP version.
- E. The switches must be configured to use the same STP version.
- F. The switches must be configured to use the same type of ID tagging.
- G. The switches must be connected over VLAN trunks.

Answer: A, B, F, G

Explanation:

For the VLAN information to pass automatically throughout the network, VTP must be set up correctly. In order for VTP to work, a VTP server is needed, the VLAN's must be in the same VTP domain, and the encapsulation on each end of the trunk must both set to either 802.1Q or ISL.

Incorrect Answers:

C. Root bridges and other functions of the Spanning Tree Protocol (STP) have no impact of the VTP configuration.

D, E. There is only one version of VTP and STP.

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**QUESTION 7:**

A network administrator needs to force a high-performance switch that is located in the MDF to become the root bridge for a redundant path switched network. What can be done to ensure that this switch assumes the role of the Root Bridge?

- A. Configure the switch so that it has a lower priority than other switches in the network.
- B. Assign the switch a higher MAC address than the other switches in the network have.
- C. Configure the switch for full-duplex operation and configure the other switches for half-duplex operation.
- D. Connect the switch directly to the MDF router, which will force the switch to assume the role of root bridge.

- E. Establish a direct link from the switch to all other switches in the network.
- F. None of the above

Answer: A

Explanation:

For all switches in a network to agree on a loop-free topology, a common frame of reference must exist. This reference point is called the Root Bridge. The Root Bridge is chosen by an election process among all connected switches. Each switch has a unique Bridge ID (also known as the bridge priority) that it uses to identify itself to other switches. The Bridge ID is an 8-byte value. 2 bytes of the Bridge ID is used for a Bridge Priority field, which is the priority or weight of a switch in relation to all other switches. The other 6 bytes of the Bridge ID is used for the MAC Address field, which can come from the Supervisor module, the backplane, or a pool of 1024 addresses that are assigned to every Supervisor or backplane depending on the switch model. This address is hardcode, unique, and cannot be changed.

The election process begins with every switch sending out BPDUs with a Root Bridge ID equal to its own Bridge ID as well as a Sender Bridge ID. The latter is used to identify the source of the BPDU message. Received BPDU messages are analyzed for a lower Root Bridge ID value. If the BPDU message has a Root Bridge ID (priority) of the lower value than the switch's own Root Bridge ID, it replaces its own Root Bridge ID with the Root Bridge ID announced in the BPDU. If two Bridge Priority values are equal, then the lower MAC address takes preference.

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### **QUESTION 8:**

Which of the protocols below, operates at Layer 2 of the OSI model, and is used to maintain a loop-free network?

- A. RIP
- B. STP
- C. IGRP
- D. CDP
- E. VTP
- F. None of the above

Answer: B

Explanation:

STP (spanning tree protocol) operates on layer 2 to prevent loops in switches and bridges.

Incorrect Answers:

A, C. RIP and IGRP are routing protocols, which are used at layer 3 to maintain a loop free routed environment.

D. CDP does indeed operate at layer 2, but it does not provide for a loop free topology. CDP is used by Cisco devices to discover information about their neighbors.



E. VTP is the VLAN Trunking Protocol, used to pass VLAN information through switches. It relies on the STP mechanism to provide a loop free network.

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**QUESTION 9:**

By default, which of the following factors determines the spanning-tree path cost?

- A. It is the individual link cost based on latency
- B. It is the sum of the costs based on bandwidth
- C. It is the total hop count
- D. It is dynamically determined based on load
- E. None of the above

Answer: B

Explanation:

"The STP cost is an accumulated total path cost based on the available bandwidth of each of the links."

Reference: Sybex CCNA Study Guide 4th Edition (Page 323)

Note: A path cost value is given to each port. The cost is typically based on a guideline established as part of 802.1d. According to the original specification, cost is 1,000 Mbps (1 gigabit per second) divided by the bandwidth of the segment connected to the port.

Therefore, a 10 Mbps connection would have a cost of  $(1,000/10) = 100$ .

To compensate for the speed of networks increasing beyond the gigabit range, the standard cost has been slightly modified. The new cost values are:

Bandwidth	STP Cost Value
4 Mbps	250
10 Mbps	100
16 Mbps	62
45 Mbps	39
100 Mbps	19
155 Mbps	14
622 Mbps	6
1 Gbps	4
10 Gbps	2

You should also note that the path cost can be an arbitrary value assigned by the network administrator, instead of one of the standard cost values.

Incorrect Answers:

A, D: The STP process does not take into account the latency or load of a link. STP does not recalculate the link costs dynamically.

C. Hop counts are used by RIP routers to calculate the cost of a route to a destination.



The STP process resides at layer 2 of the OSI model, where hop counts are not considered.

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**QUESTION 10:**

What is the purpose of the spanning-tree algorithm in a switched LAN?

- A. To provide a monitoring mechanism for networks in switched environments.
- B. To manage VLANs across multiple switches.
- C. To prevent switching loops in networks with redundant switched paths.
- D. To segment a network into multiple collision domains.
- E. To prevent routing loops in networks.

Answer: C

Explanation:

STP is used in LANs with redundant paths or routes to prevent loops in a layer 2 switched or bridged LAN.

Incorrect Answers:

A, B: The primary purpose of STP is to prevent loops, not for monitoring or management of switches or VLANs.

D. VLANs are used to segment a LAN into multiple collision domains, but the STP process alone does not do this.

E. Routers are used to prevent routing loops at layer 3 of the OSI model. STP operates at layer 2.

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**QUESTION 11:**

Which two of the following values does STP take into consideration when it elects the root bridge? (Select two answer choices)

- A. The BPDU version number
- B. The access layer bridge setting
- C. The Bridge ID
- D. The spanning-tree update number
- E. The bridge priority
- F. The VLAN number

Answer: C, E

Explanation:

The bridges elect a root bridge based on the bridge IDs in the BPDUs. The root bridge is the bridge with the lowest numeric value for the bridge ID. Because the two part bridge ID starts with the priority value, essentially the bridge with the lowest priority becomes the root. For instance, if one bridge has priority 100, and another bridge has priority 200, the bridge with priority 100 wins, regardless of what MAC address was used to create the

bridge ID or each bridge/switch.

Reference: CCNA Self-Study CCNA ICND Exam Certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 39

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**QUESTION 12:**

Which of the following are spanning tree port states? (Select three answer choices)

- A. Learning
- B. Spanning
- C. Listening
- D. Forwarding
- E. Initializing
- F. Filtering
- G. Permitting

Answer: A, C, D

Explanation:

There are 4 STP states that a bridge port can be in: Blocking, Listening, Learning, and Forwarding:

*Spanning-Tree Intermediate States*

State	Forwards Data Frames?	Learns MACs Based on Received Frames?	Transitory or Stable State?
Blocking	No	No	Stable
Listening	No	No	Transitory
Learning	No	Yes	Transitory
Forwarding	Yes	Yes	Stable

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**QUESTION 13:**

What are the switch and bridge port characteristics of a layer two spanning-tree network that is fully converged?

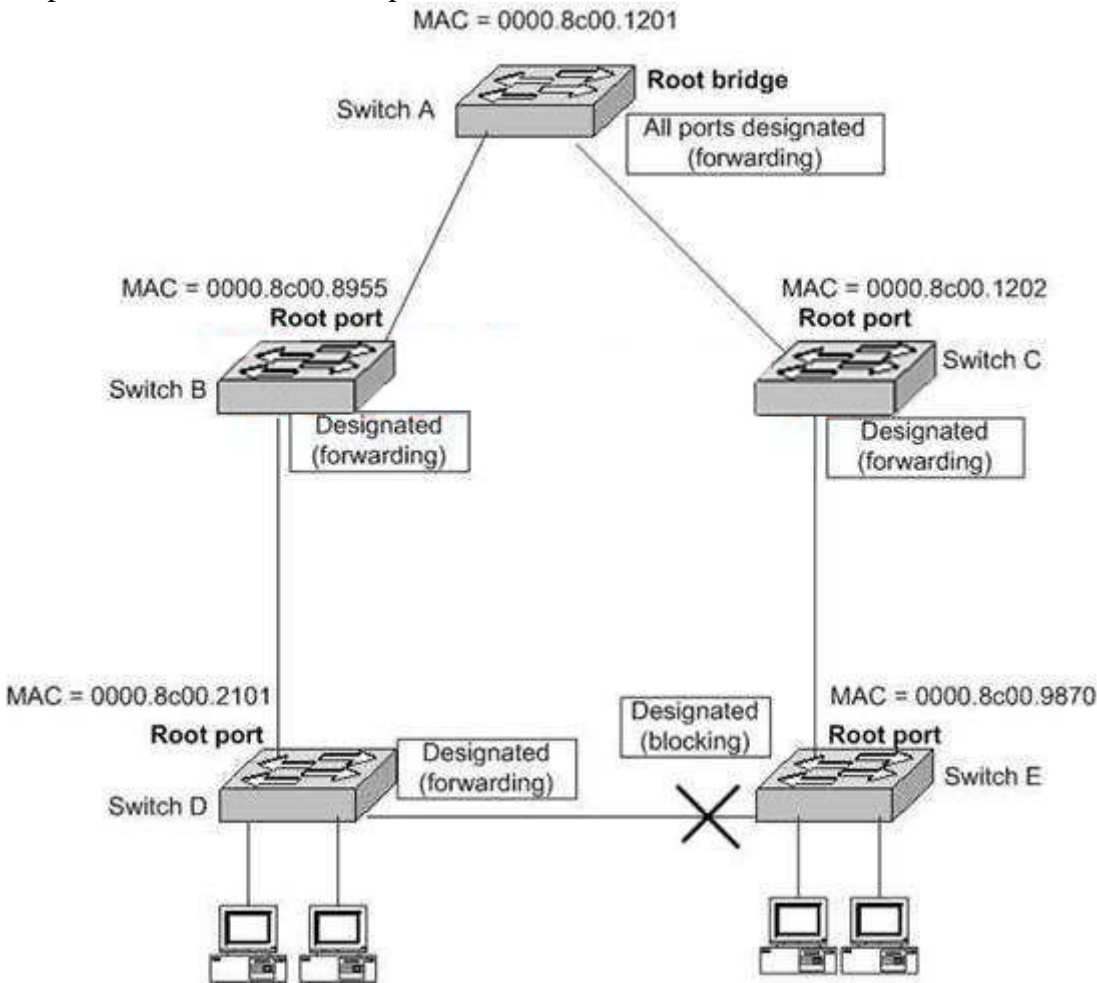
- A. All switch and bridge ports are in the forwarding state.
- B. All switch and bridge ports are in the stand-by state.
- C. All switch and bridge ports are assigned as either root or designated ports.
- D. All switch and bridge ports are in either the forwarding or blocking state.
- E. All switch and bridge are either blocking or looping.

Answer: D

Explanation:

When a switch first comes up, it will be in the listening and learning states. This is

needed so that the switch learns the MAC addresses of the devices on the LAN, and to learn where any loops in the network may exist. After this initial period of listening and learning, the ports will be forwarding to the hosts, or blocking certain ports that create a loop in the network. An example of this is shown below:



In the above figure, after the network has converged, spanning tree protocol puts each port either in designated (Forwarding) or Non-designated (Blocking) state. So, Choice D is correct.

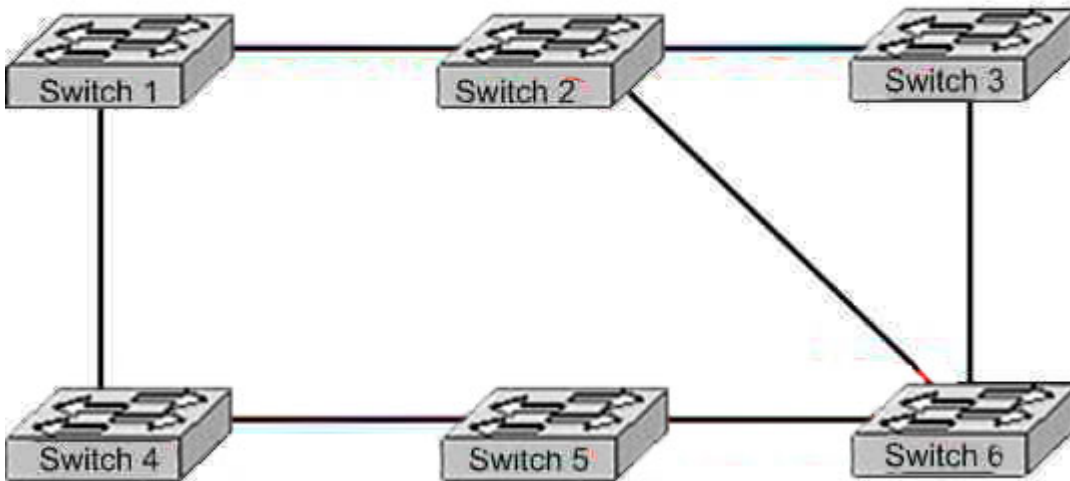
If you get a converged spanning-tree network, you have only two port states.

Forwarding and Blocking. Forwarding: all traffic will be forwarded

Blocking: all traffic to devices that will create a loop in a spanning-tree network will be blocked. It is possible to get redundant paths in large switched and routed networks.

#### QUESTION 14:

The Certkiller LAN consists of 6 switches connected together as shown in the diagram below:



What is the name of the potential problem of this switch setup, and what protocol can prevent its occurrence. (Select only one answer choice)

- A. Routing loops, hold down timers
- B. Switching loops, split horizon
- C. Routing loops, split horizon
- D. Switching loops, VTP
- E. Routing loops, STP
- F. Switching loops, STP

Answer: F

Explanation:

The spanning-Tree Protocol (STP) prevents loops from being formed when switches or bridges are interconnected via multiple paths. Spanning-Tree Protocol implements the 802.1D IEEE algorithm by exchanging BPDU messages with other switches to detect loops, and then removes the loop by shutting down selected bridge interfaces. This algorithm guarantees that there is one and only one active path between two network devices.

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### QUESTION 15:

In a switched LAN network, what is the Spanning-Tree algorithm used for?

- A. It is used to provide a mechanism for routing updates in switched environments.
- B. It is used to prevent routing loops in networks with redundant routes.
- C. It is used to prevent switching loops in networks with redundant switched routes.
- D. It is used to manage, the addition, deletion, and naming of VLANs across multiple switches.
- E. It is used to segment a network into multiple collision domains.
- F. None of the above.

G. All of the above are functions of STP.

Answer: C

Explanation:

To avoid loops, all bridging devices, including switches, use STP. STP causes each interface on a bridging device to settle into a blocking state or a forwarding state. Blocking means that the interface cannot forward or receive data frames. Forwarding means that the interface can send and receive data frames. By having a correct subset of the interfaces blocked, a single currently active logical path will exist between each pair of LANs. STP resides at the data link layer, so it is used to prevent loops within a switched network. It is not used to prevent routing loops; that is the function of the mechanisms within a routing protocol.

Reference:

CCNA Self-Study CCNA INTRO exam certification Guide (Cisco Press, ISBN 1-58720-094-5) page 248.

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**QUESTION 16:**

In which Spanning-Tree states does a switch port learn MAC addresses? (Select two)

- A. Blocking
- B. Listening
- C. Forwarding
- D. Learning
- E. Relaying

Answer: C, D

Explanation:

STP uses a couple of port states besides forwarding and blocking.

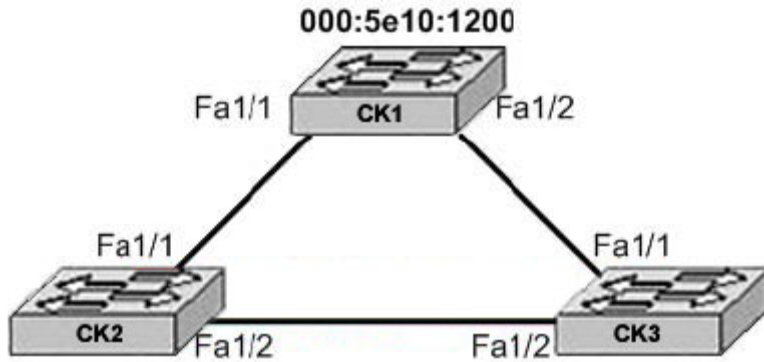
1. Listening - Listens to incoming Hello messages to ensure that there are no loops, but does not forward traffic. This is an interim state between blocking and forwarding.
2. Learning - Still listens to BPDUs, plus learns MAC addresses from incoming frames. It does not forward traffic. This is an interim state between blocking and forwarding.
3. Disabled - Administratively down.

Reference: Cisco CCNA intro 640-821

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**QUESTION 17:**

Three Certkiller switches are connected together as shown in the diagram below:



**000:6e10:1200**

**000:7e10:1200**

Study the Exhibit carefully. All switches have the default STP configuration and all links are Fast Ethernet. Which port on which switch will Spanning Tree place in blocking mode?

- A. Switch CK1 - Port Fa1/1
- B. Switch CK1 - Port Fa1/2
- C. Switch CK2 - Port Fa1/2
- D. Switch CK2 - Port Fa1/1
- E. Switch CK3 - Port Fa1/1
- F. Switch CK3 - Port Fa1/2

Answer: F

Explanation:

Switch CK1 will become the ROOT BRIDGE because it has the lowest MAC address.

Its both ports will become designated ports so choice A and B are wrong.

Next Election will be of ROOT PORTS. Port FA1/1 of both the switches CK2 and CK3 will become ROOT ports because they have minimum path cost to reach the root bridge.

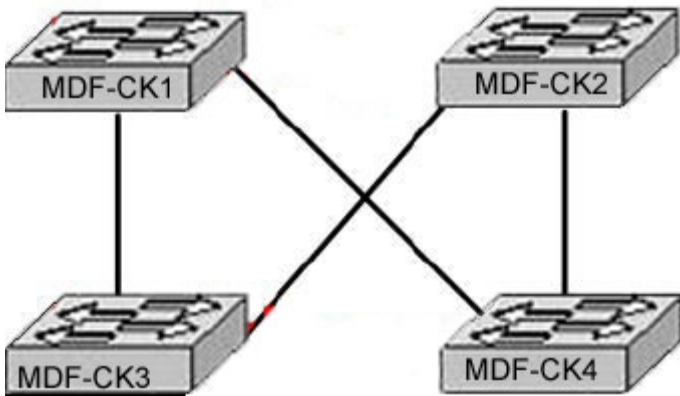
So, choices D and E are also wrong.

Next Election will be of Designated Ports on the segment connecting CK2 and CK3 . CK2 has lower MAC address so, its port FA1/2 will become designated port and FA1/2 of CK3 will be placed in a BLOCKING state to avoid switching LOOPS.

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### QUESTION 18:

Four Certkiller switches are connected together as shown below:



The network shown in the exhibit was designed to provide reliability through redundancy. Both of the IDF switches, CK3, and CK4, are connected to both of the MDF switches, CK1 and CK2. Which configuration scenario will provide a loop-free switching environment?

- A. Spanning Tree Protocol should be running on all switches.
- B. Spanning Tree Protocol should be running on only the MDF switches CK1 and CK2.
- C. Spanning Tree Protocol should be running on only the IDF switches CK3 and CK4.
- D. Spanning Tree Protocol should be run only on the root bridge.
- E. Spanning Tree Protocol is not needed in this network.

Answer: A

Explanation:

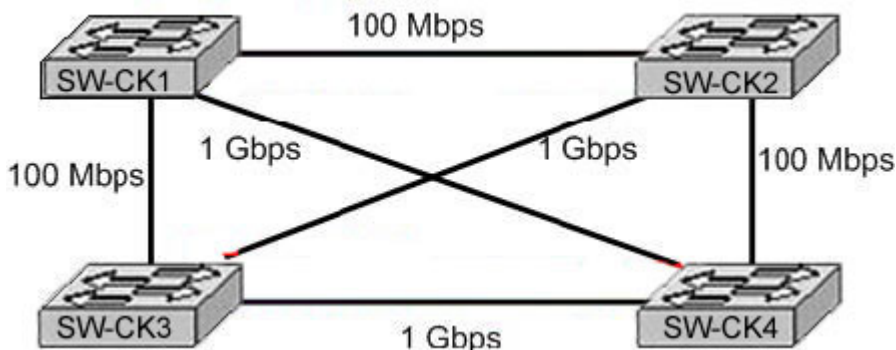
Spanning-Tree Protocol (STP) prevents loops from being formed when switches or bridges are interconnected via multiple paths. Spanning-Tree Protocol implements the 802.1D IEEE algorithm by exchanging BPDUs with other switches to detect loops, and then removes the loop by shutting down selected bridge interfaces. This algorithm guarantees that there is one and only one active path between two network devices.

Reference:

[http://www.cisco.com/en/US/tech/CK389/CK621/tsd\\_technology\\_support\\_protocol\\_home.html](http://www.cisco.com/en/US/tech/CK389/CK621/tsd_technology_support_protocol_home.html)

### QUESTION 19:

Four Certkiller switches are connected together as shown in the diagram below:





Study the Exhibit carefully. What is the purpose of the Spanning Tree Protocol that is operating in the exhibited switch topology?

- A. To elect a particular switch as backup designated switch.
- B. To have one active Layer 2 path through the switches network.
- C. To select the best path to a remote destination that is on a different network.
- D. To learn the MAC addresses of host attached to the switches network.
- E. To distribute VLAN configuration information throughout the switched network.

Answer: B

Explanation:

Switches are connected in a way to provide full-mesh topology. So, a redundant path is provided in the case of a link or switch failure. The STP is used to prevent frames from looping throughout the network.

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**QUESTION 20:**

When is a switched network that is running the Spanning Tree Protocol considered to be fully converged?

- A. when all switches have the same BID as the root switch
- B. when all switches have received the MAC address of each neighboring switch
- C. when every enabled switch port has been assigned a unique identifier
- D. when every operating switch port is in either the blocking or forwarding state
- E. when all switches are in either client, server, or transparent mode

Answer: D

Explanation:

States of the Spanning Tree Protocol:

Blocking A blocked port won't forward frames; it just listens to BPDUs. All ports are in blocking state by default when the switch is powered up. The purpose of the blocking state is to prevent the use of looped paths.

Listening The port listens to BPDUs to make sure no loops occur on the network before passing data frames. A port in listening state prepares to forward data frames without populating the MAC address table.

Learning The switch port listens to BPDUs and learns all the paths in the switched network. A port in learning state populates the MAC address table but doesn't forward data frames.

Forwarding The port sends and receives all data frames on the bridged port.

Disabled A port in the disabled state does not participate in the frame forwarding or STP.

A port in the disabled state is virtually no operational.

In Blocking States, all ports are in blocking state. The purpose of the blocking state is to prevent the use of looped paths. The forward state sends and receives the all data frames in a loop free network. So these two states are considered to be fully converged.

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**QUESTION 21:**

Exhibit:

```
CertKillerSwitch #show spanning-tree
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    32769
             Address    000b.5fe0.7a80
             Cost        19
             Port        17 (FastEthernet0/17)
             Hello Time  2 sec Max Age 20 sec Forward Delay 15 sec

  Bridge ID  Priority    32769 (priority 32768 sys-id-ext 1)
             Address    000b.fdeb.c600
             Hello Time  2 sec Max Age 20 sec Forward Delay 15 sec
             Aging Time  200
```

Interface	Role Sts Cost	Pco.Nbl	Type
Fa0/1	Desg FWD 19	128.1	P2p
Fa0/11	Desg FWD 100	128.11	Shr
Fa0/13	Desg FWD 19	128.13	P2p
Fa0/17	Root FWD 19	128.17	P2p
Fa0/23	Altn BLK 19	128.23	P2p

Based on the output from the show spanning-tree command shown, what can be determined about the switch configuration? (Choose two.)

- A. This switch is the root bridge for VLA.N 1
- B. The 802.1d protocol is enabled on the switch
- C. This switch is connected to port 17 on the root bridge
- D. The switches are using Rapid Spanning Tree Protocol
- E. Port 17 is the root port and port 23 is the redundant link

Answer: B, E

The answer shows that the bridge output is the root bridge for VLAN 1. If that were the case, then there would be no blocked ports for this output. Also, the Root ID and Bridge ID would have the same Address.

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**QUESTION 22:**

Exhibit:

**CertKiller1# show spanning-tree**

```
VLAN0001
Spanning tree enabled protocol ieee
Root ID    Priority    32769
Address    000d.bdc3.37c0
Cost       19
Port       26 (FastEthernet0/2)
Hello Time 2sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority    32769 (priority 32768 sys-id-ext 1)
Address    000d.bdc3.a340
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 300
```

Based on the information shown above, what can be determined from the output shown?

- A. The Certkiller 1 switch is using VTP.
- B. This is the only switch in the LAN topology.
- C. The Certkiller 1 switch is not the root switch.
- D. The link to the root bridge is through a 1 Gbps connection.
- E. Spanning Tree Protocol is disabled on the Certkiller 1 switch.

Answer: C

Explanation:

The root ID of the switch is the default root ID assigned to all Cisco switches, in order to force this switch to become the Root switch you may issue the spanning-tree vlan 1 priority [0-61440 in increments of 4096] command.

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### **QUESTION 23:**

What is the purpose of the Spanning Tree Protocol (STP)?

- A. To prevent routing loops
- B. To create a default route
- C. To provide multiple gateways for hosts
- D. To maintain a loop-free Layer 2 network topology
- E. To enhance the functions of SNMP

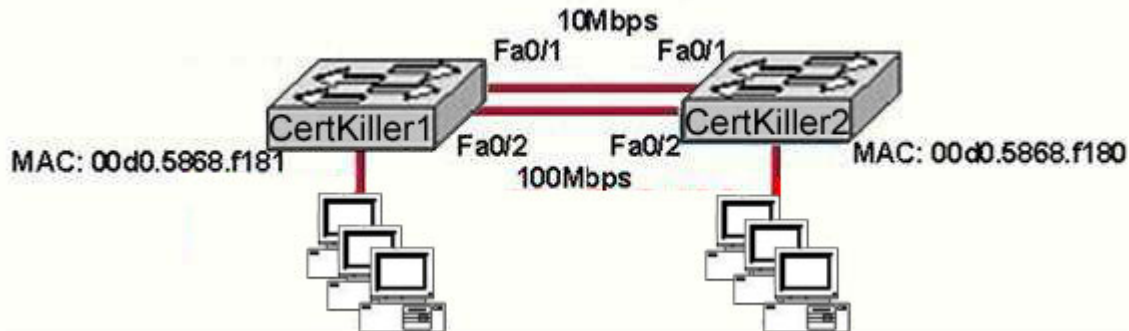
Answer: D

Explanation:

STP's main task is to stop network loops from occurring on your Layer 2 network (bridges or switches). It vigilantly monitors the network to find all links, making sure that no loops occur by shutting down any redundant ones. STP uses the spanning-tree algorithm (STA) to first create a topology database, then search out and destroy redundant links. With STP running, frames will only be forwarded on the premium, STP-picked links.

**QUESTION 24:**

The Certkiller network is shown below:



How will Spanning Tree affect the operation of the network devices shown in the graphic?

- A. Spanning Tree will block client ports that suffer from excessive errors.
- B. Spanning Tree will learn client MAC addresses and assign them to switch ports.
- C. Spanning Tree will allow these switches to load balance across the redundant links to increase network throughput.
- D. Spanning Tree will learn which of the redundant links should be blocked.
- E. Spanning tree will automatically configure the switches with VLAN information.

Answer: D

Explanation:

STP states are as follows:

Disabled-Ports that are administratively shut down by the network administrator, or by the system due to a fault condition, are in the Disabled state. This state is special and is not part of the normal STP progression for a port.

Blocking-After a port initializes, it begins in the Blocking state so that no bridging loops can form. In the Blocking state, a port cannot receive or transmit data and cannot add MAC addresses to its address table. Instead, a port is allowed to receive only BPDUs so that the switch can hear from other neighboring switches. In addition, ports that are put into standby mode to remove a bridging loop enter the Blocking state.

Listening-The port will be moved from Blocking to Listening if the switch thinks that the port can be selected as a Root Port or Designated Port. In other words, the port is on its way to begin forwarding traffic. In the Listening state, the port still cannot send or receive data frames. However, the port is allowed to receive and send BPDUs so that it can actively participate in the Spanning Tree topology process. Here, the port is finally allowed to become a Root Port or Designated Port because the switch can advertise the port by sending BPDUs to other switches. Should the port lose its Root Port or Designated Port status, it returns to the Blocking state.

Learning-After a period of time called the Forward Delay in the Listening state, the port is allowed to move into the Learning state. The port still sends and receives BPDUs as before. In addition, the switch can now learn new MAC addresses to add to its address table. This gives the port an extra period of silent participation and allows the switch to assemble at least some address table information.

Forwarding-After another Forward Delay period of time in the Learning state, the port is allowed to move into the Forwarding state. The port can now send and receive data frames, collect MAC addresses in its address table, and send and receive BPDUs. The port is now a fully functioning switch port within the Spanning Tree topology.

---

**QUESTION 25:**

Four Certkiller switches are shown below:



**Catalyst 1900**  
**2 MB DRAM**

**Certkiller1# show spantree**

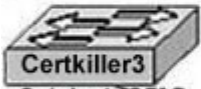
VLAN1 is executing the IEEE compatible Spanning Tree Protocol  
Bridge Identifier has priority 32768, address 00d0.5868.f180  
<output omitted>



**Catalyst 2900XL**  
**4 MB DRAM**  
**2 100Base-FX ports**

**Certkiller2# show spanning-tree**

Spanning tree 1 is executing the IEEE compatible Spanning Tree protocol  
Bridge Identifier has priority 32768, address 00d0.5868.f181  
<output omitted>



**Catalyst 2950G**  
**8 MB DRAM**

**Certkiller3# show spanning-tree**

Spanning tree 1 is executing the IEEE compatible Spanning Tree protocol  
Bridge Identifier has priority 32768, address 00d0.5868.f182  
<output omitted>



**Catalyst 2950G**  
**32 MB DRAM**  
**2 10/100/1000 ports**

**Certkiller4# show spanning-tree**

Spanning tree 1 is executing the IEEE compatible Spanning Tree protocol  
Bridge Identifier has priority 32768, address 00d0.5868.f183  
<output omitted>

Assuming these are the only four switches in the network and the switches are connected with redundant links, which switch will be elected as the spanning-tree root bridge?

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

Answer: A

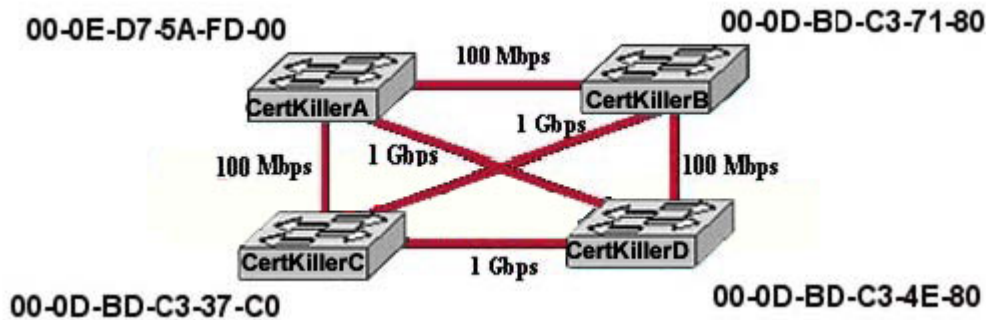
Explanation:

To elect the root bridge in the LAN, first check the priority value. The switch having lowest priority will win the race. If Priority Value is same then it checks the MAC

Address, the switch having lowest MAC Address will be the root bridge. Here Switch 1 has the lowest MAC Address so it becomes the root bridge.

### QUESTION 26:

Four Certkiller switches are shown below:



The bridge ID for each switch and the bandwidth for each link is shown. Assuming that all switches are set to the default configuration, which ports will be blocking when Spanning Tree has converged? (Choose three.)

- A. Certkiller A port that connects to Certkiller D
- B. Certkiller A port that connects to Certkiller B
- C. Certkiller A port that connects to Certkiller C
- D. Certkiller B port that connects to Certkiller C
- E. Certkiller B port that connects to Certkiller D
- F. Certkiller D port that connects to Certkiller A

Answer: A, B, E

Explanation:

STP uses the concept of cost to determine many things. Selecting a Root Port involves evaluating the Root Path Cost. This value is the cumulative cost of all the links leading to the Root Bridge. A particular switch link has a cost associated with it, too, called the Path Cost. To understand the difference between these values, remember that only the Root Path Cost is carried inside the BPDU. As the Root Path Cost travels along, other switches can modify its value to make it cumulative. The Path Cost, however, is not contained in the BPDU. It is known only to the local switch where the port (or "path" to a neighboring switch) resides.

Path Costs are defined as a 1-byte value, with the default values shown in Table 9-3.

Generally, the higher the bandwidth of a link, the lower the cost of transporting data across it. The original IEEE 802.1D standard defined Path Cost as 1000 Mbps divided by the link bandwidth in Mbps. These values are shown in the center column of the table.

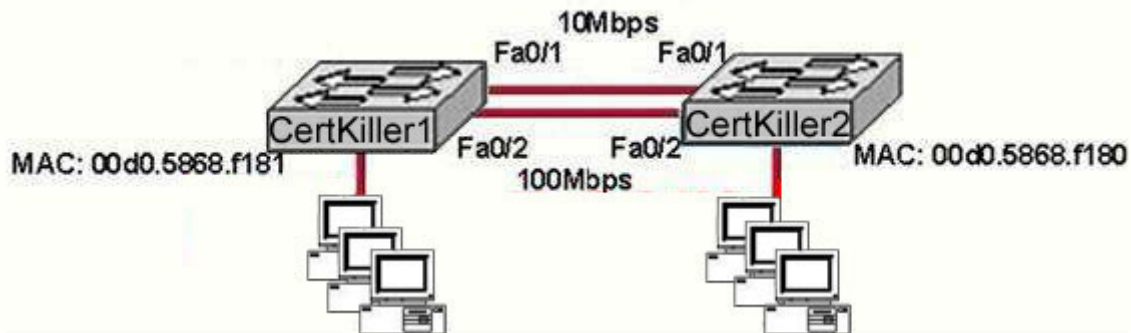
Modern networks commonly use Gigabit Ethernet and OC-48 ATM, which are both either too close to or greater than the maximum scale of 1000 Mbps. The IEEE now uses a nonlinear scale for Path Cost, as shown in the right column of the table.

All Remaining ports then root will be in blocking mode.



**QUESTION 27:**

Two Certkiller switches are shown below:



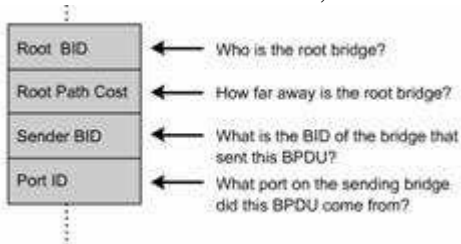
This network is stable and operating properly. Assuming that default STP configurations are running on both switches, which port will be in blocking mode?

- A. Port Fa0/1 on Certkiller 1
- B. Port Fa0/2 on Certkiller 1
- C. Port Fa0/1 on Certkiller 2
- D. Port Fa0/2 on Certkiller 2

Answer: A

Explanation:

Spanning-Tree Protocol (STP) is a Layer 2 protocol that utilizes a special-purpose algorithm to discover physical loops in a network and effect a logical loop-free topology. STP creates a loop-free tree structure consisting of leaves and branches that span the entire Layer 2 network. The actual mechanics of how bridges communicate and how the STP algorithm works will be discussed at length in the following topics. Note that the terms bridge and switch are used interchangeably when discussing STP. In addition, unless otherwise indicated, connections between switches are assumed to be trunks.



The switches move on to selecting Root Ports. The Root Port of a bridge is the port that is closest to the Root Bridge in terms of Path Cost. Every non-Root Bridge must select one Root Port. Again, bridges use the concept of cost to measure closeness. As with some routing metrics, the measure of closeness using STP is not necessarily reflected by hop count. Specifically, bridges track what is referred to as Root Path Cost, which is the cumulative cost of all links to the Root Bridge. So, Answer A is correct.

**QUESTION 28:**



Exhibit:

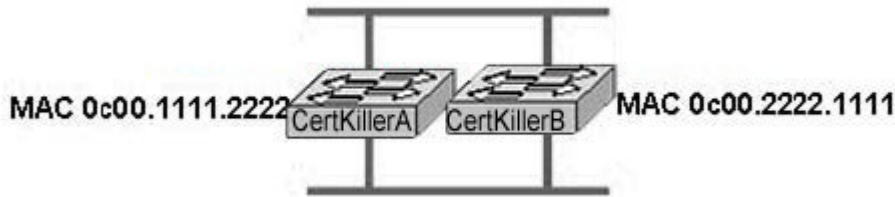


Exhibit:

Please study the exhibit carefully. How can a network administrator ensure that the STP election process would result in Certkiller B being elected as the root switch?

- A. Clear the Certkiller B STP revision number.
- B. Assign Certkiller B a low priority number.
- C. Increase the Certkiller B priority number.
- D. Change the MAC address of Certkiller B

Answer: B

Explanation:

An election process among all connected switches chooses the Root Bridge. Each switch has a unique Bridge ID that identifies it to other switches. The Bridge ID is an 8-byte value consisting of the following fields:

Bridge Priority 2 bytes-The priority or weight of a switch in relation to all other switches. The priority field can have a value of 0 to 65,535 and defaults to 32,768 (or 0x8000) on every Catalyst switch.

MAC Address 6 bytes-The MAC address used by a switch can come from the Supervisor module, the backplane, or a pool of 1024 addresses that are assigned to every Supervisor or backplane depending on the switch model. In any event, this address is hardcoded and unique, and the user cannot change it.

When a switch first powers up, it has a narrow view of its surroundings and assumes that it is the Root Bridge itself. This notion will probably change as other switches check in and enter the election process. The election process then proceeds as follows: Every switch begins by sending out BPDUs with a Root Bridge ID equal to its own Bridge ID and a Sender Bridge ID of its own Bridge ID. The Sender Bridge ID simply tells other switches who is the actual sender of the BPDU message. (After a Root Bridge is decided upon, configuration BPDUs are only sent by the Root Bridge. All other bridges must forward or relay the BPDUs, adding their own Sender Bridge Ids to the message.) Received BPDU messages are analyzed to see if a "better" Root Bridge is being announced. A Root Bridge is considered better if the Root Bridge ID value is lower than another. Again, think of the Root Bridge ID as being broken up into Bridge Priority and MAC address fields. If two Bridge Priority values are equal, the lower MAC address makes the Bridge ID better. When a switch hears of a better Root Bridge, it replaces its own Root Bridge ID with the Root Bridge ID announced in the BPDU. The switch is then required to recommend or advertise the new Root Bridge ID in its own BPDU messages; although, it will still identify itself as the Sender Bridge ID.

---

**QUESTION 29:**

Which of the following components must be elected before the Spanning Tree Protocol can converge in a switched LAN?

- A. Designated ports.
- B. Duplex operating mode.
- C. Fast mode ports.
- D. Root bridge.
- E. Root ports.
- F. BPDU priority.

Answer: A, D, E

Explanation:

Designated port: Either a root port or a port that has been determined as having the best (lower) cost-a designated port will be marked as a forwarding port.

Root bridge: The root bridge is the bridge with the best bridge ID. With STP, the key is for all the switches in the network to elect a root bridge that becomes the focal point in the network. All other decisions in the network-like which port is to be blocked and which port is to be put in forwarding mode-are made from the perspective of this root bridge.

Root port: Always the link directly connected to the root bridge, or the shortest path to the root bridge. If more than one link connects to the root bridge, then a port cost is determined by checking the bandwidth of each link. The lowest cost port becomes the root port.

So these three components must be elected before the spanning tree protocol can converge in a switched LAN

---

### **QUESTION 30:**

Why would the Certkiller administrator change the value of the spanning-tree priority of a switch?

- A. in order to optimize the path that frames take from source to destination
- B. to increase the priority so a designated port will become a root port
- C. to increase the BID, so the switch is more likely to become root bridge
- D. in order to allow VLANs to be sent from one switch to another across a single link
- E. to force a given switch to become an STP server
- F. None of the above

Answer: A

Explanation:

The Bridge Priority is used to measure the preference of a bridge in the spanning-tree Algorithm. The possible values range between 0 and 65,535. The default setting is 32,768. By adjusting the priority, the root bridge can be manually assigned to meet the needs of the network administrator.

**QUESTION 31:**

What value is primarily used to determine which port becomes the root port on each nonroot switch in a spanning-tree topology?

- A. path cost
- B. lowest port MAC address
- C. VTP revision number
- D. highest port priority number
- E. port priority number and MAC address
- F. None of the above

Answer: A

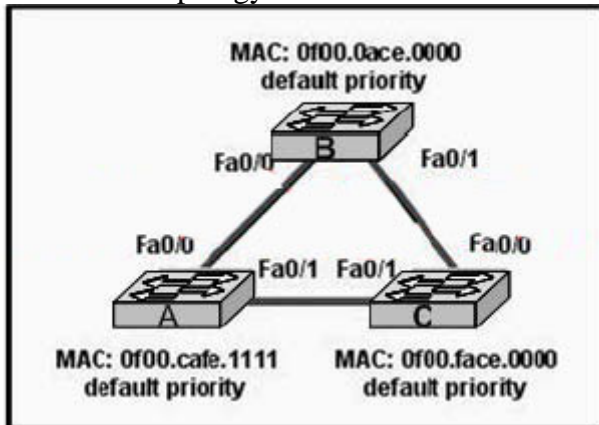
Explanation:

At the conclusion of the root bridge election process, the switches move on to selecting Root Ports. The Root Port of a bridge is the port that is closest to the Root Bridge in terms of Path Cost. Every non-Root Bridge must select one Root Port. Again, bridges use the concept of cost to measure closeness. As with some routing metrics, the measure of closeness using STP is not necessarily reflected by hop count. Specifically, bridges track what is referred to as Root Path Cost, which is the cumulative cost of all links to the Root Bridge.

---

**QUESTION 32:**

Refer to the topology shown in the exhibit below:



Based on the information above, which ports will be STP designated ports if all the links are operating at the same bandwidth? (Choose three)

- A. Switch A - Fa0/1
- B. Switch B - Fa0/0
- C. Switch A - Fa0/0
- D. Switch B - Fa0/1
- E. Switch C - Fa0/0
- F. Switch C - Fa0/1

Answer: A, B, D

**Explanation:**

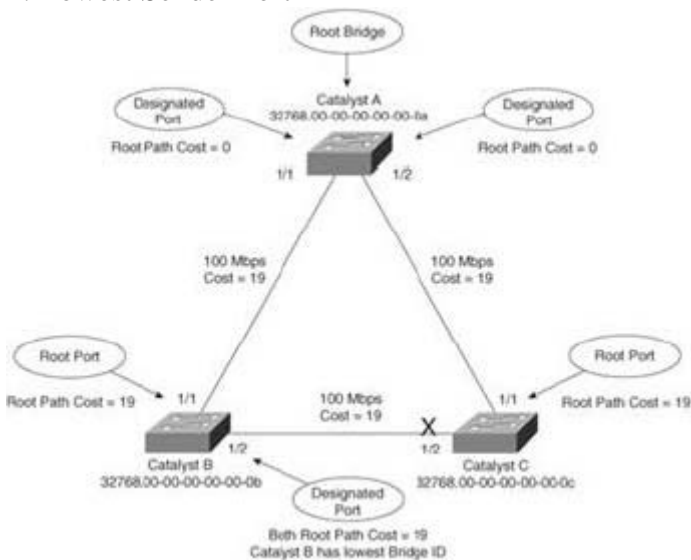
To remove the possibility of bridging loops, STP makes a final computation to identify one Designated Port on each network segment. Suppose that two or more switches have ports connected to a single common network segment. If a frame appears on that segment, all the bridges attempt to forward it to its destination. Recall that this behavior was the basis of a bridging loop and should be avoided.

Instead, only one of the links on a segment should forward traffic to and from that segment-the one that is selected as the Designated Port. Switches choose a Designated Port based on the lowest cumulative Root Path Cost to the Root Bridge. For example, a switch always has an idea of its own Root Path Cost, which it announces in its own BPDUs. If a neighboring switch on a shared LAN segment sends a BPDU announcing a lower Root Path Cost, the neighbor must have the Designated Port. If a switch learns only of higher Root Path Costs from other BPDUs received on a port, however, it then correctly assumes that its own receiving port is the Designated Port for the segment. Notice that the entire STP determination process has served only to identify bridges and ports. All ports are still active, and bridging loops still might lurk in the network. STP has a set of progressive states that each port must go through, regardless of the type or identification. These states actively prevent loops from forming and are described in the next section.

**Note:**

In each determination process discussed so far, two or more links might have identical Root Path Costs. This results in a tie condition, unless other factors are considered. All tie-breaking STP decisions are based on the following sequence of four conditions:

1. Lowest Root Bridge ID
2. Lowest Root Path Cost to Root Bridge
3. Lowest Sender Bridge ID
4. Lowest Sender Port ID



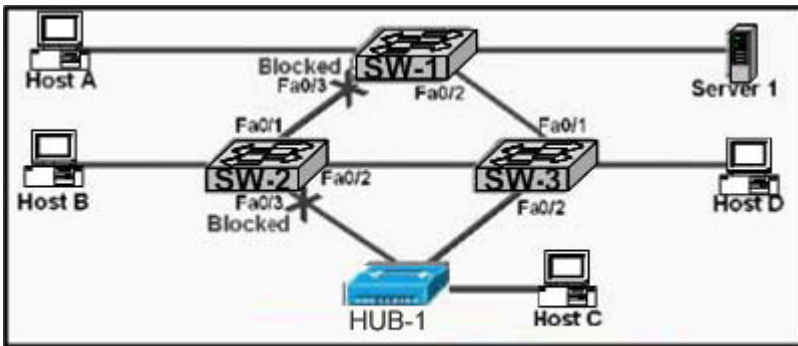
The three switches have chosen their Designated Ports (DP) for the following reasons:

1. Catalyst A- Because this switch is the Root Bridge, all its active ports are Designated Ports, by definition. At the Root Bridge, the Root Path Cost of each port is 0.
2. Catalyst B- Catalyst A port 1/1 is the DP for the Segment A-B because it has the lowest Root Path Cost (0). Catalyst B port 1/2 is the DP for segment B-C. The Root Path Cost for each end of this segment is 19, determined from the incoming BPDU on port 1/1. Because the Root Path Cost is equal on both ports of the segment, the DP must be chosen by the next criteria-the lowest Sender Bridge ID. When Catalyst B sends a BPDU to Catalyst C, it has the lowest MAC address in the Bridge ID. Catalyst C also sends a BPDU to Catalyst B, but its Sender Bridge ID is higher. Therefore, Catalyst B port 1/2 is selected as the segment's DP.
3. Catalyst C- Catalyst A port 1/2 is the DP for Segment A-C because it has the lowest Root Path Cost (0). Catalyst B port 1/2 is the DP for Segment B-C. Therefore, Catalyst C port 1/2 will be neither a Root Port nor a Designated Port. As discussed in the next section, any port that is not elected to either position enters the Blocking state. Where blocking occurs, bridging loops are broken.

Reference: CCNP BCMSN Exam Certification Guide, 3rd Edition, Cisco Press

### QUESTION 33:

Exhibit:



The switches in the exhibit above are configured with the default parameters. What can be determined from the exhibit?

- A. Fa0/2 on SW-1 and Fa0/2 on SW-2 are nondesignated ports.
- B. SW-1 is the backup designated root bridge.
- C. SW-3 is the root bridge.
- D. Fa0/3 on SW-1 and Fa0/3 on SW-2 are attached to the lowest-cost paths to the root bridge.
- E. None of the above

Answer: C

Explanation:

Remember that one root switch is identified per-VLAN. After the root switch identification, the switches adhere to these rules:

1. STP Rule 1-All ports of the root switch must be in forwarding mode.

Next, each switch determines the best path to get to the root. The switches determine this path by a comparison of the information in all the BPDUs that the switches receive on all ports. The switch uses the port with the least amount of information in the BPDU in order to get to the root switch; the port with the least amount of information in the BPDU is the root port. After a switch determines the root port, the switch proceeds to rule 2.

1. STP Rule 2-The root port must be set to forwarding mode.

In addition, the switches on each LAN segment communicate with each other to determine which switch is best to use in order to move data from that segment to the root bridge. This switch is called the designated switch.

1. STP Rule 3

-In a single LAN segment, the port of the designated switch that connects to that LAN segment must be placed in forwarding mode.

2. STP Rule 4-All the other ports in all the switches (VLAN-specific) must be placed in blocking mode. The rule only applies to ports that connect to other bridges or switches. STP does not affect ports that connect to workstations or PCs. These ports remain forwarded.

Our answer can be found in Rule 1 above. Since none of the ports in SW-3 are blocking, we can determine that this switch must be the root.

Reference:

[http://www.cisco.com/en/US/tech/ CK3 89/ CK6 21/technologies\\_configuration\\_example09186a008009467c.shtml](http://www.cisco.com/en/US/tech/ CK3 89/ CK6 21/technologies_configuration_example09186a008009467c.shtml)

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### **QUESTION 34:**

In the Certkiller switched LAN environment, what does the IEEE 802.1Q standard describe?

- A. VLAN pruning
- B. A method of VLAN trunking
- C. An approach to wireless LAN communication
- D. The operation of VTP
- E. The process for root bridge selection
- F. None of the above

Answer: B

Explanation:

A broadcast domain must sometimes exist on more than one switch in the network. To accomplish this, one switch must send frames to another switch and indicate which VLAN a particular frame belongs to. On Cisco switches, a trunk link is created to accomplish this VLAN identification. ISL and IEEE 802.1Q are different methods of putting a VLAN identifier in a Layer 2 frame.

The IEEE 802.1Q protocol interconnects VLANs between multiple switches, routers, and servers. With 802.1Q, a network administrator can define a VLAN topology to span multiple physical devices.

Cisco switches support IEEE 802.1Q for FastEthernet and Gigabit Ethernet interfaces.

An 802.1Q trunk link provides VLAN identification by adding a 4-byte tag to an Ethernet Frame as it leaves a trunk port.

---

**QUESTION 35:**

You are an administrator of the Certkiller switched network and your goal is to reduce some of the administrative overhead on your network. You plan on achieving this by configuring a new VLAN for each department in the Certkiller network. However, you need to share the VLAN information across numerous switches. Which of the following would allow you accomplish this?

- A. STP
- B. GVRP
- C. SNMP
- D. VTP
- E. DHCP
- F. None of the above

Answer: D

Explanation:

The VTP (VLAN Trunking Protocol) is a Cisco Layer 2 messaging protocol that manages the addition, deletion, and renaming of VLANs on a network-wide basis. It allows for VLAN information to span multiple switches within the switch domain.

Incorrect Answers:

- A. STP is a switching protocol but it is used for preventing network loops.
- B. GVARP is an actual protocol used in switch administration, but it beyond the scope of what a CCNA is expected to know.
- C. SNMP is a protocol used for managing and monitoring networks
- E. DHCP is the Dynamic Host Configuration Protocol, which allows for PC's to obtain their IP address dynamically upon booting up, along with their DNS and default gateway information.

---

**QUESTION 36:**

You need to configure the Cisco VLAN Trunking Protocol on switch CK1 . What is the purpose of this protocol?

- A. To allow native VLAN information to be carried over a trunk link.
- B. To provide a mechanism to dynamically assign VLAN membership to switch ports.
- C. To allow traffic to be carried from multiple VLANs over a single link between switches.
- D. To provide a mechanism to dynamically assign VLAN membership to switch ports.
- E. To allow for managing to additions, deletions, and changes of VLANs between switches.



F. None of the above

Answer: E

Explanation:

The basic goals of the VLAN Trunking Protocol (VTP) are to manage all configured VLANs across a switched internet work and to maintain consistency throughout that network VTP allows you to add, delete, and rename VLANs-information that is then propagated to all other switches in the VTP domain.

---

**QUESTION 37:**

Which of the following a true statements regarding the use of VLANs to segment a network? (Select three)

- A. They increase the size of collision domains
- B. They allow logical grouping of users by function.
- C. They can enhance network security.
- D. They increase the size of the broadcast domain while decreasing the number of collision domains.
- E. They increase the number of broadcast domains while decreasing the size of the broadcast domains.
- F. They simplify switch administration.

Answer: B, C, E

Explanation:

VLANs are used to segment a LAN into multiple, smaller LANs. This can be used to enhance security as local traffic from one VLAN will not be passed to users in other VLANs.

Incorrect Answers:

- A. VLANs are used to decrease the size of a collision domain, not increase it.
- D. The opposite is true.
- F. The default operation of a switch is to allow all traffic and to enable all ports in VLAN 1. The use of VLANs will increase the complexity of the switch environment, making for more difficult administration.

---

**QUESTION 38:**

You wish to segment your LAN into multiple broadcast domains. Which technology method should you implement in order to do this?

- A. Transparent bridging
- B. Cut-through switching
- C. Fragment-free switches

- D. Virtual LANs
- E. Store-and-forward switching
- F. None of the above

Answer: D

Explanation:

The creation of VLANs in a switch will provide separate Broadcast domains. By default, all ports in a Catalyst switch belong to VLAN 1. By creating additional VLANs, the LAN will be logically segmented into separate broadcast domains.

Incorrect Answers

- A. Transparent bridging is called Transparent because the endpoints devices do not need to know that the bridges exists. It will not play any role for creating separate broadcast domain
- B, E. Both of these are switching methods.
- C. This has nothing to do with the creation of multiple broadcast domains.

---

**QUESTION 39:**

Certkiller has implemented the use of VLANs in their network. Which of the following are considered to be a benefit of VLANs? (Choose three)

- A. They increase the size of collision domains.
- B. They allow logical grouping of users by function.
- C. They can enhance network security,
- D. The increase the size of broadcast domains while decreasing the number of the broadcast domains.
- E. The increase the number of broadcast domains while decreasing the size of the broadcast domains.
- F. They simplify switch administration.

Answer: B, C, E

Explanation:

There are many motivations for using VLANs, including these:

1. To group users by department, or by groups that work together, instead of by physical location. (B)
2. To reduce overhead by limiting the size of each broadcast domain (E)
3. To enforce better security by keeping sensitive devices on a separate VLAN (C)
4. To separate specialized traffic from mainstream traffic - for example, putting IP telephones on a separate VLAN from user PCs.

---

**QUESTION 40:**

What are some of the characteristics of a typical VLAN arrangement, found

throughout the Certkiller switched LAN? (Select all that apply)

- A. VLANs logically divide a switch into multiple, independent switches at Layer 2.
- B. Trunk links can carry traffic for multiple VLANs.
- C. VLAN implementation significantly increases traffic due to added trunking information.
- D. A VLAN can span multiple switches.
- E. VLANs typically increase the number of switches needed
- F. VLANs typically decrease the number of switches needed

Answer: A, B, D

Explanation:

VLANs give you the power of making virtual LAN networks to subdivide collision domains into smaller units of functionality, without being limited by physical location. A is correct because that is the exact function of a VLAN. B is correct because trunk links are used to carry traffic for multiple VLANs. D is correct because a VLAN can and often does span across multiple switches. VTP makes this possible.

Incorrect Answers:

- C. Although trunking information does indeed add some level of overhead, the overall traffic overhead is greatly reduced through the use of VLANs.
- E, F. The number of total switches needed in a network is the result of the number of devices on the entire LAN that need to be connected. Whether VLANs are used or not will have little, if any, impact on the total number of switches needed in a LAN.

---

#### **QUESTION 41:**

How could the Certkiller corporation benefit from using VLANs on their network? (Select three answer choices.)

- A. VLANs allow access to network services based on department, not physical location.
- B. VLANs utilize packet filtering to enhance network security.
- C. VLANs provide a low-latency, high bandwidth internetworking alternative.
- D. VLANs provide a method of communication between IP addresses in large networks.
- E. VLANs establish segmented broadcast domains in switched networks.
- F. VLANs can greatly simplify adding, moving, or changing hosts on the network.

Answer: A, E, F

Explanation:

VLANs establish broadcast domains in switched networks, so by virtue of having the option to create many efficient broadcast domains, congestion is reduced and network throughput is greatly enhanced. VLANs allow networks to be divided by department or resource needs, rather than by physical location. When people move departments, leave a department, or join a department, administration is easy and convenient with a few keystrokes.

Incorrect Answers:

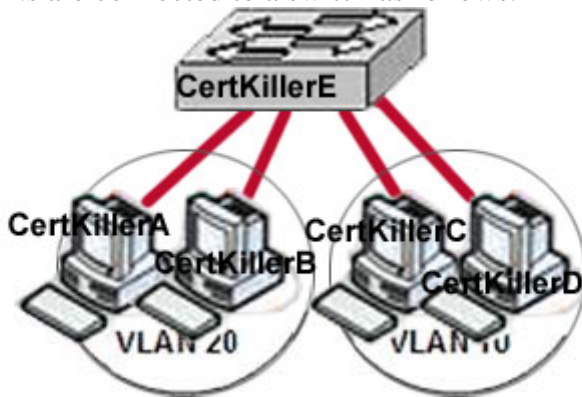
B, D. These would be router functions at layer 3. Switches and VLANs operate at layer 2 of the OSI model.

C. The use of VLANs may actually increase the latency in some cases, as traffic from one VLAN to the other will need to be routed.

---

**QUESTION 42:**

Two VLANs are connected to a switch as follows:



In this Certkiller network segment, hosts on the same VLAN can communicate with each other but are unable to communicate with hosts on different VLANs. What is needed to allow communication between these two Certkiller VLANs?

- A. A router with sub interfaces configured on the physical interface that is connected to the switch
- B. A router with an IP address on the physical interface that is connected to the switch
- C. A switch with a trunk link that is configured between the switches
- D. A switch with an access link that is configured between the switches
- E. None of the above

Answer: A

---

**QUESTION 43:**

You are working as a network technician at Certkiller University, when you get a call from the Engineering Faculty. They're complaining that they're receiving obsolete information from the Business Faculty's network traffic broadcasts. What can you do to contain the Business Faculty's broadcast while still keeping it connected to the internet and the enterprise services of the University? (Select all valid answer choices)

- A. Use half and full-duplex Ethernet on the Engineering Department LAN
- B. Establish a VTP domain to minimize the obsolete traffic
- C. Change the switch IP address of the switch
- D. Create separate VLANs and subnets for the two departments and route between the

two

E. Provide greater bandwidth to the Engineering Department LAN

F. Place the business department on a separate subnet and route between networks

Answer: D, F

Explanation:

In order to prevent the broadcast and link level multicast traffic separated between the departments, they need to be isolated at layer two. This can be accomplished in two ways. The first is to create separate VLANs and place each department into a different one. The second method would be to separate the two departments into two completely different networks, and route between them.

Incorrect Answers:

A. Mixing the use of half and full duplex will make no difference to the number of broadcasts sent.

B. Trunking is only useful in networks that already contain VLANs.

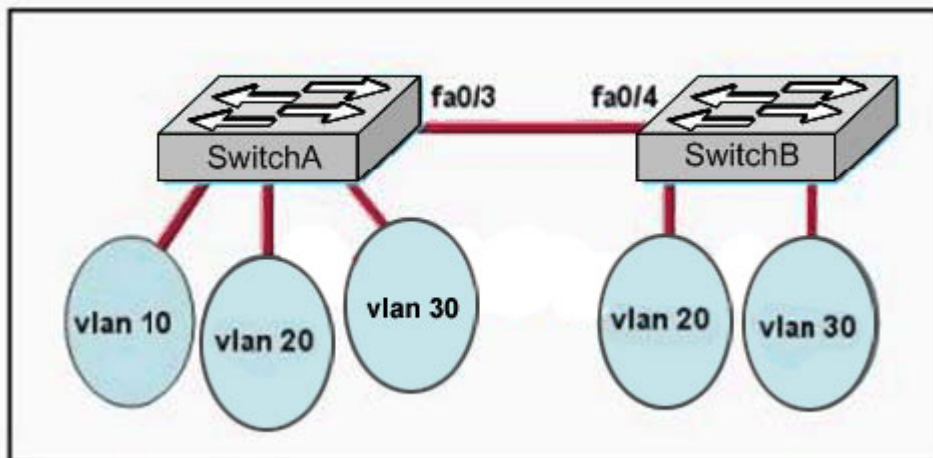
C. This will make no difference, as all users will still be contained within the same IP subnet.

E. The amount of bandwidth involved will not have any impact on the amount of broadcasts that are sent and received.

---

#### QUESTION 44:

Two Certkiller switches are shown below:



The switches have been configured with static VLANs as shown. During testing, the network administrator notices that VLAN 20 on SwitchA has no connectivity with VLAN 30 on SwitchB. What should the network administrator do?

A. Configure the interconnected ports on SwitchA and SwitchB into access mode.

B. Connect the two switches with a straight-through cable.

C. Add a Layer 3 device to connect VLAN 20 and VLAN 30.

D. Configure the management VLAN with IP address.

E. Ensure that the VIP passwords match on both switches.

Answer: C

Explanation:

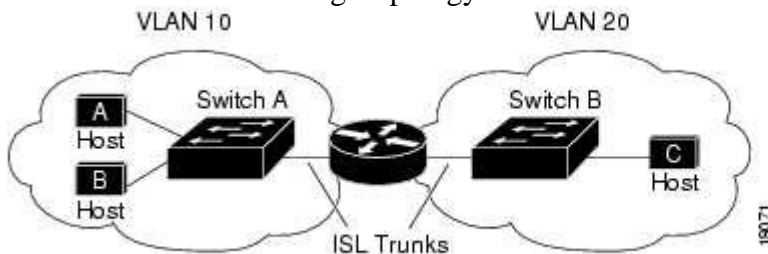
Network devices in different VLANs cannot communicate with one another without a router to route traffic between the VLANs. In most network environments, VLANs are associated with individual networks or subnetworks.

For example, in an IP network, each sub network is mapped to an individual VLAN.

Configuring VLANs helps control the size of the broadcast domain and keeps local traffic local. However, when an end station in one VLAN needs to communicate with an end station in another VLAN, interVLAN communication is required. This communication is supported by interVLAN routing. You configure one or more routers to route traffic to the appropriate destination VLAN.

The diagram below shows a basic interVLAN routing topology. SwitchA is in VLAN 10 and SwitchB is in VLAN20. The router has an interface in each VLAN.

Basic InterVLAN Routing Topology:



When HostA in VLAN10 needs to communicate with HostB in VLAN10, it sends a packet addressed to that host. SwitchA forwards the packet directly to HostB, without sending it to the router.

When HostA sends a packet to HostC in VLAN20, SwitchA forwards the packet to the router, which receives the traffic on the VLAN10 interface. The router checks the routing table, determines the correct outgoing interface, and forwards the packet out the VLAN20 interface to SwitchB. SwitchB receives the packet and forwards it to HostC.

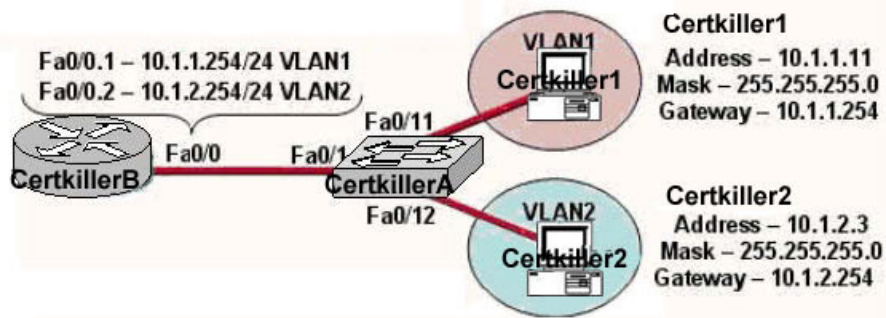
Reference:

[http://www.cisco.com/univercd/cc/td/doc/product/lan/cat5000/rel\\_5\\_2/layer3/routing.htm#wp13354](http://www.cisco.com/univercd/cc/td/doc/product/lan/cat5000/rel_5_2/layer3/routing.htm#wp13354)

---

**QUESTION 45:**

The Certkiller network is displayed below:



CertkillerA# show vlan

VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4, Fa0/5, Fa0/6, Fa0/7, Fa0/8, Fa0/9 Fa0/10, Fa0/11, Gi0/1
2	VLAN0002	active	Fa0/12

<--- output omitted --->

Study the exhibit: the topology and the partial switch command output.

The internetwork shown in the exhibit is experiencing connectivity problems. Host Certkiller 1 is unable to ping Host Certkiller 2.

What needs to be done to enable these hosts to ping each other?

- A. The gateway on Host Certkiller 1 needs to be changed.
- B. The IP address on Host Certkiller 2 needs to be reconfigured.
- C. VLAN2 must be named.
- D. The Fa0/1 interface on the Certkiller A switch must be configured as a trunk port.
- E. Switch port Fa0/1 must be moved to a different VLAN.

Answer: D

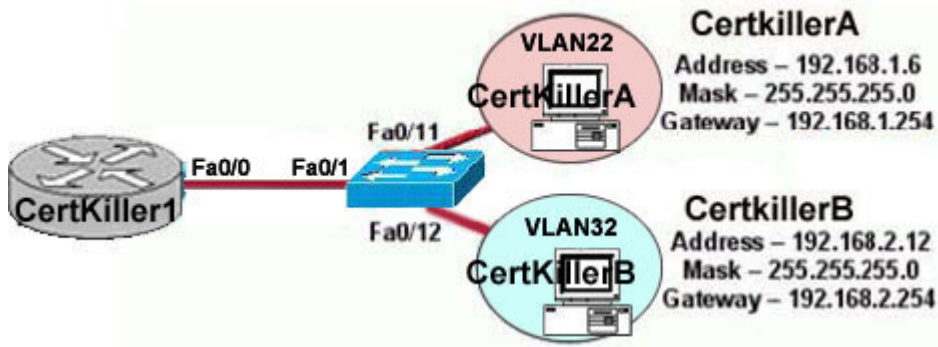
Explanation:

Interface FA0/1 should be in any case configured as a trunk port so that a router could switch packets between the VLANs. The IP addresses are acceptable, so no issues should be caused due this.

#### QUESTION 46:

A Certkiller network is displayed below:





```
Certkiller1 # show interfaces fastethernet 0/0.2
FastEthernet0/0.2 is up, line protocol is up
Hardware is AmdFE, address is 000c.ce8d.8860 (bia 000c.cd8d.8860)
Internet address is 192.168.2.254/24
MTU 1500 bytes, BW 10000 Kbit, DLY 100 usec, reliability 255/255
  txload 1/255, rxload 1/255
Encapsulation 802.1Q Virtual LAN, VLAN ID 23.
ARP type: ARPA, ARP Timeout 04:00:00
```

Host Certkiller B in the diagram is experiencing connectivity problems. Further Testing reveals that it cannot ping the default gateway. Based on the information shown in the exhibit, what is the problem?

- A. The IP address of Certkiller B is on a different subnet than the default gateway.
- B. The Fa0/1 interface on the switch is administratively shutdown.
- C. The switch is connected to the wrong interface on the Certkiller 1 router.
- D. The FastEthernet interface on the Certkiller router is not configured for trunking.
- E. The Fastethernet 0/0.2 interface on the Certkiller 1 router is configured for the wrong VLAN.
- F. The FastEthernet interface of the Certkiller 1 router is configured with the wrong Ethernet encapsulation.

Answer: E

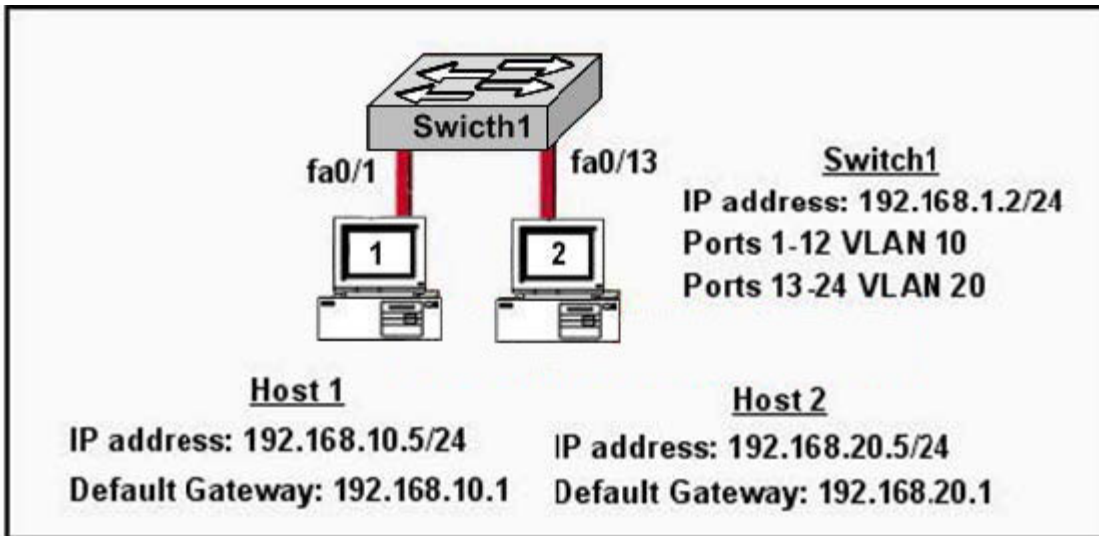
Explanation:

Based on the output shown above, the Fa 0/0.2 interface should be in VLAN 32, which is the same VLAN that other devices in the 192.168.2.X/24 subnet belong to. Interface FA0/0.1 should be configured for VLAN 22, while FA0/0.2 should be configured for VLAN 32.

---

### QUESTION 47:

A Certkiller switch is connected as shown below:



In the network above Host 1 cannot ping Host 2. What needs to be configured to allow host 1 and host 2 to communicate?

- A. The switch needs to be configured with an IP address on the correct subnet.
- B. The default gateway of the hosts should be configured to 192.168.1.2.
- C. Spanning Tree Protocol needs to be configured on the switch.
- D. A router needs to be configured to route between the VLANs.
- E. VTP needs to be configured on the switch to create a trunk between the VLANs.

Answer: D

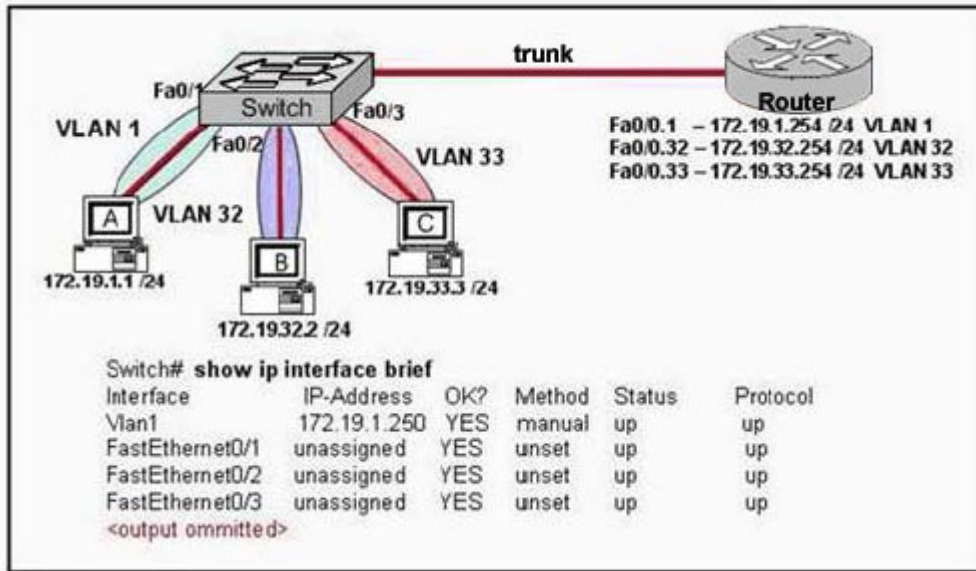
Explanation:

By default only members of the same VLAN can communicate with each other. For inter-VLAN communication we require a router to route between the different VLANs. Alternatively, if Host1 and Host2 were in the same subnet and the same VLAN, then they would also be able to communicate.

---

#### **QUESTION 48:**

The Certkiller network is shown below:



The network administrator normally establishes a Telnet session with the switch from host

A. However, host A is unavailable. The administrator's attempt to telnet to the switch from host B fails, but pings to the other two hosts are successful. What is most likely the issue?

- A. Host B and the switch need to be in the same subnet.
- B. The switch interface connected to the router is down.
- C. Host B needs to be assigned an IP address in VLAN 1.
- D. The switch needs an appropriate default gateway assigned.
- E. The switch interfaces need the appropriate IP addresses assigned.

Answer: D

Explanation:

This scenario requires inter-VLAN routing, which requires a layer three device. Based on the information above, a trunk has indeed been set up to route traffic between VLAN's so the only logical explanation why a host in VLAN 32 can not reach a host in VLAN1 (which is where the IP address of the switch is) would be because no default gateway has been specified in the switch.

Incorrect Answers:

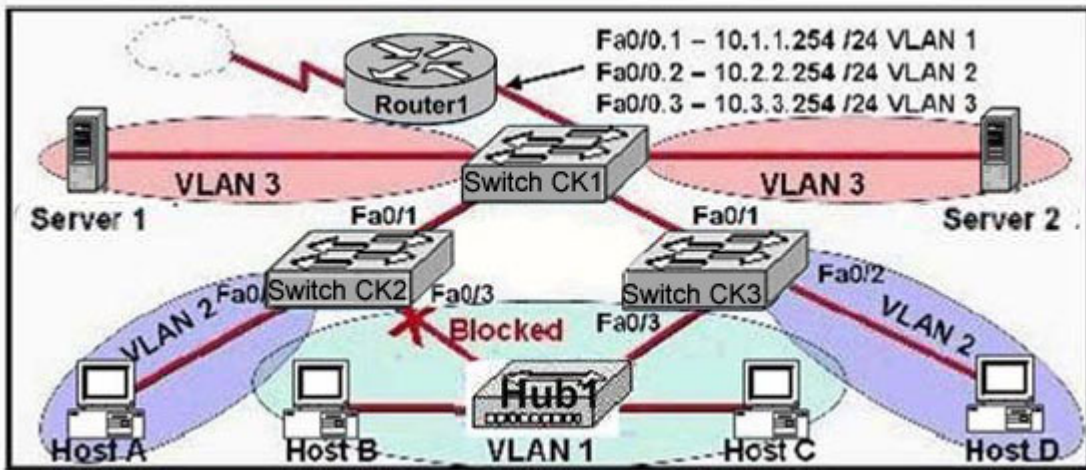
A, C: This is not a requirement, as a number of VLAN's can be configured within a switch, while the management IP address can reside in a different VLAN on a different subnet.

B: Based on the output above, the trunk link (fa 0/3) is indeed up and active.

E: Since switches operate at layer 2, each individual VLAN does not need its own IP address.

## QUESTION 49:

A portion of the Certkiller network is shown in the following exhibit:



Based on this diagram, which of the following is true?

- A. Switch CK2 is the root bridge.
- B. Spanning Tree is not running.
- C. Host D and Server 1 are in the same network.
- D. No collisions can occur in traffic between Host B and Host C.
- E. If Fa0/0 is down on Router 1, Host A cannot access Server 1.
- F. If Fa0/1 is down on Switch 3, Host C cannot access Server 2.
- G. None of the above

Answer: E

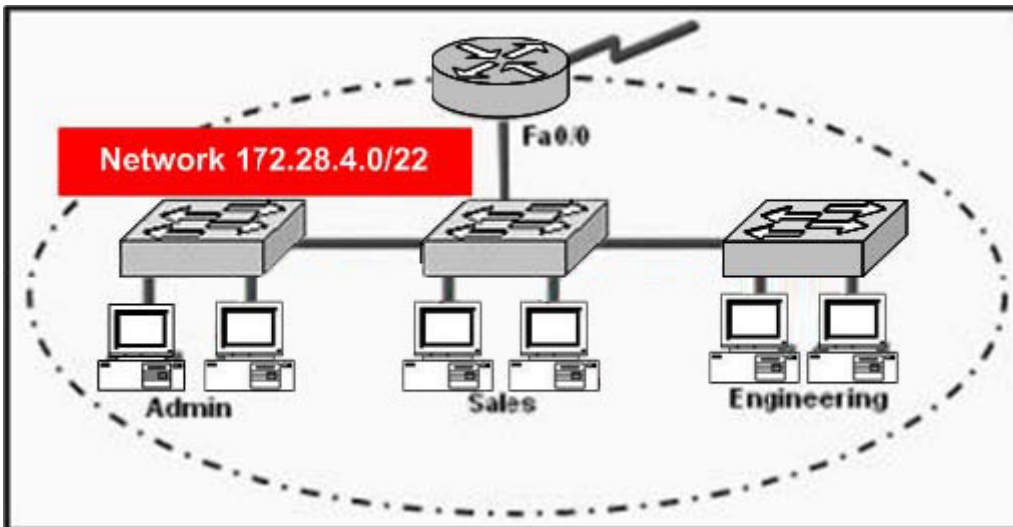
Explanation:

A VLAN is a group of hosts with a common set of requirements that communicate as if they were attached to the same wire, regardless of their physical location. A VLAN has the same attributes as a physical LAN, but it allows for end stations to be grouped together even if they are not located on the same LAN segment.

The above diagram is configured with inter-VLAN communication so the router has a great role to make communication between different VLAN. When router's port configured with trunk goes down all host can't communicate with other host in different VLAN as it is the router that directs traffic between the separate VLANs.

#### QUESTION 50:

The corporate LAN shown in the Certkiller network uses IP network 172.28.4.0/22 for all departments. All workstations use 172.28.4.1 as a default gateway address.



In this network, administrators have recently become concerned that excessive broadcasts are slowing network performance. Which change is most likely to reduce broadcast traffic on the corporate LAN?

- A. Configure an access control list on the router to prevent broadcast forwarding.
- B. Configure each NIC and switch port to operate at full duplex.
- C. Change the router-to-switch connection from Fast Ethernet to Gigabit Ethernet.
- D. Implement VLANs after creating IP subnets for each department.
- E. Increase the number of switches in the network closet of each department.

Answer: D

Explanation:

Switches using VLANs create the same division of the network into separate broadcast domains but do not have the latency problems of a router. Switches are also a more cost-effective solution.

There are several benefits to using VLANs, including:

1. Increased performance
2. Improved manageability
3. Network tuning and simplification of software configurations
4. Physical topology independence
5. Increased security options

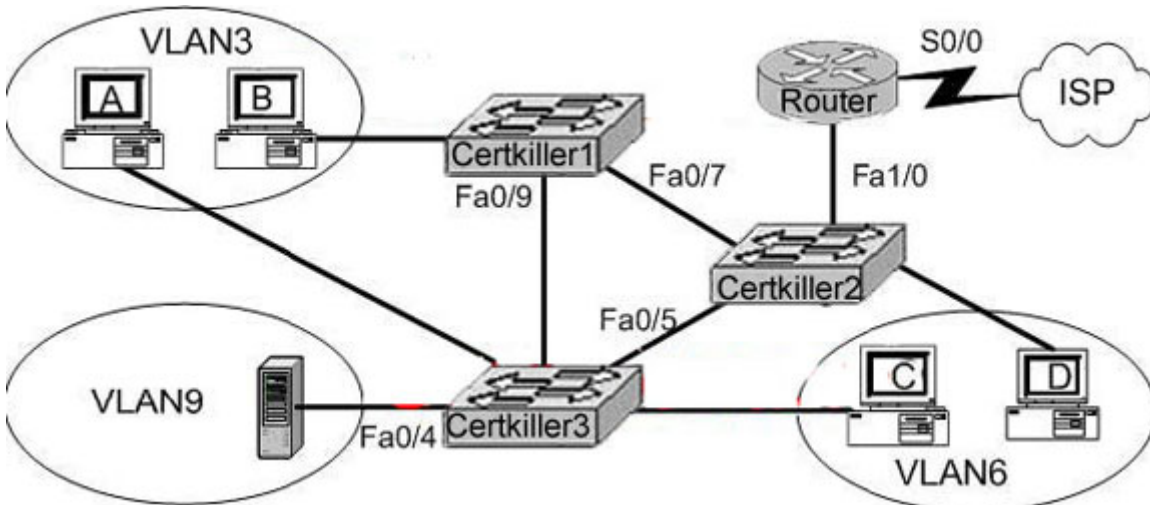
Increased performance

Switched networks by nature will increase performance over shared media devices in use today, primarily by reducing the size of collision domains. Grouping users into logical networks will also increase performance by limiting broadcast traffic to users performing similar functions or within individual workgroups. Additionally, less traffic will need to be routed, and the latency added by routers will be reduced.

## QUESTION 51:

The Certkiller LAN is displayed below:





A technician is investigating a problem with the exhibited network. These symptoms have been observed:

1. None of the user hosts can access the Internet.
2. None of the user hosts can access the server in VLAN 9.
3. Host A can ping Host B.
4. Host A CANNOT ping Host C or Host D.
5. Host C can ping Host D.

What could cause these symptoms?

- A. Interface S0/0 on the router is down.
- B. Interface Fa1/0 on the router is down.
- C. Interface Fa0/5 on Certkiller 3 is down.
- D. Certkiller 1 is turned off.
- E. Certkiller 3 is turned off.

Answer: B

Explanation:

Choice B is correct because a Router is used for communication between different VLANs and it is stated that none of the hosts can access the server in VLAN 9 it means that there is no connection of the network with router so FA1/0 is down. In this example, connectivity problems only occur with inter-VLAN communication, which means the problem is with the routing element.

Incorrect Answers:

- A. This may indeed be true, but until the LAN interface problems of the router are resolved, it is not an issue. If this was the only problem, then there would be no problems with Host A trying to reach Host C or D.
- C. This choice is wrong because Host C can ping Host D so FA0/5 cannot be down.
- D, E. Choice D and E are wrong because Host A can Ping Host B it means that the switch Certkiller 1 and switch Certkiller 3 are both functioning properly and is turned on.

## QUESTION 52:

Which of the following steps are necessary in order to add a new VLAN to the Certkiller switched network? (Select all that apply)

- A. Create the VLAN.
- B. Name the VLAN.
- C. Configure an IP address for the VLAN.
- D. Add the desired ports to the new VLAN.
- E. Add the VLAN to the VTP domain.

Answer: A, B, D

Explanation:

The following are the basic requirements for creating VLANs:

- \* Creating the VLAN numbers and names
- \* Configuring each port's assigned VLAN

Incorrect Answers:

- C. This is an optional feature, but not a necessary step for creating a VLAN.
- E. Adding any VLAN to a Virtual Trunking Protocol (VTP) domain may be desired in a complex multi-switch and multi-VLAN network. However, it is not a necessary step for creating stand-alone VLANs on a single switch.

---

### **QUESTION 53:**

You need to create a new VLAN on your Catalyst switch. This VLAN is to be named Certkiller . Which of the following need to be completed for the creation of this new VLAN? (Select all that apply)

- A. The Certkiller VLAN must be created.
- B. The desired ports must be added to the new Certkiller VLAN.
- C. The Certkiller VLAN must be added to all of the domains.
- D. The Certkiller VLAN must be named.
- E. An IP address must be configured for the Certkiller VLAN.
- F. None of the above. VLAN creations are automatic.

Answer: A, B, D

Explanation:

Creating a VLAN is done in 3 steps:

1. Create the VLAN
2. Name the VLAN
3. Assign ports to the VLAN

From there, other features and functionality can be configured, but these are the only steps that are required for the addition of a VLAN.

Incorrect Answers:

- C. The VLAN needs only to be added to a single switch, where it can act as a stand-alone VLAN, or it can be transferred to other switches in the network through the use of the



VTP protocol.

E. VLANs operate at layer 2, and although many are configured with a layer 3 IP address, it is not absolutely necessary to do this.

---

**QUESTION 54:**

What must the Certkiller network administrator do in order to successfully configure a VLAN trunk between two switches named CK1 and CK2 ? (Select two answer choices)

- A. Set each end of the trunk line to IEEE 802.1Q encapsulation.
- B. Set the same VTP management domain name on both switches.
- C. Set all ports on the two switches as access ports.
- D. Configure one of the two switches as a VTP server.
- E. Connect the two switches using a rollover cable.
- F. Use a router to forward VTP traffic between the VLANs.

Answer: B, D

Explanation:

All switches that need to share VLAN information using VTP must use the same VTP domain name, and a switch can only be in one domain at a time. This means that a switch can only share VTP domain information with other switches if they're configured into the same VTP domain. You can use a VTP domain if you have more than one switch connected in a network, but if you've got all your switches in only one VLAN, you don't need to use VTP. VTP information is sent between switches via a trunk port.

Switches advertise VTP management domain information, as well as a configuration revision number and all known VLANs with any specific parameters. There's also something called VTP transparent mode, in it, you can configure switches to forward VTP information through trunk ports, but not to accept information updates or update their VTP databases. At least one of the switches will need to be configured as the VTP server in order to pass the VLAN info.

Incorrect Answers:

- A. Although this is a valid option, it is not a requirement since using ISL as the encapsulation type is also a valid option.
  - E. A rollover cable is not used between switches for any of the port types.
  - F. Routers will be required for sending traffic from one VLAN to the other, but not to forward the actual VTP traffic.
- 

**QUESTION 55:**

After connecting a PC to an available port on a switch, you find that the PC can not access any of the resources on the LAN. No other PC's connected to the switch appear to be having any issues. What is the most likely cause for this problem?

- A. The router lacks a routing table entry for the new host
- B. The host switch port is assigned to the incorrect VLAN
- C. The host MAC address is incorrectly configured
- D. A STP instance for the new host has not been initialized
- E. The switch does not have the MAC address hard coded in the CAM table.

Answer: B

Explanation:

Virtual LANs break up broadcast domains in a layer-two switched internetwork. If a host is in a different VLAN then the network services it needs to use, the packets must go through a router. If routing does not take place, the PC will be unable to communicate with any other devices not in the same VLAN. Answer B is the best answer for this question.

Incorrect Answers:

- A. The PC is unable to communicate with other LAN users. No router needs to even be installed for this to work.
- C, E. The MAC address of the PC does not need to be entered manually into the switch. The switch will dynamically learn of the MAC address of the PC.
- D. The STP algorithm does not need to have any end host information added in order for it to work.

---

### **QUESTION 56:**

The Certkiller network administrator needs to verify that switch interface 0/5 has been assigned to the Marketing VLAN. Which command will accomplish this task?

- A. Show vlan
- B. Show mac-address-table
- C. Show vtp status
- D. show spanning-tree root
- E. show ip interface brief
- F. None of the above

Answer: A

Explanation:

The "show vlan" command displays the configured vlan name and ID as well as the ports that belong to each VLAN, etc. By default all ports belongs to VLAN 1

Note: You can also use: show vlan brief, show vlan ID where ID is the VLAN ID.

---

### **QUESTION 57:**

Exhibit:

Certkiller1# show vlan

VLAN Name	Status	Ports
1 default	active	Fa0/1, Fa0/2, Fa0/6, Fa0/7 Fa0/8, Fa0/10, Fa0/11, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/18, Fa0/19, Fa0/20 Fa0/21, Fa0/22, Fa0/23, Fa0/24
86 VLAN0086	active	Fa0/9
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default		
1005 trnet-default		

Please study the exhibit shown above carefully. The Certkiller switch that generated this output has 24 ports. Why are some of the ports missing from VLAN1?

- A. The missing ports are in VLAN 86.
- B. The missing ports are administratively disabled.
- C. The missing ports are not participating in spanning tree.
- D. The missing ports are configured as trunk ports.
- E. The missing ports have a status problem such as a speed or duplex mismatch.
- F. None of the above

Answer: D

Explanation:

The show vlan command displays the VLAN information and ports in all VLANs. This command displays only the ports in access mode. The missing ports must be configured as trunks.

---

### QUESTION 58:

You need to configure VLANs on some new Cisco switches in the Certkiller network. Which two statements describe the Cisco implementation of VLANs? (Select two)

- A. VLANs 1002 through 1005 are automatically created and cannot be deleted.
- B. VLAN 1 is the default Ethernet VLAN.
- C. By default, the switch IP address is in VLAN 1005.
- D. CDP advertisements are only sent on VLAN 1002.
- E. VLAN 100 is the default Ethernet VLAN.

Answer: A, B

Explanation:

A VLAN can be defined as a virtual broadcast domain. Instead of segmenting the broadcast domain with routers at Layer 3, you segment using switches at Layer 2. Each VLAN should be associated with its own IP subnet.

See the output of the "show vlan" command on a cisco switch:

Switch CK1 #show vlan  
VLAN Name Status Ports

-----  
1 default active Fa0/1, Fa0/2, Fa0/3, Fa0/4  
Fa0/5, Fa0/6, Fa0/7, Fa0/8  
Fa0/9, Fa0/10, Fa0/11, Fa0/12  
Fa0/13, Fa0/14, Fa0/15, Fa0/16  
Fa0/17, Fa0/18, Fa0/19, Fa0/20  
Fa0/21, Fa0/22, Fa0/23, Fa0/24  
1002 fddi-default active  
1003 token-ring-default active  
1004 fddinet-default active  
1005 trnet-default active

Normally Cisco switches supports VLAN upto 1005 but among them VLAN 1 Default Ethernet VLAN, 1002 fddi-default VLAN, 1003 token-ring-default VLAN, 1004 fddinet-default VLAN, 1005 trnet-default are created. You can't remove these VLANs.

---

**QUESTION 59:**

Exhibit:

**CertKiller2(config)# interface fa0/0**

**CertKiller2(config-if)# switchport access vlan 2**

You configure a new Certkiller switch as shown. Which two statements about the configuration of this switch interface are correct? (Select two)

- A. A network host can be connected to this interface.
- B. The switchport belongs only to VLAN 2.
- C. The exhibit shows interface fa0/0 to be dynamically mapped to VLAN 2.
- D. Interface fa0/0 will be in both VLAN 1 (by default) and VLAN 2.
- E. This command is invalid as all access ports must reside in VLAN1.

Answer: A, B

Explanation:

On a Cisco switch, ports are assigned to a single VLAN. These ports are referred to as access ports and provide a connection for end users or node devices, such as a router or server. By default all devices are assigned to VLAN 1, known as the default VLAN. After creating a VLAN, you can manually assign a port to that VLAN and it will be able to communicate only with or through other devices in the VLAN. In this case, the port has been manually assigned to VLAN 2, not the default value of VLAN 1.

---

**QUESTION 60:**

A new trunk has been configured on a switch in the Certkiller LAN. By default, which VLANs are allowed over this trunk link?

- A. No VLANs
- B. Only the VLANs that are specified when creating the trunk
- C. Only VLANs 1-64
- D. All VLANs
- E. All VLAN's except VLAN 1
- F. None of the above

Answer: D

---

**QUESTION 61:**

The Certkiller network administrator has just issued the "switchport trunk native vlan 998" command on switch CK2 . What is the function of this command?

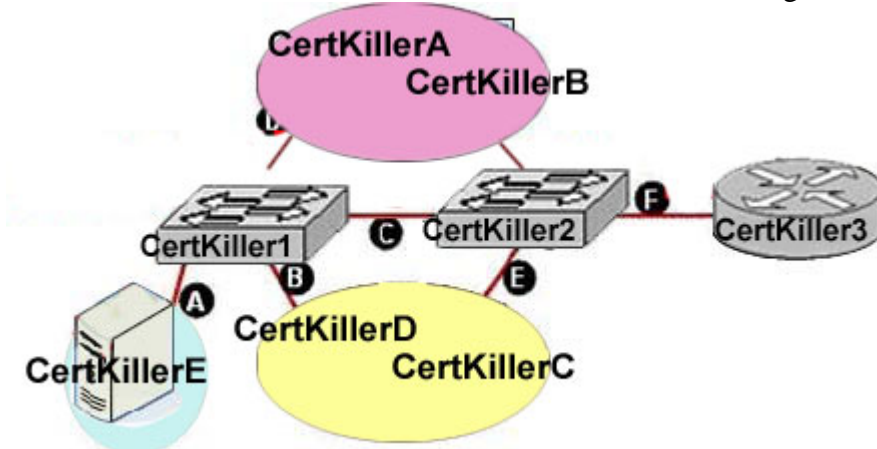
- A. It designates VLAN 998 as the default for all unknown tagged traffic
- B. It designates VLAN 998 for untagged traffic
- C. It blocks VLAN 998 traffic from passing on the trunk
- D. It creates a VLAN 998 interface
- E. None of the above

Answer: B

---

**QUESTION 62:**

Part of the Certkiller switched LAN is shown in the following exhibit:



As a network associate for Certkiller , you need to configure the switches and router in the graphic shown above so that the hosts in VLAN3 and VLAN4 can communicate with the enterprise server ( Certkiller E) in VLAN2. To accomplish this, which two Ethernet segments would need to be configured as trunk links? (Choose two)

- A. A
- B. B

- C. C
- D. D
- E. E
- F. F

Answer: C, F

---

**QUESTION 63:**

You are bringing up a new Certkiller switch, and wish to connect it via a trunk to another switch from a different vendor, which uses the IEEE standard for the trunking method. When setting the encapsulation type on the trunk, what should you configure on the Cisco switch?

- A. Switch(config)# switchport trunk encapsulation isl
- B. Switch(config)# switchport trunk encapsulation ietf
- C. Switch(config-if)# switchport trunk encapsulation isl
- D. Switch(config-if)# switchport trunk encapsulation ietf
- E. Switch(config-if)# switchport trunk encapsulation dot1q

Answer: E

Explanation:

The only real choices for setting up switching trunks are ISL and 802.1Q. ISL is Cisco proprietary, while 802.1Q uses the IEEE defined standard for trunking between switches. To configure the 802.1Q standard, the keyword "dot1q" is used in Cisco switches.

Incorrect Answers:

- A, B, D. These are not valid options in a Cisco switch.
- C. ISL is a Cisco proprietary method for setting up trunks, and will only work between Cisco switches.

---

**QUESTION 64:**

A new switch is being installed in the Certkiller network and you have been assigned the task of connecting it to an existing switch. In doing this, you want to set up the VLAN Trunking Protocol so that VLAN information can be passed between the switches. Which of the following must you do to accomplish this? (Choose all that apply).

- A. You must set each end of the trunk line to IEEE 802.1e encapsulation.
- B. You must set the same VTP management domain name on both switches.
- C. You must set all ports on the two switches as access ports.
- D. You must configure one of the switches as a VTP server.
- E. You must use a rollover cable to connect the two switches.

Answer: B, D

Explanation:

The following describes what is needed in order to correctly set up VTP:

VTP operates in one of three modes:

- Server mode
- Client mode
- Transparent mode

For VTP to exchange information, some switches act as servers, and some act as clients. VTP servers can create, modify, and delete VLANs and other configuration parameters for the entire VTP domain; this information, in turn, is propagated to the VTP clients and servers in that same domain. VTP servers save VLAN configurations in the Catalyst NVRAM, whereas in clients, the VLAN configuration is not stored at all. A VTP client cannot create, change, or delete VLANs, nor can it save VLAN configurations in nonvolatile memory.

Incorrect Answers:

- A. The encapsulation can be either ISL or 802.1Q, and need to match at each end of the trunk.
- C. Ports must only be assigned to VLANs. Once that is done and the trunk is up and running, the VLAN information will be passed between the switches.
- E. A regular CAT5 cable is used to connect the switches, assuming 10/100 Ethernet is used.

---

#### **QUESTION 65:**

A new Certkiller switch is installed into an existing LAN and a new VTP trunk is set up with an existing switch. Which VLANs will be allowed on this new trunk?

- A. All defined VLANs are allowed on the trunk by default.
- B. Each VLAN, or VLAN range, that is specified with the switchport mode command.
- C. Each VLAN, or VLAN range, that is specified with the vtp domain command.
- D. Each VLAN, or VLAN range, that is specified with the vlan database command.
- E. None of the above

Answer: A

Explanation:

The question does not state that there are multiple VTP Domains meaning that all defined VLANs are allowed on the trunk until a vtp domain command is issued.

---

#### **QUESTION 66:**

You need to decide on which trunking method to implement in the Certkiller network. What is a characteristic of ISL and 802.1q frame tagging in a switched LAN environment?

- A. They are used to find the best path through a network.



- B. They allow the exchange of filtering tables.
- C. They specify different implementations of the Spanning-Tree Protocol.
- D. They allow the exchange of routing tables
- E. They provide inter-switch VLAN communication.

Answer: E

Explanation: A trunk link is the other type of Layer 2 port supported on Cisco switches. When a trunk port is configured, it begins marking frames as they exit the port to indicate which VLAN each frame is associated with. The trunk port can also read the markings, called tags, as they enter the trunk port. This enables the switch to send a frame only to the ports for the given VLAN associated with the incoming frame.

The main purpose of trunking is to carry traffic between switches and maintain the VLAN information. Unlike an access link, the trunk link does not belong to a single VLAN but instead can carry traffic from several VLANs over a point-to-point link between two devices that understand the protocol.

Two forms of trunking are used for Cisco switches on Ethernet networks:

An IEEE industry standard called IEEE 802.1Q. This is a frame-tagging mechanism that adds a VLAN identifier to the frame by inserting a tag at Layer 2.

Another form of trunking on Cisco switches is called Inter-Switch Link (ISL), which is a Cisco proprietary trunking mechanism. ISL uses a frame encapsulation method that adds a header to identify the VLAN.

Incorrect Answers:

A, D. These are the functions of routers, not switches.

B. Filtering tables can be used on certain Catalyst switches via the use of VLAN access control lists, but this information is never shared between switches.

C. A separate STP instance is created for each VLAN, but the STP implementation remains the same.

---

### **QUESTION 67:**

Which one of the following protocols allows the information about the configuration of a new VLAN to be distributed across entire switched network?

- A. STP
- B. VTP
- C. EIGRP
- D. SNMP
- E. CDP
- F. None of the above

Answer: B

Explanation:

Sybex CCNA Study Guide 4th Edition states on page 359:

"The basic goals of VLAN Trunking Protocol (VTP) are to manage all configured VLANs across a switched internetwork and to maintain consistency throughout that network. VTP allows an administrator to add, delete, and rename VLANs-information that is then propagated to all other switches in the VTP domain."

Incorrect Answers:

- A. STP is the Spanning Tree Protocol, used to prevent bridging loops in a LAN.
- C. EIGRP is a routing protocol used to exchange routing information, not VLAN information.
- D. SNMP is the Simple Network Management Protocol, used to provide information to remote network management stations.
- E. CDP is the Cisco Discovery Protocol, which is used to exchange information between Cisco devices. It can only be used between Cisco routers and switches.

---

### **QUESTION 68:**

Which encapsulation types are configurable on a Cisco switch for a trunk? (Select two answer choices)

- A. VTP
- B. ISL
- C. CDP
- D. 802.1Q
- E. 802.1p
- F. LLC
- G. IETF

Answer: B, D

Explanation:

Trunks are used to carry traffic belonging to multiple VLANs between devices over the same link. A device can determine which VLAN the traffic belongs to by its VLAN identifier. The VLAN identifier is a tag that is encapsulated with the data. ISL and 802.1q are two types of encapsulations used to carry data from multiple VLANs over trunk links. ISL is a Cisco proprietary protocol for interconnecting multiple switches and maintaining VLAN information as traffic goes between switches. ISL provides VLAN trunking capabilities while maintaining full wire speed performance on Ethernet links in full-duplex or half-duplex mode. ISL operates in a point-to-point environment and will support up to 1000 VLANs. In ISL, the original frame is encapsulated and an additional header is added before the frame is carried over a trunk link. At the receiving end, the header is removed and the frame is forwarded to the assigned VLAN. .ISL uses Per VLAN Spanning Tree (PVST) which runs one instance of Spanning Tree Protocol (STP) per VLAN. PVST allows for optimal root switch placement for each VLAN and supports load balancing of VLANs over multiple trunk links.

802.1Q is the IEEE standard for tagging frames on a trunk and supports up to 4096 VLANs. In 802.1Q, the trunking device inserts a four-byte tag into the original frame and

re-computes the Frame Check Sequence (FCS) before sending the frame over the trunk link. At the receiving end, the tag is removed and the frame is forwarded to the assigned VLAN. 802.1Q does not tag frames on the native VLAN. It tags all other frames transmitted and received on the trunk. While configuring a 802.1 trunk, you must make sure that the same native VLAN is configured on both sides of the trunk. IEEE 802.1Q defines a single instance of spanning tree running on the native VLAN for all the VLANs in the network which is called Mono Spanning Tree (MST). This lacks the flexibility and load balancing capability of PVST available with ISL. However, PVST+ offers the capability to retain multiple Spanning Tree topologies with 802.1Q trunking.

---

**QUESTION 69:**

You need to configure an 802.1Q link on a Certkiller switch. Which commands, when used together, would do this? (Select two answer choices)

- A. Switch(vlan)# mode trunk
- B. Switch(config)# switchport access mode trunk
- C. Switch(config-if)# switchport mode trunk
- D. Switch(config-if)# switchport trunk encapsulation dot1q
- E. Switch(config)# switchport access mode 1
- F. Switch(vlan)# trunk encapsulation dot1q

Answer: C, D

Explanation:

Creating this trunk link is a two step process. First you have to set the switchport mode to trunk, and then you configure the encapsulation. The giveaway on this question is the fact that to create a trunk on an interface, you have to be in interface configuration mode. So switchport mode trunk sets the trunk, and switchport trunk encapsulation dot1q sets the encapsulation.

---

**QUESTION 70:**

Which of the following are VLAN frame encapsulation types that may be configured on a Catalyst switch? (Choose two.)

- A. VTP
- B. ISL
- C. CDP
- D. 802.1Q
- E. 802.1p
- F. LLC

Answer: B, D

Explanation:

The two VLAN trunking encapsulation types are:

**Inter-Switch Link (ISL):** This is proprietary to Cisco switches, and it's used for Fast Ethernet and Gigabit Ethernet links only. ISL routing can be used on a switch port, router interfaces, and server interface cards to trunk a server. ISL lets you explicitly tag VLAN information onto an Ethernet frame. This tagging information allows VLANs to be multiplexed over a trunk link through an external encapsulation method, which allows the switch to identify the VLAN membership of a frame over the trunked link.

**IEEE 802.1Q:** Created by the IEEE as a standard method of frame tagging, this actually inserts a field into the frame to identify the VLAN. If you're trunking between a Cisco switched link and a different brand of switch, you have to use 802.1Q for the trunk to work.

---

**QUESTION 71:**

There are 2 switches in the Certkiller LAN, with no routers. Ports 1, 2 & 3 are assigned to VLAN 1 in switch 1 and 2 and ports 4, 5 & 6 are assigned to VLAN 2 in both switches. These two switches are connected together via a trunked link. Which of the conditions below would verify trunk and VLAN operation? (Select all valid answers)

- A. Host 1 on VLAN 1 can ping Host 2 on VLAN 1
- B. Host 1 on VLAN 1 can ping Host 4 on VLAN 2
- C. Host 1 on VLAN 1 can not ping Host 2 on VLAN 1
- D. Host 4 on VLAN 2 can not ping Host 1 on VLAN 1
- E. Host 4 on VLAN 2 can ping Host 2 on VLAN 2

Answer: A, D, E

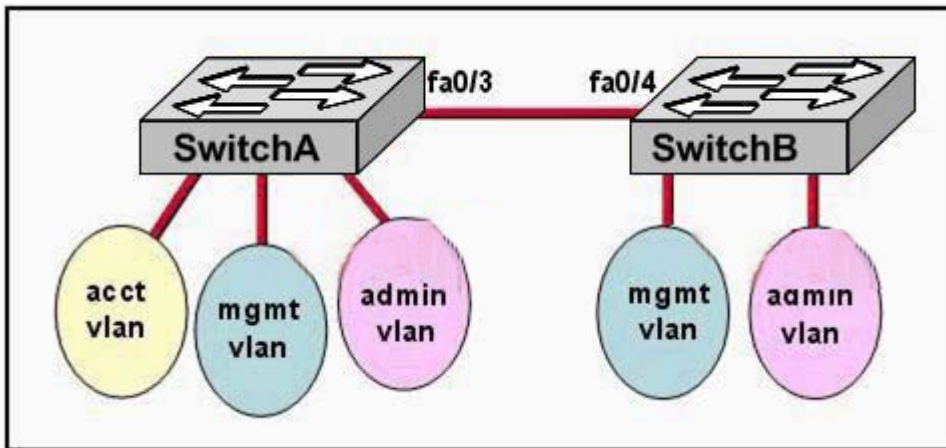
Explanation:

If there is no router present, only hosts in the same VLAN will be able to ping each other. In order for any host on one VLAN to communicate with a host on another VLAN, the traffic must pass through a router. Host within the same VLAN will be able to ping each other, even though they reside on different switches, as long as the switches have a trunk connection configured between them.

---

**QUESTION 72:**

Two Certkiller switches are connected as shown below:



Please study the exhibit carefully. Configuration of both switches has been completed. During testing, the network administrator notices that users on SwitchA can not connect with users in the same VLAN on SwitchB. What should be done to solve this problem?

- A. Ensure that the IP address of SwitchA is on the same network as the IP address of SwitchB.
- B. Ensure that the same interface number is used to connect both switches.
- C. Ensure that the ports connecting the two switches are configured to trunk.
- D. Ensure that SwitchA and SwitchB are connected with a straight-through cable.

Answer: C

Explanation:

Ports can be in two states on a switch:

**Access ports:** This type of link is only part of one VLAN, and it's referred to as the native VLAN of the port. Any device attached to an access link is unaware of a VLAN membership the device just assumes it's part of a broadcast domain, but it does not understand the physical network.

**Trunk links:** Trunks can carry multiple VLANs and originally gained their name after the telephone system trunks that carry multiple telephone conversations.

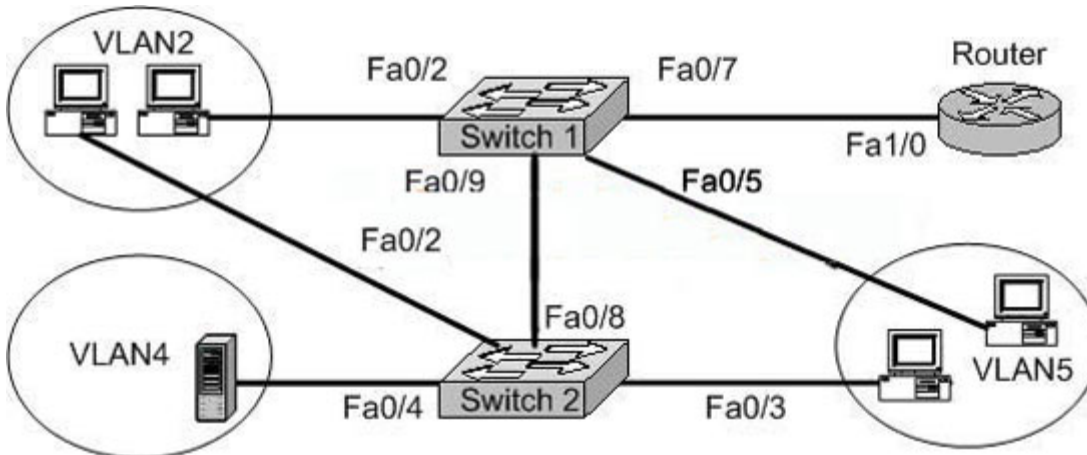
So to carry the VLAN information from one switch to another switch, a trunk link needs to be configured between the two switches, using the "showtchport mode trunk" command.

Note: By default all ports are in access mode.

---

### QUESTION 73:

The Certkiller network is displayed in the diagram below:



A network associate is trying to understand the operation of the Certkiller network by studying the graphic. All hosts are able to reach the enterprise server on VLAN4. The associate needs to determine which interfaces are functioning as a trunk ports. Which of the interfaces are trunks? (Choose two)

- A. Switch1 - Fa0/2
- B. Switch1 - Fa0/9
- C. Switch2 - Fa0/3
- D. Switch2 - Fa0/4
- E. Switch2 - Fa0/6
- F. Router - Fa1/0

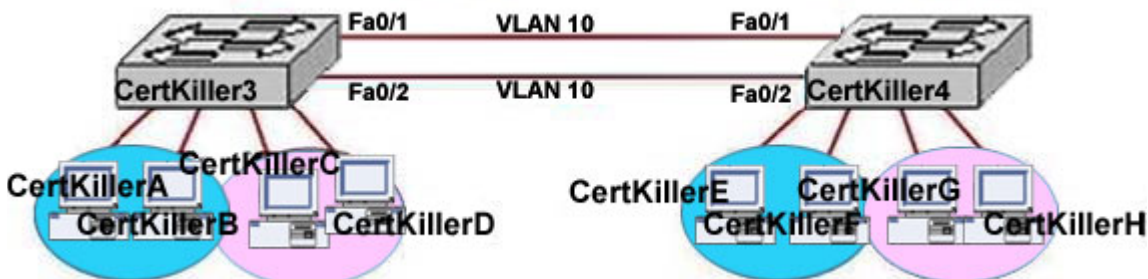
Answer: B, F

Explanation:

Trunks are only used on connections between two switches, or between routers and switches. Trunk ports are not used on connections to end stations, such as servers or computer stations. In this example, only choice B and F are possible trunks.

#### QUESTION 74:

Network topology exhibit:



Certkiller 3 configuration exhibit:

```
CertKiller3 # show interface fa0/1 switchport
Name Fa0/1
Switchport: Enabled
Administrative Mode: static access
Operational Mode: static access
Administrative Trunking Encapsulation: dot1q
Negotiation of Trunking: Off
Access Mode VLAN: 10 (Sales)
Trunking Native Mode VLAN: 1 (default)
- output omitted -
```

Certkiller 4 configuration exhibit:

```
CertKiller4 # show interface fa0/2 switchport
Name Fa0/2
Switchport: Enabled
Administrative Mode: static access
Operational Mode: static access
Administrative Trunking Encapsulation: dot1q
Negotiation of Trunking: Off
Access Mode VLAN: 20 (Accounting)
Trunking Native Mode VLAN: 1 (default)
- output omitted -
```

You work as a network administrator at Certkiller .com. Study the exhibits carefully. Certkiller connects two different office segments, supporting two VLANs through the two switches shown in the exhibit. Inter-VLAN communications is not required. The network is working properly and there is full connectivity. Certkiller needs to add additional VLANs, so it has been decided to implement VTP. Both switches are configured as VTP servers in the same VTP domain. VLANs added to Certkiller 3 are not learned by Certkiller 4. Based on this information and the partial configurations in the exhibit, what is the problem?

- A. STP has blocked one of the links between the switches, limiting connectivity.
- B. Certkiller 4 should be configured as a VTP client.
- C. The links between the switches are access links.
- D. VTP is Cisco proprietary and requires a different trunking encapsulation.
- E. A router is required to route VTP advertisements between the switches.
- F. None of the above.

Answer: C

Explanation:

A trunk link is a special connection; the key difference between an ordinary connection (access port) and a trunk port is that although an Access port is only in one VLAN at a time, a trunk port has the job of carrying traffic for all VLANs from one switch to another. Any time you connect a switch to another switch and want to make sure that all VLANs will be carried across the switches, you want to make it a trunk.

To carry on the data frames for all VLANs, you need to create the Trunk link on switch port as well as you need to select the encapsulation type.

Switchport mode trunk

Switchport trunk encapsulation dot1q or isl

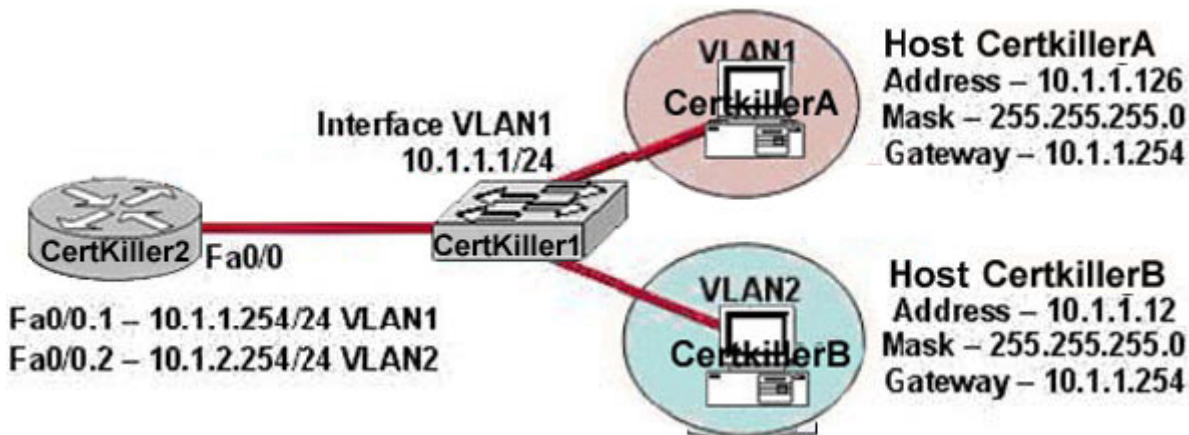
In the above topology the switches are connected on access ports. Making them trunk ports should solve this issue.



---

**QUESTION 75:**

Two Certkiller hosts reside in different VLANs as shown below:



The Certkiller network shown in the diagram above is experiencing connectivity problems. Which of the following will correct the problems? (Choose two.)

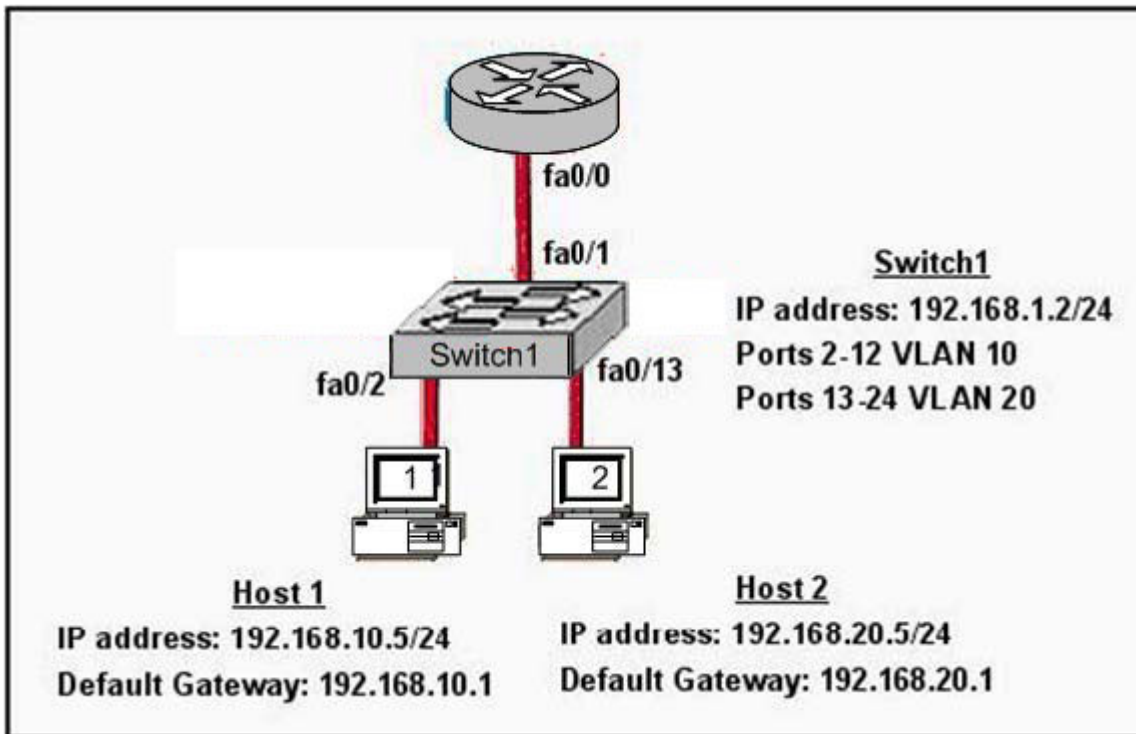
- A. Configure the gateway on Host Certkiller A as 10.1.1.1
- B. Configure the IP Address of Host Certkiller B as 10.1.2.2
- C. Configure the IP Address of Host Certkiller A as 10.1.2.2
- D. Configure the gateway on host Certkiller B as 10.1.2.254

Answer: B, D

---

**QUESTION 76:**

A Certkiller network is shown below:



Based on the information shown above, what commands must be configured on the Certkiller 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 shutdown  
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

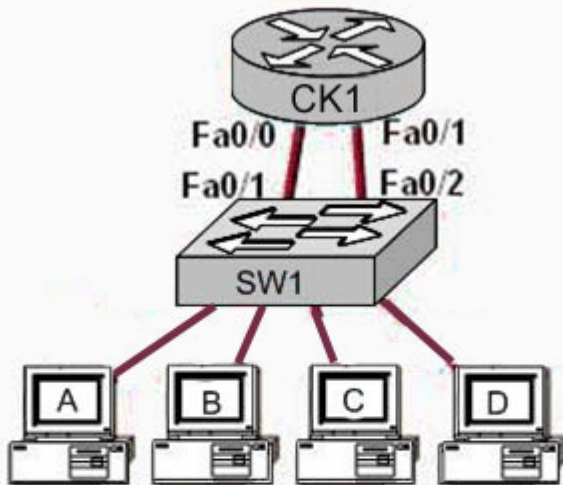
Answer: B, E

Explanation:

In this exhibit, there are two different VLANs (VLAN 10 and VLAN 20). In this case, the router is required for Inter-VLAN routing. In order to properly configure Inter-VLAN Routing, we need to assign the IP address and the encapsulation type. In the router we need two sub-interfaces created we need to assign the IP as well as defined the encapsulation type for each of these. In the switch, only a trunk port can carry the information of multiple VLANs so fa0/1 is trunked on the switch as shown by answer E.

### QUESTION 77:

Two Certkiller devices are connected as shown below:



**Hosts A, B, SW1 Fa0/1, and CK1 Fa0/0 on VLAN1**

**Hosts C, D, SW1 Fa0/2, and CK1 Fa0/1 on VLAN2**

The Certkiller network administrator needs to add a new VLAN, named VLAN3, to the network shown above. Unfortunately, there is not another FastEthernet interface on CK1 to connect to the new VLAN3. Which approach is the most cost effective solution for this problem?

- A. Purchase a new FastEthernet module and install it on CK1 .
- B. Replace CK1 with a new router that has at least three FastEthernet interfaces.
- C. Configure a second switch to support VLAN3 with a VLAN trunk between SW1 and the new switch.
- D. Configure a single VLAN trunk between CK1 and SW1 and configure a subinterface on the CK1 interface for each VLAN.
- E. Connect another router to a serial interface of CK1 . Use a FastEthernet interface on the new router for VLAN3.
- F. None of the above

Answer: D

Explanation:

A Router is a Layer 3 device that plays the vital role for inter-VLAN communication. For inter-VLAN communication either we require multiple interfaces or we can create sub interfaces on the router for each VLAN.

Example router configuration for this scenario:

```
(config)# interface fa0.1
```

```
(config-if)#ip address 192.168.1.1 255.255.255.0
```

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

```
(config)#interface fa0.2
```

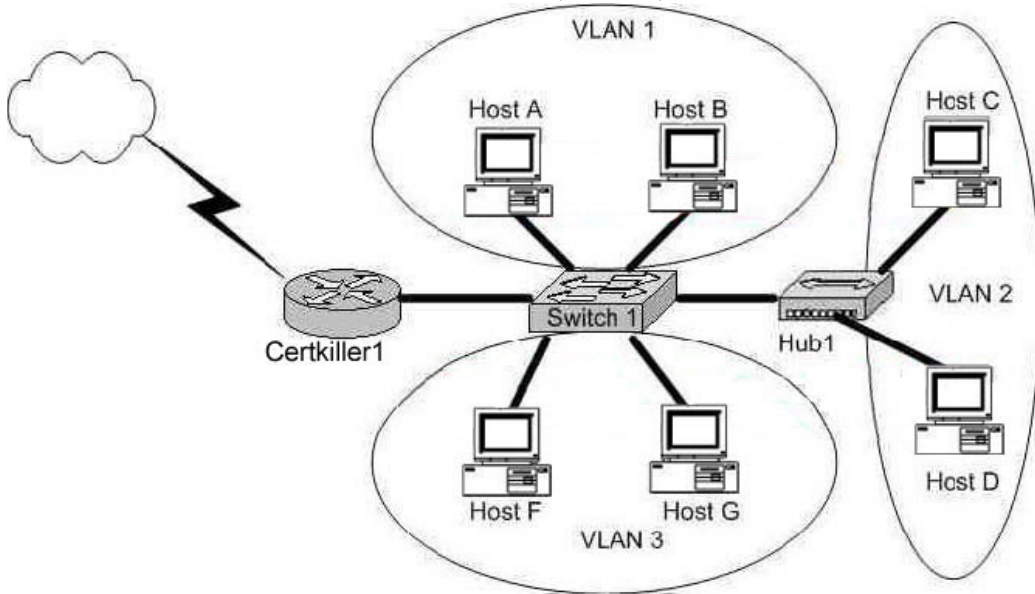
```
(config-if)#ip address 192.168.2.1 255.255.255.0
```

With this configuration, the switch can connect to the router's FastEthernet Interface by trunking, so one port of switch can carry the information of multiple VLANs.

---

### QUESTION 78:

The Certkiller Network consists of a router, switch, and hub as shown below:



In accordance with the above diagram; which of the statements below correctly describe the switch port configuration and the router port configurations? (Select three answer choices)

- A. The Certkiller 1 WAN port is configured as a trunking port.
- B. The Certkiller 1 port connected to Switch1 is configured using subinterfaces.
- C. The Certkiller 1 port connected to Switch1 is configured as 10 Mbps.
- D. The Switch1 port connected to Certkiller 1 is configured as a trunking port.
- E. The Switch1 port connected to Host B is configured as an access port.
- F. The switch1 port connected to Hub1 is configured as full duplex.

Answer: B, D, E

Explanation:

B is correct because the diagram and the function match the description of a subinterface. Subinterfaces are needed because for inter-vlan communication, routing needs to take place. D is correct because all 3 VLAN's are trunked to reach the router. E is correct because access ports are correct in this case.

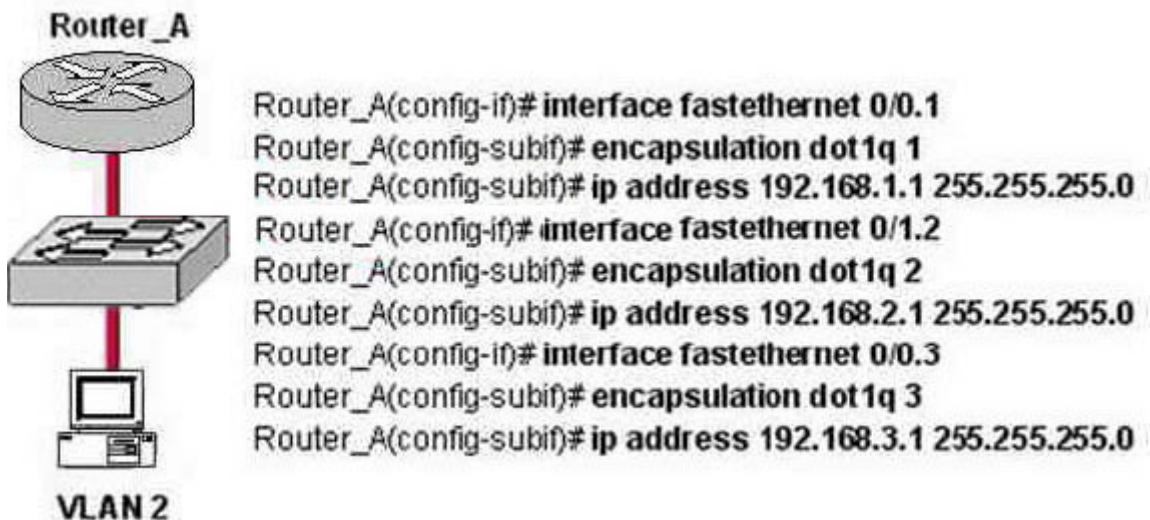
Incorrect Answers:

A. This is incorrect because trunks only work between switches, and not between a router and a WAN.

C, F. Although these may be true, we are not given enough information in this diagram to confirm it.

---

### QUESTION 79:



A Certkiller router is configured as shown in the graphic above. The switch is connected to the router over a VLAN trunk. The switch has been configured with three VLANs: VLAN1, VLAN2, and VLAN3. In addition, the IP address of the switch is 192.168.1.2. A host is being added to the switch on VLAN 2.

What is the correct default gateway for this computer?

- A. 192.168.1.1
- B. 192.168.1.2
- C. 192.168.2.1
- D. 192.168.2.2
- E. 192.168.3.1
- F. 192.168.3.2
- G. None of the above

Answer: C

Explanation:

The default gateway for this host should be the IP address of the local router on that VLAN. Based on the router configuration, this IP address is 192.168.2.1. In the router

configuration, the number that follows the "encapsulation dot1q" command is the VLAN that is assigned to it. In this case, the PC host belongs to VLAN 2, so the subinterface fast Ethernet 0/0.2 is the one that should be chosen.

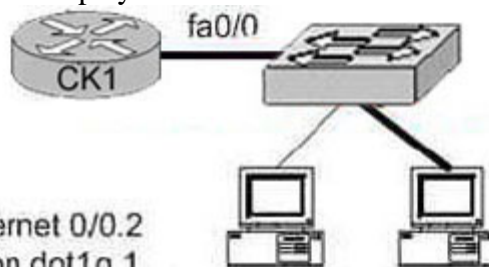
Incorrect Answers:

- A. This is the IP address that hosts in VLAN 1 should use as their default gateway.
- B. Even though this is the IP address of the switch itself as stated in the question, it should not be chosen as the default gateway for any of the hosts in any of the VLANs. This IP address would be used only to administer and make changes to the switch.
- D, F. These are incorrect choices.
- E. This is the IP address that hosts in VLAN 3 should use as their default gateway.

---

### QUESTION 80:

A portion of the Certkiller network is displayed below:



```
CK1(config)# interface FastEthernet 0/0.2
CK1(config-subif)# encapsulation dot1q 1
CK1(config-subif)# ip address 192.1.1.129 255.255.255.240
CK1(config)# interface FastEthernet 0/0.3
CK1(config-subif)# encapsulation dot1q 2
CK1(config-subif)# ip address 192.1.1.65 255.255.255.192
```

Host A in the graphic is connected to a switch port assigned to VLAN 1.  
Which two settings on host A are required to allow connectivity with Host B on VLAN 2? (Choose two)

- A. IP address: 192.1.1.66 255.255.255.240
- B. IP address: 192.1.1.130 255.255.255.192
- C. IP address: 192.1.1.142 255.255.255.240
- D. Default gateway: 192.1.1.129
- E. Default gateway: 192.1.1.65
- F. Default gateway: 192.1.1.1

Answer: C, D

Explanation:

Sub-interface Fast Ethernet 0/0.2 was created for VLAN 1 through the use of the "encapsulation dot1q 1" command. Therefore, since host A resides in VLAN 1 it must be configured with an IP address in the 192.1.1.128/28 subnet and it must be configured with the IP address of the default gateway, which is the IP address assigned to the corresponding sub-interface of the router.

Incorrect Answers:

- A. This IP address is not in the same subnet as the Fast Ethernet 0/0.2 sub-interface.

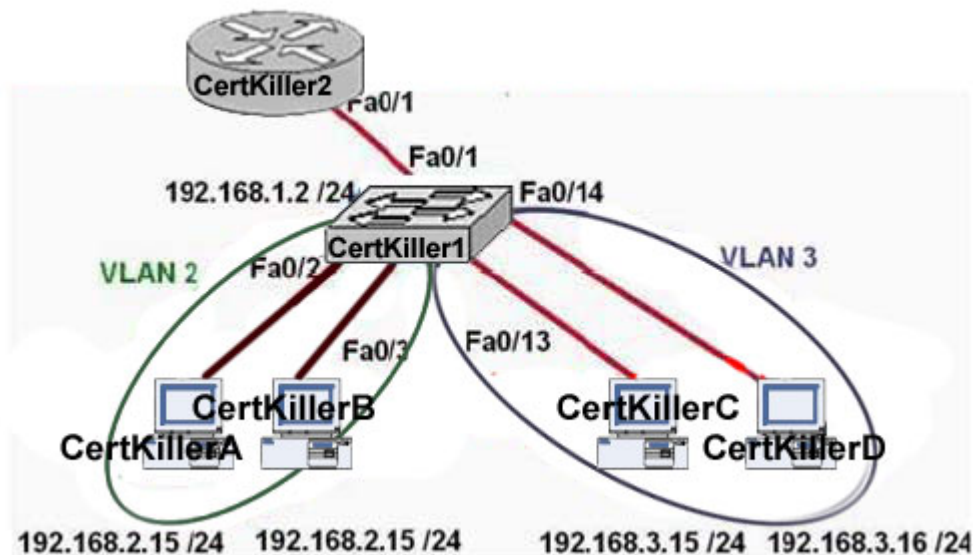


B. The subnet mask is incorrect in this choice.

E, F. The default gateway needs to be set as the IP address for the sub-interface created in the router for VLAN 1.

### QUESTION 81:

Part of the Certkiller WAN is shown below:



Certkiller 2 configuration exhibit:

```
CertKiller2# show ip route
<output omitted>
C 192.168.1.0 /24 is directly connected to Fa0/1.1
C 192.168.2.0 /24 is directly connected to Fa0/1.2
```

In this network segment, the Certkiller network administrator has created a new VLAN on Certkiller 1 and added host Certkiller C and host Certkiller D. This administrator has properly configured switch interfaces FastEthernet0/13 through FastEthernet0/24 to be members of the new VLAN. However, after the network administrator completed the configuration, host Certkiller A could communicate with host Certkiller B, but host Certkiller A could not communicate with host Certkiller C or host Certkiller D. Which commands are required to resolve this problem?

- A. Certkiller 2(config)# router rip  
 Certkiller 2(config-router)# network 192.168.1.0  
 Certkiller 2(config-router)# network 192.168.2.0  
 Certkiller 2(config-router)# network 192.168.3.0
- B. Certkiller 2(config)# interface fastethernet 0/1.3  
 Certkiller 2(config-if)# encapsulation dot1q 3  
 Certkiller 2(config-if)# ip address 192.168.3.1 255.255.255.0
- C. Certkiller 1(config)# interface fastethernet 0/1  
 Certkiller 1(config-if)# switchport mode trunk  
 Certkiller 1(config-if)# switchport trunk encapsulation isl

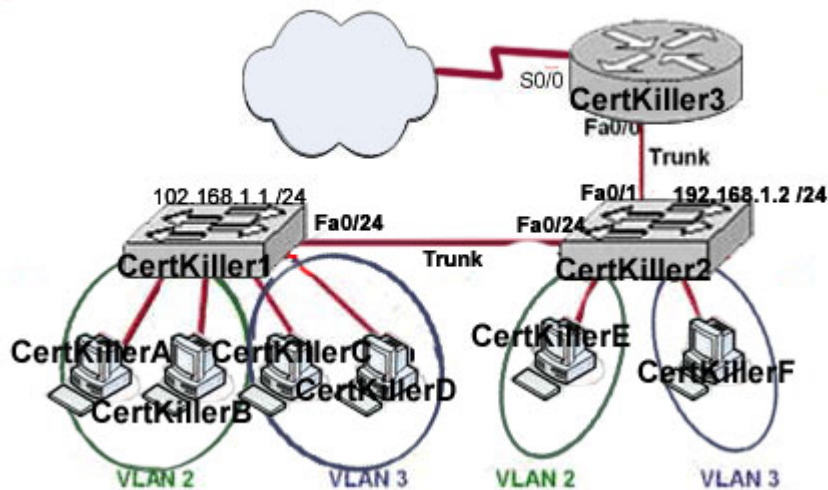


- D. Certkiller 1# vlan database
- Certkiller 1(vlan)# vtp v2-mode
- Certkiller 1(vlan)# vtp domain Certkiller
- Certkiller 1(vlan)# vtp server
- E. None of the above

Answer: B

### QUESTION 82:

Part of the Certkiller network is shown below:



Based on the information provided above, which two statements are true about interVLAN routing in this Certkiller network segment? (Choose two)

- A. Router Certkiller 3 and Switch Certkiller 2 should be connected via a crossover cable.
- B. Host Certkiller E and host Certkiller F use the same IP gateway address.
- C. The FastEthernet 0/0 interface on Router Certkiller 3 and Switch Certkiller 2 trunk ports must be configured using the same encapsulation type.
- D. Router Certkiller 3 will not play a role in communications between host Certkiller A and host Certkiller D.
- E. Router Certkiller 3 needs more LAN interfaces to accommodate the VLANs that are shown in the exhibit.
- F. The FastEthernet 0/0 interface on Router Certkiller 3 must be configured using subinterfaces.

Answer: C, F

### QUESTION 83:

The Certkiller network administrator cannot connect to Switch CK1 over a Telnet session, although the hosts attached to Switch CK1 can ping the interface Fa0/0 of the router. Given the information shown below and assuming that the router and

Switch2 are configured properly, which of the following commands should be issued on Switch CK1 to correct this problem?

Exhibit:

```
interface Vlan1
ip address 192.168.24.2 255.255.255.0
no ip route-cache
!
CertKillerA# show run
ip http server
!
line con 0
line vty 0 4
password cisco
login
!
end
```

- A. Switch CK1 (config)# ip default-gateway 192.168.24.1
- B. Switch CK1 (config)# interface fa0/1
- Switch CK1 (config-if)# ip address 192.168.24.3 255.255.255.0
- C. Switch CK1 (config)# line con0
- Switch CK1 (config-line)# password cisco
- Switch CK1 (config-line)# login
- D. Switch CK1 (config)# interface fa0/1
- Switch CK1 (config-if)# duplex full
- Switch CK1 (config-if)# speed 100
- E. Switch CK1 (config)# interface fa0/1
- Switch CK1 (config-if)# switchport mode trunk
- F. None of the above

Answer: A

Explanation:

To route traffic to other vlans, we need to enter the IP address of the next-hop router interface that is directly connected to the switch where a default gateway is being configured. The default gateway receives IP packets with unresolved destination IP addresses from the switch.

Once the default gateway is configured, the switch will have connectivity to the remote networks with which a host needs to communicate.

---

#### **QUESTION 84:**

The Certkiller network administrator has issued the "VTP password Certkiller " command on a Cisco device. What is the purpose of this command?

- A. It allows two VTP servers to exist in the same domain, each configured with different passwords
- B. It is the password required when promoting a switch from VTP client mode to VTP server mode

- C. It is used to access the VTP server to make changes to the VTP configuration
- D. It is used to validate the sources of VTP advertisements sent between switches
- E. None of the above

Answer: D

---

### QUESTION 85:

The VTP status of two Certkiller devices is displayed below:

CertKiller1# show vtp status		CertKiller2# show vtp status	
VTP Version	: 2	VTP Version	: 2
Configuration Revision	: 0	Configuration Revision	: 0
Maximum VLANs supported locally	: 64	Maximum VLAN Supported locally	: 64
Number of existing VLANs	: 5	Number of existing VLANs	: 5
VTP Operating Mode	: Server	VTP Operating Mode	: Server
VTP Domain Name	: London	VTP Domain Name	: Madrid
VTP Pruning Mode	: Disabled	VTP Pruning Mode	: Disabled
VTP V2 Mode	: Disabled	VTP V2 Mode	: Disabled
VTP Traps Generation	: Disabled	VTP Traps Generation	: Disabled

You work as a network technician at Certkiller and you have configured two switches, named Certkiller 1 and Certkiller 2 to use VTP. However, the switches are not sharing VTP messages. Given the command output shown in the graphic above, why are these switches not sharing VTP messages?

- A. The VTP domain name is not correctly configured
- B. VTP traps generation is disabled
- C. VTP V2 mode is disabled
- D. VTP pruning mode is disabled
- E. The VTP operating mode is not correctly configured
- F. The VTP version is not correctly configured
- G. VTP has not been enabled on one of the Certkiller devices
- H. None of the above

Answer: A

---

### QUESTION 86:

The VTP status of switch Certkiller 1 is shown below:

Certkiller1# show vtp status	
VTP Version	: 2
Configuration Revision	: 1
Maximum VLANs supported locally	: 250
Number of existing VLANs	: 8
VTP Operating Mode	: Client
VTP Domain Name	: XYZ
VTP Pruning Mode	: Disabled
VTP V2 Mode	: Disabled
VTP Traps Generation	: Disabled

Given the output of the Certkiller 1 switch shown above, which statement best describes the operation of this switch?

```
Floor3# show vtp status
VTP Version                : 2
Configuration Revision      : 1
Maximum VLANs supported locally : 250
Number of existing VLANs    : 8
VTP Operating Mode          : Client
VTP Domain Name             : XYZ
VTP Pruning Mode            : Disabled
VTP V2 Mode                 : Disabled
VTP Traps Generation        : Disabled
```

- A. VTP is disabled on this switch
- B. The switch can create, change and delete VLANs
- C. The switch learns VLAN information but does not have save it to NVRAM
- D. The switch can create VLANs locally but will not forward this information to other switches
- E. The switch learns VLAN information and updates the local VLAN database in NVRAM
- F. None of the above

Answer: C

---

### QUESTION 87:

Which VTP mode should a Cisco switch be set to if this switch is to add or delete VLANs to a management domain?

- A. Transparent
- B. Server
- C. Auto
- D. Client
- E. User

Answer: B

Explanation:

VTP Modes:

If you intend to make a switch part of a VTP management domain, each switch must be configured in one of three possible VTP modes. The VTP mode assigned to a switch will determine how the switch interacts with other VTP switches in the management domain. The three VTP modes that can be assigned to a Cisco switch include server mode, client mode, and transparent mode. Each of these roles is outlined below:

**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.

Based on the roles of each VTP mode, the use of each should be more or less obvious. For example, if you had 15 Cisco switches on your network, you could configure each of them to be in the same VTP management domain. Although each could theoretically be left in the default Server Mode, it would probably be easier to leave only one switch in this configuration, and then configure all remaining switches for VTP Client Mode. Then, when you need to add, delete, or modify a VLAN, that change can be carried out on the VTP Server Mode switch and passed to all Client Mode switches automatically. In cases where you need a switch to act in a relatively standalone manner, or do not want it to propagate information about its configured VLANs, use Transparent Mode.

Incorrect Answers:

A. 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.

C, E. These are not valid VTP modes.

D. Client mode merely accepts changes made by the switch that is connected and in SERVER mode.

---

### QUESTION 88:

Refer to the following output shown on router Certkiller 2:

```
CertKiller2 # show vtp status
VTP Version                :      2
Configuration Revision      :      0
Maximum VLANs supported locally :    64
Number of existing VLANs    :    17
VTP Operating Mode          :    Transparent
VTP Domain Name             :    ICND
VTP Pruning Mode            :    Disabled
VTP V2 Mode                 :    Disabled
VTP Traps Generation        :    Disabled

<output omitted>
```

The "show vtp status" command is executed on the Certkiller 2 switch as shown above. Based on this information, which statement is true for this switch?

- A. The VLAN database is updated when VTP information is received from other switches.
- B. The configuration revision number increments each time the VLAN database is updated.
- C. The switch forwards its VLAN database to other switches in the ICND VTP domain.

- D. The switch forwards VTP updates that are sent by other switches in the ICND domain.
- E. None of the above.

Answer: D

---

**QUESTION 89:**

What are two results of entering the CKSwitch(config)# vtp mode client command on a Catalyst switch in the Certkiller LAN? (Choose two.)

- A. The switch will ignore VTP summary advertisements
- B. The switch will forward VTP summary advertisements
- C. The switch will process VTP summary advertisements
- D. The switch will originate VTP summary advertisements
- E. The switch will create, modify and delete VLANs for the entire VTP domain

Answer: B, C

Explanation :

Server mode-VTP servers have full control over VLAN creation and modification for their domains. All VTP information is advertised to other switches in the domain, while all received VTP information is synchronized with the other switches. By default, a switch is in VTP server mode. Note that each VTP domain must have at least one server so that VLANs can be created, modified, or deleted, and VLAN information can be propagated.

Client mode-VTP clients do not allow the administrator to create, change, or delete any VLANs. Instead, they listen to VTP advertisements from other switches and modify their VLAN configurations accordingly. In effect, this is a passive listening mode. Received VTP information is forwarded out trunk links to neighboring switches in the domain, so the switch also acts as a VTP relay.

Transparent mode

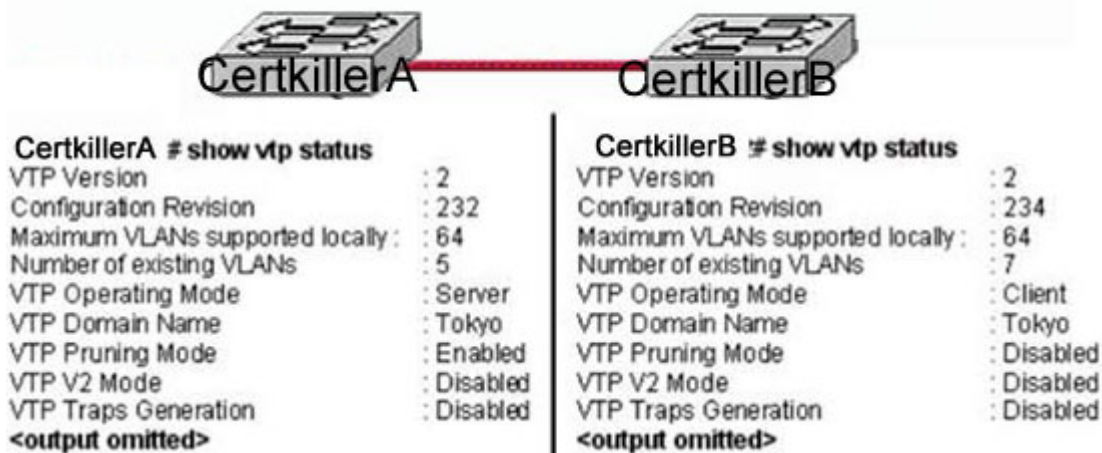
-VTP transparent switches do not participate in VTP. While in transparent mode, a switch does not advertise its own VLAN configuration, and a switch does not synchronize its VLAN database with received advertisements. In VTP version 1, a transparent-mode switch does not even relay VTP information it receives to other switches, unless its VTP domain names and VTP version numbers match those of the other switches. In VTP version 2, transparent switches do forward received VTP advertisements out of their trunk ports, acting as VTP relays. This occurs regardless of the VTP domain name setting.

---

**QUESTION 90:**

Exhibit:





Study the Exhibit carefully. Switch Certkiller A sends a VTP advertisement and Switch Certkiller B receives it. Which statement accurately describes how Switch Certkiller B will respond?

- A. Switch Certkiller B will add 2 VLANs to its VLAN database and change the configuration revision number to 232
- B. Switch Certkiller B will remove 2 VLANs from its VLAN database and change the configuration revision number to 232
- C. Switch Certkiller B will enable VTP pruning, add two VLANs, and increment the configuration revision number to 233
- D. Switch Certkiller B will ignore the VTP advertisement
- E. None of the above

Answer: D

Explanation:

Switches advertise VTP management domain information, as well as a configuration revision number and all known VLANs with any specific parameters. There's also something called VTP transparent mode; in it, you can configure switches to forward VTP information through trunk ports, but not to accept information updates or update their VTP databases. If you find yourself having problems with users adding switches to your VTP domain, you can include passwords, but don't forget that every switch must be set up with the same password-this can get ugly.

Switches detect the additional VLANs within a VTP advertisement and then prepare to receive information on their trunk ports with the newly defined VLAN in tow. This information would be VLAN ID, 802.10 SAID fields, or LANE information. Updates are sent out as revision numbers that are the notification plus 1. Any time a switch sees a higher revision number, it knows the information that it's receiving is more current, and it will overwrite the current database with that new information.

The Client synchronizes with the vtp server on every 5 minutes, if revision number is updated then client copy the configuration.



The client has a revision number of 234, but would receive an update number of 232 from the VTP server.

---

**QUESTION 91:**

Given the output of the London switch displayed in the graphic below, what VTP functions will this switch perform?

```
London#show vtp status
VTP Version:                2
Configuration Revision:      0
Maximum VLAN supported locally 64
Number of existing VLANs     5
VTP Operating Mode           Client
VTP Domain Name              London
VTP Pruning Mode              Disabled
VTP V2 Mode                   Disabled
VTP Traps Generation         Disabled
```

- A. It will pass on information about the VTP configuration
- B. VTP is disabled on this device
- C. It will learn and save VTP configuration in the running configuration but does not save it to NVRAM
- D. It will create, change and delete VLANs
- E. None of the above

Answer: C

Explanation:

The 3 VTP Modes are:

1. Server: By default, a Catalyst switch is in the VTP server mode and in the "no management domain" state until the switch receives an advertisement for a domain over a trunk link or a VLAN management domain is configured. A switch that has been put in VTP server mode and had a domain name specified can create, modify, and delete VLANs. VTP servers can also specify other configuration parameters such as VTP version and VTP pruning for the entire VTP domain. VTP information is stored in NVRAM.
2. Client: The VTP client maintains a full list of all VLANs within the VTP domain, but it does not store the information in NVRAM. VTP clients behave the same way as VTP servers, but it is not possible to create, change, or delete VLANs on a VTP client. Any changes made must be received from a VTP server advertisement.
3. Transparent: VTP transparent switches do not participate in VTP. A VTP transparent switch does not advertise its VLAN configuration, and does not synchronize its VLAN configuration based on received advertisements. However, in VTP Version 2, transparent switches do forward VTP advertisements that the switches receive out their trunk ports. VLANs can be configured on a switch in the VTP transparent mode, but the information is local to the switch (VLAN information is not propagated to other switches) and is stored in NVRAM.

As can be seen by the output above, this switch is running in VTP client mode, making choice C correct.

---

**QUESTION 92:**

Study the Exhibit below carefully:

London#show vtp

VTP Version: 2

Configuration Revision: 0

Maximum VLANs supported locally: 64

Number of existing VLANs: 5

VTP Operating Mode: Client

VTP Domain Name: London

VTP Pruning Mode: Disabled

VTP V2 Mode: Disabled

VTP Traps Generation: Disabled

Based on the information given above, what is the VTP function of this particular switch?

- A. Learn and save VTP configuration in the running configuration.
- B. Create and change VLANs.
- C. Forwards information about VTP configuration.
- D. VTP is disabled on this device.
- E. VTP is not saved to NVRAM.

Answer: C

Explanation:

From the output this switch is operating merely as VTP client, so it basically does as the VTP server says, and passes on information about VTP configuration to the next switch in line.

Incorrect Answers:

- A. This is incorrect because the function is redundant.
  - B. This incorrect because the switch must be in server or transparent mode to create and change VLANs.
  - D. This is incorrect because if VTP would be disabled, it wouldn't appear on the command output.
  - E. If this were true, the VTP configuration information would not be displayed after being powered on.
- 

**QUESTION 93:**

Exhibit:

```
Labs# show vtp status
VTP Version                : 1
Configuration Revision      : 2
Maximum VLANs supported locally : 64
Number of existing VLANs    : 9
VTP Operating Mode          : Server
VTP Domain Name             : Labs
VTP Pruning Mode            : Disabled
VTP V2 Mode                 : Disabled
VTP Traps Generation        : Disabled
MD5 digest                  : 0xF3 0x6D 0x21 0x7C 0x0F 0xA9 0xE9 0x60

Offices# show vtp status
VTP Version                : 1
Configuration Revision      : 3
Maximum VLANs supported locally : 64
Number of existing VLANs    : 9
VTP Operating Mode          : Server
VTP Domain Name             : Offices
VTP Pruning Mode            : Disabled
VTP V2 Mode                 : Disabled
VTP Traps Generation        : Disabled
MD5 digest                  : 0x07 0x35 0xFA 0xD5 0xF8 0xBA 0xE5 0xD8
```

Study the Exhibit carefully. The network administrator has configured the switches in the school network to use VTP. The switches are not sharing VLAN information. Which sequence of commands should be issued to correct this problem?

- A. Offices(config)# vtp mode client  
Labs(config)# vtp mode client
- B. Offices(config)# vtp domain School  
Labs(config)# vtp domain School
- C. Offices(config)# vtp pruning  
Labs(config)# vtp pruning
- D. Offices(config)# vtp version 2  
Labs(config)# vtp version 2

Answer: B

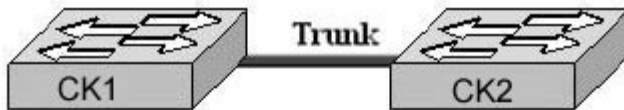
Explanation:

For switched to share vlan information, there VTP domain names must be same. In the Output shown, VTP domain name of LABS router is Labs and VTP domain name of Offices router is Offices. As the domain names are different, they are unable to communicate with each other. In order to correct this problem, we have to change their names to a single common name.

---

### **QUESTION 94:**

Two Certkiller switches are connected together as shown below:

**CK1#show vtp status**

```

VTP Version          : 2
Configuration Revision : 5
Maximum VLANs supported locally : 68
Number of existing VLANs : 8
VTP Operating Mode    : Server
VTP Domain Name       : JAX
VTP Pruning Mode      : Disabled
VTP V2 Mode           : Disabled
VTP Traps Generation  : Disabled
MD5 digest            : 0x2D 0x88 0xA9 0x2A 0xC4 0xF8 0x77 0xEF
Configuration last modified by 0.0.0.0 at 0-0-00 00:00:00

```

**CK2#show vtp status**

```

VTP Version          : 2
Configuration Revision : 3
Maximum VLANs supported locally : 68
Number of existing VLANs : 8
VTP Operating Mode    : Server
VTP Domain Name       : JAK
VTP Pruning Mode      : Disabled
VTP V2 Mode           : Disabled
VTP Traps Generation  : Disabled
MD5 digest            : 0xA8 0x67 0xF9 0xA8 0x92 0xE9 0x30 0x6B
Configuration last modified by 0.0.0.0 at 0-0-00 00:00:00

```

Switches CK1 and CK2 have been configured with a trunked line that has been verified as working correctly. However, VTP is not propagating VLANs from one switch to the other. Based on the command output shown, what is the problem?

- A. The revision number is not the same on both switches.
- B. Only one switch can be in server mode.
- C. The VTP domain name is not correctly configured.
- D. VLANs have not been configured on the VTP server.
- E. The VTP pruning mode is not correctly configured.

Answer: C

**Explanation:**

VTP messages are exchanged between switches within a common VTP domain. In the output shown, VTP domain name of switch CK1 is JAX and domain name of switch CK2 is JAK. As the VTP domain names are different so these two switches will not exchange the VTP Information.

Reference: <http://www.ciscopress.com/articles/article.asp?p=29803&seqNum=4&rl=1>

---

**QUESTION 95:**

Network topology exhibit:



Certkiller 1 exhibit:

```
CertKiller1#show vtp status
VTP Version: 2
Configuration Revision: 240
Maximum VLANs supported locally: 1005
Number of existing VLANs: 33
VTP Operating Mode: Client
VTP Domain Name: Lab Network
VTP Printing Mode:Enabled

<output omitted>
```

Certkiller 2 exhibit:

```
CertKiller2#show vtp status
VTP Version: 2
Configuration Revision: 0
Maximum VLANs supported locally: 1005
Number of existing VLANs: 17
VTP Operating Mode: Client
VTP Domain Name: Lab Network
VTP Printing Mode:Enabled

<output omitted>
```

Certkiller 3 exhibit:

```
CertKiller3#show vtp status
VTP Version: 2
Configuration Revision: 247
Maximum VLANs supported locally: 250
Number of existing VLANs: 30
VTP Operating Mode: Client
VTP Domain Name: Lab Network
VTP Printing Mode:Enabled

<output omitted>
```

Study the exhibits carefully. You are told by your boss, Mrs. Certkiller, that the VLAN configuration of switch Certkiller 3 is not synchronized with the other parts of the network. She tells you that you need to find out why Certkiller 3 is not receiving VTP updates. What should you tell her?

- A. Certkiller 1 supports a greater number of VLANs than does switch Certkiller 3.
- B. Certkiller 2 is not relaying VTP advertisements to Certkiller 3.
- C. Certkiller 2 should be operating in VTP server or client mode to relay VTP updates.
- D. Certkiller 3 has fewer existing VLANs than does Certkiller 1.
- E. Certkiller 3 should be operating in VTP mode to relay VTP updates.
- F. Certkiller 3 has a revision number higher than that being advertised.

Answer: F

Explanation:

The configuration revision number is a 32-bit number that indicates the level of revision for a VTP packet. Each VTP device tracks the VTP configuration revision number that is assigned to it. Most of the VTP packets contain the VTP configuration revision number of the sender.

This information is used in order to determine whether the received information is more

recent than the current version. Each time that you make a VLAN change in a VTP device, the configuration revision is incremented by one. In this case, Certkiller 3 is configured as a client but the revision number is higher than the other switches, so it will ignore the updates. In order to reset the configuration revision of a switch, change the VTP domain name, and then change the name back to the original name.

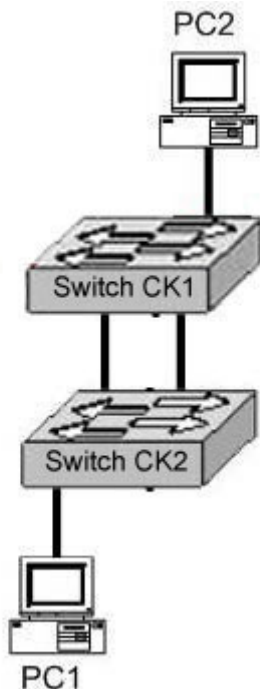
Reference:

[http://www.cisco.com/en/US/tech/CK3\\_89/CK6\\_89/technologies\\_tech\\_note09186a0080094c52.shtml](http://www.cisco.com/en/US/tech/CK3_89/CK6_89/technologies_tech_note09186a0080094c52.shtml)

---

### QUESTION 96:

A simple Certkiller network is displayed in the diagram below:



When PC1 sends an ARP request for the MAC address of PC2, network performance slows dramatically, and the Certkiller switches detect an unusually high number of broadcast frames. What is the most likely cause of this?

- A. The portfast feature is not enabled on all switch ports.
- B. The PCs are in two different VLANS.
- C. Spanning Tree Protocol is not running on the switches.
- D. PC2 is down and is not able to respond to the request.
- E. The VTP version running on the two switches do not match.
- F. None of the above

Answer: C

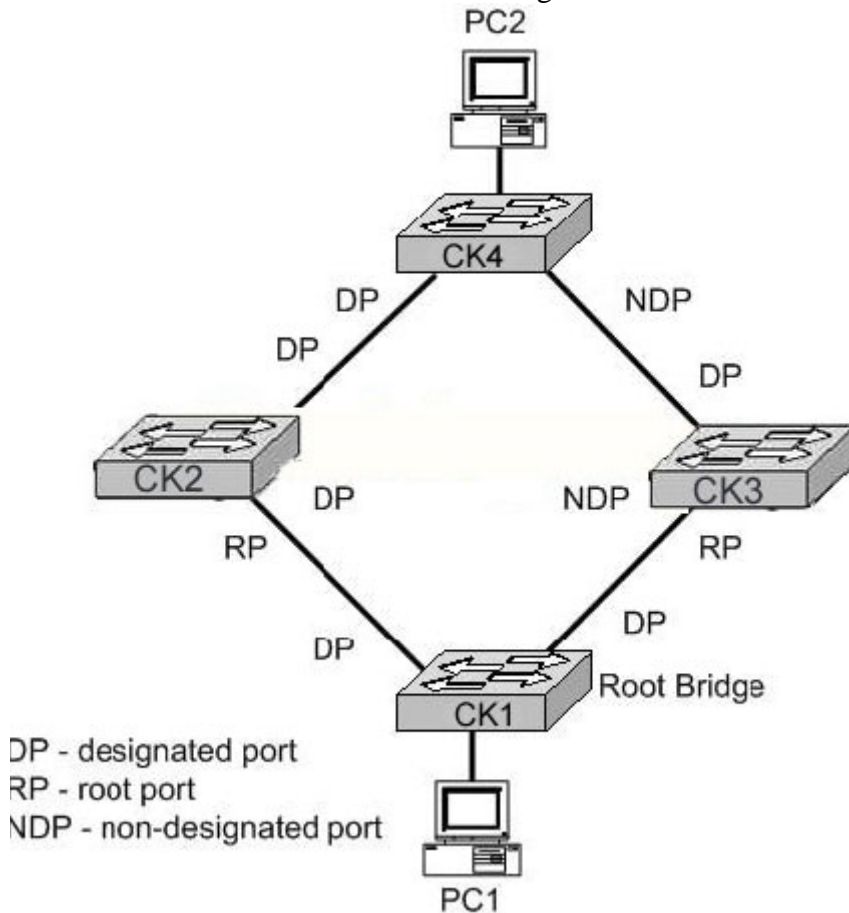
Explanation:

As the switches CK1 and CK2 are connected with each other via two links, spanning tree must be enabled on both switches to avoid switching loops and broadcast storms. An

ARP request is a broadcast message. If Spanning tree is not running, broadcast loops will form reducing the performance of the network.

### QUESTION 97:

Four Certkiller switches are connected together as shown in the network below:



Study the Exhibit carefully. Based on the Spanning Tree Protocol port states shown, over which path will frames flow when sent from PC1 to PC2?

- A. CK1 - CK3 - CK4
- B. CK1 - CK2 - CK4
- C. CK1 - CK2 - CK3 - CK4
- D. CK1 - CK3 - CK2 - CK4
- E. None of the above

Answer: B

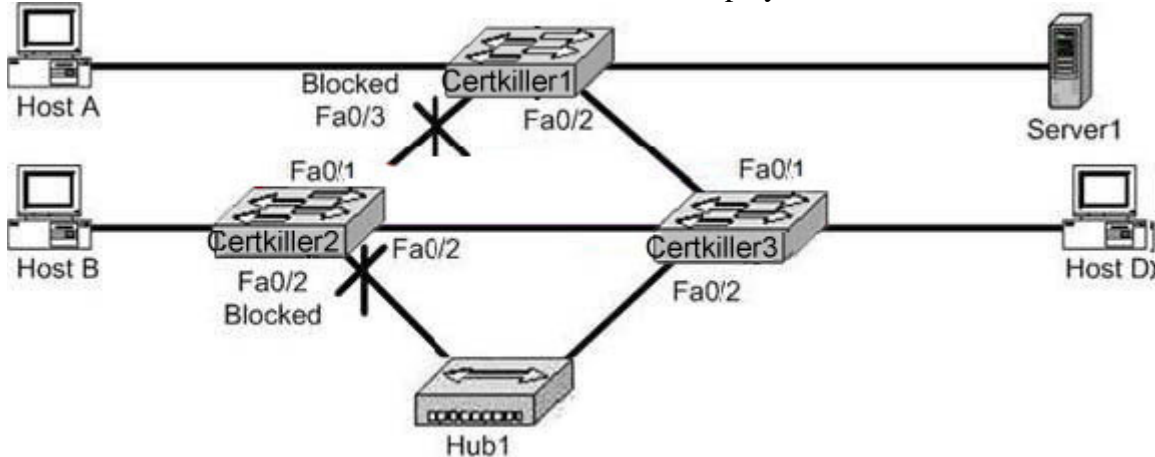
Explanation:

As shown in the diagram, port connecting CK3 to CK4 and CK2 to CK3 are non-designated ports. It means that spanning tree has blocked these ports temporarily so; frames will not flow through these ports. The communication will be done via CK1 to CK2 to CK4 through ROOT and DESIGNATED ports.



**QUESTION 98:**

The Certkiller LAN network for one of the offices is displayed below:



Assuming there is only one VLAN in this network, which switch is acting as the root bridge?

- A. Certkiller 1
- B. Certkiller 2
- C. Certkiller 3
- D. A root bridge is not required in this network.
- E. None of the above

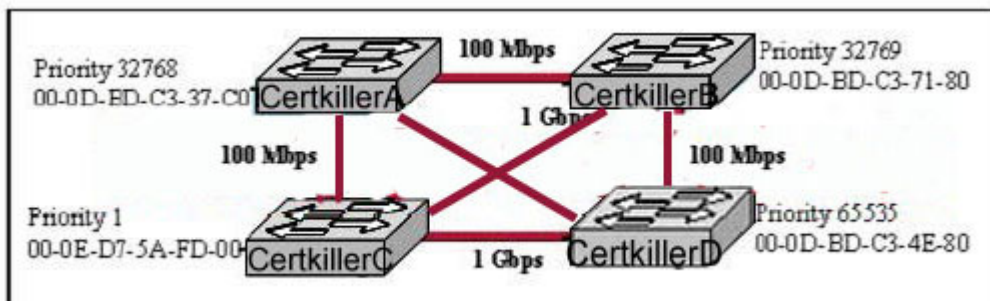
Answer: C

Explanation:

A root switch has all ports in non-blocking mode. Based on the diagram above, Certkiller 1 and Certkiller 2 contain ports that have been blocked by the STP process, so Certkiller 3 must be the root bridge.

**QUESTION 99:**

Four Certkiller switches are connected as shown in the exhibit below:



Refer to the exhibit above. Based on the information given, which switch will be elected root bridge and why?

- A. Switch A, because it has the lowest MAC address
- B. Switch A, because it is the most centrally located switch
- C. Switch B, because it has the highest MAC address
- D. Switch C, because it is the most centrally located switch
- E. Switch C, because it has the lowest priority
- F. Switch D, because it has the highest priority

Answer: E

Explanation:

To elect the root bridge in the LAN, first check the priority value. The switch having the lowest priority will win the election process. If Priority Value is the same then it checks the MAC Address; the switch having the lowest MAC Address will become the root bridge. In this case, switch C has the lowest MAC Address so it becomes the root bridge.

---

**QUESTION 100:**

Certkiller is experiencing network delays. The network administrator discovers that a worker in a location far from the MDF has connected an old 10BASE-T switch with redundant links to the existing network. How could this action be responsible for the impaired network performance?

- A. Connecting a host to the old switch has created a broadcast storm.
- B. The 10BASE-T switch forced the entire network to be reduced to 10 Mbps operation.
- C. The old switch does not support VLANs, which has disabled the VLAN configuration of the entire the network.
- D. The old switch does not support full-duplex operation, effectively forcing half-duplex operation throughout the network.
- E. Spanning Tree Protocol has elected the old switch as the root bridge, creating inefficient data paths through the switched network.
- F. None of the above

Answer: E

Explanation:

Without the Spanning Tree Protocol (STP), frames would loop for an indefinite period of time in networks with physically redundant links. To prevent looping frames, STP blocks some ports from forwarding frames so that only one active path exists between any pair of LAN segments (collision domains). The result of STP is good: Frames do not loop infinitely, which makes the LAN usable. However, the network uses some redundant links in case of a failure, but not for balancing traffic.

To avoid loops, all bridging devices, including switches, use STP. STP causes each interface on a bridging device to settle into a blocking state or a forwarding state. Blocking means that the interface cannot forward or receive data frames. Forwarding means that the interface can send and receive data frames. By having a correct subset of the interfaces blocked, a single currently active logical path will exist between each pair of LANs. STP behaves identically for a transparent bridge and a switch. So, the terms bridge,

switch, and bridging device all are used interchangeably when discussing STP.

Root bridge The root bridge is the bridge with the best bridge ID. With STP, the key is for all the switches in the network to elect a root bridge that becomes the focal point in the network. All other decisions in the network-like which port is to be blocked and which port is to be put in forwarding mode-are made from the

---

**QUESTION 101:**

In which circumstance are multiple copies of the same unicast frame likely to be transmitted in the Certkiller Switched LAN?

- A. During high traffic periods
- B. In an improperly implemented redundant topology
- C. After broken links are re-established
- D. When upper-layer protocols require high reliability
- E. When a dual ring topology is in use
- F. None of the above

Answer: B

Explanation:

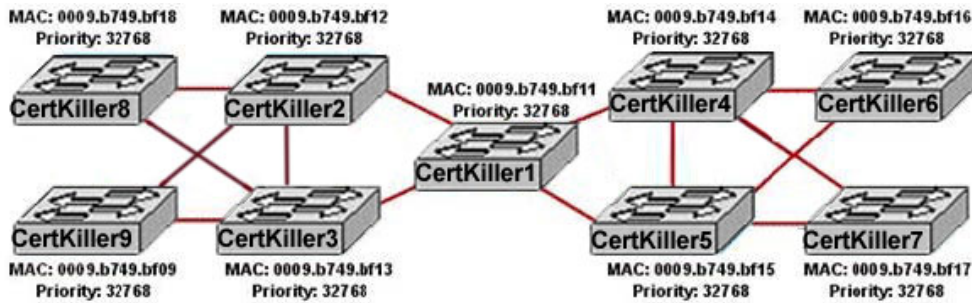
A redundant topology eliminates single points of failure, but it also causes broadcast storms, multiple frame copies, and MAC address table instability problems. Multiple Frame Copies--when a new switch is added, the other switches may not have learned its correct MAC address. The host may send a unicast frame to the new switch. The frame is sent through several paths at the same time. The new switch will receive several copies of the frame. This causes MAC database instability. MAC database instability results when multiple copies of a frame arrive on different ports of a switch. Layer 2 has no mechanism to stop the loop. This is the main reason for the Spanning Tree Protocol(STP) IEEE 802.1d which was developed to prevent routing loops.

If multiple connections between switches are created for redundancy purposes, network loops can occur in an improperly designed topology. Spanning Tree Protocol (STP) is used to stop network loops while still permitting redundancy.

---

**QUESTION 102:**

Exhibit:



You work as a network administrator at Certkiller .com. Study the exhibit carefully. The switches on the Certkiller campus network has been interconnected as displayed in the exhibit. All of the switches are running the Spanning Tree Protocol with its default settings. Unusual traffic patterns are observed and it is discovered that Switch Certkiller 9 is the root bridge. Which change will ensure that Switch Certkiller 1 will be selected as the root bridge instead of Switch Certkiller 9?

- A. Disable spanning tree on Switch Certkiller 9.
- B. Lower the bridge priority on Switch Certkiller 1.
- C. Lower the bridge priority on Switch Certkiller 9.
- D. Physically replace switch Certkiller 9 with Switch Certkiller 9 in the topology.
- E. Raise the bridge priority on Switch Certkiller 1.
- F. Raise the bridge priority on Switch Certkiller 9.
- G. None of the above

Answer: B

Explanation:

The root bridge is the bridge or switch that is the root of the Spanning Tree, with the branches being loop-free paths to the other switches in the system. The Root is the switch with the lowest Bridge ID; the ID is determined by a combination of an administrative Priority and the MAC address of the switch. The Priority is set to 32,768 (8000 hex) by default; if we leave the Priority at the default, whatever switch has the lowest MAC will be the Root. So to elect the Certkiller 1 switch as a root bridge need to set the lowest priority.

### QUESTION 103:

The "show interfaces" command was issued on a Certkiller router as shown below:

```
CertKiller1#show interfaces <<output omitted>>
<<output omitted>> is up, line protocol is up
Hardware is LAN oe doness is 0010.7b80.bfa6 (bia 0010.7b80.bfa6)
MTU 1500 bytes, BW 100000 Kbit, DLY 1000 usec, rely 255/255, load 1/255
Encapsulation ARPA, loopback not set, keepalive set (10 sec)
ARP type :ARPA. ARP Lnm out 04:00:00
<<output omitted>>
```

Assume that the router is configured with the default settings. Based on the information shown above, what type of router interface is this?

- A. Ethernet
- B. Gigabit Ethernet
- C. FastEthernet
- D. Synchronous Serial
- E. Asynchronous Serial

Answer: C

Explanation:

See the output of a serial interface shown below and compare:

Router#show interfaces serial 0

Serial0 is down, line protocol is down

Hardware is HD64570

Internet address is 192.168.0.1/24

MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec,

reliability 255/255, TX load 1/255, rxload 1/255

Encapsulation HDLC, loop back not set

Keepalive set (10 sec)

Last input never, output never, output hang never

Last clearing of "show interface" counters never

Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0

Queueing strategy: fifo

Output queue :0/40 (size/max)

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

5 minute output rate 0 bits/sec, 0 packets/sec

0 packets input, 0 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

0 packets output, 0 bytes, 0 underruns

0 output errors, 0 collisions, 2 interface resets

0 output buffer failures, 0 output buffers swapped out

0 carrier transitions

DCD=down DSR=down DTR=up RTS=up CTS=down

In this exhibit the BW=10000Kbit and the encapsulation type is ARPA which means it could only be a Fast Ethernet interface.

---

#### **QUESTION 104:**

The following output was displayed on a Certkiller device:

**CertKiller1# show mac address-table**

Dynamic Addresses Count:	3		
Secure Addresses (User-defined) Count:	0		
Static Addresses (User-defined) Count:	0		
System Self Addresses Count:	41		
Total Mac addresses:	50		
Non-static Address Table			
Destination Address	Address Type	VLAN	Destination Port
0010.0de0.e289	Dynamic	1	FastEthernet0/1
0010.7b00.1540	Dynamic	2	FastEthernet0/3
0010.7b00.1545	Dynamic	2	FastEthernet0/2

Study the exhibit above. Switch- Certkiller 1 needs to send data to host with a MAC address of 00b0.d056.efa4. What will Switch- Certkiller 1 do with this data?

- A. Switch- Certkiller 1 will send an ARP request out all its ports except the port from which the data originated
- B. Switch- Certkiller 1 will drop the data because it does not have an entry for the MAC address
- C. Switch- Certkiller 1 will forward the data to its default gateway
- D. Switch- Certkiller 1 will flood the data out all of its ports except the port from which the data originated
- E. None of the above

Answer: D

**Explanation:**

Switches work as follows:

Switches learn the MAC addresses of PCs or workstations that are connected to their switch ports by examining the source address of frames that are received on that port. Machines may have been removed from a port, turned off, or moved to another port on the same switch or a different switch.

This could cause confusion in frame forwarding.

The MAC address entry is automatically discarded or aged out after 300 seconds

If there is not MAC address entry of destination host in MAC table, switch sends broadcast to all ports except the source to find out the destination host.

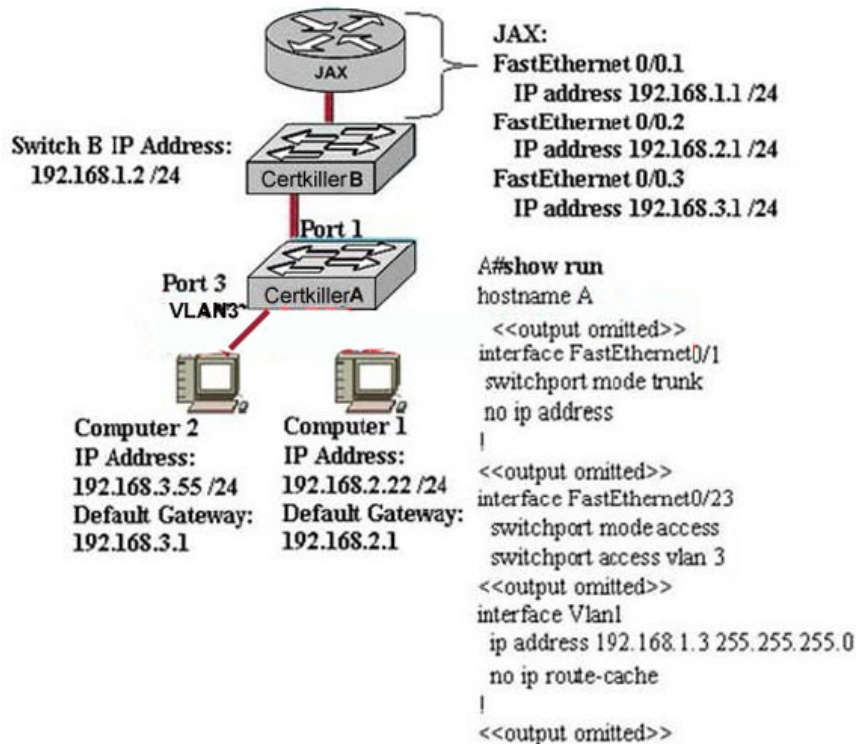
In output there is no MAC address of give host so switch floods to all ports except the source port.

---

**QUESTION 105:**

Some Certkiller devices are connected as shown below:





The router shows the FastEthernet port as being up, and the computer on VLAN 3 can ping all of the FastEthernet IP addresses on the router.

Computer 1 is used to console into switch CertkillerA. From the command prompt of switch Certkiller A, the switch cannot ping the computer on VLAN 3. The switch configuration shown in the exhibit lists only the commands that are different from the default configuration. What is the problem, based on the information shown?

- A. Computer 1 must be connected to a switch port in order to communicate with a device located on VLAN 3.
- B. Switch Certkiller A does not have a default gateway assigned.
- C. The router is not routing VLAN 3 information.
- D. The computer on VLAN 3 is assigned an incorrect IP address.
- E. Switch A does not have an IP address assigned to the management VLAN.

Answer: B

Explanation:

This scenario requires inter-VLAN routing, which requires a layer three device. Based on the information above, a trunk has indeed been set up to route traffic between VLAN's so the problem is that default gateway has been specified in the switch, so traffic will not be forwarded to the router from the switch from one VLAN to the other.

### QUESTION 106:

Two Certkiller switches are connected together as shown below:





The interface status of Certkiller A is shown below:

```
CertKillerA# show interfaces FastEthernet0/1
FastEthernet0/1 is up, line protocol down (notconnect)
Hardware is FastEthernet, address is 0009.11f3.8848 (bia 0009.11f3.8848)
<output omitted>
```

The Certkiller network administrator has verified that a functioning cable connects Switch Certkiller 1 and Switch Certkiller 2 shown above. From the output that is shown above, what two pieces of information below are true? (Choose two)

- A. Using a source MAC address of 0009.11f3.8848, Switch Certkiller 2 is sending frames to Switch Certkiller 1
- B. The status of fa0/2 should be checked on Switch Certkiller 2
- C. The interface is functional at OSI layer 1
- D. There is likely to be an IP address issue on Switch Certkiller 1 Fa0/1
- E. Interface fa0/1 on Switch Certkiller 1 is in a shutdown state
- F. Switch Certkiller B is not powered on

Answer: B, C

---

### QUESTION 107:

You are the administrator of the Certkiller LAN and you have been reviewing error logs of networking devices and notice a large number of errors associated with several MAC addresses. You suspect that some of the errors are being generated by the routers. Which router commands will allow you to find the ip address associated with each MAC address? (Choose two)

- A. show arp
- B. show version
- C. show address
- D. show hosts
- E. show interface
- F. show protocols

Answer: A, E

Explanation:

The "show arp" command Displays the entries in the ARP table, including their layer 2 MAC address and layer 3 IP address.

Example:

The following is the output for the show arp command on Router 1:

CK1 # show arp

Protocol	Address	Age (min)	Hardware Addr	Type	Interface
Internet	10.0.0.3	0	0004.dd0c.ffcb	ARPA	Ethernet01
Internet	10.0.0.1	-	0004.dd0c.ff86	ARPA	Ethernet0

To see the MAC (hardware) address of the router interfaces as well as their IP addresses, use the "show interfaces" command as shown in the example below:

CK1 # show interfaces

Ethernet 0 is up, line protocol is up

Hardware is MCI Ethernet, address is 0000.0c00.750c (bia 0000.0c00.750c)

Internet address is 10.108.28.8, subnet mask is 255.255.255.0

MTU 1500 bytes, BW 10000 Kbit, DLY 100000 usec, rely 255/255, load 1/255

---

### **QUESTION 108:**

The Certkiller network administrator issues the ping 192.168.2.5 command and successfully tests connectivity to a host that has been newly connected to the network. Which protocols were used during the test? (Choose two)

- A. ARP
- B. CDP
- C. DHCP
- D. DNS
- E. ICMP

Answer: A, E

Explanation:

ARP finds the hardware address of a host from a known IP address. Here's how it works: when IP has a datagram to send, it must inform a Network Access protocol, such as Ethernet or Token Ring, of the destination's hardware address on the local network. (It has already been informed by upper-layer protocols of the destination's IP address.) If IP doesn't find the destination host's hardware address in the ARP cache, it uses ARP to find this information.

ICMP works at the Network layer and is used by IP for many different services. ICMP is a management protocol and messaging service provider for IP. Its messages are carried as IP datagrams. RFC 1256 is an annex to ICMP, which affords hosts' extended capability in discovering routes to gateways. Periodically, router advertisements are announced over the network, reporting IP addresses for the router's network interfaces. Hosts listen for these network infomercials to acquire route information. A router solicitation is a request for immediate advertisements and may be sent by a host when it starts up.

---

### **QUESTION 109:**

Exhibit:

```

CertKiller3# show mac-address-table
Dynamic Addresses Count: 19
Secure Addresses (User-defined) Count: 0
Static Addresses (User-defined) Count: 0
System Self Addresses Count: 41
Total MAC addresses: 50
Non-static Address Table:
Destination Address      AddressType      VLAN      Destination Port
-----
0010.0de0.e289          Dynamic          1          FastEthernet0/1
0010.7b00.1540          Dynamic          2          FastEthernet0/5
0010.7b00.1545          Dynamic          2          FastEthernet0/5
0060.5cf4.0076          Dynamic          1          FastEthernet0/1
0060.5cf4.0077          Dynamic          3          FastEthernet0/1
0060.5cf4.1315          Dynamic          1          FastEthernet0/1
0060.70cb.f301          Dynamic          2          FastEthernet0/1
0060.70cb.3f01          Dynamic          5          FastEthernet0/2
00e0.1e42.9978          Dynamic          4          FastEthernet0/1
00e0.1e9f.3900          Dynamic          3          FastEthernet0/1
0060.70cb.33f1          Dynamic          6          FastEthernet0/3
0060.70cb.103f          Dynamic          6          FastEthernet0/4

<output omitted>

CertKiller3# show cdp neighbors
Capability Codes R - Router T - Trans Bridge B
                  S - Strith H  Host I  IGIP  Source Route Bridge
                  - Repeater

Device ID           Local Intrfce    Holdtime    Capability    Platform    Port ID
Switch2             Fas 0/1          157         S             2950-12     Fas 0/1
Switch3             Fas 0/2          143         S             2950-12     Fas 0/5

CertKiller3#

```

You work as a network engineer at Certkiller .com. You study the exhibit carefully. You are told by your boss, Mrs. Certkiller, to study the interfaces of switch Certkiller 3 in particular. What can you tell her? (Select two)

- A. A hub is connected directly to FastEthernet0/5.
- B. FastEthernet0/1 is connected to a host with multiple network interface cards.
- C. Interface FastEthernet0/2 has been disabled.
- D. Mutliple devices are connected directly to FastEthernet0/1.
- E. FastEthernet0/1 is configured as a trunk link.
- F. FastEthernet0/5 has statically assigned MAC addresses.

Answer: E, F

Explanation:

Based on the output shown, there are multiple MAC addresses from different VLANs attached to the FastEthernet 0/1 interface. Only trunks are able to pass information from devices in multiple VLANs.

### QUESTION 110:

The Certkiller network administrator wants to ensure that only a single web server can connect to port Fa0/1 on a catalyst switch. The server is plugged into the switch's FastEthernet 0/1 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 this 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. Configure the MAC address of the server as a static entry associated with port Fa0/1
- C. Employ a proprietary connector type on Fa0/1 that is incompatible with other host connectors
- D. Configure port security on Fa0/1 to reject traffic with a source MAC address other than that of the server
- E. Bind the IP address of the server to its MAC address on the switch to prevent other hosts from spoofing the server IP address

Answer: B, D

Explanation:

You can use port security to block input to an Ethernet, Fast Ethernet, or Gigabit Ethernet port when the MAC address of the station attempting to access the port is different from any of the MAC addresses specified for that port.

When a secure port receives a packet, the source MAC address of the packet is compared to the list of secure source addresses that were manually configured or autoconfigured (learned) on the port. If a MAC address of a device attached to the port differs from the list of secure addresses, the port either shuts down permanently (default mode), shuts down for the time you have specified, or drops incoming packets from the insecure host. The port's behavior depends on how you configure it to respond to a security violation. When a security violation occurs, the Link LED for that port turns orange, and a link-down trap is sent to the Simple Network Management Protocol (SNMP) manager. An SNMP trap is not sent if you configure the port for restrictive violation mode. A trap is sent only if you configure the port to shut down during a security violation.

---

### **QUESTION 111:**

The network administrator has configured port security on a Certkiller switch. Why would a network administrator configure port security on this Certkiller device?

- A. To prevent unauthorized hosts from getting access to the LAN
- B. To limit the number of Layer 2 broadcasts on a particular switch port
- C. To prevent unauthorized Telnet or SSH access to a switch port
- D. To prevent the IP and MAC address of the switch and associated ports
- E. None of the above

Answer: A

Explanation:

You can use the port security feature to restrict input to an interface by limiting and identifying MAC addresses of the stations allowed to access the port. When you assign

secure MAC addresses to a secure port, the port does not forward packets with source addresses outside the group of defined addresses. If you limit the number of secure MAC addresses to one and assign a single secure MAC address, the workstation attached to that port is assured the full bandwidth of the port.

If a port is configured as a secure port and the maximum number of secure MAC addresses is reached, when the MAC address of a station attempting to access the port is different from any of the identified secure MAC addresses, a security violation occurs.

Also, if a station with a secure MAC address configured or learned on one secure port attempts to access another secure port, a violation is flagged.

Reference:

[http://www.cisco.com/en/US/products/hw/switches/ps628/products\\_configuration\\_guide\\_chapter09186a00800d6](http://www.cisco.com/en/US/products/hw/switches/ps628/products_configuration_guide_chapter09186a00800d6)

---

### **QUESTION 112:**

The network security policy for Certkiller requires that only one host be permitted to attach dynamically to each switch interface. If that policy is violated, the interface should be automatically disabled. Which two commands must the Certkiller network administrator configure on the 2950 Catalyst switch to meet this policy? (Choose two)

- A. SW Certkiller 1(config-if)# switchport port-security maximum 1
- B. SW Certkiller 1(config)# mac-address-table secure
- C. SW Certkiller 1(config)# access-list 10 permit ip host
- D. SW Certkiller 1(config-if)# switchport port-security violation shutdown
- E. SW Certkiller 1(config-if)# ip access-group 10

Answer: A, D

Explanation

Catalyst switches offer the port security feature to control port access based on MAC addresses. To configure port security on an access layer switch port, begin by enabling it with the following interface configuration command:

Switch(config-if)# switchport port-security

Next, you must identify a set of allowed MAC addresses so that the port can grant them access. You can explicitly configure addresses or they can be dynamically learned from port traffic. On each interface that uses port security, specify the maximum number of MAC addresses that will be allowed access using the following interface configuration command:

Switch(config-if)# switchport port-security maximum max-addr

Finally, you must define how each interface using port security should react if a MAC address is in violation by using the following interface configuration command:

Switch(config-if)# switchport port-security violation {shutdown | restrict | protect}

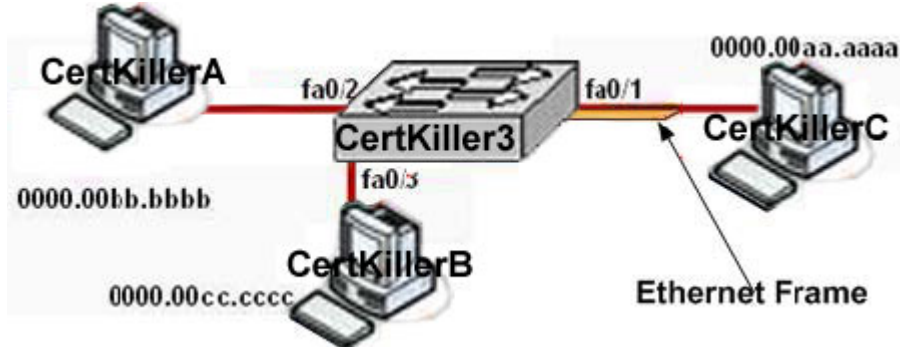
A violation occurs if more than the maximum number of MAC addresses are learned, or if an unknown (not statically defined) MAC address attempts to transmit on the port. The switch port takes one of the following configured actions when a violation is detected:

shutdown-The port is immediately put into the err disable state, which effectively shuts it down. It must

be re-enabled manually or through err disable recovery to be used again.  
 restrict-The port is allowed to stay up, but all packets from violating MAC addresses are dropped. The switch keeps a running count of the number of violating packets and can send an SNMP trap and a sys log message as an alert of the violation.  
 protect-The port is allowed to stay up, as in the restrict mode. Although packets from violating addresses are dropped, no record of the violation is kept.

### QUESTION 113:

Three hosts connect to a Certkiller switch as shown below:

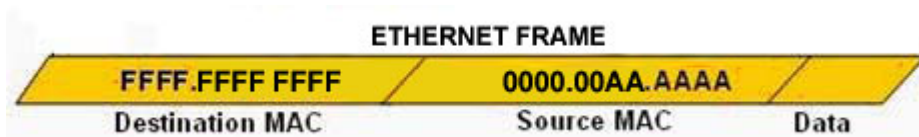


Certkiller 3 Mac Address Table Exhibit:

Fa0/2 0000.00bb.bbbb

Fa0/3 0000.00cc.cccc

Ethernet FrameExhibit:



You work as a network technician at Certkiller and are working on the network shown above. You are administering the 2950 Cisco switch named Certkiller 3 and you enter the following commands on interface fa0/1 of the switch.

```
Certkiller 3(config-if)# switchport port-security
```

```
Certkiller 3(config-if)# switchport port-security mac-address sticky
```

```
Certkiller 3(config-if)# switchport port-security maximum 1
```

The Ethernet frame that is shown arrives on interface fa0/1. Based on the information provided, what two functions will occur when this frame is received by Certkiller 3? (Choose two)

- A. All frames arriving on Certkiller 3 with a destination of 0000.00aa.aaaa will be forwarded out fa0/1.
- B. Hosts B and C may forward frames out fa0/1 but frames arriving from other switches will not be forwarded out fa0/1.
- C. Only frames from source 0000.00bb.bbbb, the first learned MAC address of Certkiller 3, will be forwarded out fa0/1.
- D. This frame will be discarded when it is received by Certkiller 3.
- E. Only host Certkiller A will be allowed to transmit frames on fa0/1.
- F. The MAC address table will now have an additional entry of fa0/1 FFFF.FFFF.FFFF.



Answer: A, E

Explanation:

The configuration shown here is an example of port security, specifically port security using sticky addresses. You can use port security with dynamically learned and static MAC addresses to restrict a port's ingress traffic by limiting the MAC addresses that are allowed to send traffic into the port. When you assign secure MAC addresses to a secure port, the port does not forward ingress traffic that has source addresses outside the group of defined addresses. If you limit the number of secure MAC addresses to one and assign a single secure MAC address, the device attached to that port has the full bandwidth of the port.

Port security with sticky MAC addresses provides many of the same benefits as port security with static MAC addresses, but sticky MAC addresses can be learned dynamically. Port security with sticky MAC addresses retains dynamically learned MAC addresses during a link-down condition.

If you enter a write memory or copy running-config startup-config command, then port security with sticky MAC addresses saves dynamically learned MAC addresses in the startup-config file and the port does not have to learn addresses from ingress traffic after bootup or a restart.

Since the maximum number of MAC addresses has been configured to 1, only host Certkiller A will be able to send frames on interface fa 0/1, making choice E correct.

---

**QUESTION 114:**

You have configured a Certkiller switch as shown below:

```
Certkiller 3(config-if)# switchport port-security
```

```
Certkiller 3(config-if)# switchport port-security mac-address sticky
```

Select the action below that results from executing these commands.

- A. A dynamically learned MAC address is saved in the VLAN database.
- B. A dynamically learned MAC address is saved in the startup-configuration file.
- C. Statically configured MAC addresses are saved in the startup-configuration file if frames from that address are received.
- D. A dynamically learned MAC address is saved in the running-configuration file.
- E. Statically configured MAC addresses are saved in the running-configuration file if frames from that address are received.
- F. None of the above

Answer: D

Explanation:

With port security, the switch supports these types of secure MAC addresses:  
Static secure MAC addresses-These are manually configured by using the switchport port-security mac-address mac-address interface configuration command, stored in the address table, and added to the switch running configuration.



Dynamic secure MAC addresses-These are dynamically configured, stored only in the address table, and removed when the switch restarts.

Sticky secure MAC addresses-These are dynamically configured, stored in the address table, and added to the running configuration. If these addresses are saved in the configuration file, when the switch restarts, the interface does not need to dynamically reconfigure them.

You can configure an interface to convert the dynamic MAC addresses to sticky secure MAC addresses and to add them to the running configuration by enabling sticky learning.

To enable sticky learning, enter the switchport port-security mac-address sticky interface configuration command. When you enter this command, the interface converts all the dynamic secure MAC addresses, including those that were dynamically learned before sticky learning was enabled, to sticky secure MAC addresses. The interface adds all the sticky secure MAC addresses to the running configuration.

The sticky secure MAC addresses do not automatically become part of the configuration file, which is the startup configuration used each time the switch restarts. If you save the sticky secure MAC addresses in the configuration file, when the switch restarts, the interface does not need to relearn these addresses. If you do not save the sticky secure addresses, they are lost.

Reference:

[http://www.cisco.com/en/US/docs/switches/lan/catalyst2950/software/release/12.1\\_11\\_ea1/configuration/guide/s](http://www.cisco.com/en/US/docs/switches/lan/catalyst2950/software/release/12.1_11_ea1/configuration/guide/s)

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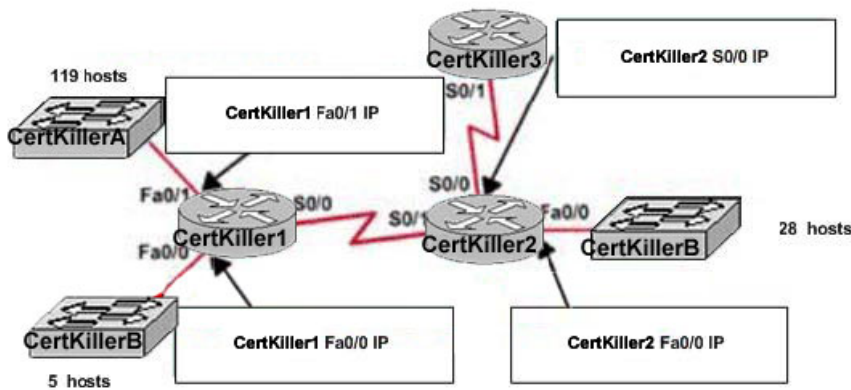
### **QUESTION 115:**

#### **DRAG DROP**

Certkiller has three locations and has plans to redesign the network accordingly. The networking team received 192.168.151.0 to use as the addressing for entire network from the administrator. After subnetting the address, the team is ready to assign the address.

The administrator plans to configure "ip subnet-zero" and use RIP v2 as the routing protocol. As a member of the networking team, you must address the network and at the same time conserve unused addresses for future growth.

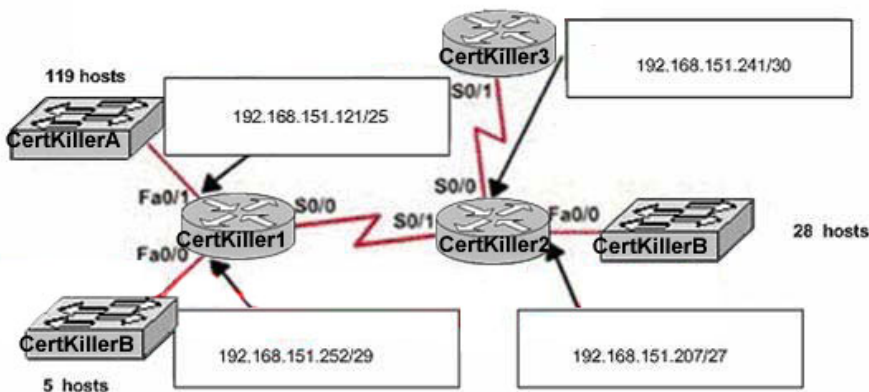
Being mindful of these goals, drag the host addresses on the left to the correct router interface. One of the routers is partially configured. Move the mouse over a router to view its configuration (\*\* This information is missing\*\*). Not all of the host address choices will be used.



Select from these

- 192.168.151.240/30
- 192.168.151.252/29
- 192.168.151.239/28
- 192.168.151.241/30
- 192.168.151.207/27
- 192.168.151.121/25

Answer:



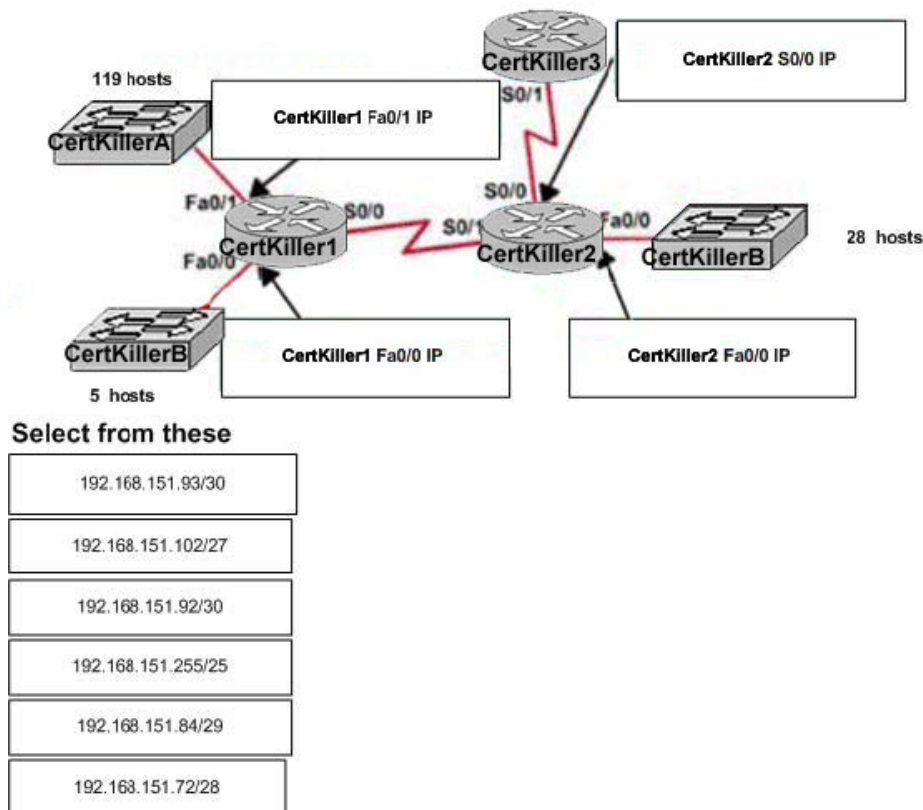
### QUESTION 116:

#### DRAG DROP

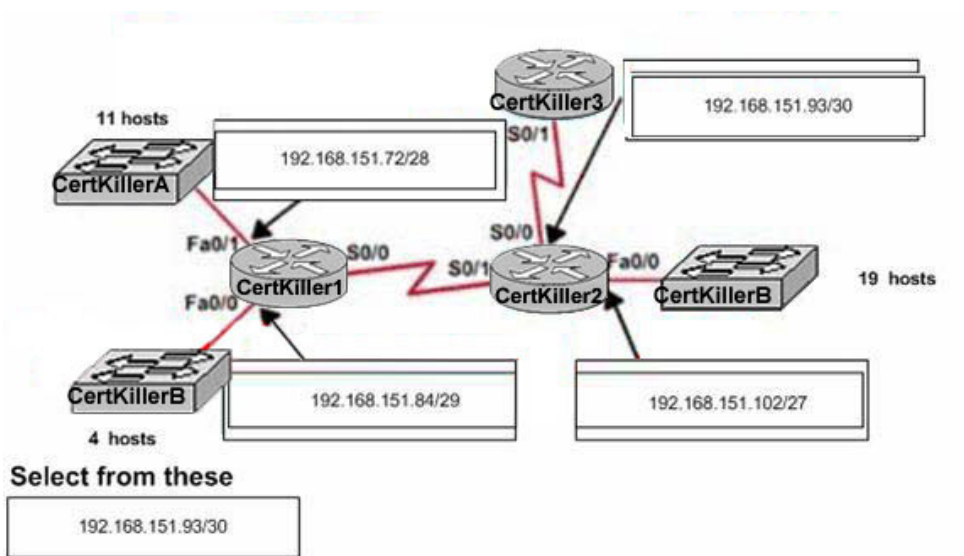
Certkiller has three locations and has plans to redesign the network accordingly. The networking team received 192.168.151.0 to use as the addressing for entire network from the administrator. After subnetting the address, the team is ready to assign the address.

The administrator plans to configure ip subnet-zero and use RIP v2 as the routing

protocol. As a member of the networking team, you must address the network and at the same time conserve unused addresses for future growth. Being mindful of these goals, drag the host addresses on the left to the correct router interface. One of the routers is partially configured. Move the mouse over a router to view its configuration (\*\* This information is missing\*\*). Not all of the host addresses on the left will be used.



Answer:

**QUESTION 117:**

If a host on a network has the address 172.16.45.14/30, what is the address of the subnetwork to which this host belongs?

- A. 172.16.45.0
- B. 172.16.45.4
- C. 172.16.45.8
- D. 172.16.45.12
- E. 172.16.45.18

Answer: D

Explanation:

The last octet in binary form is 00001110. Only 6 bits of this octet belong to the subnet mask. Hence, the subnetwork is 172.16.45.12.

**QUESTION 118:**

Which two of the addresses below are available for host addresses on the Certkiller subnet 192.168.15.19/28? (Select two answer choices)

- A. 192.168.15.17
- B. 192.168.15.14
- C. 192.168.15.29
- D. 192.168.15.16
- E. 192.168.15.31
- F. None of the above

Answer: A, C

Explanation:

The network uses a 28bit subnet (255.255.255.240). This means that 4 bits are used for the networks and 4 bits for the hosts. This allows for 14 networks and 14 hosts ( $2^n - 2$ ). The last bit used to make 240 is the 4th bit (16) therefore the first network will be 192.168.15.16. The network will have 16 addresses (but remember that the first address is the network address and the last address is the broadcast address). In other words, the networks will be in increments of 16 beginning at 192.168.15.16/28. The IP address we are given is 192.168.15.19. Therefore the other host addresses must also be on this network. Valid IP addresses for hosts on this network are: 192.168.15.17-192.168.15.30.

Incorrect Answers:

B. This is not a valid address for this particular 28 bit subnet mask. The first network address should be 192.168.15.16.

D. This is the network address.

E. This is the broadcast address for this particular subnet.

---

### **QUESTION 119:**

Certkiller has a Class C network and you need ten subnets. You wish to have as many addresses available for hosts as possible. Which one of the following subnet masks should you use?

- A. 255.255.255.192
- B. 255.255.255.224
- C. 255.255.255.240
- D. 255.255.255.248
- E. None of the above

Answer: C

Explanation:

Using the  $2^n - 2$  formula, we will need to use 4 bits for subnetting, as this will provide for  $2^4 - 2 = 14$  subnets. The subnet mask for 4 bits is then 255.255.255.240.

Incorrect Answers:

A. This will give us only 2 bits for the network mask, which will provide only 2 networks.

B. This will give us 3 bits for the network mask, which will provide for only 6 networks.

D. This will use 5 bits for the network mask, providing 30 networks. However, it will provide for only for 6 host addresses in each network, so C is a better choice.

---

### **QUESTION 120:**

You have a single Class C IP address and a point-to-point serial link that you want to implement VLSM on. Which subnet mask is the most efficient for this point to

point link?

- A. 255.255.255.0
- B. 255.255.255.240
- C. 255.255.255.248
- D. 255.255.255.252
- E. 255.255.255.254
- F. None of the above

Answer: D

Explanation:

For a single point to point link, only 2 IP addresses are required, one for the serial interface of the router at each end. Therefore, the 255.255.255.252 subnet mask is often used for these types of links, as no IP addresses are wasted.

---

**QUESTION 121:**

You have a network that supports VLSM and you need to reduce IP address waste in your point to point WAN links. Which of the masks below would you use?

- A. /38
- B. /30
- C. /27
- D. /23
- E. /18
- F. /32

Answer: B

Explanation:

For a single point to point link, only 2 IP addresses are required, one for the serial interface of the router at each end. Therefore, the 255.255.255.252 subnet mask is often used for these types of links because no IP addresses are wasted. The subnet mask 255.255.255.252 is a /30, so answer B is correct.

Incorrect Answers:

- A. The largest mask that can be used is the single IP host mask, which is /32. It is not possible to use a /38 mask, unless of course IPv6 is being used.
- C, D, E. These masks will provide for a larger number of host addresses, and since only 2 IP addresses are needed for a point to point link, these extra addresses are wasted.
- F: No available host addresses with a /32 mask

---

**QUESTION 122:**

What is the maximum number of IP addresses that can be assigned to hosts on a

Certkiller subnet that uses the 255.255.255.224 subnet mask?

- A. 14
- B. 15
- C. 16
- D. 30
- E. 31
- F. 32

Answer: D

Explanation:

The subnet mask 255.255.255.224 means that there are 27 network bits. The remaining 5 bits are the host bits. The maximum possible combinations with 5 bits are  $2^5 = 32$ . As all zero's and all one's hosts are not allowed so, maximum number of valid hosts with the mask 255.255.255.224 are  $2^5 - 2 = 32 - 2 = 30$  Hosts

---

**QUESTION 123:**

In a Certkiller network that supports VLSM, which network mask should be used for point-to-point WAN links in order to reduce waste of IP addresses?

- A. /24
- B. /30
- C. /27
- D. /26
- E. /32
- F. None of the above

Answer: B

Explanation:

A 30-bit mask is used to create subnets with two valid host addresses. This is the exact number needed for a point-to-point connection.

---

**QUESTION 124:**

The network 172.25.0.0 has been divided into eight equal subnets. Which of the following IP addresses can be assigned to hosts in the third subnet if the ip subnet-zero command is configured on the router? (Choose three)

- A. 172.25.78.243
- B. 172.25.98.16
- C. 172.25.72.0
- D. 172.25.94.255
- E. 172.25.96.17



F. 172.25.100.16

Answer: A, C, D

Explanation:

If we divide the address 172.25.0.0 in 8 subnets, the resulting subnets will be

1. 172.25.0.0
2. 172.25.32.0
3. 172.25.64.0 This is the third subnet
4. 172.25.96.0
5. 172.25.128.0
6. 172.25.160.0
7. 172.25.192.0
8. 172.25.224.0

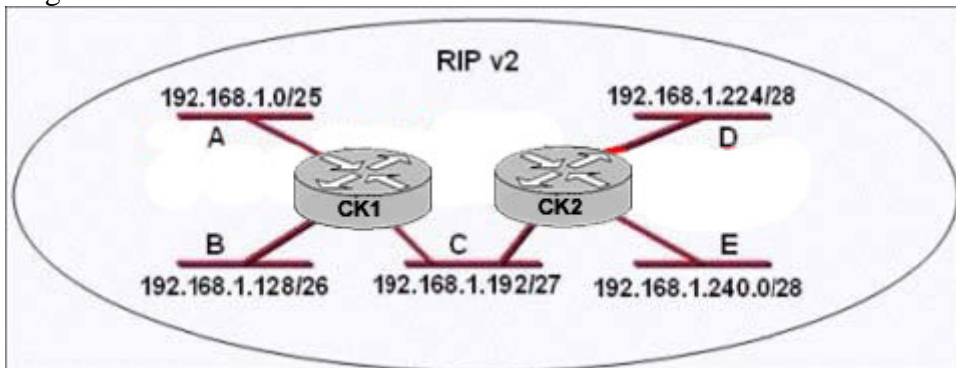
Addresses that fall in the 3rd subnet will be from 172.25.64.0 ---- 172.25.95.255

Choices A, C and D lie in this network range.

---

### QUESTION 125:

The Certkiller network administrator has designed the IP scheme as shown in the diagram below:



Based on the information shown above, what effect will this addressing scheme have on the network?

- A. IP traffic between subnet A and B will be prevented.
- B. Routing information will not be exchanged.
- C. The addressing scheme will allow all IP traffic between the LANs.
- D. IP traffic between all the LANs will be prevented.
- E. None of the above

Answer: C

Explanation:

This scheme will allow for communication between all networks, and uses all IP addresses in the 192.168.1.0/24 IP network with no overlap. Note that RIPv2 is being

used instead of RIPv1. RIPv2 carries subnet mask information allowing for VLSM networks like the one shown here.

---

**QUESTION 126:**

The network with the IP address 172.31.0.0/19 is to be configured on the Certkiller router with the partial configuration shown in the graphic. Which of the following statements describes the number of available subnets and hosts that will result from this configuration?

Exhibit:

```
Current configuration:
!
version 12.0
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname R1
!
ip subnet-zero
!
!
ip classless
ip route 0.0.0.0 0.0.0.0 Serial0/0
no ip http server
!
<output omitted>
```

- A. There are 7 usable subnets, with 2046 usable host addresses.
- B. There are 8 usable subnets, with 30 usable host addresses.
- C. There are 7 usable subnets, with 30 usable host addresses.
- D. There are 8 usable subnets, with 2046 usable host addresses.
- E. There are 7 usable subnets, with 8190 usable host addresses.
- F. There are 8 usable subnets, with 8190 usable host addresses.

Answer: F

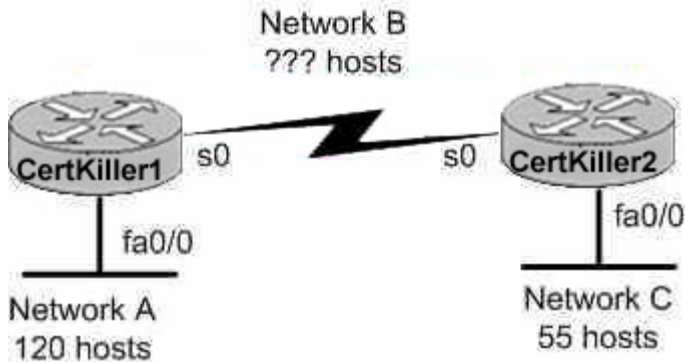
Explanation:

The 172.31.0.0/19 will have 3 bits in the network portion, and 13 bits in the host portion. This will allow for  $2^3 = 8$  networks and  $2^{13} = 8192$  hosts available for each network (8190 usable). Since the IP subnet-zero command is used the first network is available, making choice F correct.

---

**QUESTION 127:**

A portion of the Certkiller network is shown in the diagram below:



Consider the 192.1.1.0/24 network in this exhibit. This network uses RIP v2. Which combination of subnetwork assignments will satisfy the requirements for networks A, B, and C of this design? (Select three)

- A. Network A = 192.1.1.128/25
- B. Network A = 192.1.1.0/25
- C. Network B = 192.1.1.252/30
- D. Network B = 192.1.1.4/30
- E. Network C = 192.1.1.64/26
- F. Network C = 192.1.1.224/27

Answer: A, D, E

Explanation:

To properly answer this question, it is best to start from the end, which is network C. Since network C requires at least 55 host addresses, a /26 network must be used. A network mask of /26 will provide for 62 usable IP addresses while a /27 network will only provide for 30 so we must choose E. With choice E taken, hosts within the range of 192.1.1.65-192.1.1.126 will be used.

For network A, both choices A and B are using the correct subnet mask, but we are only limited to choice A since many of the hosts in choice B are already being used in network C. Finally, for network B we are left with choice D since hosts in choice C are already being used by network A.

---

### QUESTION 128:

If an ethernet port on router CK1 was assigned an IP address of 172.16.112.1/20, what is the maximum number of hosts allowed on this LAN subnet?

- A. 2046
- B. 1024
- C. 4096
- D. 8190
- E. 4094
- F. None of the above

Answer: E

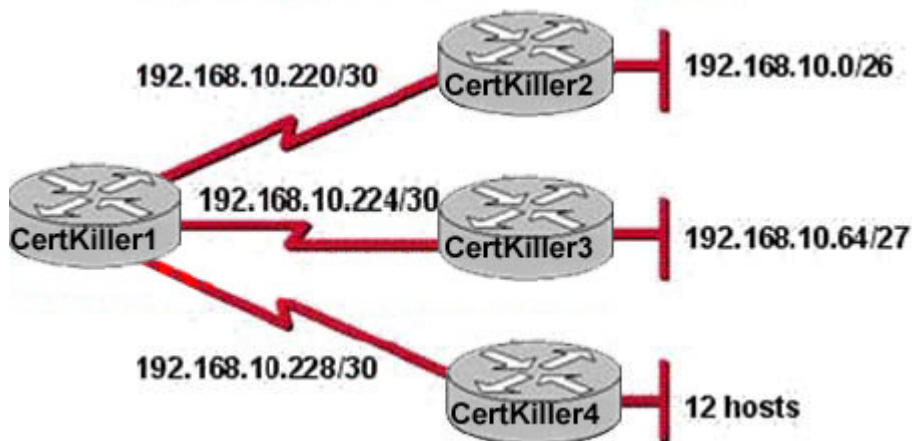
Explanation:

Since a /20 equates to 12 bits used for the subnet mask, 4094 hosts can be uniquely addressed.

Number of Bits in the Host or Subnet Field	Maximum number of Hosts or Subnets ( $2^n - 2$ )
1	0
2	2
3	6
4	14
5	30
6	62
7	126
8	254
9	510
10	1022
11	2046
12	4094
13	8190
14	16,382

### QUESTION 129:

Part of the Certkiller WAN is shown below:



A new subnet with 12 hosts has been added to the Certkiller network shown above. Which subnet address should this network use to provide enough useable addresses, while wasting the fewest number of IP addresses?

- A. 192.168.10.80/29
- B. 192.168.10.80/28
- C. 192.168.10.96/28
- D. 192.168.10.96/29
- E. None of the above

Answer: C

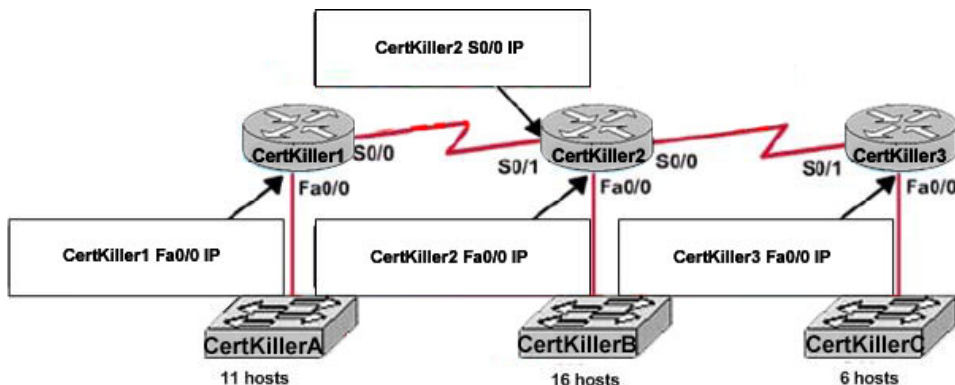
### QUESTION 130:

#### DRAG DROP

Certkiller has three locations and has plans to redesign the network accordingly. The networking team received 192.168.151.0 to use as the addressing for entire network from the administrator. After subnetting the address, the team is ready to assign the address.

The administrator plans to configure ip subnet-zero and use RIP v2 as the routing protocol. As a member of the networking team, you must address the network and at the same time conserve unused addresses for future growth.

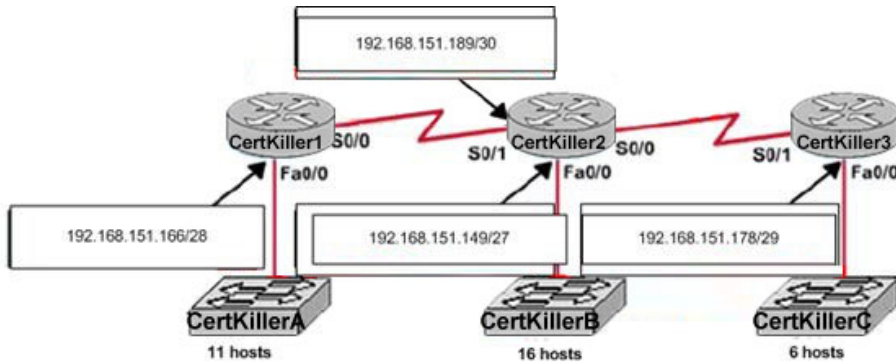
Being mindful of these goals, drag the host addresses on the left to the correct router interface. One of the routers is partially configured. Move the mouse over a router to view its configuration (\*\* This information is missing\*\*). Not all of the host addresses on the left will be used.



#### Select from these

192.168.151.180/30
192.168.151.166/28
192.138.151.149/27
192.138.151.188/30
192.168.151.178/29
192.168.151.255/26

Answer:



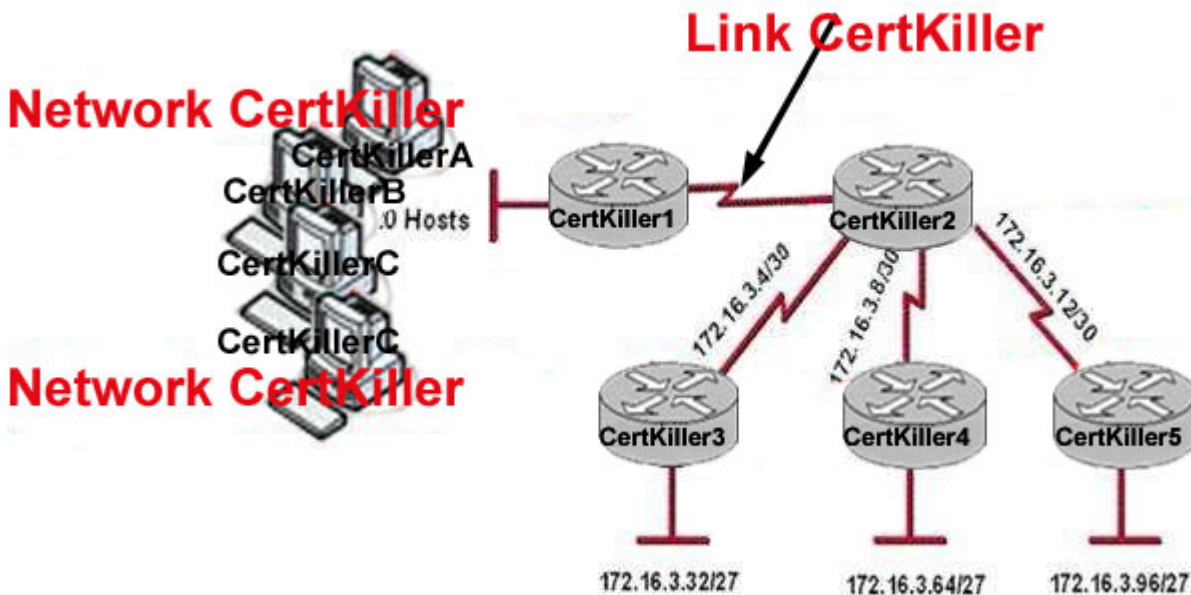
Select from these

192.168.151.188/30

192.168.151.255/26

### QUESTION 131:

Part of the Certkiller WAN is shown below:



All of the Certkiller routers in this network segment are configured with the "ip subnet-zero" IOS command. Because of this, which network addresses should be used for Link Certkiller and Network Certkiller shown above? (Choose two.)

- A. Network Certkiller - 172.16.3.128/25
- B. Link Certkiller - 172.16.3.40/30
- C. Network Certkiller - 172.16.3.192/26
- D. Link Certkiller - 172.16.3.112/30
- E. Link Certkiller - 172.16.3.0/30
- F. Network Certkiller - 172.16.3.48/26

Answer: A, E

---

**QUESTION 132:**

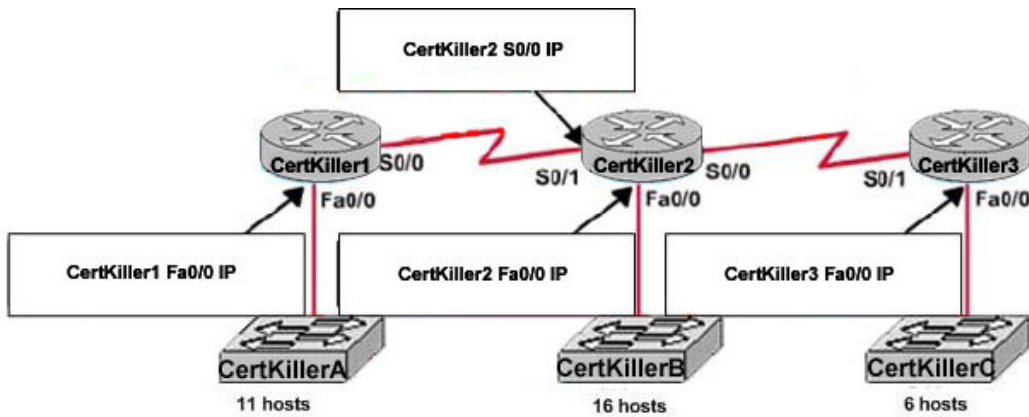
**DRAG DROP**

Certkiller has three locations and has plans to redesign the network accordingly. The networking team received 192.168.151.0 to use as the addressing for entire network from the administrator. After subnetting the address, the team is ready to assign the address.

The administrator plans to configure ip subnet-zero and use RIP v2 as the routing protocol. As a member of the networking team, you must address the network and at the same time conserve unused addresses for future growth.

Being mindful of these goals, drag the host addresses on the left to the correct router interface. One of the routers is partially configured. Move the mouse over a router to view its configuration (\*\* This information is missing\*\*). Not all of the host addresses on the left will be used.





Select from these

192.168.151.249/28

192.168.151.224/30

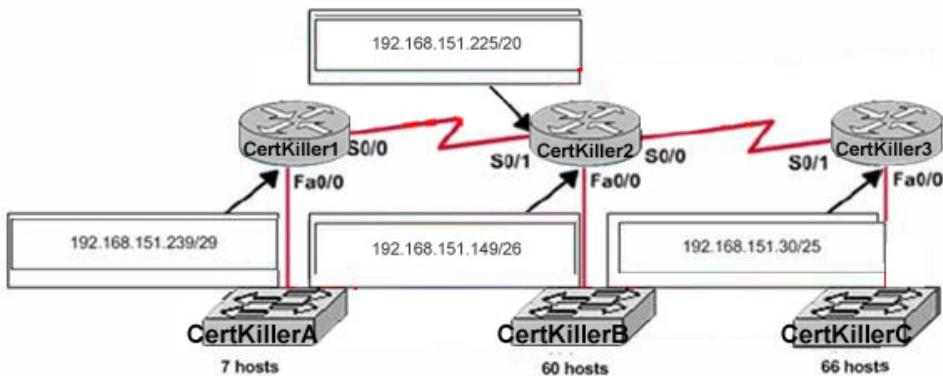
192.168.151.239/29

192.168.151.30/25

192.168.151.225/30

192.168.151.149/26

Answer:



Select from these

192.168.151.249/28

192.168.151.224/30

### QUESTION 133:

A host on the Certkiller network has been configured with the IP address 10.16.3.66/23. Which two statements describe this IP address? (Choose two)

- A. The broadcast address of the subnet is 10.16.3.255 255.255.254.0.
- B. This network is not subnetted.
- C. The last valid host address in the subnet is 10.16.2.254 255.255.254.0
- D. The subnet address is 10.16.3.0 255.255.254.0.
- E. The lowest host address in the subnet is 10.16.2.1 255.255.254.0.

Answer: A, E

Explanation:

A subnet mask of /23 translates to 255.255.254.0 and will provide for up to 512 IP addresses.

If we take the 10.16.X.X network using the /23 subnet mask, the first network available is 10.16.0.0/23, which will provide host address from 10.16.0.1 to 10.16.2.254, with 10.16.2.255 being the broadcast address. The next available network in the 10.16.X.X covers our example in this question of 10.16.3.66.

In this case, the first usable IP address is (10.16.2.1 choice E), and the broadcast address is 10.16.3.255 (choice A).

In closing, the partial reference table on IPv4 subnets:

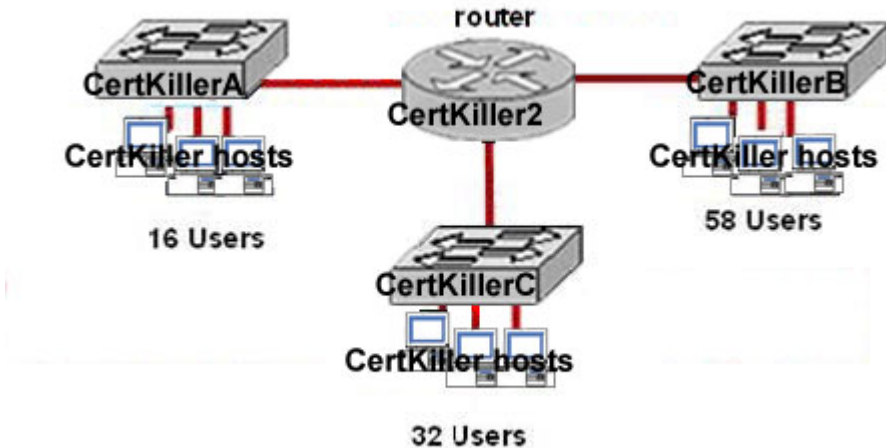
CIDR | Netmask | Addresses

-----+-----+-----		
/18	255.255.192.0	16384
/19	255.255.224.0	8192
/20	255.255.240.0	4096
/21	255.255.248.0	2048
/22	255.255.252.0	1024
/23	255.255.254.0	512
/24	255.255.255.0	256
/25	255.255.255.128	128
/26	255.255.255.192	64
/27	255.255.255.224	32
/28	255.255.255.240	16

---

### **QUESTION 134:**

Part of the Certkiller network is shown below:



In the Certkiller network shown above the IP address space of 128.107.7.0/24 has been allocated for all devices. All devices must use the same subnet mask and all subnets are usable. Which subnet mask is required to apply the allocated address space to the configuration that is shown?

- A. 255.255.255.192
- B. 255.255.255.128
- C. 255.255.255.0
- D. 255.255.255.224
- E. 255.255.254.0
- F. None of the above

Answer: A

Explanation:

In this example the requirement is that the company needs 3 subnets and at least 58 hosts per subnet. Referring to the following formula we see that 6 bits of subnet masking is needed.

Number of Bits in the Host or Subnet Field	Maximum number of Hosts or Subnets ( $2^n - 2$ )
1	0
2	2
3	6
4	14
5	30
6	62
7	126
8	254

With 6 bits used for the subnet portion, we get will get 4 different subnets with 62 usable IP addresses in each. The subnet mask for this /28 network translates to 255.255.255.192.

### QUESTION 135:

#### DRAG DROP

Certkiller has three locations and has plans to redesign the network accordingly. The networking team received 192.168.151.0 to use as the addressing for entire network from the administrator. After subnetting the address, the team is ready to assign the address.

The administrator plans to configure ip subnet-zero and use RIP v2 as the routing protocol. As a member of the networking team, you must address the network and at the same time conserve unused addresses for future growth.

Being mindful of these goals, drag the host addresses on the left to the correct router interface. One of the routers is partially configured. Move the mouse over a router to view its configuration (\*\* This information is missing\*\*). Not all of the host addresses on the left will be used.

Select from these:

192.168.151.52/26

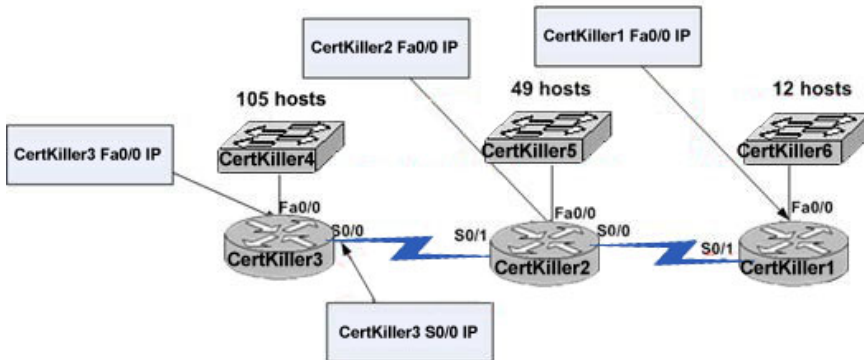
192.168.151.127/27

192.168.151.72/30

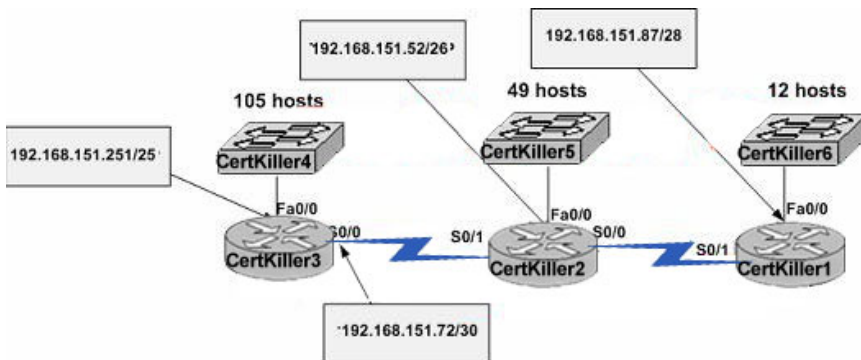
192.168.151.73/30

192.168.151.87/28

192.168.151.251/25



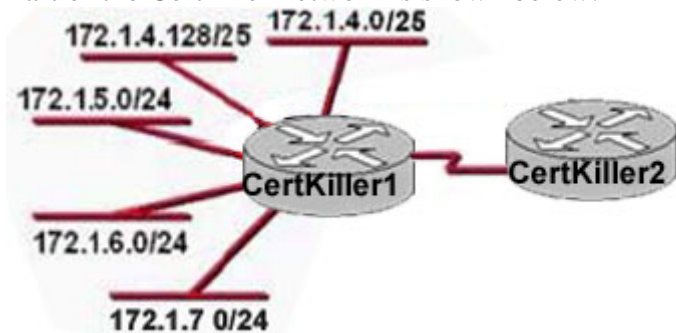
Answer:



---

**QUESTION 136:**

Part of the Certkiller network is shown below:



Based on the information shown above, what is the most efficient summarization that Router Certkiller 1 can use to advertise its networks to Router Certkiller 2?

- A. 172.1.4.0/24  
172.1.5.0/24  
172.1.5.0/24  
172.1.6.0/24  
172.1.7.0/24
- B. 172.1.0.0/22
- C. 172.1.0.0/21
- D. 172.1.4.0/24  
172.1.4.128/25  
172.1.5.0/24  
172.1.6.0/24  
172.1.7.0/24
- E. 172.1.4.0/22
- F. None of the above

Answer: E

---

**QUESTION 137:**

You need subnet a Certkiller network segment. How many subnetworks and hosts are available per subnet if you apply a /28 mask to the 210.10.2.0 class C network?

- A. 30 networks and 6 hosts.
- B. 6 networks and 30 hosts.
- C. 8 networks and 32 hosts.
- D. 32 networks and 18 hosts.
- E. 16 networks and 14 hosts.
- F. None of the above

Answer: E

Explanation:

A 28 bit subnet mask (11111111.11111111.11111111.11110000) applied to a class C network uses a 4 bits for networks, and leaves 4 bits for hosts. Using the  $2^n - 2$  formula, we have  $2^4 - 2$  (or  $2 \times 2 \times 2 - 2$ ) which gives us 14 for the number of hosts, and the number of networks is  $2^4 = 16$ .

Incorrect Answers:

- A. This would be the result of a /29 (255.255.255.248) network.
- B. This would be the result of a /27 (255.255.255.224) network.
- C. This is not possible, as we must subtract two from the subnets and hosts for the network and broadcast addresses.
- D. This is not a possible combination of networks and hosts.

---

**QUESTION 138:**

The Certkiller network was assigned the Class C network 199.166.131.0 from the ISP. If the administrator at Certkiller were to subnet this class C network using the 255.255.255.224 subnet mask, how many hosts will they be able to support on each subnet?

- A. 14
- B. 16
- C. 30
- D. 32
- E. 62
- F. 64

Answer: C

Explanation:

The subnet mask 255.255.255.224 is a 27 bit mask (11111111.11111111.11111111.11100000). It uses 3 bits from the last octet for the network ID, leaving 5 bits for host addresses. We can calculate the number of hosts supported by this subnet by using the  $2^n - 2$  formula where n represents the number of host bits. In this case it will be 5.  $2^5 - 2$  gives us 30.

Incorrect Answers:

- A. Subnet mask 255.255.255.240 will give us 14 host addresses.
- B. Subnet mask 255.255.255.240 will give us a total of 16 addresses. However, we must still subtract two addresses (the network address and the broadcast address) to determine the maximum number of hosts the subnet will support.
- D. Subnet mask 255.255.255.224 will give us a total of 32 addresses. However, we must still subtract two addresses (the network address and the broadcast address) to determine the maximum number of hosts the subnet will support.
- E. Subnet mask 255.255.255.192 will give us 62 host addresses.
- F. Subnet mask 255.255.255.192 will give us a total of 64 addresses. However, we must still subtract two addresses (the network address and the broadcast address) to determine the maximum number of hosts the subnet will support.

---

**QUESTION 139:**

What is the subnet for the host IP address 172.16.210.0/22?

- A. 172.16.42.0
- B. 172.16.107.0
- C. 172.16.208.0
- D. 172.16.252.0
- E. 172.16.254.0
- F. None of the above

Answer: C

Explanation:

This question is much easier then it appears when you convert it to binary and do the Boolean operation as shown below:

IP address 172.16.210.0 = 10101100.00010000.11010010.00000000

/22 mask = 11111111.11111111.11111100.00000000

AND result = 11111111.11111111.11010000.00000000

AND in decimal= 172 . 16 . 208 . 0

---

**QUESTION 140:**

What is the subnet for the host IP address 201.100.5.68/28?

- A. 201.100.5.0
- B. 201.100.5.32
- C. 201.100.5.64
- D. 201.100.5.65
- E. 201.100.5.31
- F. 201.100.5.1

Answer: C

Explanation:

This question is much easier then it appears when you convert it to binary and do the Boolean operation as shown below:

IP address 201.100.5.68 = 11001001.01100100.00000101.01000100

/28 mask = 11111111.11111111.11111111.11000000

AND result = 11001001.01100100.00000101.01000000

AND in decimal= 200 . 100 . 5 . 64

---

**QUESTION 141:**

Your network uses the 172.12.0.0 class B address. You need to support 459 hosts per



subnet, while accommodating the maximum number of subnets. Which mask would you use?

- A. 255.255.0.0.
- B. 255.255.128.0.
- C. 255.255.224.0.
- D. 255.255.254.0.
- E. None of the above

Answer: D

Explanation:

To obtain 459 hosts the number of host bits will be 9. This can support a maximum of 510 hosts. To keep 9 bits for hosts means the last bit in the 3rd octet will be 0. This gives 255.255.254.0 as the subnet mask.

---

**QUESTION 142:**

Using a subnet mask of 255.255.255.224, which of the IP addresses below can you assign to the hosts on this subnet? (Select all that apply)

- A. 16.23.118.63
- B. 87.45.16.159
- C. 92.11.178.93
- D. 134.178.18.56
- E. 192.168.16.87
- F. 217.168.166.192

Answer: C, D, E

Explanation:

Since the subnet mask is 255.255.255.224, the number of network hosts that is available is 30. Every network boundary will be a multiple of 32. This means that every subnet will be a multiple (0, 32, 64, 96, 128, 160, 192, 224) and the broadcast address for each of these subnets will be one less this number (31, 63, 95, 127, 159, 191, 223). Therefore, any IP address that does not end in one of these numbers will be a valid host IP address.

- C. Valid Host in subnetwork 2 (92.11.178.64 to 92.11.178.95)
- D. Valid Host in subnetwork 1 (134.178.18.32 to 134.178.18.63)
- E. Valid Host in subnetwork 2 (192.168.16.64 to 192.168.16.95)

Incorrect Answers:

- A. This will be the broadcast address for the 16.23.118.32/27 network.
- B. This will be the broadcast address for the 87.45.16.128/27 network
- F. This will be the network address for the 217.168.166.192/27 network.

---

**QUESTION 143:**

Your ISP has assigned you the following IP address and subnet mask:

IP address: 199.141.27.0

Subnet mask: 255.255.255.240

Which of the following addresses can be allocated to hosts on the resulting subnet?

(Select all that apply)

- A. 199.141.27.2
- B. 199.141.27.175
- C. 199.141.27.13
- D. 199.141.27.11
- E. 199.141.27.208
- F. 199.141.27.112

Answer: A, C, D

Explanation:

IP address = 11001000.10001101.00011011.00000000 = 199.141.27.0

Subnet mask = 11111111.11111111.11111111.11110000 = 255.255.255.240

Subnet # = 11001000.10001101.00011011.00000000 = 199.141.27.0

Broadcast = 11001000.10001101.00011011.00001111 = 199.141.27.15

The valid IP address range = 199.141.27.1 - 199.141.27.14

---

#### **QUESTION 144:**

The IP network 210.106.14.0 is subnetted using a /24 mask. How many usable networks and host addresses can be obtained from this?

- A. 1 network with 254 hosts
- B. 4 networks with 128 hosts
- C. 2 networks with 24 hosts
- D. 6 networks with 64 hosts
- E. 8 networks with 36 hosts

Answer: A

Explanation:

A subnet with 24 bits on would be 255.255.255.0. Since this is a class C network, this subnet can have only 1 network and 254 usable hosts.

---

#### **QUESTION 145:**

Given that you have a class B IP address network range, which of the subnet masks below will allow for 100 subnets with 500 usable host addresses per subnet?

- A. 255.255.0.0
- B. 255.255.224.0

- C. 255.255.254.0
- D. 255.255.255.0
- E. 255.255.255.224

Answer: C

Explanation:

Using the  $2^n - 2$  formula for host addresses,  $2^9 - 2 = 510$  host address, so a 9-bit subnet mask will provide the required number of host addresses. If these 9 bits are used for the hosts in a class B network, then the remaining 7 bits are used for the number of networks. Again using the  $2^n - 2$  formula, we have  $2^7 - 2 = 126$  networks that are available.

Incorrect Answers:

- A. This will provide for only 1 network with  $2^{16} - 2 = 65534$  hosts
- B. This will provide for 6 networks with 8190 host addresses.
- D. This will provide 254 networks and 254 hosts.
- E. This will provide 2046 different networks, but each network will have only 30 hosts.

---

**QUESTION 146:**

You have a class C network, and you need to design it for 5 usable subnets with each subnet handling a minimum of 18 hosts each. Which of the following network masks should you use?

- A. 225.225.224.0.
- B. 225.225.240.0.
- C. 225.225.255.0.
- D. 255.255.255.224
- E. 225.225.255.240

Answer: D

Explanation:

The default subnet mask for class C network is 255.255.255.0. If one has to create 5 subnets, then 3 bits are required. With 3 bits we can create 8 subnets. The remaining 5 bits are used for Hosts. One can create 30 hosts using 5 bits in host field. This matches with the requirement.

Incorrect Answers:

- A, B: This is an illegal subnet mask for a class C network, as the third octet can not be divided when using a class C network.
  - C. This is the default subnet mask for a class C network. It provides for one network, with 254 usable host IP addresses.
  - E. This subnet mask will provide for 14 separate networks with 14 hosts each. This does not meet the requirement of a minimum of 18 hosts.
-

**QUESTION 147:**

The 213.115.77.0 network was subnetted using a /28 subnet mask. How many usable subnets and host addresses per subnet were created as a result of this?

- A. 2 networks with 62 hosts
- B. 6 networks with 30 hosts
- C. 16 networks and 16 hosts
- D. 62 networks and 2 hosts
- E. 14 networks and 14 hosts
- F. None of the above

Answer: F

Explanation:

A class C subnet with a 28 bit mask requires 4 bits for the network address, leaving 4 bits for host addresses. Using the  $2^n - 2$  formula ( $2^4 - 2$  in this case) we have 14 host addresses and 16 network addresses.

Incorrect Answers:

- A. This would be the result of a /26 network mask
- B. This would be the result of a /27 network mask
- C. Remember we need to always subtract two for the network and broadcast addresses, so this answer is incorrect.
- D. This would be the result of a /30 network mask.

---

**QUESTION 148:**

The 201.145.32.0 network is subnetted using a /26 mask. How many networks and IP hosts per network exists using this subnet mask?

- A. 4 networks and 64 hosts
- B. 64 networks and 4 hosts
- C. 4 networks and 62 hosts
- D. 62 networks and 2 hosts
- E. 6 network and 30 hosts

Answer: C

Explanation:

A class C network with a 26 bit mask requires 2 bits for the network address, leaving 6 bits for host addresses. Using the  $2^n - 2$  formula ( $2^6 - 2$  for the network and  $2^6 - 2$  for hosts) we have 4 network addresses and 62 host addresses.

Incorrect Answers:

A, B: This is not a possible combination. No network mask will provide for 64 usable hosts, because we must always subtract 2 for the network and broadcast address.

- D. This would be the result of a /30 mask.
- E. This would be the result of a /27 network mask.

---

**QUESTION 149:**

You have a class B network with a 255.255.255.0 mask. Which of the statements below are true of this network? (Select all valid answers)

- A. There are 254 usable subnets.
- B. There are 256 usable hosts per subnet.
- C. There are 50 usable subnets.
- D. There are 254 usable hosts per subnet.
- E. There are 24 usable hosts per subnet.
- F. There is one usable network.

Answer: A, D

Explanation:

The default subnet mask for Class B is 255.255.0.0. Thus an extra 8 bits have been used for the network portion, leaving 8 for hosts. The  $2^n - 2$  formula ( $2^8 - 2$  in this case for both the network and IP hosts) gives us 254 networks and 254 hosts per network.

Incorrect Answers:

- B. We must remember to always subtract 2 (one for the network, and one for the broadcast) so the result is 254, not 256.
- C, E: No possible network mask would give us this exact number of subnets or hosts.
- F. This would be true if this were a class C network, not a class B.

---

**QUESTION 150:**

How many usable IP addresses can you get from a conventional Class C address?

- A. 128
- B. 192
- C. 254
- D. 256
- E. 510

Answer: C

Explanation:

Class C addresses range from 192.0.0.0 through 223.255.255.255 and default subnet mask of 255.255.255.0. In Class C addresses, the first 24 bits are used as for the network ID while only the last 8 bits is used for the host ID. Using the  $2^n - 2$  formula, we can calculate that Class C addresses can support a maximum of 254 ( $2^8 - 2$ ) hosts.

Incorrect Answers:

- D. Note that the question asked for the number of usable addresses, and not the total

number of all addresses. We must subtract 2 for the network and broadcast addresses to calculate the number of usable addresses in any subnet.

---

**QUESTION 151:**

Your ISP assigned you a full class B address space. From this, you need at least 300 sub-networks that can support at least 50 hosts each. Which of the subnet masks below are capable of satisfying your needs? (Select two).

- A. 255.255.255.0
- B. 255.255.255.128
- C. 255.255.252.0
- D. 255.255.255.224
- E. 255.255.255.192
- F. 255.255.248.0

Answer: B, E

Explanation:

Requirement in the question is that the company needs 300 subnets and 50 hosts per subnet.

Number of Bits in the Host or Subnet Field	Maximum number of Hosts or Subnets ( $2^n - 2$ )
1	0
2	2
3	6
4	14
5	30
6	62
7	126
8	254
9	510
10	1022
11	2046
12	4094
13	8190
14	16,382

With 9 bits used for the subnet portion, we get 510 subnets and using the remaining 7 bits for the hosts gives us 126 hosts per subnet. The subnet mask will be 255.255.255.128

With 10 bits used for the subnet portion, we get 1022 subnets and then using the

remaining 6 bits for hosts provides 62 hosts per subnet. The subnet mask will be 255.255.255.192 in this case which will also fulfill the requirement.

---

**QUESTION 152:**

A Certkiller PC has the IP address 172.16.209.10 /22. What is the subnet of this address?

- A. 172.16.42.0
- B. 172.16.107.0
- C. 172.16.208.0
- D. 172.16.252.0
- E. 172.16.254.0

Answer: C

Explanation:

172.16.209.10/22 translates to 10101100.00010000.11010001.00001010 in binary form. The network portion is 22 bits, so after the logical AND comparison the network address translates to 10101100.00010000.11010000.00001010. Converting the network portion to decimal results in the address 172.16.208.0/22

---

**QUESTION 153:**

You've been assigned the CIDR (classless inter domain routing) block of 115.64.4.0/22 from your ISP. Which of the IP addresses below can you use for a host? (Select all valid answers)

- A. 115.64.8.32
- B. 115.64.7.64
- C. 115.64.6.255
- D. 115.64.3.255
- E. 115.64.5.128
- F. 115.64.12.128

Answer: B, C, E

Explanation:

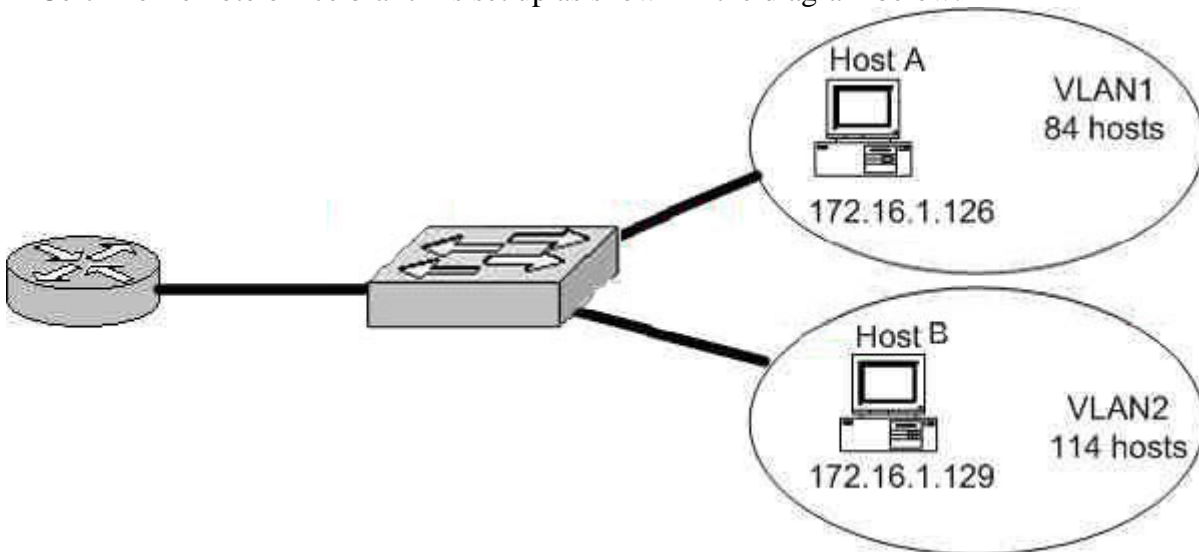
115.64.4.0 = 01110011.01000000.00000100.00000000  
Subnet mask = 11111111.11111111.11111100.00000000 = 255.255.252.0  
Subnet number = 01110011.01000000.00000100.00000000 = 115.64.4.0  
Broadcast = 01110011.01000000.00000111.11111111 = 115.64.7.255  
Valid address range = 115.64.4.1 - 115.64.7.254

---

**QUESTION 154:**



A Certkiller remote office branch is set up as shown in the diagram below:



All of the hosts in the above exhibit are connected with each other via the single Catalyst switch. Which of the following statements correctly describe the addressing scheme of this network? (Select three)

- A. The subnet mask in use is 255.255.255.192.
- B. The subnet mask in use is 255.255.255.128.
- C. The IP address 172.16.1.25 can be assigned to hosts in VLAN1.
- D. The IP address 172.16.1.205 can be assigned to hosts in VLAN1
- E. The LAN interface of the router is configured with one IP address.
- F. The LAN interface of the router is configured with multiple IP addresses.

Answer: B, C, F

Explanation:

Based on the diagram above, the subnet mask used for each VLAN is 255.255.255.128. This means that hosts in VLAN 1 will be addressed 172.16.1.1-172.16.1.126, with 172.16.1.127 being used as the broadcast address. Hosts in VLAN 2 will be addressed 172.16.1.129-172.16.1.254. Because there is only one LAN interface on the router, sub interfaces will be used, so the router's LAN interface will be configured with 2 IP addresses, one for VLAN 1 and 1 for VLAN 2.

Incorrect Answers:

- A. This subnet mask will only provide 62 host IP addresses, and the diagram shows that as many as 114 host IP addresses are needed.
- D. This IP address can be used in VLAN 2, not VLAN 1.
- E. Since there are 2 subnets in this network, each separate network will require a distinct default gateway IP address, so 2 IP addresses will be required on the LAN interface of the router.

---

### QUESTION 155:

On the topic of VLSM, which one of the following statements best describes the

concept of the route aggregation?

- A. Deleting unusable addresses through the creation of many subnets.
- B. Combining routes to multiple networks into one supernet.
- C. Reclaiming unused space by means of changing the subnet size.
- D. Calculating the available host addresses in the AS.
- E. None of the above

Answer: B

Explanation:

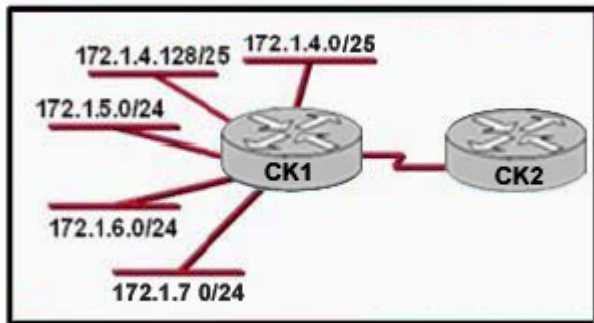
In the networking world route aggregate means combining routes to multiple networks into one. This is also known as route summarization or supernetting. It is normally used to reduce the number of route entries in the routing table by advertising numerous routes into one larger route.

Reference: CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 236.

---

### **QUESTION 156:**

In the Certkiller network shown below, what is the most efficient summarization that CK1 can use to advertise its networks to CK2 ?



- A. 172.1.4.0/24 172.1.5.0/24 172.1.6.0/24 172.1.7.0/24
- B. 172.1.0.0/22
- C. 172.1.4.0/25 172.1.4.128/25 172.1.5.0/24 172.1.6.0/24 172.1.7.0/24
- D. 172.1.0.0/21
- E. 172.1.4.0/22

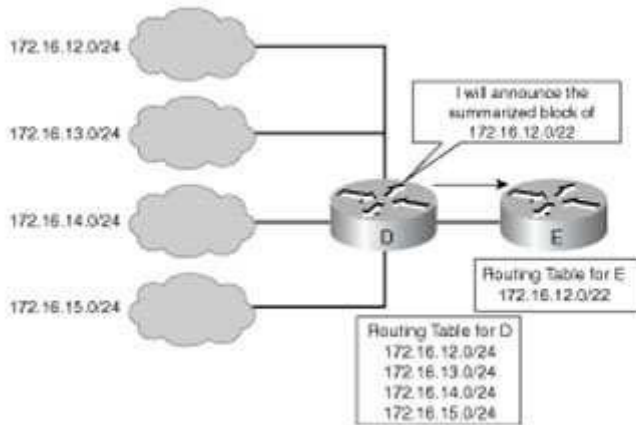
Answer: E

Explanation:

Route Summarization Overview:

In large internetworks, hundreds, or even thousands, of network addresses can exist. It is

often problematic for routers to maintain this volume of routes in their routing tables. Route summarization (also called route aggregation or supernetting) can reduce the number of routes that a router must maintain, because it is a method of representing a series of network numbers in a single summary address.



For example, in the figure above, router D can either send four routing update entries or summarize the four addresses into a single network number. If router D summarizes the information into a single network number entry, the following things happen:

1. Bandwidth is saved on the link between routers D and E.
2. Router E needs to maintain only one route and therefore saves memory.
3. Router E also saves CPU resources, because it evaluates packets against fewer entries in its routing table.

A summary route is announced by the summarizing router as long as at least one specific route in its routing table matches the summary route.

### QUESTION 157:

Part of the Certkiller network is shown below:



The five Ethernet networks connected to router Certkiller 1 in the graphic have been summarized for router Certkiller 2 as 192.1.144.0/20. Based on this information, which of the following packet destination addresses will Certkiller 2 forward to Certkiller 1, according to this summary? (Choose two.)

- A. 192.1.1.144
- B. 192.1.159.2
- C. 192.1.138.41

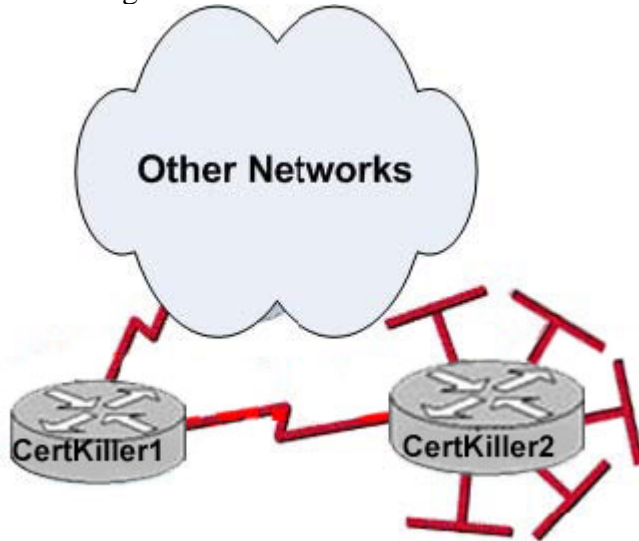
- D. 192.1.151.254
- E. 192.1.160.11
- F. 192.1.143.145
- G. 0.0.0.0

Answer: B, D

---

**QUESTION 158:**

Refer to the following exhibit:



In this network segment, the IP subnets connected to router Certkiller 2 have been summarized as a 192.18.176.0/21 route and sent to Certkiller 1. Based on this information, which two packet destination addresses will Certkiller 1 forward to Certkiller 2? (Choose two)

- A. 192.18.183.255
- B. 192.18.159.2
- C. 192.18.194.160
- D. 192.18.179.4
- E. 192.18.183.41
- F. 192.18.184.45

Answer: D, E

---

**QUESTION 159:**

Certkiller is migrating to an IPv6 addressing scheme. Identify the four valid IPv6 addresses below that could be used in this network. (Choose four)

- A. ::192:168:0:1
- B. 2002:c0a8:101::42

- C. 2000::
- D. ::
- E. 2001:3452:4952:2837::
- F. 2003:dead:beef:4dad:23:46:bb:101

Answer: A, B, D, F

Explanation:

From RFC 1884: IP Version 6 Addressing Architecture

There are three conventional forms for representing IPv6 addresses as text strings:

1. The preferred form is x:x:x:x:x:x:x, where the 'x's are the hexadecimal values of the eight 16-bit pieces of the address.

Examples:

FEDC:BA98:7654:3210:FEDC:BA98:7654:3210

1080:0:0:0:8:800:200C:417A

Note that it is not necessary to write the leading zeros in an individual field, but there must be at least one numeral in every field (except for the case described in 2.).

2. Due to the method of allocating certain styles of IPv6 addresses, it will be common for addresses to contain long strings of zero bits. In order to make writing addresses containing zero bits easier a special syntax is available to compress the zeros. The use of "::" indicates multiple groups of 16-bits of zeros. The "::" can only appear once in an address. The "::" can also be used to compress the leading and/or trailing zeros in an address.

For example the following addresses:

1080:0:0:0:8:800:200C:417A a unicast address

FF01:0:0:0:0:0:0:43 a multicast address

0:0:0:0:0:0:0:1 the loopback address

0:0:0:0:0:0:0:0 the unspecified addresses

may be represented as:

1080::8:800:200C:417A a unicast address

FF01::43 a multicast address

::1 the loopback address

:: the unspecified addresses

3. An alternative form that is sometimes more convenient when dealing with a mixed environment of IPv4 and IPv6 nodes is x:x:x:x:x:x:d.d.d.d, where the 'x's are the hexadecimal values of the six high-order 16-bit pieces of the address, and the 'd's are the decimal values of the four low-order 8-bit pieces of the address (standard IPv4 representation). Examples:

0:0:0:0:0:0:13.1.68.3

0:0:0:0:FFFF:129.144.52.38

or in compressed form:

::13.1.68.3

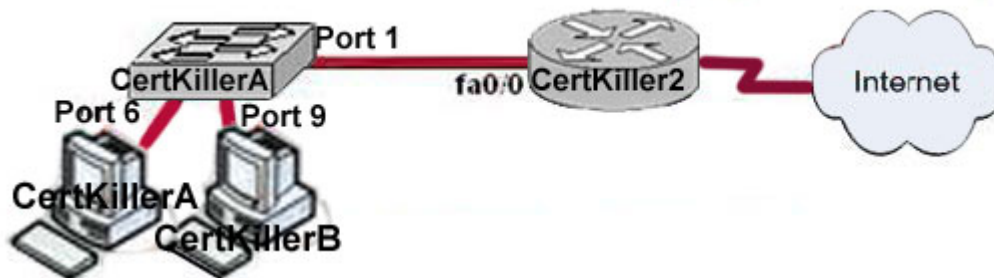
::FFFF:129.144.52.38

Reference: <http://www.faqs.org/rfcs/rfc1884.html>

---

**QUESTION 160:**

The Certkiller network topology exhibit is shown below:



Configuration exhibit:

**Switch CertKillerA configuration:**

```
Port1: dot1q trunk
VLAN 1: Ports 2, 3, 4
VLAN 10: Ports 5, 6, 7
VLAN 20: Ports 8, 9, 10, 11, 12
```

**Router CertKiller2 configuration:**

```
interface fa0/0.1
 encapsulation dot1q 1
 ip address 192.168.1.14 255.255.255.248
interface fa0/0.10
 encapsulation dot1q 10
 ip address 192.168.1.78 255.255.255.224
interface fa0/0.20
 encapsulation dot1q 20
 ip address 192.168.1.130 255.255.255.192
```

The Certkiller network administrator is adding two new hosts to switch Certkiller A. Of the following choices, which values could be used for the configuration of these hosts? (Choose three.)

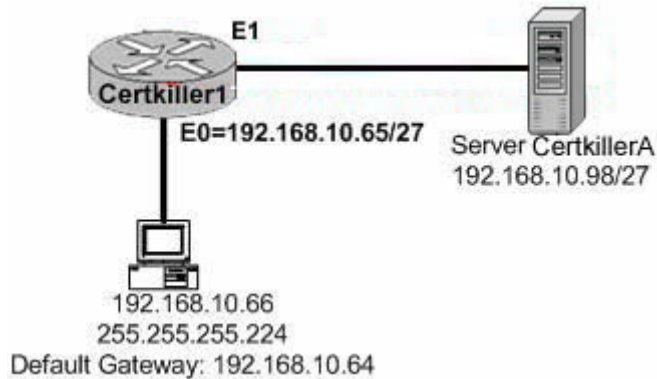
- A. Host Certkiller B IP Address: 192.168.1.128
- B. Host Certkiller A default gateway: 192.168.1.78
- C. Host Certkiller A IP Address: 192.168.1.64
- D. Host Certkiller B IP Address: 192.168.1.190
- E. Host Certkiller A IP address: 192.168.1.79
- F. Host Certkiller B default gateway: 192.168.1.129

Answer: B, D, E

---

**QUESTION 161:**

The new Certkiller location is displayed below:



A new PC is installed on the LAN of the Certkiller 1 router as shown above. This PC is unable to connect to the Certkiller A server located on the Ethernet 1 network.

What is the cause of this?

- A. IP address of the Ethernet 0 router interface is wrong
- B. Server is using an invalid IP address
- C. Workstation default gateway is set incorrectly
- D. Workstation subnet mask is incorrect
- E. Workstation IP address is invalid
- F. None of the above

Answer: C

Explanation:

The default gateway of the host (192.168.10.64) is wrong. 192.168.10.64 is the network address of the host's network in this question. The default gateway should be the address of the local interface of the router. In this case: 192.168.10.65.

Incorrect Answers:

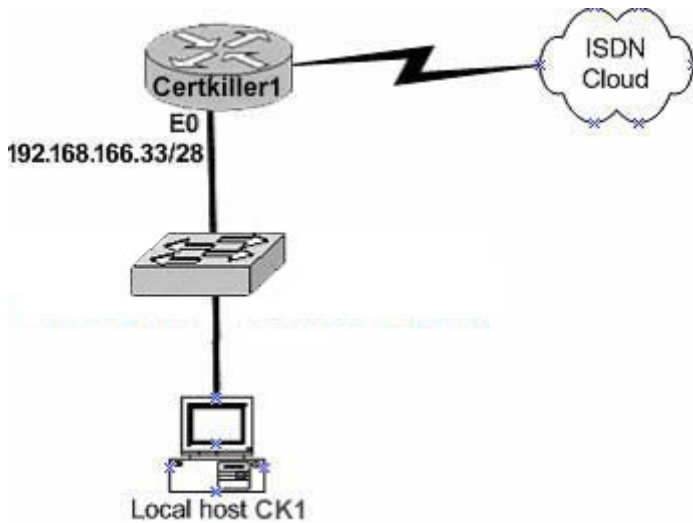
- A: The IP address of the Ethernet0 interface is valid.
- B: The IP address of the server is valid.
- D: The network uses a 27 bit subnet mask which equates to 255.255.255.224.
- E: The IP host address 192.168.10.66 is a valid host address on the subnet.

---

**QUESTION 162:**

A new LAN is being implemented on the Certkiller 1 network as shown below:





The local host CK1 can't access any of the resources on the other networks. The configuration of CK1 is as follows:

host address: .....192.168.166.45

subnet mask: .....255.255.255.240

default gateway: ..192.168.166.32

What is the underlying cause of this problem?

- A. The default gateway is a network address.
- B. The default gateway is on a different subnet address as the host.
- C. The IP address of the host is on a different subnet.
- D. The host subnet mask is incompatible to the subnet mask of the attached router interface.

Answer: A

Explanation:

The range of the subnet used in this question is 192.168.166.32 to 192.168.166.47.

192.168.166.32 is the network address and 192.168.166.47 is the broadcast. This leaves the usable host address range of 192.168.166.33 to 192.168.166.46.

The default gateway for the host should be 192.168.166.33.

Incorrect Answers:

B: The default gateway is on the same network but it is a network address.

C: The host address is correct.

D: The subnet mask 255.255.255.240 uses 28 bits and is therefore correct.

---

### **QUESTION 163:**

While troubleshooting a connectivity issue from a PC you obtain the following information:

Local PC IP address: 190.0.3.35/24

Default Gateway: 190.0.3.1

Remote Server: 190.0.5.250/24

You then conduct the following tests from the local PC:

Ping 127.0.0.1 - Unsuccessful

Ping 190.0.3.35 - Successful

Ping 190.0.3.1 - Unsuccessful

Ping 190.0.5.250 - Unsuccessful

What is the underlying cause of this problem?

- A. TCP/IP not correctly installed
- B. Local physical layer problem
- C. NIC not functioning
- D. Remote physical layer problem
- E. None of the above

Answer: A

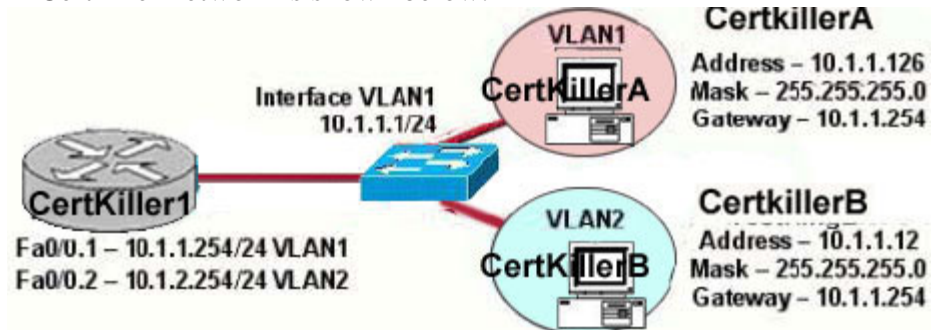
Explanation:

Every Windows based PC uses the 127.0.0.1 as the local loopback IP address. Every PC will respond to this local IP address if the TCP/IP stack is correctly installed and running on the machine. If you cannot ping the loopback address of 127.0.0.1, then something is wrong with the TCP/IP protocol stack.

---

#### QUESTION 164:

A Certkiller network is shown below:



The network shown in the exhibit above is experiencing connectivity problems.

Which of the following will correct the problems? (Select two)

- A. Configure the gateway on Certkiller A as 10.1.1.1.
- B. Configure the gateway on Certkiller B as 10.1.2.254.
- C. Configure the IP address of Certkiller A as 10.1.2.2.
- D. Configure the IP address of Certkiller B as 10.1.2.2.
- E. Configure the masks on both hosts to be 255.255.255.224.
- F. Configure the masks on both hosts to be 255.255.255.240.

Answer: B, D

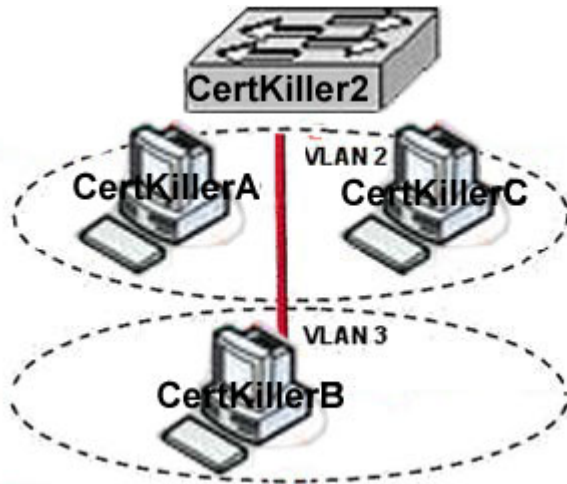
Explanation:

All devices must have their default gateways set to an IP address that is in the same IP network that the station is in. Based on the diagram above, Certkiller B is in VLAN2, so the default gateway for this device should be the IP address of the VLAN 2 interface on the router. In addition, the IP addresses of both devices reside within the same IP subnet. Since they belong to different VLANs, the best method to ensure proper connectivity would be to give Certkiller B an IP address within the same IP range as the VLAN that it belongs to, which is VLAN2 in this example.

---

**QUESTION 165:**

Part of the Certkiller LAN is shown below:



Based on the diagram shown above, which of the following IP addressing schemes could be used for this Certkiller LAN segment?

- A. Host Certkiller A - 192.168.10.22/24; Host Certkiller B - 192.168.11.23/24; Host Certkiller C - 192.168.10.23/24
- B. Host Certkiller A - 192.168.10.22/24; Host Certkiller B - 192.168.10.23/24; Host Certkiller C - 192.168.11.23/24
- C. Host Certkiller A - 192.168.10.22/24; Host Certkiller B - 192.168.10.23/24; Host Certkiller C - 192.168.10.24/24
- D. Host Certkiller A - 192.168.11.22/24; Host Certkiller B - 192.168.11.23/24; Host Certkiller C - 192.168.10.24/24
- E. None of the above

Answer: A

Explanation:

Hosts in the same VLAN must belong to the same IP subnet. In this case, hosts A and C should have IP addresses in one subnet, and host B should have an IP address in a separate subnet. Only choice A is correct.

Incorrect Answers:

B: In this case, hosts A and B are both in the 192.168.10.0/24 subnet, but they are in different VLANs

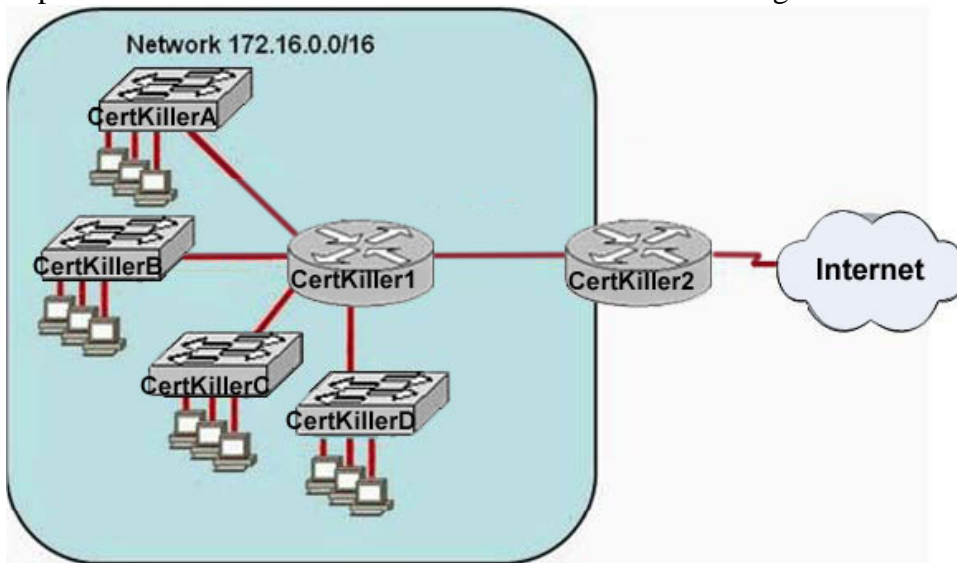
C: In this case, all three hosts are in the same 192.168.10.0/24 subnet, even though there are 2 different VLANs

D: Here hosts A and B are both in the 192.168.11.0/24 subnet even though they are in different VLANs.

---

**QUESTION 166:**

A portion of the Certkiller network is shown in the following exhibit:



You work as a network technician at Certkiller .com. Study the exhibit carefully. The Certkiller network administrator requires easy configuration options and minimal routing protocol traffic. What two options provide adequate routing table information for traffic that passes between the two routers and satisfy the requests of the network administrator? (Choose two)

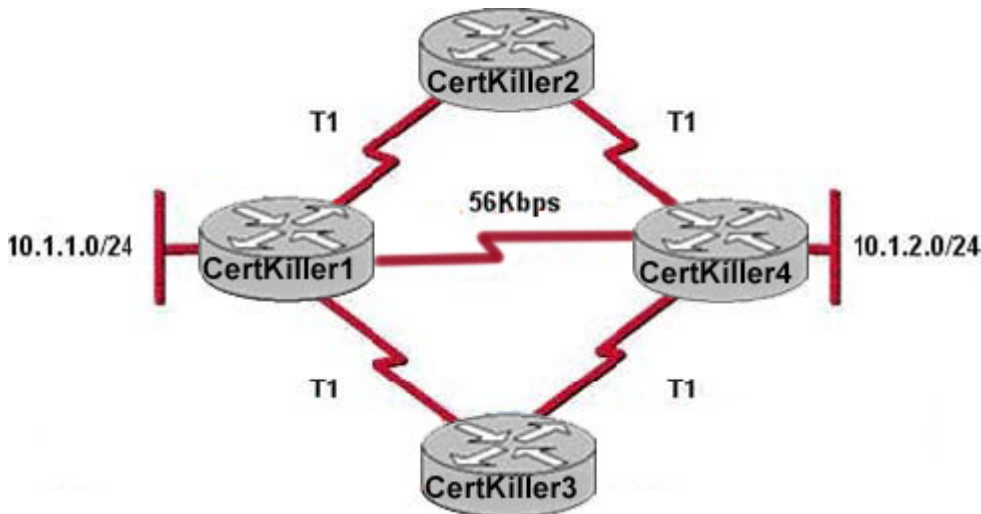
- A. A dynamic routing protocol on Certkiller 1 to advertise summarized routes to Certkiller 2
- B. A dynamic routing protocol Certkiller 2 to advertise summarized routes a Certkiller 1
- C. A static route on Certkiller 2 to direct traffic that is destined for 172.16.0.0/16 to Certkiller 1
- D. A dynamic routing protocol on Certkiller 2 to advertise all routes a Certkiller 1
- E. A dynamic routing protocol on Certkiller 1 to advertise all routes to Certkiller 2
- F. A static, default route on Certkiller 1 that directs traffic to Certkiller 2

Answer: C, F

---

**QUESTION 167:**

Four different Certkiller routers are connected together as shown below:



Based on the information shown above, how will router Certkiller 1 choose a path to the 10.1.2.0/24 network when different routing protocols are configured? (Choose three)

- A. If RIPv2 is the routing protocol, the equal cost paths Certkiller 1- Certkiller 2- Certkiller 4 and Certkiller 1- Certkiller 3- Certkiller 4 will be installed in the routing table by default
- B. If EIGRP is the routing protocol, only the path Certkiller 1- Certkiller 4 will be installed in the routing table by default
- C. If RIPv2 is the routing protocol, only the path Certkiller 1- Certkiller 4 will be installed in the routing table by default
- D. If EIGRP and OSPF are both running on the network, the EIGRP paths will be installed in the routing table
- E. If EIGRP and OSPF are both running on the network, the OSPF paths will be installed in the routing table
- F. If EIGRP is the routing protocol, the equal cost paths Certkiller 1- Certkiller 2- Certkiller 4 and Certkiller 1- Certkiller 3- Certkiller 4 will be installed in the routing table by default

Answer: C, D, F

Explanation:

Path selection criteria for RIP and RIPv2 is hop count so path CK1 - CK4 will be used because of 1 hop count. Choice C is correct.

EIGRP has lower administrative distance of 90 than OSPF 110 so EIGRP will be preferred. Choice D is correct.

EIGRP uses bandwidth for the path selection criteria and load balances by default for equal cost paths, making choice F correct.

---

### QUESTION 168:

When designing OSPF networks; what is the purpose of using a hierarchical design? (Select all choices that apply)

- A. To reduce the complexity of router configuration
- B. To speed up convergence
- C. To confine network instability to single areas of the network
- D. To reduce routing overhead
- E. To lower costs by replacing routers
- F. To decrease latency

Answer: B, C, D

Explanation:

An OSPF network designed in a hierarchical fashion with different areas is used because a small change in the topology of a single area won't force every router to run the SPF algorithm. Changes in one area are limited to that area only, not to every router within the entire network. Confining the topology changes to one area reduces the overhead and speeds the convergence of the network.

Reference: CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 194

Incorrect Answers:

- A. This choice is incorrect because a hierarchical design actually adds complexity to the router configuration.
- E. This is incorrect because a hierarchical design will not eliminate the need for routers. In fact, segmenting the network into multiple areas may actually require the use of additional routers.
- F. The use of a hierarchical design will in no way reduce the latency involved. If additional routers are implemented in order to segment the network into additional areas, then the latency involved may actually increase.

---

### **QUESTION 169:**

You are a network administrator and you need to implement a routing protocol on your network that provides:

- \* Scalability
  - \* VLSM support
  - \* Minimal overhead
  - \* Support for connecting networks using routers of multiple vendors
- Which of the following routing protocol would best serve your needs?

- A. VTP
- B. RIP version 1
- C. EIGRP
- D. OSPF
- E. IGRP
- F. CDP

Answer: D

Explanation:

Since one of the requirements is that the routing protocol must support other vendors, our only choices are RIP and OSPF. Since RIP version 1 does not support VLSM, OSPF is the only choice.

Incorrect Answers:

A. VTP is the VLAN Trunking Protocol. This is not a routing protocol.

B. RIP version one does not support VLSM. Note that RIPv2 does support VLSM, and would be a valid choice.

C, E: EIGRP and IGRP are Cisco proprietary routing protocols, and are not supported by other vendors.

F. CDP is the Cisco Discovery Protocol, which is used to exchange information between Cisco devices. It can only be used between Cisco routers and switches, and it is not a routing protocol.

---

**QUESTION 170:**

You need to configure a single router into load balancing traffic across 4 unequal cost paths. Which routing protocols can satisfy this requirement? (Select two)

- A. RIP v1
- B. RIP v2
- C. IGRP
- D. EIGRP
- E. OSPF
- F. IS-IS

Answer: C, D

Explanation:

In general, load balancing is the capability of a router to distribute traffic over all its network ports that are the same distance from the destination address. Load balancing increases the utilization of network segments, thus increasing effective network bandwidth. There are two types of load balancing: equal cost path and unequal cost path. Every routing protocol supports equal cost path load balancing. In addition to that, IGRP and EIGRP also support unequal cost path load balancing, which is known as variance. The variance command instructs the router to include routes with a metric less than n times the minimum metric route for that destination, where n is the number specified by the variance command. The variable n can take a value between 1 and 128, with the default being 1, which means equal cost load balancing (variance<n> for example. Traffic is also distributed proportionally among unequal cost links, with respect to the metric.

---

**QUESTION 171:**



You need to choose a routing protocol for a new Certkiller network. This network will be running IP, IPX, and Appletalk, and you wish to utilize only one routing protocol. Which one would be the best choice?

- A. OSPF
- B. EIGRP
- C. RIP v2
- D. IGRP
- E. RIP v1

Answer: B

Explanation:

Only EIGRP provides routing protocol support for IP, IPX, and Appletalk networks.

---

**QUESTION 172:**

Which of the routing protocols shown below support both VLSM and route summarization? (Select three)

- A. IGRP
- B. EIGRP
- C. RIP v1
- D. RIP v2
- E. OSPF
- F. VTP
- G. CDP

Answer: B, D, E

Explanation:

EIGRP and OSPF support Variable Length Subnet Masks (VLSM) and provide for both automatic and manual route summarization configurations. RIPv2 is an enhanced version of RIP, and overcame some of the limitations of RIP by introducing support for VLSM.

Incorrect Answers:

A, C: IGRP and RIP are relatively old and simplistic routing protocols that were developed before the concepts of VLSM and route summarization.

F. VTP is the VLAN Trunking Protocol, used in switched LAN environments to carry VLAN information. It is not a routing protocol.

G. CDP is the Cisco Discovery Protocol, used between neighboring Cisco devices to automatically discover information. It is not a routing protocol.

---

**QUESTION 173:**

Which of the following routing protocols support the use of VLSM (Variable Length Subnet Masking)? (Select three)

- A. RIPv1
- B. EIGRP
- C. OSPF
- D. IGRP
- E. RIPv2

Answer: B, C, E

Explanation:

Static routing, OSPF, IS-IS, EIGRP, BGP, and RIP version 2 all support VLSM.

Incorrect Answers:

A, D: RIPv1 and IGRP do not support VLSM.

Reference: Skybox CCNA Study Guide edition 4, Page 123

---

**QUESTION 174:**

Which of the following routing protocols do NOT support VLSM (variable length subnet masking)? (Choose all that apply).

- A. RIPv1
- B. IGRP
- C. EIGRP
- D. OSPF
- E. IS-IS
- F. RIPv2

Answer: A, B

Explanation:

RIP version 1 and IGRP are classful IP routing protocols. They do not support variable length subnet masks.

Incorrect Answers:

C, D, E, F. Static routing, OSPF, IS-IS, EIGRP, BGP, and RIP version 2 all support VLSM.

---

**QUESTION 175:**

You need to implement the use of a routing protocol that meets the following requirements:

1. Converges quickly
2. Supports VLSM, CIDR, IP, and IPX.
3. Uses minimal bandwidth for routing updates.

Which one of the following routing protocols would be the best choice?

- A. RIPv1

- B. RIPv2
- C. IGRP
- D. OSPF
- E. EIGRP

Answer: E

Explanation:

EIGRP would be the best choice as it provides support for VLSM and CIDR, has faster convergence times than other protocols, is scalable, and supports IP, IPX, and Appletalk. EIGRP is a Cisco proprietary routing protocol, so it will not work with other vendors. However, the requirements of the question made no mention of the use of non-Cisco routers, so it will not be an issue in this case.

Incorrect Answers:

A, C: Both of these routing protocols do not support VLSM.

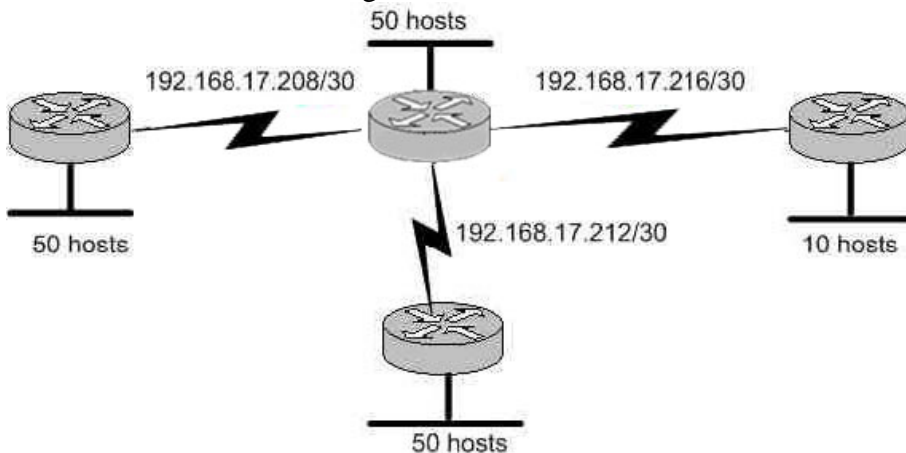
B. While RIPv2 supports VLSM, it provides no support for IPX. The IPX RIP protocol is similar in function to RIP version 1. Both versions of RIP also consume more bandwidth than EIGRP.

D. OSPF does not support IPX.

---

#### **QUESTION 176:**

See the Certkiller WAN diagram below:



Certkiller has four offices, each with its own network, as shown in the graphic. Three of the networks have approximately 50 hosts each, and one network has 10 hosts. The multi-vendor routers are connected by serial links that use separate subnetwork numbers. The Certkiller network has leased one Class C address to be used for all networks and serial links, and they do not wish to replace any of their existing routers.

Which routing protocol would be most appropriate for this scenario?

- A. TCP/IP
- B. RIP version 1
- C. RIP version 2

- D. IGRP
- E. EIGRP
- F. All of the above are acceptable

Answer: C

Explanation:

The question describes 2 important requirements. The first is the fact that a routing protocol that supports VLSM is needed, as specified by the fact that one class C address range is to be used for all networks. The second important requirement is that routers from multiple vendors are being used, so the routing protocol chosen must be non-proprietary. RIP version 2 is a standards based routing protocol that supports variable length subnet masking (VLSM). Note that OSPF would also be a viable choice, but it was not one of the answer choices.

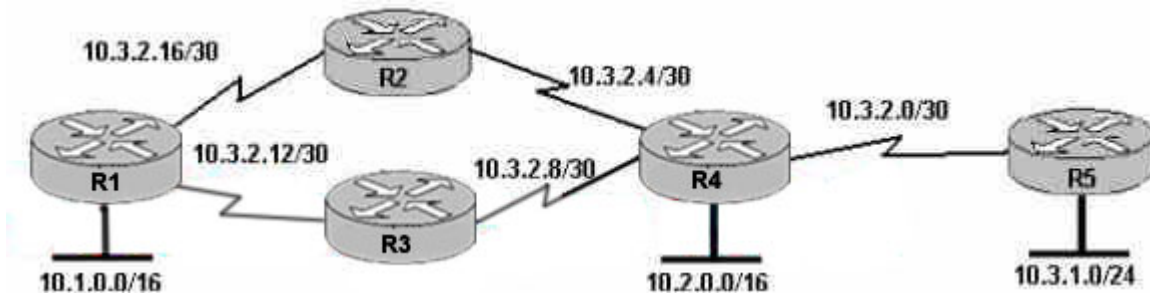
Incorrect Answers:

- A. This is not a routing protocol.
- B. RIP version 1 does not support VLSM
- D, E: Although these both support VLSM, IGRP and EIGRP are Cisco proprietary routing protocols which are not supported by other router vendors.

---

#### **QUESTION 177:**

The Certkiller WAN is displayed in the diagram below:



Based on the information shown above, which routing protocols can be used within the Certkiller network show in the diagram? (Choose three).

- A. RIP v1
- B. RIP v2
- C. IGRP
- D. OSPF
- E. BGP
- F. EIGRP

Answer: B, D, F

Explanation: the exhibit showed routers with Variable Length Subnet Mask (VLSM), and asked which 3 protocols can be used. 3 protocols that support VLSM are RIP v2, OSPF and EIGRP.

Incorrect Answers:

A, C: Both of these routing protocols do not support VLSM information.

E. BGP is used for external routing between different autonomous systems, and is not generally used within a single AS.

---

**QUESTION 178:**

The Certkiller Network consists of the following 5 IP networks:

NETWORK 1: 192.168.10.0/26

NETWORK 2: 192.168.10.64/27

NETWORK 3: 192.168.10.96/27

NETWORK 4: 192.168.10.128/30

NETWORK 5: 192.168.10.132/30

Which of the following routing protocols will support this IP addressing scheme?

(Choose all that apply).

A. RIP version 1

B. RIP version 2

C. IGRP

D. EIGRP

E. OSPF

F. BGP

Answer: B, D, E

Explanation:

Because this network is using IP subnets with variable length subnet masks, only routing protocols that support VLSM will fit this particular case. The routing protocols that support VLSM are RIP v2, EIGRP and OSPF.

Incorrect Answers:

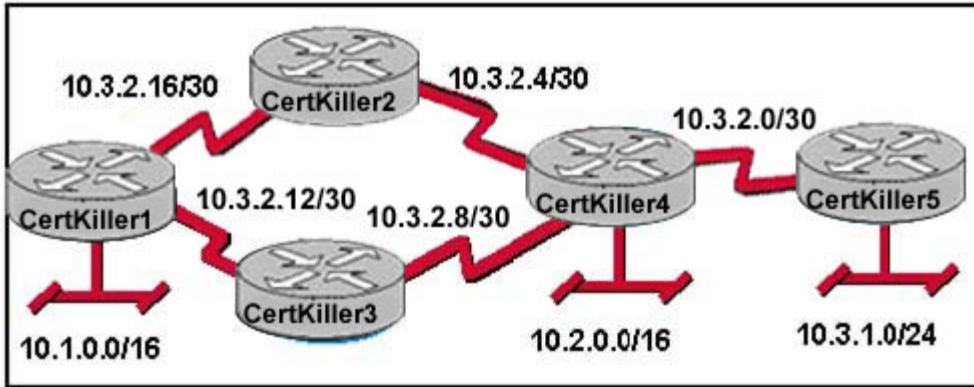
A, C: RIP version 1 and IGRP do not support VLSM information within the routing updates.

F. BGP is used for inter-AS routing, such as the Internet. It is not normally used as an Interior routing protocol.

---

**QUESTION 179:**

The Certkiller network is shown in the following exhibit:



Which routing protocols can be used within the Certkiller network shown in the diagram? (Choose three.)

- A. RIP v1
- B. RIP v2
- C. IGRP
- D. OSPF
- E. BGP
- F. EIGRP

Answer: B, D, F

Explanation:

In this network there are IP subnets which use variable length subnet masks. RIP V2, OSPF and EIGRP are the interior routing protocols that support VLSM.

### QUESTION 180:

Certkiller .com is merging with several local businesses that use routers from multiple vendors. Which routing protocol would work best to connect Certkiller .com with the enterprise networks it has acquired by providing scalability and VLSM support while minimizing network overhead?

- A. IGRP
- B. EIGRP
- C. OSPF
- D. RIP v2
- E. RIP v1

Answer: D

Explanation:

RIP (both version 1 and version 2) is standards based, providing inter-operability support between vendors. RIPv2 is an enhancement to the first version and contains the following enhancements:

1. Support for variable length subnet masks (VLSM) (Because of this, RIP doesn't assume that all networks are classful.)

2. Multicast routing updates

3. Authentication with an encrypted password for routing updates

Incorrect Answers:

A, B: IGRP and EIGRP are Cisco proprietary routing protocols that are not supported by other vendors.

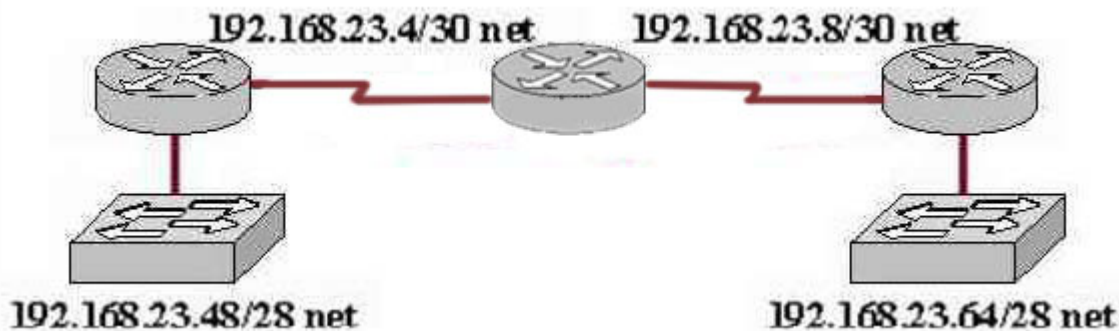
C: OSPF is a CPU-intensive protocol, and very large OSPF networks can experience routing and update traffic problems that seriously impact network performance. In addition, routers in large OSPF networks require large amounts of memory.

E: RIPv1 does not support VLSM.

---

**QUESTION 181:**

The Certkiller WAN is displayed in the diagram below:



Which dynamic routing protocol should be recommended for the Certkiller network shown in the graphic above? (Choose three)

- A. OSPF
- B. RIP version 1
- C. RIP version 2
- D. IGRP
- E. EIGRP

Answer: A, C, E

Explanation:

In this network, the 192.168.23.0/24 network is subnetted into two other networks.

Because this class C network is being subnetted, a routing protocol that supports variable length subnet mask information is required. OSPF, EIGRP, and RIP version 2 all support VLSM information to be shared across the network.

Incorrect Answers:

B, D. RIP version 1 and IGRP do not support VLSM, which will be required in order for this network to have the two LANs both be reachable.



**QUESTION 182:**

Router CK1 learns about a remote network from EIGRP, OSPF, and a static route. Assuming all routing protocols are using their default administrative distance, which route will CK1 use to forward data to the remote network?

- A. The router will use the static route.
- B. The router will use the OSPF route.
- C. The router will use the EIGRP route.
- D. The router will load balance and use all three routes.
- E. None of the above

Answer: A

Explanation:

When a router learns about the same network via multiple sources, the router will choose the source with the lowest administrative distance (AD). By default, the AD for these routing protocols are:

Connected Interface has 0 AD

Static Route : 1

EIGRP : 90

OSPF : 110

So, the static route will be chosen since it has the lowest AD.

---

**QUESTION 183:**

A Certkiller router learns two routes to a remote network, one route via OSPF and one route via RIPv2. The network administrator wants the router to install the route learned via RIPv2 into its routing table. What should the network administrator configure to ensure that the router will use the route learned via RIPv2?

- A. Nothing. The router will automatically use routes learned via RIP over routes learned via OSPF.
- B. The network administrator should configure the routers along the OSPF path with lower priority numbers.
- C. The network administrator should configure the router interface on the OSPF path to be a passive interface.
- D. The network administrator should configure an administrative distance for RIP that is lower than the administrative distance of OSPF.
- E. If two paths exist to a remote network, the only way to force the router to prefer one path over the other is to configure the preferred path as a static route.

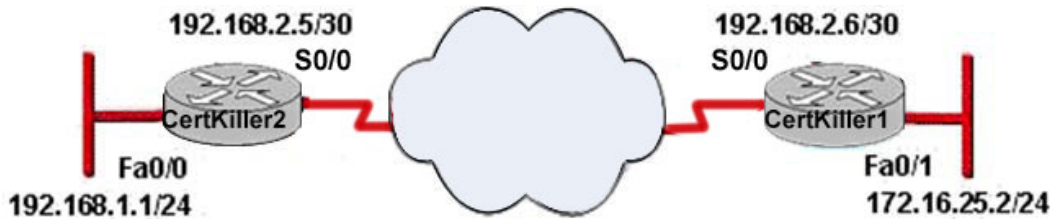
Answer: D

Explanation:

When multiple routing protocols are configured for the same networks, the router will use the path with the lowest Administrative Distance (AD). By default, OSPF has an AD of 110 and RIP has an AD of 120. In order to ensure that the router prefers the route learned via RIP over OSPF, the AD of the RIP route must be reduced to a value less than 120.

#### QUESTION 184:

Routers Certkiller 1 and Certkiller 2 are connected as shown below:



The Certkiller network associate has configured the internetwork that is shown above, but has failed to configure routing properly. Which configuration combinations will allow the hosts on the Certkiller 2 LAN to access resources on the Certkiller 1 LAN with the least impact on router processing and WAN bandwidth?

- A. Certkiller 1(config)# router ospf 1  
 Certkiller 1(config-router)# network 192.168.2.4 0.0.0.3 area 0  
 Certkiller 1(config-router)# network 172.16.25.0 0.0.0.255 area 0  
 Certkiller 2(config)# router ospf 1  
 Certkiller 2 (config-router)# network 192.168.1.0 0.0.0.255 area 0  
 Certkiller 2 (config-router)# network 192.168.2.4 0.0.0.3 area 0
- B. Certkiller 1(config)# router rip  
 Certkiller 1(config-router)# network 192.168.2.0  
 Certkiller 1(config-router)# network 172.16.0.0  
 Certkiller 2(config)# router rip  
 Certkiller 2 (config-router)# network 192.168.1.0  
 Certkiller 2 (config-router)# network 192.168.2.0
- C. Certkiller 1(config)# ip route 192.168.1.0 255.255.255.0 192.168.2.5  
 Certkiller 2(config)# ip route 172.16.25.0 255.255.255.0 192.168.2.6
- D. Certkiller 1(config)# router eigrp 56  
 Certkiller 1(config-router)# network 192.168.2.4  
 Certkiller 1(config-router)# network 172.16.25.0  
 Certkiller 2(config)# router eigrp 56  
 Certkiller 2 (config-router)# network 192.168.1.0  
 Certkiller 2 (config-router)# network 192.168.2.4

Answer: C

#### QUESTION 185:

You need to choose a routing protocol for use in the Certkiller network that meets

the following requirements:

- 1) routing update authentication
- 2) an addressign scheme that conserves IP addresses
- 3) multiple vendors
- 4) a network with over 50 routers

Which routing protocol fulfills these requirements?

- A. OSPF
- B. RIPv2
- C. RIPv1
- D. EIGRP
- E. None of the above

Answer: A

---

**QUESTION 186:**

You have been tasked with choosing a routing protocol that would best fit the needs of the Certkiller network. Which routing protocol uses bandwidth and delay as metrics, by default?

- A. EIGRP
- B. OSPF
- C. BGP
- D. RIPv1
- E. RIPv2
- F. None of the above

Answer: A

---

**QUESTION 187:**

Non-contiguous networks can pose a problem for network reachability in certain circumstances. Which of the following routing protocols have means of minimizing the risk? (Select three choices)

- A. RIP v1
- B. RIP v2
- C. EIGRP
- D. IGRP
- E. OSPF
- F. VLSM

Answer: B, C, E

Explanation:

OSPF, RIP version 2, and EIGRP all provide support for discontinuous networks. This is provided by the fact that subnet mask information is advertised along with the routes, and these protocols all support Variable Length Subnet Masks (VLSM).

Incorrect Answers:

A. Whenever RIP version 1 advertises a network across a different major net boundary, RIP summarizes the advertised network at the major net boundary. RIP version 2 is an updated version of RIP, and one of the main features that it was able to provide over RIPv1 is support for VLSM information.

D. IGRP does not support VLSM. Like RIP version 2, EIGRP is the updated version of IGRP, which provides support for VLSM.

F. VLSM is the feature that is required to support non-contiguous networks, but VLSM is not itself a routing protocol.

---

**QUESTION 188:**

Which of the following technologies can be used in distance vector routing protocols to prevent routing loops? (Select two)

- A. Spanning Tree Protocol
- B. Shortest path first tree
- C. Link-state advertisements (LSA)
- D. Hold-down timers
- E. Split horizon
- F. VRRP

Answer: D, E

Explanation:

In order to prevent information from looping throughout a network, distance vector protocols, such as RIP version 2, use the following mechanisms:

\* Split horizon - the routing protocol advertises routes out an interface only if they were not learned from updates entering that interface.

\* Hold-down timer - After finding out that a router to a subnet has failed, a router waits a certain period of time before believing any other routing information about that subnet. In addition to these, a finite number of hops are also used. This ensures that packets do not loop through a network indefinitely.

Reference: CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 154.

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**QUESTION 189:**

Which of the following routing protocols are less likely prone to problems in non contiguous networks? (Select all valid responses)

- A. IGRP

- B. ICMP
- C. OSPF
- D. RIP v1
- E. RIP v2
- F. EIGRP

Answer: C, E, F

Explanation:

OSPF, RIP v2, and EIGRP all support VLSM information, which will eliminate the problems that can arise from non contiguous networks.

Incorrect Answers:

A, D. IGRP and RIP version 1 are distance vector routing protocols that do not support VLSM information, so they are prone to problems that can arise from discontinuous network schemes.

B. ICMP (Internet Control Message Protocol) is not a routing protocol. It is used primarily for the management and monitoring of networks.

---

**QUESTION 190:**

Which of the following statements describe the characteristic of link state routing protocols? (Choose all that apply.)

- A. The exchange of an advertisement is triggered by a change in the network.
- B. All routers exchange routing tables with each other in a multipoint network.
- C. Packets are routed based upon the shortest path to the destination.
- D. Paths are chosen depending on the cost efficiency factor.
- E. Every router in an OSPF area is capable of representing the entire network topology.
- F. Only the designated router in an OSPF area can represent the entire network topology.

Answer: A, C, E

Explanation:

The predominant link state routing protocols are OSPF and IS-IS. The following describes the features and functionality of OSPF:

Open Shortest Path First

- \* Each router discovers its neighbors on each interface. The list of neighbors is kept in a neighbor table.
- \* Each router uses a reliable protocol to exchange topology information with its neighbors.
- \* Each router places the learned topology information into its topology database.
- \* Each router runs the SPF algorithm against its own topology database.
- \* Each router runs the SPF algorithm against its own topology database to calculate the best routes to each subnet in the database.
- \* Each router places the best route to each subnet into the IP routing table.

The following list points out some of the key features of OSPF:

- \* Converges very quickly - from the point of recognizing a failure, it often can converge in less than 10 seconds.
- \* Supports VLSM.
- \* Uses short Hello messages on a short regular interval, with the absence of hello messages indicating that a neighbor is no longer reachable.
- \* Sends partial updates when link status changes and floods full updates every 30 minutes. The flooding, however, does not happen all at once, so the overhead is minimal.
- \* Uses cost for the metric.

Reference: CCNA Self-Study CCNA INTRO exam certification Guide (Cisco Press, ISBN 1-58720-094-5) Page 417

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### **QUESTION 191:**

What are the different characteristics of distance vector and link state routing protocols?

- A. Distance vector protocols send the entire routing table to directly connected neighbors.
- B. Distance vector protocols are responsible for sending updates to all networks listed in the routing table.
- C. Link state protocols are responsible for sending the entire routing table to the whole network.
- D. Link state protocols send updates regarding their own links status to all other routers on the network.
- E. None of the above

Answer: A, D

Explanation:

Distance Vector Protocols:

Distance Vector Protocols advertise routing information by sending messages, called routing updates, out the interfaces on a router. These updates contain a series of entries, with each entry representing a subnet and a metric.

Link-State Protocols:

Sends partial updates when link status changes and floods full updates every 30 minutes. The flooding, however, does not happen all at once, so the overhead is minimal.

Reference: CCNA Self-Study CCNA INTRO exam certification Guide (Cisco Press, ISBN 1-58720-094-5) Page 413 + 419

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### **QUESTION 192:**

Which one of the following statements best explains the split horizon rule used in distance vector routing protocols?

- A. Only routers can split boundaries (horizons) between concentric networks.

- B. Each AS must keep routing tables converged to prevent dead routes from being advertised across boundaries.
- C. Networks can only remain fully converged if all information is sent out all active interfaces.
- D. Information about a route should not be sent back in the direction from which the original update came.
- E. Distance vector protocols need fall back routers that are responsible for momentary loops.

Answer: D

Explanation:

Simply said, the rule of split horizons says that routing information should not be sent out the same interface that it was learned on. This is used to prevent routing loops in the network, but it can also cause problems on NBMA networks, such as a hub and spoke frame relay network. Split horizons include two related concepts that affect what routes are included in a routing update:

An update does not include the subnet of the interface out which the update is sent

All routes with outgoing interface of interface x are not included in updates sent out that same interface x.

Incorrect Answers

- A. There is no such requirement
- C. This is not a feature of split horizon
- B. This is not a related feature for split horizon
- E. Distance vector protocols updates routing table at regular intervals instead of Topology changes

Reference: Wendell Odom. CISCO CCNA Certification Guide (2000 Cisco Press) Page 369.

---

### **QUESTION 193:**

Which of the following statements are correct in regard to classless routing protocols? (Select two)

- A. Discontiguous subnets are not allowed.
- B. Variable length subnet masks are allowed.
- C. RIP v1 is a classless routing protocol.
- D. IGRP supports classless routing within the same autonomous system.
- E. RIP v2 supports classless routing.

Answer: B, E

Explanation:

Classless and Classful Routing Protocols

Some routing protocols must consider the Class A, B, or C network number that a subnet



resides in when performing some of its tasks. Other routing protocols can ignore Class A, B, and C rules altogether. Routing protocols that must consider class rules are called classful routing protocols; those that do not need to consider class rules are called classless routing protocols.

You can easily remember which routing protocols fall into each category because of one fact:

Classful routing protocols do not transmit the mask information along with the subnet number, whereas classless routing protocols do transmit mask information.

You might recall that routing protocols that support VLSM do so because they send mask information along with the routing information. Table 7-3 lists the routing protocols and whether they transmit mask information, support VLSM, and are classless or classful.

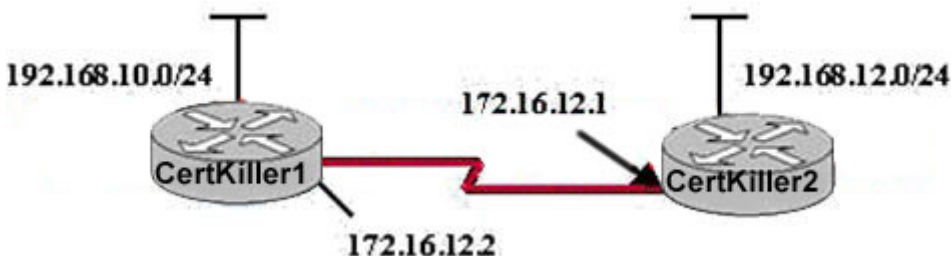
Table 7-3 Interior IP Routing Protocol: Classless or Classful?

Routing Protocol	Classless	Sends Mask/Prefix in Routing Updates	VLSM Support	Route Summarization Support
RIP-1	No	Yes	No	No
IGRP	No	No	No	No
RIP-2	Yes	Yes	Yes	Yes
EIGRP	Yes	Yes	Yes	Yes
OSPF	Yes	Yes	Yes	Yes

Reference: CCNA ICND Exam Certification Guide by Wendell Odem, Pg.233

#### QUESTION 194:

Part of the Certkiller network is shown below:



Study the exhibit shown above carefully. In this Certkiller network segment, you add the following command to the Certkiller 1 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. Traffic for network 172.16.12.0 is forwarded to the 192.168.12.0 network
- B. The command establishes a static route
- C. Traffic for all networks is forwarded to 172.16.12.1
- D. The command invokes a dynamic routing protocol for 192.168.12.0
- E. Traffic for network 192.168.12.0 is forwarded to 172.16.12.1
- F. This route is automatically propagated throughout the entire network

Answer: B, E

Explanation:

To create static routes on a Cisco router, you use the ip route command followed by the destination network, network mask, and either the next-hop IP address or the local exit interface. It's vital to keep that last part in mind - you're either configuring the IP address of the downstream router, or the interface on the local router that will serve as the exit interface.

Let's say your local router has a serial0 interface with an IP address of 200.1.1.1/30, and the downstream router that will be the next hop will receive packets on its serial1 interface with an IP address of 200.1.1.2/30. The static route will be for packets destined for the 172.10.1.0 network. Either of the following ip route statements would be correct.

R1(config)#ip route 172.10.1.0 255.255.255.0 200.1.1.2 (next-hop IP address)

OR

R1(config)#ip route 172.10.1.0 255.255.255.0 serial0 ( local exit interface)

---

### **QUESTION 195:**

Certkiller is using a link-state routing protocol within their network. What are two drawbacks of implementing a link-state routing protocols? (Select two)

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

Answer: C, D

Explanation:

The main drawbacks to Link State protocols are the amount of CPU overhead involved in calculating route changes and memory resources that are required to store neighbor tables, route tables, and a complete topology map.

In addition to being resource intensive, link state routing protocols are hierarchical by design using the concepts of areas in OSPF or levels in IS-IS, so a hierarchical IP addressing scheme is needed for optimal routing functionality.

---

### **QUESTION 196:**

Exhibit:

**CertKiller2#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	192.168.12.133	YES	manual	up	up

**CertKiller2#**

You work as a network technician at Certkiller .com. Study the exhibit carefully. A network associate has configured OSPF with the command:

Certkiller 2(Config-router)#network 192.168.12.64 0.0.0.63 area 0

After completing the configuration, the associate discovers that not all 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.)

- A. Serial0/1.103
- B. FastEthernet 0/1
- C. Serial0/1.102
- D. Serial0/0
- E. FastEthernet 0/0

Answer: B, C, D

Explanation:

OSPF uses the concept of wildcard masks much like access list filters. OSPF network matches are done using the network number and wildcard bits. The network number is the network portion of the IP address, with the host bits all set to zero. The wildcard bits determine which portion of the address the access list will act on. Only bits set to zero are acted upon (bits set to one are ignored.) This is the exact opposite of a netmask.

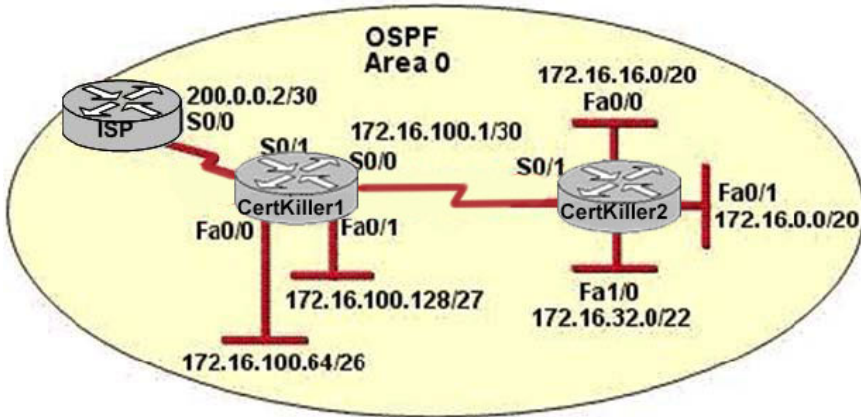
Remember that this number is in bits, and you will always have all zeros to the left of the first one, and all ones to the right of the last zero. The table below shows some examples of net masks and wildcard bits.

Type of network	Netmask	Wildcard Bits
Class A	255.0.0.0	0.255.255.255
Class B	255.255.0.0	0.0.255.255
Class C	255.255.255.0	0.0.0.255
Class C 2-bit subnet	255.255.255.192	0.0.0.63
Class B 4-bit subnet	255.255.240.0	0.0.31.255

In this example, the 192.168.12.64 0.0.0.63 will comprise of all interfaces with an IP address in the 192.168.12.64-127 range.

### QUESTION 197:

Part of the Certkiller OSPF network is shown below:



Configuration exhibit:

#### CertKiller1 Routing Commands:

```
ip route 0.0.0.0 0.0.0.0 serial0/0
router ospf 1
network 172.16.100.0 0.0.0.3 area 0
network 172.16.100.64 0.0.0.63 area 0
network 172.16.100.128.0.0.0.31 area 0
default-information originate
```

You work as a network technician at Certkiller .com. Study the exhibits carefully. Assume that all router interfaces are operational and correctly configured. In addition, assume that OSPF has been correctly configured on Router Certkiller 2. How will the default route configured on Certkiller 1 affect the operation of Certkiller 2?

- A. Any Packet destined for a network that is not referenced in the routing table of Router Certkiller 2 will be directed to Certkiller 1. Certkiller 1 will then send that packet back to Certkiller 2 and a routing loop will occur
- B. Any packet destined for a network that is not directly connected to router Certkiller 1 will be dropped
- C. The networks directly connected to router Certkiller 2 will not be able to communicate with the 172.16.100.0, 172.16.100.128 and 172.16.100.64 subnetworks
- D. Any packet destined for a network that is not directly connected to Router Certkiller 2 will be dropped immediately because of the lack of a gateway on Certkiller 1
- E. Any packet destined for a network that is not directly connected to router Certkiller 2 will be dropped immediately
- F. None of the above

Answer: A

---

**QUESTION 198:**

Certkiller 1 is a Backup Designated Router on the Certkiller OSPF network. On which types of network will OSPF elect a BDR?

- A. Nonbroadcast and broadcast multi-access
- B. Point-To-Multipoint and multi-access
- C. Point-To-Point and Point-To-multipoint
- D. Point-To-Point and multi-access
- E. NonBroadcast and Broadcast multipoint
- F. None of the above

Answer: A

Explanation:

DR and BDR are elected on broadcast and nonbroadcast multi-access networks.

Reference: Sybex CCNA Study Guide 4th Edition (Page 283)

---

**QUESTION 199:**

The OSPF interface status of two Certkiller devices is shown below:

**CertKiller1**

```
Ethernet0 is up, line protocol is up
Internet address 192.168.1.2/24, Area 0
Process ID 1, Router ID 192.168.31.33, Network Type BROADCAST, Cost: 10
Transmit Delay is 1 sec, State DR, Priority 1
Designated Router (ID) 192.168.31.33, Interface address 192.168.1.2
No backup designated router on this network
Timer intervals configured, Hello 5 Dead 20, Wait 20, Retransmit 5
```

**CertKiller2**

```
Ethernet0 is up, line protocol is up
Internet address 192.168.1.1/24, Area 0
Process ID 2, Router ID 192.168.31.11, Network Type BROADCAST, Cost: 10
Transmit Delay is 1 sec, State DR, Priority 1
Designated Router (ID) 192.168.31.11, Interface address 192.168.1.1
No backup designated router on this network
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
```

You work as a network technician at Certkiller and are responsible for the OSPF network. You are troubleshooting the OSPF configuration of routers Certkiller 1 and Certkiller 2. The routers can't establish an adjacency relationship on their common Ethernet link. The graphic shows the output of the "show ip ospf interface eth0" command for routers Certkiller 1 and Certkiller 2. Based on the information in the graphic, what is the cause of this problem?

- A. The priority on Certkiller 1 should be set higher
- B. A backup designated router needs to be added to the network
- C. The cost on Certkiller 1 should be set higher

- D. The OSPF area is not configured properly
- E. The hello and dead timers are not configured properly
- F. The OSPF process ID numbers must match
- G. None of the above

Answer: E

Explanation:

As can be seen above, the hello interval for CK1 has been set to 5 seconds, while it is set to 10 for CK2 . Also, the dead interval on CK1 is set at 20 seconds while on router CK2 it is set to 40 seconds. In order for two routers to establish an OSPF neigh adjacency, the hello and dead timers must match.

---

**QUESTION 200:**

Which of the following OSPF commands, when used together, will put the network 192.168.10.0/24 into OSPF area 0? (Select all valid responses)

- A. Router(config-router)# network 192.168.10.0 0.0.0.255 0
- B. Router(config-router)# network 192.168.10.0 0.0.0.255 area 0
- C. Router(config-router)# network 192.168.10.0 255.255.255.0 area 0
- D. Router(config)# router ospf 0
- E. Router(config)# router ospf 1

Answer: B, E

Explanation:

B. The network command specifies the IP address (192.168.10.0) followed by the wildcard mask (not the subnet mask), and the area that is to be associated with the OSPF address range (in this case, area 0). The wildcard mask indicates in binary how much of the IP address must be matched with 0s indicating that the bits must match and 1 indicating that they may vary. Thus 0.0.0.255 or 00000000.00000000.00000000.11111111 indicates that any bit in the last octet can vary while all bits in the first 3 octets must match the network address (in other words, 192.168.10.xx)

E. The router ospf command enables OSPF routing and enters router configuration mode. This command takes a <process-id> argument which identifies the OSPF process.

Incorrect Answers:

- A. This command is correct, except for the fact that the keyword "area" is missing and needs to be inserted.
- C. For OSPF, the inverse mask must be used, not the regular subnet mask.
- D. OSPF can not use process ID 0, and the goal of this question is to put a specific network in area 0, not the entire routing process.



**QUESTION 201:**

Under which circumstance, i.e. network type, would an OSPF router establish a neighbor adjacency, even though the DR/BDR election process was not performed?

- A. Point-to-point
- B. Broadcast multicast
- C. Nonbroadcast multicast
- D. Backbone area 0
- E. Virtual Link

Answer: A

Explanation: If there's a point to point connection, there's no need for a designated router or a backup designated router election. By definition, only two routers exist on a point to point connection.

Incorrect Answers:

- B, C. In these network types, the potential for more than two routers on the segment exist, so the Designated Router and Backup Designated Routers are elected.
- D. This is not a network type. Area 0 is the backbone of any OSPF network.
- E. Virtual Links are used in OSPF to link an area to area 0. Every area must be directly connected to area 0 at some point, and virtual links are used for areas that do not meet this requirement.

---

**QUESTION 202:**

On the assumption that every OSPF router in a particular area is configured with the same priority value; which secondary value would be used as a router ID when there is no loopback interface set?

- A. The IP address of the first Fast Ethernet interface.
- B. The IP address of the console management interface.
- C. The highest IP address among its active interfaces.
- D. The lowest IP address among its active interfaces.
- E. There will be no router ID until a loopback interface is configured.

Answer: C

Explanation: Ordinarily the loopback interface would be selected as the router ID. In the event that no loopback interface is configured, the router ID will be the first active interface that comes up on the router. If that particular interface has more than one IP address, then the highest address will be selected as the Router ID.

Incorrect Answers:

- B. Putting an IP address on the management console is a concept that is configured on a Catalyst switch, not a router.



**QUESTION 203:**

On the topic of OSPF routing; which of the following are the traits of an OSPF area? (Select all that apply)

- A. Each OSPF area requires a loopback interface to be configured.
- B. Areas may be assigned any number from 0 to 65535.
- C. Area 0 is called the backbone area.
- D. Hierarchical OSPF networks do not require multiple areas.
- E. Multiple OSPF areas must connect to area 0.
- F. Single area OSPF networks must be configured in area 1.
- G. None of the above

Answer: C, E

Explanation:

OSPF uses areas in a hierarchical fashion, and the backbone area is always area 0. All other areas have at least one connection to area 0.

Incorrect Answers:

- A. Loopback interfaces are often used in OSPF networks, so that the router ID can be configured. However, this is not a requirement.
- B. The area-id can be an integer between 0 and 4294967295.
- F. Single area OSPF networks do not have to be configured with the backbone area 0. Although area 1 can indeed be used, it is not required that area 1 is used. Single area OSPF networks can be any integer from 0-4294967295.

---

**QUESTION 204:**

If the bandwidth of an OSPF interface on a Certkiller router is configured with the "bandwidth 64" command, what would be the calculated cost of the link?

- A. 1
- B. 64
- C. 1562
- D. 64000
- E. 1500
- F. None of the above

Answer: C

Explanation: The question states that OSPF interface has been configured with the bandwidth 64 command. Cisco IOS always interprets the values for the bandwidth command as being in kbps, so the bandwidth is configured as 64 kbps. The metric for any OSPF defaults to 100,000,000/bandwidth. So, in this example:

$100,000,000 / 64000 = 1562.5$

Reference: Sybex CCNA Study Guide edition 4, page 284.

---

**QUESTION 205:**

Certkiller is using OSPF as the routing protocol in their network. What are some of the characteristics of this routing protocol? (Select all valid answer choices)

- A. It confines network instability to a single area of network.
- B. It increases the routing overhead of the network
- C. It supports VLSM
- D. It routes between Autonomous Systems.
- E. It allows extensive control of routing updates
- F. None of the above

Answer: A, C, E

Explanation:

The following describes some of the features and functionality of the OSPF protocol:

Open Shortest Path First

- \* Each router discovers its neighbors on each interface. The list of neighbors is kept in a neighbor table.
- \* Each router uses a reliable protocol to exchange topology information with its neighbors.
- \* Each router places the learned topology information into its topology database.
- \* Each router runs the SPF algorithm against its own topology database.
- \* Each router runs the SPF algorithm against its own topology database to calculate the best routes to each subnet in the database.
- \* Each router places the best route to each subnet into the IP routing table.

The following list points out some of the key features of OSPF:

- \* Converges very quickly - from the point of recognizing a failure, it often can converge in less than 10 seconds.
- \* Supports VLSM.
- \* Uses short Hello messages on a short regular interval, with the absence of hello messages indicating that a neighbor is no longer reachable.
- \* Sends partial updates when link status changes and floods full updates every 30 minutes. The flooding, however, does not happen all at once, so the overhead is minimal.
- \* Uses cost for the metric.

Incorrect Answers:

- B. This is incorrect because the hierarchical design characteristics of OSPF actually reduce the overhead on larger networks.
  - D. This is not true as OSPF doesn't route between Autonomous Systems. OSPF is an IGP. Routing between autonomous systems is reserved for EGP protocols such as BGP.
-

**QUESTION 206:**

Which of the following are true statements regarding the characteristics of OSPF areas? (Select all that apply)

- A. All OSPF networks require the use of multiple areas
- B. Multiple OSPF areas must connect to area 0
- C. Single area OSPF networks must be configured in area 1
- D. Areas can be assigned any number from 0 to 63535
- E. Area 0 is called the backbone area
- F. Each OSPF area need to be configured with a loopback interface

Answer: B, E

Explanation:

OSPF divides its routing domain into areas. Area 0, the backbone, is required. This divides interior routing into two levels. If traffic must travel between two areas, the packets are first routed to the backbone. This may cause non-optimal routes, since interarea routing is not done until the packet reaches the backbone. Once there, it is routed to the destination area, which is then responsible for final delivery. This layering permits addresses to be consolidated by area, reducing the size of the link state databases. All areas must be connected to area 0, either directly or through the use of virtual links.

Incorrect Answers:

- A. OSPF network can only consist of a single area.
- C. Single area networks can use any area number. If more than one area is configured in the network, then at least one of the areas must be area 0.
- D. The area-id can be an integer between 0 and 4294967295.
- F. While loopback interfaces are commonly used in OSPF networks, it is not a requirement.

---

**QUESTION 207:**

On what kinds of networks does the OSPF protocol elect a backup designated router? (Select all that apply)

- A. Point-to-point
- B. Point to multipoint
- C. Broadcast
- D. Non-broadcast multi-access
- E. None of the above

Answer: C, D

Explanation:

The DR and BDR election process is performed on broadcast and non-broadcast

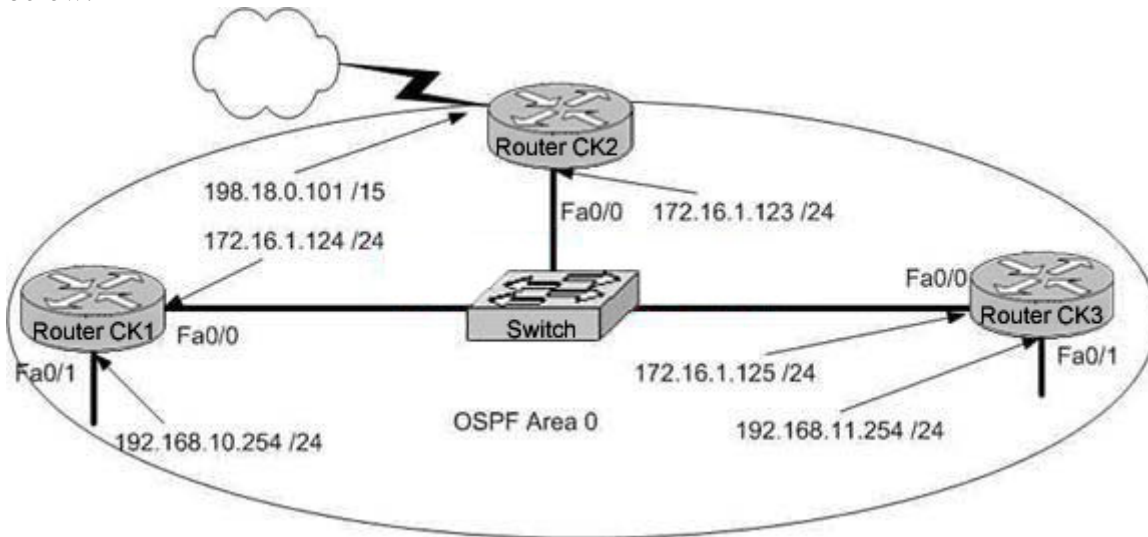
multi-access networks.

Incorrect Answers:

A, B: There is no DR or BDR on point to point and point to multipoint links. On a point to point link, only two routers exist so there is no need for a DR or BDR.

### QUESTION 208:

Three Certkiller routers are configured for OSPF area 0 as shown in the diagram below:



You wish to ensure that router CK2 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 all that apply)

- A. Configure the priority value of the Fa0/0 interface of Router CK2 to a higher value than any other interface on the Ethernet network.
- B. Change the router id for Router CK2 by assigning the IP address 172.16.1.130/24 to the Fa0/0 interface of Router CK2 .
- C. Configure a loopback interface on Router CK2 with an IP address higher than any IP address on the other routers.
- D. Change the priority value of the Fa0/0 interface of Router CK2 to zero.
- E. Change the priority values of the Fa0/0 interfaces of Router CK1 and Router CK3 to zero.
- F. No further configuration is necessary.
- G. All of the above will make CK2 the DR

Answer: A, C, E

Explanation:

In order to ensure that a router will become the OSPF DR for any given segment, there are a number of options. One way is to manually configure the interface priority as described in option A above using the "ip ospf priority" interface configuration

command. The second method is described in option C. OSPF routers will always use the loopback interface IP address as the router ID, when configured, and the router with the highest IP address will be chosen as the DR when the priorities are the same. The final method is to change the priority of the other routers in the segment to zero. When the OSPF priority is set to 0, the router is ineligible to become the DR or the BDR. Important Note: The OSPF DR/BDR election process is not pre-emptive, so any changes to the network regarding the DR/BDR election process will only occur when the routers are restarted.

Incorrect Answers:

B. This method will not work as the router ID is taken by using the highest IP address of all interfaces in the router, or from the loopback interface if it is configured. Although choosing this option will give router CK2 the highest IP address on the LAN segment, the router ID will be taken from the highest IP address in the router, which as shown will be 192.168.0.101.

D. This will make CK2 ineligible to become either the DR or the BDR.

---

**QUESTION 209:**

Certkiller uses OSPF in their WAN. The OSPF Hello protocol performs which of the following tasks in this network? (Choose two)

- A. It maintains neighbor relationships.
- B. It broadcasts hello packets throughout the internetwork to discover all routers that are running OSPF.
- C. It uses timers to elect the router with the fastest links as the designated router.
- D. It negotiates correctness parameters between neighboring interfaces.
- E. It detects unreachable neighbors in 90 second intervals.
- F. It provides dynamic neighbor discovery.
- G. It is only used once when the router boots up

Answer: A, F

---

**QUESTION 210:**

CK1 and CK2 are OSPF routers on a point-point link. On this point-to-point network, OSPF hello packets are addressed to which address?

- A. 192.168.0.5
- B. 254.255.255.255
- C. 223.0.0.1
- D. 172.16.0.1
- E. 224.0.0.5
- F. 127.0.0.1
- G. None of the above

Answer: E

Explanation:

The multicast IP address 224.0.0.5 is known as 'AllSPFRouters.' All routers running OSPF should be prepared to receive packets sent to this address since hello packets are always sent to this destination. Also, certain OSPF protocol packets are sent to this address during the flooding procedure.

Incorrect Answers:

A. This is the IP address reserved for the internal loopback on PC hosts. All windows based PC's will use this internal IP address, assuming that the TCP/IP stack is correctly installed.

B, D. These addresses are part of the range of addresses reserved for internal use, as defined in RFC 1918.

---

### **QUESTION 211:**

Which of the following statements below best describe the process identifier that is used to run OSPF on a Certkiller router? (Choose two)

- A. It is an optional parameter required only if multiple OSPF processes are running on the router.
- B. It is locally significant.
- C. It is needed to identify a unique instance of an OSPF database.
- D. All routers in the same OSPF area must have the same process ID if they are to exchange routing information.
- E. It is globally significant.
- F. It is shared among all OSPF routers

Answer: B, C

Explanation:

The OSPF process ID is locally significant, and is only used by the local router to discriminate between multiple OSPF processes. In any given OSPF network, the process ID's do not need to match between neighboring routers. This is in contrast to other routing protocols, such as EIGRP.

Additional info:

```
router ospf process-id  
no router ospf process-id  
process-id
```

Internally used identification parameter for an OSPF routing process. It is locally assigned and can be any positive integer. A unique value is assigned for each OSPF routing process.

Reference:

[http://www.cisco.com/en/US/products/sw/iosswrel/ps1826/products\\_command\\_summary\\_chapter09186a00800d](http://www.cisco.com/en/US/products/sw/iosswrel/ps1826/products_command_summary_chapter09186a00800d)

---

**QUESTION 212:**

The interface information for router Certkiller 3 is displayed below:

CertKiller3 # show ip interface brief					
Interface	IP Address	OK?	Method	Status	Protocol
Ethernet0	190.172.32.10	YES	NVRAM	up	up
Loopback0	208.149.23.162	YES	NVRAM	up	up
Loopback1	208.149.23.194	YES	NVRAM	up	up
Serial0	220.173.149.10	YES	manual	down	down
Serial1	unassigned	YES	NVRAM	administratively down	down

Router Certkiller 3 was just successfully rebooted. Based on the information shown above, correctly identify the current OSPF router ID for Router Certkiller 3.

- A. 220.173.149.10
- B. 208.149.23.194
- C. 208.149.23.162
- D. 190.172.32.10
- E. None of the above

Answer: B

**QUESTION 213:**

The interface status for router Certkiller 3 is as follows:

CertKiller3 #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	192.168.12.132	YES	manual	up	up	

CertKiller3#

Prior to the command shown above, you had configured OSPF with the command:

Certkiller 3(config-router)# network 192.168.12.64 0.0.0.63 area 0

After completing the configuration, you now discover that not all the interfaces are participating in OSPF. Based on the information shown above, which three of the interfaces will participate in OSPF according to this configuration statement?

(Choose three)

- A. Serial0/1.104
- B. Serial0/1.102
- C. Serial0/0
- D. Serial0/1.103



- E. FastEthernet0 /1
- F. FastEthernet0 /0

Answer: B, C, E

---

**QUESTION 214:**

Which one of the following privileged EXEC mode IOS show commands will display the state of the OSPF DR/BDR (designated router / backup designated router) election process?

- A. CK1 # show ip ospf interface
- B. CK1 # show ip ospf priority
- C. CK1 # show ospf neighbor detail
- D. CK1 # show ospf processes
- E. CK1 # show ospf neighbor state
- F. None of the above

Answer: A

Explanation:

This command will display the router ID of both the DR and the BDR on the network segment that the particular interface is connected to.

Example:

```
Router1#show ip ospf interface ethernet 0
Ethernet0 is up, line protocol is up
Internet Address 10.10.10.1/24, Area 0
Process ID 1, Router ID 192.168.45.1, Network Type BROADCAST, Cost: 10
Transmit Delay is 1 sec, State BDR, Priority 1
Designated Router (ID) 172.16.10.1, Interface address 10.10.10.1
Backup Designated router (ID) 192.168.45.1, Interface address 10.10.10.1
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
Hello due in 00:00:06
Index 1/1, flood queue length 0
Next 0x0(0)/0x0(0) Last flood scan length is 2, maximum is 2
Last flood scan time is 0 msec, maximum is 4 msec
Neighbor Count is 1, Adjacent neighbor count is 1
Adjacent with neighbor 172.16.10.1 (Designated Router)
Suppress hello for 0 neighbor(s)
```

---

**QUESTION 215:**

On your OSPF network, routers CK1 and CK2 belong to the same Ethernet network. However, they are unable to establish an adjacency over this link. While troubleshooting this problem, you issue the "show ip ospf interface Ethernet 0" command on each router. The output from these commands is displayed below:

```
CK1 : Ethernet is up, line protocol is up
Internet address 192.168.1.2/24, Area 0
Process ID 1, Router ID 192.168.31.33, Network Type BROADCAST, Cost: 10
Transmit Delay is 1 sec, State DR, Priority 1
Designated Router (ID) 192.168.31.33, Interface address 192.168.1.2
No backup designated router on this network
```

Time intervals configured, Hello 5, Dead 20, Wait 20, Retransmit 5  
CK2 : Ethernet0 is up, line protocol is up  
Internet address 192.168.1.1/24, Area 0  
Process ID 2, Router ID 192.168.31.11, Network Type BROADCAST, Cost: 10  
Transmit Delay is 1 sec, State DR, Priority 1  
Designated Router (ID) 192.168.31.11, Interface address 192.168.1.1  
No backup designated router on this network  
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5  
What is the underlying cause of the routers failing to become adjacent?

- A. The OSPF area is misconfigured.
- B. The priority on CK2 should be set lower.
- C. The cost on CK2 should be set lower.
- D. The hello and dead timers are misconfigured.
- E. You need to add a backup designated router to the network.
- F. The OSPF process ID numbers do not match.

Answer: D

Explanation:

OSPF routers must have the same hello intervals and the same dead intervals to exchange information. By default, the dead interval is four times the value of the hello interval. This means that a router has four chances to send a hello packet before being declared dead.

On broadcast OSPF networks, the default hello interval is 10 seconds and the default dead interval is 40 seconds. On nonbroadcast networks, the default hello interval is 30 seconds and the default dead interval is 120 seconds. These default values result in efficient OSPF operation and seldom need to be modified. As shown in the output, the hello timer on router CK1 was changed to 5 seconds, with the dead timer being set to 20 seconds.

Incorrect Answers:

- A. Both routers are configured to be in area 0.
- B. In this example the adjacency should come up regardless of which one was the DR/BRD. Therefore, setting the priority on one router will not solve this problem.
- C. This will not solve the adjacency issue.
- E. Only the DR is absolutely required on the Ethernet subnet, not the BDR.
- F. Unlike other protocols, the routing process ID's do not necessarily need to match in OSPF for routing to work.

---

### **QUESTION 216:**

Router CK1 is being installed. You wish to add this router to your existing OSPF network. In doing so, you configure the following:

```
CK1 (config)# router ospf 1
```

```
CK1 (config-router)# network 10.10.10.0 255.255.255.0 area 0
```

After making this change, you notice that the networks attached to CK1 are not

being learned by the other OSPF routers. What could be the cause of this?

- A. The AS is not correctly configured
- B. The network subnet mask is incorrectly configured
- C. The network wildcard mask is configured incorrectly
- D. The network number is not correctly configured
- E. The process id is configured incorrectly
- F. None of the above

Answer: C

Explanation:

The network command specifies the IP address (10.10.10.0) followed by the wildcard mask (not the subnet mask) and the area that is to be associated with the OSPF address range (in this case, area 0). The wildcard mask indicates in binary how much of the IP address much be matched with 0s indicating that the bits must match and 1 indicating that they may vary. Thus 0.0.0.255 or 00000000.00000000.00000000.11111111 indicates that any bit in the last octet can vary while all bits in the first 3 octets must match the network address (in other words, 10.10.10.xx)

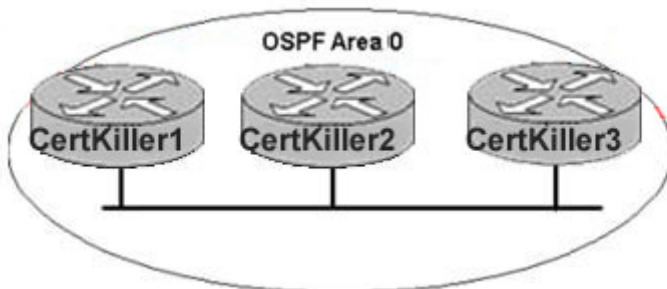
Incorrect Answers:

- A. Here the process ID is 99, which is valid.
- B. Area 0 is the backbone area, so configuring the network to be in area 0 should be acceptable.
- D. This is not the problem, assuming that all 10.X.X.X networks are to be configured for OSPF.
- E. The AS number, as called the process ID in OSPF is 99.
- F. OSPF uses wildcard masks, not the usual subnet masks

---

### **QUESTION 217:**

The Certkiller OSPF Backbone network is displayed below:



Certkiller 1 is unable to establish an OSPF neighbor relationship with Certkiller 3. What are possible reasons for this problem? (Choose Two).

- A. All of the routers need to be configured for backbone Area1.
- B. Certkiller 1 and Certkiller 2 are the DR and BDR, so OSPF will not establish neighbor adjacency with Certkiller 3
- C. A static route has been configured from Certkiller 1 to Certkiller 3 and prevents

the neighbor adjacency from being established.

D. The hello and dead interval timers are not set to the same values on Certkiller 1 and Certkiller 3.

E. EIGRP is also configured on these routers with a lower administrative distance.

F. Certkiller 1 and Certkiller 3 are configured in different areas.

Answer: D, F

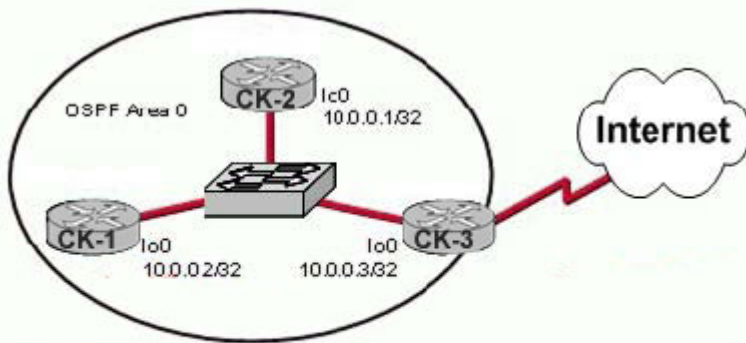
Explanation:

In order for two OSPF routers to establish a neighbor adjacency, they must agree on a number of things, including the hello intervals, dead intervals, and the area ID's.

Although a router can be configured for multiple OSPF areas, a neighbor relationship will only be built on interfaces that share the same area.

### QUESTION 218:

The Certkiller OSPF network is shown below:



CK-2# show ip ospf neighbor

Neighbor ID	PRI	State	Dead Time	Address	Interface
10.0.0.2	1	FULL/DROTHER	00 00:30	192.168.0.21	FastEthernet0/0
10.0.0.3	1	FULL/DR	00 00:30	192.168.0.23	FastEthernet0/0

Based on the output from the show ip ospf neighbor command on CK-2, what must a network administrator do to ensure that CK-2 will always be the DR and CK-3 will never be the DR or BDR for OSPF area 0? (Choose three.)

- A. Set the CK-3 OSPF priority to 0 on the serial interface.
- B. Change the CK-2 FastEthernet IP address to 192.168.0.27.
- C. Set the CK-2 OSPF priority to 255 on the FastEthernet interface.
- D. Change the CK-3 FastEthernet IP address to 192.168.0.27.
- E. Set the CK-3 OSPF priority to 0 on the FastEthernet interface.
- F. Set the CK-1 OSPF priority to 0 on the FastEthernet interface.

Answer: C, E, F

Explanation:

In OSPF, the DR is the router responsible for making adjacencies with all neighbors on a multiaccess network, such as

Ethernet or FDDI. The DR represents the multiaccess network, in that it ensures that every router on the link has the same topology database.

The BDR is the backup to the designated router (DR), in case the DR fails. The BDR performs none of the DR functions while the DR is operating correctly.

Router(config-if)#ip ospf priority number

The number in the priority command can be set between 0-255, where the higher the number, the greater the likelihood that this router will be selected as the DR.

To determine manually which router will be the DR, it is necessary to set the priority of the router. A router interface can have a priority of 0 to 255. The value of 0 means that the router cannot be a DR or BDR; otherwise, the higher the priority, the more favorable the chances are of winning the election. If there is more than one router on the segment with the same priority level, the election process picks the router with the highest router ID. The default priority on a Cisco router is 1.

If Priority value is same then goes to the highest IP address assigned in loopback interface then any interface.

---

### QUESTION 219:

Referring to the Certkiller Border router shown below, what can be concluded from the output of this debug command?

Exhibit:

```
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 OSPF router connected to interface Serial0/1 has NOT formed a neighbor relationship with the Border router.
- C. The interfaces of two OSPF routers connected to the Border router are in the same subnet.
- 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.
- E. None of the above

Answer: B

Explanation:

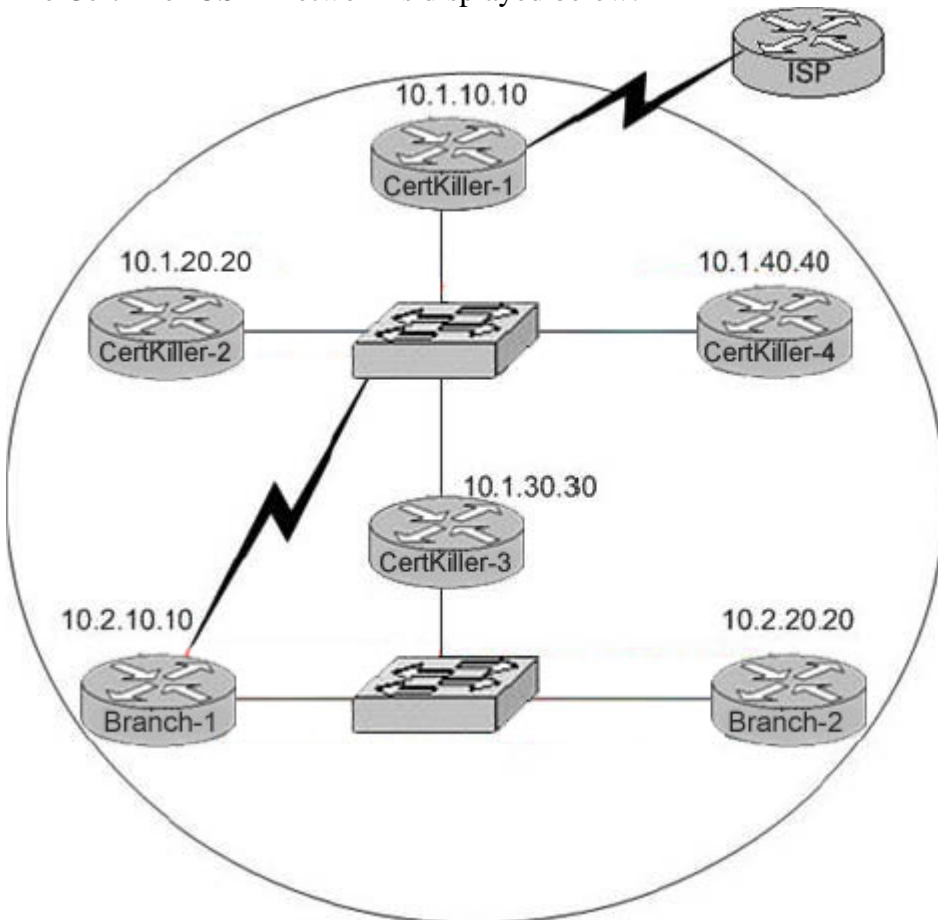
This "debug ip ospf events" output shown might appear if any of the following situations occurs:

1. The IP subnet masks for routers on the same network do not match.
  2. The OSPF hello interval for the router does not match that configured for a neighbor.
  3. The OSPF dead interval for the router does not match that configured for a neighbor.
- If a router configured for OSPF routing is not seeing an OSPF neighbor on an attached network, perform the following tasks:
1. Make sure that both routers have been configured with the same IP mask, OSPF hello interval, and OSPF dead interval.
  2. Make sure that both neighbors are part of the same area type.

---

**QUESTION 220:**

The Certkiller OSPF network is displayed below:



The internetwork infrastructure of Certkiller 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. Certkiller -1
- B. Certkiller -2
- C. Certkiller -3

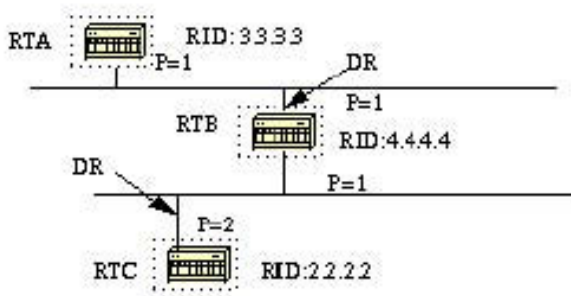
- D. Certkiller -4
- E. Branch-1
- F. Branch-2

Answer: D, F

Explanation:

DR and BDR election is done via the Hello protocol. Hello packets are exchanged via IP multicast packets on each segment. The router with the highest OSPF priority on a segment will become the DR for that segment. The same process is repeated for the BDR. In case of a tie, the router with the highest RID will win. The default for the interface OSPF priority is one. Remember that the DR and BDR concepts are per multi-access segment. Setting the OSPF priority on an interface is done using the `ip ospf priority <value> interface` command.

A priority value of zero indicates an interface which is not to be elected as DR or BDR. The state of the interface with priority zero will be DROTHERS. The following diagram illustrates the DR election:



In the above diagram, RTA and RTB have the same interface priority but RTB has a higher RID. RTB would be DR on that segment. RTC has a higher priority than RTB. RTC is DR on that segment.

The default RID is the highest IP address that is active in the router. Based on this info, router Certkiller -4 and Branch-2 will most likely be elected as the DR in their respective networks.

---

#### QUESTION 221:

Certkiller is using OSPF in their WAN. What is the maximum number of hops OSPF allows before it deems a network unreachable?

- A. 15
- B. 16
- C. 99
- D. 255
- E. Unlimited
- F. None of the above



Answer: E

Explanation:

OSPF is a link state protocol. Link state protocols do not use hops to mark networks as unreachable. Instead OSPF implements a steady state operation to its adjacent neighbors by sending and receiving small Hello packets periodically. When an OSPF router does not receive a Hello packet for a specified time period, it assumes that the neighbor is down. The router then runs the SPF algorithm to calculate new routes.

Reference:

Certkiller 640-801 Study Guide, Section 5.2 "Steady State Operation".

Incorrect Answers:

- A. This is the maximum number of hops that a RIP network could use before the route is deemed unreachable.
- B. When a RIP routes receives a routing update for a route that shows a hop count of 16, the route is considered to be unreachable. RIP routers use this to prevent packets from looping through the network indefinitely, but OSPF routers do not.

---

**QUESTION 222:**

Exhibit:

CertKiller4#show ip ospf neighbor					
Neighbor ID	Pri	State	Dead Time	Address	Interface
208.149.23.194	1	FULL/DR	00:00:33	190.172.32.10	Ethernet1
208.149.23.66	1	FULL/BDR	00:00:32	190.171.23.13	Ethernet0
208.149.23.130	1	FULL/DR	00:00:39	190.171.23.10	Ethernet0

**CertKiller4#**

While troubleshooting an issue with the Certkiller OSPF network, you notice that there are two OSPF designated routers identified on Certkiller 4. What could explain this fact?

- A. Two Router IDs have the same OSPF priority and are therefore tied for DR election.
- B. Certkiller 4 is connected to more than one multi-access network.
- C. The DR election is still underway and there are two contenders for the role.
- D. The router at 208.149.23.130 is a secondary DR in case the primary fails.
- E. None of the answer choices are correct.

Answer: B

Explanation:

OSPF elects a DR and BDR for each multi-access network that the routers are connected to. In this case, we can see that the first neighbor is the DR associated with the LAN connected to interface Ethernet1, while the last neighbor is the DR associated with the Ethernet0 LAN.

---

**QUESTION 223:**

Exhibit:

```
CertKiller2# show ip protocols
Routing Protocol is "ospf 109"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 221.130.149.10
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks
    190.171.23.0 0.0.0.255 area 0
    190.172.32.0 0.0.0.255 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
    208.149.23.66    110          00:20:09
    208.149.23.194    110          00:20:09
    208.149.23.130    110          00:20:09
  Distance: (default is 110)

CertKiller2# show ip ospf interface
Ethernet1 is up, line protocol is up
  Internet Address 190.172.32.11/24, Area 0
  Process ID 109, Router ID 221.130.149.10, Network Type BROADCAST, Cost: 10
  Transmit Delay is 1 sec, State BDR, Priority 1
  Designated Router (ID) 208.149.23.194, Interface address 190.172.32.10
  Backup Designated router (ID) 221.130.149.10, Interface address 190.172.32.11
  <output omitted>
```

Router Certkiller 2 is part of an OSPF network. You issues the "show ip protocols" command on this router as shown in the exhibit. Based on the information shown, why was Certkiller 2 not elected as the designated router?

- A. Certkiller 2 is not advertising the interface with address 221.130.149.10.
- B. The OSPF process ID of Certkiller 2 is lower than the process ID of the elected DR.
- C. The interface address of Certkiller 2 is a higher value than the interface address of the DR.
- D. Certkiller has a lower OSPF priority value than the router elected as DR.
- E. None of the above

Answer: A

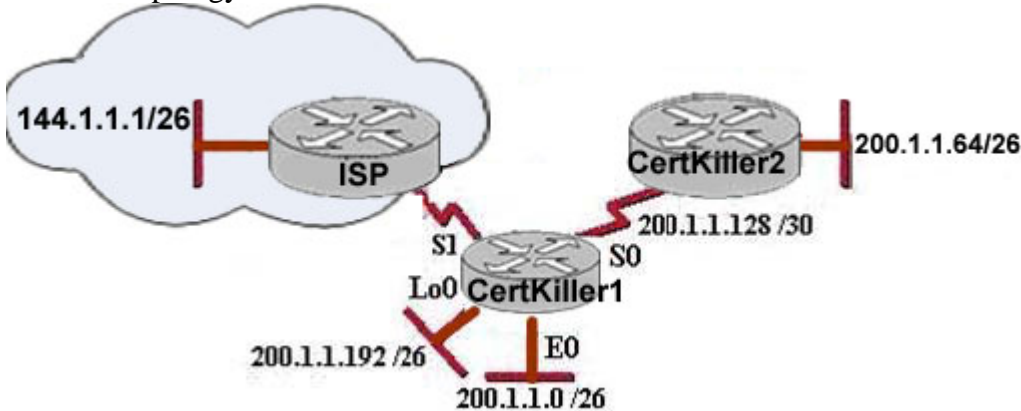
Explanation:

On broadcast and non-broadcast multi-access networks, a designated router and backup designated router are elected. The election is done by first choosing the routers with the highest priority value or, if the priorities are same, choosing the routers with the highest router ID. The router ID is chosen by the highest IP address on any loopback interface or, if no loopback interfaces are configured, the highest IP address on any active physical interface.

Referring to the exhibit of the "show ip protocols" command: Router ID is: 221.130.149.10 but this network is not advertised using network command on OSPF. So interface having 221.130.149.10 IP address is not participating on OSPF routing. Therefore, Certkiller 2 is not elected as the designated router.

**QUESTION 224:**

Network topology exhibit:



Configuration exhibit (Routing Table):

```
Gateway of last resort is 0.0.0.0 to network 0.0.0.0

200.1.1.0/24 is variably submittted, 5 Subnets, 5 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
```

You work as a network technician at Certkiller and you need to troubleshoot an issue with the network.

Based on the information provided above, what can be determined from the router output shown in the graphic?

- A. 200.1.1.64 is a default route
- B. EIGRP is in use in this network
- C. The output came from a router that has four physical interfaces
- D. The output shows that there are three default routes
- E. The output came from router Certkiller 2
- F. None of the above

Answer: B

Explanation:

In the routing table the "D" letter marks the route learned from EIGRP routing protocol. Based on the routing table above, there are 4 directly connected IP interfaces, 2 EIGRP learned routes (which means that EIGRP is in use on this network) and a static default route was also configured.

**QUESTION 225:**

You are troubleshooting a routing issue in the Certkiller EIGRP network. In this network, which statements are true about EIGRP successor routes? (Choose two)

- A. Successor routes are flagged as "active" in the routing table
- B. Successor routes are saved in the topology table to be used if the primary route fails
- C. A successor route is used by EIGRP to forward traffic to a destination
- D. A successful route may be backed up by a feasible successor route

Answer: C, D

Explanation:

The DUAL finite state machine embodies the decision process for all route computations. It tracks all routes advertised by all neighbors. The distance information, known as a metric, is used by DUAL to select efficient loop free paths. DUAL selects routes to be inserted into a routing table based on feasible successors. A successor is a neighboring router used for packet forwarding that has a least cost path to a destination that is guaranteed not to be part of a routing loop. When there are no feasible successors but there are neighbors advertising the destination, a recomputation must occur. This is the process where a new successor is determined. The amount of time it takes to recompute the route affects the convergence time. Even though the recomputation is not processor-intensive, it is advantageous to avoid recomputation if it is not necessary. When a topology change occurs, DUAL will test for feasible successors. If there are feasible successors, it will use any it finds in order to avoid any unnecessary recomputation. Feasible successors are defined in more detail later in this document.

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.

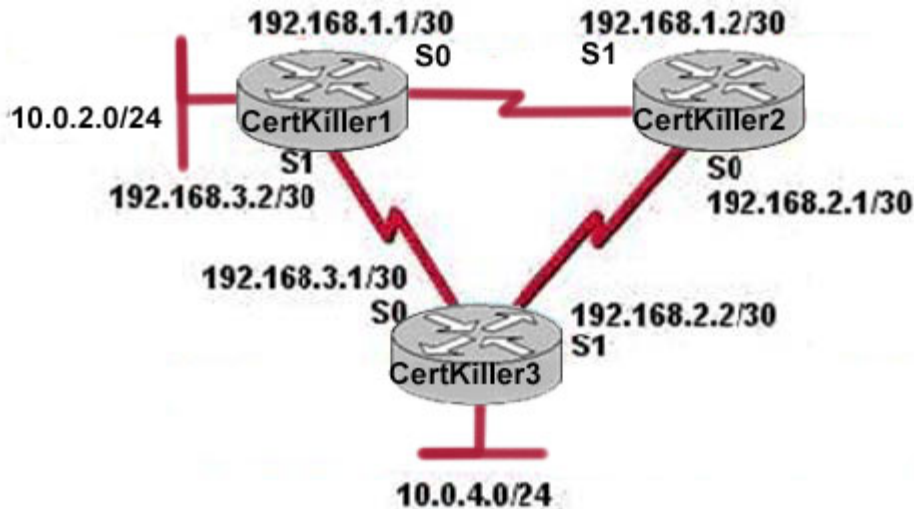
Reference:

[http://www.cisco.com/en/US/tech/ CK3 65/ CK2 07/technologies\\_tech\\_note09186a0080093f07.shtml#feasible](http://www.cisco.com/en/US/tech/ CK3 65/ CK2 07/technologies_tech_note09186a0080093f07.shtml#feasible)

---

**QUESTION 226:**

Three Certkiller routers are connected as show below:



Part of their configurations are shown below:

**CertKiller1# show running-config**

<output omitted>

```
router eigrp 10
 network 10.0.0.0
 network 192.168.1.0
 network 192.168.3.0
 no auto-summary
```

**CertKiller2# show running-config**

<output omitted>

```
router eigrp 10
 network 192.168.1.0
 network 192.168.2.0
 no auto-summary
```

**CertKiller3# show running-config**

<output omitted>

```
router eigrp 10
 network 10.0.0.0
 network 192.168.2.0
 no auto-summary
```

**CertKiller1# show ip eigrp neighbors**

Address	Interface	Holdtime	Uptime	Q	Seq Num	SRTT	RTO
		(secs)	(h:m:s)	Count		(ms)	(ms)
192.168.1.2	Se0	13	01:10:20	106	636	0	30

IP Addresses and routing for the network are configured as shown above. The Certkiller network administrator issued the "show ip eigrp neighbors" command from router Certkiller 1 and receives the output shown. Based on all the information provided above, which statement is true?

- A. It is normal for Certkiller 1 to show once active neighbor at a time to prevent routing loops
- B. The IP addresses are not configured properly on the Certkiller 1 and Certkiller 3 interfaces
- C. The "no auto-summary" command configured on the routers prevents Certkiller 1 and Certkiller 2 from forming a neighbor relationship
- D. Routing is not completely configured on Certkiller 3
- E. None of the above

Answer: D

Explanation:

The Router Certkiller 3 is connected to three different networks: 192.168.3.1/30, 192.168.2.2/30, and 10.0.4.0/24 but only 10.0.4.0 and 192.168.2.0 are being advertised



via EIGRP. In Certkiller 3, the "network 192.168.3.0" command should be placed under the EIGRP 10 process.

---

**QUESTION 227:**

The topology table for the Certkiller EIGRP network is shown below from router Certkiller 3:

```
CertKiller3# show ip eigrp topology
IP-EIGRP Topology Table for AS(109)/ID(192.168.80.28)

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply
       r - reply Status, s - sia Status

P 192.168.90.0/24 255.255.255.0, 2 successors, FD is 0
   via 192.168.80.28 (46251776/46226176), Ethernet0
   via 192.168.81.28 (46251776/46226176), Ethernet1
   via 192.168.80.31 (46277376/46251776), Serial0
P 192.168.81.0/24 255.255.255.0, 1 successors, FD is 307200
   via Connected, Ethernet1
   via 192.168.81.28 (307200/281600), Ethernet1
   via 192.168.80.28 (307200/281600), Ethernet0
   via 192.168.80.31 (332800/307200), Serial0
```

You are troubleshooting a routing issue with the Certkiller network. Why does Router Certkiller 3 show multiple unequal cost paths to network 192.168.81.0/24?

- A. Because the EIGRP topology table displays all routes to a destination
- B. Because the EIGRP topology table shows only backup routes to a destination
- C. Because variance was configured for EIGRP autonomous system 109
- D. Because multiple floating static routes were configured to network 192.168.81.0 via interface Serial0
- E. None of the above

Answer: A

---

**QUESTION 228:**

The routing table of router CK1 is shown below:

**Gateway of last resort is not set**

**192.168.25.0/30 is subnetted, 4 subnets**

- D 192.168.25.20 [90/2681856] via 192.168.15.5, 00:00:10, Serial0/1
- D 192.168.25.16 [90/1823638] via 192.168.15.5, 00:00:50, Serial0/1
- D 192.168.25.24 [90/3837233] via 192.168.15.5, 00:05:23, Serial0/1
- D 192.168.25.24 [90/8127323] via 192.168.15.5, 00:06:45, Serial0/1
- C 192.168.15.4/30 is directly connected, Serial0/1
- C 192.168.2.0/24 is directly connected, FastEthernet0/0

Based on the routing table of CK1 shown above, which address and mask combination represents a summary of the routes learned by EIGRP?

- A. 192.168.25.28 255.255.255.252
- B. 192.168.25.28 255.255.255.240
- C. 192.168.25.16 255.255.255.252
- D. 192.168.25.0 255.255.255.252
- E. 192.168.25.16 255.255.255.240
- F. 192.168.25.0 255.255.255.240

Answer: E

---

**QUESTION 229:**

You need to configure EIGRP on a new Certkiller router. What parameters must you specify when you enable EIGRP routing?

- A. The broadcast address, and AS number
- B. The network number and AS number
- C. EIGRP routing, network number and passive interface
- D. EIGRP routing, network number, and AS
- E. None of the above.

Answer: D

Explanation:

To enable EIGRP on your router, you must specify EIGRP routing, the network number, and the AS system number.

Example:

Router EIGRP 33

Network 10.0.0.0

In the case above the AS process number is 33.

---

**QUESTION 230:**

The Certkiller router has been configured for EIGRP. Information relating to the configuration is displayed in the output shown below:

**Routing Protocol is "eigrp 478"**

--- output omitted ---

**Redistributing: eigrp 478**

**Automatic network summarization is not in effect**

**Maximum path: 4**

**Routing for Networks:**

**172.26.168.128/26**

**172.26.169.0/26**

**Routing Information Sources:**

Gateway	Distance	Last Update
172.26.168.129	90	01:01:59

**Distance: internal 90 external 170**

The EIGRP configuration in the Certkiller router used a single network statement.



From the output shown in the graphic, which network statement was used to advertise these networks in EIGRP?

- A. network 172.26.168.128 0.0.0.127
- B. network 172.26.168.128 area 478
- C. network 172.26.0.0
- D. network 172.26.168.0 area 478
- E. None of the above

Answer: C

Explanation:

The correct configuration statements used in the above were:

Router eigrp 478

Network 172.26.0.0

Incorrect Answers:

- A. A wildcard mask is not required at the end of the network statement in order to configure EIGRP. It is only required for an OSPF configuration. Although a wildcard mask is now supported with EIGRP, the mask used in this example is incorrect.
- B, D: In EIGRP, the concept of an area does not exist. This is only used by OSPF.

---

### **QUESTION 231:**

Router CK1 is configured to run EIGRP. Which tables of EIGRP route information are held in RAM and maintained through the use of hello and update packets in this router? (Choose two)

- A. SPF table
- B. Query table
- C. RTP table
- D. Neighbor table
- E. DUAL table
- F. Topology table
- G. State Table

Answer: D, F

Explanation:

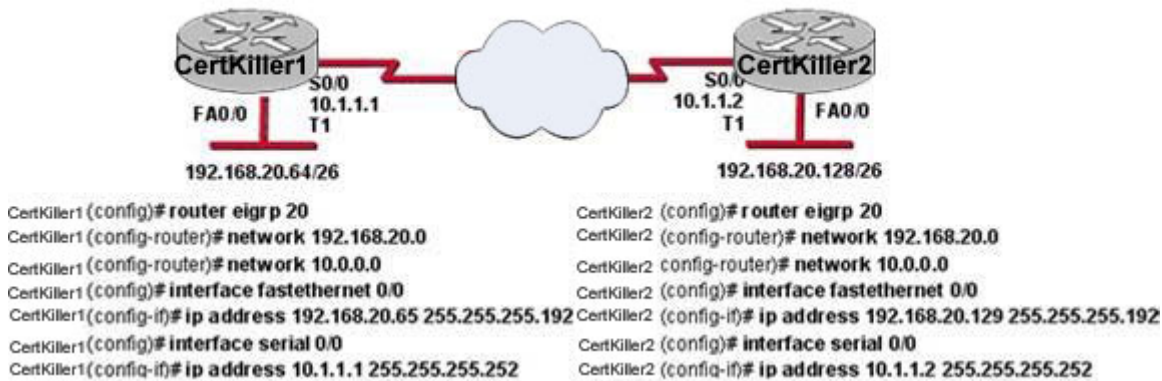
In EIGRP the only two tables of significance are the neighbor table and the topology table.

Reference: Sybex CCNA Study Guide edition 4, Page 271.

---

### **QUESTION 232:**

The Certkiller network is shown in the following exhibit:



Based on the Certkiller router configurations shown above, why has this network failed to converge?

- A. The no auto-summary command needs to be applied to the routers
- B. The network numbers have not been properly configured on the routers
- C. The subnet masks for the network numbers have not been properly configured
- D. The autonomous system number has not been properly configured
- E. The bandwidth values have not been properly configured on the serial interfaces

Answer: A

Explanation:

To restore the default behavior of automatic summarization of subnet routes into network-level routes, use the auto-summary command in router configuration mode. To disable this function and transmit subprefix routing information across classful network boundaries, use the no form of this command. Without disabling auto summarization, each router will advertise the 192.168.20.0/24 route, and the specific /26 networks will not be known.

### QUESTION 233:

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.
- F. Successors are not used in EIGRP.

Answer: A, D

Explanation:

The following are some terms relating to EIGRP:

1. Feasible Distance: The lowest calculated metric to each destination
2. Feasibility Condition: A condition that is met if a neighbor's advertised distance to a

destination is lower than the router's Feasible Distance to that same destination.

3. Successor: The neighbor that has been selected as the next hop for a given destination based on the Feasibility Condition.

Reference: Jeff Doyle, Routing TCP/IP, Volume I, Chapter 8: Enhanced Interior Gateway Routing Protocol (EIGRP), p.336-337, Cisco Press, (ISBN 1-57870-041-8)

Additional info:

The Feasible Condition is met when the receiving router has a Feasible Distance (FD) to a particular network and it receives an update from a neighbor with a lower advertised or Reported Distance (RD) to that network. The neighbor then becomes a Feasible Successor (FS) for that route because it is one hop closer to the destination network.

There may be a number of Feasible Successors in a meshed network environment.

The RD for a neighbor to reach a particular network must always be less than the FD for the local router to reach that same network. In this way EIGRP avoids routing loops. This is why routes that have RD larger than the FD are not entered into the Topology table.

Reference: Ravi Malhotra, IP Routing, Chapter 4: Enhanced Interior Gateway Routing Protocol (EIGRP), O'Reilly Press, January 2002 (ISBN 0-596-00275-0)

---

### **QUESTION 234:**

Which one of the following EIGRP commands can check the IP addresses of the adjacent neighbors, as well as verifying the EIGRP retransmit intervals and queue counts?

- A. CK1 #show ip eigrp adjacency
- B. CK1 #show ip eigrp topology
- C. CK1 #show ip eigrp interfaces
- D. CK1 #show ip eigrp neighbors
- E. None of the above

Answer: D

Explanation:

The topology database contains information from all of the LSA packets that have been received for an area. The topology database is updated by the LSAs. Each router within the area has exactly the same topology database. All routers must have the same vision of the networks; otherwise, confusion, routing loops, and loss of connectivity will result.

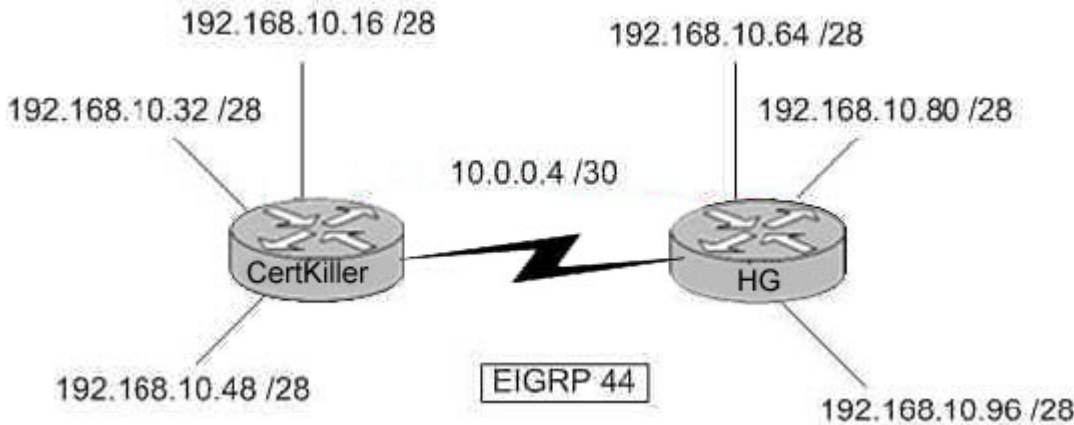
Note: The topology database is the router's view of the network within the area. It includes every OSPF router within the area and all the connected networks. This database is indeed a routing table, but a routing table for which no path decisions have been made; it is at present a topology database.

Reference: "CCNP BSCI Exam Certification Guide Third Edition" by Clare Gough, CCIE No. 2893, Page 197.

---

### **QUESTION 235:**

The Certkiller network consists of two routers as shown below:



Both routers Certkiller and HG are configured for EIGRP. Unfortunately, users on the Certkiller networks are unable to reach users on the HG networks. Which command could you enter on Certkiller to correct this problem?

- A. Certkiller (config-router)# version 2
- B. Certkiller (config-router)# no auto-summary
- C. Certkiller (config-router)# redistribute eigrp 44
- D. Certkiller (config-router)# EIGRP log-neighbor-changes
- E. Certkiller (config-router)# default-information originate

Answer: B

Explanation:

By default, EIGRP will auto-summarize IP information at the network boundaries. In this example, the 192.168.10.0 network is subnetted into 6 separate networks. Therefore, each router will only advertise the 192.168.10.0/24 network to each other by default. To disable this function and transmit sub-prefix routing information across classful network boundaries, auto summarization must be disabled.

Incorrect Answers:

- A. There is only one version of EIGRP.
- C. Based on the diagram, each router is already configured for EIGRP 44.
- D. This will have no impact on the routes.
- E. This will generate a default route, which will be advertised to the other router. However, a default route is not needed, as the individual subnets need to be advertised, not a default route.

---

### QUESTION 236:

Certkiller .com has a large corporate network that uses multiple routing protocols. Hosts in a portion of the network that uses EIGRP have become unreachable. Which router command will allow you, the network technician, to view the status of these routes?

- A. Certkiller # show eigrp entries

- B. Certkiller # show protocols
- C. Certkiller # debug eigrp routes
- D. Certkiller # show ip route eigrp
- E. Certkiller # show route eigrp

Answer: D

Explanation:

The show ip route and show ip route eigrp commands both list the EIGRP-learned routes with a D beside them. D signifies EIGRP. The letter E was already being used for Exterior Gateway Protocol (EGP) when Cisco created EIGRP, so it choose the next-closest letter to denote EIGRP-learned routes. You can see information about EIGRP neighbors with the show ip eigrp neighbors command, and the number of active neighbors (called peers in the command output) with the show ip eigrp interfaces command.

Reference: Cisco CCNA ICND 640-811 p.211

---

### **QUESTION 237:**

Which command displays EIGRP-related router activities as they occur?

- A. Certkiller # show ip route \*
- B. Certkiller # debug eigrp route
- C. Certkiller # debug ip eigrp
- D. Certkiller # debug ip protocols eigrp
- E. Certkiller # show ip route eigrp
- F. None of the above

Answer: C

Explanation:

The debug ip eigrp command helps you analyze the packets that are sent and received on an interface. Because the debug ip eigrp command generates a substantial amount of output, only use it when traffic on the network is light.

Examples:

The following is sample output from the debug ip eigrp command:

Certkiller # debug ip eigrp

IP-EIGRP: Processing incoming UPDATE packet

IP-EIGRP: Ext 192.168.3.0 255.255.255.0 M 386560 - 256000 130560 SM 360960 - 256000 104960

IP-EIGRP: Ext 192.168.0.0 255.255.255.0 M 386560 - 256000 130560 SM 360960 - 256000 104960

IP-EIGRP: Ext 192.168.3.0 255.255.255.0 M 386560 - 256000 130560 SM 360960 - 256000 104960

IP-EIGRP: 172.69.43.0 255.255.255.0, - do advertise out Ethernet0/1

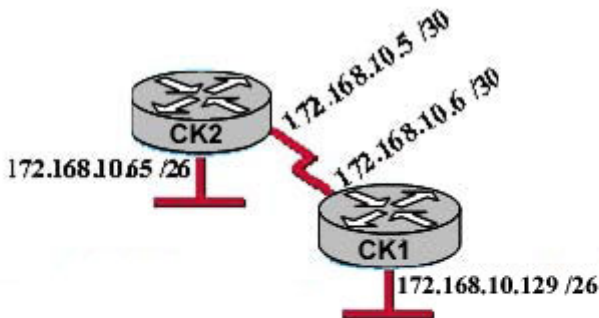
IP-EIGRP: Ext 172.69.43.0 255.255.255.0 metric 371200 - 256000 115200

IP-EIGRP: 192.135.246.0 255.255.255.0, - do advertise out Ethernet0/1  
IP-EIGRP: Ext 192.135.246.0 255.255.255.0 metric 46310656 - 45714176 596480  
IP-EIGRP: 172.69.40.0 255.255.255.0, - do advertise out Ethernet0/1  
IP-EIGRP: Ext 172.69.40.0 255.255.255.0 metric 2272256 - 1657856 614400  
IP-EIGRP: 192.135.245.0 255.255.255.0, - do advertise out Ethernet0/1  
IP-EIGRP: Ext 192.135.245.0 255.255.255.0 metric 40622080 - 40000000 622080  
IP-EIGRP: 192.135.244.0 255.255.255.0, - do advertise out Ethernet0/1

---

**QUESTION 238:**

Refer to the Certkiller network shown below:



CK2# show ip route

Gateway of last resort is not set

172.168.0.0/16 is variably subnetted, 2 subnets, 2 masks

C 172.168.10.4/30 is directly connected, Serial0/1

C 172.168.10.64/26 is directly connected, FastEthernet 0/0

In this network, CK1 can ping across the serial link to 172.168.10.5, but cannot ping the FastEthernet interface of CK2 (172.168.10.65). The routing protocol being used is EIGRP, and the routing table of CK2 is shown. Which two statements could be the cause of this problem? (Choose two)

- A. The serial interface does not have the clockrate set.
- B. EIGRP is not enabled on one of the routers.
- C. The IP addressing scheme has overlapping subnetworks.
- D. The IP addressing scheme is using subnet zero but the ip subnet-zero command has not been enabled on one or both of the routers.
- E. The FastEthernet interface of CK2 is administratively shutdown.
- F. The EIGRP autonomous system numbers configured on the two routers do not match.

Answer: B, F

Explanation:

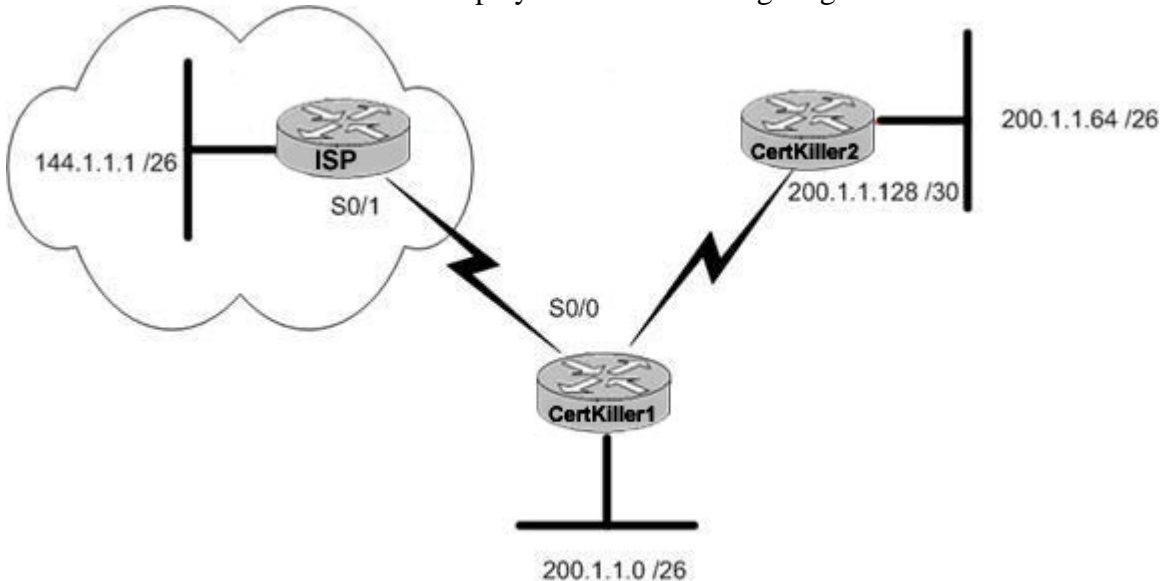
You can successfully ping over the serial link, which tells us the serial interface is properly configured, but you are unable to ping a network that is not directly connected. Since no EIGRP routes appear in the routing table, this tells us there is something wrong with the EIGRP configuration on either router. The most likely problem is that EIGRP is

not enabled on one of the routers, or the EIGRP AS numbers do not match on each router.

---

**QUESTION 239:**

The Certkiller EIGRP network is displayed in the following diagram:



Refer to the graphic. Certkiller is running EIGRP. Hosts from the 200.1.1.0/26 subnet cannot access a server located on the 200.1.1.64 subnet. The users have previously been able to access this server. After router Certkiller 1 is accessed with the use of Telnet, which of the following commands would be a logical first choice in troubleshooting this problem?

- A. Certkiller 1# show interface s0/0
- B. Certkiller 1# show controllers
- C. Certkiller 1# show ip route
- D. Certkiller 1# show hosts
- E. None of the above

Answer: C

Explanation:

Since the network was previously accessible, and users are only unable to reach a specific subnet, it can be safely assumed that a routing issue is the problem, so viewing the routing table to see how traffic destined to the 200.1.1.64/26 subnet is being routed would be a logical first step.

Incorrect Answers:

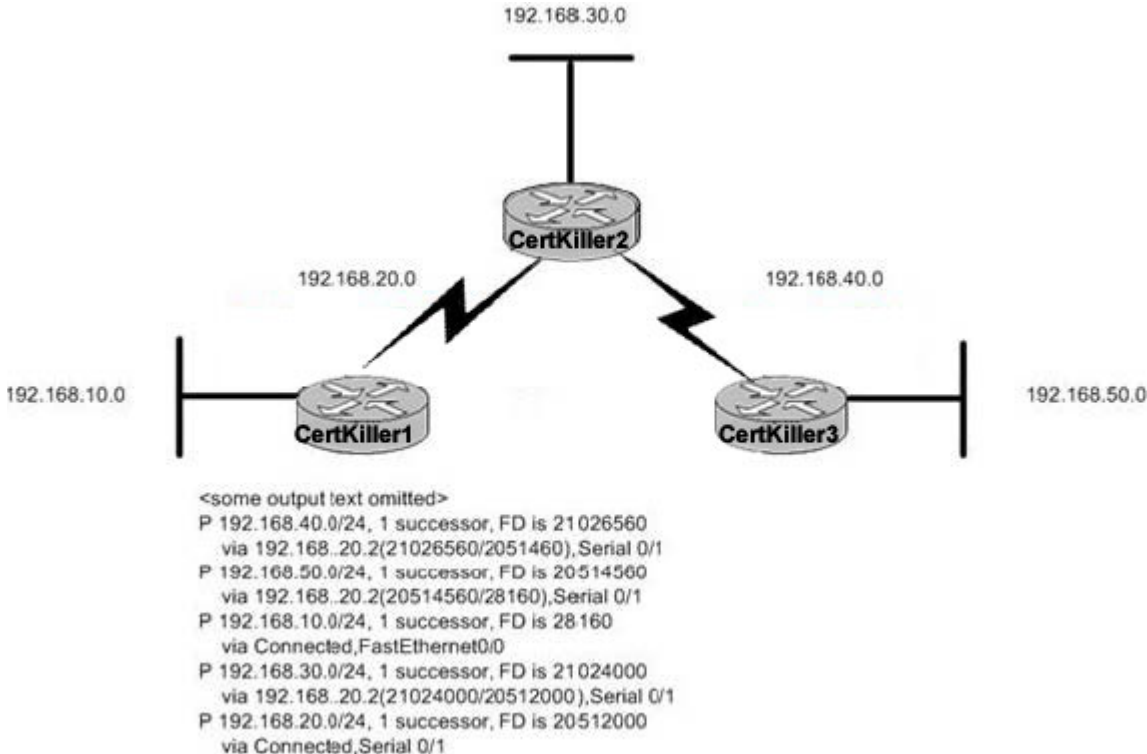
- A, B. These commands would be used if we had a reason to believe that there was a physical problem with the circuit itself. However, since we can safely telnet into the router remotely, and users appear to be able to reach other networks, we can assume that the physical serial interface is working properly.
- D. The "show hosts" command is used to display the default domain name, the style of



name lookup service, a list of name server hosts, and the cached list of host names and addresses on the network to which you can connect. It will not help us in any way in this example.

### QUESTION 240:

Three Certkiller routers are connected as shown below:



Based on the information shown above, which of the routers shown could produce the output shown?

- A. Certkiller 1
- B. Certkiller 2
- C. Certkiller 3
- D. Cannot be determined from the information shown

Answer: A

Explanation:

The following is sample output from the show ip eigrp topology command:

Router# show ip eigrp topology

IP-EIGRP Topology Table for process 77

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,  
 r - Reply status

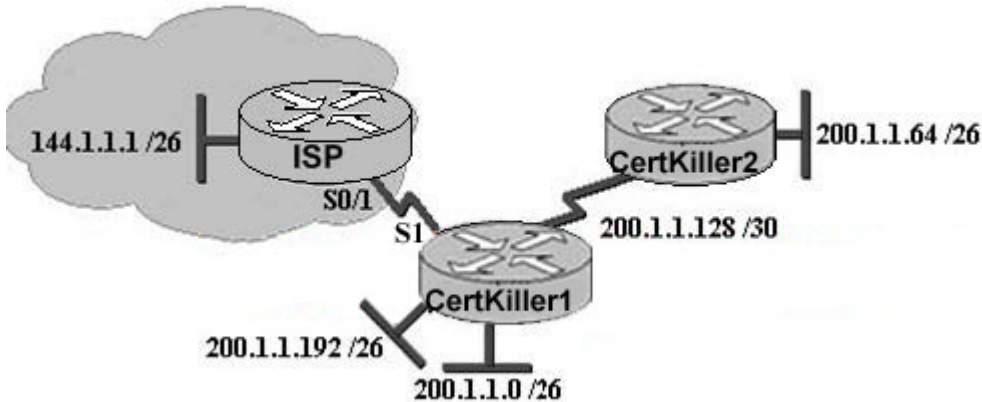
P 172.16.90.0 255.255.255.0, 2 successors, FD is 0  
   via 172.16.80.28 (46251776/46226176), Ethernet0  
   via 172.16.81.28 (46251776/46226176), Ethernet1

via 172.16.80.31 (46277376/46251776), Serial0  
P 172.16.81.0 255.255.255.0, 1 successors, FD is 307200  
via Connected, Ethernet1  
via 172.16.81.28 (307200/281600), Ethernet1  
via 172.16.80.28 (307200/281600), Ethernet0  
via 172.16.80.31 (332800/307200), Serial0  
Since in our example, the networks listed are connected are 192.168.2.0 and 192.168.10.0, this command must have been issued on router Certkiller 1.

---

**QUESTION 241:**

The Certkiller network topology is displayed below:



Exhibit, Certkiller 1 configuration

```
Gateway of last resort is 0.0.0.0 to network 0.0.0.0

 200.1.1.0/24 is variable 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
CertKiller1#
```

Based on the output of the Certkiller 1#show ip route command shown above and the information displayed in the network topology exhibit, which of the following is a potential routing problem?

- 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

Answer: A

Explanation:

By default, EIGRP will automatically summarize networks at their network boundary, which can cause problems with dis-contiguous IP networks. Since the IP routing table does indeed show a summary route to null 0, the default behavior of EIGRP was not modified. In this network, it would be best to disable the automatic summarization feature of EIGRP.

---

**QUESTION 242:**

The Certkiller WAN is using EIGRP. Which two of the following are valid characteristics of this routing protocol? (Select two answer choices)

- A. Has a maximum hop count of 25
- B. Can differentiate between internal and external routes
- C. Uses a 32-bit metric
- D. Can maintain only one routing table
- E. Need all networks to use the same subnet mask
- F. Supports only one routed protocol

Answer: B, C

Explanation:

By default, the EIGRP composite metric is a 32-bit quantity that is a sum of the segment delays and the lowest segment bandwidth.

Enhanced IGRP supports internal and external routes. Internal routes originate within an Enhanced IGRP AS. Therefore, a directly attached network that is configured to run Enhanced IGRP is considered an internal route and is propagated with this information throughout the Enhanced IGRP AS. External routes are learned by another routing protocol or reside in the routing table as static routes. These routes are tagged individually with the identity of their origin.

Incorrect Answers:

- A. This choice is wrong since it does not use hop count but a metrics that includes: bandwidth\*, delay\*, load, reliability, and MTU size. (\* used by default).
- D. This choice is wrong since we know that it keeps a three tables (neighbor table, topology table, and route table) and if you want to be a nit pick and say it still only supports one route table, then if you configure IP and IPX on the router, you will have two route tables one for each protocol.
- E. This choice is wrong since we know that EIGRP supports VLSM.
- F. This choice is wrong since we know it supports IP, IPX and Appletalk.

---

**QUESTION 243:**

Router CK1 is running EIGRP. In EIGRP; what is a feasible successor (FS) and where is it stored in this router?

- A. A FS is a primary route, stored in the routing table
- B. A FS is a backup route, stored in the routing table
- C. A FS is a backup route, stored in the topology table
- D. A FS is a primary route, stored in the topology table
- E. None of the above

Answer: C

Explanation:

The following are some terms relating to EIGRP:

1. Feasible Distance: The lowest calculated metric to each destination
2. Feasibility Condition: A condition that is met if a neighbor's advertised distance to a destination is lower than the router's Feasible Distance to that same destination.
3. Successor: The neighbor that has been selected as the next hop for a given destination based on the Feasibility Condition.

Reference: Jeff Doyle, Routing TCP/IP, Volume I, Chapter 8: Enhanced Interior Gateway Routing Protocol (EIGRP), p.336-337, Cisco Press, (ISBN 1-57870-041-8)

Additional info:

The Feasible Condition is met when the receiving router has a Feasible Distance (FD) to a particular network and it receives an update from a neighbor with a lower advertised or Reported Distance (RD) to that network. The neighbor then becomes a Feasible Successor (FS) for that route because it is one hop closer to the destination network.

There may be a number of Feasible Successors in a meshed network environment.

The RD for a neighbor to reach a particular network must always be less than the FD for the local router to reach that same network. In this way EIGRP avoids routing loops. This is why routes that have RD larger than the FD are not entered into the Topology table.

Reference: Ravi Malhotra, IP Routing, Chapter 4: Enhanced Interior Gateway Routing Protocol (EIGRP), O'Reilly Press, January 2002 (ISBN 0-596-00275-0)

---

### **QUESTION 244:**

Router CK1 is running EIGRP. In what location are EIGRP successor routes stored in this router?

- A. In the routing table only.
- B. In the neighbor table only.
- C. In the topology table only.
- D. In the routing table and neighbor table.
- E. In the routing table and topology table.
- F. In the topology table and neighbor table.
- G. None of the above

Answer: E

Explanation:

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. Successor information is needed by the routing table and by the topology table, so they are stored in both.

---

**QUESTION 245:**

Router CK1 has EIGRP configured as the only routing protocol. How does EIGRP respond if there is no feasible successor route to a destination network and the successor route fails?

- A. It immediately sends its entire routing table to its neighbors.
- B. EIGRP sends a Hello packet to the DR to inform it of the route failure.
- C. It automatically forwards traffic to a fallback default route until a successor route is found.
- D. It sends queries out to neighbors until a new successor route is found.
- E. It places the route in holddown until LSA updates inform it of a new route to the network.
- F. None of the above

Answer: D

Explanation:

EIGRP will send queries for successor if it can't find a path to destination (if no feasible successors already exist).

---

**QUESTION 246:**

EIGRP is configured on router CK1 . What does this router do if it has no EIGRP feasible successor route to a destination network and the successor route to that destination network is inactive status?

- A. It routes all traffic that is addresses to the destination network to the interface indicates 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.
- E. None of the above

Answer: C

Explanation:

When the primary route is not available, EIGRP immediately uses the feasible successor as the backup route. This shortens convergence time. Now, if the primary route is gone and no feasible successor is available, the route is in active state. The only way for EIGRP to converge quickly is to query its neighbors about the unavailable route. If the neighbor doesn't know the status of the route, the neighbor asks its neighbors, and so on, until the edge of the network is reached. The query stops if one of the following occurs:  
All queries are answered from all the neighbors.

The end of network is reached.

The lost route is unknown to the neighbors.

Reference:

<http://www.ciscopress.com/articles/article.asp?p=27839&rl=1>

---

**QUESTION 247:**

As a network administrator, you use a telnet program often. What are two characteristics of Telnet? (Choose two.)

- A. It is no longer supported on Cisco network devices
- B. It is more secure than SSH
- C. It requires that the destination device be configured to support Telnet connections
- D. It requires an enterprise license in order to be implemented
- E. It sends data in clear and text format

Answer: C, E

---

**QUESTION 248:**

Which of the following IOS commands could you use to troubleshoot a router connectivity problem on an IP network? (Select all valid answers)

- A. show ip route
- B. ipconfig
- C. tracert
- D. show interfaces
- E. traceroute
- F. ping
- G. All of the above

Answer: A, D, E, F

Explanation:

- A. The show ip route command displays the IP route table.
- D. The show interfaces EXEC command to display statistics for all interfaces configured

on the router or access server.

E. Traceroute is a valid router command, used to trace the path to a destination, and provide the latency associated with each hop.

F. The ping command tests connectivity to a remote node.

Incorrect Answers:

B, C. These are commands used on PC hosts. They are invalid router commands.

---

**QUESTION 249:**

What IOS command verifies connectivity between two hosts on the Certkiller network by sending and receiving ICMP echo messages?

A. ping

B. tracet

C. netstat

D. show cdp neighbors detail

E. show ip route

F. traceroute

G. ipconfig

Answer: A

Explanation:

Packet Internet Groper (PING) uses ICMP echo requests and replies to verify network connectivity. It is most commonly used to verify connectivity to another device and to monitor the operational status of a device.

---

**QUESTION 250:**

What kind of message does a PING send out to test connectivity?

A. ICMP echo request

B. Information interrupt request

C. Timestamp reply

D. Source quench

E. None of the above

Answer: A

Explanation:

The ping command sends an ICMP echo request packet to the stated destination address.

The TCP/IP software at the destination then replies to the ping echo request packet with a similar packet, called the ICMP echo reply.

Reference: CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 146



**QUESTION 251:**

The topology table for the Certkiller EIGRP network is shown below from router Certkiller 3:

```
CertKiller3# show ip eigrp topology
IP-EIGRP Topology Table for AS(109)/ID(192.168.80.28)

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply
       r - reply Status, s - sia Status

P 192.168.90.0/255.255.255.0, 2 successors, FD is 0
   via 192.168.80.28 (46251776/46226176), Ethernet0
   via 192.168.81.28 (46251776/46226176), Ethernet1
   via 192.168.80.31 (46277376/46251776), Serial0
P 192.168.81.0/255.255.255.0, 1 successors, FD is 307200
   via Connected, Ethernet1
   via 192.168.81.28 (307200/281600), Ethernet1
   via 192.168.80.28 (307200/281600), Ethernet0
   via 192.168.80.31 (332800/307200), Serial0
```

Based on the information shown above, how many broadcast domains exist in the Certkiller EIGRP topology?

- A. Six
- B. One
- C. Three
- D. Two
- E. Five
- F. Four
- G. None of the above

Answer: C

---

**QUESTION 252:**

The following output was shown on router Certkiller 4:

```

CertKiller4# show ip protocols
Routing Protocol is "rip"
  Sending updates every 30 seconds, next due in 18 seconds
  Invalid after 180 seconds, hold down 180, flushed after 240
  Outgoing up date filter list for all interfacees is not set
  Incoming up date filter list for all interfacees is not set
  Redistributing: rip
  Default version control: send version 2, receive version 2
    Interface          Send Recv  Triggered RIP  Key-chain
    Ethernet0           2      2
    Ethernet1           2      2
  Automatic network summarization is not in effect
  Maximum path: 4
  Routing for Networks:
    190.171.0.0
    190.172.0.0
  Routing Information Sources:
    Gateway         Distance    Last Update
    190.171.23.10      120        00:00:22
    190.171.23.12      120        00:03:30
    190.172.32.10      120        00:00:16
  Distanger (default is 100)

CertKiller4#

```

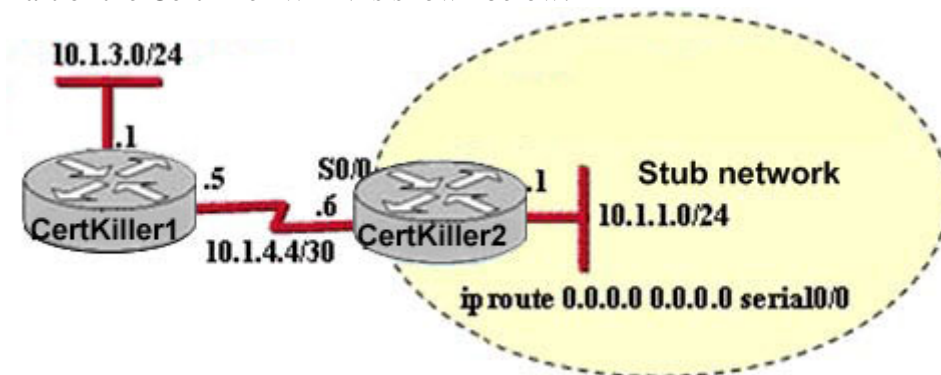
Based on the output of Certkiller 4 shown above, what can be determined about routes that are learned from the router at IP address 190.171.23.12?

- A. If Certkiller 4 Router does not receive an update from 190.171.23.12 in 30 seconds, all routes from that source will be removed from the routing table
- B. Certkiller 4 Router last received an update from 190.171.23.12 at 3:30am
- C. 190.171.23.12 is expected to send an update to Certkiller 4 Router for network 190.172.0.0 in 3 minutes and 30 seconds
- D. If Certkiller 4 Router does not receive an update from 190.171.23.12 in 30 seconds, all routes from that source will be flagged with a hold-down timer
- E. None of the above

Answer: A

### QUESTION 253:

Part of the Certkiller WAN is shown below:



In this Certkiller network segment, subnet 10.1.3.0/24 is unknown to router

Certkiller 2. Which router command will prevent router Certkiller 2 from dropping a packet destined for the 10.1.3.0/24 network if a default route is configured?

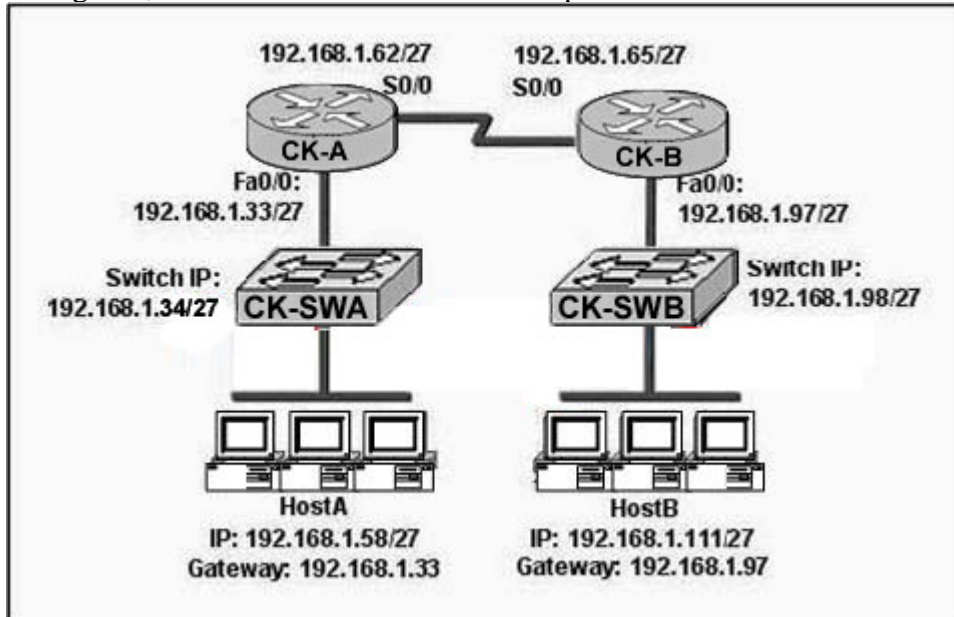
- A. ip default-network
- B. network 10.1.1.0
- C. ip classless
- D. network 10.1.1.0 0.0.0.255 area 0
- E. None of the above

Answer: C

---

**QUESTION 254:**

In the network below, HostA cannot ping HostB. Assuming routing is properly configured, what could be the cause of this problem?



- A. The Fa0/0 interface on RouterB is using a broadcast address.
- B. The serial interfaces of the routers are not on the same subnet.
- C. The address of SwitchA is a subnet address.
- D. The Fa0/0 interface on RouterA is on a subnet that can't be used.
- E. HostA is not on the same subnet as its default gateway.
- F. None of the above

Answer: B

Explanation:

A subnet mask of /27 (255.255.255.224) will have 3 bits used for the network portion and 5 bits for the host portion. This will create  $2^3 = 8$  networks with  $2^5 = 32$  hosts per network. From this we know that the number of subnets will be a multiple of 32, making the subnets:

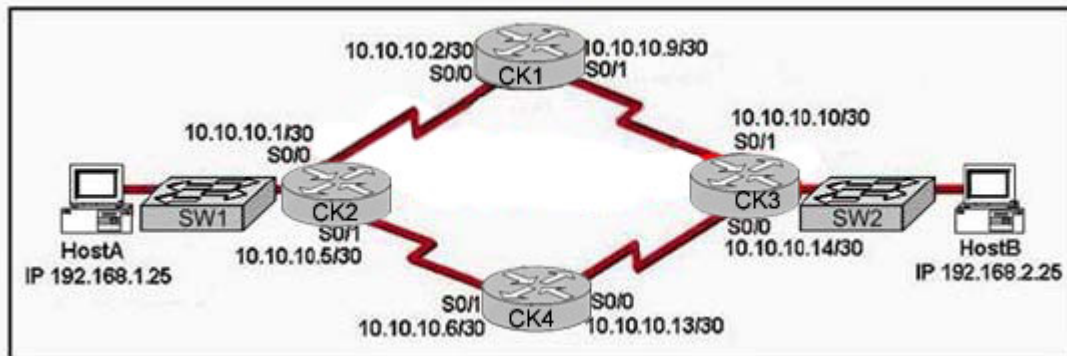
1. 192.168.1.0
2. 192.168.1.32
3. 192.168.1.64
4. 192.168.1.96
5. 192.168.1.128
6. 192.168.1.160
7. 192.168.1.192
8. 192.168.1.224

From this, we can see that the serial interface of router CK-A lies within the second network shown above while the serial interface of CK-B lies within the third. For directly connected routers they should be in the same IP subnet.

---

**QUESTION 255:**

The Certkiller network is shown in the exhibit below:



The show ip route command was issued from one of the routers shown in the exhibit and the following output was displayed:

```
10.0.0.0/30 is subnetted, 4 subnets
O 10.10.10.8 [110/128] via 10.10.10.2, 00:02:44, Serial0/0
O 10.10.10.12 [110/128] via 10.10.10.6, 00:02:44, Serial0/1
C 10.10.10.0 is directly connected, Serial0/0
C 10.10.10.4 is directly connected, Serial0/1
C 192.168.1.0/24 is directly connected, FastEthernet0/0
O 192.168.2.0/24 [110/138] via 10.10.10.6, 00:02:44, Serial0/1 [110/138] via 10.10.10.2, 00:02:44, Serial0
```

Which router produced this output?

- A. CK1
- B. CK2
- C. CK3
- D. CK4

Answer: B

Explanation:

You can see the host having address 192.168.1.25 is connected to the CK2 router through

switch SW1 in the ethernet port of the router. Based on the diagram, the 192.168.1.0 is connected to the LAN port of CK2 , and in the routing table we see that this network is indeed shown as a connected route on the Fa 0/0 interface.

---

**QUESTION 256:**

The following debug was used on a Certkiller router:

```
CertKiller3 #debug ip rip
RIP protocol debugging is on
CertKiller3#
1d05h: RIP: sending v1 update to 255.255.255.255 via FastEthernet0/0 (172.16.1.1)
1d05h: RIP: build update entries
1d05h: network 10.0.0.0 metric 1
1d05h: network 192.168.1.0 metric 2
1d05h: RIP: sending v1 update to 255.255.255.255 via Serial0/0 (10.0.8.1)
1d05h: RIP: build update entries
1d05h: network 172.16.0.0 metric 1
CertKiller3#
1d05h: RIP: received v1 update from 10.0.15.2 on Serial0/0
1d05h: 192.168.1.0 in 1 hops
1d05h: 192.168.168.0 in 16 hops (inaccessible)
```

Based on the information shown above, which of the following statement are true regarding the command output shown in the exhibit? (Choose two)

- A. There are at least two routers participating in the RIP process
- B. A ping to 10.0.15.2 will be successful
- C. A ping to 192.168.168.2 will successful
- D. RtrA has three interfaces participating in the RIP process

Answer: A, B

---

**QUESTION 257:**

The "show interface Ethernet 0" command was issued on a Certkiller router as shown below:



```
router# show interfaces ethernet 0
Ethernet 0 is up, line protocol is up
Hardware is MCI Ethernet, address is aa00.0400.0134 (via 0000.0c00.4369)
Internet address is 131.108.1.1, subnet mask is 255.255.255.0
MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec, rely 255/255, load 1/255
Encapsulation ARPA, loopback not set, keepalive set (10 sec)
ARP type: ARPA, PROBE, ARP Timeout 4:00:00
Last input 0:00:00, output 0:00:00, output hang never
Output queue 0/40 0 drops; input queue 0/75, 2 drops
Five minute input rate 01000 bits/sec, 1 packets/sec
Five-minute output rate 01000 bits/sec, 1 packets/sec
2295197 packets input, 305539992 bytes, 0 no buffer
Received 1925500 broadcasts, 534 runts, 0 giants
3 input errors, 3 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
0 input packets with dribble condition detected
3594664 packets output, 436549843 bytes, 0 underruns
8 output errors, 1790 collisions, 10 interface resets, 0 restarts
```

The router output shown in the graphic indicates that 534 runts have been detected by the router interface. What are possible causes of this condition?

- A. A large number of collisions
- B. A faulty network interface card
- C. A decrease in the size of the collision domain
- D. Fragment-free switching
- E. Incorrect network addressing
- F. TTL failures

Answer: A, B

Explanation:

Runts are packets that are discarded because they are smaller than the medium's minimum packet size. Any Ethernet packet that is less than 64 bytes is considered a runt. In half-duplex environments, it is possible for both the switch and the connected device to sense the wire and transmit at exactly the same time and result in a collision.

Collisions can cause runts, FCS, and alignment errors, caused when the frame is not completely copied to the wire, which results in fragmented frames.

Runts are the result of collisions, faulty NIC's, duplex mismatch, IEEE 802.1Q (dot1q), or an Inter-Switch Link Protocol (ISL) configuration issue.

Reference:

[http://www.cisco.com/en/US/products/hw/switches/ps700/products\\_tech\\_note09186a00800a7af0.shtml](http://www.cisco.com/en/US/products/hw/switches/ps700/products_tech_note09186a00800a7af0.shtml)

---

### QUESTION 258:

Why was the "show processes" command used on a Certkiller router before a debug command was entered on it?

- A. To verify that the CPU utilization is low enough to handle the effects of a debug command

- B. To verify the amount of space in flash memory
- C. To view the number of timers that are currently in use
- D. To check if the load meter file has enough space left to store the output of the debug command
- E. To verify the IOS version that is running
- F. None of the above

Answer: A

Explanation:

The show processes command displays information about the active processes. Issue the show processes cpu command to display detailed CPU utilization statistics on these processes and the show processes memory command to show the amount of memory used.

The following is a sample output of the show processes command:

CK1 #show processes

CPU utilization for five seconds: 0%/0%; one minute: 0%; five minutes: 0%

PID Q Ty PC Runtime(ms) Invoked uSecs Stacks TTY Process

1 C sp 602F3AF0 0 1627 0 2600/3000 0 Load Meter

2 L we 60C5BE00 4 136 29 5572/6000 0 CEF Scanner

3 L st 602D90F8 1676 837 2002 5740/6000 0 Check heaps

4 C we 602D08F8 0 1 0 5568/6000 0 Chunk Manager

5 C we 602DF0E8 0 1 0 5592/6000 0 Pool Manager

6 M st 60251E38 0 2 0 5560/6000 0 Timers

7 M we 600D4940 0 2 0 5568/6000 0 Serial Backgroun

8 M we 6034B718 0 1 0 2584/3000 0 OIR Handler

9 M we 603FA3C8 0 1 0 5612/6000 0 IPC Zone Manager

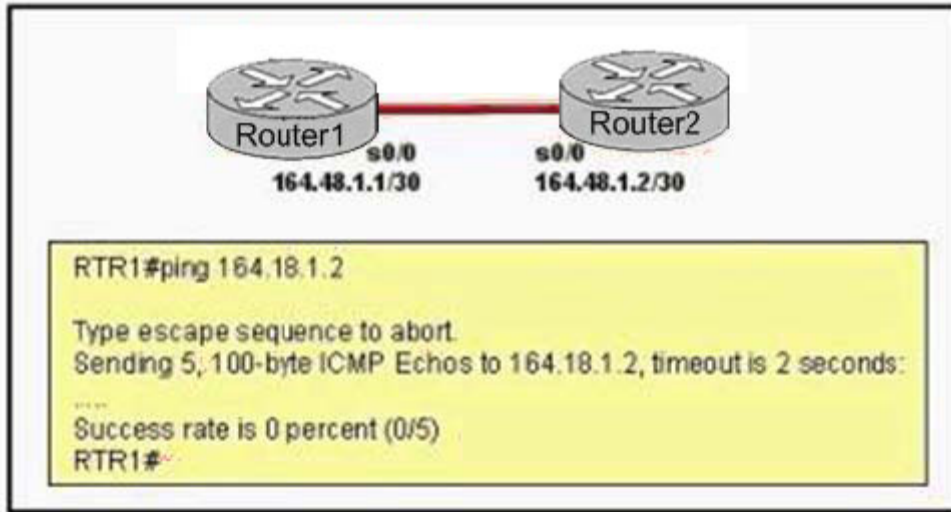
It is always a good idea to check the CPU utilization levels before doing anything that may increase the CPU load, such as using debug commands.

---

### **QUESTION 259:**

Two Certkiller routers are directly connected as shown below:





A network administrator cannot access Router2 from Router1. The interface is up and the line protocol is up on interface serial 0/0 on Router1. What command can the administrator enter on Router1 to verify the IP address of the serial interface on Router2?

- A. telnet 164.18.1.2
- B. show arp
- C. show cdp neighbors detail
- D. show interfaces
- E. show ip route
- F. trace 164.18.1.2
- G. None of the above

Answer: C

Explanation:

CDP is the Cisco proprietary protocol developed by Cisco, used to collect the information of locally attached or remote devices. If you are unable to ping but are connected, the interface's status for interface and line is up; then you can use the `show cdp neighbor detail` to collect the Router's ID, interface, assigned IP address, platform, etc. The following is sample output for the `show cdp neighbors detail` command.

router#show cdp neighbors detail

```
-----
Device ID: lab-7206
Entry address(es):
IP address: 172.19.169.83
Platform: cisco 7206VXR, Capabilities: Router
Interface: Ethernet0, Port ID (outgoing port): FastEthernet0/0/0
Holdtime : 123 sec
Version :
Cisco Internetwork Operating System Software
IOS (tm) 5800 Software (C5800-P4-M), Version 12.1(2)
```

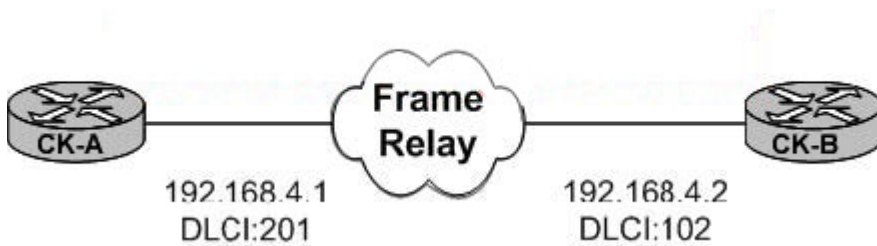
Copyright (c) 1986-2002 by Cisco Systems, Inc.  
advertisement version: 2  
Duplex: half

---

**QUESTION 260:**

Refer to the Certkiller network shown below. A ping from 192.168.4.1 to 192.168.4.2 was unsuccessful. Which three commands will provide the most useful troubleshooting information? (Choose three)

Exhibit:



- A. show interfaces
- B. show protocols
- C. show ip route
- D. show frame-relay map
- E. show frame-relay pvc
- F. show ip protocols

Answer: A, D, E

Explanation:

When troubleshooting connections between two directly connected routers over a frame relay network, the first step would be to issue the "show interfaces" command to ensure that the interfaces and line protocol is up for each. If they are indeed up, then the next step would be to troubleshoot the frame relay connection itself and looking at the status of the PVC by using the "show frame-relay map" and "show frame-relay pvc" commands.

Commonly Used Frame Relay Commands:

This section describes two Cisco IOS commands that are especially useful when configuring Frame Relay.

**show frame-relay pvc**

This command shows the status of the permanent virtual circuit (PVC), packets in and out, dropped packets if there is congestion on the line via forward explicit congestion notification (FECN) and backward explicit congestion notification (BECN), and so on. For a detailed description of the fields used with the show frame-relay pvc command, [click here](#).

**show frame-relay map**

Use this command to determine if frame-relay inverse-arp resolved a remote IP address to a local DLCI. This command is not enabled for point-to-point subinterfaces. It is

useful for multipoint interfaces and subinterfaces only.

Reference:

[http://www.cisco.com/en/US/partner/tech/CK713/CK237/technologies\\_tech\\_note09186a008014f8a7.shtml#topic11](http://www.cisco.com/en/US/partner/tech/CK713/CK237/technologies_tech_note09186a008014f8a7.shtml#topic11)

---

**QUESTION 261:**

A network administrator is having trouble with a remote router. The administrator connects to the router via telnet and types a debug command, but no debug output appears on the screen. What command should the administrator type to view the debug output?

- A. Certkiller 1# show debug
- B. Certkiller 1# debug all
- C. Certkiller 1# terminal monitor
- D. Certkiller 1# no debug \*
- E. Certkiller 1# enable debug

Answer: C

Explanation:

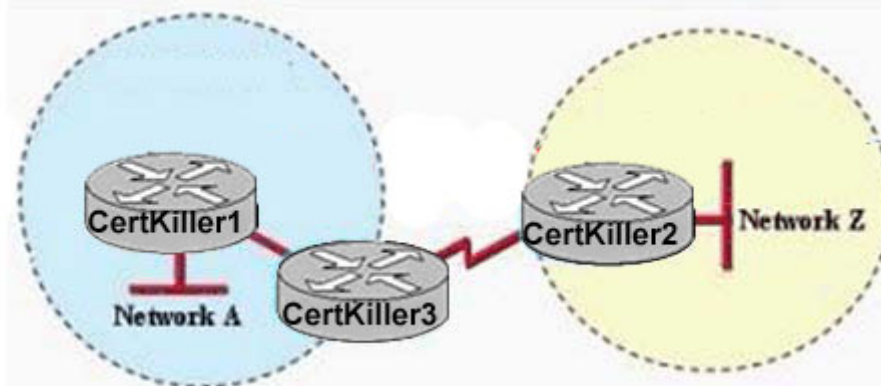
To display debug command output and system error messages for the current terminal and session, use the terminal monitor command in EXEC mode.

Remember that all terminal parameter-setting commands are set locally and do not remain in effect after a session is ended. By default, debug messages can be seen when connected to the router via the console, but not when using telnet.

---

**QUESTION 262:**

In the network below, a Certkiller user is trying to send a file from a host on Network A to a server on Network Z. The file transfer fails. The host on Network A can communicate with other hosts on Network A. Which command, issued from router Certkiller 1, would be the most useful for troubleshooting this problem?



- A. show version
- B. show flash:

- C. show interfaces
- D. show history
- E. show controllers serial
- F. None of the above

Answer: C

Explanation:

This problem is most likely due to a communication problem with the ftp server. Using the show interface command can be used to verify the IP address, speed, errors,, configuration, etc. One of the first steps in troubleshooting any connectivity issue is to issue the "show interfaces" command to ensure that all of the interfaces are up and active.

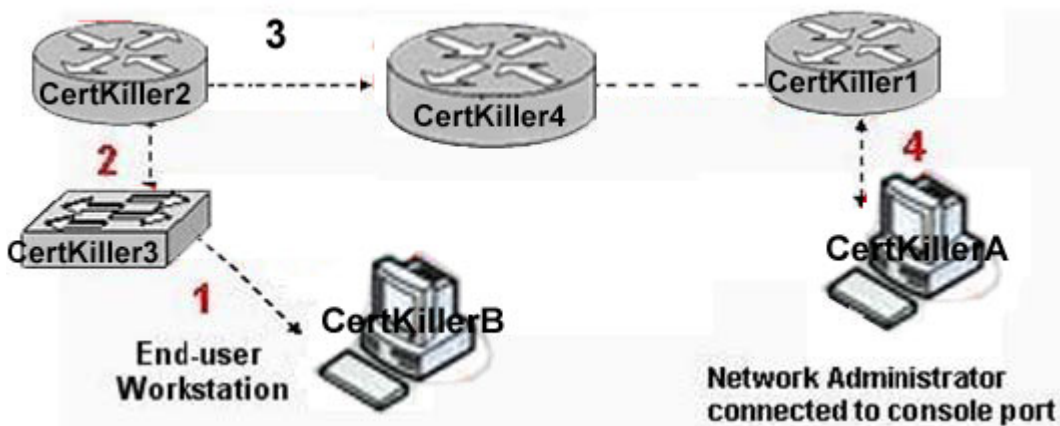
Incorrect Answers:

- A: This is used to verify the version of IOS that the router is using.
- B: This is used to see the contents of the flash memory.
- D: This command displays the past commands that were issued in the router.
- E: This should only be used after it has been determined that the serial interface is indeed faulty.

---

### QUESTION 263:

Part of the Certkiller network is shown below:



Based on the diagram shown above, what kind of cable should be used to make each connection that is identified by the numbers shown?

- A. 1 - Ethernet crossover cable
- 2 - Ethernet straight-through cable
- 3 - fiber optic cable
- 4 - rollover cable
- B. 1 - Ethernet rollover cable
- 2 - Ethernet crossover cable
- 3 - serial cable
- 4 - null modem cable
- C. 1 - Ethernet straight-through cable

- 2 - Ethernet straight-through cable
- 3 - serial cable
- 4 - rollover cable
- D. 1 - Ethernet straight-through cable
- 2 - Ethernet crossover cable
- 3 - serial cable
- 4 - rollover cable
- E. 1 - Ethernet straight-through cable
- 2 - Ethernet crossover cable
- 3 - serial cable
- 4 - Ethernet straight-through cable

Answer: C

Explanation:

When connecting other devices to a switch, such as a router or workstations, a straight through cable is used. The only exception to this rule is when you are connecting another switch to a switch, in which case a cross over cable should be used.

For a serial connection to another router or to a WAN, a serial cable should be used.

Finally, when connecting directly to the console port of a Cisco device, a rollover cable should be used. This cable is also commonly referred to as a console cable.

---

**QUESTION 264:**

In order to allow the establishment of a Telnet session with the Certkiller 2 router, which set of commands shown below, must be configured on it?

- A. Certkiller 2(Config)#line vty 0  
Certkiller 2(Config-line)#password cisco  
Certkiller 2(Config-line)#login
- B. Certkiller 2(Config)#line console 0  
Certkiller 2 (Config-line)#enable password cisco
- C. Certkiller 2(config)#line vty 0  
Certkiller 2(Config-line)#enable secret cisco  
Certkiller 2(Config-line)#ogin
- D. Certkiller 2(Config)#line vty 0  
Certkiller 2(Config-line)#enable password cisco
- E. Certkiller 2(config)#line console 0  
Certkiller 2(Config-line)#enable secret cisco  
Certkiller 2(Config-line)#login
- F. Certkiller 2(Config)#line console 0  
Certkiller 2(Config-line)#password cisco  
Certkiller 2(Config-line)#login
- G. None of the above

Answer: A

---

**QUESTION 265:**

Refer to the output shown below. Why was this message received?

```
CertKiller1#telnet 10.3.1.2
  Inping 10.3.1.2.... Open

  Password required, but None set

[Connection to 10.3.1.2 closed by foreign host]
CertKiller1#_
```

- A. The login command has not been set on CON 0.
- B. The login command has not been set on the VTY ports.
- C. No enable password has been set.
- D. No VTY password has been set.
- E. No enable secret password has been set.
- F. No console password has been set.

Answer: D

Explanation:

This error is generated due to no telnet being set. For security reasons, the Cisco router will not allow telnet access until a password has been set. You need to set the telnet password using the following example:

```
Router(config)#line vty 0 4
Router(config-line)#password telnet
Router(Config-line)#login
```

---

**QUESTION 266:**

You wish to increase the security of all of the routers within the Certkiller network. 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.

Answer: D, E

Explanation:

There are a total of 5 logical Virtual terminal interfaces in a Cisco router (lines 0-4) and

they are used for remote access into the device via telnet. Configuring these interfaces correctly with a login and password information can be used for security, as each user will be prompted for a password in order to obtain access. A second method is to use the "access-class" command. Combined with an access list, this command can be used to specify the hosts or networks that will be allow access to the device.

Incorrect Answers:

- A. Virtual terminal interfaces are logical interfaces that can not be manually shut down.
- B. Virtual terminal lines are logical interfaces that reside within a router, so there is nothing that can be physically secured.
- C. This command is used with access-lists for LAN and WAN interfaces, but is not used for the VTY lines.

---

**QUESTION 267:**

On router CK1 , the Certkiller network administrator issued the "service password-encryption" command. What is the effect of this configuration command?

- A. Only passwords configured after the command has been entered will be encrypted.
- B. Only the enable password will be encrypted.
- C. It will encrypt all current and future passwords.
- D. Only the enable secret password will be encrypted.
- E. It will encrypt the secret password and remove the enable secret password from the configuration.
- F. None of the above

Answer: C

---

**QUESTION 268:**

You want the text "Unauthorized access prohibited!" to be displayed before the login prompt every time someone tries to initiate a Telnet session to a Certkiller router, as shown in the example below:

```
Router#telnet 192.168.15.1
```

```
Trying 192.168.15.1 ... Open
```

```
Unauthorized access prohibited!
```

```
User Access Verification
```

```
Password:
```

Which command can be used to configure this message?

- A. login banner x Unauthorized access prohibited! X
- B. banner exec y Unauthorized access prohibited! Y
- C. banner motd x Unauthorized access prohibited! X
- D. vtv motd "Unauthorized access prohibited!"
- E. None of the above



Answer: C

Explanation:

The message text that is displayed when users log into the router is called the "message of the day" banner, and it can be changed with the "banner motd" command as shown in answer choice C.

---

**QUESTION 269:**

A Certkiller router was configured as shown below:

```
CertKillerC(config)# Enable password certkiller1
CertKillerC(config)# enable secret certkiller2
CertKillerC(config)# line vty 0 4
CertKillerC(config-line)# password certkiller3
CertKillerC(config-line)# exit
CertKillerC(config)# no enable certkiller2
```

A Certkiller .com technician is connected to the router console port. After configuring the commands displayed in the exhibit, the technician log out and then logs back in at the console. Which password does the technician need to enter at the router prompt get back into the privileged EXEC mode?

- A. Certkiller 1
- B. Certkiller 2
- C. Certkiller 3
- D. A password would not be required.

Answer: B

Explanation:

Certkiller 2 is the answer because the enable secret password is used to log back to the router before the enable password is used. The enable secret password always overwrites the enable password.

Answer C is incorrect because this is for the vty and not the console, so it will be required for the initial telnet login.

---

**QUESTION 270:**

Refer to the graphic. Although the console password was set to " Certkiller ", it displays in the router configuration as shown. What command caused the password to be stored like this?

```

CertKiller1 #show running-config
<<output omitted>>
line console 0
  exec-timeout 1 55
  password 7 094F60C0B1C1E
  login
transact input file
<<output omitted>>

```

- A. Certkiller 1(config)# encrypt password
- B. Certkiller 1(config)# password-encryption md 7
- C. Certkiller 1(config-line)# exec-timeout 1 55
- D. Certkiller 1(config)# service password-encryption
- E. None of the above

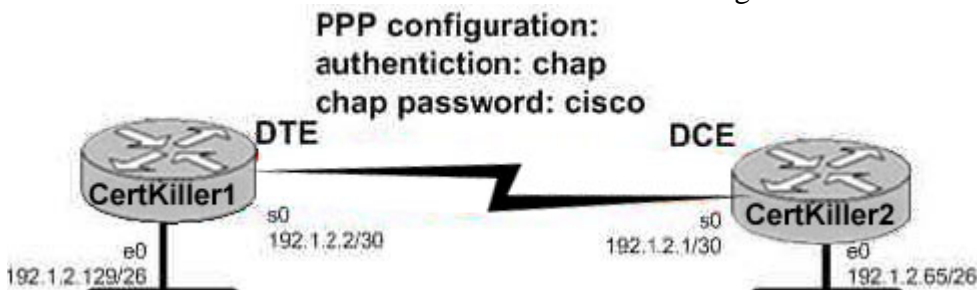
Answer: D

Explanation:

Certain types of passwords, such as Line passwords, by default appear in clear text in the configuration text file. You can use the service password-encryption command to make them more secure. Once this command is entered, each password configured is automatically encrypted and thus rendered illegible inside the configuration file (much as the Enable/Enable Secret passwords are). Securing Line passwords is doubly important in networks on which TFTP servers are used, because TFTP backup entails routinely moving config files across networks-and config files, of course, contain Line passwords.

### QUESTION 271:

The Certkiller 1 and Certkiller 2 routers are connected together as shown below:



Users on the Certkiller 1 LAN are able to successfully access the resources on the Certkiller 2 network. However, users on Certkiller 1 are unable to telnet to the Certkiller 2 router. What do you suspect are the likely causes of this problem? (Select two answer choices)

- A. PPP authentication configuration problem.
- B. A misconfigured IP address or subnet mask
- C. An access control list
- D. A defective serial cable.
- E. No clock rate on interface s0 on Certkiller 2
- F. A missing vty password.

Answer: C, F

Explanation:

An ACL or a router configured without a VTY password will prevent users from being able to telnet into a router.

Incorrect Answers:

A, B, D, E. We know that the network is connected together and communicating back and forth because of the two way CHAP authentication happening. In addition, the LAN users are able to get to each other with no problems. Therefore A is incorrect, B is incorrect, D is incorrect, and E is incorrect.

---

**QUESTION 272:**

An extended access list needs to be applied to a Certkiller router. What three pieces of information can be used in an extended access list to filter traffic? (Choose three)

- A. Source IP Address and destination IP address
- B. Source MAC address and destination MAC address
- C. Source switch port number
- D. VLAN number
- E. Protocol
- F. TCP or UDP port numbers

Answer: A, E, F

---

**QUESTION 273:**

The Certkiller administrator is implementing access control lists in the Certkiller network. What are two reasons that the Certkiller network administrator would use access lists? (Choose two.)

- A. To filter traffic as it passes through a router
- B. To filter traffic that originates from the router
- C. To replace passwords as a line of defense against security incursions
- D. To control broadcast traffic through a router
- E. To control VTY access into a router
- F. To encrypt traffic

Answer: A, E

---

**QUESTION 274:**

Router CK1 is configured with an inbound ACL. When are packets processed in this inbound access list?

- A. Before they are routed to an outbound interface.
- B. After they are routed for outbound traffic.
- C. After they are routed to an outbound interface while queuing.
- D. Before and after they are routed to an outbound interface.
- E. Depends on the configuration of the interface
- F. None of the above

Answer: A

Explanation:

When a packet is received on an interface with an inbound access list configured, the packets are matched against the access list to determine if they should be permitted or denied. After this check, the packets are processed by the routing function. The access list check is always done first.

Incorrect Answers:

B, C. The packets are always processed by the inbound access list prior to being routed.  
D. All packets are always checked against a specific access list only once. While packets traversing through a router may be checked against different access lists for each interface and in each direction (inbound and outbound), each access list is always only consulted once.

---

### **QUESTION 275:**

Many Certkiller routers are configured using access lists. Which of the following are benefits provided with access control lists (ACLs)? (Select all that apply)

- A. ACLs monitor the number of bytes and packets.
- B. Virus detection.
- C. ACLs identify interesting traffic for DDR.
- D. ACLs provide IP route filtering.
- E. ACLs provide high network availability.
- F. ACLs classify and organize network traffic.

Answer: C, D

Explanation:

IP access control lists allow a router to discard some packets based on criteria defined by the network engineer. The goal of these filters is to prevent unwanted traffic in the network - whether to prevent hackers from penetrating the network or just to prevent employees from using systems they should not be using.

IP access lists can also be used to filter routing updates, to match packets for prioritization, to match packets for prioritization, to match packets for VPN tunneling, and to match packets for implementing quality of service features. It is also used to specify the interesting traffic, which is used to trigger ISDN and Dial on Demand Routing (DDR) calls.

Reference:

CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 427

Incorrect Answers:

- A, F: ACLs do not provide for management and traffic analysis functions such as the monitoring and organization of network packets.
- B. While ACLs can be used to filter out some unwanted traffic; they can not be used to routinely provide for virus detection and removal.
- E. ACLs alone do not provide for any additional level of network availability.

---

**QUESTION 276:**

Router CK1 is configured using a named ACL. Which of the following answer choices are correct characteristics of named access list? (Select all that apply)

- A. You can delete individual statements in a named access list
- B. Named access lists require a numbered range from 1000 to 1099.
- C. Named access lists must be specified as standard or extended.
- D. You can use the ip access-list command to create named access lists.
- E. You cannot delete individual statements in a named access list.
- F. You can use the ip name-group command to apply named access lists.

Answer: A, C, D

Explanation:

Named access lists have two advantages over numbered access lists: the first one being that a name is easier to remember and the second being the fact that you can delete individual statements in a named access list. That makes A correct.

When you create a named access list you use the ip access-list command, and you have to specify whether it's standard or extended (since there are no numbers). So C and D are both correct. An example from the textbook is the command, "ip access-list extended Barney"

Incorrect Answers:

- B. Named access lists don't require a number range from 1000 to 1099 so B is incorrect.
- E. Answer choice E is not true.
- F. This is incorrect because the command ip name-group is absolutely unnecessary.

Reference: CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Pages 443-445

---

**QUESTION 277:**

A standard IP access list is applied to an Ethernet interface of router CK1 . What does this standard access list filter on?

- A. The source and destination addresses
- B. The destination port number
- C. The destination address

- D. The source address
- E. All of the above

Answer: D

Explanation:

The standard IP access-list will only filter on the source address contained in the packet. Extended access lists can filter on the source and destination address and port information.

---

**QUESTION 278:**

What are two reasons that the Certkiller network administrator would use access lists on a router? (Choose two.)

- A. To filter traffic as it passes through a router
- B. To filter traffic that originates from the router
- C. To replace passwords as a line of defense against security incursions
- D. To control vty access into a router
- E. To control broadcast traffic through a router

Answer: A, D

Explanation:

Access lists are used to process data received by a router can be divided into two broad categories:

1. traffic that passes through the router via the forwarding path (choice A)
2. traffic destined for the router via the receive path for route processor handling, such as ssh/telnet vty access (Choice D)

In normal operations, the vast majority of traffic simply flows through a router en route to its ultimate destination.

Incorrect Answers:

- B: Traffic originated by the router will bypass the access list.
- C: Access lists can be used to permit or deny access, but it can not be used to replace the need for passwords for authorizing users into the system.
- E: Routers do not forward broadcast traffic by default, and this is true regardless if access lists are configured or are not.

---

**QUESTION 279:**

Which of the following are characteristics of named access lists? (Choose three)

- A. Individual statements in a named access list may be deleted.
- B. They require a numbered range from 1000 to 1099.
- C. When created, they must be specified as standard or extended.
- D. They are created with the ip access-list command.

- E. The entire access list must be deleted before editing.
- F. They are applied with the ip name-group command.

Answer: A, C, D

Explanation:

You can identify IP access lists with an alphanumeric string (a name) rather than a number. Named access lists allow you to configure more IP access lists in a router than if you were to use numbered access lists. If you identify your access list with a name rather than a number, the mode and command syntax are slightly different. Currently, only packet and route filters can use a named list.

Consider the following guidelines before configuring named access lists:

Access lists specified by name are not compatible with Cisco IOS Releases prior to 11.2.

Not all access lists that accept a number will accept a name. Access lists for packet filters and route filters on interfaces can use a name.

A standard access list and an extended access list cannot have the same name.

To configure a named access list (standard and extended):

Router(config)# ip access-list standard <i>name</i>	Defines a standard IP access list using a name and enters standard named access list configuration mode.
---	--

Router(config)# ip access-list extended <i>name</i>	Defines an extended IP access list using a name and enters extended named access list configuration mode.
---	---

Reference:

[http://www.cisco.com/en/US/products/ps6350/products\\_configuration\\_guide\\_chapter09186a0080430e5b.html](http://www.cisco.com/en/US/products/ps6350/products_configuration_guide_chapter09186a0080430e5b.html)

---

### **QUESTION 280:**

What are the general recommendations regarding the placement of access control lists? (Choose two)

- A. Standard ACL's should be placed as close as possible to the source of traffic to be denied.
- B. Extended ACL's should be placed as close as possible to the source of traffic to be denied .
- C. Standard ACL's should be placed as close as possible to the destination of traffic to be denied .
- D. Extended ACL's should be placed as close as possible to the destination of traffic to be denied .

Answer: B, C

Explanation:

Standard Access Lists:

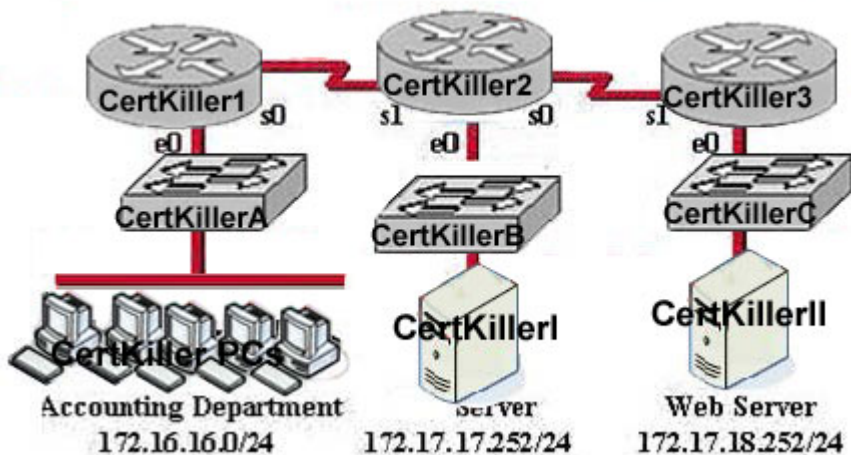
1 Access-list list# {permit/deny} source IP [wildcard mask]



1 interface [router port]  
 1 ip access-group [list#] in out (out is the default)  
 1 If a match is made, the action defined in this access list statement is performed.  
 1 If no match is made with an entry in the access list, the deny action is performed (implicit deny)  
 1 Should be put close to the destination address because you can not specify the destination address, only the source information is looked at.  
 Extended Access List:  
 1 Access-list list# {permit/deny} protocol source [source mask] destination [destination mask] operator [port]  
 1 Should be put close to the source  
 1 Since extended ACL's have destination information, you want to place it as close to the source as possible.  
 1 Place an extended ACL on the first router interface the packet enters and specify inbound in the access-group command.

### QUESTION 281:

Part of the Certkiller network is shown in the following topology exhibit:



In this network, an access list has been designed to prevent HTTP traffic from the accounting department from reaching the Certkiller I server attached to the Certkiller 2 router. Which of the following access lists will accomplish this task when grouped with the e0 interface on the Certkiller router?

- A. permit ip any any  
deny tcp 172.17.17.252 0.0.0.0 172.16.16.0 0.0.0.255 eq 80
- B. deny tcp 172.17.17.252 0.0.0.0 172.16.16.0 0.0.0.255 eq 80  
permit ip any any
- C. deny tcp 172.16.16.0 0.0.0.255 172.17.17.252 0.0.0.0 eq 80  
permit ip any any
- D. permit ip any any  
deny tcp 172.16.16.0 0.0.0.255 172.17.17.252 0.0.0.0 eq 80
- E. None of the above

Answer: C

---

**QUESTION 282:**

For security reasons, the Certkiller network administrator needs to prevent pings into the corporate networks from hosts outside the internetwork. Using access control lists, which protocol should be blocked?

- A. IP
- B. UDP
- C. TCP
- D. ICMP
- E. None of the above

Answer: D

Explanation:

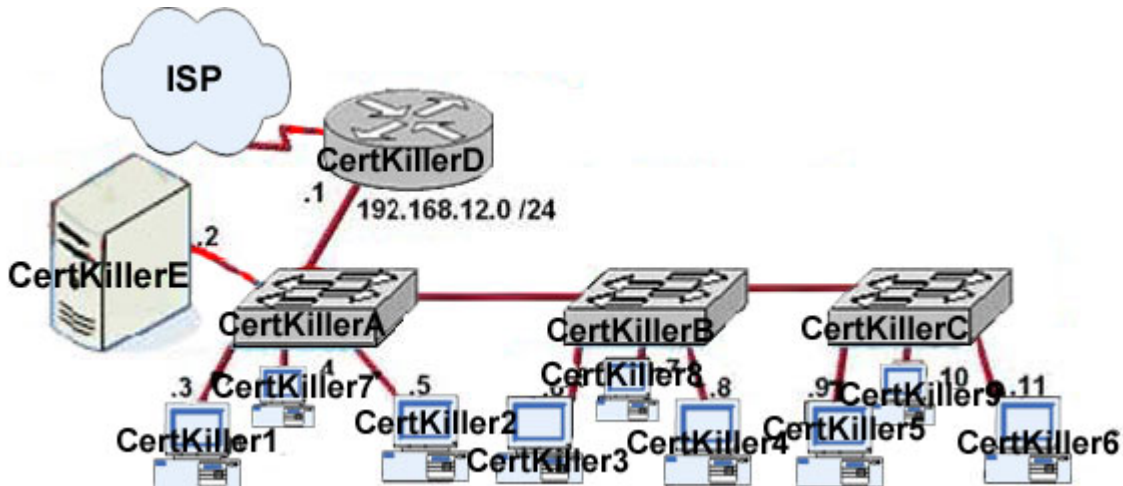
A ping is a computer network tool used to test whether a particular host is reachable across an IP network. It works by sending ICMP "echo request" packets to the target host and listening for ICMP "echo response" replies. ping estimates the round-trip time, generally in milliseconds, and records any packet loss, and prints a statistical summary when finished.

ICMP ping packet				
	Bit 0 - 7	Bit 8 - 15	Bit 16 - 23	Bit 24 - 31
Header	Version/IHL	Type of service	Length	
Identification		flags et offset		
Time To Live(TTL)	Protocol		CRC	
Source IP address				
Destination IP address				
Payload	Type of message	Code	CRC	
Quench				
Data (optional)				

---

**QUESTION 283:**

Part of the Certkiller network is shown below:



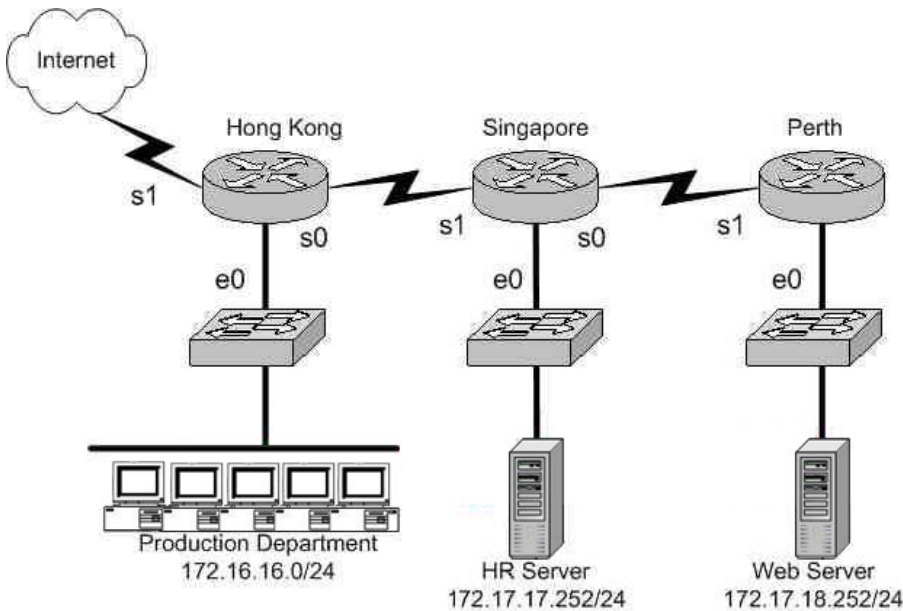
You work as a network technician at Certkiller . Certkiller is concerned about unauthorized access to the Certkiller E server. The Certkiller 1, Certkiller 4, Certkiller 6 and Certkiller 7 PCs should be the only computers with access to the Certkiller E server. What two technologies should be implemented to help prevent unauthorized access to this server? (Choose two)

- A. Encrypted router passwords
- B. VLANs
- C. STP
- D. VTP
- E. Access lists
- F. Wireless LANs
- G. Switches

Answer: B, E

#### QUESTION 284:

The Certkiller worldwide WAN is shown in the exhibit below:



On the Hong Kong router an access list is needed that will accomplish the following:

1. Allow a Telnet connection to the HR Server through the Internet
  2. Allow internet HTTP traffic to access the webserver
  3. Block any other traffic from the internet to everything else
- Which of the following access list statements are capable of accomplishing these three goals? (Select all that apply)

- A. access-list 101 permit tcp any 172.17.18.252 0.0.0.0 eq 80
- B. access-list 1 permit tcp any 172.17.17.252 0.0.0.0 eq 23
- C. access-list 101 permit tcp 172.17.17.252 0.0.0.0 any eq 23
- D. access-list 101 deny tcp any 172.17.17.252 0.0.0.0 eq 23
- E. access-list 101 deny tcp any 172.17.18.252 0.0.0.0 eq 80
- F. access-list 101 permit tcp any 172.17.17.252 0.0.0.0 eq 23

Answer: A, F

Explanation:

Because of the implicit deny rule at the end of every access list, only two choices need to be made, as the final requirement is automatic.

A. This is correct as we need to allow the access list to allow port 80 connections (port 80 = HTTP) from anywhere, to the web server's IP address.

F. This will fulfill the first requirement, as it allows port 23 (Telnet) traffic from anywhere.

Incorrect Answers:

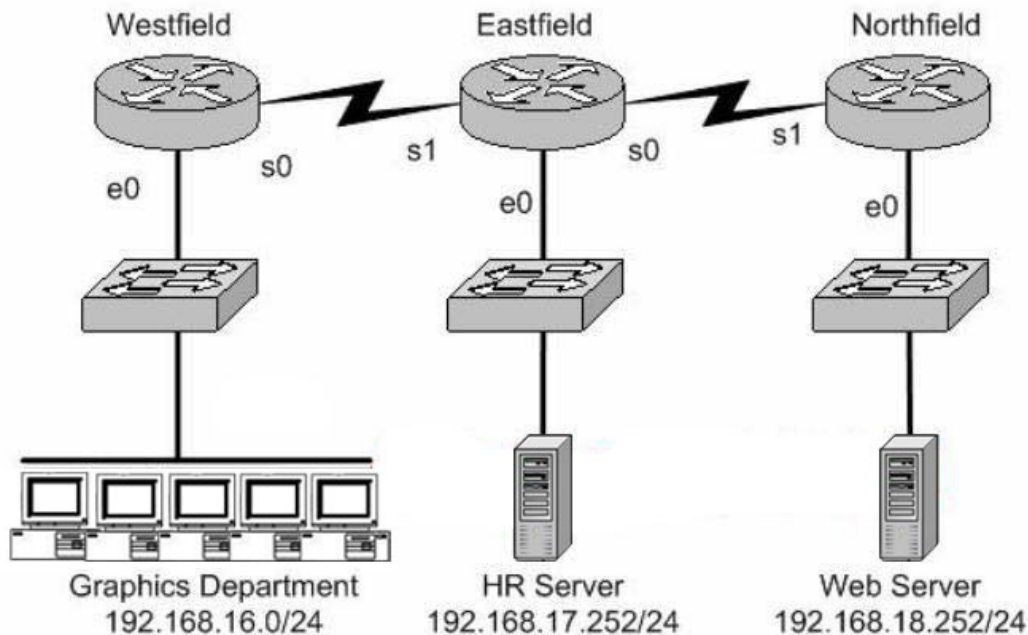
B. The answer asks you to create an access list, a single one. The answer choices require you to choose two answers. For two statements to be on the same list, you need them to have the same number. So answer choice B can be ruled out by process of elimination. In addition to this, access list 1 is an illegal number, since we need an extended access list to use source and destination information, and extended access lists are in the 100-199 range.

C. This is incorrect as it allows telnet traffic from the HR server to the Internet, but we need it to be the other way around.

D, E: Because of the implicit deny any rule; we need to only be concerned with the access rules that permit traffic.

### QUESTION 285:

The Certkiller WAN is displayed below:



An access list needs to be implemented that will block users from the Graphics Department from telnetting to the HR server; and this list is to be implemented on the Ethernet 0 interface of the Westfield router for the inbound direction. All other office communications should be allowed. Which of the following answer choices would accomplish this?

- A. deny tcp 192.168.16.0 0.0.0.255 192.168.17.252 0.0.0.0 eq 23  
permit ip any any
- B. permit ip any any  
deny tcp 192.168.16.0 0.0.0.255 192.172.252 0.0.0.0 eq 23
- C. permit ip any any  
deny tcp 192.168.17.252 0.0.0.0 192.168.0 0.0.0.255 eq 23
- D. deny tcp 192.168.18.262 0.0.0.0 192.168.16.0 0.0.0.255 eq 23  
permit ip any any
- E. None of the above

Answer: A

Explanation:

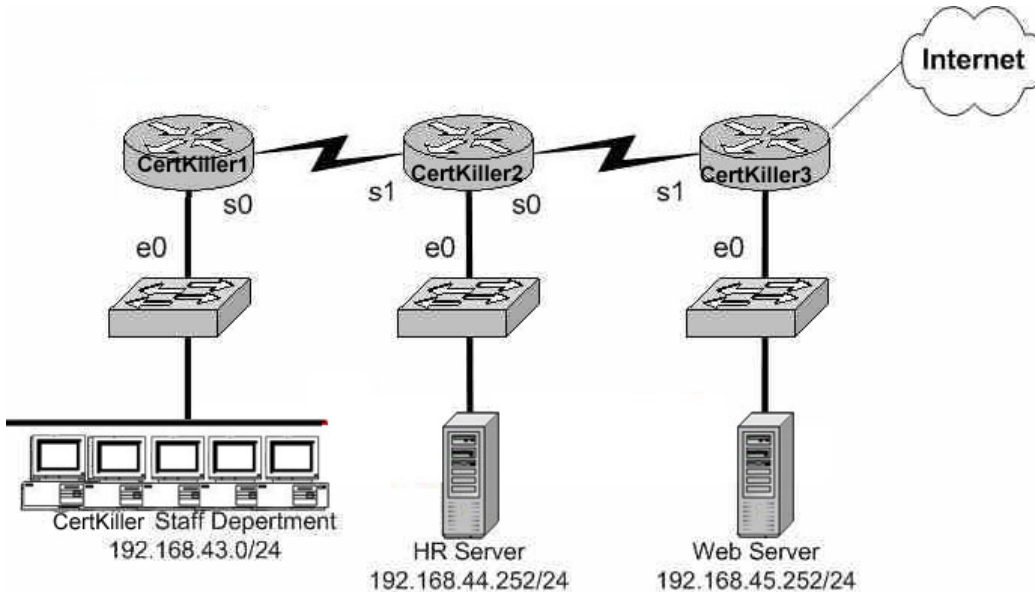
The syntax for an access list is the source address first then the destination address. In this case the source address is 192.168.16.0/24 and the destination address

192.168.17.252. The "permit ip any any" statement is required because of the implicit deny all at the end of every access list. Generally speaking, all access lists require at least one permit statement, otherwise all traffic will be denied through the interface.

---

**QUESTION 286:**

The Certkiller WAN is shown below:



Your goal is to allow FTP access to the HR server, while blocking out all other traffic. Which of the access list configurations below will fulfill your goal? (Select two answer choices)

- A. Access-list 101 Permit tcp any 192.168.44.252 0.0.0.0 eq 21
- B. Access-list 101 Permit tcp any 192.168.44.252 0.0.0.0 eq 20
- C. Access-list 101 Permit tcp 192.168.44.252 0.0.0.0 any eq 20
- D. Access-list 101 Permit tcp 192.168.44.252 0.0.0.0 any eq 21
- E. Access-list 101 Deny tcp any 192.168.44.255 0.0.0.0 gt 21
- F. Access-list 101 Permit tcp 192.168.44.255 0.0.0.0 any gt 21

Answer: A, B

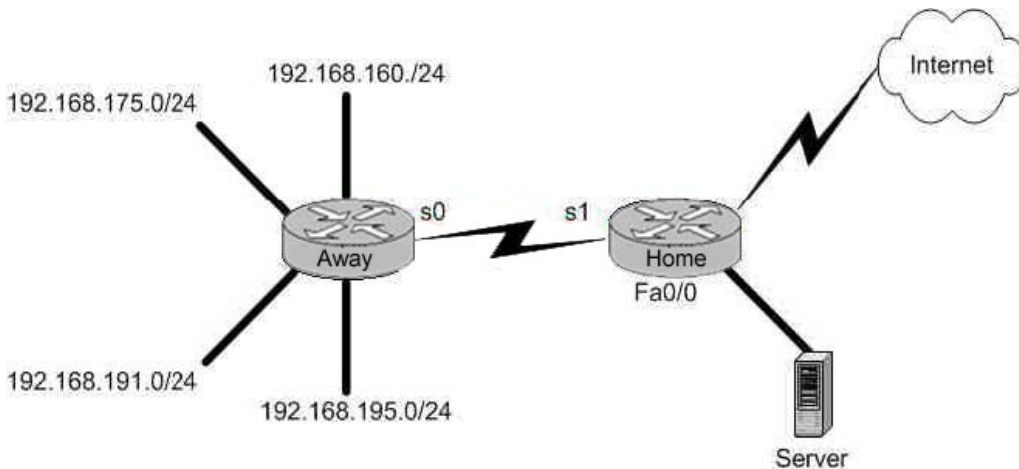
Explanation:

FTP uses two ports: TCP port 20 and TCP port 21. you want to allow all hosts (ANY) to access the HR server (192.168.44.252 0.0.0.0) through ftp (eq 20 & eq 21) and the implicit deny any rule will block everything else.

---

**QUESTION 287:**

The Certkiller Network is displayed in the flowing diagram:



You need to place an access list on the Fa0 interface of the Home router; that will deny access to all hosts that lie within the range 192.168.160.0-192.168.191.0. Hosts in the 192.168.195.0 network should be granted full access. Which one of the following answer choices fulfills your needs?

- A. access-list 1 deny 192.168.163.0 0.0.0.255
- B. access-list 1 deny 192.168.128.0 0.0.127.255
- C. access-list 1 deny 192.168.160.0 0.0.255.255
- D. access-list 1 deny 192.168.160.0 0.0.31.255
- E. None of the above

Answer: D

Explanation:

This question is really more of an inverse subnet masking questions than a security question. Your goal is to block access to the host range 192.168.160.0- 192.168.191.0 while allowing everything else (including hosts from 192.168.195.0) full access. Answer choice D is correct because the address and mask are numbered correctly.

### QUESTION 288:

Which of the following access list statements would deny traffic from a specific host?

- A. Router(config)# access-list 1 deny 172.31.212.74 any
- B. Router(config)# access-list 1 deny 10.6.111.48 host
- C. Router(config)# access-list 1 deny 172.16.4.13 0.0.0.0
- D. Router(config)# access-list 1 deny 192.168.14.132 255.255.255.0
- E. Router(config)# access-list 1 deny 192.168.166.127 255.255.255.255

Answer: C

Explanation:

Only choice C is the correct syntax for a specific host. The access list is denying all



traffic from the host with IP address 172.16.4.13. It is important to note that in an access list, the subnet mask is the inverse. Normally, a host subnet mask is 255.255.255.255, but in an access list it is 0.0.0.0.

Incorrect Answers:

- A. The syntax is incorrect here, as there is no subnet mask at all specified.
- B. This would be an acceptable choice, if the "host" keyword were placed in front of the IP address, not after.
- D. The subnet mask here includes the entire class C network here, not an individual host.
- E. In an access list, the subnet mask is an inverse mask. The mask specified here would be equivalent to all 0's in a subnet mask, meaning that the don't care bits apply to the entire address.

---

**QUESTION 289:**

Which IP address and wildcard mask would you use in your ACL to block all the hosts in the subnet 192.168.16.43/28?

- A. 192.168.16.32 0.0.0.16
- B. 192.168.16.43 0.0.0.212
- C. 192.168.16.0 0.0.0.15
- D. 192.168.16.32 0.0.0.15
- E. 192.168.16.0 0.0.0.31
- F. 192.168.16.16 0.0.0.31

Answer: D

Explanation:

Since there are 28 bits in the subnet mask, we can find the inverse mask by reversing the 1's and 0's.

/28 = 11111111.11111111.11111111.11110000

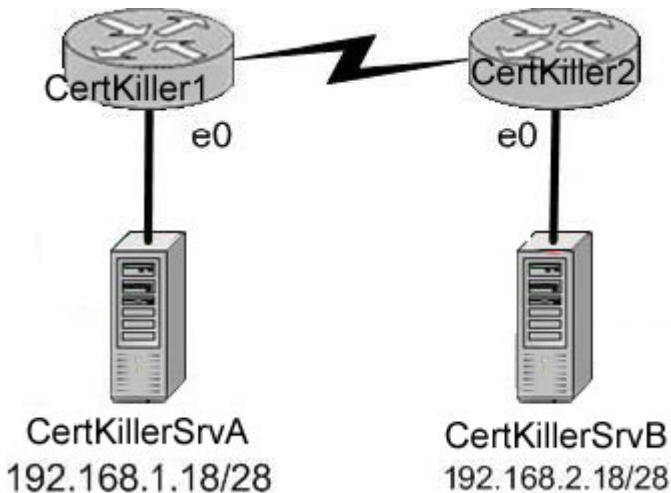
/28 Inverse = 00000000.00000000.00000000.00001111 = 192.168.16.32/15

The address 192.168.16.32 and the wildcard mask 0.0.0.15 is the correct answer as shown. This will match all addresses in the 192.168.16.32-192.168.16.47 range.

---

**QUESTION 290:**

Two Certkiller routers are connected together as shown below:



In order to control access on the Certkiller network, the following access list is created:

```
access-list 101 permit tcp 192.168.1.16 0.0.0.15 192.168.2.16 0.0.0.15 eq 23
```

What would happen if you applied the following ACL to any one of the Certkiller routers in the above exhibit? On what interface and what direction should you apply it? Once applied, what will this access list accomplish? (Select all valid answer choices)

- A. Telnet traffic from 192.168.1.16 0.0.0.15 to 168.2.16 0.0.0.15 is allowed.
- B. SMTP traffic from 192.168.1.16 0.0.0.15 to 168.2.16 0.0.0.15 is allowed.
- C. The ACL is configured to allow traffic from one specific host to another.
- D. The ACL should be applied inbound to the e0 interface of Router Certkiller 1.
- E. The ACL should be applied outbound to the e0 interface of Router Certkiller 1.

Answer: A, D

Explanation:

This is a two part question. The first part is the type of traffic that will match this specific access list entry. Since telnet uses TCP port 23, choice A is correct.

Next, to determine which interface and which direction to apply the access list, we see that the source of the traffic is the 192.168.1.16/28 network, while the destination is the 192.168.2.16/28 network. Therefore, only choice D makes sense.

Incorrect Answers:

- B. SMTP uses TCP port 25.
- C. There is a /15 network mask for both the source and destination in this access list, which translates to a /28 network.
- E. This would not be useful if applied to the outbound, as no traffic would match then. Note that if this answer had stated that the access list be placed on the outbound serial (WAN) interface, then this would have been an acceptable choice.

## QUESTION 291:

The Certkiller network is subnetted using 29 bits for the subnet mask. Which wild card 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
- G. None of the above

Answer: E

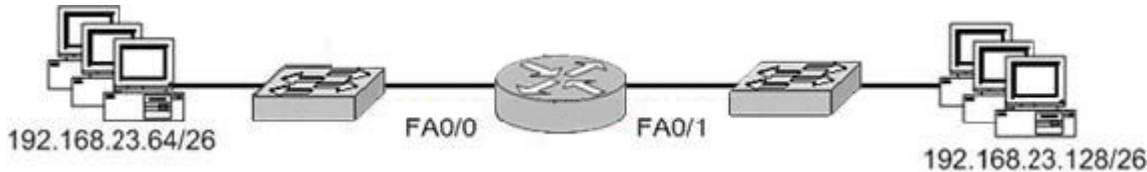
Explanation:

Class C wild card masks start with 0.0.0.x. The subnet used in this example is 29 bits, or subnet mask 255.255.255.248. Therefore, we are left with 7 hosts in the final octet (255-248) so the answer is 0.0.0.7.

---

#### **QUESTION 292:**

Part of the Certkiller network is shown below:



The Certkiller network administrator wants to prevent computers on the 192.168.23.64/26 subnet from accessing the 192.168.23.128/26 subnet via FTP. All other hosts should be allowed to access. What commands should be entered on the router to accomplish this task?

- A. Router(config)#access-list 101 deny tcp 192.168.23.64 0.0.0.63 192.168.23.128 0.0.0.63 eq ftp  
Router(config)#access-list 101 permit ip any any  
Router(config)#interface fa0/0  
Router(config-if)#ip access-group 101 in
- B. Router(config)  
#access-list 101 deny tcp 192.168.23.64 0.0.255 192.168.23.128 0.0.0.255 eq ftp  
Router(config)#access-list 101 permit ip any any  
Router(config)#interface fa0/0  
Router(config-if)#ip access-group 101 in
- C. Router(config)#access-list 101 deny tcp 192.168.23.64 0.0.0.63 192.168.23.128 0.0.0.63 eq ftp  
Router(config)#access-list 101 permit ip any any  
Router(config)#interface fa0/0  
Router(config-if)#access-list 101 out

D. Router(config)#access-list 101 deny tcp 192.168.23.64 0.0.0.255 192.168.23.128 0.0.0.255 eq ftp  
Router(config)#access-list 101 permit ip any any  
Router(config)#interface fa0/1  
Router(config-if)#ip access-group 101 in  
E. Router(config)#access-list 101 deny tcp 192.168.23.128 0.0.0.63 192.168.23.64 0.0.0.63 eq ftp  
Router(config)#access-list 101 permit ip any any  
Router(config)#interface fa0/1  
Router(config-if)#ip access-group 101 in  
F. Router(config)#access-list 101 deny tcp 192.168.23.128 0.0.0.255 192.168.23.128 0.0.0.255 eq ftp  
Router(config)#access-list 101 permit ip any any  
Router(config)#interface fa0/1  
Router(config-if)#ip access-group 101 out

Answer: A

Explanation:

Only choice A specifies the correct wildcard mask and direction. If we apply the access list to interface FA0/0, we need to specify incoming FTP traffic from the 192.168.23.64/26 network to the 192.168.23.128/26 network.

Incorrect Answers:

B, D, F. The wildcard mask for a /26 network is 0.0.0.63, not 0.0.0.255.

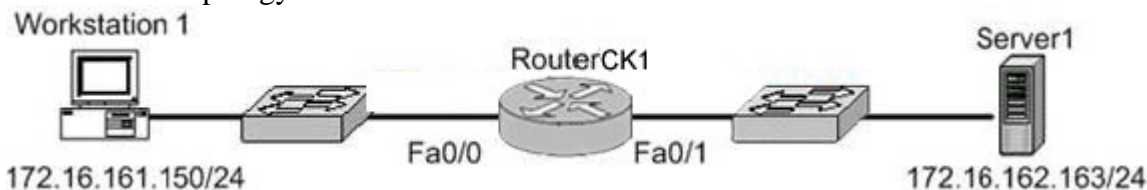
C. This access list statement is correct, but when it is applied to the FA0/0 interface it needs to be in the incoming direction.

E. This access list needs to be applied to interface FA0/0, not FA0/1. Alternatively, it could have been applied to interface FA0/1, but in the outbound direction, not the inbound direction.

---

### QUESTION 293:

The network topology for a Certkiller location is shown below:



Refer to the graphic. It has been decided that Workstation 1 should be denied access to Server1. Which of the following commands are required to prevent only Workstation 1 from accessing Server1 while allowing all other traffic to flow normally? (Choose two)

A. Router CK1 (config)# interface fa0/0  
Router CK1 (config-if)# ip access-group 101 out  
B. Router CK1 (config)# interface fa0/0

Router CK1 (config-if)# ip access-group 101 in  
C. Router CK1 (config)# access-list 101 deny ip host 172.16.161.150 host 172.16.162.163  
Router CK1 (config)# access-list 101 permit ip any any  
D. Router CK1 (config)# access-list 101 deny ip 172.16.161.150 0.0.0.255 172.16.162.163 0.0.0.0  
Router CK1 (config)# access-list 101 permit ip any any

Answer: B, C

Explanation:

To block communication between Workstation A and Server 1, we have to configure Extended Access List.

To define an extended IP access list, use the extended version of the access-list command in global configuration mode. To remove the access lists, use the no form of this command.

access-list access-list-number [dynamic dynamic-name [timeout minutes]] {deny | permit} protocol source source-wildcard destination destination-wildcard

Source Address will be of the Workstation A i.e. 172.16.161.150 and destination address will be of the Server 1 i.e. 172.16.162.163.

The access list will be placed on the FA0/0 of Router CK1 .

---

### **QUESTION 294:**

Which wild card mask will enable a network administrator to permit access to the Internet for only hosts that are assigned an address in the range 192.168.8.0 through 192.168.15.255?

- A. 0.0.0.0
- B. 0.0.0.255
- C. 0.0.255.255
- D. 0.0.7.255
- E. 0.0.3.255
- F. None of the above

Answer: D

Explanation:

Wildcard mask summarization example:

This list describes how to summarize a range of networks into a single network for ACL optimization. Consider these networks.

192.168.32.0/24

192.168.33.0/24

192.168.34.0/24

192.168.35.0/24

192.168.36.0/24

192.168.37.0/24

192.168.38.0/24

192.168.39.0/24

The first two octets and the last octet are the same for each network. This table is an explanation of how to summarize these into a single network.

The third octet for the above networks can be written as seen in this table, according to the octet bit position and address value for each bit.

Decimal	128	64	32	16	8	4	2	1
32	0	0	1	0	0	0	0	0
33	0	0	1	0	0	0	0	1
34	0	0	1	0	0	0	1	0
35	0	0	1	0	0	0	1	1
36	0	0	1	0	0	1	0	0
37	0	0	1	0	0	1	0	1
38	0	0	1	0	0	1	1	0
39	0	0	1	0	0	1	1	1
	M	M	M	M	M	D	D	D

Since the first five bits match, the above eight networks can be summarized into one network (192.168.32.0/21 or 192.168.32.0 255.255.248.0). All eight possible combinations of the three low-order bits are relevant for the network ranges in question. This command defines an ACL that permits this network. If you subtract 255.255.248.0 (normal mask) from 255.255.255.255, it yields 0.0.7.255.

access-list acl\_permit permit ip 192.168.32.0 0.0.7.255

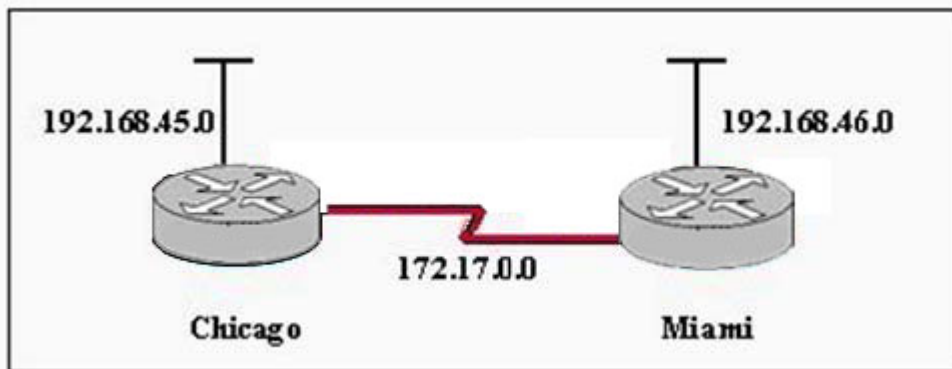
Reference:

[http://www.cisco.com/en/US/products/sw/secursw/ps1018/products\\_tech\\_note09186a00800a5b9a.shtml#topic2](http://www.cisco.com/en/US/products/sw/secursw/ps1018/products_tech_note09186a00800a5b9a.shtml#topic2)

---

### QUESTION 295:

Two Certkiller routers are connected as shown below:



A network administrator in Miami has been instructed to prevent all traffic originating on the Chicago LAN from entering the Miami router. Which statement would accomplish this filtering?

- A. access-list 101 deny ip 192.168.45.0 0.0.0.255 any
- B. access-list 101 deny ip 192.168.45.0 0.0.0.0 any
- C. access-list 101 deny ip 192.168.46.0 0.0.0.255 192.168.45.0 0.0.0.255
- D. access-list 101 deny ip 192.168.46.0 0.0.0.255 any

Answer: A

Explanation:

Using access-list we can allow or deny the packets from different hosts or networks.

There are two types of access-list standard and extended access list.

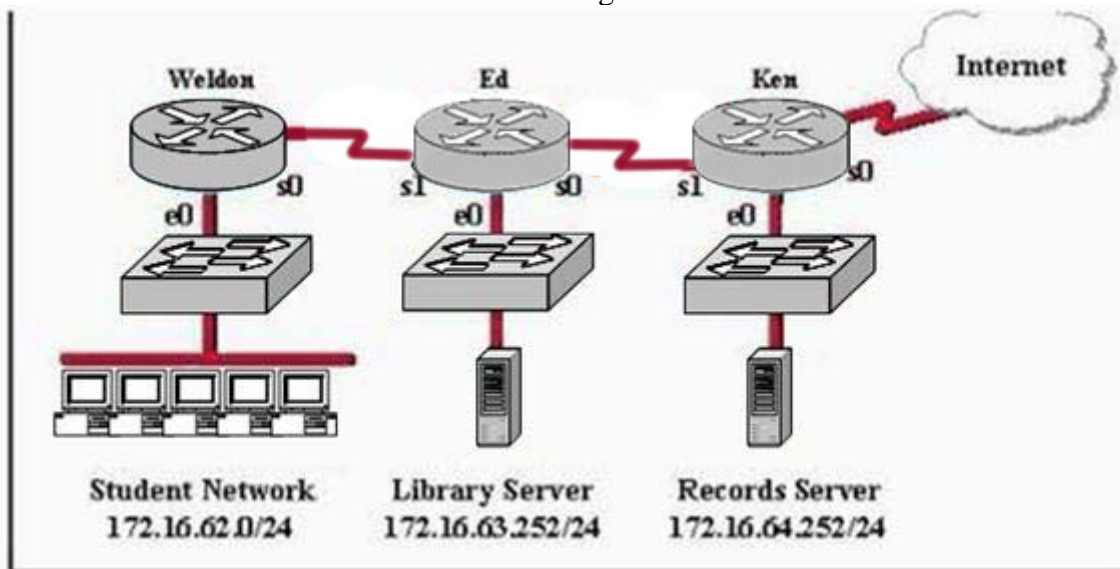
Standard. Standard Access List can allow or deny the request only on the basis of source address. Extended Access list can allow or deny on the basis of source, destination, protocol, port etc.

Syntax of standard Access List:

access-list ACL number permit | deny protocol source address netmask service

### QUESTION 296:

The Certkiller network is shown in the following exhibit:



Refer to the graphic. A named access list called records\_block has been written to prevent student and Internet access to the records server. All other users within the enterprise should have access to this server. The list was applied to the e0 interface of the Ken router in the outbound direction. Which of the following conditions should the access list contain to meet these requirements? (Choose two.)

- A. deny 172.16.64.252 0.0.0.0 172.16.62.0 0.0.0.255
- B. deny 172.16.62.0 0.0.0.255 172.16.64.252 0.0.0.0
- C. deny 172.16.64.252 0.0.0.0 any
- D. permit 172.16.64.252 0.0.0.0 172.16.0.0 0.0.255.255
- E. permit 172.16.0.0 0.0.255.255 172.16.64.252 0.0.0.0



F. permit any any

Answer: B, E

Explanation:

When you create the named access list, you can start your policy from permit or deny. As per the question, traffic from the internet access and student networks need to be blocked, with the student network lies on 172.16.62.0/24 network.

The "deny 172.16.62.0 0.0.0.255 172.16.64.0 0.0.0.255" command will deny access from the student network accessing the Record Server. If you don't permit to any other network then at last explicit deny to all.

The "permit 172.16.0.0 0.0.255.255 172.16.64.252 0.0.0.0" allows all other hosts from the 172.16 network to access the Record Server. The implicit deny all will then block Internet users from accessing the records server.

---

**QUESTION 297:**

You are securing a network for Certkiller and want to apply an ACL (access control list) to an interface of a router. Which one of the following commands would you use?

- A. permit access-list 101 out
- B. ip access-group 101 out
- C. apply access-list 101 out
- D. access-class 101 out
- E. ip access-list e0 out
- F. None of the above

Answer: B

Explanation:

To enable an ACL on an interface and define the direction of packets to which the ACL is applied, the ip access-group command is used. In this example, the access list is applied to packets going out of the interface. Packets coming in on the interface are not checked against access list 101.

---

**QUESTION 298:**

The following access list below was applied outbound on the E0 interface connected to the 192.169.1.8/29 LAN:

access-list 135 deny tcp 192.169.1.8 0.0.0.7 eq 20 any

access-list 135 deny tcp 192.169.1.8 0.0.0.7 eq 21 any

How will the above access lists affect traffic?

- A. FTP traffic from 192.169.1.22 will be denied.
- B. No traffic, except for FTP traffic will be allowed to exit E0.

- C. FTP traffic from 192.169.1.9 to any host will be denied.
- D. All traffic exiting E0 will be denied.
- E. All FTP traffic to network 192.169.1.9/29 will be denied.

Answer: D

Explanation:

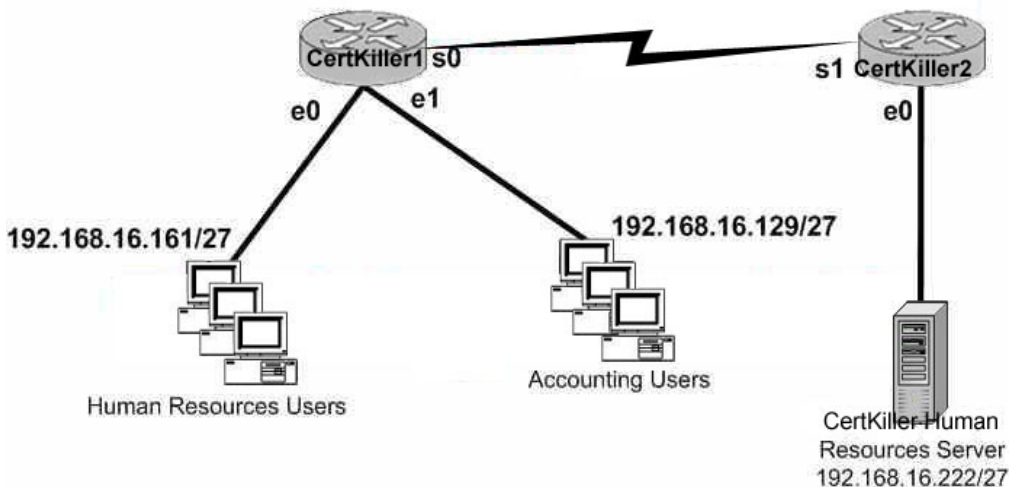
When an access list is created, an implicit deny all entry is created at the end. Therefore, each access list created needs to have at least one permit statement, otherwise it will have the effect of prohibiting all traffic. If the intent in this example was to block only certain hosts from being able to FTP, then the following line should have been included at the end of the access list:

Router(config)#access-list 135 permit ip any any

---

### QUESTION 299:

Study the following network diagram displaying the Certkiller network:



With the goal of preventing the accounting department from gaining access to the HR server, the following access list is created:

```
access-list 19 deny 192.168.16.128 0.0.0.31
```

```
access-list 19 permit any
```

All other traffic is to be permitted through the network. On which interface and in what direction should the access list be applied?

- A. Certkiller 1 S0, out.
- B. Certkiller 1 E1, in.
- C. Certkiller 1 E1, out.
- D. Certkiller 2 S1, in.
- E. Certkiller 2 E0, out.
- F. Certkiller 2 E0, in.

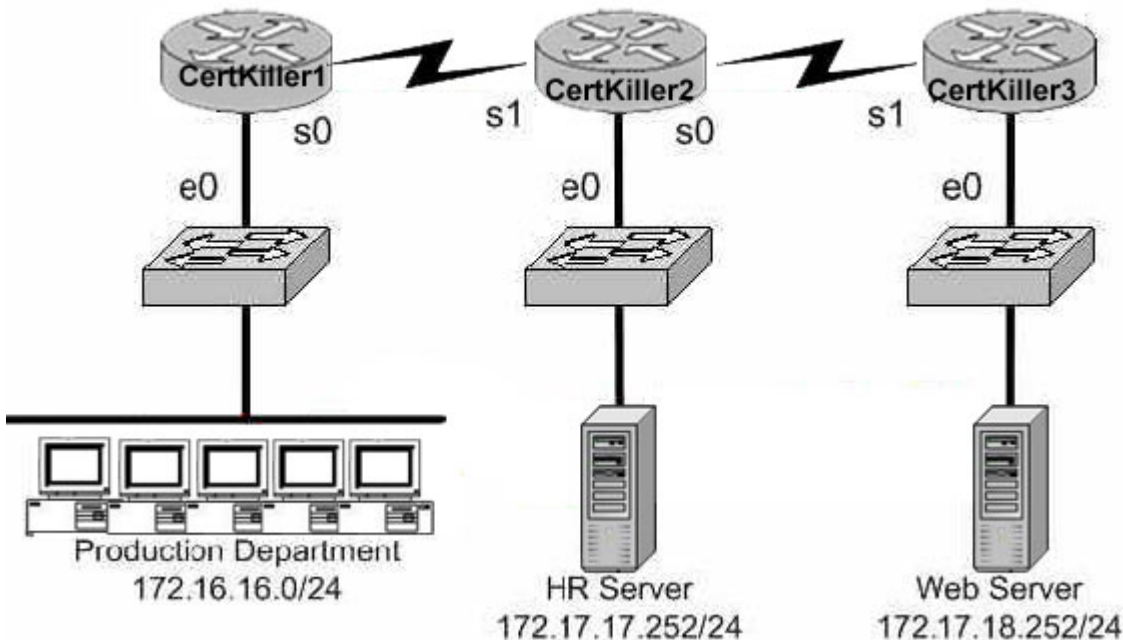
Answer: E

Explanation:

Since this is a standard access list it should be placed near the destination. Standard access lists only match against the source IP address, so placing this access list anywhere else will prevent traffic from the Accounting department to other areas of the network.

### QUESTION 300:

The Certkiller network is displayed below:



You want to apply an access list to the e0 interface on the Certkiller 1 router, with the goal of halting HTTPS traffic from the Production Department from reaching the HR server via the Certkiller 2 router. Which of the following access lists would you use?

- A. Permit ip any any  
Deny tcp 172.16.16.0 0.0.0.255 172.17.17.252 0.0.0.0 eq 443
- B. Permit ip any any  
Deny tcp 172.17.17.252 0.0.0.0 172.16.16.0 0.0.0.255 eq 443
- C. Deny tcp 172.17.17.252 0.0.0.0 172.16.16.0 0.0.0.255 eq 443  
Permit ip any any
- D. Deny tcp 172.16.16.0 0.0.0.255 172.17.17.252 0.0.0.0 eq 443  
Permit ip any any

Answer: D

Explanation:

This access problem is very simple; it tells you where to put the access list, all you have to do is to select the right one. You have to deny all HTTP traffic (TCP port 80) from

crossing router 1's e0 while, allowing everything else. This is accomplished by Deny tcp 172.16.16.0 0.0.0.255 172.17.17.252 0.0.0.0 eq 443, Permit ip any any.

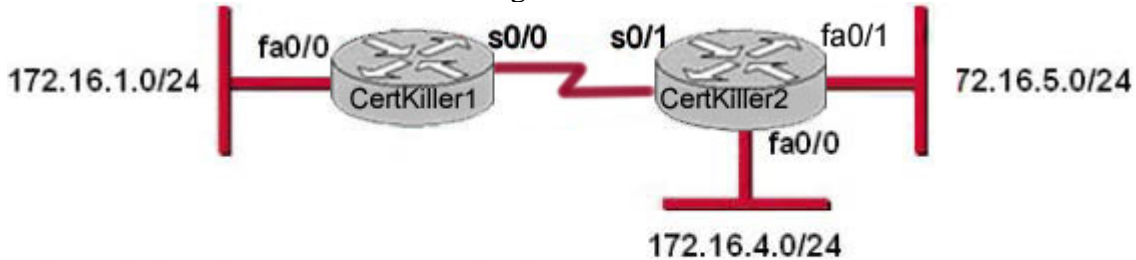
Incorrect Answers:

Either the order of the statements are reversed. Since all traffic checked against an access list is performed in order from the top down, all traffic will match the first statement and be permitted or the source addresses are incorrect.

---

### QUESTION 301:

Two Certkiller routers are connected together as shown below:



```
access-list 10 permit host 172.16.1.5
access-list 10 deny 172.16.1.0 0.0.0.255
access-list 10 permit any
```

The access list shown should deny all hosts located on network 172.16.1.0, except host 172.16.1.5, from accessing the 172.16.4.0 network. All other networks should be accessible. Which command sequence will correctly apply this access list?

- A. Certkiller 1(config)#interface fa0/0  
Certkiller 1(config-if)#ip access-group 10 in
- B. Certkiller 1(config)#interface s0/0  
Certkiller 1(config-if)#ip access-group 10 out
- C. Certkiller 2(config)#interface fa0/1  
Certkiller 2(config-if)#ip access-group 10 out
- D. Certkiller 2(config)#interface fa0/0  
Certkiller 2(config-if)#ip access-group 10 out
- E. Certkiller 2(config)#interface s0/1  
Certkiller 2(config-if)#ip access-group 10 out

Answer: D

Explanation:

In order to only deny access to the 172.16.4.0 network while permitting all other access as specified in this question, we need to apply this access list to router Certkiller 2, and it must be placed in the outbound direction of interface fa0/0. Applying this access list to any other interface or any other router would result in making other network unreachable from the 172.16.1.0 network, except of course for 172.16.1.5.

---

### QUESTION 302:

A network administrator wants to add a line to an access list that will block only Telnet access by the hosts on subnet 192.168.1.128/28 to the server at 192.168.1.5. What command should be issued to accomplish this task?

- A. access-list 101 deny tcp 192.168.1.128 0.0.0.15 192.168.1.5 0.0.0.0 eq 23  
access-list 101 permit ip any any
- B. access-list 1 deny tcp 192.168.1.128 0.0.0.15 host 192.168.1.5 eq 23  
access-list 1 permit ip any any
- C. access-list 1 deny tcp 192.168.1.128 0.0.0.255 192.168.1.5 0.0.0.0 eq 21  
access-list 1 permit ip any any
- D. access-list 101 deny tcp 192.168.1.128 0.0.0.240 192.168.1.5 0.0.0.0 eq 23  
access-list 101 permit ip any any
- E. access-list 101 deny ip 192.168.1.128 0.0.0.240 192.158.1.5 0.0.0.0 eq 23  
access-list 101 permit ip any any
- F. access-list 101 deny ip 192.168.1.128 0.0.0.15 192.168.1.5 0.0.0.0 eq 23  
access-list 101 permit ip any any

Answer: A

Explanation:

Only choice specifies the correct TCT port and wildcard mask, and uses a valid access list number.

Incorrect Answers:

B, C. Access list 1 is used for these choices, which is a standard access list. In this example, an extended access list is required. Choice C also specifies port 21, which is used by FTP not Telnet.

D, E: These choices use an incorrect wildcard mask of 0.0.0.240. It should be 0.0.0.15 for a /28 subnet.

F. IP is specified as the protocol, when it should be TCP.

---

### **QUESTION 303:**

You are the network administrator at Certkiller . You apply the following access list on the E0 outbound interface connected to the 192.168.1.8/29 LAN:

```
access-list 21 deny tcp 192.168.1.8 0.0.0.7 eq 20 any
access-list 21 deny tcp 192.168.1.8 0.0.0.7 eq 21 any
```

What will the effect of this access list be?

- A. All traffic will be allowed to out of E0 except FTP traffic.
- B. FTP traffic from 192.168.1.22 to any host will be blocked.
- C. FTP traffic from 192.168.1.9 to any host will be blocked.
- D. All traffic will be prevented from leaving E0.
- E. All FTP traffic to network 192.168.1.9/29 from any host will be blocked.

Answer: D

Explanation:

By default access lists contain an implicit deny statement at the end. In this example there is no permit statement, so it will deny all traffic exiting E0 Interface. Any useful access list must contain at least one permit statement, or everything will be denied.

---

**QUESTION 304:**

You want to configure an ACL to block only TCP traffic using port 5190 on router CK1 . Which access list statement will block all traffic on this router with a destination TCP port number of 5190 while not affecting other traffic?

- A. access-list 180 deny ip any eq 5190 any
- B. access-list 180 deny tcp any any eq 5190
- C. access-list 180 deny tcp any eq 5190
- D. access-list 180 deny tcp any eq 5190 any
- E. access-list 180 deny telnet any any 5190
- F. None of the above

Answer: B

Explanation:

Creating an extended ACL:

These lists are created and applied to an interface as either inbound or outbound packet filters. They are implemented in this format:

Access-list [list number] [permit | deny] [protocol] [source address] [source-mask] [destination address] [destination-mask] [operator] [port] [log]

1. List Number-A number between 100 and 199 (Think of it as the name of the list.)
2. Permit | Deny-Whether to permit or deny this packet of information if conditions match
3. Protocol-Type of protocol for this packet (i.e., IP, ICMP, UDP, TCP, or protocol number)
4. Source Address-Number of the network or host that the packet is from (Use the dotted-decimal format 192.168.1.12 or use the keyword ANY as an abbreviation for an address of 0.0.0.0 255.255.255.255 or use HOST and the dotted-decimal address.)
5. Source Mask-The network mask to use with the source address (Cisco masks are a little different, 0 = octet must match exactly; 255 = octet is not significant or doesn't matter.)
6. Destination Address-The address that the packet is going to, or ANY
7. Destination Mask-The network mask to use with the destination address (if you specify one)
8. Operator (optional entry)-This applies to TCP or UDP ports only  
eq=equal  
lt=less than  
gt=greater than  
neq=not equal  
range=a range of ports; you must specify two different port numbers

est.=established connections

9. Port (optional entry)-TCP/UDP destination port number or service

10. Log-Whether to log (if logging is enabled) this entry to the console

A sample inbound ACL would be:

```
access-list 100 deny ip 10.0.0.0 0.255.255.255 any log
```

```
access-list 100 deny ip 172.16.0.0 0.15.255.255 any log
```

```
access-list 100 deny ip 192.168.0.0 0.0.255.255 any log
```

```
access-list 100 deny ip any host 127.0.0.1 log
```

```
access-list 100 permit ip any [your network IP address] [your network mask] est
```

```
access-list 100 deny ip [your network IP address] [your network mask] any log
```

```
access-list 100 deny tcp any any eq 22222
```

```
access-list 100 deny tcp any any range 60000 60020 log
```

```
access-list 100 deny udp any any eq SNMP log
```

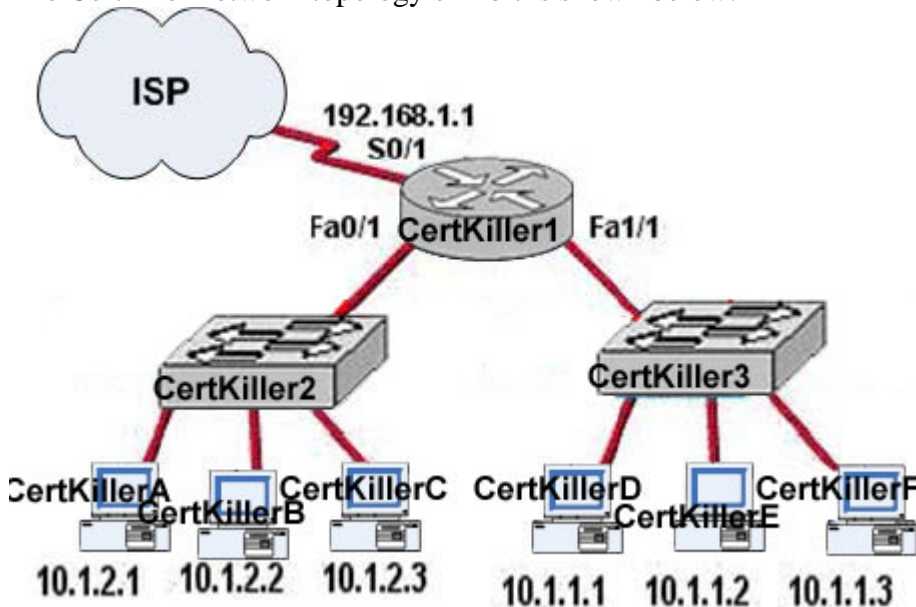
```
access-list 100 permit ip any any
```

Reference: [http://articles.techrepublic.com.com/5100-1035\\_11-1058307.html](http://articles.techrepublic.com.com/5100-1035_11-1058307.html)

---

### QUESTION 305:

The Certkiller network topology exhibit is shown below:



Configuration exhibit:

```
CertKiller1 (config)#access-list 2 permit 10.1.1.0 0.0.0.255
```

```
CertKiller1 (config)#line vty 0 4
```

```
CertKiller1 (config-line)#access-class 2 in
```

Based on the information shown above, why would the Certkiller network administrator configure Router Certkiller 1 as shown above?

- A. To prevent students connected to Certkiller 2 from accessing the command prompt of Router Certkiller 1
- B. To give administrators access to the internet

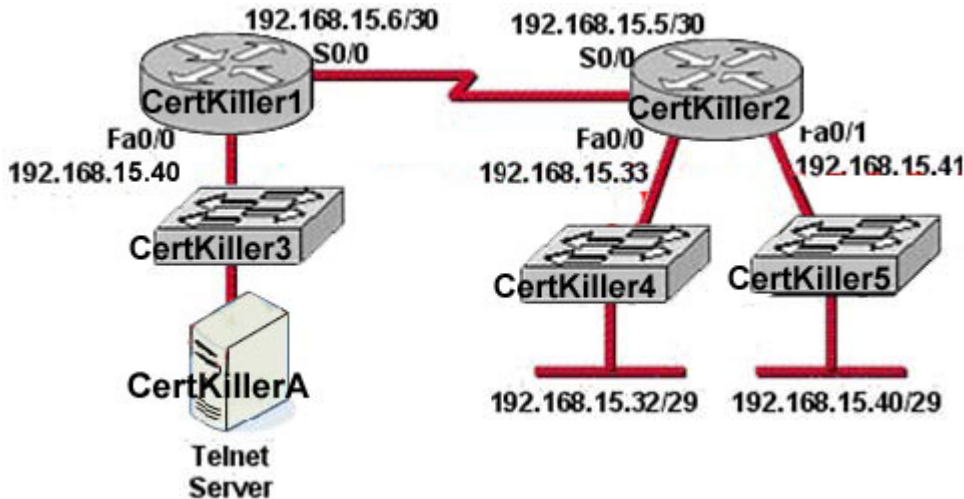


- C. To prevent students from accessing the admin network
- D. To prevent students from accessing the internet
- E. To give students access to the internet
- F. To prevent administrators from accessing the console of Router Certkiller 1
- G. None of the above

Answer: A

### QUESTION 306:

Part of the Certkiller network is shown below:



In this Certkiller network segment, the following ACL was configured on the S0/0 interface of router Certkiller 2 in the outbound direction:

Access-list 101 deny tcp 192.168.15.32 0.0.0.15 any eq telnet

Access-list 101 permit ip any any

Based on this information which two packets, if routed to the interface, will be denied? (Choose two)

- A. Source IP address: 192.168.15.5; destination port: 21
- B. Source IP Address: 192.168.15.37 destination port: 21
- C. Source IP Address: 192.168.15.41 destination port: 21
- D. Source IP Address: 192.168.15.36 destination port: 23
- E. Source IP Address: 192.168.15.46; destination port: 23
- F. Source IP Address: 192.168.15.49 destination port 23

Answer: D, E

### QUESTION 307:

You want to control all telnet access going through router CK1. Which one of the access control list statements below will deny all telnet connections to subnet 10.10.1.0/24?

- A. access-list 15 deny telnet any 10.10.1.0 0.0.0.255 eq 23
- B. access-list 115 deny udp any 10.10.1.0 eq telnet
- C. access-list 15 deny tcp 10.10.1.0 255.255.255.0 eq telnet
- D. access-list 115 deny tcp any 10.10.1.0 0.0.0.255 eq 23
- E. access-list 15 deny udp any 10.10.1.0 255.255.255.0 eq 23
- F. None of the above

Answer: D

Explanation:

Telnet uses port TCP port 23. Since we are using source and destination IP address information, an extended access list is required. Extended access lists are access lists in the 100-199 range.

Incorrect Answers:

- A, C, E. These access lists are numbered 15. Standard access lists are numbered 1-99, and in this case an extended access lists is required.
- B. This access list specifies UDP port 23, and TCP port 23 is the port used by telnet.

---

**QUESTION 308:**

You wish to limit telnet access into your Certkiller router to only a single host. In order to accomplish this, access list 1 has been written to allow host 172.16.1.224 access to the router vty lines. What command would assign this access- list to the Virtual Terminal Lines?

- A. CK1 (config-line)# ip access-group 1 in
- B. CK1 (config-line)# access-class 1 in
- C. CK1 (config-line)# ip access-list 1 in
- D. CK1 (config-line)# access-line 1 in
- E. None of the above

Answer: B

Explanation:

To restrict incoming and outgoing connections between a particular vty (into a Cisco device) and the addresses in an access list, use the access-class command in line configuration mode.

Example:

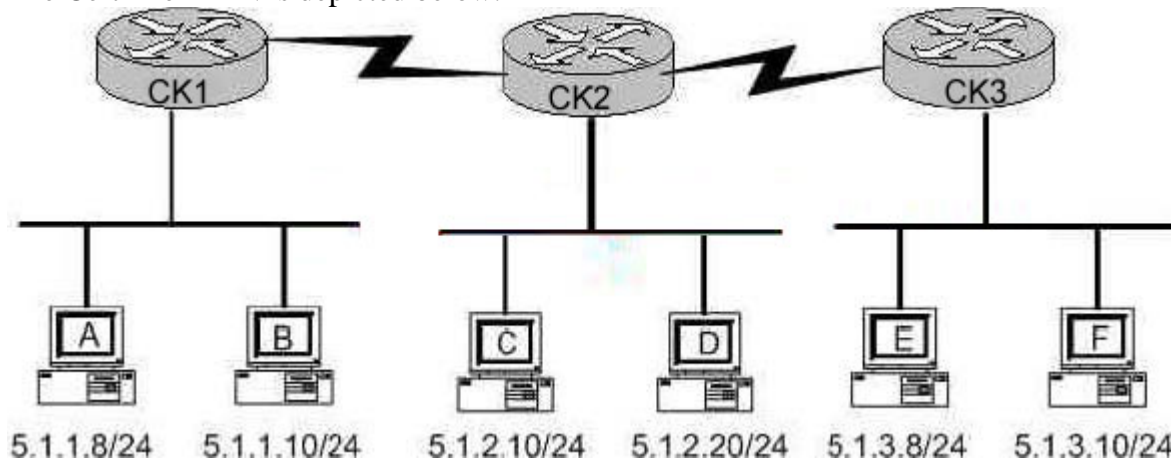
The following example defines an access list that permits only the host 172.16.1.224 to connect to the virtual terminal ports on the router, as described in this question:

```
access-list 1 permit 172.16.1.224 0.0.0.0
line 1 5
access-class 1 in
```

---

**QUESTION 309:**

The Certkiller LAN is depicted below:



You're the systems administrator at Testing, and you create the following access control lists.

```
access-list 101 deny tcp 5.1.1.10 0.0.0.0 5.1.3.0 0.0.0.255 eq telnet
```

```
access-list 101 permit any any
```

You then enter the command "ip access-group 101 in" to apply access control list 101 to router CK1's e0 interface.

Which of the following Telnet sessions will be blocked as a result of your access lists? (Select all that apply)

- A. Telnet sessions from host A to host 5.1.1.10
- B. Telnet sessions from host A to host 5.1.3.10
- C. Telnet sessions from host B to host 5.1.2.10
- D. Telnet sessions from host B to host 5.1.3.8
- E. Telnet sessions from host C to host 5.1.3.10
- F. Telnet sessions from host F to host 5.1.1.10

Answer: D, F

Explanation:

All the telnet sessions from host B to network 5.1.3.0/24 will be denied. In addition, all telnet traffic to host B from the 5.1.3.0/24 network will not work, because the return telnet traffic will be denied.

### QUESTION 310:

Which of the following commands would successfully implement an access list on a router's virtual terminal line? (Select only one answer choice)

- A. RouterCK(config-line)# access-class 10 in
- B. RouterCK(config-if)# ip access-class 23 out
- C. RouterCK(config-line)# access-list 150 in
- D. RouterCK(config-if)# ip access-list 128 out
- E. RouterCK(config-line)# access-group 15 out

F. RouterCK(config-if)# ip access-group 110 in

Answer: A

Explanation:

To configure VTY you must be in the config-line mode. Virtual terminal sessions use VTY lines 0-4, and VTY access lists use the access-class command.

Incorrect Answers:

B. This is placed in the wrong configuration mode

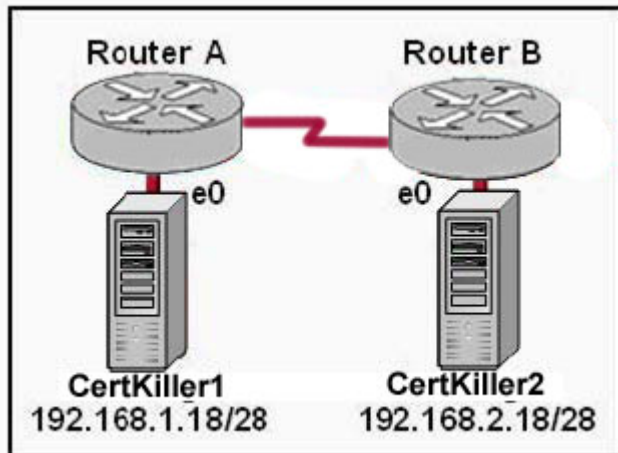
C, D, E, F. The correct syntax for VTY lines is the access-class command, not the access-group or access-list commands.

---

### QUESTION 311:

The following access control list needs to be applied to one of the routers shown in the graphic:

```
access-list 101 permit tcp 192.168.1.16 0.0.0.15 192.168.2.16 0.0.0.15 eq 23
```



What can be concluded about this ACL? (Choose two.)

- A. Telnet traffic from 192.168.1.16 0.0.0.15 to 192.168.2.16 0.0.0.15 is allowed.
- B. SMTP traffic from 192.168.2.16 0.0.0.15 to 192.168.1.16 0.0.0.15 is allowed.
- C. The ACL is configured to allow traffic from one specific host to another.
- D. When the ACL is applied, Certkiller 1 will be able to ping Certkiller 2.
- E. The ACL should be applied inbound to the e0 interface of Router A.
- F. The ACL should be applied outbound to the e0 interface of Router A.

Answer: A, E

Explanation:

The given extended ACL allow the telnet traffic from 192.168.1.16 0.0.0.15 to 192.168.2.16 0.0.0.15. Telnet uses TCP port 23. With access lists, the first network specified is the source of the traffic and the second is the destination, so since this access

list says to allow telnet traffic from the Jack1 network to the Certkiller 2 network, it should be placed on the inbound interface of E0.

---

**QUESTION 312:**

Unauthorized users have used Telnet to gain access to Certkiller 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  
access-list 101 permit ip any any  
interface s0/0  
ip access-group 101 in
- B. access-list 3 permit host 172.16.3.3  
line vty 0 4  
ip access-group 3 in
- C. access-list 101 permit tcp any host 172.16.3.3 eq telnet  
interface s0/0ip access-group 101 in
- D. access-list 3 permit host 172.16.3.3  
line vty 0 4  
access-class 3 in

Answer: D

Explanation:

To restrict incoming and outgoing connections between a particular vty (into a Cisco device) and the addresses in an access list, use the access-class command in line configuration mode.

Example:

The following example defines an access list that permits only hosts on network 192.89.55.0 to connect to the virtual terminal ports on the router:

```
access-list 12 permit 192.89.55.0 0.0.0.255  
line 1 5  
access-class 12 in
```

Reference:

[http://www.cisco.com/en/US/products/sw/iosswrel/ps1835/products\\_command\\_reference\\_chapter09186a008008](http://www.cisco.com/en/US/products/sw/iosswrel/ps1835/products_command_reference_chapter09186a008008)

---

**QUESTION 313:**

An inbound access list has been configured on a Certkiller router. This inbound access list has been applied to the serial interface to deny packet entry for TCP and UDP ports 21, 23 and 25. All other traffic types will be allowed. What types of packet will be permitted by this ACL? (Choose three)

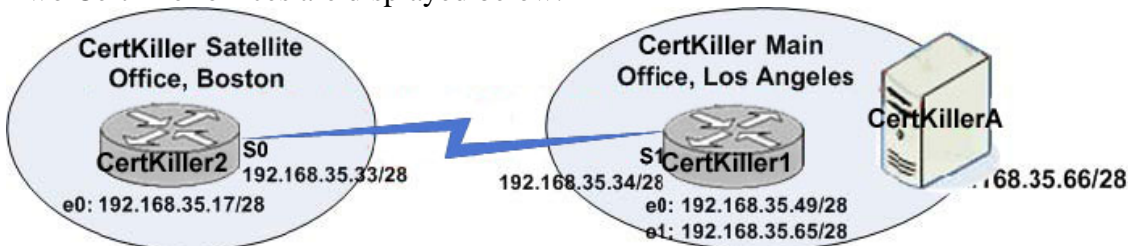
- A. HTTP
- B. HTTPS
- C. FTP
- D. Telnet
- E. DNS
- F. SMTP

Answer: A, B, E

### QUESTION 314:

#### DRAG DROP

Two Certkiller offices are displayed below:



You work as a network technician at Certkiller .com. Study the exhibit carefully. Certkiller .com has a main office in Los Angeles and a satellite office in Boston. The offices are connected through two Cisco routers. The Boston satellite office is connected through the Certkiller 2 Router s0 interface to the Los Angeles office Certkiller 1 router s1 interface. Certkiller 1 has two local area networks. Boston users receive Internet access through the Certkiller 1 router.

#### Options, select from these

permit ip any any

permit ip 192.168.35.0 0.0.0.255 host  
192.168.35.66

deny ip 192.168.35.55 0.0.0.0 host  
192.168.35.66

deny ip 192.168.35.16 0.0.0.15 host  
192.168.35.66

#### Goals

Prevent all users from outside the enterprise network from accessing the CertKillerA server

Block a user from CertKiller1 e0 network from access to the CertKillerA server

Block only the users attached to the e0 interface of the CertKiller2 router from access to the CertKillerA server

#### Options, place here

Place here

Place here

Place here

Answer:

**Options, select from these**

permit ip any any

**Goals**

Prevent all users from outside the enterprise network from accessing the CertKillerA server

Block a user from CertKiller1 e0 network from access to the CertKillerA server

Block only the users attached to the e0 interface of the CertKiller2 router from access to the CertKillerA server

**Options, place here**

permit ip 192.168.35.0 0.0.0.255 host 192.168.35.66

deny ip 192.168.35.55 0.0.0.0 host 192.168.35.66

deny ip 192.168.35.16 0.0.0.15 host 192.168.35.66

---

**QUESTION 315:**

Observe the following access list configuration:

```
access-list 10 permit 172.29.16.0 0.0.0.255
access-list 10 permit 172.29.17.0 0.0.0.255
access-list 10 permit 172.29.18.0 0.0.0.255
access-list 10 permit 172.29.19.0 0.0.0.255
```

An access list was configured on CK1 with the four statements shown in the graphic above. Which single access list statement will combine all four of these statements into a single statement that will have exactly the same effect?

- A. access-list 10 permit 172.29.16.0 0.0.0.255
- B. access-list 10 permit 172.29.16.0 0.0.1.255
- C. access-list 10 permit 172.29.16.0 0.0.3.255
- D. access-list 10 permit 172.29.16.0 0.0.15.255
- E. access-list 10 permit 172.29.0.0 0.0.255.255
- F. None of the above

Answer: C

Explanation:



172.29.16.0 0.0.3.255 is an aggregate address for those 4 networks. If you would write all these addresses in binary form and will mark the equal part, than you will see that it is 172.29.16.0 0.0.3.255 is the correct wildcard mask as it will aggregate these four contiguous ACL statements.

---

**QUESTION 316:**

**DRAG DROP**

You work as a network technician at Certkiller .com. You are configuring the Certkiller .com office. In particular the host Certkiller C, with the IP address 192.168.125.34/27, needs to be configured so that it cannot access hosts outside its own subnet.

You decide to use the following command:

accesslist 100 deny \*protocol\* \*address\* \*mask\* any

You are required to fill in the \*protocol\*, \*address\*, and \*mask\* in this command using the choices below:

Options, select from these

ip	udp	tcp	0.0.0.0
255.255.255.255	192.168.125.0	192.168.125.32	192.168.125.34

protocol

Place here

address

Place here

mask

Place here

Answer:

Options, select from these

			udp	tcp
255.255.255.255	192.168.125.0	192.168.125.32		
<b>protocol</b>				
ip				
<b>address</b>				
192.168.125.34				
<b>mask</b>				
0.0.0.0				

---

**QUESTION 317:**

On your newly installed router, you apply the access list illustrated below to interface Ethernet 0 on a Certkiller router. The interface is connected to the 192.168.1.8/29 LAN.

access-list 123 deny tcp 192.168.166.18 0.0.0.7 eq 20 any

access-list 123 deny tcp 192.168.166.18 0.0.0.7 eq 21 any

How will the above access lists affect traffic?

- A. All traffic will be allowed to exit E0 except FTP traffic.
- B. FTP traffic from 192.168.166.19 to any host will be denied.
- C. FTP traffic from 192.168.166.22 to any host will be denied.
- D. All traffic exiting E0 will be denied.
- E. All FTP traffic to network 192.168.166.18/29 from any host will be denied.
- F. None of the above

Answer: D

Explanation:

By default every access list contains an implicit deny statement at the end. Because of this, only an access list that contains at least one permit statement will be useful. In this example there is no permit statement, so it will deny all traffic exiting E0 Interface.

Incorrect Answers:

A. It will deny everything, including FTP and telnet traffic.

B, C, E. It will deny all traffic in addition to the condition mentioned in these answers, because there is no permit statement at the end.

**QUESTION 318:**

On a newly installed Certkiller router, the following access list is added to serial interface for incoming traffic:

Access-list 101 permit tcp any 10.18.10.0 0.0.0.255 eq 23

What is the effect of the "any" keyword in the above access list?

- A. check any of the bits in the source address
- B. permit any wildcard mask for the address
- C. accept any source address
- D. check any bit in the destination address
- E. permit 255.255.255.255 0.0.0.0
- F. accept any destination
- G. None of the above

Answer: C

Explanation:

The "any" in this list is the source address to filter. If it is set to any or "0.0.0.0 255.255.255.255", then any source address will be filtered. In the example above, the access list is stating that any TCP traffic from any source going to the 10.18.10.0/24 network will be allowed.

---

**QUESTION 319:**

Which one of the following commands will display the placement and direction of an IP access control list on the interfaces of a router?

- A. show interface list
- B. show ip route
- C. show ip interface
- D. show ip interface brief
- E. show interface
- F. None of the above

Answer: C

Explanation:

The command "show ip interface" will include a reference to the access lists enabled on the interface.

---

**QUESTION 320:**

You are a technician at Certkiller . Your assistant applied an IP access control list to Router CK1 . You want to check the placement and direction of the access control

list.

Which command should you use?

- A. show access-list
- B. show ip access-list
- C. show ip interface
- D. show interface
- E. show interface list
- F. None of the above

Answer: C

Explanation:

The show ip interface [name] command can be used to see if the access-list is on the interface. Output will vary depending on how the access-list command was applied but can include:

- \* Outgoing access list is not set
- \* Inbound access list is 101
- \* Outgoing access list is not set
- \* Inbound access list is 101, default is not set

Incorrect Answers:

A, B. This would simply show you the contents of the ACL, as well as the counters assuming the "log" keyword was configured on the access list. Example:

Show access list 101 or show IP access list 101

- \* Extended IP access list 101
- \* deny tcp any any (1649 matches)
- \* deny udp any any (35 matches)
- \* deny icmp any any (36 matches)

D. This will display the statistics pertaining to the interface, but not any configured access lists that are applied.

---

### **QUESTION 321:**

Which of the following statements regarding the use of multiple access lists are valid when configuring a single interface on a Cisco router?

- A. Application of up to three access lists per protocol to a single interface.
- B. No more than two access lists per interface.
- C. One access list may be configured per direction for each Layer 3 protocol configured on an interface.
- D. The maximum number allowed varies due to RAM availability in the router.
- E. An infinite number of access lists that can be applied to an interface, from most specific to most general.
- F. Cisco IOS allows only one access list to an interface.
- G. None of the above

Answer: C

Explanation:

For each interface, one access list for each protocol (IP, IPX, etc) can be applied in the inbound direction, and one for the outbound direction.

Incorrect Answers:

B. It is true that no more than two access lists can be applied per interface (inbound and outbound). However, this applies per layer 3 protocol, so it is possible to configure more than 2 access lists per interface.

---

**QUESTION 322:**

The following configuration line was added to router CK1 :

Access-list 101 permit ip 10.25.30.0 0.0.0.255 any

What is the effect of this access list configuration?

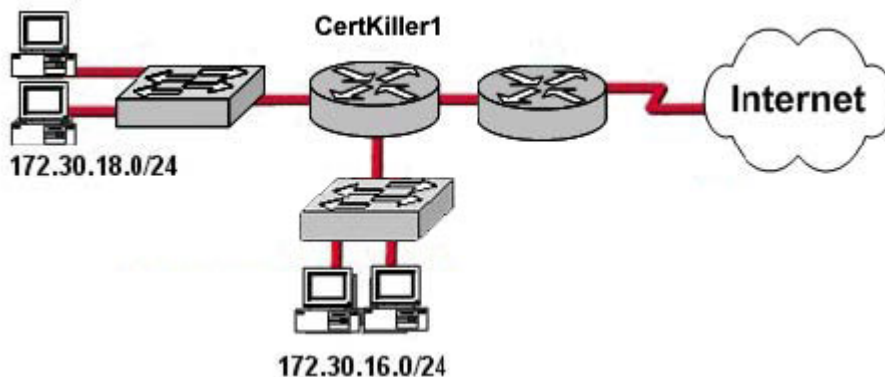
- A. It will permit all packets matching the host bits in the source address to all destinations
- B. It will permit all packets to destinations matching the first three octets in the destination address
- C. It will permit all packets from the third subnet of the network address to all destinations
- D. It will permit all packets matching the first three octets of the source address to all destinations
- E. It will permit all packets matching the last octet of the destination address and accept all source addresses
- F. None of the above

Answer: D

---

**QUESTION 323:**

The Certkiller network is shown below:



The CK network administrator needs to troubleshoot an ACL issue. He would like to permit only hosts on the 172.30.16.0/24 network to access the Internet. Which

wild card mask and address combination will only match addresses on this network?

- A. 172.30.0.0 0.0.0.0
- B. 172.30.16.0 0.0.0.255
- C. 172.30.0.0 0.0.15.255
- D. 172.30.16.0 0.0.31.255
- E. 172.30.16.0 0.0.255.255

Answer: B

Explanation:

According to question, only the hosts from 172.30.16.30/24 network allow to access the Internet, for that we should use the wildcard masking. 172.168.16.0 0.0.0.255 where 0 means exact and 255 means 1-255 range.

For any particular host: 192.168.0.1 0.0.0.0

For Range: 192.168.0.1 0.0.0.3 means 1-4 total 4 hosts.

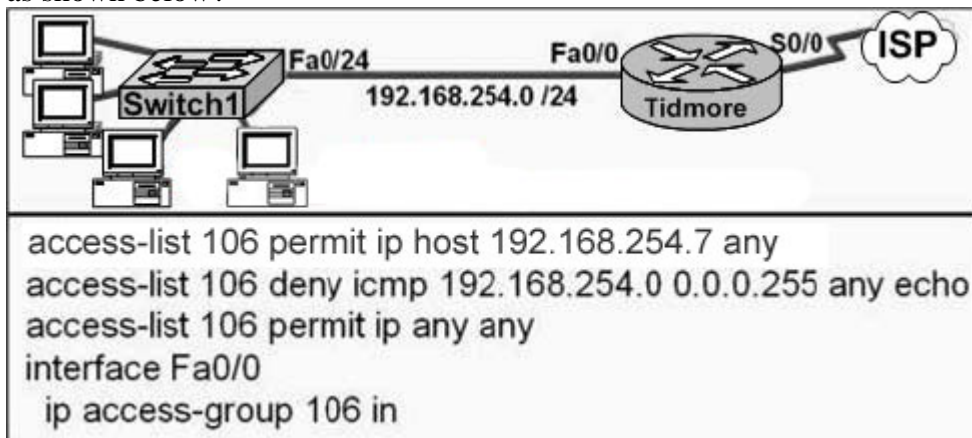
---

#### QUESTION 324:

In the Certkiller network shown below, 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, given that the router was already configured as shown below?



- A. Web pages from the Internet cannot be accessed by hosts in the 192.168.254.0 LAN.
- B. No hosts in the 192.168.254.0 LAN except 192.168.254.7 can access web pages from the Internet.
- C. The change has no effect on the packets being filtered.
- D. All traffic from the 192.168.254.0 LAN to the Internet is permitted.

Answer: C

Explanation:

Traffic that comes into the router is compared to ACL entries based on the order that the entries occur in the router. New statements are added to the end of the list. The router continues to look until it has a match. If no matches are found when the router reaches the end of the list, the traffic is denied. For this reason, you should have the frequently hit entries at the top of the list. There is an "implied deny" for traffic that is not permitted. A single-entry ACL with only one "deny" entry has the effect of denying all traffic. You must have at least one "permit" statement in an ACL or all traffic is blocked. In this example, since the statement will be added to the end of the access list, and since there is already an entry that permits all IP traffic, the www traffic will be allowed, all traffic will never reach this access list entry.

---

**QUESTION 325:**

For security reasons, the network administrator needs to prevent pings into the corporate networks from hosts outside the internetwork. Which protocol should be blocked with access control lists?

- A. UDP
- B. ICMP
- C. IP
- D. TCP
- E. None of the above

Answer: B

Explanation:

ICMP is used for error and control messages within the IP world and is very much integrated with IP. Ping is a computer network tool used to test whether a particular host is reachable across an IP network. Ping works by sending ICMP "echo request" packets to the target host and listening for ICMP "echo response" replies.

<i>protocol</i>
tcp

<i>mask</i>
0.0.3.255

<i>port</i>
80



**QUESTION 326:**

A Certkiller network associate creates the configuration shown in the exhibit below:

Exhibit:

```
access-list 100 permit ip 172.16.232.253 0.0.0.0 any
access-list 110 deny tcp 172.16.232.0 0.0.0.255 any eq telnet
access-list 120 deny icmp 172.16.232.0 0.0.0.255 any echo
access-list 130 permit ip any any
```

What will be the results of this configuration?

- A. The configuration creates an access list that allows all the hosts in the 172.16.232.0/24 subnet to use Telnet but not to access web pages.
- B. The configuration creates an access list that allow all traffic from the host 172.16.232.253 except Telnet and ping traffic.
- C. The fourth line of the configuration creates an access list that allows only traffic from the host 172.16.232.253 to anywhere in the network.
- D. The configuration creates four access lists.

Answer: D

Explanation:

With all access list entries, the order of entries is important. Normally, when a packet is evaluated against entries in an access list, the entries are evaluated in sequential order, and when a match occurs, no more entries are evaluated. However, this applies to access lists with the same number, but has multiple lines. When a different number is specified for each line, a different, separate, access list is actually created as is the case here.

---

**QUESTION 327:**

You need to configure NAT on a Certkiller router that is connected to the Internet. To do so, you must determine what the Inside Global IP addresses will be. What does the "Inside Global" address represent in the configuration of NAT?

- A. The summarized address for all of the internal submitted addresses
- B. A registered address that represents that represents an inside host to an outside network
- C. A globally unique, private IP address assigned to a host on the inside network
- D. The MAC address of the router used by inside hosts to connect to the Internet
- E. None of the above

Answer: B

---

**QUESTION 328:**

Which one of the following varieties of NAT utilizes different ports to map multiple IP addresses to a single globally registered IP address?

- A. Static NAT
- B. Port loading
- C. NAT Overloading
- D. Dynamic NAT
- E. None of the above

Answer: C

Explanation:

Port address translation, or NAT overloading, uses transport layer port information to dynamically create NAT entries. This is also known as one to many network address translation.

Incorrect Answers:

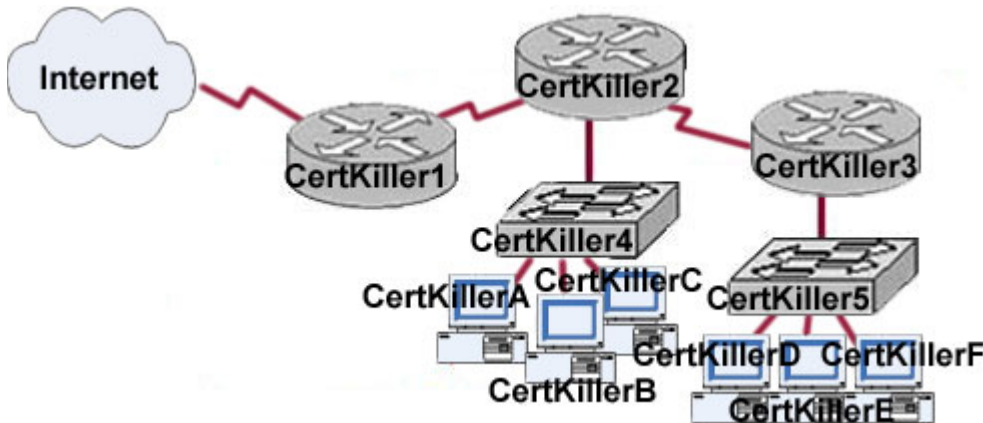
A. Static NAT is known as one to one NAT, and is used to map a single IP address to a single registered IP address. It is often used for servers that need to be accessed via the Internet.

B, D: This is the incorrect term, and is not used.

---

### **QUESTION 329:**

Part of the Certkiller network is shown below:



The Certkiller network administrator would like to implement NAT in the Certkiller network segment shown in the graphic to allow inside hosts to use a private addressing scheme. In this network segment, where should NAT be configured?

- A. All routers
- B. All routers and switches
- C. Certkiller 1 router
- D. Certkiller 2 router
- E. Certkiller 3 router
- F. None of the above

Answer: C

Explanation:

Network Address Translation (NAT) can be used to hide the private IP addressing scheme of the entire network from the Internet. To do this, NAT needs to only be configured on the router that resides between the Internet and the rest of the private internal network. In this case, it needs to only be implemented on the Corporate router.

---

**QUESTION 330:**

In any NAT (network address translation) configuration, what is the Inside Global IP address?

- A. The summarized address for all internal subnetted addresses.
- B. A private IP address assigned to a host on the inside network.
- C. A registered address that represents an inside host to an outside network.
- D. A unique IP address used on an internal network
- E. Non of the above

Answer: C

Explanation:

With NAT, Cisco defines 4 different types of addresses as follows:

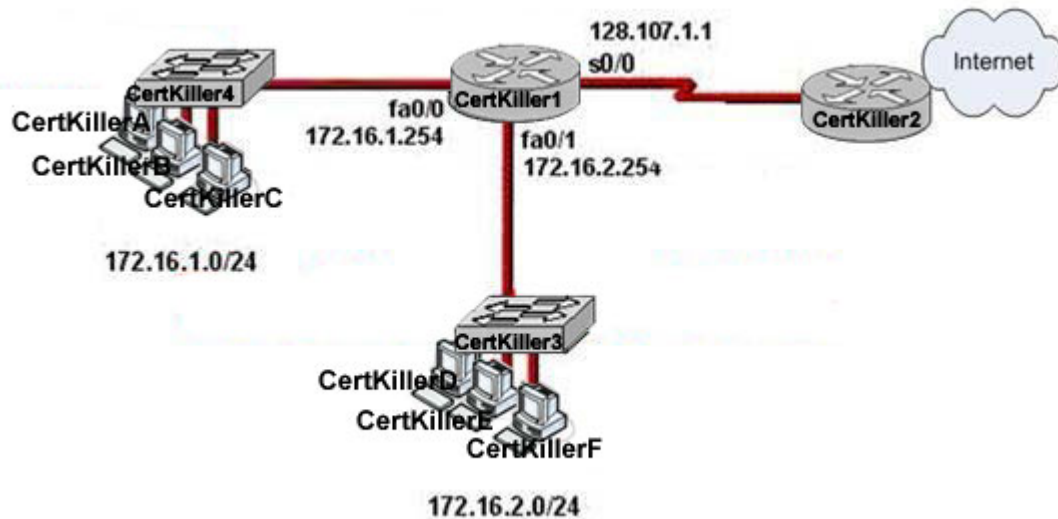
- \* Inside local address - The IP address assigned to a host on the inside network. This is the address configured as a parameter of the computer's OS or received via dynamic address allocation protocols such as DHCP. The address is likely not a legitimate IP address assigned by the Network Information Center (NIC) or service provider.
- \* Inside global address - A legitimate IP address assigned by the NIC or service provider that represents one or more inside local IP addresses to the outside world.
- \* Outside local address - The IP address of an outside host as it appears to the inside network. Not necessarily a legitimate address, it is allocated from an address space routable on the inside.
- \* Outside global address - The IP address assigned to a host on the outside network by the host's owner. The address is allocated from a globally routable address or network space.

The above definitions still leave a lot to be interpreted. For this example, this document redefines these terms by first defining "local address" and "global address." Keep in mind that the terms "inside" and "outside" are NAT definitions. Interfaces on a NAT router are defined as "inside" or "outside" with the NAT configuration commands, ip nat inside and ip nat outside. Networks to which these interfaces connect can then be thought of as "inside" networks or "outside" networks, respectively.

- \* Local address - A local address is any address that appears on the "inside" portion of the network.
- \* Global address - A global address is any address that appears on the "outside" portion of the network.

**QUESTION 331:**

Network Topology Exhibit:



Configuration Exhibit:

```
hostname CertKiller1
!
interface FastEthernet0/0
ip address 172.16.1.254 255.255.255.0
ip nat inside
!
interface FastEthernet0/1
ip address 172.16.2.254 255.255.255.0
ip nat inside
!
interface Serial0/0
ip address 128.107.1.1 255.255.255.252
ip nat outside
!
ip nat inside source list 1 interface Serial0/0 overload
!
ip route 0.0.0.0 0.0.0.0 Serial0/0
!
access-list 1 permit 172.16.1.0.0.0.255
access-list 1 permit 172.16.1.0.0.0.255
```

You work as a network administrator at Certkiller .com. You study the exhibit carefully. Based on the information provided in the exhibits, what statement is true regarding the configuration for this network?

- A. Certkiller 2 must be configured with static routes to networks 172.16.1.0/24 and 172.16.2.0/24.
- B. Because of the addressing on interface FastEthernet0/1, the Serial0/0 interface address will not support the NAT configuration as shown.
- C. The configuration that is shown provides inadequate outside address space for translation of the number of inside addresses that are supported.
- D. The number 1 referred to in the ip nat inside source command references access-list

number 1.  
E. None of the above

Answer: D

Explanation:

The ip nat inside source list 1 pool interface command tells the router to translate IP addresses that match access-list 1 to an IP address of Serial0/0 interface.

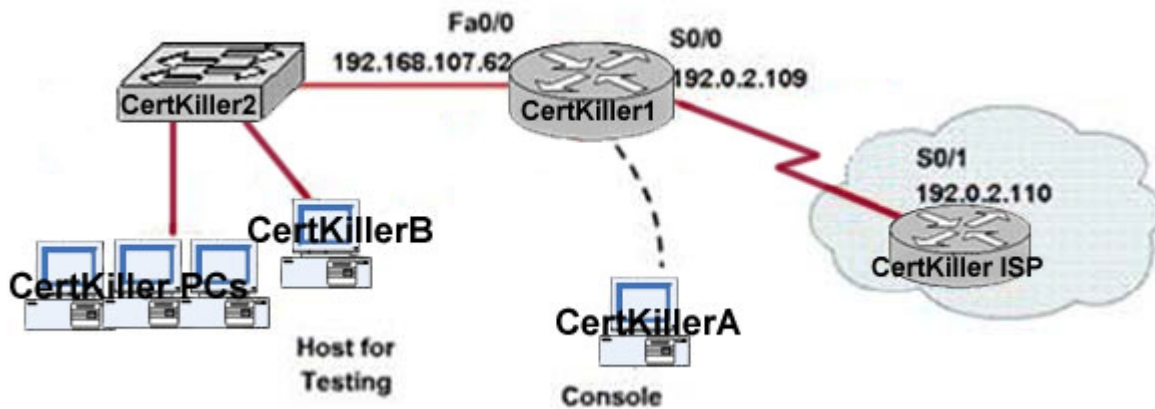
The access list in this case is not being used to permit or deny traffic as we would use it for security reasons to filter traffic. It is being used in this case to select or designate what we often call interesting traffic. When interesting traffic has been matched with the access list, it is pulled into the NAT process to be translated.

---

### QUESTION 332:

SIMULATION

Network topology exhibit:



You work as a network technician at Certkiller .com. Study the exhibit carefully. You are required to perform configurations to enable internet access. The Certkiller ISP has given you six public IP addresses in the 198.18.227.25 198.18.227.30 range. Certkiller .com has 30 clients that needs to have simultaneous internet access. These local hosts use private IP addresses in the 192.168.107.33 - 192.168.107.62 range. You need to configure Router Certkiller 1 using the Certkiller A console. You have already made basic router configuration. You have also configured the appropriate NAT interfaces; NAT inside and NAT outside respectively. Now you are required to finish the configuration of Certkiller 1.

Answer:

Explanation:

```
Certkiller 1#config t
Certkiller 1(Config)#access-list 1 permit 192.168.107.33 0.0.0.30
Certkiller 1(Config)#access-list 1 deny any
Certkiller 1(Config)#interface fa0/0
```

```
Certkiller 1(Config-if)#ip nat inside
Certkiller 1(Config-if)#exit
Certkiller 1(Config)#interface s0/0
Certkiller 1(Config-if)#ip nat outside
Certkiller 1(Config-if)#exit
Certkiller 1(Config)#ip nat pool test_nat 198.18.227.25 198.18.227.30 prefix-length 24
Certkiller 1(Config)#ip nat inside source list 1 pool test_nat override
Verify using:
Certkiller 1#show ip nat translations
```

---

**QUESTION 333:**

Certkiller has 25 computers and decides to connect the network to the Internet. Certkiller would like for all of the computers to have access to the Internet at the same time, but Certkiller only has four usable publicly routable IP addresses. What should be configured on the router so that all computers can connect to the Internet simultaneously?

- A. Static NAT
- B. Global NAT
- C. Dynamic NAT
- D. Static NAT with ACLs
- E. Dynamic NAT with overload

Answer: E

Explanation:

NAT overload, also called many to one NAT or Port Address Translation (PAT) allows for many IP hosts to share a single IP address when connecting to the outside. In this case, the use of dynamic NAT with overloading will allow for the 25 hosts to use an IP address from the NAT pool, which will contain the 4 public IP addresses.

---

**QUESTION 334:**

A Certkiller router has been configured with the following command:  
IP nat pool nat-test 192.168.6.10 192.168.6.20 netmask 255.255.255.0  
This is an example of what type of NAT?

- A. Static NAT
- B. Dynamic NAT
- C. Dynamic NAT with overload
- D. Port Address Translation
- E. None of the above

Answer: B

Explanation:

The configuration statement in this example is used to define a pool of IP addresses to be used for dynamic NAT translations.

Incorrect Answers:

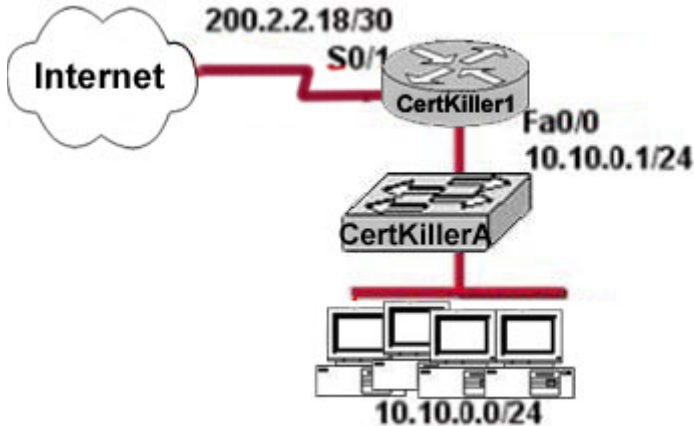
A. Static NAT is used for 1 to 1 translation entries, using the "static" configuration keyword. In this example a range of addresses are being defined for the use in a pool.

C, D. With NAT overload, also known as Port Address Translation (PAT), the keyword "overload" is added at the end of the configuration statement.

---

**QUESTION 335:**

The Certkiller network is displayed below:



Certkiller .com wants to use NAT in network displayed in the exhibit.

Which commands will apply the NAT configuration to the proper interfaces? Select two.

- A. Certkiller 1(config)# interface serial0/1  
Certkiller 1(config-if)# ip nat inside
- B. Certkiller 1(config)# interface serial0/1  
Certkiller 1(config-if)# ip nat outside
- C. Certkiller 1(config)# interface fastethernet0/0  
Certkiller 1(config-if)# ip nat inside
- D. Certkiller 1(config)# interface fastethernet0/0  
Certkiller 1(config-if)# ip nat outside
- E. Certkiller 1(config)# interface serial0/1  
Certkiller 1(config-if)# ip nat outside source pool 200.2.2.18 255.255.255.252
- F. Certkiller 1(config)# interface serial0/1  
Certkiller 1(config-if)# ip nat inside source 10.10.0.0 255.255.255.0

Answer: B, C

Explanation:

After creating the static NAT entries, the router needs to know which interfaces are "inside" and which are "outside." The ip nat inside and ip nat outside interface

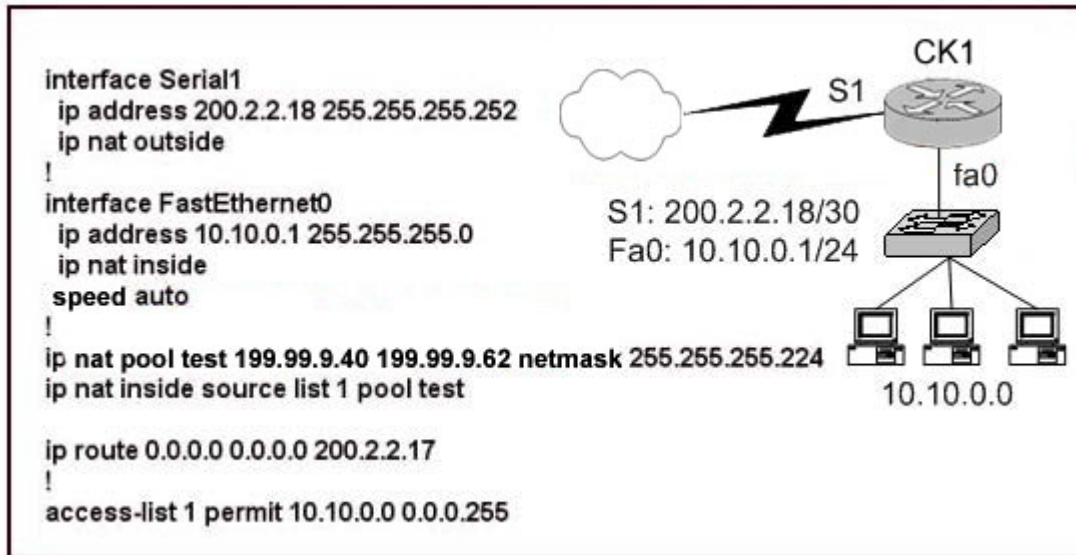


sub-commands identify each interface appropriately.

Reference: Cisco CCNA ICND, p.271

### QUESTION 336:

Refer to the topology and partial configuration output shown in the graphic below:



The ip subnet-zero configuration command is also in effect on router CK1 . After this router performs network address translation, which address is a valid "inside global address"?

- A. 10.10.0.1
- B. 10.10.0.17
- C. 200.2.2.17
- D. 200.2.2.18
- E. 199.99.9.33
- F. 199.99.9.47

Answer: F

Explanation:

Regarding NAT operation, Cisco defines these terms as follows:

1. Inside local address - The IP address assigned to a host on the inside network. This is the address configured as a parameter of the computer's OS or received via dynamic address allocation protocols such as DHCP. The address is likely not a legitimate IP address assigned by the Network Information Center (NIC) or service provider.
2. Inside global address - A legitimate IP address assigned by the NIC or service provider that represents one or more inside local IP addresses to the outside world. In this case, the NAT pool is used to distribute the Inside Global IP addresses.
3. Outside local address - The IP address of an outside host as it appears to the inside network. Not necessarily a legitimate address, it is allocated from an address space routable on the inside.

4. Outside global address - The IP address assigned to a host on the outside network by the host's owner. The address is allocated from a globally routable address or network space.

Reference:

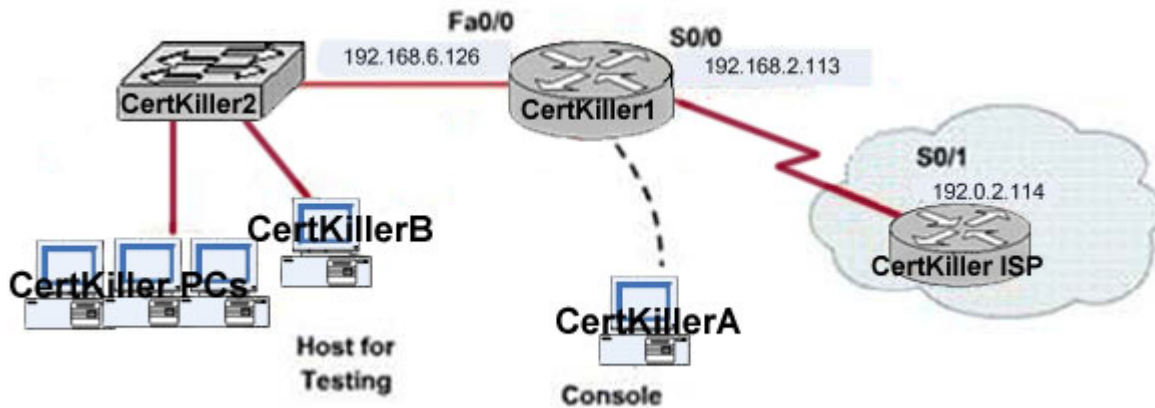
[http://www.cisco.com/en/US/tech/CK648/CK361/technologies\\_tech\\_note09186a0080094837.shtml](http://www.cisco.com/en/US/tech/CK648/CK361/technologies_tech_note09186a0080094837.shtml)

---

### QUESTION 337:

#### SIMULATION

Network topology exhibit:



You work as a network technician at Certkiller .com. Study the exhibit carefully. You are required to perform configurations to enable internet access. The Certkiller ISP has given you six public IP addresses in the 198.18.32.65 198.18.32.70/29 range. Certkiller .com has 62 clients that needs to have simultaneous internet access. These local hosts use private IP addresses in the 192.168.6.65 - 192.168.6.126/26 range. You need to configure Router Certkiller 1 using the Certkiller A console. You have already made basic router configuration. You have also configured the appropriate NAT interfaces; NAT inside and NAT outside respectively. Now you are required to finish the configuration of Certkiller 1.

Answer:

Explanation:

Certkiller 1:

Certkiller 1#Config t

Certkiller 1(Config)#interface fa0/0

Certkiller 1(Config-if)#ip nat inside

Certkiller 1(Config)#interface S0/0

Certkiller 1(Config-if)#ip nat outside

Certkiller 1(Config-if)#exit

Certkiller 1(Config)#access-list 1 permit 192.168.6.65 0.0.0.62

Certkiller 1(Config)#access-list 1 deny any

Certkiller 1(Config)#ip nat pool nat\_test 198.18.32.65 198.18.32.70 prefix-length 29

Certkiller 1(Config)#ip nat inside source list 1 pool nat\_test overload

**QUESTION 338:**

You need to review the NAT configuration of a Certkiller router. What is the function of the Cisco IOS command "ip nat inside source static 10.99.199.9 172.137.16.9" that is being used in this router?

- A. It creates a global address pool for all outside NAT transactions
- B. It creates dynamic source translations for all inside local PAT transactions
- C. It establishes a dynamic address pool for an inside static address
- D. It creates a one-to-one mapping between an inside local address and an inside global address
- E. It maps one inside source address to a range of outside global addresses
- F. None of the above

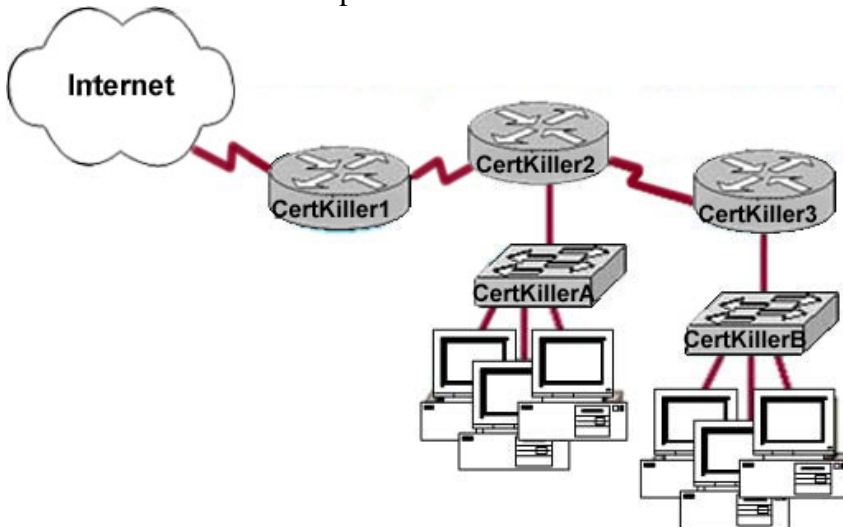
Answer: D

Explanation:

In this example, the inside IP address of 10.99.199.9 is being translated to the 172.137.16.9 public IP address. This static 1-1 mapping is typically done for Internet facing servers, such as web servers, FTP servers, or email servers so that users from the outside can access the inside server using the outside (public) IP address.

**QUESTION 339:**

The Certkiller WAN is depicted below:



As a network technician at Certkiller .com you would like to implement NAT in the network shown in the exhibit. You would like to allow inside hosts to use a private addressing scheme. Where should NAT be configured?

- A. Certkiller 1 router
- B. Certkiller 2 router

- C. Certkiller 3 router
- D. All routers
- E. All routers and switches
- F. None of the above

Answer: A

Explanation:

NAT should always be configured on the border device. It can be either a border router or a PIX firewall connecting to the Internet.

---

**QUESTION 340:**

The administrator of the Certkiller network needs to ensure that a web server in their network is accessible from the Internet. Since the network uses private addressing, this requires an IP-to-registered-address mapping. The following command is entered on the router:

```
Certkiller 1(config)# ip nat inside source static 192.168.2.1 198.18.1.254
```

After unsuccessful results from a ping to the Internet, the administrator issues the show ip nat translations command and the output is blank. What could be the problem with the NAT configuration for this mapping?

- A. The keyword overload is missing from the command.
- B. The administrator needs to define a NAT pool first.
- C. An access list must be defined to create static NAT translations.
- D. The interfaces need to be configured for NAT.

Answer: D

Explanation:

After configuring the static NAT administrator should configure the NAT on interface in order to define which interfaces are on the outside and which are on the inside:

Example:

```
interface s0
```

```
ip nat outside àBecause s0 interface is connected to ISP
```

```
interface e0
```

```
ip nat inside à Because e0 interface is connected to Local LAN.
```

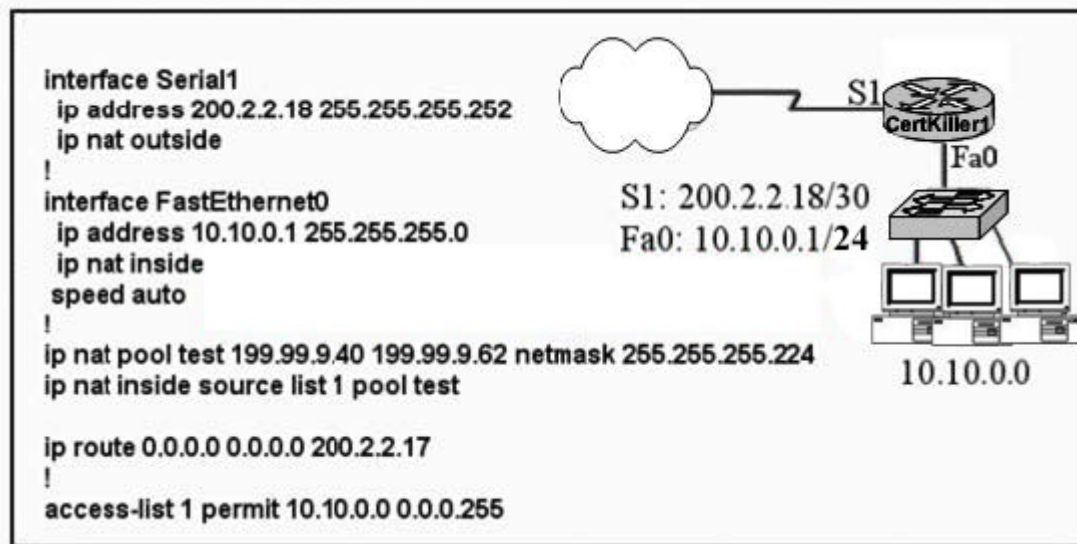
Incorrect Answers:

A, B, C: These are all tasks that need to be configured when performing many to one NAT, also known as Port Address Translation (PAT). In this example, we are specifying a static 1-1 NAT entry.

---

**QUESTION 341:**

Part of the Certkiller network is shown below:



Refer to the topology and router configuration shown in the graphic above. A host on the Certkiller LAN is accessing an FTP server across the Internet. Which of the following addresses could appear as a source address for the packets forwarded by the router to the destination server?

- A. 10.10.0.1
- B. 10.10.0.2
- C. 199.99.9.3
- D. 199.99.9.57
- E. 200.2.2.17
- F. 200.2.2.18
- G. None of the above

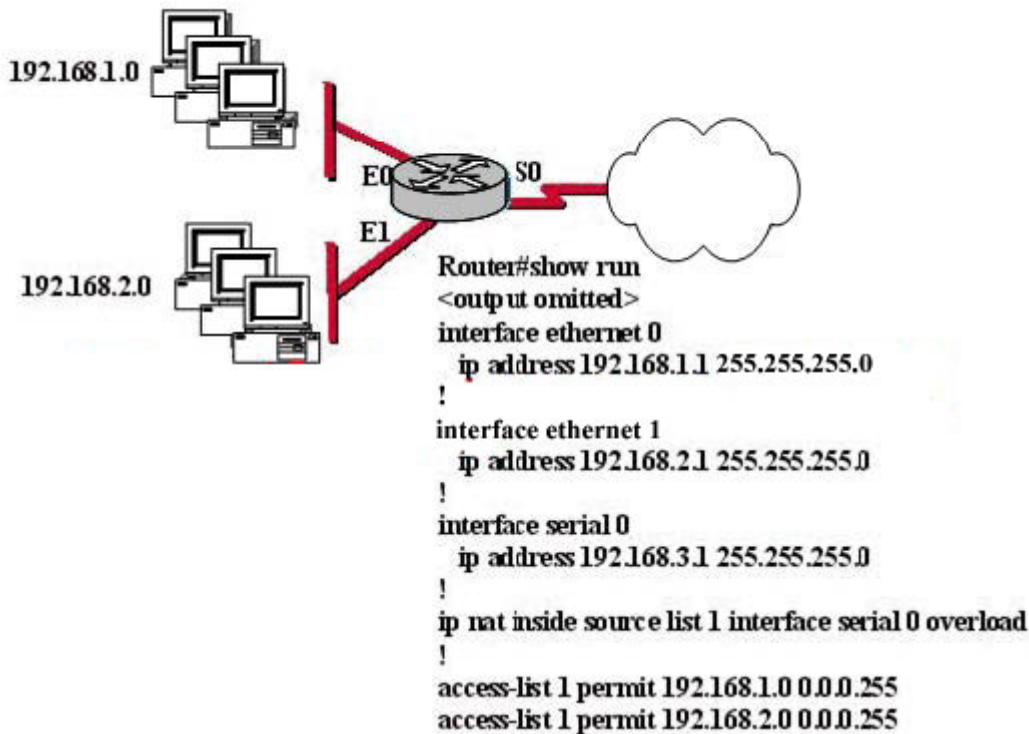
Answer: D

Explanation:

Using NAT we can translate the Source or Destination Address. In our example all source address from the 10.10.0.0/24 network will be translated to an IP address from the 199.99.9.40-62 pool, making only choice D correct.

#### QUESTION 342:

Part of the configuration of a Certkiller router is shown below:



The Certkiller network administrator has configured NAT as shown above. Clients still cannot access the Internet. What should the network administrator do to resolve this problem?

- A. Configure an IP NAT address pool.
- B. Properly configure the ACL.
- C. Apply the "ip nat" command to the S0 interface.
- D. Configure the "ip nat inside" and "ip nat outside" commands on the appropriate interfaces.
- E. None of the above

Answer: D

Explanation:

The "ip nat inside" and "ip nat outside" commands must be used from interface configuration mode to tell the router which interface is performing which role in the NAT process. The following commands show how to configure our example router:

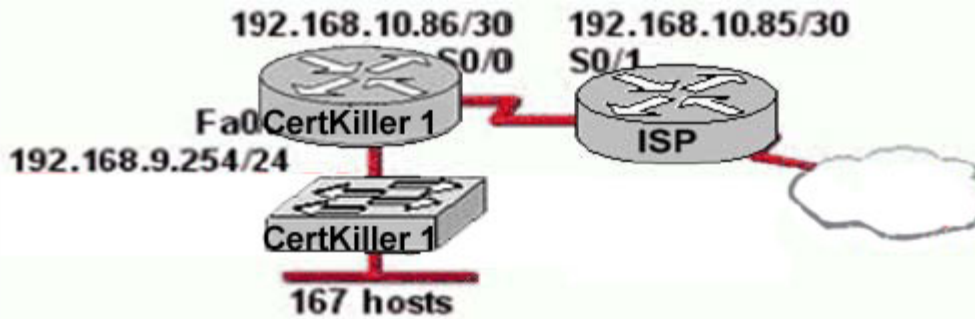
```

CK1 (config)#interface ethernet0 CK1 (config-if)#ip nat
inside CK1 (config-if)#exit CK1 (config)#interface serial0 CK1 (config-if)#ip nat
outside CK1 (config-if)#exit CK1 (config)#

```

### QUESTION 343:

The Certkiller WAN is shown in the diagram below:



```
CertKiller 1 (config)# ip nat pool c-pool 66.179.148.33 66.179.148.34
netmask 255.255.255.248
CertKiller 1 (config)# Access-list 1 permit 192.168.9.0 0.0.0.7
CertKiller 1 (config)# ip nat inside source list 1 pool c-pool overload
CertKiller 1 (config)# interface fastethernet 0/0
CertKiller 1 (config-if)# ip nat inside
CertKiller 1 (config)# interface serial 0/0
CertKiller 1 (config-if)# ip nat outside
```

Study the Exhibit carefully and sequence of configuration commands shown in the graphic. The network at Certkiller 1 has just been configured for NAT as shown. Initial tests indicate that the network is functioning properly. However, several users report that they cannot access the Internet. What is the problem?

- A. The NAT pool does not have enough IP addresses.
- B. The access list is not permitting all of the LAN host addresses to be translated.
- C. The NAT inside and NAT outside interfaces are reversed.
- D. The link between the Certkiller routers and the Certkiller 2 ISP
- E. None of the above

Answer: B

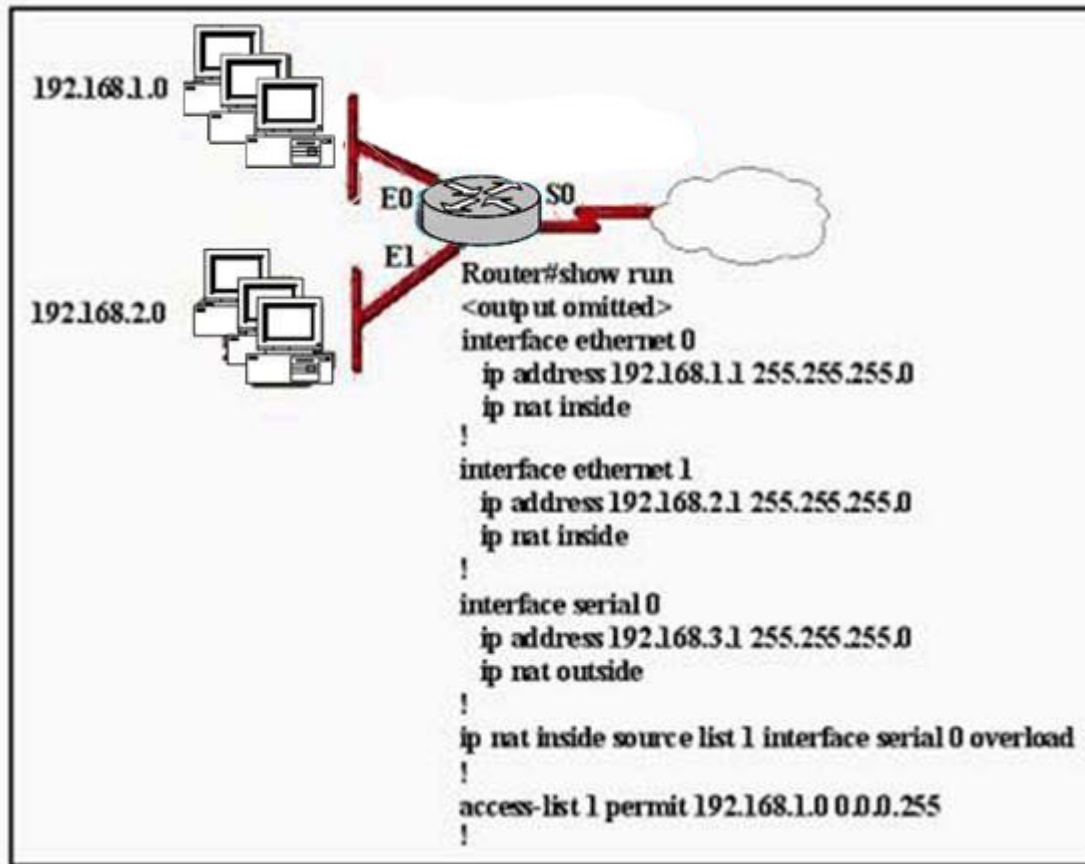
Explanation:

The source of the IP address hosts that should be translated is specified in access list 1, which only specifies 192.168.9.0 0.0.0.7. This will only translate host 192.168.9.1-192.168.9.7. The correct syntax should have been:  
access-list 1 permit 192.168.9.0 0.0.0.255

#### QUESTION 344:

The Certkiller network is shown below:





The network administrator has configured NAT as shown in the graphic. Some clients can access the Internet while others cannot. What should the network administrator do to resolve this problem?

- A. Configure an IP NAT pool.
- B. Properly configure the ACL.
- C. Apply the ACL to the S0 interface.
- D. Configure another interface with the ip nat outside command.
- E. None of the above.

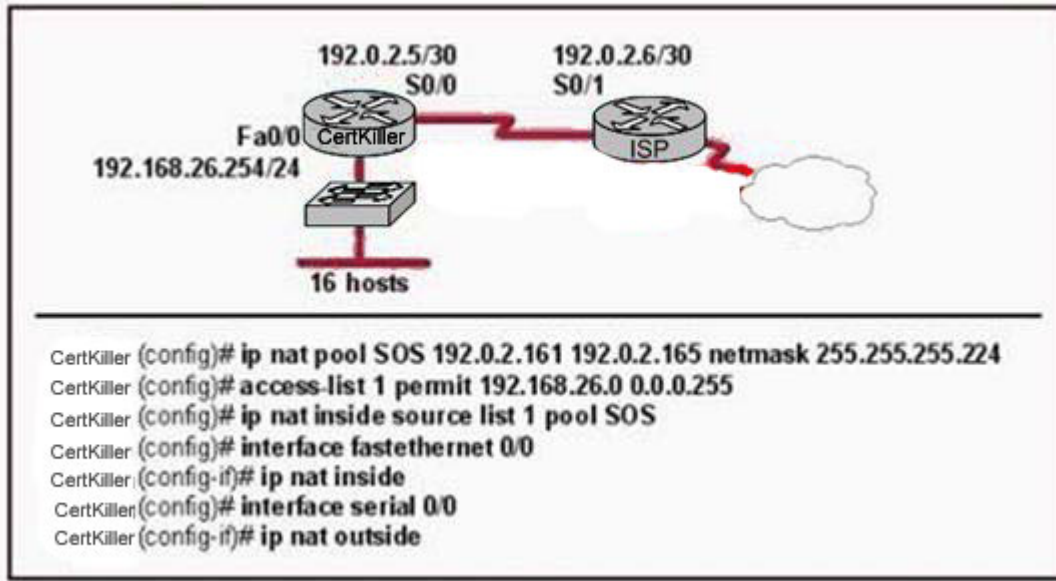
Answer: B

Explanation:

In the exhibit the ACL is only configured for the 192.168.1.0/24 network. In order to make Internet access available to all clients of both networks the access list 1 needs to include both 192.168.1.0/24 and 192.168.2.0/0.

#### QUESTION 345:

The Certkiller network is shown below:



The network at the Certkiller has just been configured for NAT as shown. Initial tests indicate that everything is functioning as intended. However, it is found that a number of hosts cannot access the Internet. What is the problem?

- A. The access list is not correct.
- B. There are not enough IP addresses available in the NAT address pool.
- C. The wrong interface has been configured with the ip nat inside command.
- D. The IP address of the Fa0/0 interface is not usable.
- E. The S0/1 interface of the ISP router is in the wrong subnet.

Answer: B

Explanation:

According to the configuration shown above, the NAT pool only specifies 5 IP addresses (192.0.2.161-165) while there are 16 hosts on the network that need to be translated. This explains why everything functions well for the first hosts, but not for the rest. To fix this issue, more IP addresses need to be specified in the NAT pool named SOS, or alternatively the "overload" keyword could be used to specify many to one address translation, or PAT.

Several internal addresses can be NATed to only one or a few external addresses by using a feature called Port Address Translation (PAT) which is also referred to as "overload", a subset of NAT functionality.

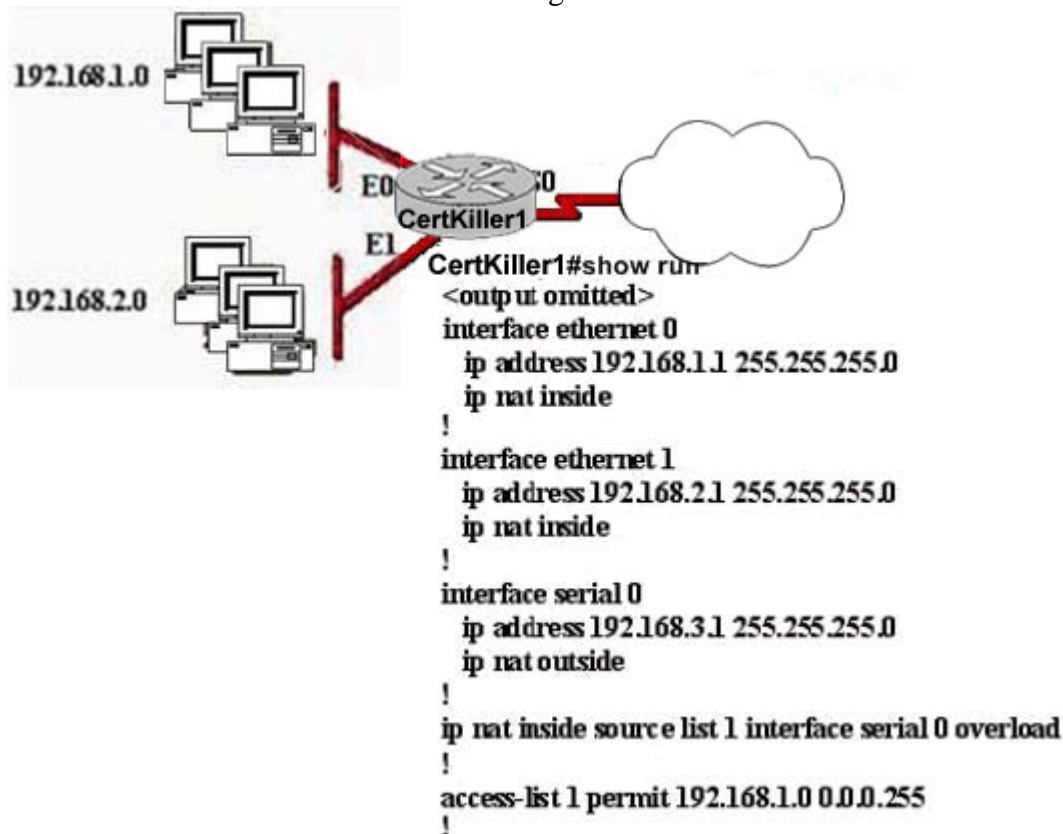
PAT uses unique source port numbers on the Inside Global IP address to distinguish between translations. Because the port number is encoded in 16 bits, the total number could theoretically be as high as 65,536 per IP address. PAT will attempt to preserve the original source port, if this source port is already allocated PAT will attempt to find the first available port number starting from the beginning of the appropriate port group 0-5111, 512-1023 or 1024-65535. If there is still no port available from the appropriate group and more than one IP address is configured, PAT will move to the next IP address

and try to allocate the original source port again. This continues until it runs out of available ports and IP addresses.

Alternatively, we could have configured port address translation, or NAT overload, to provide Internet access to the given number of hosts.

### QUESTION 346:

The Certkiller network is shown in the diagram below:



The network administrator has configured NAT as shown in the exhibit. Some clients can access the Internet while others cannot.

What should the network administrator do to resolve this problem?

- A. Configure an IP NAT pool.
- B. Properly configure the ACL.
- C. Apply the ACL to the S0 interface.
- D. Configure another interface with the ip nat outside command.
- E. Configure the ip nat inside and ip nat outside commands

Answer: B

Explanation:

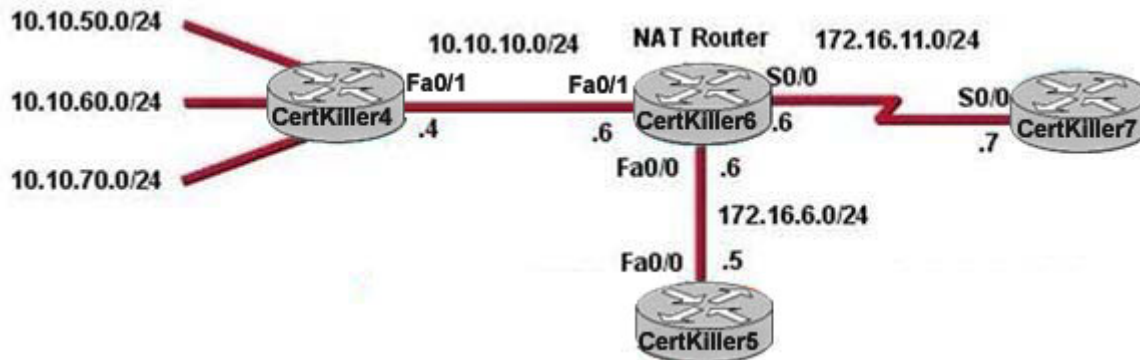
"Some clients can access the Internet while others cannot." this is a huge hint that tell us either:

1. ACL is blocking some people

2. You are not using overload when you should
  3. That you are using 2 inside subnets like in this example & 1 of those does not have the IP NAT INSIDE statement against it.
- In this example, the access list specified is only allowing users on the 192.168.1.0/24 subnet should be translated, so all of the users on E1 (192.168.2.X/24 subnet) will not get translated, and will therefore not be able to reach the Internet.

### QUESTION 347:

Network topology exhibit:



Configuration status:

```
CertKiller6# 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
```

```
CertKiller7# 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
```

You work as a network administrator at Certkiller .com. You study the exhibits carefully. Certkiller 4 can ping Certkiller 5 (172.16.6.5), but not Certkiller 7 (172.16.11.7). There are no routing protocols running in any of the routers. Certkiller 4 has Certkiller 6 as its default gateway. What can be done to address this problem?

- A. Change the inside and outside NAT commands.
- B. Convert to static NAT.

- C. Add a static route in Certkiller 7 back to Certkiller 4.
- D. Convert to dynamic NAT.
- E. None of the above

Answer: C

Explanation:

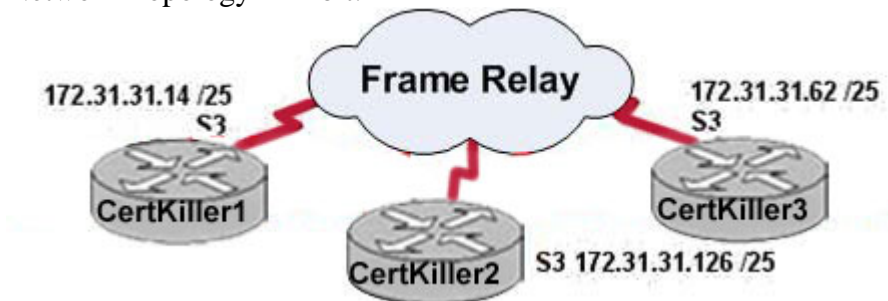
In this example NAT is translating the 10.10.10.4 ( Certkiller 4 router IP) statically to 172.16.6.14. However, we can see that Certkiller 7 does not have any route to the 172.16.6.0/24 network so there is no way for Certkiller 7 to return the ping traffic back to Certkiller 4. Configuring a static route to the 172.16.6.0 network will fix this problem.

Note: The reason that pings to Certkiller 5 work is because it knows how to get back to the 172.16.6.0/24 network, since this network resides on its directly connected interface.

---

### QUESTION 348:

Network Topology Exhibit:



Configuration exhibit:

```
CertKiller1#show frame-relay map
Serial3 (up): ip 172.31.31.126 dlci 205 (0xCD,0x30D0), static, broadcast,
CISCO, status defined, active

CertKiller2#show frame-relay map
Serial3 (up): ip 172.31.31.126 dlci 605 (0x25D,0x94D0), static, broadcast,
CISCO, status defined, active

CertKiller3#show frame-relay map
Serial3 (up): ip 172.31.31.62 dlci 509 (0x1FD,0x7CD0), static, broadcast,
CISCO, status deleted
Serial3 (up): ip 172.31.31.14 dlci 502 (0x1F6,0x7C60), static, broadcast,
CISCO, status defined, active
```

You work as a network technician at Certkiller .com. Study the exhibits carefully.

The Frame-Relay network in the diagram is not functioning properly. Based on the information shown above, what is the cause of the problem?

- A. The S3 interface of the Certkiller 2 router has been configured with the "frame relay encapsulation ietf" command
- B. The Frame-relay map statement in the Certkiller 3 router for the PVC to Certkiller 2 is not correct
- C. The Certkiller 1 router has the wrong LMI type configured
- D. Inverse ARP is providing the wrong PVC information to the Certkiller 1 Router



- E. The IP Address on the serial interface of the Certkiller 3 router is configured incorrectly
- F. None of the above

Answer: B

Explanation:

On serial 3 of Certkiller 3 we can see that there are 2 PVC's defined, but only one of them is working and is shown as active. The frame relay map that was used to specify DLCI 509 was incorrect. Incorrect DLCI assignments that are configured in routers normally show up as "deleted" in the frame relay maps.

---

#### **QUESTION 349:**

The following output was displayed on a Certkiller router:

#### **CertKiller1 # show frame-relay map**

```
Serial0/0 (up) :ip 172.16.3.1 dlci 100 (0x64, 0x1840), dynamic  
broadcast., status defined, active
```

Based on the information shown above, what is the meaning of the term "dynamic" as displayed in the output of the show frame-relay map command shown?

- A. The DLCI 100 will be dynamically changed as required to adapt to changes in the Frame Relay cloud
- B. The DLIC 100 was dynamically allocated by the router
- C. The mapping between DLCI 100 and the end station IP Address 172.16.3.1 was learned through inverse ARP
- D. The Scenario0/0 interface is passing traffic
- E. The Serial0/0 interface acquired the IP address 172.16.3.1 from a DHCP server
- F. None of the above

Answer: C

Explanation:

Inverse Address Resolution Protocol (Inverse ARP) was developed to provide a mechanism for dynamic DLCI to Layer 3 address maps. Inverse ARP works much the same way Address Resolution Protocol (ARP) works on a LAN. However, with ARP, the device knows the Layer 3 IP address and needs to know the remote data link MAC address. With Inverse ARP, the router knows the Layer 2 address which is the DLCI, but needs to know the remote Layer 3 IP address.

When using dynamic address mapping, Inverse ARP requests a next-hop protocol address for each active PVC. Once the requesting router receives an Inverse ARP response, it updates its DLCI-to-Layer 3 address mapping table. Dynamic address mapping is enabled by default for all protocols enabled on a physical interface. If the Frame Relay environment supports LMI autosensing and Inverse ARP, dynamic address mapping takes place automatically. Therefore, no static address mapping is required.

---

**QUESTION 350:**

The command "frame-relay map ip 10.121.16.8 102 broadcast" was entered on a Certkiller FR router. Which of the following statements is true concerning this command?

- A. The command is required for all frame relay configurations
- B. The broadcast option allows packets, such as RIP updates to be forwarded across the PVC
- C. This command should be executed from the global configure mode
- D. 102 is the remote DLCI that will receive the information
- E. The IP Address 10.121.16.8 is the local router port used to forward data
- F. None of the above

Answer: B

Explanation:

The broadcast keyword is commonly used with the frame-relay map command. The broadcast keyword provides two functions. First, it forwards broadcasts when multicasting is not enabled and secondly, it simplifies the configuration of OSPF for nonbroadcast networks that use Frame Relay.

The broadcast keyword might also be required for routing protocols such as RIP that depend on regular routing table updates. This is especially true when the router at the remote end is waiting for a routing update packet to arrive before adding the route.

---

**QUESTION 351:**

Many Certkiller locations are connected via Frame Relay, and the default network types are being used. By default, a Frame Relay WAN is classified as what type of physical network?

- A. Point-To-Point
- B. Nonbroadcast multi-access
- C. Broadcast Point-To-Multipoint
- D. Nonbroadcast multipoint
- E. Broadcast multi-access
- F. Broadcast multi-access
- G. None of the above

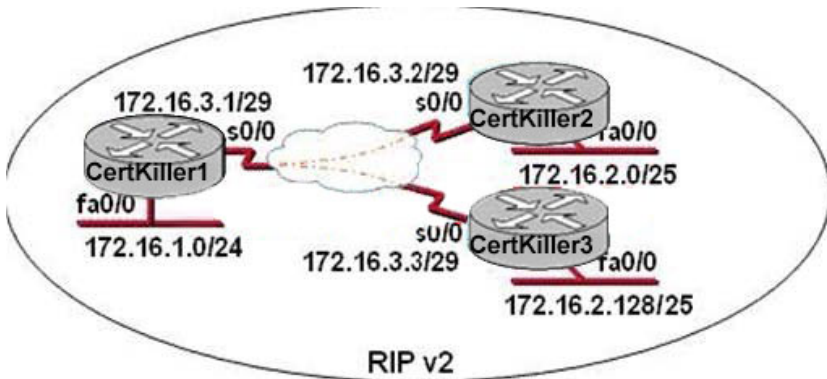
Answer: B

---

**QUESTION 352:**

Three Certkiller routers are connected as shown below:





Here, serial 0/0 on Certkiller 1 is configured as a multipoint interface to communicate with Certkiller 2 and Certkiller 3 in this hub-and-spoke Frame Relay topology. While testing this configuration, a technician notes that pings are successful from hosts on the 172.16.1.0/24 network to hosts on both the 172.16.2.0/25 and 172.16.2.128/25 networks. However, pings between hosts on the 172.16.2.0/25 and 172.16.2.128/25 networks are not successful. Of the following choices, what could explain this connectivity problem?

- A. The 172.16.3.0/29 network used on the Frame Relay links is creating a discontinuous network between the Certkiller 2 and Certkiller 3 router subnetworks
- B. The 172.16.2.0/25 and 172.16.2.128/25 networks are overlapping networks that can be seen by Certkiller 1 but not between Certkiller 2 and Certkiller 3
- C. The ip subnet-zero command has been issued on the Certkiller 1 router
- D. Split Horizon is preventing Certkiller 2 from learning about the Certkiller 3 networks and Certkiller 3 from learning about the Certkiller 2 networks
- E. The RIP v2 dynamic routing protocol can't be used across Frame Relay network
- F. None of the above

Answer: D

Explanation:

The problem in this situation is related to split horizon, which reduces incorrect routing information and routing overhead in a distance-vector network by enforcing the rule that information cannot be sent back in the direction from which it was received. In other words, the routing protocol differentiates which interface a network route was learned on, and once it determines this, it won't advertise the route back out of that same interface. In a spoke and hub Frame Relay topology, the Frame Relay interface for the hub router must have split-horizon processing disabled. Otherwise, the spoke routers never receive each other's routes.

### QUESTION 353:

You are implementing a new frame relay network to provide connectivity between you offices. To do this, you set up the frame relay network using point-to-point subinterfaces.

Which of the following does NOT need to be configured?

- A. The Frame Relay encapsulation on the physical interface.
- B. The local DLCI on each subinterface.
- C. An IP address on the physical interface.
- D. The subinterface type as point-to-point.

Answer: C

Explanation:

When using point to point subinterfaces in a frame relay network, the subinterfaces will each have their own IP addresses and will each be contained within their own IP subnet. The physical interface does not require an IP address.

Incorrect Answers:

- A. The physical interface will need to be configured with a layer two encapsulation type, so in this case it must be frame relay.
- B. The subinterfaces will have the local DLCI assigned to each one, using the "frame-relay interface-dlci" command for each of the subinterfaces.
- D. Each subinterface should be configured as a point to point network type.

---

**QUESTION 354:**

It has become necessary to configure an existing serial interface to accept a second Frame Relay virtual circuit. Which of the following procedures are required to accomplish this task? (Choose three.)

- A. Encapsulate the physical interface with multipoint PPP.
- B. Configure static Frame Relay map entries for each subinterface network.
- C. Disable split horizon to prevent routing loops between the subinterface networks.
- D. Remove the IP address from the physical interface.
- E. Create the virtual interfaces with the interface command.
- F. Configure each subinterface with its own IP address.

Answer: D, E, F

Explanation:

Normally, when only one logical virtual circuit (PVC) is assigned to a router it is placed on the physical serial interface. To accept a second PVC, subinterfaces must be created, with each PVC using its own logical interface as shown in the example below:

```
interface serial 0
encapsulation frame-relay
interface serial 0.1 point-to-point
ip address 10.0.1.1 255.255.255.0
frame-relay interface-dlci 142
interface serial 0.2 multipoint
ip address 10.0.2.1 255.255.255.0
```

frame-relay map 10.0.2.2 118

In this example, two virtual circuits are used (one pt-pt and one point-multipoint), each with its own IP address. Note that the physical serial 0 interface was not assigned an IP address.

---

**QUESTION 355:**

You are a technician at Certkiller . Your newly appointed Certkiller trainee is setting up a new frame relay connection to a remote branch and wants to know what the valid options for frame relay LMI types are.  
What would your reply be? (Choose all that apply.)

- A. EIA/TIA
- B. Q.932
- C. Q.933 A
- D. IEEE
- E. IETF
- F. Cisco
- G. ANSI

Answer: C, F, G

Explanation:

The following describe the various frame relay LMI options:

Name Document IOS LMI-Type

- \* Cisco Proprietary cisco
- \* ANSI T1.617 Annex D ansi
- \* ITU Q.933. Annex A q.933a

You can set one of three types of LMIs on our devices: ANSI T1.617 Annex D, Cisco, and ITU-T Q.933 Annex A. To do so, use the following commands beginning in interface configuration mode:

	Command	Purpose
Step 1	<b>frame-relay lmi-type {ansi   cisco   q933a}</b>	Sets the LMI type.

Reference:

CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 382

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**QUESTION 356:**

How should router CK1 , which will be used in the Certkiller Frame Relay network, be configured to avoid split horizon issues from preventing routing updates?

- A. Configure a single sub-interface to establish multiple PVC connections to multiple remote router interfaces.

- B. Configure a separate sub-interface for each PVC with a unique DLCI and subnet assigned to the sub-interface.
- C. Configure many sub-interfaces on the same subnet.
- D. Configure each Frame Relay circuit as a point-to-point line to support multicast and broadcast traffic.
- E. None of the above

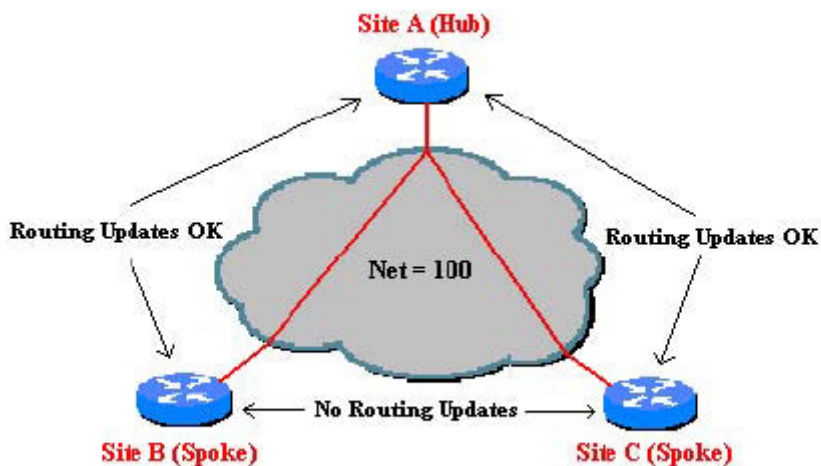
Answer: B

Explanation:

Point-To-Point Subinterfaces:

The concept of subinterfaces was originally created in order to better handle issues caused by split-horizon over Non-Broadcast Multiple Access (NBMA) networks (e.g. frame relay, X.25) and distance-vector based routing protocols (e.g. IPX RIP/SAP, AppleTalk). Split-horizon dictates that a routing update received on an interface cannot be retransmitted out onto the same interface. This rule holds even if the routing update was received on one frame relay PVC and destined to retransmit out onto another frame relay PVC. Referring to figure 2, this would mean that sites B and C can exchange routing information with site A, but would not be able to exchange routing information with each other. Split-horizon does not allow Site A to send routing updates received from Site B on to Site C and vice versa.

Note: For TCP/IP, Cisco routers can disable split-horizon limitations on all frame relay interfaces and multipoint subinterfaces and do this by default. However, split-horizon cannot be disabled for other protocols like IPX and AppleTalk. These other protocols must use subinterfaces if dynamic routing is desired.



**Figure 2: Split-horizon does not allow remote sites to send routing updates to each other.**

By dividing the partially-meshed frame relay network into a number of virtual, point-to-point networks using subinterfaces, the split-horizon problem can be overcome. Each new point-to-point subnetwork is assigned its own network number. To the routed protocol, each subnetwork now appears to be located on separate interfaces (Figure 3). Routing updates received from Site B on one logical point-to-point subinterface can be forwarded to site C on a separate logical interface without violating split horizon.



- A. DLCI 17 is the Layer 2 address used by CK2 to describe a PVC to CK3 .
- B. DLCI 17 describes the ISDN circuit between CK2 and CK3 .
- C. DLCI 17 describes a PVC on CK2 . It cannot be used on CK3 or CK1 .
- D. DLCI 17 describes the dial-up circuit from CK2 and CK3 to the service provider.
- E. None of the above

Answer: A

Explanation:

DLCI-Data Link Connection Identifier Bits: The DLCI serves to identify the virtual connection so that the receiving end knows which information connection a frame belongs to. Note that this DLCI has only local significance. Frame Relay is strictly a Layer 2 protocol suite

---

**QUESTION 360:**

When configuring Frame Relay using point-to-point subinterfaces, which of the following must not be configured? (Select one)

- A. The local DLCI on each subinterface of the Frame Relay.
- B. The Frame Relay encapsulation on the physical interface.
- C. An IP address on the physical interface.
- D. The subinterface type as point-to-point
- E. None of the above

Answer: C

Explanation:

Frame Relay does not require IP addresses on physical interfaces. A subnet address is usually assigned to each point-to-point connection. Therefore, only one DLCI can be configured per point-to-point subinterface. On point-to-point subinterfaces, the destination is identified and configured with the frame-relay interface-dlci command beginning in interface configuration mode. When configured on a point-to-point subinterface, the command associates the selected point-to-point subinterface with a DLCI. The command also allows users to select the type of Frame Relay encapsulation to be used on the specific VC. The command can be executed without specifying the Frame Relay encapsulation type to be used. By default, the Cisco Frame Relay encapsulation type will be used.

---

**QUESTION 361:**

You are in the midst of configuring a router for a Frame Relay network. What could you do to prevent split horizon problems? (Select all that apply)

- A. Configure a separate sub-interface for each PVC. Assign a unique DLCI and subnet to each sub-interface.

- B. Configure each Frame Relay circuit as a point-to-point line to support multicast and broadcast traffic.
- C. Configure one sub-interface to disperse into multiple PVC connections to multiple remote router interfaces.
- D. Configure as many as possible sub-interfaces on the same subnet.
- E. Use the "no ip split-horizons" command on the physical interface.

Answer: A, E

Explanation:

The best solution is to configure subinterfaces for each virtual connection, because the individual virtual circuits can be maintained and split horizon can remain on. Routing update information that is received through one subinterface can be propagated to other subinterfaces, because each sub-interface is treated as a completely separate interface. 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. Another alternative to using sub-interfaces is to simply disable the split horizon mechanism as shown in choice E.

Reference: [http://www.cisco.com/warp/public/116/fr\\_faq.html](http://www.cisco.com/warp/public/116/fr_faq.html)

---

### **QUESTION 362:**

A new frame-relay network is being implemented and inverse ARP does not appear to be operating correctly. Which alternative command can be used to provide connectivity?

- A. frame-relay arp
- B. frame-relay map
- C. frame-relay interface-dlci
- D. frame-relay lmi-type
- E. frame-relay pvc

Answer: B

Explanation:

When using dynamic address mapping, Inverse ARP requests a next-hop protocol address for each active PVC. Once the requesting router receives an Inverse ARP response, it updates its DLCI-to-Layer 3 address mapping table. Dynamic address mapping is enabled by default for all protocols enabled on a physical interface. If the Frame Relay environment supports LMI autosensing and Inverse ARP, dynamic address mapping takes place automatically. Therefore, no static address mapping is required. If the environment does not support LMI autosensing and Inverse ARP, a Frame Relay map must be manually configured. Use the frame-relay map command to configure static address mapping. Once a static map for a given DLCI is configured, Inverse ARP is disabled on that DLCI.



---

**QUESTION 363:**

Which of the following Frame-Relay encapsulation commands would you use, if you had to connect your Cisco router to a non-Cisco router?

- A. CertK Router(config-if)# Encapsulation frame-relay dot1q
- B. CertK Router(config-if)# Encapsulation frame-relay aal5snap
- C. CertK Router(config-if)# Encapsulation frame-relay ietf
- D. CertK Router(config-if)# Encapsulation frame-relay isl
- E. None of the above

Answer: C

Explanation:

In general, the IETF Frame Relay encapsulation should be used when connecting a Cisco router to non-Cisco equipment across a Frame Relay network. The IETF Frame Relay encapsulation allows interoperability between equipment from multiple vendors.

Both Cisco and IETF encapsulations for Frame Relay can be configured on a per-virtual-circuit (VC) basis. This gives greater flexibility when configuring Frame Relay in a multi-vendor environment. A user can specify the Frame Relay encapsulation types to be used on different virtual circuits configured under the same physical interface.

Incorrect Answers:

- A, D: 802.1Q and ISL are trunking encapsulation types and have nothing to do with frame relay.
- B. AAL 5 SNAP is an ATM encapsulation and is not related to frame relay.

---

**QUESTION 364:**

In Frame Relay; what is the purpose of Inverse ARP? (Select only one answer choice)

- A. It is used to map a known IP address to a MAC address
- B. It is used to map a known DLCI to a MAC address
- C. It is used to map a known MAC address to an IP address
- D. It is used to map a known DLCI to an IP address
- E. It is used to map a known MAC address to DLCI
- F. None of the above

Answer: D

Explanation:

Just as ARP resolves IP addresses to MAC addresses, Inverse ARP maps a known DLCI to an IP address.

Incorrect Answers:

A, C: ARP and Reverse ARP (RARP) are used for IP address/MAC address mappings.  
B, E: DLCI do not have a need to discover the MAC address of a host, so a DLCI is never mapped to a MAC address.

---

**QUESTION 365:**

In regard to a default Frame-Relay data network, what kind of physical network is it classified as?

- A. Point-to-point
- B. Broadcast multi-access
- C. Nonbroadcast multipoint
- D. Nonbroadcast multi-access
- E. Broadcast point-to-multipoint
- F. None of the above

Answer: D

Explanation:

Frame relay networks are considered to be NBMA networks. Frame Relay is a WAN protocol that operates at the physical and data link layers of the Open System Interconnection (OSI) reference model. This protocol is standardized by both the International Telecommunication Union Telecommunications Standardization Sector (ITU-T) and American National Standards Institute (ANSI).

Frame Relay uses statistical multiplexing techniques to provide network access in a packet-switched network. It is strictly a Layer 2 protocol suite. Being a Layer 2 protocol enables Frame Relay to offer higher performance WAN applications (such as LAN interconnection) than the older protocols (such as X.25), which incorporated Layer 3 functions. Given these performance benefits, Frame Relay is a popular WAN medium. However, it has some limitations with regard to IP multicast. To illustrate, Frame Relay is a Layer 2 nonbroadcast multiaccess (NBMA) network protocol. IP multicast networks are designed to utilize the capabilities of Layer 2 broadcast media such as on a LAN.

---

**QUESTION 366:**

Which of the following statements correctly describes the characteristics of a Frame Relay point-to-point subinterface? (Select two answer choices)

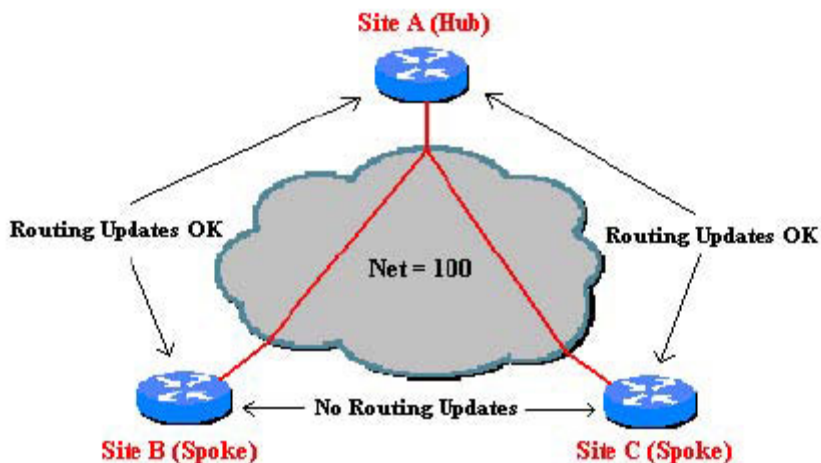
- A. Needs to use Inverse ARP.
- B. Maps a single IP subnet per DLCI.
- C. Maps a single IP subnet across multiple DLCIs.
- D. Resolves NBMA (non broadcast multi access) split horizon issues.
- E. Requires use of the frame-relay map command.
- F. None of the above

Answer: B, D

Explanation:

B is correct because only one DLCI can be configured per point-to-point subinterface. The command 'frame-relay interface-dlci' associates the selected point-to-point subinterface with only one DLCI.

Subinterfaces were originally created to take care of split-horizon issues from distance vector routing protocols over non-broadcast multiple access networks, because split horizon prevents routing updates received on one interface from retransmitting out onto the same interface. This is true even if the routing update is received on one frame relay PVC destined out to another frame relay PVC! By partitioning the frame relay network into numerous point-to-point networks using subinterfaces; each new point-to-point subnetwork gets their own network number assigned. Therefore, the routed protocol views each subnetwork as if it was located on a separate interface.



**Figure 2: Split-horizon does not allow remote sites to send routing updates to each other.**

Incorrect Answers:

A. Since only one DLCI is assigned per subnet in a logical point to point interface, there is no need for Inverse ARP, since both the DLCI and IP addresses are already known.

C. The IP subnet is mapped across a single virtual circuit, so only one DLCI is mapped per subinterface.

E. This command would be needed when multiple virtual circuits are being configured on one physical interface. When logical subinterfaces are used, the "frame-relay interface-dlci" command is used, not this command.

Reference: <http://www.ciscopress.com/articles/article.asp?p=170741&seqNum=6>

### QUESTION 367:

Regarding Frame Relay Multipoint subinterfaces; which statement is true?

A. An IP address is required on the physical interface

B. All routers are required to be fully meshed

C. All routers must be in the same subnet to forward routing updates and broadcasts

- D. Multipoint is the default configuration for Frame Relay subinterfaces
- E. None of the above

Answer: C

Explanation:

Unlike Frame Relay point-to-point connections, multipoint Frame Relay router interfaces must all be in the same subnet. With multipoint, a single subinterface is used to establish multiple PVC connections to multiple physical interfaces or subinterfaces on remote routers. In this case, all the participating interfaces are in the same subnet, and each interface has its own local DLCI. Because the subinterface is acting like a regular NBMA Frame Relay network in this environment, broadcast traffic is subject to the split horizon rule.

Incorrect Answers:

- A. The IP address is required on the logical subinterface, not the physical interface.
- B. It is never an absolute requirement for a frame relay network to be fully meshed. The vast majority of frame relay networks are configured in a hub and spoke fashion, to avoid all of the charges associated with the numerous PVC's needed to be fully meshed.
- D. Point to point is the default frame relay subinterface type.

---

### **QUESTION 368:**

The Certkiller Frame Relay network is displayed below:



In regard to router Certkiller 1; what is the function of the Frame Relay DLCI?

- A. Defines the signaling standard between Certkiller 1 and Certkiller 2.
- B. Classifies the encapsulation used between Certkiller 1 and Certkiller 2.
- C. Identifies the circuit between Certkiller 2 and the frame switch.
- D. Classifies the circuit between Certkiller 1 and Certkiller 2.
- E. Defines the signaling standard between Certkiller 1 and the frame switch.

Answer: C

Explanation:

Certkiller 1 sends frames with DLCI, and they reach the local switch. The local switch sees the DLCI field and forwards the frame through the Frame Relay network until it reaches the switch connected to Certkiller 2. The Certkiller 2's local switch forwards the frame out of the access link to Certkiller 2. DLCI information is considered to be locally significant, meaning that the DLCI is used between the end router and the carrier's local frame relay switch.

Reference: CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 386

Incorrect Answers:

- A, E. DLCI is used only as a circuit identifier (DLCI=Data Link Circuit Identifier), and not used for signaling.
- B. The encapsulation options are not defined with DLCIs.
- D. The DLCI information is considered to be locally significant, meaning that the DLCI is used between the end router and the carrier's local frame relay switch. The DLCI is not used end to end (router to router).

---

**QUESTION 369:**

Your frame relay network uses DLCI information on each of the PVC's. What is the purpose of them?

- A. They determine the encapsulation type employed by the Frame Relay.
- B. They identify the logical circuit between a local router and a Frame Relay WAN switch.
- C. They represent the physical address of the router.
- D. They represent the keep lives in the maintenance of PVC.

Answer: B

Explanation:

Routers use the data-link connection identifier (DLCI) as the Frame Relay address, which identifies the VC over which the frame should travel. Data Link Connection Identifiers are the "hardware address" on a Frame Relay network. They identify a routers PVC to the Frame Relay switch.

Incorrect Answers:

- A. DLCI information is not used to determine the encapsulation of the frame relay circuit in any way.
- C. A DLCI is used at layer two, but it is a separate identifier that is not related to the hardware MAC address of any device.
- D. The function of a keepalive is handled by LMI in a frame network, not the DLCI.

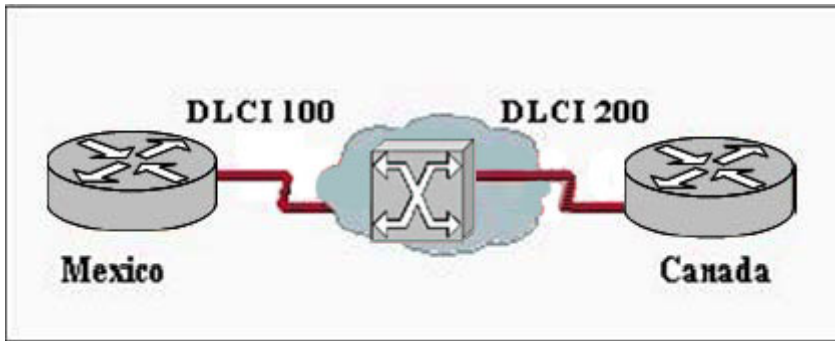
Reference:

CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) page 377

---

**QUESTION 370:**

The Certkiller international frame relay network is shown below:



The Frame Relay circuit between Mexico and Canada is experiencing congestion. Which types of notification are used to alleviate the congestion? (Choose three.)

- A. FECN
- B. CIR
- C. BECN
- D. DE
- E. DLCI 100 is down
- F. DLCI 200 is down

Answer: A, C, D

Explanation:

In a frame relay network, FECN (forward explicit congestion notification) is a header bit transmitted by the source (sending) terminal requesting that the destination (receiving) terminal slow down its requests for data. BECN (backward explicit congestion notification) is a header bit transmitted by the destination terminal requesting that the source terminal send data more slowly. FECN and BECN are intended to minimize the possibility that packets will be discarded (and thus have to be resent) when more packets arrive than can be handled.

If the source terminal in a communications circuit generates frequent FECN bits, it indicates that the available network bandwidth (at that time) is not as great as can be supported by the destination terminal. Likewise, if the destination generates frequent BECN bits, it means the available network bandwidth (at that time) is not as great as can be supported by the source. In either case, the root cause is lack of available bandwidth at the times during which FECN or BECN bits are generated. This can occur because of outdated or inadequate network infrastructure, heavy network traffic, high levels of line noise, or portions of the system going down. Identifying and resolving these issues can improve overall network performance, especially when the system is called upon to carry a large volume of traffic.

Discard Eligibility (DE)

When there is congestion on the line, the network must decide which frames to discard in order to free the line. Discard Eligibility provides the network with a signal to determine which frames to discard. The network will discard frames with a DE value of 1 before discarding other frames.

The DE bit may be set by the user on some of its lower-priority frames. Alternatively, the

network may set the DE bit to indicate to other nodes that a frame should be preferentially selected for discard, if necessary.

---

**QUESTION 371:**

Exhibit:

```
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>
```

Please study the exhibit carefully. What does the STATUS=ACTIVE refer to in the output of the show frame-relay pvc command shown above?

- 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.
- E. None of the above

Answer: B

Explanation:

The Frame Relay switch uses LMI to report the status of configured PVCs. The three possible PVC states are as follows:

Active state - Indicates that the connection is active and that routers can exchange data. This is the state of an operational PVC.

Inactive state - Indicates that the local connection to the Frame Relay switch is working, but the remote router connection to the Frame Relay switch is not working.

Deleted state - Indicates that no LMI is being received from the Frame Relay switch, or that there is no service between the CPE router and Frame Relay switch.

---

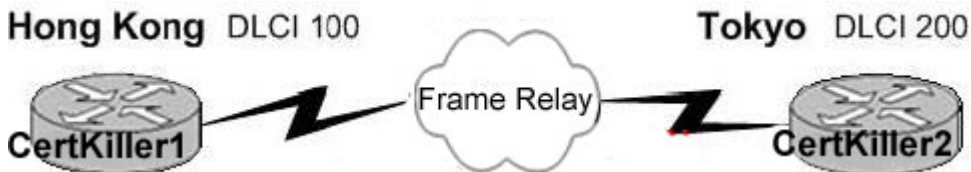
**QUESTION 372:**

Study the output script and the network topology exhibit below:



Certkiller 1# show running-config

```
interface serial0/0
bandwidth 64
ip address 172.16.100.2 255.255.0.0
encapsulation frame-relay
frame-relay map ip 172.16.100.1 100 broadcast
```



The Router Certkiller 1 in Hong Kong is connected to the router Certkiller 2 in Tokyo via a new Frame Relay link. However, Certkiller 1 is unable to communicate with Certkiller 2. Based on the above output, what do you suspect as the underlying cause of this problem?

- A. Bandwidth configuration incorrect
- B. IP address not correct
- C. Improper map statement
- D. Improper LMI configuration
- E. None of the above

Answer: C

Explanation: From looking at the diagram you can see that Hong Kong's DLCI is 100, while Tokyo's DLCI is 200.

The Frame Relay map command is an interface configuration mode command that statically defines a mapping between a network layer address and a DLCI.

Incorrect Answers:

- A. The bandwidth statement is not used by the routers at a physical or data link layer, so this statement will not have any impact on the function of the frame relay circuit.
- B. We do not know what the IP address of the Tokyo side is, so this can not be assumed.
- D. The default LMI type is Cisco, and since both routers in this network appear to be Cisco's, we can assume that this is acceptable.

---

### **QUESTION 373:**

While troubleshooting an issue with your frame relay network, you issue the "show frame pvc" command as shown in the exhibit below:

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 bcst pkts 107	out bcst bytes 19722	

pvc create time 00:25:50, last time pvc status changed 00:25:40

You're a network administrator at a Certkiller branch office, that's connected to the central headquarters by means of Frame Relay. You've been getting complaints that the connection has suddenly become slow, so you make the assumption that there's too much traffic going through the link.

Taking into consideration the above output from the 'show frame relay pvc' command; which command output value is indicating that there's congestion between the local router and the corporate site?

- A. in DE packets 0
- B. last time PVC status changed 00:25:40
- C. in BECN packets 192
- D. DLCI = 100
- E. in FECN packets 147

Answer: C

Explanation:

BECN stands for Backward Explicit Congestion Notification. The BECN tells the transmitting device that the Frame Relay network is congested and that it should "back off" to allow better throughput. BECN and FECN go hand to hand together, but since the question specifically asks for what's indicating congestion between the local router and corporate site, BECN is correct.

#### QUESTION 374:

You are attempting to troubleshoot a frame relay problem you are having within the Certkiller network, but you are unsure where to start. You begin by entering the command:

Router# show frame-relay ?

Which three options will you be prompted for? (Select three answers choices)

- A. dlci

- B. clients
- C. pvc
- D. neighbors
- E. lmi
- F. map

Answer: C, E, F

Explanation:

The valid options for, 'show frame-relay' are: show frame-relay map, show frame-relay lmi, & show frame-relay pvc. In the Cisco IOS, if you don't type in a command specific enough, it will prompt you to select an option.

Incorrect Answers:

A, B, D. Show frame-relay dlci, show frame-relay clients, and show frame-relay neighbors are all invalid commands.

---

### QUESTION 375:

Exhibit:



```
Router(config)# interface serial 0/0
Router(config-if)# frame-relay lmi-type cisco

% Unrecognized command
Router(config-if)# frame-relay ?
% Unrecognized command
```

In the example above, A Certkiller router interface is being configured for Frame Relay. However, as the exhibit shows, the router will not accept the command to configure the LMI type. What is the problem?

- A. The interface does not support Frame Relay connections.
- B. The interface does not have an IP address assigned to it yet.
- C. The interface requires that the no shutdown command be configured first.
- D. The interface requires that the encapsulation frame-relay command be configured first.

Answer: D

Explanation:

Before entering LMI type in interface, you should type the encapsulation frame-relay command. By default, serial interfaces use HDLC encapsulation, where the LMI type is

not a configurable option as HDLC does not understand the concept of LMI.

See the sample Configuration steps:

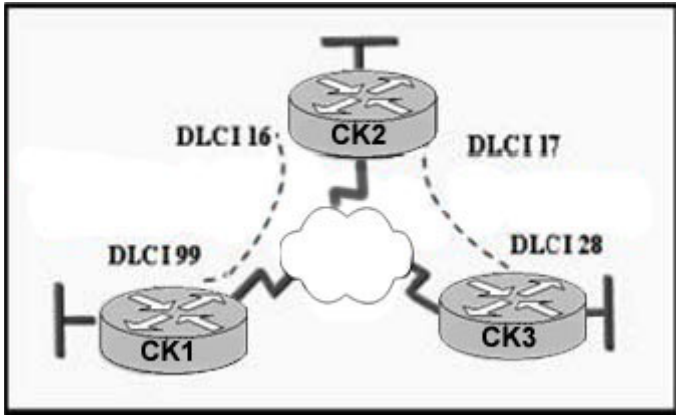
```
Router(config-if)#encapsulation frame-relay {cisco | ietf}
```

```
Router(config-if)#frame-relay lmi-type {ansi | cisco | q933a}
```

---

**QUESTION 376:**

Refer to the Certkiller frame relay exhibit below:



In this frame relay network, which IP addresses would be assigned to the CK1 , CK2 , and CK3 interfaces when using 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: 192.168.10.2 /24  
DLCI 99: 192.168.10.3 /24  
DLCI 28: 192.168.10.4 /24
- D. 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

Answer: D

Explanation:

With Point to point PVC's, two subinterfaces would be created on router CK2 , one for

each connection to the remote locations. In this network, the connection to CK1 would require one IP subnet, and the connection to router CK3 would require another. These two subnets must be separated, as each subinterface requires a distinct IP network. Only choice D correctly shows one IP subnet allocated to the CK1 - CK2 network, and one for the CK2 - CK3 connection.

---

**QUESTION 377:**

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.
- E. None of the above

Answer: B

Explanation:

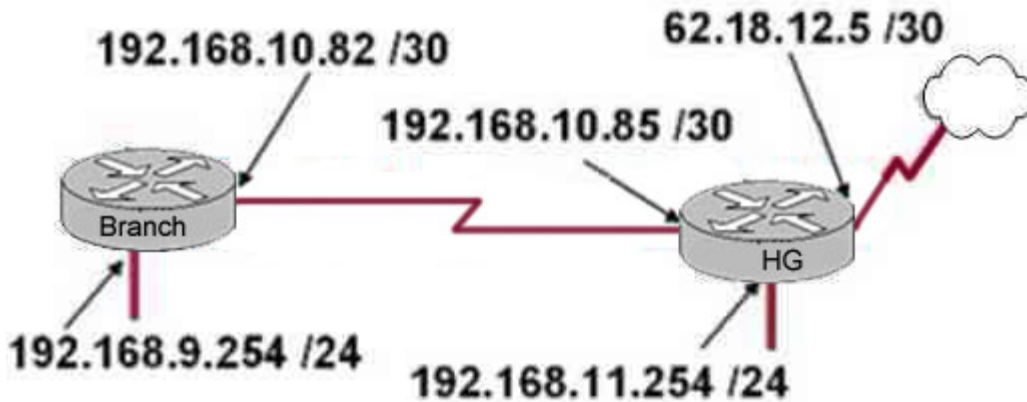
Frame Relay supports two types of interfaces: point-to-point and multipoint. The one you choose determines whether you need to use the configuration commands that ensure IP address to data-link connection identifier (DLCI) mappings. After configuring the PVC itself, you must tell the router which PVC to use in order to reach a specific destination. Let's look at these options:

1. Point-to-point subinterface - With point-to-point subinterfaces, each pair of routers has its own subnet. If you put the PVC on a point-to-point subinterface, the router assumes that there is only one point-to-point PVC configured on the subinterface. Therefore, any IP packets with a destination IP address in the same subnet are forwarded on this VC. This is the simplest way to configure the mapping and is therefore the recommended method. Use the `frame-relay interface-dlci` command to assign a DLCI to a specified Frame Relay subinterface.
2. Multipoint networks - Multipoint networks have three or more routers in the same subnet. If you put the PVC in a point-to-multipoint subinterface or in the main interface (which is multipoint by default), you need to either configure a static mapping or enable inverse Address Resolution Protocol (ARP) for dynamic mapping.

---

**QUESTION 378:**

Part of the Certkiller network is shown below:



After the router interfaces shown in the diagram above have been configured, it is discovered that hosts in the Branch LAN cannot access the Internet. Further testing reveals additional connectivity issues. What will fix this problem?

- A. Change the address of the Branch router LAN interface.
- B. Change the address of the Branch router WAN interface.
- C. Change the subnet mask of the HQ router LAN interface.
- D. Change the address of the HQ router LAN interface.
- E. Change the address of the HQ router interface to the Internet.
- F. Change the subnet mask of the HQ router interface to the Internet.
- G. None of the above

Answer: B

Explanation:

The serial line connection between the Branch office and the HQ office should have interfaces that belong in the same subnet. Based on the diagram above, the WAN interface of the Branch router is configured with an IP address that is in a different IP network than the serial interface of the HQ router. As it is set up currently, no traffic will pass from the Branch router to the HQ until these two interfaces are in the same subnet.

---

#### **QUESTION 379:**

Two Certkiller routers are connected as shown below:



Certkiller 1 command output exhibit:

```

CertKiller1# sh cdp entry *
-----
Device ID: CertKiller2
Entry address(es):
  IP address: 10.1.1.2
Platform: cisco 2610, Capabilities: Router
Interface: Serial10/0, Port ID (outgoing port): Serial0/1
Heldtime : 125 sec

<output omitted>

```

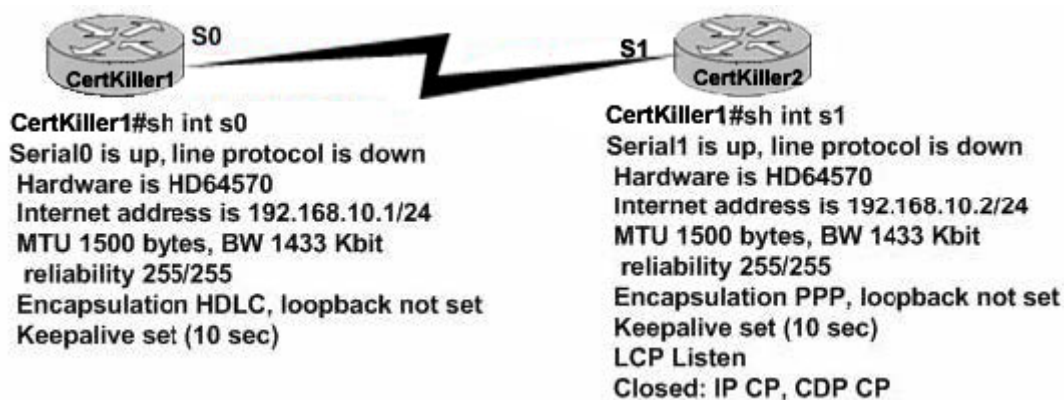
The two Certkiller routers shown above are the only Cisco devices on the network. The serial network between the two devices has a mask of 255.255.255.252 (/30). Given the output that is shown, what three statements are true of these devices? (Choose three)

- A. The Certkiller 1 serial address is 10.1.1.1.
- B. The CDP information was received on port Serial0/0 of the Certkiller 1 router.
- C. The CDP information was sent by port Serial0/0 of the Certkiller 2 router.
- D. The Certkiller 2 router is a Cisco 2610.
- E. The Certkiller 1 router is a Cisco 2610.
- F. The Certkiller 1 serial address is 10.1.1.2.
- G. CDP is not enabled on Certkiller 2

Answer: A, B, D

### QUESTION 380:

A point to point leased line connecting routers Certkiller 1 and Certkiller 2 is installed as shown below:



The two serially connected routers can't communicate. Can you identify the fault on router Certkiller 2?

- A. Link reliability is insufficient



- B. IPCP is not open
- C. Incorrect subnet mask
- D. Incompatible encapsulation
- E. Bandwidth allocation is too low
- F. Incomplete IP address
- G. None of the above

Answer: D

Explanation:

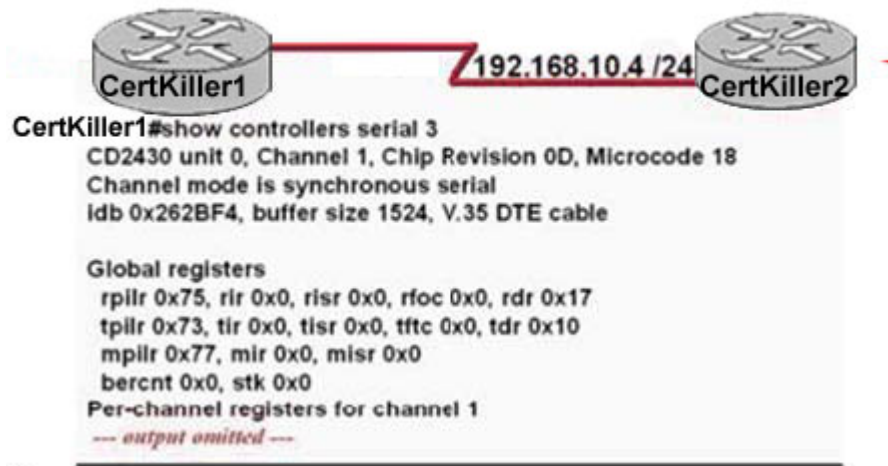
HDLC and PPP configuration is straightforward. You just need to be sure to configure the same WAN data-link protocol on each end of the serial link. Otherwise, the routers will misinterpret the incoming frames, because each WAN data-link protocol uses a different frame format. The routers must match at each end of the private leased line link.

Reference: CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 310.

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### QUESTION 381:

The two Certkiller Lab routers shown below are interconnected with back-to-back cables between their serial interfaces. How should the serial interface of the Certkiller 1 router be configured to establish Layer 3 connectivity between the two routers?



- A. Certkiller 1(config)#interface serial 3  
Certkiller 1(config-if)# clock rate 64000  
Certkiller 1(config-if)# no shutdown
- B. Certkiller 1(config)#interface serial 3  
Certkiller 1(config-if)# ip address 192.168.10.3 255.255.255.0

Certkiller 1(config-if)# clock rate 64000  
C. Certkiller 1(config)#interface serial 3  
Certkiller 1(config-if)# ip address 192.168.10.3 255.255.255.0  
Certkiller 1(config-if)# clock rate 64000  
Certkiller 1(config-if)# no shutdown  
D. Certkiller 1(config)#interface serial 3  
Certkiller 1(config-if)# ip address 192.168.10.3 255.255.255.0  
Certkiller 1(config-if)# no shutdown  
E. None of the above

Answer: D

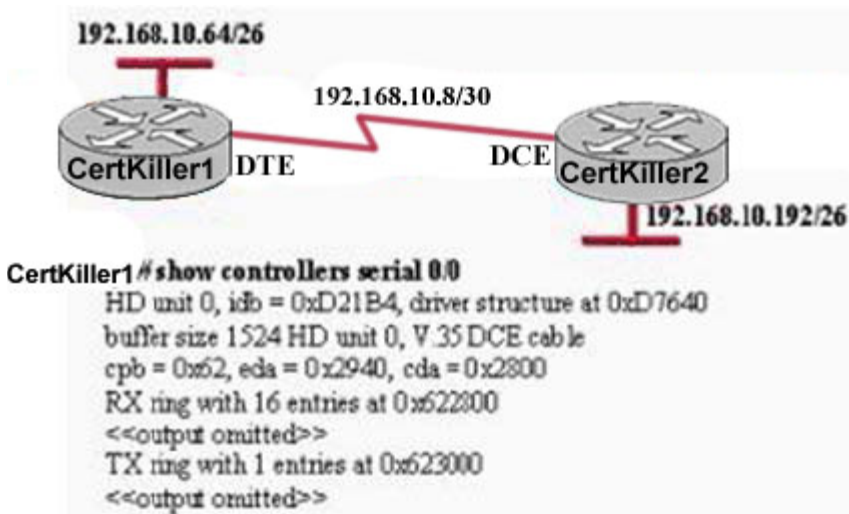
Explanation:

When examining the interface using the show controllers command, the DTE cable is connected so there is no need to specify the clock rate and bandwidth; just specify the IP address and bring up the interface. Only the DCE side of the serial to serial connection is required to specify the clock rate.

---

### QUESTION 382:

An administrator cannot connect from Certkiller 1 to Certkiller 2. To troubleshoot this problem, the administrator has entered the command shown in the exhibit.



Based on the output shown, what could be the problem?

- A. The serial interface has a full buffer.
- B. The serial interface is configured for half duplex.
- C. The serial interface has the wrong type of cable attached.
- D. The serial interface does not have a cable attached.
- E. The serial interface is configured for the wrong frame size.

Answer: C

Explanation:

According to the figure DTE cable should connect to Certkiller 1 on interface but while examining using show controllers serial 0/0 command it showing that a DCE is connected so the wrong type of cable is being used.

---

**QUESTION 383:**

While logged into a router you manually shut down the serial 0 interface using the "shutdown" interface configuration command. You then issue the "show interface serial 0" command in exec mode. What could you expect the status of the serial 0 interface to be?

- A. Serial 0 is up, line protocol is up
- B. Serial 0 is up, line protocol is down
- C. Serial 0 is down, line protocol is down
- D. Serial 0 is down, line protocol is up
- E. Serial 0 is administratively down, line protocol is down
- F. Serial 0 is administratively down, line protocol is up

Answer: E

Explanation:

To bring down an interface for administrative reasons and, as a side effect, remove the connected router from the routing table, you can use the shutdown interface subcommand. To enable the interface back up, issue the "no shutdown" configuration command.

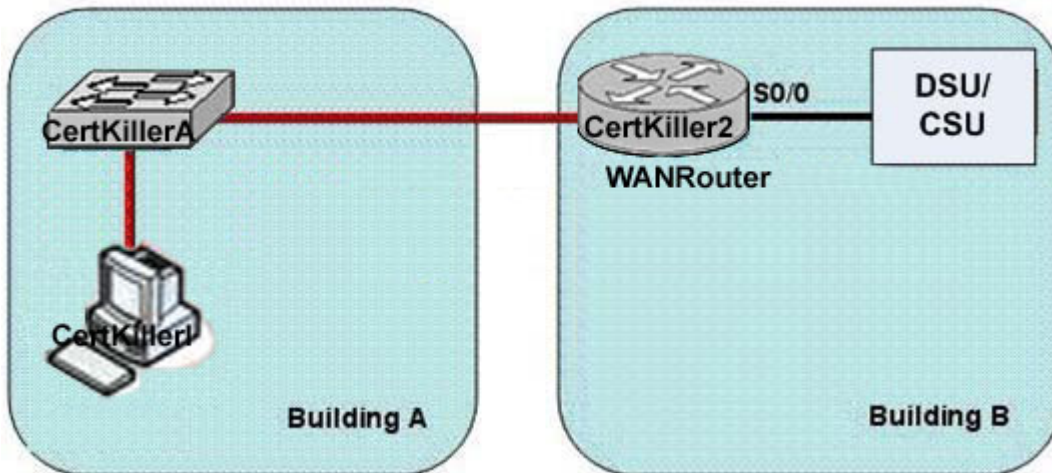
Incorrect Answers:

- A. This is the status of a fully operational interface.
- B, C. These are the results of line problems or configuration errors.
- D, F. These two interface conditions should never be seen.

---

**QUESTION 384:**

Two Certkiller buildings are connected together as shown below:



The Certkiller network administrator is in a campus building distant from Building B. The WANRouter is hosting a newly installed WAN link on interface S0/0. The new link is not functioning and the administrator needs to determine if the correct cable has been attached to the S0/0 interface. How can the administrator accurately verify the correct cable type on S0/0 in the most efficient manner?

- A. Physically examine the cable between Certkiller 2 S0/0 and the DCE
- B. Telnet to Certkiller 2 and execute the command show interface S0/0
- C. Telnet to Certkiller 2 and execute the command show controller S0/0
- D. Telnet to Certkiller 2 and execute the command show processes S0/0
- E. None of the above

Answer: C

#### QUESTION 385:

Two Certkiller routers are connected via a PPP connection. Which of the following are key characteristics of this PPP connection? (Choose three)

- A. PPP can be used over analog circuits
- B. PPP encapsulates several routed protocols
- C. PPP maps Layer 2 to Layer 3 address
- D. PPP provides error correction
- E. PPP supports IP only
- F. PPP provides encryption services

Answer: A, B, D

#### QUESTION 386:

In a point to point connection between two Certkiller offices, which PPP subprotocol negotiates authentication options?

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

Answer: D

Explanation:

LCP: A method of establishing, configuring, maintaining, and terminating the point-to-point connection.

Link-establishment phase

LCP packets are sent by each PPP device to configure and test the link. These packets contain a field called the Configuration Option that allows each device to see the size of the data, compression, and authentication. If no Configuration Option field is present, then the default configurations are used.

---

**QUESTION 387:**

Routers CK1 and CK2 are connected via a private line using PPP. On this link, which of the following options lists the steps in PPP session establishment in the correct order?

- A. network layer protocol phase, optional authentication phase, link establishment phase
- B. link establishment phase, network layer protocol phase, optional authentication phase
- C. optional authentication phase, network layer protocol phase, link establishment phase
- D. link establishment phase, optional authentication phase, network layer protocol phase
- E. network layer protocol phase, link establishment phase, optional authentication phase
- F. optional authentication phase, link establishment phase, network layer protocol phase
- G. None of the above

Answer: D

Explanation:

According to the related RFC on CHAP: In order to establish communications over a point-to-point link, each end of the PPP link must first send LCP packets to configure the data link during Link Establishment phase. After the link has been established, PPP provides for an optional Authentication phase before proceeding to the Network-Layer Protocol phase.

Reference: <http://www.ietf.org/rfc/rfc1994.txt>

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**QUESTION 388:**

You are about to configure PPP on the interface of a Cisco router. Which authentication methods could you use? (Select two answer choices)

- A. SSL
- B. SLIP
- C. PAP
- D. LAPB
- E. CHAP
- F. VNP

Answer: C, E

Explanation:

Password Authentication Protocol (PAP) and Challenge Handshake Authentication Protocol (CHAP) authenticate the endpoints on either end of a point-to-point serial link. Chap is the preferred method today because the identifying codes flowing over the link are created using a MD5 one-way hash, which is more secure than the clear-text passwords sent by PAP.

Reference:

CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 314

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**QUESTION 389:**

In a lab, two routers are connected directly together using serial interfaces in a back-to-back configuration. No external DCE devices are being used. What additional command is needed to bring this link up?

- A. serial up
- B. clockrate
- C. clock rate
- D. dce rate
- E. dte rate
- F. None of the above

Answer: C

Explanation:

The clock rate command (two words), is used to provide clocking on a line where no DCE device is located. Clocking must be provided by one end of this link. Normally in a point to point HDLC or PPP connection the clock rate is supplied by the network provider.

Incorrect Answers:

- A. This is an invalid command
- B. This command will not work. The clock rate command must use two words.
- D, E: These are invalid commands.

**QUESTION 390:**

An ISDN link can be encapsulated using either PPP or HDLC. What are the advantages of using PPP? (Select two answer choices)

- A. PPP is easier to configure and maintain than HDLC.
- B. PPP is consistently implemented among different equipment vendors.
- C. PPP will run faster and more efficiently than HDLC on circuit-switched ISDN links.
- D. PPP authentication will prevent unauthorized callers from establishing an ISDN circuit.
- E. PPP can be routed across public facilities, while HDLC is not routable in circuit-switched networks.
- F. PPP supports asynchronous communication.

Answer: B, D

Explanation:

PPP has numerous advantages over HDLC. Unlike HDLC which is Cisco proprietary, PPP was designed for multi-protocol interoperability. Secondly, PPP supports authentication, using either PAP or CHAP. Finally, PPP supports error correction and the use of bonded multilink circuits.

Incorrect Answers:

- A. The default encapsulation is HDLC. PPP must be explicitly configured and there are many more options available with it, so it is more complicated than HDLC.
- C. HDLC is slightly more efficient than PPP.
- E. Neither PPP nor HDLC work in public circuit switched environments.
- F. Although this is true, it would not be considered an advantage on an ISDN link, as ISDN signaling is not asynchronous.

Reference: CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 308-310

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**QUESTION 391:**

Which of the following correctly describe characteristics of PPP? (Select all valid answer choices)

- A. Encapsulates several different types of routing protocols.
- B. Supports only IP.
- C. Can be used over analog circuits.
- D. Is proprietary to Cisco
- E. Supports error correction.

Answer: A, C

Explanation:



Characteristics of PPP:

- \* PPP can be used on either type of line (dial or switched lines), because data-link protocols are designed for point-to-point environment.
- \* PPP uses one LCP per link and one Control Protocol for each Layer 3 protocol defined on the link. If a router is configured for IPX, Apple Talk, and IP on a PPP serial link, the router configured for PPP encapsulation automatically tries to bring up the appropriate control protocols for each layer 3 protocol.

Incorrect Answers:

B. PPP can be used to support any higher layer protocol, including IP, IPX, Appletalk, etc.

D. PPP is an industry standard used in point to point data networks. The Cisco proprietary method that is similar to PPP is HDLC.

Reference:

CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 309

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### **QUESTION 392:**

You are preparing to create a point to point WAN by connecting a Cisco router with a Juniper router by way of their serial links. Which one of the following commands would you use?

- A. CK1 (config-if)# encapsulation hdlc ansi
- B. CK1 (config-if)# encapsulation ppp
- C. CK1 (config-if)# encapsulation LAPD
- D. CK1 (config-if)# encapsulation frame-relay ietf
- E. CK1 (config)#encapsulation ppp

Answer: B

Explanation:

PPP is the best encapsulation type to use, when connecting routers of different manufacturers, because PPP is non proprietary (unlike HDLC). PPP is an industry standard layer 2 encapsulation type that is supported by every router manufacturer.

Incorrect Answers:

A. HDLC is a cisco proprietary method of encapsulation for connecting a point to point connection. Although HDLC has become so popular that many other router vendors also support it, HDLC ANSI is not an option that can be used.

C. LAPD is used as an out of band signaling protocol on connections such as ISDN. It is not a choice that can be made in this case.

D. This would be the correct choice if the connection was a frame relay connection, instead of a leased line connection. The ietf keyword is needed for connecting frame links to routers that are non-cisco.

E. This command needs to be placed in interface configuration mode, not in global configuration mode.

---

**QUESTION 393:**

The Certkiller WAN connection is shown below:



Based on this diagram, which two devices can be used to complete the connection between the WAN router at the customer site and the service provider? (Choose two.)

- A. CSU/DSU
- B. modem
- C. WAN switch
- D. ATM switch
- E. Frame Relay switch
- F. ISDN TA

Answer: A, B

Explanation:

DTE is an abbreviation for Data Terminal Equipment, and refers to an end instrument that converts user information into signals for transmission, or reconverts the received signals into user information. A DTE device communicates with the Data Circuit-terminating Equipment (DCE), such as a modem or CSU/DSU.

A DTE is the functional unit of a data station that serves as a data source or a data sink and provides for the data communication control function to be performed in accordance with link protocol.

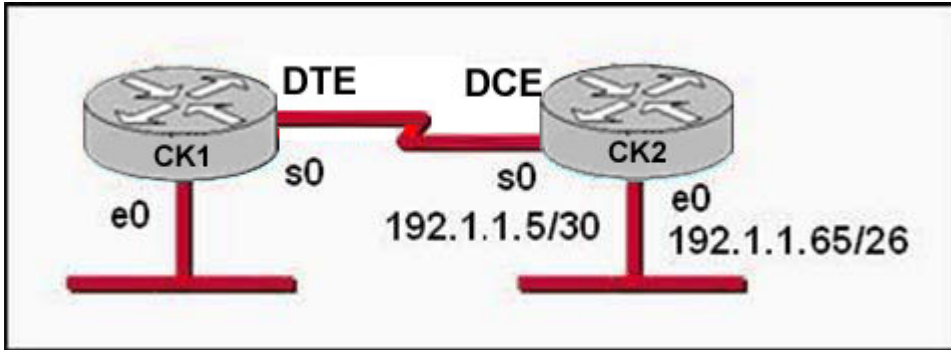
The data terminal equipment (DTE) may be a single piece of equipment or an interconnected subsystem of multiple pieces of equipment that perform all the required functions necessary to permit users to communicate. A user interacts with the DTE (e.g. through a Human-Machine Interface), or the DTE may be the user.

Usually, the DTE device is the terminal (or a computer emulating a terminal), and the DCE is a modem.

A CSU/DSU (Channel Service Unit/Data Service Unit) is a hardware device about the size of an external modem that converts a digital data frame from the communications technology used on a local area network (LAN) into a frame appropriate to a wide-area network (WAN) and vice versa. The DSU provides an interface to the data terminal equipment (DTE) using a standard (EIA/CCITT) interface. It also provides testing capabilities.

**QUESTION 394:**

Two Certkiller routers are connected as shown in the diagram below:



Which series of commands will configure router CK1 for LAN-to-LAN communication with router CK2 ? The enterprise network address is 192.1.1.0/24 and the routing protocol in use is RIP. (Choose three)

- A. CK1 (config)# interface ethernet 0  
CK1 (config-if)# ip address 192.1.1.129 255.255.255.192  
CK1 (config-if)# no shutdown
- B. CK1 (config)# interface ethernet 0  
CK1 (config-if)# ip address 192.1.1.97 255.255.255.192  
CK1 (config-if)# no shutdown
- C. CK1 (config)# interface serial 0  
CK1 (config-if)# ip address 192.1.1.4 255.255.255.252  
CK1 (config-if)# clock rate 56000
- D. CK1 (config)# interface serial 0  
CK1 (config-if)# ip address 192.1.1.6 255.255.255.252  
CK1 (config-if)# no shutdown
- E. CK1 (config)# router rip  
CK1 (config-router)# network 192.1.1.4  
CK1 (config-router)# network 192.1.1.128
- F. CK1 (config)# router rip  
CK1 (config-router)# version 2  
CK1 (config-router)# network 192.1.1.0

Answer: A, D, F

Explanation:

To establish connectivity on router CK1 the first step is to configure the interfaces with the correct IP address and enable them with the "no shutdown" command as shown in answer choices A and D. The final step is to enable the RIP routing process. Since this network uses VLSM, RIP version 2 will be required to establish connectivity. RIP version 1 is the default RIP version, but it does not support VLSM.

Incorrect Answers:

B: The IP address in use here will conflict with the LAN network configured on CK2 .

C: the 192.168.1.4/30 address is a network address, not a host address.

E: In this example we are required to use RIP version 2, not 1. In addition, the IP networks shown are not required. Since RIP assumes classful routing, we only need the single 192.168.1.0 network to be added to the routing process.

---

### QUESTION 395:

The Certkiller 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 172.16.1.1 255.255.255.255

Main(config-f)# no shut

B. Main(config)# interface serial 0/0

Main(config-if)# ip address 172.16.1.1 255.255.255.255

Main(config-f)# encapsulation ppp

Main(config-if)# no shut

C. Main(config)# interface serial 0/0

Main(config-if)# ip address 172.16.1.1 255.255.255.255

Main(config-f)# 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 172.16.1.1 255.255.255.255

Main(config-f)# encapsulation ietf

Answer: B

Explanation:

The default encapsulation on a serial interface is the Cisco proprietary HDLC. When connecting to routers from another vendor, we will need to use the standards based PPP, which is correctly defined in choice B.

Incorrect Answers:

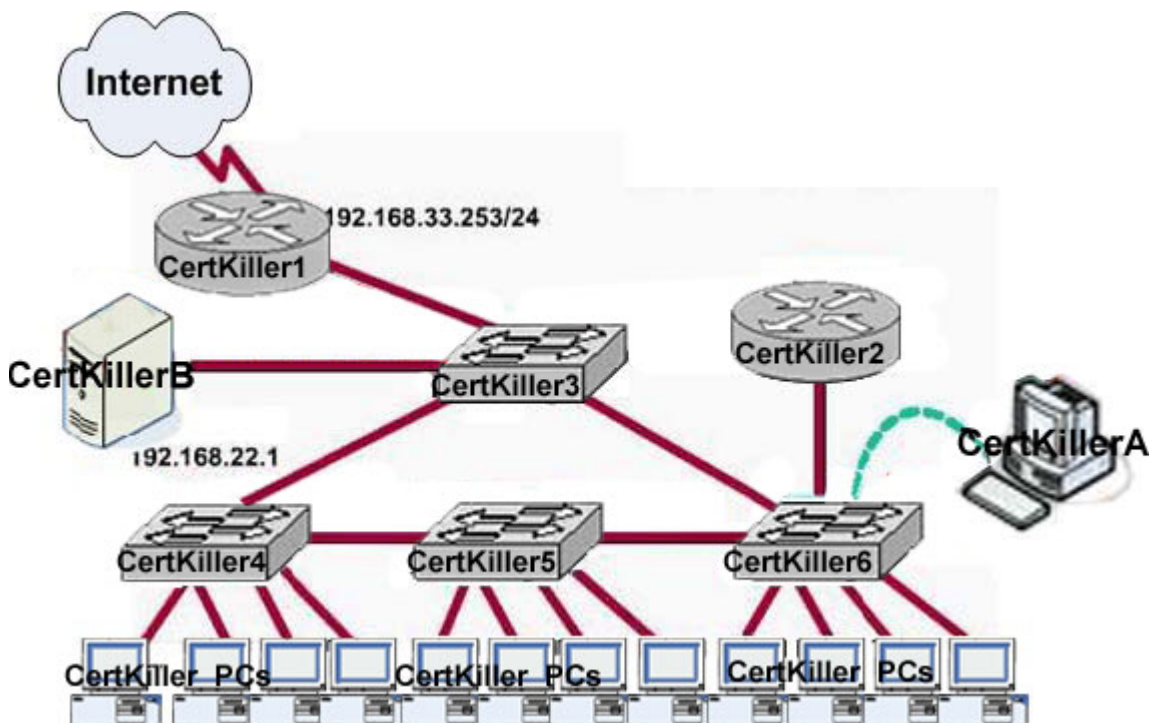
A: This is not a correct answer because no encapsulation is defined, so the default HDLC will be used, which is a Cisco proprietary protocol.

C: CHAP authentication is only used by PPP, not HDLC.

D: IETF itself is not an encapsulation option on an interface; it is used in frame relay networks, where the encapsulation can be frame relay IETF, but not simply IETF alone.

## Topic 1, Configuration Network, Scenario

Network topology exhibit:



Certkiller 6 interfaces exhibit:

**Fa0/0.1 - 192.168.1.254 /24 VLAN1**  
**Fa0/0.22 -192.168.1.254 /24 VLAN22**  
**Fa0/0.33 -192.168.33.254/24 VLAN33**  
**Fa0/0.44 -192.168.44.254/24 VLAN44**

Certkiller Command Line information:

\* Missing\*

You work as a network administrator at Certkiller .com. There have been some troubles with the Certkiller network. You are now required to investigate and troubleshoot this network thoroughly. Study the exhibits carefully.

Use the PC Certkiller A to check the current configuration of switch Certkiller 6.

Note: This information is missing in this scenario.

**Topic 1, Configuration Network, (5 questions)**

### QUESTION 396:

Note: Please refer to the Configuration Network Scenario for further information.  
 Your boss, Mrs. Certkiller, wants to know which of the Certkiller network devices is

the root bridge of VLAN 1.  
What should you tell her?

- A. Router Certkiller 1
- B. Router Certkiller 2
- C. Server Certkiller B
- D. Switch Certkiller 3
- E. Switch Certkiller 4
- F. Switch Certkiller 5
- G. Switch Certkiller 6
- H. PC Certkiller A

Answer:

---

**QUESTION 397:**

Note: Please refer to the Configuration Network Scenario for further information.  
Consider the interfaces of switch Certkiller 6. Which of these has the source MAC address of 0010.5a0c.ffba?

- A. Fa 0/0
- B. Fa 0/1
- C. Fa 0/2
- D. Fa 0/3
- E. Fa 0/4
- F. Fa 0/5
- G. Fa 0/6
- H. Fa 0/7
- I. Fa 0/8
- J. Fa 0/9
- K. Fa 0/10
- L. Fa 0/11
- M. Fa 0/12
- N. Fa 0/13
- O. Fa 0/14
- P. Fa 0/15
- Q. Fa 0/16

Answer:

---

**QUESTION 398:**

Note: Please refer to the Configuration Network Scenario for further information.  
Consider the interfaces of switch Certkiller 6. Assume there is an IP packet that is sent from switch Certkiller 6 to an destination address outside the local LAN.  
Through which port would a frame containing such a packet be forwarded?

- A. Fa 0/0
- B. Fa 0/1
- C. Fa 0/2
- D. Fa 0/3
- E. Fa 0/4
- F. Fa 0/5
- G. Fa 0/6
- H. Fa 0/7
- I. Fa 0/8
- J. Fa 0/9
- K. Fa 0/10
- L. Fa 0/11
- M. Fa 0/12
- N. Fa 0/13
- O. Fa 0/14
- P. Fa 0/15
- Q. Fa 0/16

Answer:

---

**QUESTION 399:**

Note: Please refer to the Configuration Network Scenario for further information.  
You connect a new PC Certkiller VII to the Fa0/4 interface of the Certkiller 6 switch.  
What default gateway address should be assigned to Certkiller VII?

- A. 192.168.44.254
- B. 127.0.0.1
- C. 192.168.1.254
- D. 192.168.22.254
- E. 192.168.33.254

Answer:

---

**QUESTION 400:**

Note: Please refer to the Configuration Network Scenario for further information.  
show vlan exhibit:



```
CertKiller0#show vlan
VLAN Name      Status Ports
-----
1  default      active Fa0/1, Fa0/2, Fa0/3
                        Fa0/4, Fa0/5, Fa0/6
                        Fa0/7, Fa0/8, Fa0/9
                        Fa0/10, Fa0/11, Fa0/12
                        Gi0/1, Gi0/2
2  students     active
3  admin        active
4  faculty      active
```

show vtp stat:

```
CertKiller0# show vtp stat
VTP Version      : 2
Configuration Revision : 5
Maximum VLANs supported locally : 250
Number of existing VLANs : 8
VTP Operating Mode : Server
VTP Domain Name   : home-office
VTP Pruning Mode  : Disabled
VTP V2 Mode       : Disabled
VTP Traps Generation : Disabled
MD5 digest        : 0xD8 0xD8 0x38 0x22
                   0x98 0xE3 0xAC 0x65
Configuration last modified by 0.0.0.0 at
3-28-99 01:24:88
```

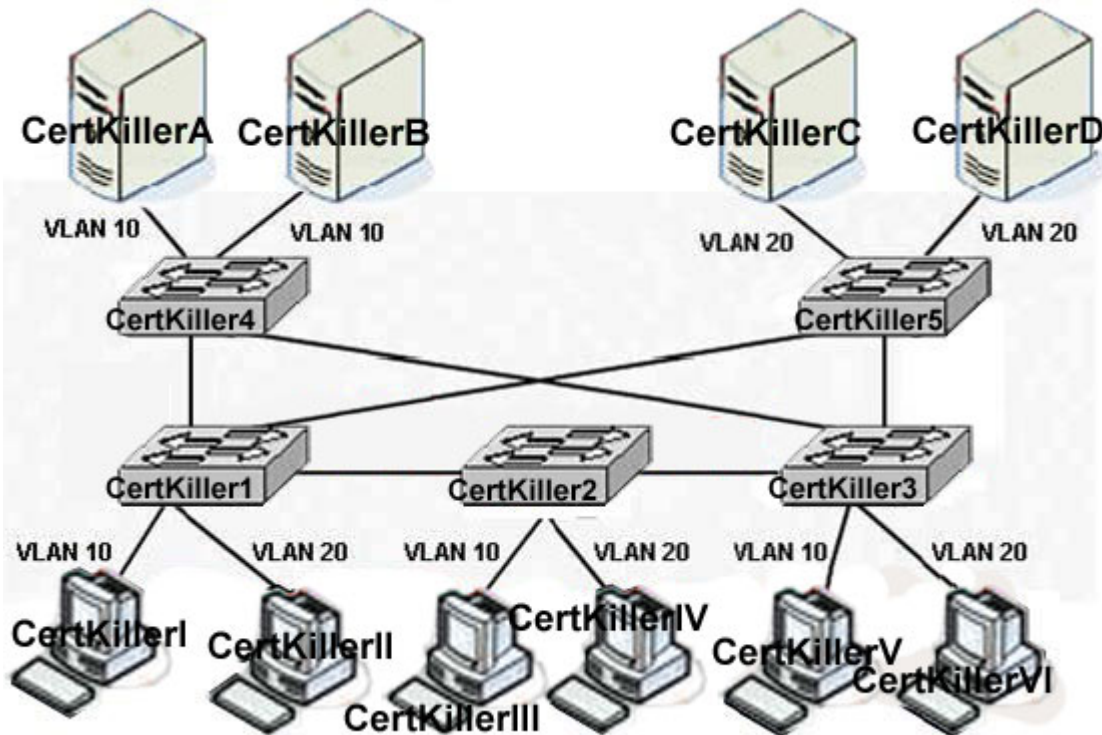
Please study the two exhibits carefully. Last month switch Certkiller 0 was removed from the network. Now Certkiller 0 must be connected to switch Certkiller 6. Assume you reconnect Certkiller 0 and a trunk exists between Certkiller 0 and Certkiller 6. What would happen?

- A. The VLANs Servers, Management, Production and no-where will replace the VLANs on Certkiller 0.
- B. All VLANs except the default VLAN will be removed from all switches.
- C. The VLANs Servers, Management, Production and no-where will be removed from existing switches.
- D. All existing switches will have students, admin, faculty, Servers, Management, Production, and no-where VLANs.

Answer:

## Topic 2, Switched Network, Scenario

Network topology exhibit:



You work as a network administrator at Certkiller .com. You are required to make an initial assessment of the Certkiller .com switched LAN. Study the network topology exhibit carefully.

**Topic 2 Switched Network, (5 questions)**

**QUESTION 401:**

Note: Please refer to the Switched Network Scenario.

Assume that the Certkiller 5 switch is the root for all VLANs. What path would be a valid path from PC Certkiller I to server Certkiller A?

- A. Switch Certkiller 1, Switch Certkiller 2, Switch Certkiller 3, Switch Certkiller 4
- B. Switch Certkiller 1, Switch Certkiller 5, Switch Certkiller 3, Switch Certkiller 4
- C. Switch Certkiller 1, Switch Certkiller 5, Switch Certkiller 1, Switch Certkiller 4
- D. Switch Certkiller 1, Switch Certkiller 4
- E. Switch Certkiller 1, Switch Certkiller 5, Switch Certkiller 4

Answer:

**QUESTION 402:**

Note: Please refer to the Switched Network Scenario.

Your boss, Mrs. Certkiller, is worried about communications between PC Certkiller III and server Certkiller C.

What is needed for this communication to occur?

- A. nothing is required
- B. DHCP
- C. A router
- D. A trunk link between switch Certkiller 2 and switch Certkiller 5

Answer:

---

**QUESTION 403:**

Note: Please refer to the Switched Network Scenario.

Assume the the most communications are between the Personal PCs of the LAN and the server. With this assumption which would be the preferred root switch for VLAN 20?

- A. Switch Certkiller 5
- B. Switch Certkiller 2
- C. Switch Certkiller 4
- D. Switch Certkiller 1
- E. Switch Certkiller 3

Answer:

---

**QUESTION 404:**

Note: Please refer to the Switched Network Scenario.

Your boss, Mrs. Certkiller, is worried about communications between PC Certkiller III and PC Certkiller IV

What link between Switch Certkiller 1 and Certkiller 2 is needed for this communication to occur?

- A. nothing is required
- B. access
- C. straight. through
- D. multi-access
- E. trunk

Answer:

---

**QUESTION 405:**

Note: Please refer to the Switched Network Scenario.

Your boss, Mrs. Certkiller, is worried that the frames would start looping in the network. You tell her not to worry, since the ..... technology prevents frame looping switched networks,

- A. VTP
- B. CSAM/CD
- C. STP
- D. ARP
- E. VTP

Answer:

### Mixed question.

---

#### QUESTION 406:

Exhibit:

System image file is "flash:c2600-ik8o3s-mz.122-8.T5.bin"

Cisco 2620 (MFC850) processor(revision 0x200) with 16384/2048K bytes of memory.  
Processor board ID JAD05076EF6  
M860 processor: part number 0, mask 49  
Bridging software.  
X.25 software, Version 3.0.0  
1 FastEthernet/IEEE 802.3 interface(s)  
2 Low-speed serial(synch/asynch) network interface(s)  
32K bytes of non-volatile configuration memory.  
16384K bytes of processor board System flash(Read/Write)

Configuration register is 0x2142

You work as a network technician at Certkiller .com. You study the exhibit carefully.  
A router consistently loses its configuration each time it reboots. Given the output shown in the graphic, what is the cause of this problem?

- A. The configuration register is misconfigured.
- B. NVRAM failed POST.
- C. There is insufficient RAM for the IOS image.
- D. There is insufficient NVRAM.
- E. There is insufficient flash memory.

Answer: A

---

#### QUESTION 407:

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. Have end users e-mail their MAC addresses. Telnet to the switch to enter the switchport-port security mac-address command.

- B. Use the switchport port-security MAC address sticky command on all the switch ports that have end devices connected to them.
- C. 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.
- D. Visually verify the MAC addresses and then telnet to the switches to enter the switchport-port security mac-address command.

Answer: B

---

**QUESTION 408:**

Exhibit:

```
CertKiller4# show ip route
192.168.12.1/24 is variably submitted, 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 [110/128] 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 [110/782] via 192.168.12.233,00:35:36, Serial0
O 192.168.12.240/30 [110/128] via 192.168.12.233,00:35:36, Serial0
O 192.168.12.253/32 [110/782] via 192.168.12.233,00:35:37, Serial0
O 192.168.12.253/32 [110/782] via 192.168.12.233,00:35:37, Serial0
```

You work as a network technician at Certkiller .com. You study the exhibit carefully. To what does the 128 refer in the router output O 192.168.12.240/30 [110/128] via 192.168.12.233,00:35:36, Serial 0?

- A. OSPF cost
- B. OSPF administrative distance
- C. OSPF hop count
- D. OSPF priority
- E. OSPF ID number

Answer: A

---

**QUESTION 409:**

DRAG DROP

Exhibit:

```
CertKiller6# show interfaces s1/0
Serial1/0 is up, line protocol is up
Hardware is CD2430 in sync mode
Internet address is 192.168.0.10/30
MTU 1500 bytes, BW 128 Kbit, DLY 20000 usec, reliability 255/255, txload 1/255, rxload 1/255
Encapsulation PPP, LCP Open Open: CDPCP, IPCP, loopback not set
Last input 00:00:00, output 00:00:00, output hang never
Last clearing of "show interface" counters 4d21h
```

You work as a network technician at Certkiller .com. You study the exhibit carefully. You need to match output lines in the exhibit with the proper OSI layer. One line will not be used.

Options, select from these

Encapsulation PPP

Hardware is CD2430 in sync mode

Internet address is 192.168.0.10/30

Serial1/0 is up

Line protocol is up

Provides information about the data link layer

Place here

Place here

Provides information about the physical layer

Place here

Place here

Answer:

Options, select from these

Internet address is 192.168.0.10/30

Provides information about the data link layer

Encapsulation PPP

Line protocol is up

Provides information about the physical layer,

Hardware is CD2430 in sync mode

Serial1/0 is up

---

**QUESTION 410:**

Running both IPv4 and IPv6 on a router simultaneously is known as what?

- A. binary routing
- B. dual-stack routing
- C. 6to4 routing
- D. NextGen routing
- E. 4to6 routing

Answer: B

---

**QUESTION 411:**

DRAG DROP

You work as a network administrator for the Certkiller .com corporation. Your boss, Miss Certkiller, is interested in switch ports. Match the options to the appropriate switch ports.



Options, select from these

Cames traffic for multiple VLANs	Connects and end-user workstation to a switch
Uses a straight-through cable to connect a device	Uses 802.1q to identify traffic from different VLANs
Facilitates interVLAN communication when connected to a Layer 3 device	Cames traffic for single VLANs

Trunk Port

Access Port

Place here	Place here
Place here	Place here
Place here	Place here

Answer:

Trunk Port

Access Port

Cames traffic for multiple VLANs	Connects and end-user workstation to a switch
Uses 802.1q to identify traffic from different VLANs	Uses a straight-through cable to connect a device
Facilitates interVLAN communication when connected to a Layer 3 device	Cames traffic for single VLANs

---

### QUESTION 412:

DRAG DROP

Exhibit:

```
CertKiller3# ip route 0.0.0.0 0.0.0.0 192.168.1.1
CertKiller3# ip route 10.1.0.0 255.255.255.0 192.168.2.2
CertKiller3# ip route 10.1.0.0 255.255.0.0 192.168.3.3
```

You work as a network administrator for the Certkiller .com corporation. Consider the exhibit. It displays the configuration of the Certkiller 3 router. Your boss, Miss Certkiller, is interested in next hop addresses. Select the appropriate next hop addresses.

**Options, select from these**

10.6.8.4

10.1.0.14

10.1.46

10.2.1.3

10.1.0.123

10.1.1.10

**Next hop 192.168.1.1**

*Place here*

*Place here*

**Next hop 192.168.2.2**

*Place here*

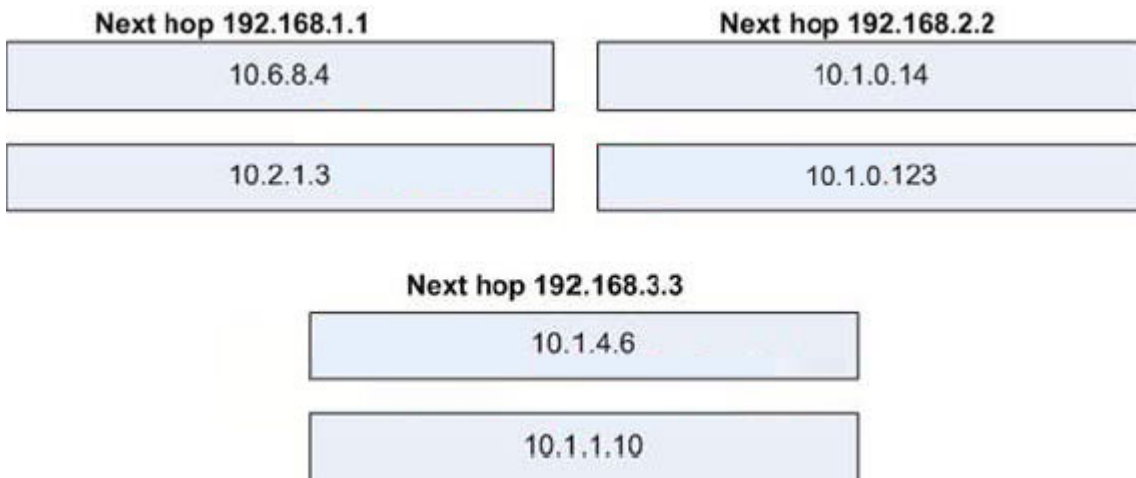
*Place here*

**Next hop 192.168.3.3**

*Place here*

*Place here*

Answer:



---

**QUESTION 413:**

**DRAG DROP**

You work as a network administrator for the Certkiller .com corporation. Your boss, Miss Certkiller, is interested in Cisco routing. Match the terms to the appropriate definitions.

Options, select from these

LSA

Poison reverse

Split horizon

Count to infinity

Holddown timer

Definitions

This prevents sending information about a route back out the same interface that originally learned about the route

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.

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

The packets flooded when a topology change occurs, causing network routers to update their topologic databases and recalculate routes

Options, place here

*Place here*

*Place here*

*Place here*

*Place here*

Answer:

Options, select from these

Count to infinity

Definitions

This prevents sending information about a route back out the same interface that originally learned about the route

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.

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

The packets flooded when a topology change occurs, causing network routers to update their topologic databases and recalculate routes

Options, place here

Split horizon

Poison reverse

Holddown timer

LSA

---

**QUESTION 414:**

**DRAG DROP**

You work as a network administrator for the Certkiller .com corporation. Your boss, Miss Certkiller, is interested in Cisco show ip interface commands. Match the categories with the appropriate router output lines.

Options, select from these

Port operational

Layer 1 problem

Layer 3 problem

Layer 2 problem

Port disabled

Definitions

Serial0/1 is administratively down, line protocol is down

Serial0/1 is up, line protocol is up

Serial0/1 is down, line protocol is down

Serial0/1 is up, line protocol is down

Options, place here

*Place here*

*Place here*

*Place here*

*Place here*

Answer:

Options, select from these

Layer 3 problem

Definitions

Serial0/1 is administratively down, line protocol is down

Serial0/1 is up, line protocol is up

Serial0/1 is down, line protocol is down

Serial0/1 is up, line protocol is down

Options, place here

Port disabled

Port operational

Layer 1 problem

Layer 2 problem

---

**QUESTION 415:**

DRAG DROP

You work as a network administrator for the Certkiller .com corporation. Your boss, Miss Certkiller, is interested in routing protocols. Match the descriptions with the appropriate routing protocol.



Options, select from these

Uses cost as its metric

Elects a DR on each multiaccess network

Has a default administrative distance of 90

Uses the Bellman-Ford algorithm

Is vendor-specific

Uses hop count as its metric

**OSPF**

**EIGRP**

*Place here*

*Place here*

*Place here*

*Place here*

Answer:

Options, select from these

Uses the Bellman-Ford algorithm

Uses hop count as its metric

**OSPF**

**EIGRP**

Uses cost as its metric

Has a default administrative distance of 90

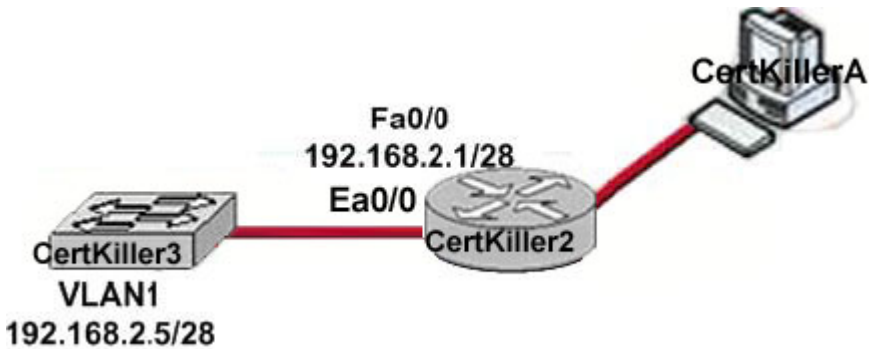
Elects a DR on each multiaccess network

Is vendor-specific

---

**QUESTION 416:**

Exhibit:



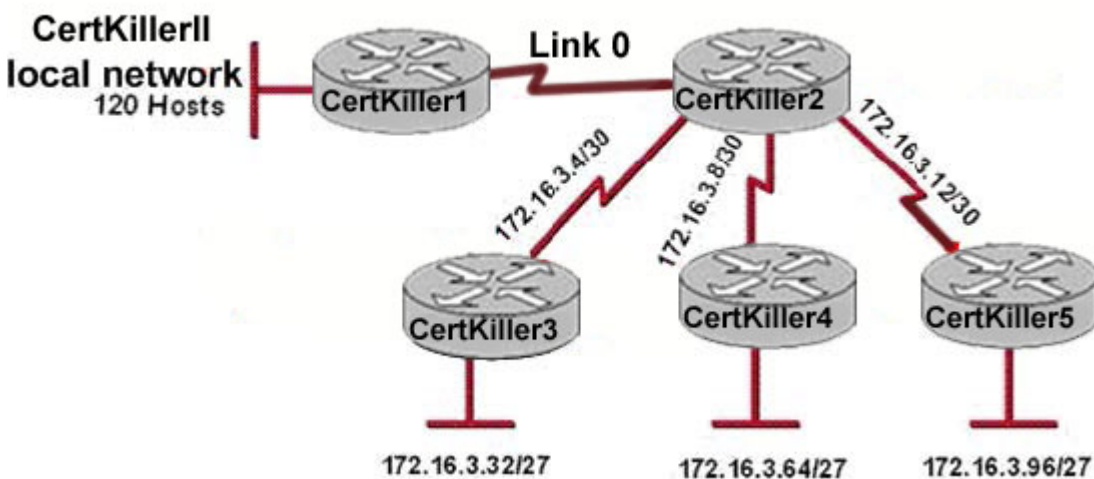
You work as a network technician at Certkiller .com. You study the exhibit carefully. Workstation A must be able to telnet to switch Certkiller 3 through router Certkiller 2 for management purposes. What must be configured for this connection to be successful?

- A. IP routing on Certkiller 3
- B. default gateway on Certkiller 3
- C. cross-over cable connecting Certkiller 3 and Certkiller 2
- D. VLAN 1 on Certkiller 2

Answer: B

#### QUESTION 417:

Exhibit:



You work as a network technician at Certkiller .com. You study the exhibit carefully. All of the routers in the network are configured with the ip subnet-zero command. Which

network addresses should be used for Link 0 and Certkiller II local network? (Choose two.)

- A. Network Certkiller II - 172.16.3.128/25
- B. Network Certkiller II - 172.16.3.48/26
- C. Network Certkiller II - 172.16.3.192/26
- D. Link 0 - 172.16.3.40/30
- E. Link 0 - 172.16.3.0/30
- F. Link 0 - 172.16.3.112/30

Answer: A,E

---

**QUESTION 418:**

A large corporation that frequently integrates networks from newly acquired businesses has just decided to use OSPF as the corporate routing protocol instead of EIGRP. What two benefits will the change from EIGRP to OSPF provide to the corporation? (Choose two.)

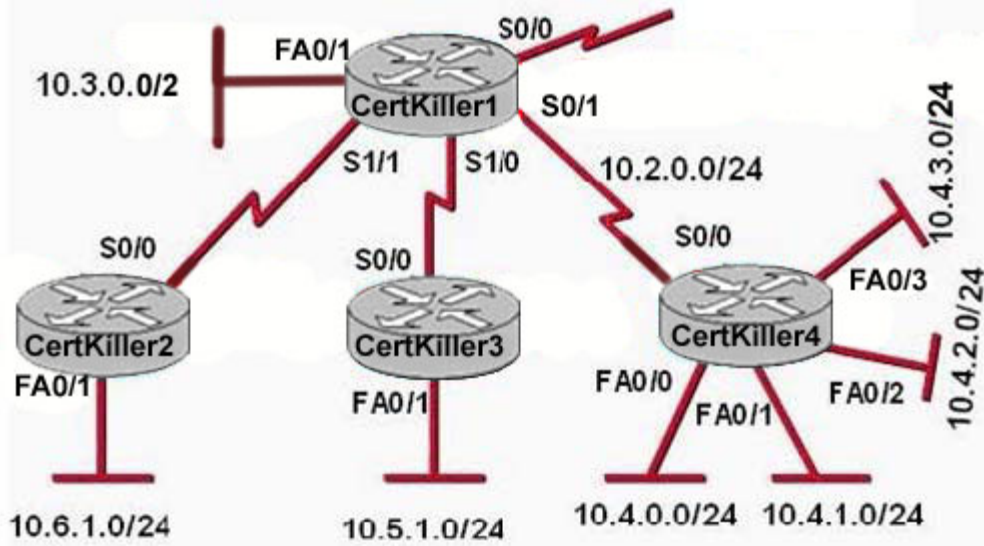
- A. the ability to create a hierarchical design using areas
- B. the ability to use VLSM
- C. the ability to redistribute default and static routes
- D. the ability to automatically summarize networks
- E. the ability to support multi-vendor routers

Answer: A,E

---

**QUESTION 419:**

Exhibit:



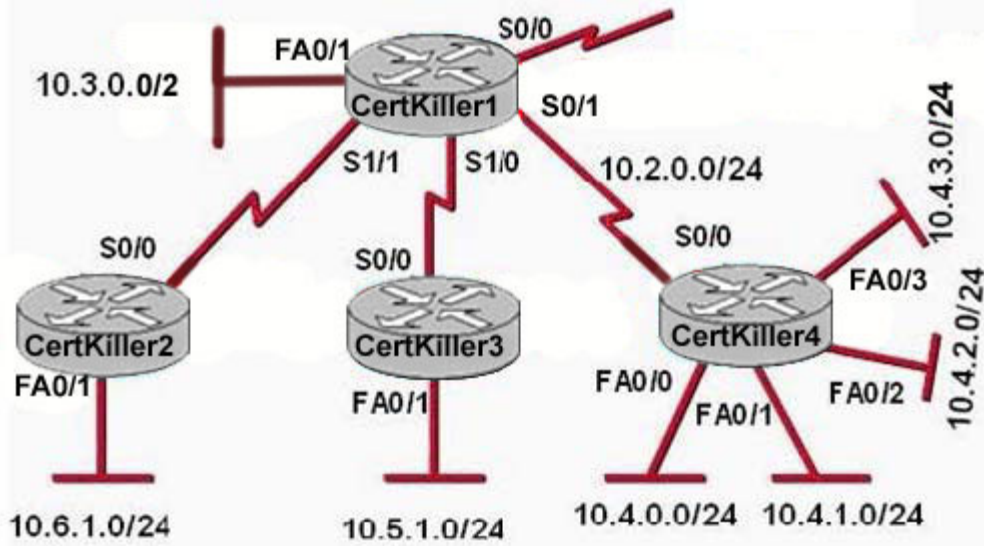
You work as a network technician at Certkiller .com. You study the exhibit carefully. Certkiller .com has the internetwork in the exhibit. The administrator would like to reduce the size of the routing table on the Certkiller 1 router. Which partial routing table entry in the Certkiller 1 router represents a route summary that represents the LANs in Certkiller 4 but no additional subnets?

- A. 10.0.0.0/30 is subnetted, 1 subnets  
D10.2.2.0 [90/20514560] via 10.2.0.2, 6w0d, Serial0/1
- B. 10.0.0.0/30 is subnetted, 1 subnets  
D10.4.4.4 [90/20514560] via 10.2.0.2, 6w0d, Serial0/1
- C. 10.0.0.0/28 is subnetted, 1 subnets  
D10.2.0.0 [90/20514560] via 10.2.0.2, 6w0d, Serial0/1
- D. 10.0.0.0/28 is subnetted, 1 subnets  
D10.4.4.0 [90/20514560] via 10.2.0.2, 6w0d, Serial0/1
- E. 10.0.0.0/22 is subnetted, 1 subnets  
D10.0.0.0 [90/20514560] via 10.2.0.2, 6w0d, Serial0/1
- F. 10.0.0.0/22 is subnetted, 1 subnets  
D10.4.0.0 [90/20514560] via 10.2.0.2, 6w0d, Serial0/1

Answer: F

#### QUESTION 420:

Exhibit:



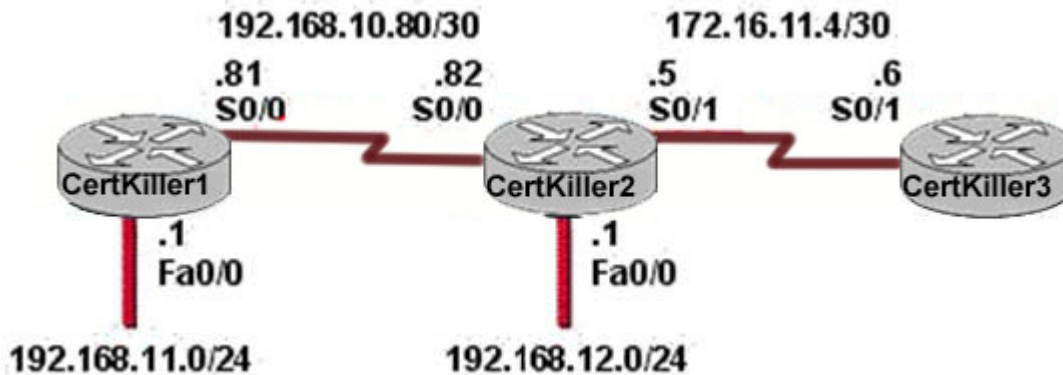
You work as a network technician at Certkiller .com. You study the exhibit carefully. The routers are running RIPv2. Which addressing scheme would satisfy the needs of this network yet waste the fewest addresses?

- A. Network Certkiller 1: 192.168.10.0/26  
Network Certkiller 2: 192.168.10.64/26  
Network Certkiller 3: 192.168.10.128/26  
Serial link 1: 192.168.20.0/24  
Serial link 2: 192.168.30.0/24
- B. Network Certkiller 1: 192.168.10.0/27  
Network Certkiller 2: 192.168.10.64/28  
Network Certkiller 3: 192.168.10.96/29  
Serial link 1: 192.168.10.112/30  
Serial link 2: 192.168.10.116/30
- C. Network Certkiller 1: 192.168.10.0/26  
Network Certkiller 2: 192.168.10.64/27  
Network Certkiller 3: 192.168.10.96/28  
Serial link 1: 192.168.10.112/30  
Serial link 2: 192.168.10.116/30
- D. Network Certkiller 1: 192.168.10.0/26  
Network Certkiller 2: 192.168.10.64/28  
Network Certkiller 3: 192.168.10.80/29  
Serial link 1: 192.168.10.88/30  
Serial link 2: 192.168.10.96/30

Answer: C

#### QUESTION 421:

Network topology exhibit:



Certkiller 1 configuration exhibit:

```
hostname CertKiller1
router rip
 network 192.168.10.0
 network 192.168.11.0
 ip route 0.0.0.0 0.0.0.0 192.168.10.82
<output omitted>
```

Certkiller 2 configuration exhibit:

```
hostname CertKiller3
router rip
 network 192.168.10.0
 network 192.168.12.0
 ip route 0.0.0.0 0.0.0.0 172.16.11.6
<output omitted>
```

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. R 172.16.11.4/30 [120/1] via 192.168.10.82, 00:00:22, Serial0/0
- B. R 192.168.11.0/24 [120/1] via 192.168.10.81, 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. C 192.168.12.0/24 is directly connected, FastEthernet0/0
- E. S\* 0.0.0.0/0 [1/0] via 192.168.10.82

Answer: E

---

#### QUESTION 422:

What is the default administrative distance of the OSPF routing protocol?

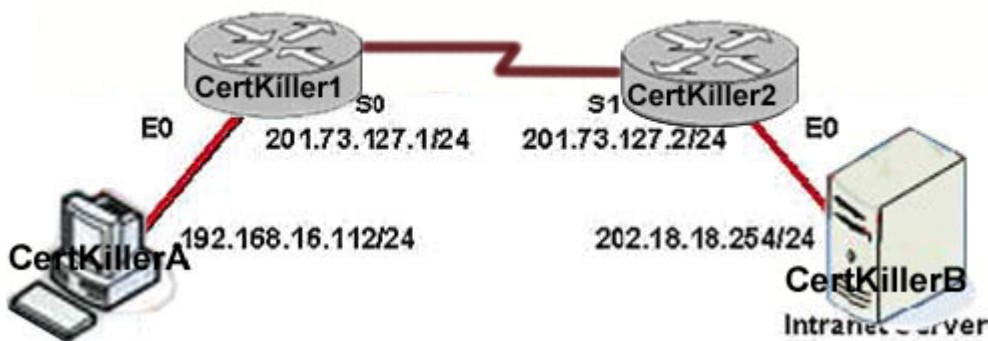
- A. 90
- B. 110
- C. 170
- D. 100
- E. 130
- F. 120

Answer: B

---

**QUESTION 423:**

Exhibit:



You work as a network technician at Certkiller .com. You study the exhibit carefully. Users on the Certkiller 1 router are unable to access the intranet server attached to interface E0 of the Certkiller 2 router. Inspection of the routing table of the Certkiller 1 router shows that an entry for the Certkiller 2 E0 network is missing. Which command will configure the Certkiller 1 router with a path to the intranet server network?

- A. Certkiller 1(config)# ip host Certkiller 2 201.73.127.0 255.255.255.0
- B. Certkiller 1(config)# ip host Certkiller 2 201.73.127.2
- C. Certkiller 1(config)# ip route 201.73.127.2 255.255.255.0 202.18.18.0
- D. Certkiller 1(config)# ip network 202.18.38.0
- E. Certkiller 1(config)# ip route 202.18.18.0 255.255.255.0 201.73.127.2
- F. Certkiller 1(config)# ip network 202.18.18.0 255.255.255.0

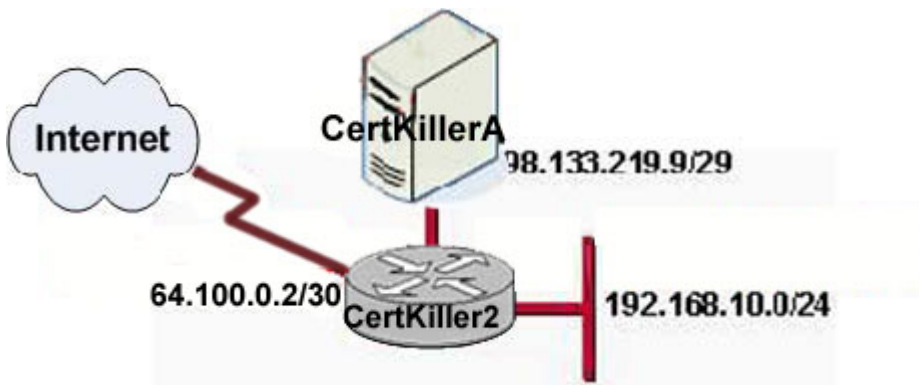
Answer: E

---

**QUESTION 424:**

Network Topology Exhibit:





Configuration exhibit:

```
<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, FastEthernet0/0
S: 0.0.0.0/0[0] via 64. 100.0.1
CertKiller2#
```

You work as a network technician at Certkiller .com. You study the exhibit carefully. The router has been configured with these commands:

```
hostname Certkiller 2
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.)

- A. The address of the subnet segment with the Certkiller A server will support seven more servers.
- B. Hosts on the LAN that is connected to FastEthernet 0/1 are using public IP addressing.
- C. Hosts on the LAN that is connected to FastEthernet 0/1 will not be able to access the Internet without address translation.
- D. The default route should have a next hop address of 64.100.0.3.
- E. The addressing scheme allows users on the Internet to access the Certkiller A server.

Answer: C,E

---

**QUESTION 425:**

Which Frame Relay feature is responsible for transmitting keep lives to ensure that the PVC does not shut down because of inactivity?

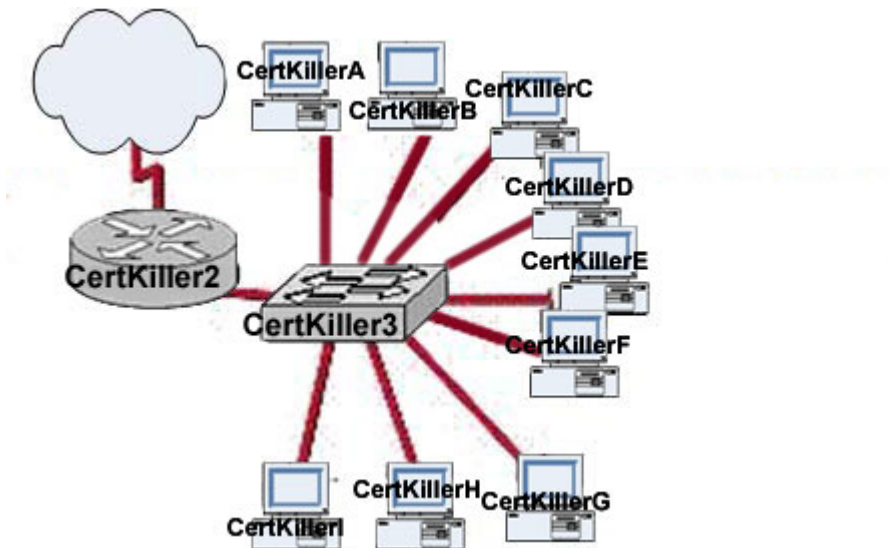
- A. LMI
- B. DE
- C. CIR
- D. DLCI
- E. BECN
- F. FECN

Answer: A

---

**QUESTION 426:**

Network Topology Exhibit:



Configuration exhibit:

```
CertKiller2 #show interfaces FastEthernet 0
Fast Ethernet0 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 (10 sec)
Half-duplex, 10Mb/s, 100BaseTX/FX
(... output omitted ...)
```

You work as a network technician at Certkiller .com. You study the exhibit carefully. 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?

- A. Certkiller 2(config-if)# ip address 192.168.10.30 255.255.255.240
- B. Certkiller 2(config-if)# bandwidth 100
- C. Certkiller 2(config-if)# no keepalive
- D. Certkiller 2(config-if)# duplex full
- E. Certkiller 2(config-if)# no shutdown
- F. Certkiller 2(config-if)# encapsulation 802.3

Answer: A

---

#### **QUESTION 427:**

What is the media access method used by Gigabit Ethernet?

- A. point-to-point
- B. token passing
- C. logical link control
- D. CSMA/CA
- E. CSMA/CD

Answer: E

---

#### **QUESTION 428:**

The system LED is amber on a Cisco Catalyst 2950 series switch. What does this indicate?

- A. The system is forwarding traffic.
- B. The system is not powered up.
- C. The system is powered up and operational.

- D. The system is sensing excessive collisions.
- E. The system is malfunctioning.

Answer: E

---

**QUESTION 429:**

Exhibit:



You work as a network technician at Certkiller .com. You study the exhibit carefully. Which Frame Relay feature allows the point-to-point Frame Relay PVC between Router Certkiller 1 and Router Certkiller 2 to be identified at Router A as 100 and at Router Certkiller 2 as 200?

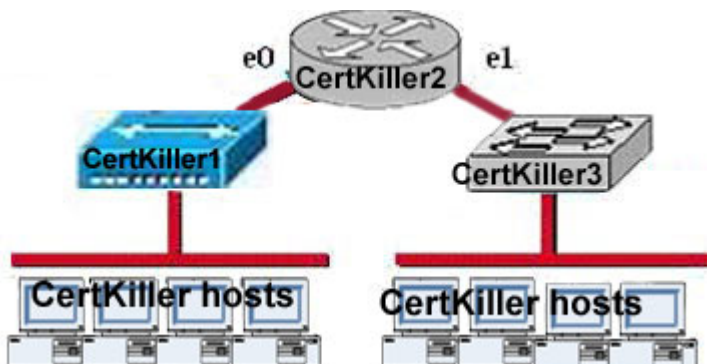
- A. locally significant LMI
- B. globally significant DLCI
- C. locally significant DLCI
- D. globally significant LMI

Answer: C

---

**QUESTION 430:**

Exhibit:



You work as a network technician at Certkiller .com. You study the exhibit carefully. Which of the following statements describe the network shown in the graphic? (Choose two.)

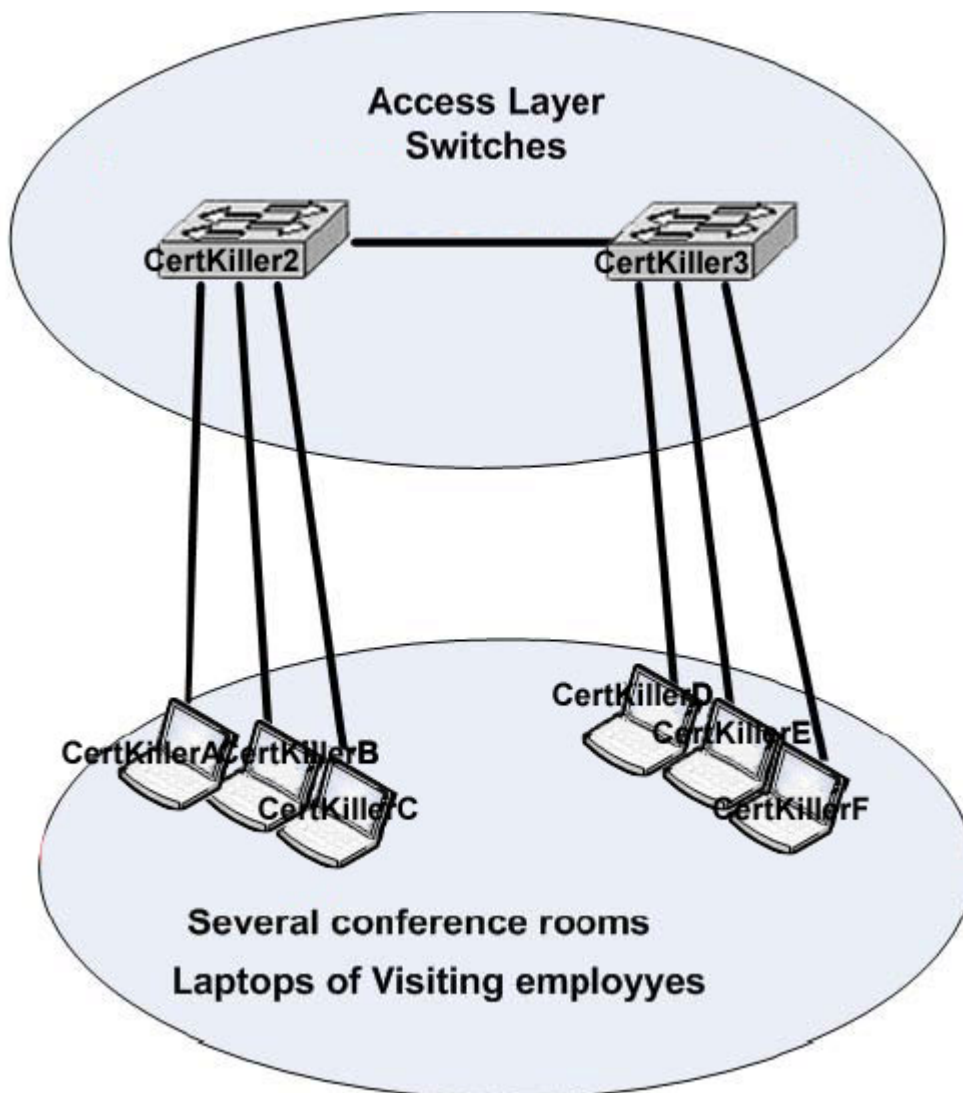
- A. There are two broadcast domains in the network.
- B. There are four broadcast domains in the network.
- C. There are four collision domains in the network.
- D. There are five collision domains in the network.
- E. There are six broadcast domains in the network.
- F. There are seven collision domains in the network.

Answer: A, F

---

**QUESTION 431:**

Exhibit:



You work as a network technician at Certkiller .com. You study the exhibit carefully.

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?

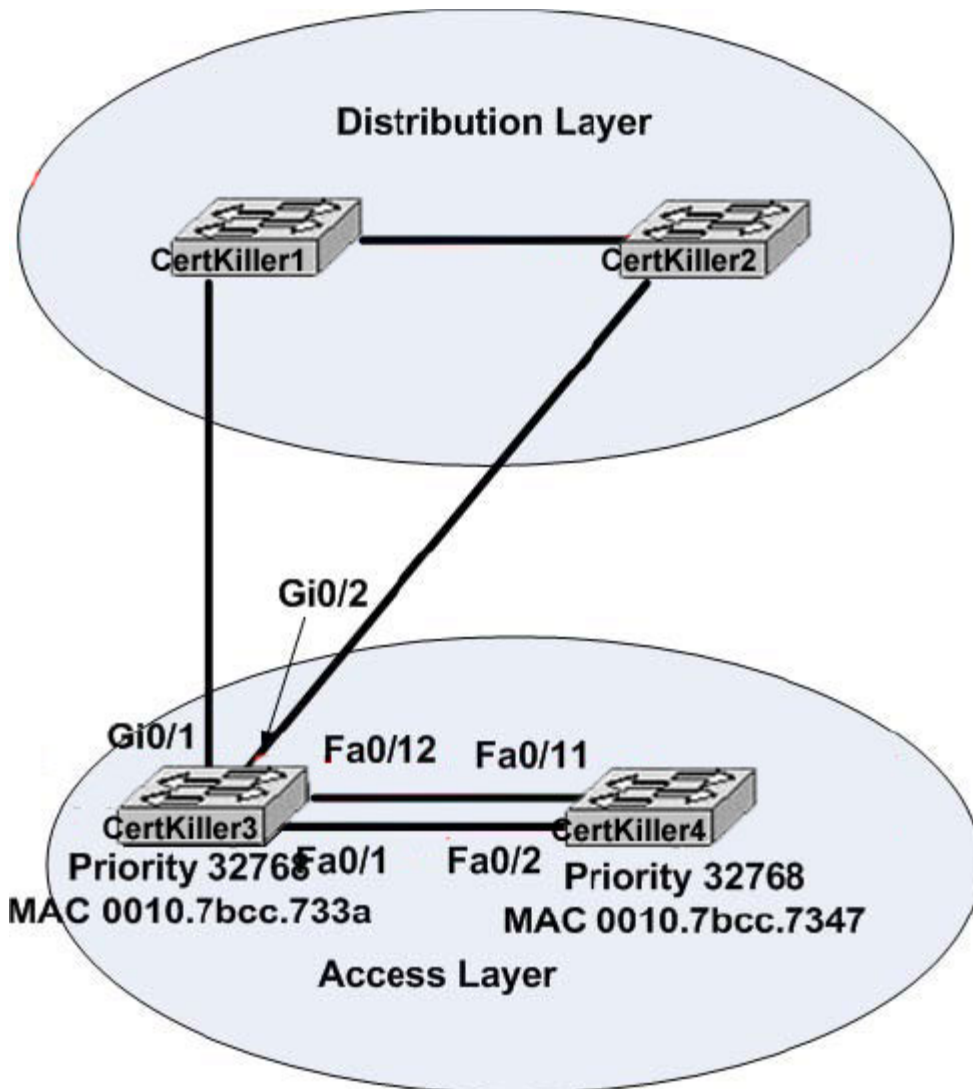
- A. Implement Port Security on all interfaces and use the port-security mac-address sticky command to limit access to a single MAC address.
- B. Use the mac-address-table 1 global configuration command to limit each port to one source MAC address.
- C. Configure static entries in the switch MAC address table to include the range of addresses used by visiting employees.
- D. Implement Port Security at global configuration mode and use the port-security maximum 1 command to allow each switch only one attached hub.
- E. Configure an ACL to allow only a single MAC address to connect to the switch at one time.
- F. Implement Port Security on all interfaces and use the port-security maximum 1 command to limit port access to a single MAC address.

Answer: F

---

**QUESTION 432:**

Exhibit:



You work as a network technician at Certkiller .com. You study the exhibit carefully. At the end of an RSTP election process, which access layer switch port will assume the discarding role?

- A. Switch Certkiller 3, port Gi0/1
- B. Switch Certkiller 4, port fa0/11
- C. Switch Certkiller 3, port fa0/1
- D. Switch Certkiller 3, port fa0/12
- E. Switch Certkiller 4, port fa0/2
- F. Switch Certkiller 3, port Gi0/2

Answer: B

#### QUESTION 433:

Which protocol should be used to establish a secure terminal connection to a remote



network device?

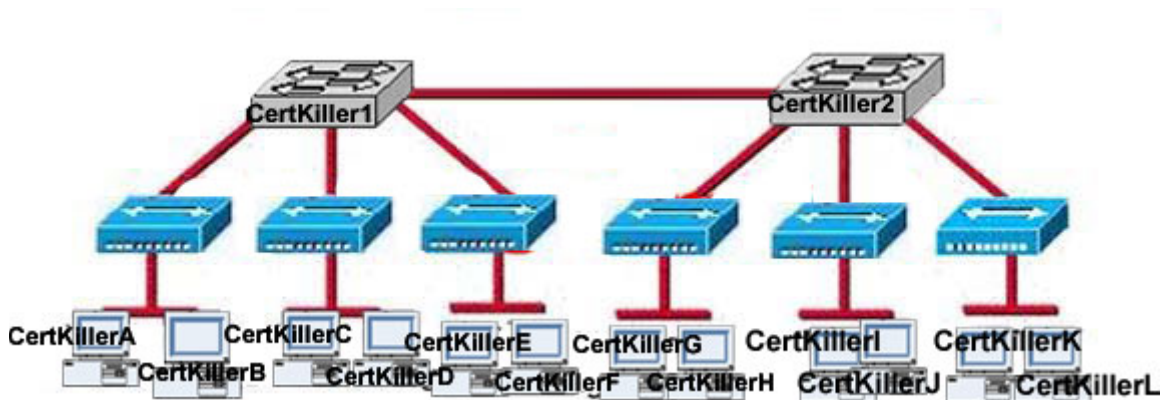
- A. SSH
- B. ARP
- C. SNMPv2
- D. Telnet
- E. SNMPv1
- F. WEP

Answer: A

---

**QUESTION 434:**

Exhibit:



You work as a network technician at Certkiller .com. You study the exhibit carefully. How many broadcast domains are shown in the graphic assuming only the default VLAN is configured on the switches?

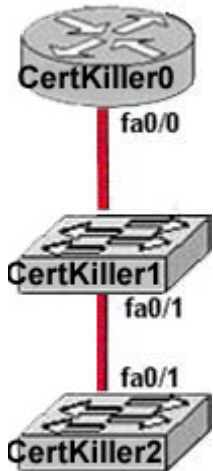
- A. one
- B. two
- C. twelve
- D. six

Answer: A

---

**QUESTION 435:**

Network Topology Exhibit:



Configuration Exhibit:

**CertKiller1**

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

**CertKiller2**

IP address: 192.168.1.2/24  
Ports 3-12 VLAN 10  
Ports 13-24 VLAN 20

**CertKiller3**

IP address: 192.168.1.3/24  
Ports 2-12 VLAN 10  
Ports 13-24 VLAN 20

You work as a network technician at Certkiller .com. You study the exhibit carefully. 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?

A. Certkiller 1(config)# interface fastethernet 0/1

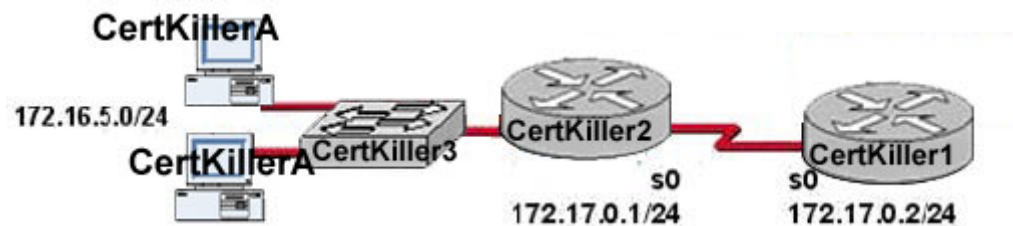
Certkiller 1(config-if)# switchport mode trunk  
B. Certkiller 1(config)# interface fastethernet 0/1  
Certkiller 1(config-if)# switchport mode trunk  
Certkiller 1(config-if)# switchport trunk vlan 1  
Certkiller 1(config-if)# switchport trunk vlan 10  
Certkiller 1(config-if)# switchport trunk vlan 20  
C. Certkiller 1(config)# interface fastethernet 0/1  
Certkiller 1(config-if)# switchport mode access  
Certkiller 1(config-if)# switchport access vlan 1  
D. The ports only need to be connected by a crossover cable.

Answer: A

---

### QUESTION 436:

Exhibit:



Certkiller 1 configuration exhibit:

```
CertKiller1# show ip route
Gateway of last resort is 172.17.0.2 to network 0.0.0.0

172.17.0.0/24 is subnetted, 1 subnets
C    172.17.0.0 is directly connected, Serial0
172.16.5.0/24 is subnetted, 1 subnets
C    172.16.5.0 is directly connected, FastEthernet0
S*  0.0.0.0/0 [1/0] via 172.17.0.2
```

Certkiller 2 configuration exhibit:

```
CertKiller2 # show ip route
Gateway of last resort is 172.17.0.1 to network 0.0.0.0

172.17.0.0/24 is submitted, 1 subnets
C*  172.17.0.0 is directly connected, Serial0
S*  0.0.0.0/0 [1/0] via 172.17.0.2
```

You work as a network technician at Certkiller .com. You study the exhibit carefully.

Refer to the topology and command output within the exhibit. When hosts on the 172.16.5.0 network attempt to ping the remote server at 192.168.145.27, the message "Reply from 192.168.145.27:TTL expired in transit" is returned. What is the cause of this problem?

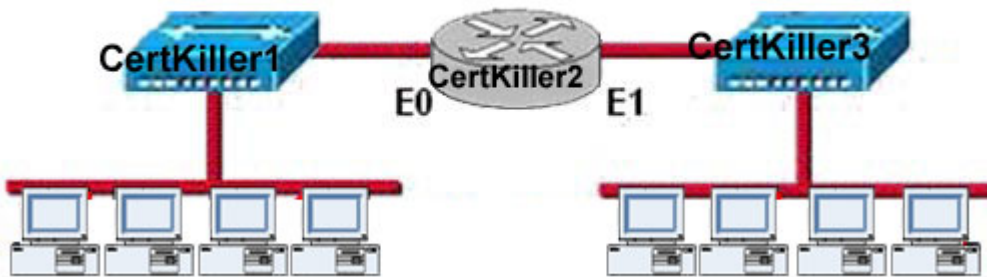
- A. No static route is configured on the SOHO router to the 192.168.145.0 network.
- B. A routing loop has occurred.
- C. A routing protocol must be configured to send packets between SOHO and ISP.
- D. No static route is configured on the ISP router to the 192.168.145.0 network.

Answer: B

---

**QUESTION 437:**

Exhibit:



You work as a network technician at Certkiller .com. You study the exhibit carefully. How many collision domains are shown?

- A. four
- B. one
- C. two
- D. fourteen
- E. six
- F. three

Answer: C

---

**QUESTION 438:**

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

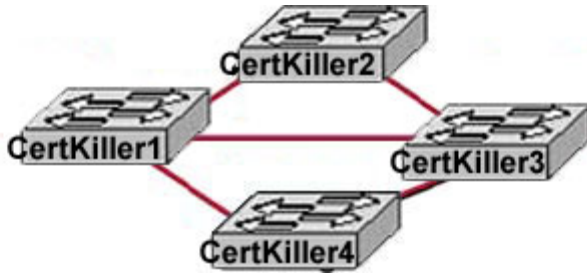
- C. show interfaces serial 0/0
- D. show ip interface serial 0/0

Answer: B

---

**QUESTION 439:**

Exhibit:



You work as a network technician at Certkiller .com. You study the exhibit carefully. How does Spanning Tree Protocol prevent switching loops?

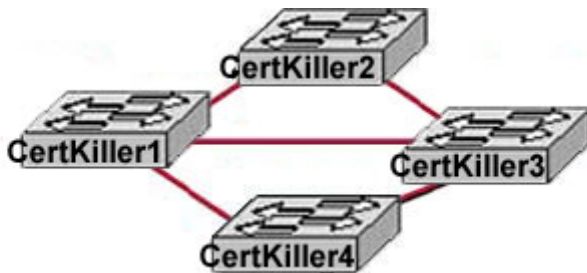
- A. STP load balances traffic evenly across the redundant links.
- B. STP identifies cables that must be disconnected to eliminate the redundant paths.
- C. STP allows the switches to communicate with a router that makes the traffic forwarding decisions.
- D. STP places ports into the blocking state to disable the redundant paths.
- E. STP shuts down switch S3 to to eliminate the switching loops.

Answer: D

---

**QUESTION 440:**

Exhibit:



You work as a network technician at Certkiller .com. You study the exhibit carefully. Spanning Tree Protocol has created a loop-free logical topology in the network that is pictured. How many ports have been placed in the blocking mode?

- A. four
- B. three
- C. two
- D. one
- E. none

Answer: C

---

**QUESTION 441:**

Which statement about RIP routing is true?

- A. The no ip classless command enables classful RIP routing.
- B. If RIP version 2 is used, the subnet mask is sent to neighboring RIP routers.
- C. Classless routing is the default method used by RIP on a router.
- D. Subnetting is not supported if RIP is being used.

Answer: B

---

**QUESTION 442:**

What is the default Local Management Interface frame type transmitted by a Cisco router on a Frame Relay circuit?

- A. B8ZS
- B. ANSI
- C. IETF
- D. Cisco
- E. Q933a

Answer: D

---

**QUESTION 443:**

What is the purpose of the OSPF router ID in a DR/BDR election?

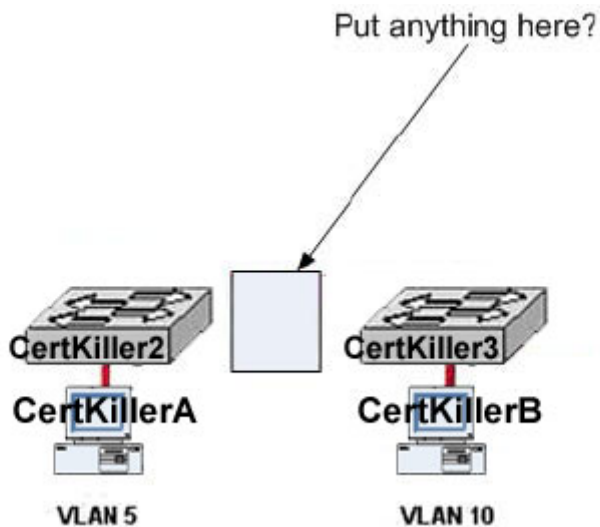
- A. It is used with the OSPF priority values to determine which OSPF router will become the DR or BDR in a point-to-point network.
- B. It is used with the OSPF priority values to determine which interface will be used to form a neighbor relationship with another OSPF router.
- C. It is used to determine which interfaces will send Hello packets to neighboring OSPF routers.
- D. It is used with the OSPF priority values to determine which router will become the DR or BDR in a multiaccess network.

Answer: D

---

**QUESTION 444:**

Exhibit:



You work as a network technician at Certkiller .com. You study the exhibit carefully.  
What is required to allow communication between host Certkiller A and host Certkiller B?

- A. a crossover cable only
- B. a router connected to the switches with crossover cables
- C. a CSU/DSU connected to the switches with crossover cables
- D. a router connected to the switches with straight-through cables
- E. a straight-through cable only

Answer: D

---

**QUESTION 445:**

Exhibit:



CertKiller3 #show ip eigrp topology  
IP EIGRP Topology Table for AS(100)/ID(192.168.8.21)

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,  
r - reply Status, s - sia Status

P 192.168.2.0/24, 1 successors, FD is 2707456  
    via 192.168.8.22 (2707456/2195456), Serial0/0  
    via 192.168.8.18 (3815424/281600), Serial0/2  
P 192.168.8.20/30, 1 successors, FD is 2169856  
    via Connected Serial0/0  
P 192.168.8.16/30, 1 successors, FD is 3789824  
    via Connected, Serial0/2  
P 192.168.8.24/30, 1 successors, FD is 2681856  
    via 192.168.8.22 (2681856/2169856), Serial0/0  
    via 192.168.8.18 (4301824/2169856), Serial0/2

You work as a network technician at Certkiller .com. You study the exhibit carefully.  
Based on the topology table that is shown in the exhibit and assuming that variance is not  
configured for EIGRP, which route or routes should appear in the routing table?

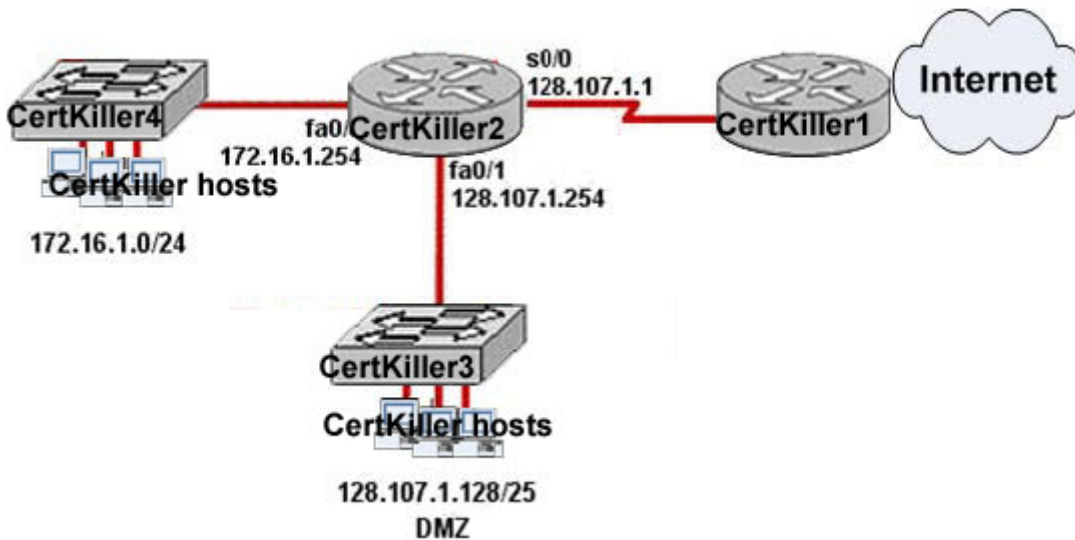
- A. D 192.168.2.0/24 [90/2707456] via 192.168.8.22, 00:27:50, Serial0/0  
[90/3815424] via 192.168.8.18, 00:27:50, Serial0/2
- B. D 192.168.8.20 (2707456/2195456), Serial0/1
- C. D 192.168.8.24/30 [90/2681856] via 192.168.8.22, 00:27:50, Serial0/0
- D. D 192.168.2.0/24 [90/3815424] via 192.168.8.18, 00:27:50, Serial0/2

Answer: C

---

#### **QUESTION 446:**

Network Topology Exhibit:



Certkiller 2 Configuration Exhibit:

```
hostname CertKiller2
!
interface FastEthernet0/0
ip address 172.16.1.254 255.255.255.0
ip nat inside
!
interface FastEthernet0/1
ip address 128.107.1.254 255.255.255.128
ip nat inside
!
interface Serial0/0
ip address 128.107.1.1 255.255.255.252
ip nat outside
!
ip nat inside source list 1 interface Serial0/0 overload
!
ip route 0.0.0.0 0.0.0.0 Serial0/0
!
access-list 1 permit 172.16.1.0 0.0.0.255
access-list 1 permit 128.107.1.128 0.0.0.127
```

You work as a network technician at Certkiller .com. You study the exhibit carefully. 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. Internet hosts may not initiate connections to DMZ Devices through the configuration that is shown.
- B. Address translation on fa0/1 is not required for DMZ Devices to access the Internet.
- C. The fa0/1 IP address is invalid for the IP subnet on which it resides.
- D. The fa0/1 IP address overlaps with the space used by s0/0.
- E. The two FastEthernet interfaces will require NAT configured on two outside serial interfaces.

Answer: A,B

---

**QUESTION 447:**

Exhibit:

```
CertKiller3 # show running-config
Current configuration:
!
version 12.1
hostname CertKiller3
!
ip subnet-zero
ip name-server 192.16.1.1
ip dhcp excluded-address 10.90.201.1
!
ip dhcp pool CertKiller3_pool
    network 10.90.201.0 255.255.255.0
    default-router 10.90.201.1
    dns-server 192.31.7.152
!
interface FastEthernet 0/0
    no ip directed-broadcast
    ip nat inside
!
interface Serial 0/0
    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>
```

You work as a network technician at Certkiller .com. You study the exhibit carefully. 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?

- A. Add access-list 14 permit any any to the access list configuration.
- B. Add an interface description to the FastEthernet 0/0 interface configuration.
- C. Configure the IP address of the FastEtherent 0/0 interface to 10.90.201.1.

D. Apply access-group 14 to interface FastEthernet 0/0.

Answer: C

---

**QUESTION 448:**

A college has a small campus where 25 faculty members are located. The faculty offices and student computers are currently on the same network. The faculty are concerned about students being able to capture packets going across the network and obtain sensitive material. What could a network administrator do to protect faculty network traffic from student connections?

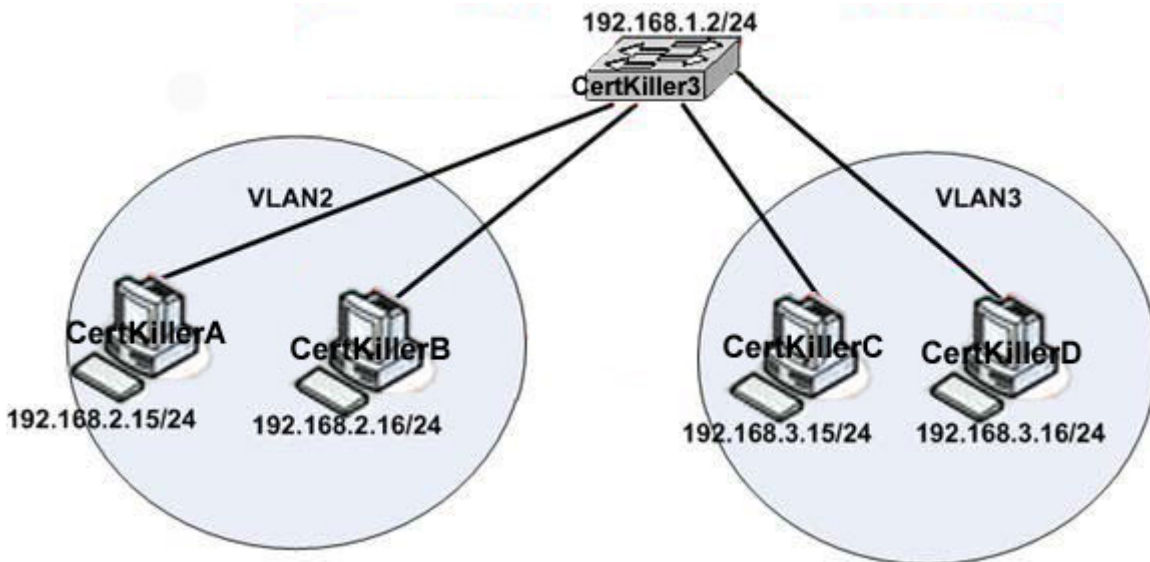
- A. Remove the student computers from the network and put them on a peer-to-peer network.
- B. Put the faculty computers in a separate VLAN.
- C. Install anti-virus software on the student computers.
- D. Power down the switches that connect to faculty computers when they are not in use.
- E. Create an access list that blocks the students from the Internet where the hacking tools are located.

Answer: B

---

**QUESTION 449:**

Exhibit:



You work as a network technician at Certkiller .com. You study the exhibit carefully. Host Certkiller A can communicate with Host Certkiller B but not with Host Certkiller C or Host Certkiller D. What should the network administrator do to solve this problem?

- A. Configure a router to route between VLAN2 and VLAN3.
- B. Configure the VLAN trunking protocol on the switch.
- C. Configure Hosts Certkiller C and Certkiller D with IP addresses in the 192.168.2.0 network.
- D. Configure two separate switches for the hosts on VLANs 2 and 3.

Answer: A

---

**QUESTION 450:**

An administrator must assign static IP addresses to the servers in a network. For network 192.168.20.24/29, the router is assigned the first usable host address while the sales server is given the last usable host address. Which of the following should be entered into the IP properties box for the sales server?

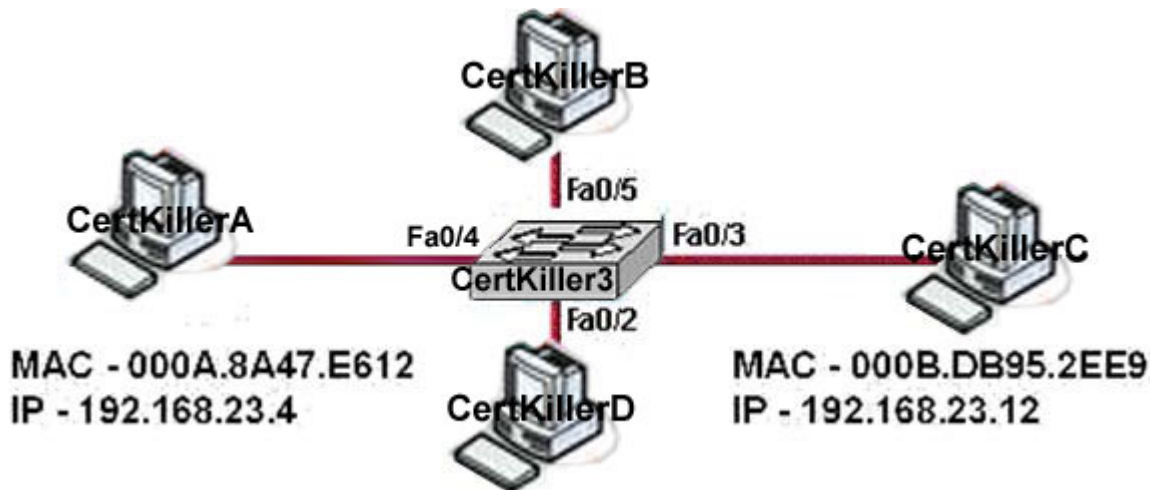
- A. IP address: 192.168.20.14  
Subnet Mask: 255.255.255.248  
Default Gateway: 192.168.20.9
- B. IP address: 192.168.20.30  
Subnet Mask: 255.255.255.240  
Default Gateway: 192.168.20.17
- C. IP address: 192.168.20.254  
Subnet Mask: 255.255.255.0  
Default Gateway: 192.168.20.1
- D. IP address: 192.168.20.30  
Subnet Mask: 255.255.255.248  
Default Gateway: 192.168.20.25
- E. IP address: 192.168.20.30  
Subnet Mask: 255.255.255.240  
Default Gateway: 192.168.20.25

Answer: D

---

**QUESTION 451:**

Exhibit:



You work as a network technician at Certkiller .com. You study the exhibit carefully. Switch1 has just been restarted and has passed the POST routine. Host A sends its initial frame to Host C. What is the first thing the switch will do as regards populating the switching table?

- A. Switch1 will add 000B.DB95.2EE9 to the switching table.
- B. Switch1 will add 000A.8A47.E612 to the switching table.
- C. Switch1 will add 192.168.23.4 to the switching table.
- D. Switch1 will add 192.168.23.12 to the switching table.

Answer: B

### QUESTION 452:

Exhibit:

**CertKiller5# show ip interface brief**

Interface	IP Address	OK?	Method Status	Protocol
FastEthernet0/0	192.168.16.1	YES	NVRAM up	up
Serial0/0	192.168.15.2	YES	NVRAM administratively down	down
FastEthernet0/1	192.168.17.1	YES	NVRAM up	up
Serial0/1	unassigned	YES	NVRAM administratively down	down

You work as a network technician at Certkiller .com. You study the exhibit carefully. Serial0/0 does not respond to a ping request from a host on the FastEthernet0/0 LAN. How can this problem be corrected?

- A. Correct the IP address for Serial 0/0.
- B. Enable the Serial 0/0 interface.
- C. Change the encapsulation type on Serial 0/0.

- D. Correct the IP address for FastEthernet 0/0.
- E. Enable autoconfiguration on the Serial 0/0 interface.

Answer: B

---

**QUESTION 453:**

What are two benefits of using VTP in a switching environment? (Choose two.)

- A. It allows ports to be assigned to VLANs automatically.
- B. It allows VLAN information to be automatically propagated throughout the switching environment.
- C. It maintains VLAN consistency across a switched network.
- D. It allows frames from multiple VLANs to use a single interface.
- E. It allows switches to read frame tags.

Answer: B,C

---

**QUESTION 454:**

What are three valid reasons to assign ports to VLANs on a switch? (Choose three.)

- A. to allow more devices to connect to the network
- B. to increase network security
- C. to make VTP easier to implement
- D. to logically group hosts according to function
- E. to isolate broadcast traffic
- F. to increase the size of the collision domain

Answer: B,D,E

---

**QUESTION 455:**

Exhibit:



```
CertKiller2 # show running-config
<<output omitted>>
interface FastEthernet0/24
no ip address
<<output omitted>>

CertKiller2 # show interfaces fastethernet0/24 switchport
Name: Fa0/24
Switchport: Enabled
Administrative Mode: static access
Operational Mode: static access
Administrative Trunking Encapsulation: dot1q
Operational Trunking Encapsulation: native
Negotiation of Trunking: Off
Access Mode VLAN: 1 (default)
Trunking Native Mode VLAN: 1 (default)
Voice VLAN: none
Administrative private-vlan host-association: none
Administrative private-vlan mapping: none
Operational private-vlan: none
Trunking VLANs Enabled: ALL
Pruning VLANs Enabled: 2-1001
Capture Mode Disabled
Capture VLANs Allowed: ALL

Protected: false

Voice VLAN: none (Inactive)
Appliance trust: none
```

You work as a network technician at Certkiller .com. You study the exhibit carefully. Switch port FastEthernet 0/24 on Switch Certkiller 2 will be used to create an IEEE 802.1Q-compliant trunk to another switch. Based on the output shown, what is the reason the trunk does not form, even though the proper cabling has been attached?

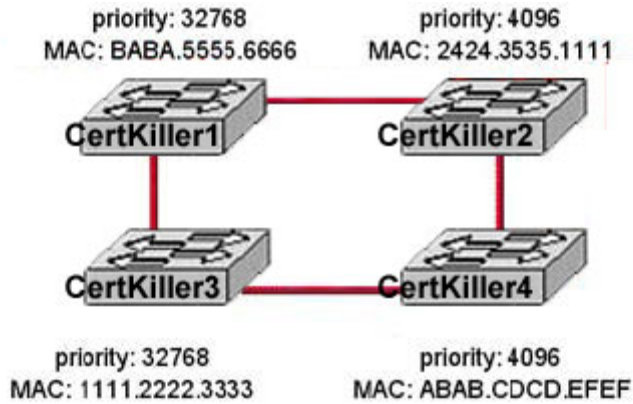
- A. The port is currently configured for access mode.
- B. VLANs have not been created yet.
- C. The correct encapsulation type has not been configured.
- D. An IP address must be configured for the port.
- E. The no shutdown command has not been entered for the port.

Answer: A

---

#### QUESTION 456:

Exhibit:



You work as a network technician at Certkiller .com. You study the exhibit carefully. If all four switches are running STP, which one will become the root bridge?

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

Answer: D

---

**QUESTION 457:**

What can a network administrator utilize by using PPP Layer 2 encapsulation? (Choose three.)

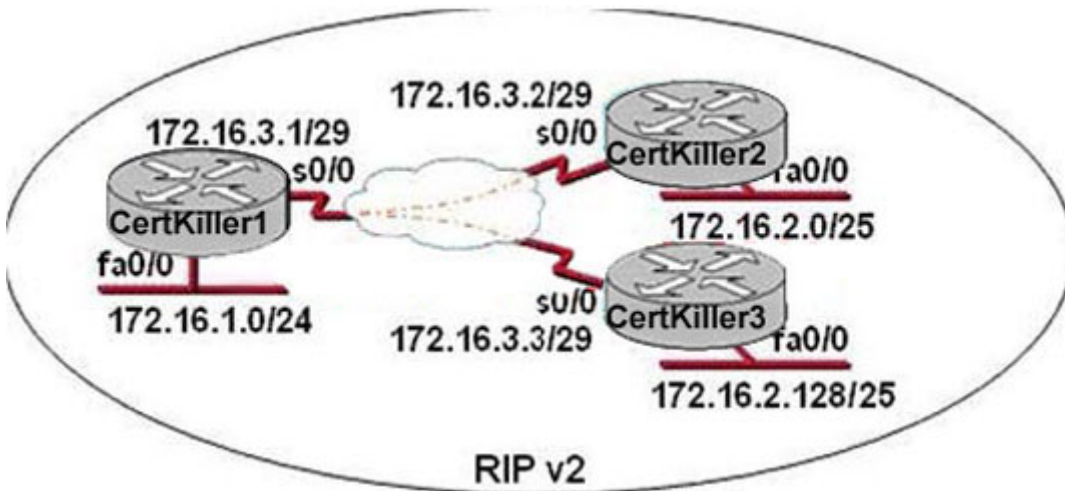
- A. compression
- B. sliding windows
- C. VLAN support
- D. multilink support
- E. quality of service
- F. authentication

Answer: A,D,F

---

**QUESTION 458:**

Exhibit:



You work as a network technician at Certkiller .com. You study the exhibit carefully. S0/0 on Certkiller 1 is configured as a multipoint interface to communicate with Certkiller 2 and Certkiller 3 in the hub-and-spoke Frame Relay topology shown in the exhibit. Originally, static routes were configured between these routers to successfully route traffic between the attached networks. What will need to be done in order to use RIP v2 in place of the static routes?

- A. Configure the s0/0 interface on Certkiller 1 as two subinterfaces and configure point-to-point links to Certkiller 2 and Certkiller 3.
- B. Configure the no ip subnet-zero command on Certkiller 1, Certkiller 2, and Certkiller 3.
- C. Change the network address configurations to eliminate the discontinuous 172.16.2.0/25 and 172.16.2.128/25 subnetworks.
- D. Change the 172.16.2.0/25 and 172.16.2.128/25 subnetworks so that at least two bits are borrowed from the last octet.
- E. Dynamic routing protocols such as RIP v2 cannot be used across Frame Relay networks.

Answer: A

#### QUESTION 459:

Which of the following describe private IP addresses? (Choose two.)

- A. addresses chosen by Certkiller .com to communicate with the Internet
- B. a scheme to conserve public addresses
- C. addresses licensed to enterprises or ISPs by an Internet registry organization
- D. addresses that can be routed through the public Internet
- E. addresses that cannot be routed through the public Internet

Answer: B,E

**QUESTION 460:**

Exhibit:

```
CertKiller4# debug ip rip
RIP protocol debugging is on
CertKiller4#RIP: sending v1 update to 255.255.255.255 via Serial0/0 (192.168.2.2)
RIP: build update entries
    network 192.168.3.0 metric 1
RIP: sending v1 update to 255.255.255.255 via FastEthernet0/0 (192.168.3.1)
RIP: build update entries
    network 192.168.2.0 metric 1
RIP: ignored v2 packet from 192.168.2.1 (illegal version)
CertKiller4#
```

You work as a network technician at Certkiller .com. You study the exhibit carefully. Two routers Certkiller 3 and Certkiller 4 have just been configured by a new technician. All interfaces are up. However, the routers are not sharing their routing tables. What is the problem?

- A. Router Certkiller 3 is using authentication and Router Certkiller 4 is not.
- B. Router Certkiller 3 has an ACL that is blocking RIP version 2.
- C. Split horizon is preventing Router Certkiller 4 from receiving routing information from Router Certkiller 3.
- D. Router Certkiller 3 is configured for RIP version 2, and Router Certkiller 4 is configured for RIP version 1.
- E. There is a physical connectivity problem between Router Certkiller 3 and Router Certkiller 4.

Answer: D

---

**QUESTION 461:**

How does replacing a hub with a switch affect CSMA/CD behavior in an Ethernet network?

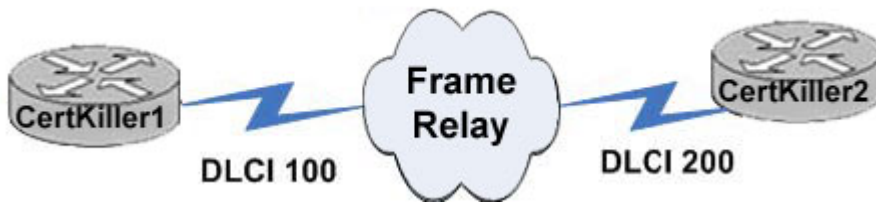
- A. It increases the size of the collision domain by allowing more devices to be connected at once.
- B. It reduces the total amount of bandwidth available to each device.
- C. It eliminates Layer 3 broadcast traffic.
- D. It effectively eliminates collisions.
- E. It decreases the amount of time that a jam signal must be sent to reach all network devices.

Answer: D

---

**QUESTION 462:**

Network Topology Exhibit:



Certkiller 1 configuration Exhibit:

**CertKiller1# show running-config**

<some output text omitted>

```
interface serial0/0
bandwidth 64
ip address 172.16.100.2 255.255.255.0
encapsulation frame-relay
frame-relay map ip 172.16.100.1 200 broadcast
```

You work as a network technician at Certkiller .com. You study the exhibit carefully. Router Certkiller 1 is unable to reach Router Certkiller 2. Both routers are running IOS version 12.0. After reviewing the command output and graphic, what is the most likely cause of the problem?

- A. incorrect IP address
- B. incorrect bandwidth configuration
- C. incorrect map statement
- D. incorrect LMI configuration

Answer: C

---

### QUESTION 463:

Network Topology Exhibit:



Certkiller 1 configuration Exhibit:

```
CertKiller1 (config)# username CertKiller2 password certkiller abc  
CertKiller1 (config)# interface serial0/0  
CertKiller1 (config-if)# encapsulation ppp  
CertKiller1 (config-if)# ppp authentication chap
```

Certkiller 2 configuration Exhibit:

```
CertKiller1 (config)# username CertKiller1 password certkiller 123  
CertKiller1 (config)# interface serial0/0  
CertKiller1 (config-if)# encapsulation ppp  
CertKiller1 (config-if)# ppp authentication chap
```

You work as a network technician at Certkiller .com. You study the exhibits carefully.  
The Certkiller 1 router is unable to authenticate to the Certkiller 2 router. What is the cause of the problem?

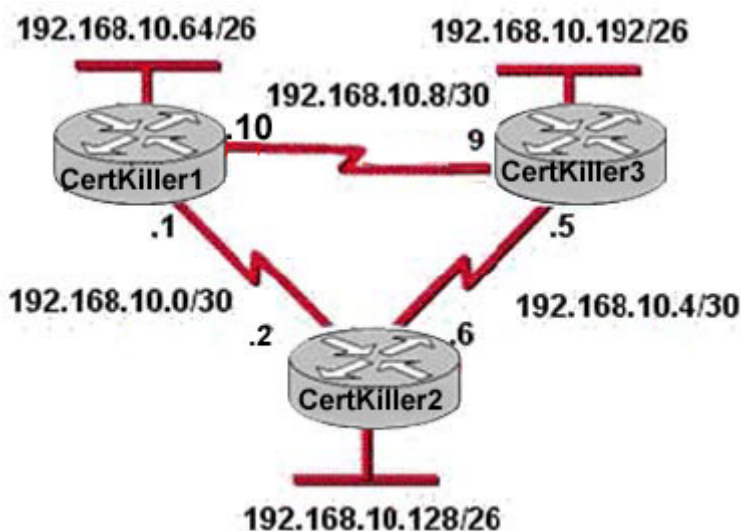
- A. With CHAP authentication, one router must authenticate to another router. The routers cannot be configured to authenticate to each other.
- B. The usernames are incorrectly configured on the two routers.
- C. The routers cannot be connected from interface S0/0 to interface S0/0.
- D. CHAP authentication cannot be used on a serial interface.
- E. The passwords do not match on the two routers.

Answer: E

---

#### QUESTION 464:

Network Topology Exhibit:



Certkiller 3 configuration exhibit:

CertKiller3 # 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, Serial0/1
C    192.168.10.8/30 is directly connected, Serial0/0
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, Serial0/1
```

You work as a network technician at Certkiller .com. You study the exhibits carefully. 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?

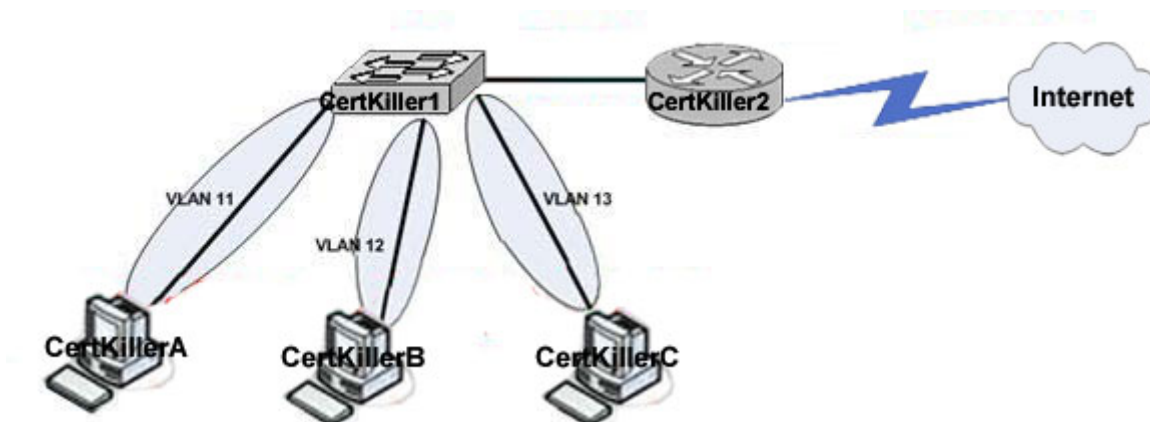
- A. The router will forward packets from Certkiller 3 to Certkiller 1 to Certkiller 2.
- B. The router will forward packets from Certkiller 3 to Certkiller 1.
- C. The router will forward packets from Certkiller 3 to Certkiller 2 to Certkiller 1.
- D. The router will forward packets from Certkiller 3 to Certkiller 2 to Certkiller 1 AND from Certkiller 3 to Certkiller 1.

Answer: D

---

### QUESTION 465:

Network Topology Exhibit:



Certkiller 1 interface exhibit:

```
Fa0.0.11 - 172.19.11.254 /24 VLAN 11
Fa0.0.12 - 172.19.12.254 /24 VLAN 12
Fa0.0.13 - 172.19.13.254 /24 VLAN 13
```



You work as a network technician at Certkiller .com. You study the exhibit carefully. The network shown in the exhibit has just been installed. Host Certkiller B can access the Internet, but it is unable to ping host Certkiller C. What is the problem with this configuration?

- A. The switch port connected to the router is incorrectly configured as an access port.
- B. The address of host Certkiller C is incorrect.
- C. The gateway for host Certkiller 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. Host Certkiller B should be in VLAN 13.

Answer: B

---

**QUESTION 466:**

What will an Ethernet switch do if it receives a unicast frame with a destination MAC that is listed in the switch table?

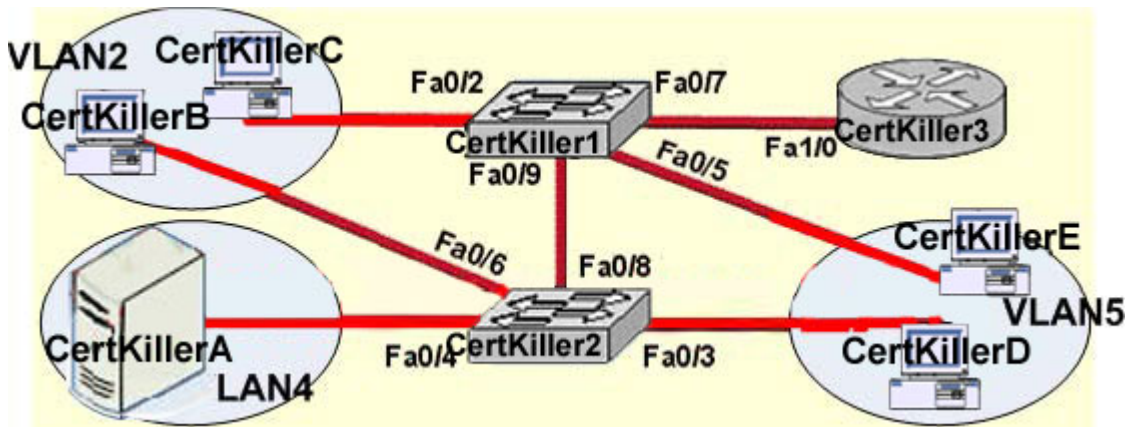
- A. The switch will return a copy of the frame out the source port.
- B. The switch will forward the frame to all ports except the port on which it was received.
- C. The switch will forward the frame to a specific port.
- D. The switch will remove the destination MAC from the switch table.
- E. The switch will not forward unicast frames.

Answer: C

---

**QUESTION 467:**

Network Topology Exhibit:



A network associate is trying to understand the operation of the FLD Corporation by studying the network in the exhibit. The associate knows that the server in VLAN 4 provides the necessary resources to support the user hosts in the other VLANs. The associate needs to determine which interfaces are access ports. Which interfaces are access ports? (Choose three.)

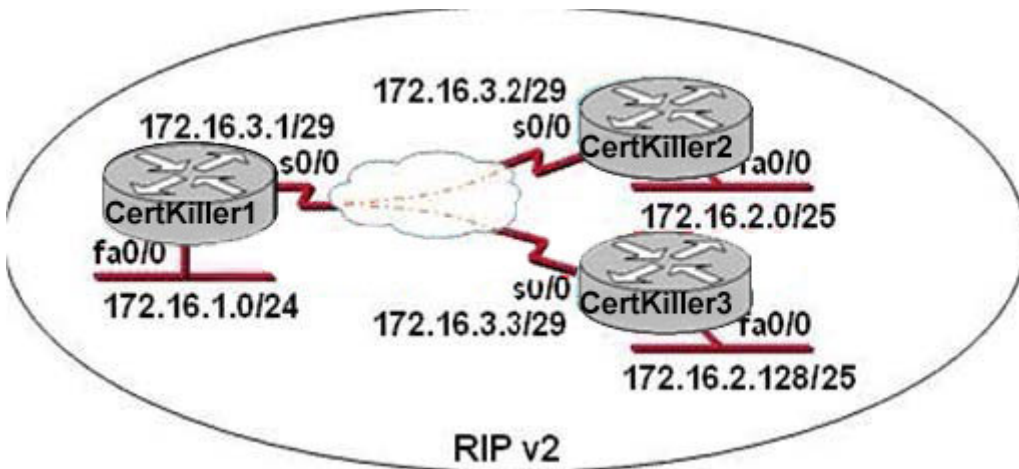
- A. Certkiller 2 - Fa 0/3
- B. Certkiller 1 - Fa 0/2
- C. Certkiller 1 - Fa 0/9
- D. Certkiller 2 - Fa 0/8
- E. Certkiller 2 - Fa 0/4
- F. Certkiller 3 - Fa 1/0

Answer: A,B,E

---

**QUESTION 468:**

Three Certkiller routers are connected as shown below:



Here, serial 0/0 on Certkiller 1 is configured as a multipoint interface to communicate with Certkiller 2 and Certkiller 3 in this hub-and-spoke Frame Relay topology. While testing this configuration, a technician notes that pings are successful from hosts on the 172.16.1.0/24 network to hosts on both the 172.16.2.0/25 and 172.16.2.128/25 networks. However, pings between hosts on the 172.16.2.0/25 and 172.16.2.128/25 networks are not successful. Of the following choices, what could explain this connectivity problem?

- A. The 172.16.3.0/29 network used on the Frame Relay links is creating a discontinuous network between the Certkiller 2 and Certkiller 3 router subnetworks
- B. The 172.16.2.0/25 and 172.16.2.128/25 networks are overlapping networks that can be seen by Certkiller 1 but not between Certkiller 2 and Certkiller 3
- C. The ip subnet-zero command has been issued on the Certkiller 1 router

- D. Split Horizon is preventing Certkiller 2 from learning about the Certkiller 3 networks and Certkiller 3 from learning about the Certkiller 2 networks
- E. The RIP v2 dynamic routing protocol can't be used across Frame Relay network
- F. None of the above

Answer: D

Explanation:

The problem in this situation is related to split horizon, which reduces incorrect routing information and routing overhead in a distance-vector network by enforcing the rule that information cannot be sent back in the direction from which it was received. In other words, the routing protocol differentiates which interface a network route was learned on, and once it determines this, it won't advertise the route back out of that same interface. in a spoke and hub Frame Relay topology, the Frame Relay interface for the hub router must have split-horizon processing disabled. Otherwise, the spoke routers never receive each other's routes.