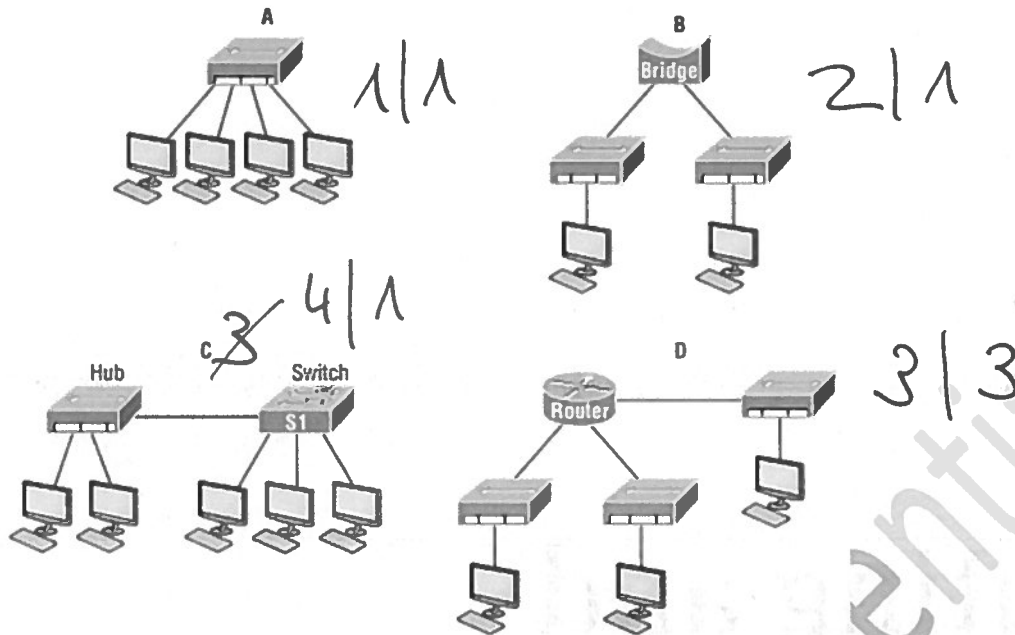


Routing and switching assessment questions

In the following exhibit, identify the number of collision domains and broadcast domains in each specified device. Each device is represented by a letter: A. Hub B. Bridge C. Switch D. Router



With respect to the OSI model, which of the following are correct statements about PDUs?

- A. A segment contains IP addresses.
- B. A packet contains IP addresses.
- C. A segment contains MAC addresses.
- D. A packet contains MAC addresses.

Protocol Data Unit

You are the Cisco administrator for your company. A new branch office is opening and you are selecting the necessary hardware to support the network. There will be two groups of computers, each organized by department. The Sales group computers will be assigned IP addresses ranging from 192.168.1.2 to 192.168.1.50. The Accounting group will be assigned IP addresses ranging from 10.0.0.2 to 10.0.0.50. What type of device should you select to connect the two groups of computers so that data communication can occur?

- A. Hub
- B. Switch
- C. Router ^
- D. Bridge ^

The most effective way to mitigate congestion on a LAN would be to _____?

- A. Upgrade the network cards
- B. Change the cabling to CAT 6
- C. Replace the hubs with switches
- D. Upgrade the CPUs in the routers

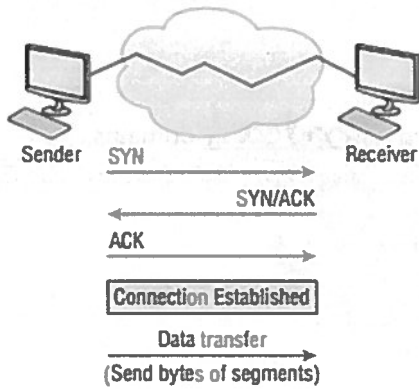
In the work area below draw a line from the OSI model layer to its PDU.

| Layer | Description |
|-----------|-------------|
| Transport | Bits |
| Data Link | Segment |
| Physical | Packet |
| Network | Frame |

A
P
S
T
A
C
K
P

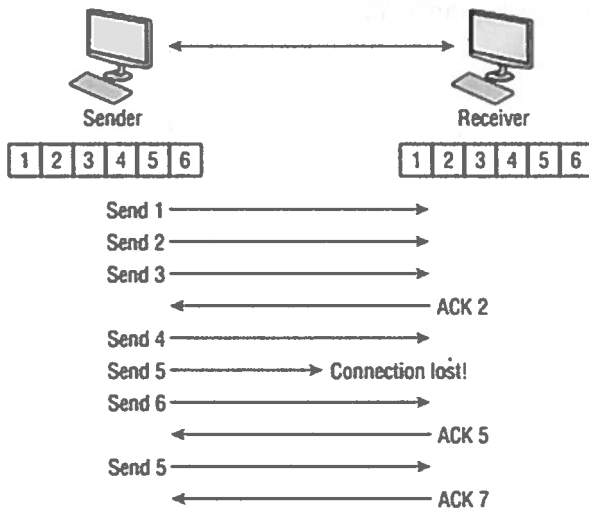
Transp. → Segment
 Data L. → Frame
 Physical → Bits
 Netw. → Packet

In the diagram below what procedure is shown?



- A. flow control
- B. windowing
- C. TCP handshake
- D. reliable delivery

What feature of TCP is illustrated below?



- A. flow control
- B. UDP handshake
- C. TCP handshake
- D. reliable delivery

Which of the following is an example of a routed protocol?

- A. EIGRP
- B. IP
- C. OSPF
- D. BGP

Which of the following is NOT a function carried out on the Application layer of the OSI model?

- A. email
- B. data translation and code formatting
- C. file transfers
- D. client/server processes

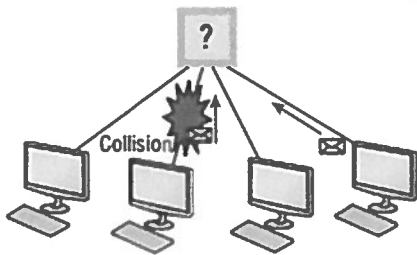
Switches break up coll domains and routers break up broadcast domains.

- A. broadcast, broadcast
- B. collision, collision
- C. collision, broadcast
- D. broadcast, collision

Which if the following is the ONLY device that operates at all layers of the OSI model?

- A. Network host
- B. Switch
- C. Router
- D. Bridge

On which type of device could the situation shown in the diagram occur?



- A. Hub
- B. Switch
- C. Router
- D. Bridge

In the Ethernet II frame shown here, what is the function of the section labeled "FCS"?

Ethernet II

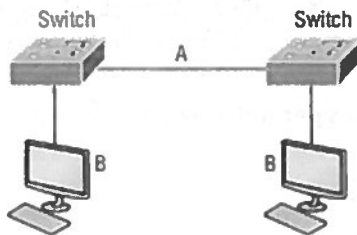
| | | | | | | |
|---------------------|---------------|------------------------|-------------------|-----------------|---------------------------------|----------------|
| Preamble 7 bytes | SFD 1 byte | Destination 6 bytes | Source 6 bytes | Type 2 bytes | Data and Pad 46 – 1500 bytes | FCS 4 bytes |
|---------------------|---------------|------------------------|-------------------|-----------------|---------------------------------|----------------|

- ~ A. Allows the receiving devices to lock the incoming bit stream.
- B. Error detection
- C. Identifies the upper-layer protocol
- D. Identifies the transmitting device

When the I/G bit in a MAC address is set to 1 the transmission is _____.
(Choose all that apply.)

- A. Unicast
- B. Broadcast
- C. Multicast
- D. Anycast

In the diagram below, identify the cable types required for connections A and B.



- A. A crossover, B crossover
- B. A crossover, B straight through
- C. A straight through, B straight through
- D. A straight through, B crossover

Which of the following items comprise a socket?

- A. IP address and MAC address
- B. IP address and port number
- ~ C. Port number and MAC address
- D. MAC address and DLCI

Which of the following hexadecimal numbers converts to 28 in decimal?

- A. 1c ✓
- B. 12
- C. 15
- D. ab

Which of the following Application layer protocols sets up a secure session that's similar to Telnet?

- A. FTP
- B. SSH
- C. DNS
- D. DHCP

What protocol is used to find the hardware address of a local device?

- A. RARP
- B. ARP ✓
- C. IP
- D. ICMP
- E. BootP

Which of the following are layers in the TCP/IP model? (Choose three.)

- A. Application
- B. Session
- C. Transport
- D. Internet
- E. Data Link
- F. Physical

Which class of IP address provides a maximum of only 254 host addresses per network ID?

- A. Class A
- B. Class B
- C. Class C
- D. Class D
- E. Class E

Which layer 4 protocol is used for a Telnet connection?

- A. IP
- B. TCP
- C. TCP/IP
- D. UDP
- E. ICMP

Which Class of IP addresses uses the pattern shown below?

| | | | |
|---------|---------|---------|------|
| Network | Network | Network | Host |
|---------|---------|---------|------|

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

Which of the following is an example of a multicast address?

- A. 10.6.9.1
- B. 192.168.10.6
- C. 224.0.0.10
- D. 172.16.9.5

The following illustration shows a data structure header. What protocol is this header from?

| | | | |
|-------------------------------|----------|-------------------------|--------------------|
| 16-Bit Source Port | | 16-Bit Destination Port | |
| 32-Bit Sequence Number | | | |
| 32-Bit Acknowledgement Number | | | |
| 4-Bit Header Length | Reserved | Flags | 16-Bit Window Size |
| 16-bit TCP Checksum | | 16-bit Urgent Pointer | |
| Options | | | |
| Data | | | |

- A. IP
- B. ICMP
- C. TCP
- D. UDP
- E. ARP
- F. RARP

Which two of the following are private IP addresses?

- A. 12.0.0.1
- B. 168.172.19.39
- C. 172.20.14.36
- D. 172.33.194.30
- E. 192.168.24.43

172.16.0.0/12

What is the address range of a Class B network address in binary?

- A. 01xxxxxx
- B. 0xxxxxxx
- C. 10xxxxxx
- D. 110xxxxx

Complete the following based on the decimal IP address.

| Decimal IP Address | Address Class | Number of Subnet and Host Bits | Number of Subnets (2^x) | Number of Hosts ($2^x - 2$) |
|--------------------|---------------|--------------------------------|-----------------------------|-------------------------------|
| 10.25.66.154/23 | A | 16/9 | 32768 | 510 |
| 172.31.254.12/24 | B | 8/8 | 256 | 254 |
| 192.168.20.123/28 | C | 4/4 | 16 | 14 |
| 63.24.89.21/18 | A | 20/14 | 1024 | 1032 |
| 128.1.1.254/20 | B | 4/12 | 16 | 14 |
| 208.100.54.209/30 | C | 6/2 | 64 | 2 |

What is the maximum number of IP addresses that can be assigned to hosts on a local subnet that uses the 255.255.255.224 subnet mask?

- A. 14
- B. 15
- C. 16
- D. 30
- E. 31
- F. 62

What is the subnetwork address for a host with the IP address 200.10.5.68/28?

- G. 200.10.5.56
- H. 200.10.5.32
- I. 200.10.5.64
- J. 200.10.5.0

The network address of 172.16.0.0/19 provides how many subnets and hosts?

- K. 7 subnets, 30 hosts each
- L. 7 subnets, 2,046 hosts each
- M. 7 subnets, 8,190 hosts each
- N. 8 subnets, 30 hosts each
- O. 8 subnets, 2,046 hosts each
- P. 8 subnets, 8,190 hosts each

Which two statements describe the IP address 10.16.3.65/23? (Choose two.) A. The subnet address is 10.16.3.0 255.255.254.0.

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

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

- Q. 172.16.45.0
- R. 172.16.45.4
- S. 172.16.45.8
- T. 172.16.45.12
- U. 172.16.45.16

Which mask should you use on point-to-point WAN links in order to reduce the waste of IP addresses?

- V. /27
- W. /28
- X. /29
- Y. /30
- E. /31

What is the subnetwork number of a host with an IP address of 172.16.66.0/21?

- Z. 172.16.36.0
- AA. 172.16.48.0
- BB. 172.16.64.0
- CC. 172.16.0.0

You have an interface on a router with the IP address of 192.168.192.10/29. Including the router interface, how many hosts can have IP addresses on the LAN attached to the router interface?

- DD. 5
- EE. 8
- FF. 30
- GG. 62
- HH. 126

You have an interface on a router with the IP address of 192.168.192.10/29. What is the broadcast address the hosts will use on this LAN?

- II. 192.168.192.15
- JJ. 192.168.192.31
- KK. 192.168.192.63
- LL. 192.168.192.127
- MM. 192.168.192.255

You need to subnet a network that has 5 subnets, each with at least 16 hosts. Which classful subnet mask would you use?

- NN. 255.255.255.192
- OO. 255.255.255.224
- PP. 255.255.255.240
- QQ. 255.255.255.248

You configure a router interface with the IP address 192.168.10.62 255.255.255.192 and receive the following error:

Bad mask /26 for address 192.168.10.62

Why did you receive this error?

RR. You typed this mask on a WAN link and that is not allowed.

SS. This is not a valid host and subnet mask combination.

TT. ip subnet-zero is not enabled on the router.

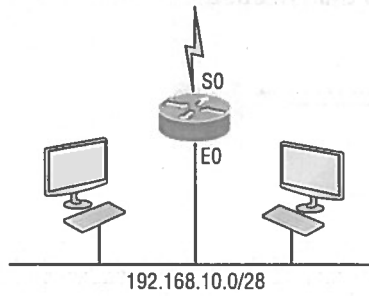
UU. The router does not support IP.

If an Ethernet port on a router were assigned an IP address of 172.16.112.1/25, what would be the valid subnet address of this interface?

- VV. 172.16.112.0
- WW. 172.16.0.0
- XX. 172.16.96.0
- YY. 172.16.255.0
- ZZ. 172.16.128.0

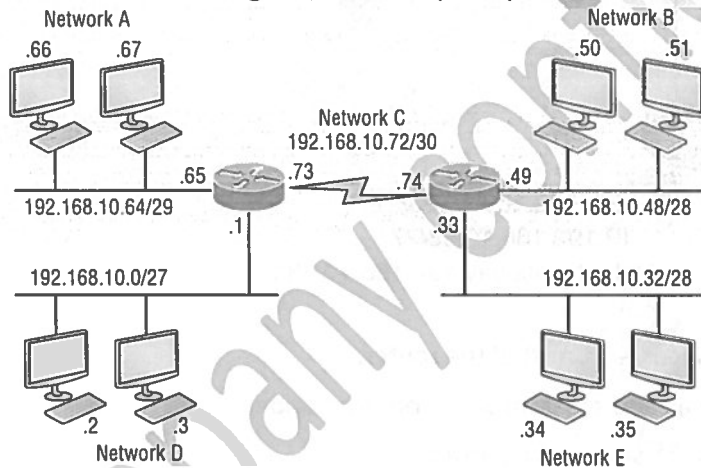
Security Operations Center Ottobrunn

Using the following illustration, what would be the IP address of E0 if you were using the eighth subnet? The network ID is 192.168.10.0/28 and you need to use the last available IP address in the range. The zero subnet should not be considered valid for this question.



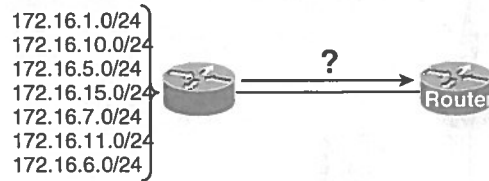
- AAA. 192.168.10.142
- BBB. 192.168.10.66
- CCC. 192.168.100.254
- DDD. 192.168.10.143
- EEE. 192.168.10.126**

In the network shown in the diagram, how many computers could be in subnet B?



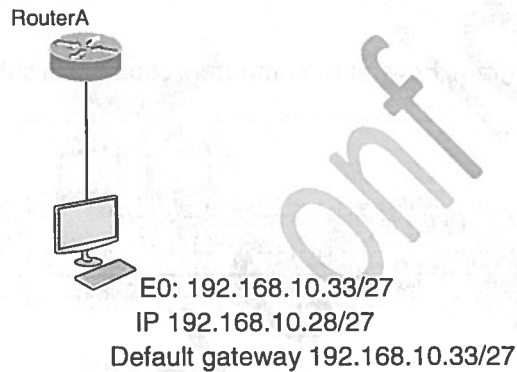
- A. 6
- B. 12
- C. 14**
- D. 30

What summary address would cover all the networks shown and advertise a single, efficient route to Router B that won't advertise more networks than needed?



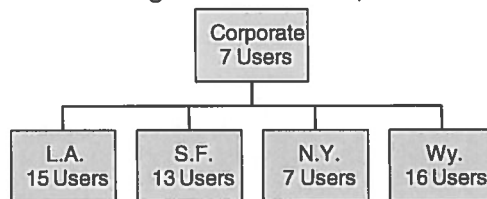
- A. 172.16.0.0/24
- B. 172.16.1.0/24
- C. 172.16.0.0/24
- D. 172.16.0.0/20
- E. 172.16.16.0/28

In the diagram below what is the most likely reason the station cannot ping outside of its network?



- A. The IP address is incorrect on E0 of the router.
- B. The default gateway address is incorrect on the station.
- C. The IP address on the station is incorrect.
- D. The router is malfunctioning. ✓

Which of the networks in the diagram could use a /29 mask?



- A. Corporate
- B. LA
- C. SF
- D. NY
- E. none

What network service is the most likely problem if you can ping a computer by IP address but not by name?

- A. DNS ✓
- B. DHCP
- C. ARP
- D. ICMP

When you issue the ping command, what protocol are you using?

- A. DNS
- B. DHCP
- C. ARP
- D. ICMP ✓

Which of the following commands displays the networks traversed on a path to a network destination?

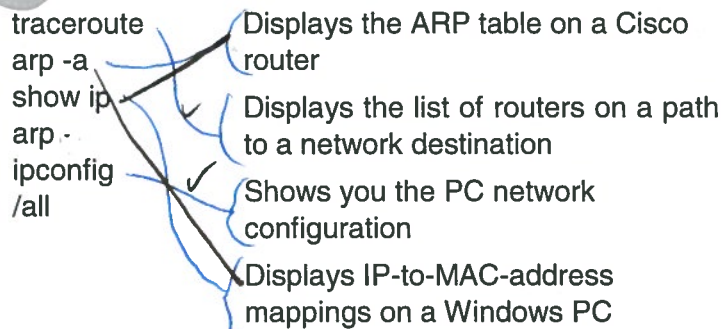
- A. ping
- B. traceroute
- C. pingroute
- D. pathroute

What command generated the output shown below?

```
Reply from 172.16.10.2: bytes=32 time<1ms TTL=128
Reply from 172.16.10.2: bytes=32 time<1ms TTL=128
Reply from 172.16.10.2: bytes=32 time<1ms TTL=128
Reply from 172.16.10.2: bytes=32 time<1ms TTL=128
```

- A. traceroute
- B. show ip route
- C. ping ✓
- D. pathping

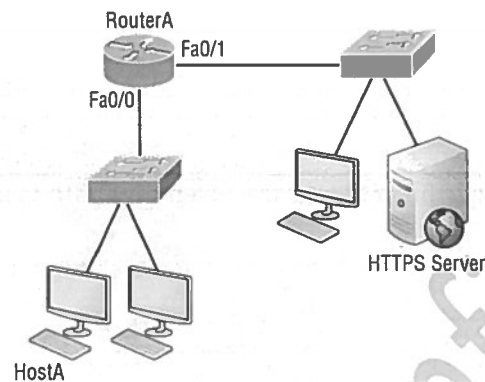
In the work area, match the command to its function on the right.



Which of the following is the best summarization of the following networks:
192.168.128.0 through 192.168.159.0

- A. 192.168.0.0/24
- B. 192.168.128.0/16
- C. 192.168.128.0/19
- D. 192.168.128.0/20

What destination addresses will be used by HostA to send data to the HTTPS server as shown in the following network? (Choose two.)



- A. The IP address of the switch
- B. The MAC address of the remote switch
- C. The IP address of the HTTPS server ✓
- D. The MAC address of the HTTPS server
- E. The IP address of RouterA's Fa0/0 interface
- F. The MAC address of RouterA's Fa0/0 interface ✓

When a packet is routed across a network, the _____ in the packet changes at every hop while the _____ does not.

- A. MAC address, IP address ✓
- B. IP address, MAC address
- C. Port number, IP address
- D. IP address, port number

Which two of the following are true regarding the distance-vector and link-state routing protocols?
(Choose two.)

- A. Link state sends its complete routing table out of all active interfaces at periodic time intervals.
- B. Distance vector sends its complete routing table out of all active interfaces at periodic time intervals.
- C. Link state sends updates containing the state of its own links to all routers in the internetwork.
- D. Distance vector sends updates containing the state of its own links to all routers in the internetwork.

Which of the following is an EGP?

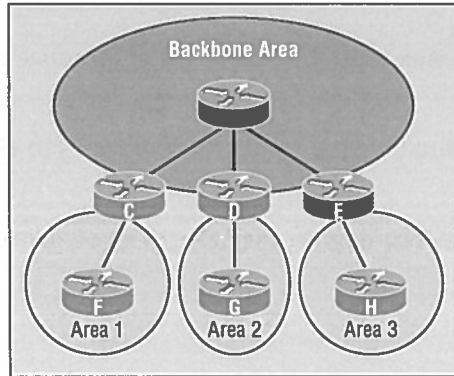
- A. RIPv2
- B. EIGRP
- C. BGP
- D. RIP

How I get!

There are three possible routes for a router to reach a destination network. The first route is from OSPF with a metric of 782. The second route is from RIPv2 with a metric of 4. The third is from EIGRP with a composite metric of 20514560. Which route will be installed by the router in its routing table?

- A. RIPv2
- B. EIGRP
- C. OSPF
- D. All three

In the accompanying diagram, which of the routers must be ABRs? (Choose all that apply.)

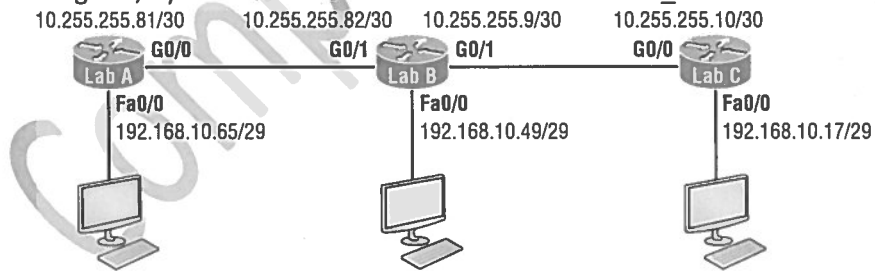


- E. C
- F. D
- G. E
- H. F
- I. G
- J. H

All of the following must match for two OSPF routers to become neighbors except which?

- K. Area ID
- L. Router ID
- M. Stub area flag
- N. Authentication password if using one

In the diagram, by default what will be the router ID of Lab_B?



- O. 10.255.255.82
- P. 10.255.255.9
- Q. 192.168.10.49
- R. 10.255.255.81

What is the administrative distance of OSPF?

- A. 90
- B. 100
- C. 120
- D. 110

In OSPF, Hellos are sent to what IP address?

- E. 224.0.0.5
- F. 224.0.0.9
- G. 224.0.0.10
- H. 224.0.0.1

A(n) _____ is an OSPF data packet containing link-state and routing information that are shared among OSPF routers.

- A. LSA
- B. TSA
- C. Hello
- D. SPF

If routers in a single area are configured with the same priority value, what value does a router use for the OSPF router ID in the absence of a loopback interface?

- E. The lowest IP address of any physical interface
- F. The highest IP address of any physical interface
- G. The lowest IP address of any logical interface
- H. The highest IP address of any logical interface

There are three possible routes for a router to reach a destination network. The first route is from OSPF with a metric of 782. The second route is from RIPv2 with a metric of 4. The third is from EIGRP with a composite metric of 20514560. Which route will be installed by the router in its routing table?

- A. RIPv2
- B. EIGRP
- C. OSPF
- D. All three

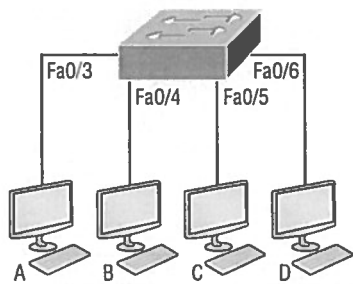
Which of the following describes a router that connects to an external routing process (e.g., EIGRP)?

- E. ABR
- F. ASBR
- G. Type 2 LSA
- H. Stub router

Which of the following statements is not true with regard to layer 2 switching?

- A. Layer 2 switches and bridges are faster than routers because they don't take up time looking at the Data Link layer header information.
- B. Layer 2 switches and bridges look at the frame's hardware addresses before deciding to either forward, flood, or drop the frame.
- C. Switches create private, dedicated collision domains and provide independent bandwidth on each port.

In the diagram shown, what will the switch do if a frame with a destination MAC address of 000a.f467.63b1 is received on Fa0/4? (Choose all that apply.)

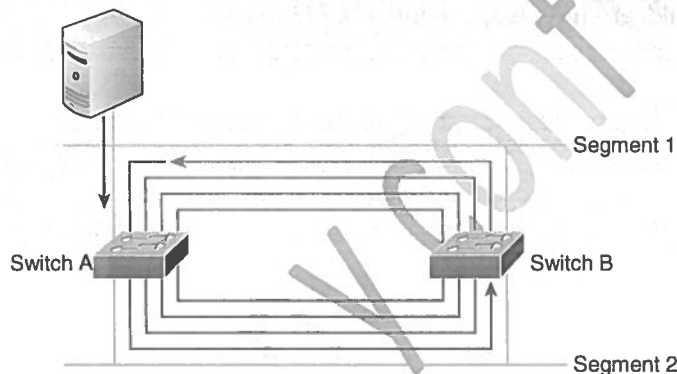


Switch# show mac address-table

| VLAN | Mac Address | Ports |
|------|----------------|-------|
| 1 | 0005.dccb.d74b | Fa0/4 |
| 1 | 000a.f467.9e80 | Fa0/5 |
| 1 | 000a.f467.9e8b | Fa0/6 |

- A. Drop the frame.
- B. Send the frame out of Fa0/3.
- C. Send the frame out of Fa0/4.
- D. Send the frame out of Fa0/5.
- E. Send the frame out of Fa0/6.

What issue that arises when redundancy exists between switches is shown in the figure?

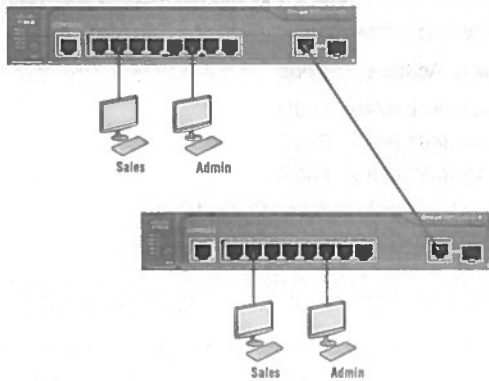


- A. Broadcast storm
- B. Routing loop
- C. Port violation
- D. Loss of gateway

Which of the following statements is true with regard to VLANs?

- A. VLANs greatly reduce network security.
- B. VLANs increase the number of collision domains while decreasing their size.
- C. VLANs decrease the number of broadcast domains while decreasing their size.
- D. Network adds, moves, and changes are achieved with ease by just configuring a port into the appropriate VLAN.

1. In the diagram, how must the port on each end of the line be configured to carry traffic between the two hosts in the Sales VLAN?



- A. Access port
- B. 10 GB
- C. Trunk
- D. Spanning

Which of the following is the wildcard (**inverse**) version of a /27 mask?

- A. 0.0.0.7
- B. 0.0.0.31
- C. 0.0.0.27
- D. 0.0.31.255

IPv6

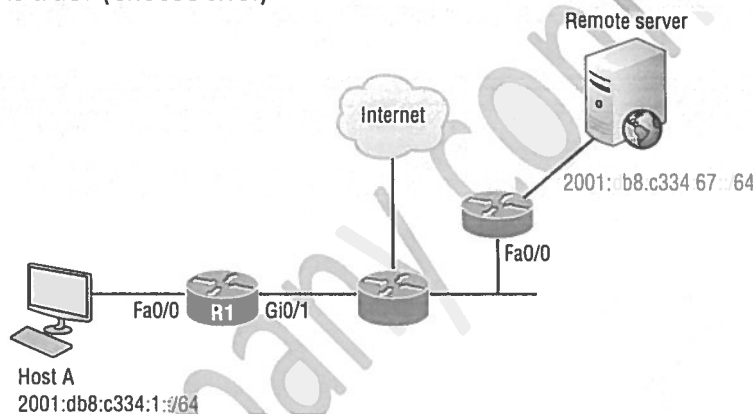
A host sends a router solicitation (RS) on the data link. What destination address is sent with this request?

- A. FF02::A
- B. FF02::9
- C. FF02::2
- D. FF02::1
- E. FF02::5

What two multicast addresses does OSPFv3 use? (Choose two.)

- F. FF02::A
- G. FF02::9
- H. FF02::5
- I. FF02::6

An IPv6 hostname Host A is trying to connect to a web page on a remote server. Which of the following is true? (Choose two.)



- J. A RA would be used by R1 to communicate its layer 2 MAC address to Host A.
- K. OSPFv2 is used for the routers to share IPv6 routes.
- L. IPv6 uses a two-part addressing scheme, similar to the way IPv4 uses a network and host portion of an IPv4 address.
- M. Host A would send the server's link-local address to the router.

Which of the following statements about IPv6 addresses are true? (Choose two.) A. Leading zeros are required.

✓

- B. Two colons (::) are used to represent successive hexadecimal fields of zeros.
- C. Two colons (::) are used to separate fields.
- D. A single interface will have multiple IPv6 addresses of different types.

What two statements about IPv4 and IPv6 addresses are true? (Choose two.) A. An IPv6 address is 32 bits long, represented in hexadecimal.

B. An IPv6 address is 128 bits long, represented in decimal.

C. An IPv4 address is 32 bits long, represented in decimal.

D. An IPv6 address is 128 bits long, represented in hexadecimal.

Which of the following descriptions about IPv6 is correct?

N. Addresses are not hierarchical and are assigned at random.

O. Broadcasts have been eliminated and replaced with multicasts.

P. There are 2.7 billion addresses.

Q. An interface can only be configured with one IPv6 address.

How many bits are in an IPv6 address field?

- R. 24
- S. 4
- T. 3
- U. 16
- V. 32
- W. 128

Which of the following correctly describe characteristics of IPv6 unicast addressing? (Choose two.)

- X. Global addresses start with 2000::/3.
- Y. Link-local addresses start with FF00::/10.
- Z. Link-local addresses start with FE00:/12.
- AA. There is only one loopback address and it is ::1.

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

- A. The first 64 bits represent the dynamically created interface ID.
- B. A single interface may be assigned multiple IPv6 addresses of any type.
- C. Every IPv6 interface contains at least one loopback address.
- D. Leading zeroes in an IPv6 16-bit hexadecimal field are mandatory.