

# Chapter 1

# Network Fundamentals (Domain 1)

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**THE CCNA EXAM TOPICS COVERED IN THIS PRACTICE TEST INCLUDE THE FOLLOWING:**

✓ **1.0 Network Fundamentals**

1.1 Explain the role and function of network components

1.1.a Routers

1.1.b Layer 2 and Layer 3 switches

1.1.c Next-generation firewalls and IPS

1.1.d Access points

1.1.e Controllers

1.1.f Endpoints

1.1.g Servers

1.1.h PoE

1.2 Describe the characteristics of network topology architectures

1.2.a Two-tier

1.2.b Three-tier

1.2.c Spine-leaf

1.2.d WAN

1.2.e Small office/home office (SOHO)

1.2.f On-premises and cloud

1.3 Compare physical interface and cabling types

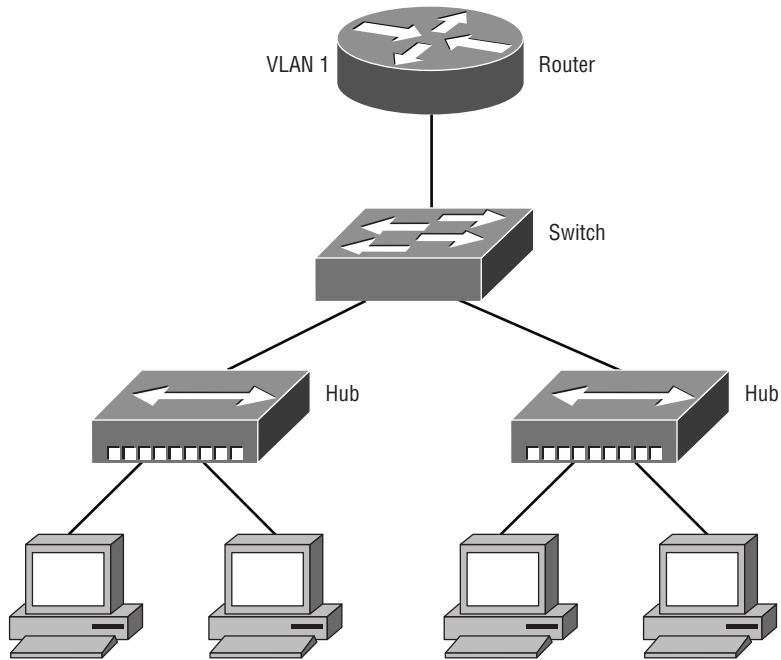
1.3.a Single-mode fiber, multimode fiber, copper

1.3.b Connections (Ethernet shared media and point-to-point)



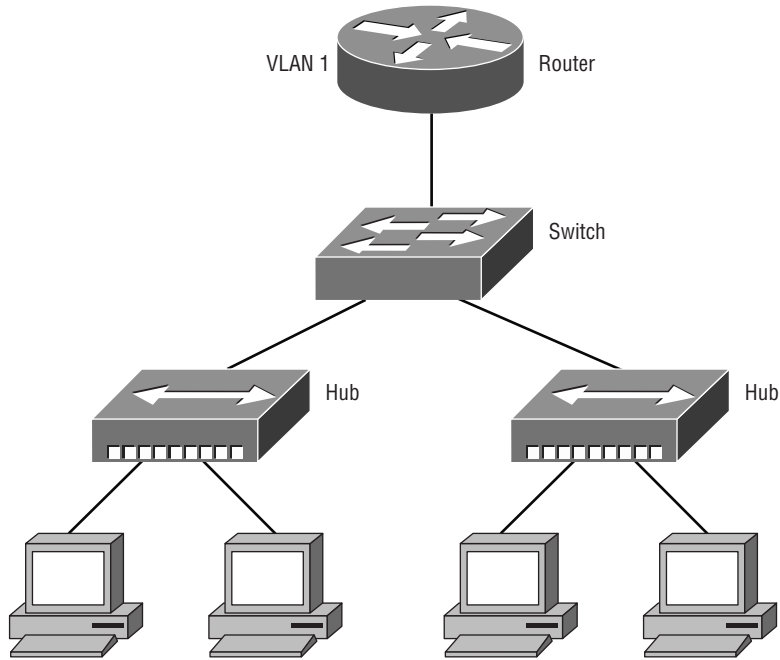
- 1.4 Identify interface and cable issues (collisions, errors, mismatch duplex, and/or speed)
- 1.5 Compare TCP to UDP
- 1.6 Configure and verify IPv4 addressing and subnetting
- 1.7 Describe private IPv4 addressing
- 1.8 Configure and verify IPv6 addressing and prefix
- 1.9 Compare IPv6 address types
  - 1.9.a Unicast (global, unique local, and link local)
  - 1.9.b Anycast
  - 1.9.c Multicast
  - 1.9.d Modified EUI 64
- 1.10 Verify IP parameters for Client OS (Windows, Mac OS, Linux)
- 1.11 Describe wireless principles
  - 1.11.a Nonoverlapping Wi-Fi channels
  - 1.11.b SSID
  - 1.11.c RF
  - 1.11.d Encryption
- 1.12 Explain virtualization fundamentals (server virtualization, containers, and VRFs)
- 1.13 Describe switching concepts
  - 1.13.a MAC learning and aging
  - 1.13.b Frame switching
  - 1.13.c Frame flooding
  - 1.13.d MAC address table

1. How many broadcast domains are present in the network in the following figure?



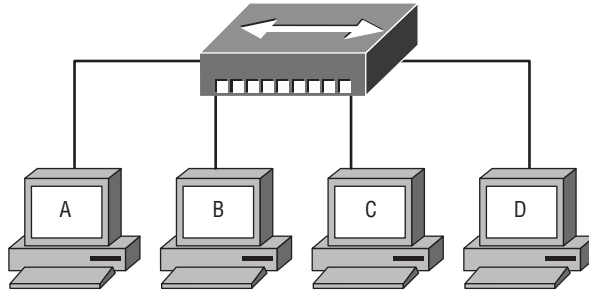
- A. One broadcast domain
- B. Two broadcast domains
- C. Three broadcast domains
- D. Seven broadcast domains

2. How many potential collision domains are present in the network in the following figure?

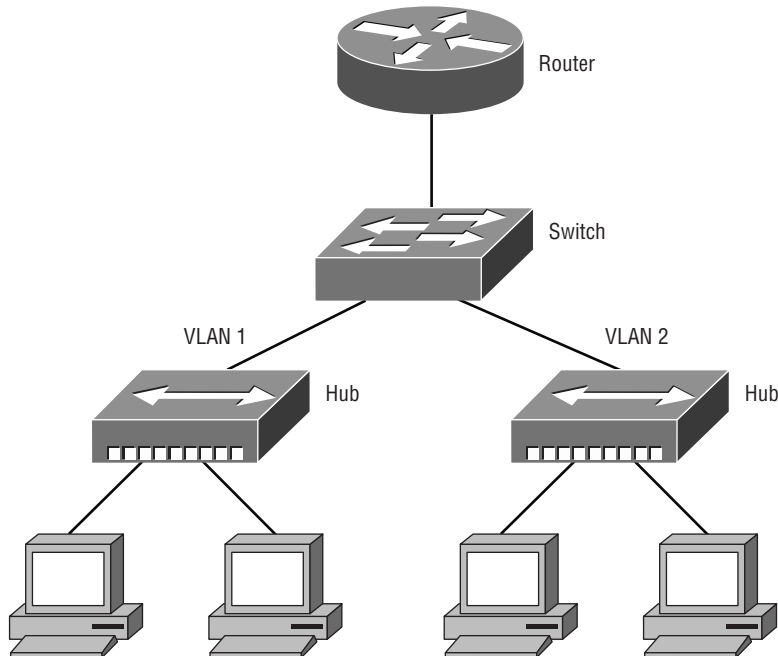


- A. One collision domain  
B. Two collision domains  
C. Three collision domains  
D. Seven collision domains
3. Which statement is true about collision domains?
- A. All computers in the collision domain have the potential to have a frame collision.  
B. All computers in the collision domain have the potential to receive layer 2 broadcast messages.  
C. All computers in the collision domain have the potential to receive layer 3 broadcast messages.  
D. All computers in the collision domain are set to 10 Mb/s full-duplex.

4. In the following figure, which would be true if the hub was replaced with a switch?



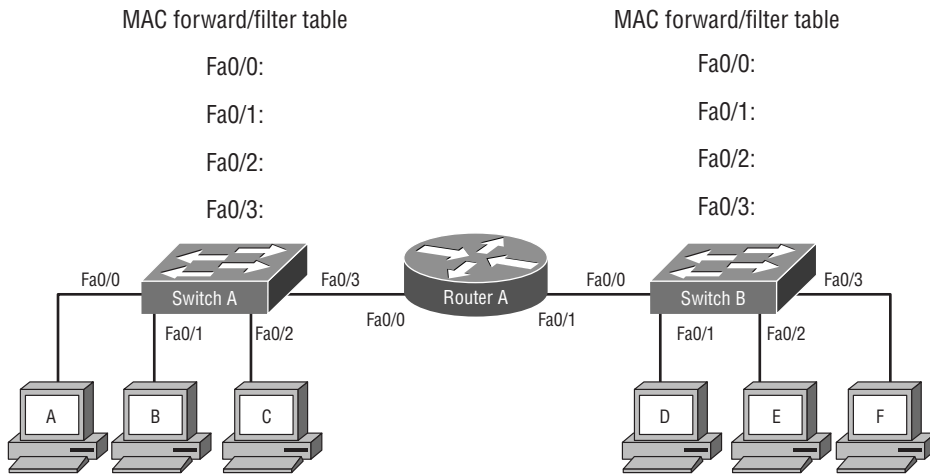
- A. The number of collision domains would increase.  
 B. The number of collision domains would decrease.  
 C. The number of broadcast domains would increase.  
 D. The number of broadcast domains would decrease.
5. Considering the following figure, which of the following is a correct statement?



- A. One collision domain exists with one broadcast domain.  
 B. Two collision domains exist with one broadcast domain.  
 C. Three collision domains exist with two broadcast domains.  
 D. Seven collision domains exist with two broadcast domains.

6. Which component acts as a distribution switch for the physical data center?
  - A. Top of Rack switch
  - B. End of Row switch
  - C. Core switch
  - D. Virtual switch
7. Which advantage(s) are gained using switches?
  - A. Low latency
  - B. Software switching
  - C. High cost
  - D. All of the above
8. Which is a correct statement when hubs are replaced with switches?
  - A. The replacement increases collision domains.
  - B. The replacement decreases collision domains.
  - C. The replacement increases broadcast domains.
  - D. The replacement decreases broadcast domains.
9. Which is a function of a layer 2 switch?
  - A. Forwarding the data based on logical addressing
  - B. Repeating the electrical signal to all ports
  - C. Learning the MAC address by examining the destination MAC addresses
  - D. Determining the forwarding interfaces based upon the destination MAC address and tables
10. What is a reason a network administrator would segment a network with a switch?
  - A. To create more broadcast domains
  - B. To create isolation of ARP messages
  - C. To create fewer collision domains
  - D. To isolate traffic between segments
11. What is the maximum wire speed of a single port on a 48-port Gigabit Ethernet switch?
  - A. 1,000 Mb/s
  - B. 2 Gb/s
  - C. 48 Gb/s
  - D. 96 Gb/s
12. Which statement describes the microsegmentation that a switch provides?
  - A. All of the ports on the switch create a single collision domain.
  - B. Each port on the switch segments broadcasts.
  - C. Each port on the switch creates its own collision domain.
  - D. Each port on the switch creates an isolation for layer 2 broadcasts.

13. Given the information in the following figure, which statement is true when Computer A needs to communicate with Computer F?



- A. Switch A and Switch B will flood the frame across all ports.
- B. Only Switch A will flood the frame across all ports.
- C. Only Switch B will flood the frame across all ports.
- D. Switch A will flood the frame across all ports; Switch B will forward traffic only to Computer F's port.
14. When firewalls are placed in a network, which zone contains Internet-facing services?
- A. Outside zone
- B. Enterprise network zone
- C. Demilitarized zone
- D. Inside zone
15. According to best practices, what is the proper placement of a firewall?
- A. Only between the internal network and the Internet
- B. At key security boundaries
- C. In the DMZ
- D. Only between the DMZ and the Internet
16. Which is a false statement about firewalls?
- A. Firewalls can protect a network from external attacks.
- B. Firewalls are commonly deployed to protect a network from internal attacks.
- C. Firewalls can provide stateful packet inspection.
- D. Firewalls can control application traffic.

17. Which of the following statements does not represent the logical management of a firewall?
  - A. All physical access to the firewall should be tightly controlled.
  - B. All firewall policies should be documented.
  - C. Firewall logs should be regularly monitored.
  - D. Firewalls should allow traffic by default and deny traffic explicitly.
18. What is the reason firewalls are considered stateful?
  - A. Firewalls keep track of the zone states.
  - B. Firewalls keep accounting on the state of packets.
  - C. Firewalls track the state of a TCP conversation.
  - D. Firewalls transition between defense states.
19. You have an Adaptive Security Appliance (ASA) and two separate Internet connections via different providers. How could you apply the same policies to both connections?
  - A. Place both connections into the same zone.
  - B. Place each connection into an ISP zone.
  - C. Apply the same ACL to both of the interfaces.
  - D. Each connection must be managed separately.
20. Why should servers be placed in the DMZ?
  - A. To allow unrestricted access by Internet clients
  - B. To allow access to the Internet and the internal network
  - C. To allow the server to access the Internet
  - D. To restrict the server to the Internet
21. Which type of device will detect but not prevent unauthorized access?
  - A. Firewall
  - B. IPS
  - C. IDS
  - D. Honeypots
22. Which term describes what it is called when more than one wireless access point (WAP) covers the same SSID?
  - A. Broadcast domain
  - B. Basic service set
  - C. Extended service set
  - D. Wireless mesh

23. Which protocol allows a Lightweight AP (LWAP) to forward data to the wired LAN?
- A. Spanning Tree Protocol (STP)
  - B. Bridge Protocol Data Units (BPDUs)
  - C. Orthogonal Frequency Division Multiplexing (OFDM)
  - D. Control and Provisioning of Wireless Access Points (CAPWAP)
24. Which component allows wireless clients to roam between access points and maintain authentication?
- A. Basic service set
  - B. Extended service set
  - C. Wireless LAN controller
  - D. Service set ID
25. Why would you use Multiprotocol Label Switching (MPLS) as a connectivity option?
- A. You need support for multicast packets.
  - B. You need support for both IPv4 and IPv6 packets.
  - C. You need a high amount of bandwidth.
  - D. You require encryption.
26. What is a service-level agreement (SLA) for network connectivity?
- A. It is an agreement of bandwidth between the ISP and the customer.
  - B. It is a quality of service agreement between the ISP and the customer.
  - C. It is an agreement of uptime between the ISP and the customer.
  - D. All of the above.
27. Which is a valid reason to implement a wireless LAN controller?
- A. Centralized authentication
  - B. The use of autonomous WAPs
  - C. Multiple SSIDs
  - D. Multiple VLANs
28. Which allows for seamless wireless roaming between access points?
- A. Single SSID
  - B. Single service set
  - C. 802.11ac
  - D. Wireless LAN controller
29. Which is one of the critical functions that a wireless LAN controller performs?
- A. Allows autonomous WAPs
  - B. Synchronizes the WAPs with the same IOS
  - C. Triangulates users for location lookups
  - D. Allows for the use of all frequency channels

30. Which should be performed at the core layer?
  - A. Routing
  - B. Supporting clients
  - C. Configuring ACLs
  - D. Switching
31. Which network topology design has a centralized switch connecting all of the devices?
  - A. Star topology
  - B. Full-mesh topology
  - C. Partial-mesh topology
  - D. Hybrid topology
32. Which is a direct benefit of a full-mesh topology?
  - A. Increased bandwidth
  - B. Increased redundancy
  - C. Decreased switch count
  - D. Increased complexity
33. Where is the hybrid topology most commonly seen in the three-tier design model?
  - A. Core layer
  - B. Distribution layer
  - C. Access layer
  - D. Routing layer
34. Where is the full-mesh topology commonly seen in the three-tier design model?
  - A. Core layer
  - B. Distribution layer
  - C. Access layer
  - D. Routing layer
35. Where is the star topology most commonly seen in the three-tier design model?
  - A. Core layer
  - B. Distribution layer
  - C. Access layer
  - D. Routing layer
36. Which topology does the collapsed core layer switch use in a two-tier design model?
  - A. Star topology
  - B. Full-mesh topology
  - C. Partial-mesh topology
  - D. Hybrid topology

37. The two-tier design model contains which layer switches?
- A. Core, distribution, and access
  - B. Core and distribution
  - C. Distribution and access
  - D. Internet, core, distribution, and access
38. You have one campus, which contains 2,000 PCs, and each edge switch will contain 25 to 40 PCs. Based on this layout, which design model should be used?
- A. Collapsed core model
  - B. Three-tier model
  - C. DOD model
  - D. Access model
39. Which is an accurate statement about the collapsed core design concept?
- A. It is best suited for large-scale networks.
  - B. It allows for better bandwidth.
  - C. It is best suited for small enterprises.
  - D. It bottlenecks bandwidth.
40. Access layer switches in the three-tier design model perform which task?
- A. Connect to other switches for redundancy
  - B. Connect to users
  - C. Connect campuses
  - D. Connect to the Internet
41. Distribution layer switches in the three-tier design model perform which task?
- A. Connect to other switches for redundancy
  - B. Connect to users
  - C. Connect campuses
  - D. Connect to the Internet
42. Core layer switches in the three-tier design model perform which task?
- A. Connect to other switches for redundancy
  - B. Connect to users
  - C. Connect to campuses
  - D. Connect to the Internet
43. You have four campuses, each containing 500 PCs, and each edge switch will contain 20 to 30 PCs. Based on this layout, which design model should be used?
- A. Collapsed core model
  - B. Three-tier model
  - C. DoD model
  - D. Access model

44. Which layer in the three-tier model should the redistribution of routing protocols be performed?
- A. Core layer
  - B. Distribution layer
  - C. Access layer
  - D. Routing layer
45. Which layer in the three-tier model should the collision domains be created?
- A. Core layer
  - B. Distribution layer
  - C. Access layer
  - D. Routing layer
46. In Cisco's three-tier architecture, the links between the distribution layer switches indicate what kind of topology?
- A. Full-mesh topology
  - B. Partial-mesh topology
  - C. Star topology
  - D. Ring topology
47. Which technology provides for a hub-and-spoke design?
- A. E-Tree services
  - B. Wireless WAN
  - C. E-Line services
  - D. E-LAN services
48. Which is a typical use case for hub-and-spoke WAN design?
- A. Connections for an enterprise spread over a metropolitan area
  - B. Connections for an Internet service provider to its customers
  - C. Connections between two or more corporate locations
  - D. Connection internally inside of a service provider's network
49. Which WAN connectivity technology is always configured in a hub-and-spoke topology?
- A. IPsec
  - B. MPLS
  - C. DMVPN
  - D. Metro Ethernet
50. Which subprotocol inside of the PPP suite is responsible for authentication?
- A. MPLS
  - B. NCP
  - C. LCP
  - D. ACP

51. Which encapsulation protocol is used to transmit data over serial links?
- A. PPPoE
  - B. HDLC
  - C. MPLS
  - D. X.25
52. Which authentication method used with PPP uses a nonce (random number) to hash the password and prevent replay attacks?
- A. PAP
  - B. PSAP
  - C. CHAP
  - D. LDAP
53. Which subprotocol inside of the PPP suite facilitates multilink connections?
- A. MPLS
  - B. NCP
  - C. LCP
  - D. ACP
54. Which is a benefit of using MLPPP?
- A. Simplified layer 3 configuration
  - B. Does not require routing protocols
  - C. Does not require authentication protocols
  - D. Provides end-to-end encryption
55. Which configuration will create the multilink interface for an MLPPP connection to an adjoining router?
- A. RouterA(config)#interface multilink 1  
RouterA(config-if)#encapsulation ppp  
RouterA(config-if)#ppp multilink  
RouterA(config-if)#ip address 192.168.1.1 255.255.255.0  
RouterA(config-if)#ppp multilink group 1
  - B. RouterA(config)#interface multilink 1  
RouterA(config-if)#ppp multilink  
RouterA(config-if)#ip address 192.168.1.1 255.255.255.0
  - C. RouterA(config)#interface multilink 1  
RouterA(config-if)#encapsulation ppp multilink
  - D. RouterA(config)#interface multilink 1  
RouterA(config-if)#ip address 192.168.1.1 255.255.255.0  
RouterA(config-if)#ppp multilink group 1

56. You need to set up PPP authentication for RouterA. The adjoining router is named RouterB, and both routers will have a matching password of *cisco*. Which commands will achieve this?

- A. RouterA(config)#username RouterA password cisco  
RouterA(config)#interface serial 0/1/0  
RouterA(config-if)#ppp authentication chap pap
- B. RouterA(config)#username RouterB password cisco  
RouterA(config)#interface serial 0/1/0  
RouterA(config-if)#ppp authentication chap pap
- C. RouterA(config)#username RouterA cisco  
RouterA(config)#interface serial 0/1/0  
RouterA(config-if)#ppp authentication chap pap
- D. RouterA(config)#username RouterA password cisco  
RouterA(config)#interface serial 0/1/0  
RouterA(config-if)#authentication chap pap

57. In the following figure, what does the line LCP closed mean?

```
RouterA#show interface s0/3/0
Serial0/0 is up, line protocol is down
Hardware is PowerQUICC Serial0/0
Internet address is 10.0.1.1/24
MT 1500 bytes, BW 1544 kbit, DLY 20000 usec,
reliability 233/255. txload 1/255, rxload 1/255
Encapsulation PPP, loopback not set
Keepalive set (10 sec)
LCP Closed
Closed IPCP, CDPCP
```

- A. The LCP process has completed.
  - B. The router does not have an IP address configured.
  - C. The serial line is disconnected.
  - D. The LCP process has not completed.
58. You have obtained an ADSL circuit at a remote office for central office connectivity. What will you need to configure on the remote office router?
- A. Metro Ethernet
  - B. PPPoE
  - C. PPP
  - D. MPLS
59. Amazon Web Services (AWS) and Microsoft Azure are examples of what?
- A. Public cloud providers
  - B. Private cloud providers
  - C. Hybrid cloud providers
  - D. Dynamic cloud providers

- 60.** You are looking to create a fault-tolerant colocation site for your servers at a cloud provider. Which type of cloud provider would you be searching for?
- A.** PaaS
  - B.** IaaS
  - C.** SaaS
  - D.** BaaS
- 61.** Which is not a NIST criterion for cloud computing?
- A.** Resource pooling
  - B.** Rapid elasticity
  - C.** Automated billing
  - D.** Measured service
- 62.** Which term describes the type of cloud an internal IT department hosting virtualization for a company would host?
- A.** Public cloud
  - B.** Elastic cloud
  - C.** Private cloud
  - D.** Internal cloud
- 63.** What is the role of a cloud services catalog?
- A.** It defines the capabilities for the cloud.
  - B.** It defines the available VMs for creation in the cloud.
  - C.** It defines the available VMs running in the cloud.
  - D.** It defines the drivers for VMs in the cloud.
- 64.** A hosted medical records service is an example of which cloud model?
- A.** PaaS
  - B.** IaaS
  - C.** SaaS
  - D.** BaaS
- 65.** A hosted environment that allows you to write and run programs without having to manage the underlying operating system is an example of which cloud model?
- A.** PaaS
  - B.** IaaS
  - C.** SaaS
  - D.** BaaS

66. Which cloud connectivity method allows for seamless transition between public clouds?
- A. MPLS VPN
  - B. Internet VPN
  - C. Intercloud exchange
  - D. Private WAN
67. Which option is not a consideration when converting to an email SaaS application if the majority of users are internal?
- A. Internal bandwidth usage
  - B. External bandwidth usage
  - C. Location of the users
  - D. Branch office connectivity to the Internet
68. You purchase a VM on a public cloud and plan to create a VPN tunnel to the cloud provider. Your IP network is 172.16.0.0/12, and the provider has assigned an IP address in the 10.0.0.0/8 network. What virtual network function (VNF) will you need from the provider to communicate with the VM?
- A. Virtual switch
  - B. Virtual firewall
  - C. Virtual router
  - D. Another IP scheme at the provider
69. Which protocol would you use to synchronize the VM in the public cloud with an internal time source at your premises?
- A. DNS
  - B. rsync
  - C. NTP
  - D. VPN
70. Which cable type would you use to connect a switch to a switch?
- A. Straight-through cable
  - B. Crossover cable
  - C. Rolled cable
  - D. Shielded cable
71. Which fiber optic standard utilizes a 50 micron core?
- A. UTP
  - B. Multimode
  - C. Single-mode
  - D. STP

72. Which type of cable would be used to connect a computer to a switch for management of the switch?
- A. Straight-through cable
  - B. Crossover cable
  - C. Rollover cable
  - D. Shielded cable
73. Which specification for connectivity is currently used in data centers for lower cost and simplicity?
- A. 10GBase-T
  - B. 40GBase-T
  - C. 10GBase-CX
  - D. 100GBase-TX
74. If you had an existing installation of Cat5e on your campus, what is the highest speed you could run?
- A. 10 Mb/s
  - B. 100 Mb/s
  - C. 1 Gb/s
  - D. 10 Gb/s
75. Which statement is correct about straight-through cables and crossover cables?
- A. Crossover cables are wired with pins 1 through 8 on one side and 8 through 1 on the other side.
  - B. Crossover cables are wired with the 568B specification on both sides.
  - C. Straight-through cables are wired with the 568B specification on one side and the 568A specification on the other side.
  - D. Crossover cables are wired with the 568B specification on one side and the 568A specification on the other side.
76. In the following figure, PPP is negotiating the username and password for the adjacent router. You are debugging PPP on the local router. What needs to be done to fix the problem?

```
*Feb 3 12:23:57.559: Se0:3 PAP: I AUTH-REQ id 25 Len 18 from "PAPUSER"  
*Feb 3 12:23:57.559: Se0:3 PPP: Phase is FORWARDING  
*Feb 3 12:23:57.559: Se0:3 PPP: Phase is AUTHENTICATING  
*Feb 3 12:23:57.559: Se0:3 PAP: Authenticating peer PAPUSER  
*Feb 3 12:23:57.559: Se0:3 PAP: O AUTH-NAK id 25 Len 32 msg is
```

- A. Configure PAP on this router.
- B. Configure PPP encapsulation on this router.
- C. Verify that the local username matches the adjacent router's hostname and the passwords match.
- D. Verify that the remote username matches the adjacent router's hostname and the passwords match.

77. Which device is responsible for adding the label to an MPLS packet?
- Customer edge (CE) router
  - Provider edge (PE) router
  - Customer premise switch
  - Label switch routers (LSR)
78. What is the term that defines the end of the provider's responsibility and the beginning of the customer's responsibility?
- CPE
  - CO
  - Local loop
  - Demarc
79. What is the speed of a DS1 connection in North America?
- 2.048 Mb/s
  - 44.736 Mb/s
  - 1.544 Mb/s
  - 622.08 Mb/s
80. Which command would you run to diagnose a possible line speed or duplex issue?
- show speed
  - show duplex
  - show interface status
  - show diagnostics
81. In the following figure, what can you conclude about the interface or node?

```
Switch#sh int fastEthernet 0/2
FastEthernet0/2 is down, line protocol is down (disabled)
  Hardware is Lance, address is 000a.f36c.1502 (bia 000a.f36c.1502)
[output cut]
  956 packets input, 193351 bytes, 0 no buffer
  Received 956 broadcasts, 0 runts, 0 giants, 0 throttles
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
  0 watchdog, 0 multicast, 0 pause input
  0 input packets with dribble condition detected
  2357 packets output, 263570 bytes, 0 underruns
  0 output errors, 0 collisions, 10 interface resets
  0 babbles, 457 late collision, 0 deferred
  0 lost carrier, 0 no carrier
  0 output buffer failures, 0 output buffers swapped out
```

- The interface is shut down.
- The interface is negotiated at half-duplex.
- There is a duplex mismatch on the interface.
- The cabling is shorted on the interface.

82. In the following figure, what can you conclude about the interface or node?

```
Switch#sh interfaces fastEthernet 0/2
FastEthernet0/2 is administratively down, line protocol is down (disabled)
  Hardware is Lance, address is 000a.f36c.1502 (bia 000a.f36c.1502)
[output cut]
  956 packets input, 193351 bytes, 0 no buffer
  Received 956 broadcasts, 0 runts, 0 giants, 0 throttles
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
  0 watchdog, 0 multicast, 0 pause input
  0 input packets with dribble condition detected
  2357 packets output, 263570 bytes, 0 underruns
  0 output errors, 0 collisions, 10 interface resets
  0 babbles, 0 late collision, 0 deferred
  0 lost carrier, 0 no carrier
  0 output buffer failures, 0 output buffers swapped out
```

- A. The interface is shut down.
  - B. The interface is negotiated at half-duplex.
  - C. There is a duplex mismatch on the interface.
  - D. The cabling is shorted on the interface.
83. You have just resolved a problem and now need to monitor the problem on the interface. How would you reset the error counts for a single interface?
- A. `reset counters interface fast 0/1`
  - B. `clear interface fast 0/1`
  - C. `clear counters interface fast 0/1`
  - D. `clear statistics interface fast 0/1`
84. In the following figure, what can you conclude about the interface or node?

```
Switch#sh interfaces fastEthernet 0/1
FastEthernet0/1 is down, line protocol is down (disabled)
  Hardware is Lance, address is 000a.f36c.1501 (bia 000a.f36c.1501)
[output cut]
  956 packets input, 193351 bytes, 0 no buffer
  Received 956 broadcasts, 0 runts, 0 giants, 0 throttles
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
  0 watchdog, 0 multicast, 0 pause input
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  2357 packets output, 263570 bytes, 0 underruns
  0 output errors, 0 collisions, 10 interface resets
  0 babbles, 0 late collision, 0 deferred
  0 lost carrier, 0 no carrier
  0 output buffer failures, 0 output buffers swapped out
```

- A. The interface is shut down.
- B. The interface is negotiated at half-duplex.
- C. The interface is operating normally.
- D. The cable is disconnected for the node.

85. A router is connected to the switch via a Fast Ethernet interface. Intermittently you experience an outage. What should be done first to remedy the problem? Refer to the following figure.

```

!
interface FastEthernet0/2
  switchport mode access
  switchport access vlan 5
  switchport nonegotiate
[output cut]

```

- A. The speed and duplex should be set statically.  
 B. Change the VLAN to a less crowded VLAN.  
 C. Change the switchport mode to a trunk.  
 D. Set the switchport to auto-negotiate.
86. In the following figure, what can you conclude about the interface or node?

```

Switch#sh int fastEthernet 0/2
FastEthernet0/2 is up, line protocol is up (connected)
  Hardware is Lance, address is 000a.f36c.1502 (bia 000a.f36c.1502)
  BW 10000 Kbit, DLY 1000 usec,
    reliability 255/255, txload 220/255, rxload 80/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full-duplex, 10Mb/s
[output cut]
  956 packets input, 193351 bytes, 0 no buffer
  Received 956 broadcasts, 0 runts, 0 giants, 0 throttles
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
  0 watchdog, 0 multicast, 0 pause input
  0 input packets with dribble condition detected
  2357 packets output, 263570 bytes, 0 underruns
  0 output errors, 0 collisions, 10 interface resets
  0 babbles, 0 late collision, 0 deferred
  0 lost carrier, 0 no carrier
  0 output buffer failures, 0 output buffers swapped out

```

- A. There are no problems with the interface.  
 B. The interface is auto-negotiating speed and duplex.  
 C. There are a large number of broadcasts.  
 D. The node needs a faster network interface.
87. You have statically set an interface to 100 Mb/s full-duplex. However, the device you are plugging in will not work. Which command(s) would you use to set speed and duplex back to auto-negotiate?
- A. speed auto  
 duplex auto  
 B. speed autonegotiate  
 duplex autonegotiate  
 C. switchport autonegotiate  
 D. interface autonegotiate

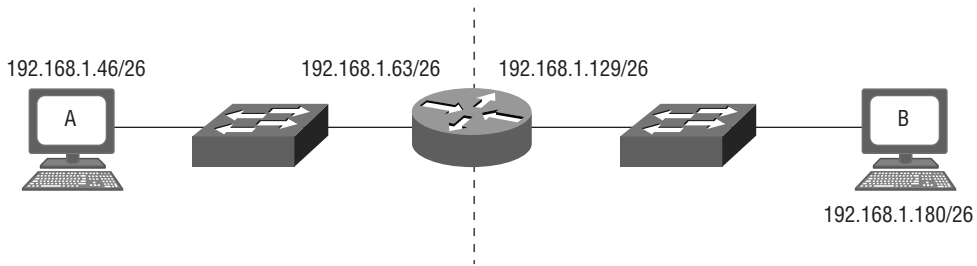
- 88.** You have auto-negotiation turned off on the node, but it is turned on at the switch's interface connecting the node. The interface is a 10/100/1000 Mb/s interface and the node is 100 Mb/s full-duplex. What will the outcome be when you plug in the node?
- A.** The switch interface will be set to the 100 Mb/s full-duplex.
  - B.** The switch interface will be set to the 100 Mb/s half-duplex.
  - C.** The switch interface will be set to the 10 Mb/s full-duplex.
  - D.** The switch interface will be set to the 10 Mb/s half-duplex.
- 89.** You plug a 100 Mb/s hub into a switch. What is the expected outcome?
- A.** The switch interface will be set to the 100 Mb/s full-duplex.
  - B.** The switch interface will be set to the 100 Mb/s half-duplex.
  - C.** The switch interface will be set to the 10 Mb/s full-duplex.
  - D.** The switch interface will be set to the 10 Mb/s half-duplex.
- 90.** You want to see the status of all speed and duplex negotiations for all interfaces. Which command would you use?
- A.** `show run`
  - B.** `show interfaces counters`
  - C.** `show interfaces status`
  - D.** `show counters interfaces`
- 91.** Flow control can typically be found at which layer of the OSI?
- A.** Transport layer
  - B.** Network layer
  - C.** Data Link layer
  - D.** Session layer
- 92.** Which protocol requires the programmer to deal with lost segments?
- A.** SSL
  - B.** TCP
  - C.** UDP
  - D.** NMS
- 93.** Which is a correct statement about the Transmission Control Protocol (TCP)?
- A.** TCP is a connectionless protocol.
  - B.** TCP allows for error correction.
  - C.** TCP is faster than UDP.
  - D.** TCP allows for retransmission of lost segments.

94. Which statement correctly describes what happens when a web browser initiates a request to a web server?
- A. The sender allocates a port dynamically above 1024 and associates it with the request.
  - B. The receiver allocates a port dynamically above 1024 and associates it with the request.
  - C. The sender allocates a port dynamically below 1024 and associates it with the request.
  - D. The receiver allocates a port dynamically below 1024 and associates it with the request.
95. Which protocol and port number is associated with SMTP?
- A. UDP/69
  - B. UDP/68
  - C. UDP/53
  - D. TCP/25
96. How does TCP guarantee delivery of segments to the receiver?
- A. Via the destination port
  - B. TCP checksums
  - C. Window size
  - D. Sequence and acknowledgment numbers
97. When a programmer decides to use UDP as a transport protocol, what is a decision factor?
- A. Redundancy of acknowledgment is not needed.
  - B. Guaranteed delivery of segments is required.
  - C. Windowing flow control is required.
  - D. A virtual circuit is required.
98. Which mechanism allows for programs running on a server (daemons) to listen for requests through the process called binding?
- A. Headers
  - B. Port numbers
  - C. MAC address
  - D. Checksums
99. Which is a correct statement about sliding windows used with TCP?
- A. The window size is established during the three-way handshake.
  - B. Sliding windows allow for data of different lengths to be padded.
  - C. It allows TCP to indicate which upper-layer protocol created the request.
  - D. It allows the router to see the segment as urgent data.

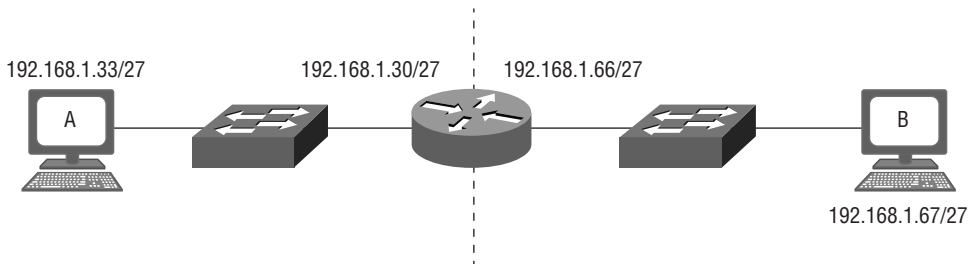
- 100.** Why does DNS use UDP for queries?
- A.** DNS requires acknowledgment of the request for auditing.
  - B.** The requests require flow control of UDP.
  - C.** DNS requests are usually small and do not require connections setup.
  - D.** DNS requires a temporary virtual circuit.
- 101.** What is required before TCP can begin sending segments?
- A.** Three-way handshake
  - B.** Port agreement
  - C.** Sequencing of segments
  - D.** Acknowledgment of segments
- 102.** Which class is the IP address 172.23.23.2?
- A.** Class A
  - B.** Class B
  - C.** Class C
  - D.** Class D
- 103.** Which is the default subnet mask for a Class A address?
- A.** 255.0.0.0
  - B.** 255.255.0.0
  - C.** 255.255.255.0
  - D.** 255.255.255.255
- 104.** Which address is a multicast IP address?
- A.** 221.22.20.2
  - B.** 223.3.40.2
  - C.** 238.20.80.4
  - D.** 240.34.22.12
- 105.** Which is true of the IP address 135.20.255.255?
- A.** It is a Class A address.
  - B.** It is a broadcast address.
  - C.** It is the default gateway address.
  - D.** It has a default mask of 255.0.0.0.
- 106.** What is the CIDR notation for a subnet mask of 255.255.240.0?
- A.** /19
  - B.** /20
  - C.** /22
  - D.** /28

- 107.** You have been given an IP address network of 203.23.23.0. You are asked to subnet it for two hosts per network. What is the subnet mask you will need to use to maximize networks?
- A. 255.255.255.252
  - B. 255.255.255.248
  - C. 255.255.255.240
  - D. 255.255.255.224
- 108.** You have been given an IP address network of 213.43.53.0. You are asked to subnet it for 22 hosts per network. What is the subnet mask you will need to use to maximize networks?
- A. 255.255.255.252
  - B. 255.255.255.248
  - C. 255.255.255.240
  - D. 255.255.255.224
- 109.** Which valid IP is in the same network as 192.168.32.61/26?
- A. 192.168.32.59
  - B. 192.168.32.63
  - C. 192.168.32.64
  - D. 192.168.32.72
- 110.** You are setting up a network in which you need 15 subnetworks. You have been given a network address of 153.20.0.0, and you need to maximize the number of hosts in each network. Which subnet mask will you use?
- A. 255.255.224.0
  - B. 255.255.240.0
  - C. 255.255.248.0
  - D. 255.255.252.0
- 111.** An ISP gives you an IP address of 209.183.160.45/30 to configure your end of the serial connection. Which IP address will be on the side at the ISP?
- A. 209.183.160.43/30
  - B. 209.183.160.44/30
  - C. 209.183.160.46/30
  - D. 209.183.160.47/30

- 112.** In the following figure, what needs to be changed for Computer A to successfully communicate with Computer B (assume the least amount of effort to fix the problem)?



- A. Computer A needs to have its IP address changed.
  - B. Computer B needs to have its IP address changed.
  - C. The default gateway IP address for Computer A needs to be changed.
  - D. The default gateway IP address for Computer B needs to be changed.
- 113.** In the following figure, what needs to be changed for Computer A to successfully communicate with Computer B (assume the least amount of effort to fix the problem)?



- A. Computer A needs to have its IP address changed.
  - B. Computer B needs to have its IP address changed.
  - C. The default gateway IP address for Computer A needs to be changed.
  - D. The default gateway IP address for Computer B needs to be changed.
- 114.** Which subnet does host 131.50.39.23/21 belong to?

- A. 131.50.39.0/21
- B. 131.50.32.0/21
- C. 131.50.16.0/21
- D. 131.50.8.0/21

- 115.** A computer has an IP address of 145.50.23.1/22. What is the broadcast address for that computer?
- A.** 145.50.254.255
  - B.** 145.50.255.255
  - C.** 145.50.22.255
  - D.** 145.50.23.255
- 116.** Which RFC defines private IP addresses?
- A.** RFC 1819
  - B.** RFC 1911
  - C.** RFC 1918
  - D.** RFC 3030
- 117.** What is a major reason to use private IP addressing?
- A.** It allows for the conservation of public IP addresses.
  - B.** Since private IP addresses are nonroutable on the Internet, they are secure.
  - C.** It keeps communications private.
  - D.** It allows easier setup than public IP addresses.
- 118.** What is required when using private IP addresses to communicate with Internet hosts?
- A.** Internet router
  - B.** IPv4 tunnel
  - C.** VPN tunnel
  - D.** Network Address Translation
- 119.** Which is the Class A private IP address range?
- A.** 10.0.0.0/8
  - B.** 10.0.0.0/12
  - C.** 172.16.0.0/12
  - D.** 10.0.0.0/10
- 120.** Which is the Class B private IP address range?
- A.** 10.0.0.0/8
  - B.** 10.0.0.0/12
  - C.** 172.16.0.0/12
  - D.** 10.0.0.0/10
- 121.** Which is the Class C private IP address range?
- A.** 192.168.1.0/24
  - B.** 192.168.0.0/24
  - C.** 192.168.0.0/16
  - D.** 192.168.0.0/12

- 122.** You plug a laptop into a network jack. When you examine the IP address, you see 169.254.23.43. What can you conclude?
- A.** The network jack is not working.
  - B.** Your laptop has a static IP address configured.
  - C.** The network is configured properly.
  - D.** The DHCP server is down.
- 123.** You want to put a web server online for public use. Which IP address would you use?
- A.** 192.168.34.34
  - B.** 172.31.54.3
  - C.** 10.55.33.32
  - D.** 198.168.55.45
- 124.** Who is the governing body that distributes public IP addresses?
- A.** IANA
  - B.** RFC
  - C.** IAB
  - D.** IETF
- 125.** Which protocol allows multicast switches to join computers to the multicast group?
- A.** ICMP
  - B.** IGMP
  - C.** IPMI
  - D.** IPGRP
- 126.** Why is IPv6 needed in the world today?
- A.** It does not require NAT to operate.
  - B.** The IPv4 public address space is exhausted.
  - C.** IPv4 is considered legacy, and IPv6 is the replacement.
  - D.** IPv6 does not support subnetting.
- 127.** How many bits is an IPv6 address?
- A.** 32 bits
  - B.** 64 bits
  - C.** 128 bits
  - D.** 256 bits

- 128.** You have two facilities and both use IPv6 addressing internally. However, both facilities are connected to the Internet via IPv4. What is one recommended method you can use to communicate between the facilities over the Internet?
- A. Dedicated leased line
  - B. Frame Relay
  - C. Dual stack
  - D. 6to4 tunnel
- 129.** Which command is required on a router to support IPv6 static addressing?
- A. `ipv6 address`
  - B. `ipv6 routing`
  - C. `ipv6 enable`
  - D. `ipv6 unicast-routing`
- 130.** Which command would you use on an interface to set the IPv6 address?
- A. `ip address 2001:0db8:85aa:0000:0000:8a2e:1343:1337`
  - B. `ipv6 address 2001:0db8:85aa:0000:0000:8a2e:1343:1337`
  - C. `ip address 2001:0db8:85aa:0000:0000:8a2e:1343:1337/64`
  - D. `ipv6 address 2001:0db8:85aa:0000:0000:8a2e:1343:1337/64`
- 131.** Which field of the IPv6 header allows for a dual-stack host to decide which stack to process the packet in?
- A. Version field
  - B. Flow label
  - C. Source address
  - D. Destination address
- 132.** You want to see all of the interfaces on a router configured with IPv6. Which command would you use?
- A. `show ipv6 interfaces brief`
  - B. `show ip interfaces brief`
  - C. `show interfaces status`
  - D. `show ip addresses`
- 133.** Which is a valid shortened IPv6 address for 2001:0db8:0000:0000:0000:8a2e:0000:1337?
- A. `2001:db8:0000::8a2e::1337`
  - B. `2001:db8:::8a2e:0000:1337`
  - C. `2001:db8::8a2e::1337`
  - D. `2001:db8::8a2e:0:1337`

- 134.** Which is the correct expansion for the IPv6 address 2001::456:0:ada4?
- A. 2001:0000:0000:0456:0000:ada4
  - B. 2001:0000:0000:0000:456:0000:ada4
  - C. 2001:0000:0000:0000:0000:0456:0000:ada4
  - D. 2001:0000:0000:0000:0456:0000:0000:ada4
- 135.** In the IPv6 address 2001:0db8:1234:0016:0023:8080:2345:88ab/64, what is the subnet quartet?
- A. 1234
  - B. 0016
  - C. 0023
  - D. 8080
- 136.** What is the network prefix for the IPv6 address 2001.db8::8080:2345:88ab/64?
- A. 2001:db8::/64
  - B. 2001:0db8:8080:2345/64
  - C. 2001:0db8:0000:8080/64
  - D. 2001:0db8:0000:2345/64
- 137.** You need to verify connectivity to the IPv6 address fc00:0000:0000:0000:0000:0000:0000:0004. Which command would you use?
- A. ping fc00::4
  - B. ping fc::4
  - C. ping ipv6 fc00::4
  - D. ping ipv6 fc::4
- 138.** Which method is used to direct communications to a single host?
- A. Unicast
  - B. Broadcast
  - C. Multicast
  - D. Anycast
- 139.** Which protocol uses broadcasting at layer 3?
- A. ARP
  - B. DHCP
  - C. IGMP
  - D. SNMP

- 140.** Which method is used to direct communications to all computers in a subnet?
- A. Unicast
  - B. Broadcast
  - C. Multicast
  - D. Anycast
- 141.** You work for an ISP. The American Registry for Internet Numbers (ARIN) has given you the 2001:0db8:8/34 IP address block. How many /48 blocks can you assign to your customers?
- A. 32,768
  - B. 16,384
  - C. 8,192
  - D. 4,096
- 142.** What protocol/process in IPv6 replaces the IPv4 ARP process?
- A. NDP (NS/NA)
  - B. DAD (NS/NA)
  - C. SLAAC (RS/RA)
  - D. ARPv6 (NS/NA)
- 143.** Which address is a global unicast address?
- A. fe80:db80:db01:ada0:1112::1
  - B. 2005:acd:234:1132::43
  - C. fd00:ac34:34b:8064:234a::7
  - D. ff00:101:4ab0:3b3e::10
- 144.** For global unicast addresses, which part of the address is allotted by the regional Internet registry (RIR) for the corresponding region?
- A. First 23 bits
  - B. First 32 bits
  - C. First 48 bits
  - D. First 64 bits
- 145.** Which address is a unique local address?
- A. fe80:db80:db01:ada0:1112::1
  - B. 2005:acd:234:1132::43
  - C. fd00:ac34:34b:8064:234a::7
  - D. ff00::10

- 146.** Which IPv6 address type is similar to IPv4 RFC 1918 addresses?
- A. Link-local addresses
  - B. Global unicast addresses
  - C. EUI-64 addresses
  - D. Anycast addresses
- 147.** Which address is a link-local address?
- A. fe80:db80:db01:ada0:1112::1
  - B. 2005:acd:234:1132::43
  - C. fd00:ac34:34b:8064:234a::7
  - D. ff00:101:4ab0:3b3e::10
- 148.** Which method is used to direct communications to the IP address that is closest to the source?
- A. Unicast
  - B. Broadcast
  - C. Multicast
  - D. Anycast
- 149.** Which command would configure a single anycast address on a router's interface?
- A. ip address 2001:db8:1:1:1::12/64
  - B. ipv6 address 2001:db8:1:1:1::12/64 anycast
  - C. ipv6 anycast address 2001:db8:1:1:1::12/128
  - D. ipv6 address 2001:db8:1:1:1::12/128 anycast
- 150.** Which method is used to direct communications to a group of computers that subscribe to the transmission?
- A. Unicast
  - B. Broadcast
  - C. Multicast
  - D. Anycast
- 151.** Which address is a multicast address?
- A. fe80:db80:db01:ada0:1112::1
  - B. 2005:acd:234:1132::43
  - C. fd00:ac34:34b:8064:234a::7
  - D. ff00::10

- 152.** You are using the EUI-64 method of allocating the host portion of the IPv6 addresses. The MAC address of the host is f423:5634:5623. Which is the correct IP address that will be calculated for a network ID of fd00:1:1::?
- A. fd00:0001:0001:0000:f623:56ff:fe34:5623/64
  - B. fd00:0001:0001:0000:f423:56ff:fe34:5623/64
  - C. fd00:0001:0001:0000:ffe:f623:5634:5623/64
  - D. fd00:0001:0001:0000:f623:56ff:ff34:5623/64
- 153.** Which address is a EUI-64 generated address?
- A. 2001:db8:33::f629:58fe:ff35:5893/64
  - B. fd00:4:33::f680:45ca:ac3b:5a73/64
  - C. 2001:db8:aa::f654:56ff:fe34:a633/64
  - D. 2001:db8:17:ffe:f623::ff34:5623/64
- 154.** Which command would use the MAC address for the host portion of the IPv6 address on a router interface?
- A. `ip address eui-64 2001:db8:1234::/64`
  - B. `ip address 2001:db8:1234::/64 mac-address`
  - C. `ipv6 address 2001:db8:1234::/64 eui-64`
  - D. `ipv6 address 2001:db8:1234::/64 mac`
- 155.** Which command on Windows will allow you to verify your IP address, subnet mask, default gateway, and MAC address?
- A. `ipconfig`
  - B. `ipstatus`
  - C. `ipconfig /all`
  - D. `hostname`
- 156.** Which command on Windows will allow you to verify the path a packet gets routed through on the network?
- A. `tracert 198.78.34.2`
  - B. `ping 198.78.34.2`
  - C. `tracert 198.78.34.2`
  - D. `route print`
- 157.** Your DNS administrator has changed the DNS entry for RouterB. You clear the DNS cache on RouterA and ping `routerb.sybex.com` from RouterA, but you still ping the original address prior to the change. All other DNS addresses work fine and the entry resolves correctly on your laptop. What is the problem?
- A. The router is configured to the wrong DNS server.
  - B. RouterA has a host entry configured.
  - C. The DNS administrator made an error.
  - D. The domain name of the router is incorrect.

- 158.** You have configured a router to point to the DNS server with the IP address 10.2.2.2 and configured the domain name of `sybex.com`. However, you cannot resolve the host `routerb.sybex.com`. Which Windows command will help you verify the DNS name resolution?
- A. `ping routerb.sybex.com`
  - B. `tracert routerb.sybex.com`
  - C. `nslookup routerb.sybex.com`
  - D. `dig routerb.sybex.com`
- 159.** Which Windows command will allow you to see the DHCP server that has configured the client computer with an IP address?
- A. `ipconfig`
  - B. `ipconfig /all`
  - C. `ipconfig /showclassid`
  - D. `ipstatus`
- 160.** You have configured a DHCP server on a router interface. You test a Windows client and receive the address 169.254.24.56. What can you conclude?
- A. You have successfully configured the scope of 169.254.24.0/24.
  - B. The client had a static IP address of 169.254.24.0/24 configured.
  - C. The DHCP server is not configured properly and the client has configured itself with a link-local address.
  - D. The DHCP server is configured for APIPA.
- 161.** Which is the contention method 802.11 wireless uses?
- A. CSMA/CA
  - B. CSMA/CD
  - C. DSSS
  - D. OFDM
- 162.** In the 2.4 GHz spectrum for 802.11, which channels are nonoverlapping?
- A. Channels 1, 3, and 11
  - B. Channels 1, 3, and 6
  - C. Channels 1, 6, and 11
  - D. Channels 1 through 6
- 163.** You are designing a wireless network for an office building. The building has a large number of tenants who utilize wireless already. Which protocol will least likely overlap with wireless channels the tenants are currently using?
- A. 802.11b
  - B. 802.11g
  - C. 802.11n
  - D. 802.11ac

- 164.** Which wireless encryption protocol uses a 24-bit initialization vector?
- A. WPA
  - B. WEP
  - C. WPA2
  - D. WPA3
- 165.** Which wireless standard does not use a preshared key for authentication?
- A. WPA
  - B. WPA2
  - C. WEP
  - D. WPA2 Enterprise
- 166.** When designing a wireless network, which would be a compelling reason to use 5 GHz?
- A. 5 GHz can go further.
  - B. 5 GHz allows for more clients.
  - C. There are 24 nonoverlapping channels.
  - D. There is less interference on 5 GHz.
- 167.** Which wireless frequency spectrum is shared with Bluetooth?
- A. 900 MHz
  - B. 2.4 GHz
  - C. 5 GHz
  - D. All of the above
- 168.** Which 802.11 standard functions strictly on 2.4 GHz?
- A. 802.11g
  - B. 802.11n
  - C. 802.11a
  - D. 802.11ac
- 169.** Which allows for the distribution of compute resources such as CPU and RAM to be distributed over several operating systems?
- A. Physical server
  - B. Hypervisor
  - C. Virtual machine
  - D. Virtual network
- 170.** Which option describes a VM best?
- A. An operating system that is running directly on hardware
  - B. An operating system that is running with dedicated hardware
  - C. An operating system that is running on reduced hardware features
  - D. An operating system that is decoupled from the hardware

- 171.** What is the physical hardware used in virtualization called?
- A. Host
  - B. VM
  - C. Hypervisor
  - D. Guest
- 172.** Which component connects the VM NIC to the physical network?
- A. vNIC
  - B. Trunk
  - C. Virtual switch
  - D. NX-OS
- 173.** Which of the following is a virtual network function (VNF) device?
- A. Virtual switch
  - B. Virtual firewall
  - C. Database server
  - D. File server
- 174.** You need to scale out some web servers to accommodate load. Which method would you use?
- A. Add vCPUs
  - B. Add vRAM
  - C. Add DNS
  - D. Add SLBaaS
- 175.** Which is a correct statement about MAC addresses?
- A. Organizationally unique identifiers (OUIs) create a unique MAC address.
  - B. The first 24 bits of a MAC address are specified by the vendor.
  - C. The IEEE is responsible for MAC address uniqueness.
  - D. If the I/G bit is set to 1, then the frame identifies a broadcast or multicast.
- 176.** Which command would you use to diagnose a problem with frames that are not getting forwarded to the destination node on a switch?
- A. `show route`
  - B. `show mac address-table`
  - C. `show mac table`
  - D. `show interface`
- 177.** Which mechanism does a switch employ to stop switching loops?
- A. Port channels
  - B. Spanning Tree Protocol (STP)
  - C. Ether channels
  - D. Trunks

- 178.** Which is a consequence of not using loop avoidance with layer 2 switching?
- A. Duplicate unicast frames
  - B. Broadcast storms
  - C. MAC address thrashing
  - D. All of the above
- 179.** Which switching method checks the CRC checksum as the frame is received by the switch?
- A. Cut-through mode
  - B. Frag-free mode
  - C. Store-and-forward mode
  - D. Fast switching
- 180.** Which switch mode operation reads only the first 64 bytes before making a switching decision?
- A. Cut-through mode
  - B. Fragment-free mode
  - C. Store-and-forward mode
  - D. Fast switching
- 181.** A user is complaining of extremely long logon times. Using the following figure, what can you conclude?

```
Switch#sh interfaces fastEthernet 0/1
FastEthernet0/1 is up, line protocol is up (connected)
Hardware is Lance, address is 000a.f36c.1501 (bia 000a.f36c.1501)
[output cut]
 956 packets input, 193351 bytes, 0 no buffer
Received 956 broadcasts, 0 runts, 0 giants, 0 throttles
 0 input errors, 0 CRC, 235 frame, 0 overrun, 0 ignored, 0 abort
 0 watchdog, 0 multicast, 0 pause input
 0 input packets with dribble condition detected
2357 packets output, 263570 bytes, 0 underruns
 0 output errors, 212 collisions, 10 interface resets
 0 babbles, 0 late collision, 0 deferred
 0 lost carrier, 0 no carrier
 0 output buffer failures, 0 output buffers swapped out
```

- A. The connection to the computer needs to be upgraded to 100 Mb/s.
  - B. The connection to the computer has wiring issues.
  - C. The NIC in the attached computer is going bad and needs replacement.
  - D. The interface or computer is running at half-duplex.
- 182.** How are MAC addresses learned and associated with the port?
- A. Destination MAC address learning
  - B. Source MAC address learning
  - C. Port listen/learning
  - D. Frame type learning

- 183.** In the following figure, what will happen if the computers on ports Fa0/1 (Computer A) and Fa0/4 (Computer B) are swapped?

Mac Address Table  
.....

Vlan	Mac Address	Type	Ports
1	0001.6c58.486e	STATIC	Fa0/1
1	0001.6c58.5606	DYNAMIC	Fa0/2
1	0001.6c58.486e	DYNAMIC	Fa0/3
1	0001.6c58.5406	DYNAMIC	Fa0/4

- A. Computer A's frames will only be forwarded to port Fa0/1.
  - B. Computer A's frames will be forwarded to ports Fa0/1 and Fa0/4.
  - C. Computer A's frames will only be forwarded to port Fa0/4.
  - D. Computer B's frames will be forwarded to all ports.
- 184.** In the following figure, what will happen if the computers on ports Fa0/2 (Computer A) and Fa0/3 (Computer B) are swapped?

Mac Address Table  
.....

Vlan	Mac Address	Type	Ports
1	0001.6c58.486e	STATIC	Fa0/1
1	0001.6c58.5606	DYNAMIC	Fa0/2
1	0001.6c58.486e	DYNAMIC	Fa0/3
1	0001.6c58.5406	DYNAMIC	Fa0/4

- A. Computer A's frames will only be forwarded to port Fa0/2.
  - B. Computer A's frames will be forwarded to port Fa0/2 and Fa0/3.
  - C. Computer A's frames will only be forwarded to port Fa0/3.
  - D. Computer B's frames will be forwarded to all ports.
- 185.** What is the default MAC address aging time for dynamic entries on most switches?
- A. 30 seconds
  - B. 60 seconds
  - C. 300 seconds
  - D. 500 seconds

- 186.** Refer to the following figure. Which statement is true about the computer with a MAC address of 0001.6c58.24ae?

Mac Address Table  
.....

Vlan	Mac Address	Type	Ports
1	0001.6c58.486e	STATIC	Fa0/1
1	0001.6c58.5606	DYNAMIC	Fa0/2
1	0001.6c58.486e	DYNAMIC	Fa0/3
1	0001.6c58.5406	DYNAMIC	Fa0/4
1	0001.6c58.2323	DYNAMIC	Gi0/1
1	0001.6c58.2325	DYNAMIC	Gi0/1
1	0001.6c58.24ae	DYNAMIC	Gi0/1

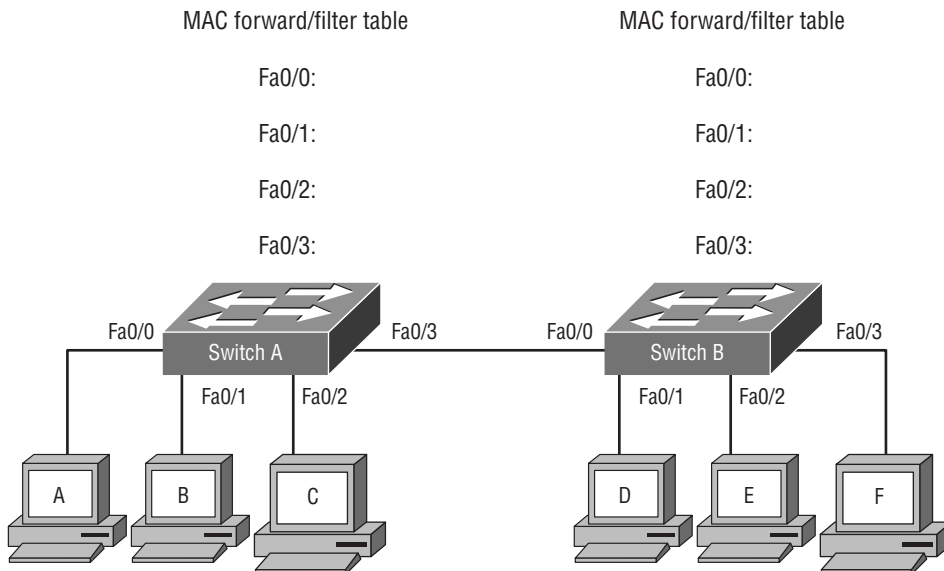
- A.** The computer is directly connected to Gi0/1.  
**B.** The computer is directly connected to Fa0/1.  
**C.** The computer is connected to another switch on Gi0/1.  
**D.** The MAC address table is thrashed due to a loop.
- 187.** What information is added to the MAC address table when a frame is received on an interface?
- A.** Destination MAC address of the frame and incoming port number  
**B.** Source MAC address of the frame and incoming port number  
**C.** Destination MAC address of the frame and outgoing port number  
**D.** Source MAC address of the frame and outgoing port number
- 188.** You need to change the default MAC address aging time on a switch to 400 seconds. Which command would you use?
- A.** `set mac aging 400`  
**B.** `mac aging-time 400 seconds`  
**C.** `mac-address-table aging-time 400`  
**D.** `mac address-aging 400`
- 189.** How do switches forward frames only to the destination computer?
- A.** Forward/filter decisions based on the MAC address table  
**B.** Forward/filter decisions based on the routing table  
**C.** Flooding ports for the destination MAC address  
**D.** Broadcasting for the MAC address

190. Referring to the following figure, what will happen when a frame destined for 0001.6c58.486f enters the switch?

Mac Address Table  
.....

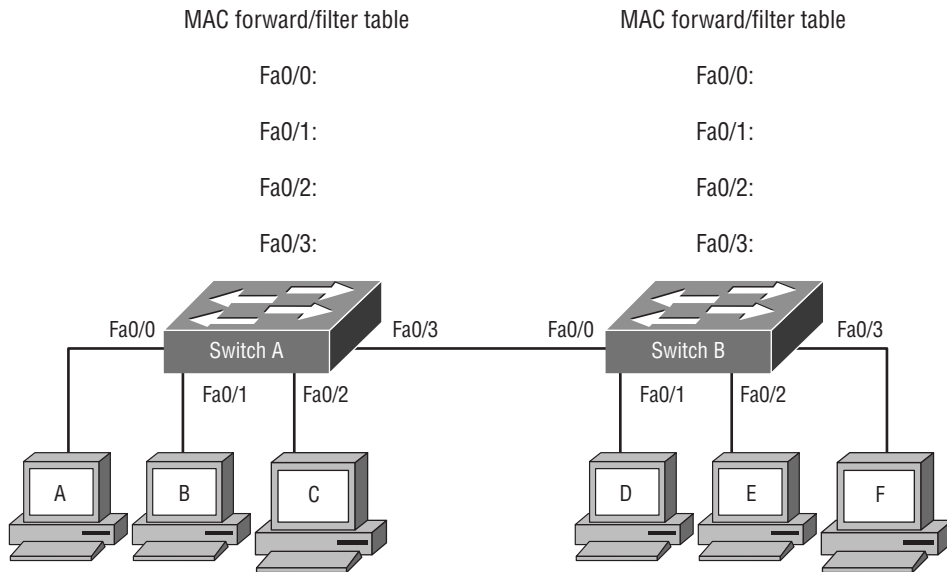
Vlan	Mac Address	Type	Ports
1	0001.6c58.486f	DYNAMIC	Fa0/1
1	0001.6c58.5606	DYNAMIC	Fa0/2
1	0001.6c58.486e	DYNAMIC	Fa0/3

- A. The frame will be forwarded to the uplink port.  
 B. The frame will be forwarded to all active ports except the one on which it was received.  
 C. The frame will be dropped.  
 D. The frame will be forwarded to a MAC address of ffff.ffff.ffff.
191. Given the information in the following figure, which statement is true when Computer A needs to communicate with Computer C?



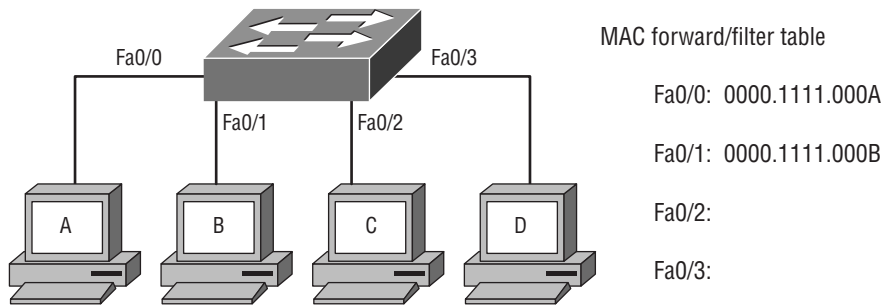
- A. Switch A and Switch B will flood the frame across all ports.  
 B. Only Switch A will flood the frame across all ports.  
 C. Only Switch B will flood the frame across all ports.  
 D. Switch A will forward traffic only to Computer C's port.

192. Given the information in the following figure, which statement is true when Computer A needs to communicate with Computer F?

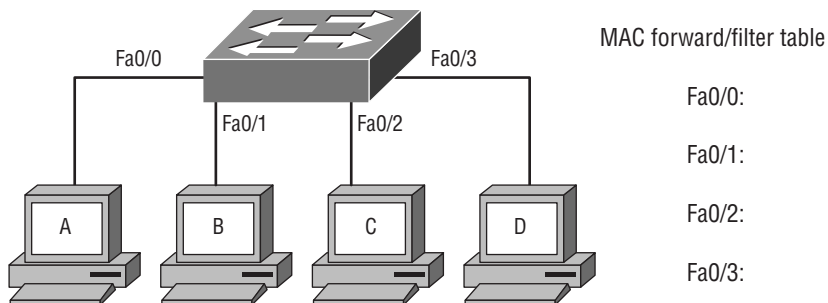


- A. Switch A and Switch B will flood the frame across all ports.
  - B. Only Switch A will flood the frame across all ports.
  - C. Only Switch B will flood the frame across all ports.
  - D. Switch A will flood the frame across all ports. Switch B will forward traffic only to Computer F's port.
193. Under which circumstance will a switch drop a frame?
- A. If the destination MAC address of the frame is unknown in the MAC address table
  - B. If the source MAC address of the frame is unknown in the MAC address table
  - C. If the frame is deemed to be corrupt via the CRC
  - D. If the destination MAC address exists in another switch's MAC address table
194. Which switch function reads the frame and uses the MAC address table to decide the egress interface for the frame?
- A. Forward/filter
  - B. Address learning
  - C. Loop avoidance
  - D. Frame flooding

195. In the following figure, what will happen first at the switch when Computer A wants to send Computer B a message?



- A. The switch will forward the frame to all ports on the switch.  
 B. The switch will direct communication to port Fa0/1.  
 C. The switch will record Computer A's MAC address on port Fa0/0.  
 D. The switch will record Computer B's MAC address on port Fa0/1.
196. In the following figure, what will happen first when Computer A wants to send Computer B a message?



- A. The switch will forward the frame to all ports on the switch.  
 B. The switch will direct communication to port Fa0/1.  
 C. The switch will record computer A's MAC address on port Fa0/0.  
 D. The switch will record computer B's MAC address on port Fa0/1.
197. Which statement is true of an ARP request entering into a switch?
- A. The source MAC address of the frame will be all fs.  
 B. The destination MAC address of the frame will be all fs.  
 C. The switch will only forward the ARP request to the port for the destination computer.  
 D. The switch will respond directly back with an ARP reply.

- 198.** Under what circumstance will a switch flood a frame to all ports on the switch?
- A.** When the source MAC address is unknown by the switch
  - B.** When the destination MAC address is a multicast address
  - C.** When the destination MAC address is unknown by the switch
  - D.** When the destination MAC address is 0000.0000.0000
- 199.** Where are MAC address tables stored?
- A.** Flash
  - B.** CPU registers
  - C.** RAM
  - D.** NVRAM
- 200.** Which command will allow you to see the MAC address table?
- A.** `show mac`
  - B.** `show mac address-table`
  - C.** `show cam table`
  - D.** `show mac table`
- 201.** Which command will display all connected ports on a switch and include descriptions?
- A.** `show ports`
  - B.** `show counters interfaces`
  - C.** `show interfaces counters`
  - D.** `show interfaces status`