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CCNA 3 (v5.0.3 + v6.0) Chapter 3 Answers Full

1. **Which spanning tree standard supports only one root bridge so that traffic from all VLANs flows over the same path?**
   - **802.1D***
   - PVST+
   - Rapid
   - PVST
   - MST

   MST is the Cisco implementation of MSTP, an IEEE standard protocol that provides up to 16 instances of RSTP. PVST+ provides a separate 802.1D spanning-tree instance for each VLAN that is configured in the network. 802.1D is the original STP standard defined by the IEEE and allows for only one root bridge for all VLANs. 802.1w, or RSTP, provides faster convergence but still uses only one STP instance for all VLANs.

2. **Which two types of spanning tree protocols can cause suboptimal traffic flows because they assume only one spanning-tree instance for the entire bridged network? (Choose two.)**
   - **STP***
   - MSTP
   - **RSTP***
   - PVST+
   - Rapid PVST+

   STP and RSTP assume only one IEEE 802.1D spanning-tree instance for the entire bridged network irrespective of the number of VLANs, This can result in suboptimal traffic flow issues. PVST+ provides a separate spanning-tree instance for each VLAN configured. Rapid PVST+ provides a separate instance of 802.1w per VLAN, and MSTP maps multiple VLANs that have the same traffic flow requirements into the same spanning-tree instance but allows for more than one instance for dissimilar traffic flows.

3. **In which two PVST+ port states are MAC addresses learned? (Choose two.)**
   - listeningblocking
   - **forwarding***
   - **learning***
   - disabled

   The two PVST+ port states during which MAC addresses are learned and populate the MAC address table are the learning and the forwarding states.

4. **Which two network design features require Spanning Tree Protocol (STP) to ensure correct network operation? (Choose two.)**
   - **redundant links between Layer 2 switches***
   - link-state dynamic routing that provides redundant routes

- implementing VLANs to contain broadcasts
- static default routes
- **removing single points of failure with multiple Layer 2 switches***

Spanning Tree Protocol (STP) is required to ensure correct network operation when designing a network with multiple interconnected Layer 2 switches or using redundant links to eliminate single points of failure between Layer 2 switches. Routing is a Layer 3 function and does not relate to STP. VLANs do reduce the number of broadcast domains but relate to Layer 3 subnets, not STP.

5. **Which STP priority configuration would ensure that a switch would always be the root switch?**
   - spanning-tree vlan 10 root primary
   - **spanning-tree vlan 10 priority 0***
   - spanning-tree vlan 10 priority 4096
   - spanning-tree vlan 10 priority 61440

   Although the spanning-tree vlan 10 root primary command will ensure a switch will have a bridge priority value lower than other bridges introduced to the network, the spanning-tree vlan 10 priority 0 command ensures the bridge priority takes precedence over all other priorities.

6. **Fill in the blank. Do not use abbreviations.**
   The spanning-tree _____ global configuration command is used to enable Rapid PVST+.
   Correct Answer: mode rapid-pvst
7. **What port type is used to interconnect switches in a switch stack?**
   - designated
   - **StackWise***
   - root
   - edge

   Switches configured to operate in a switch stack are connected together through StackWise ports.

8. **What is the purpose of the Spanning Tree Protocol (STP)?**
   - **prevents Layer 2 loops***
   - prevents routing loops on a router
   - creates smaller broadcast domains
   - allows Cisco devices to exchange routing table updates
   - creates smaller collision domains

   The Spanning-Tree Protocol (STP) creates one path through a switch network in order to prevent Layer 2 loops.

9. **What additional information is contained in the 12-bit extended system ID of a BPDU?**
   - MAC address
   - port ID
   - **VLAN ID***
   - IP address

   The BPDU has three fields; the bridge priority, the extended system ID, and the MAC address. The extended system ID contains 12 bits that identify the VLAN ID.

10. **Refer to the exhibit. Which trunk link will not forward any traffic after the root bridge election process is complete?**
    - Trunk1
    - **Trunk2***
    - Trunk3
    - Trunk4

    S4 has the lowest bridge ID, thus S4 is the root bridge. Because the path cost S1-S2-S4 is lower than the path cost S1-S3-S4, path S1-S2-S4 is the preferred path for S1 to reach S4. Thus, STP will set the S1 port Fa0/1 to a blocking state, and the trunk link Trunk2 will not forward any traffic.

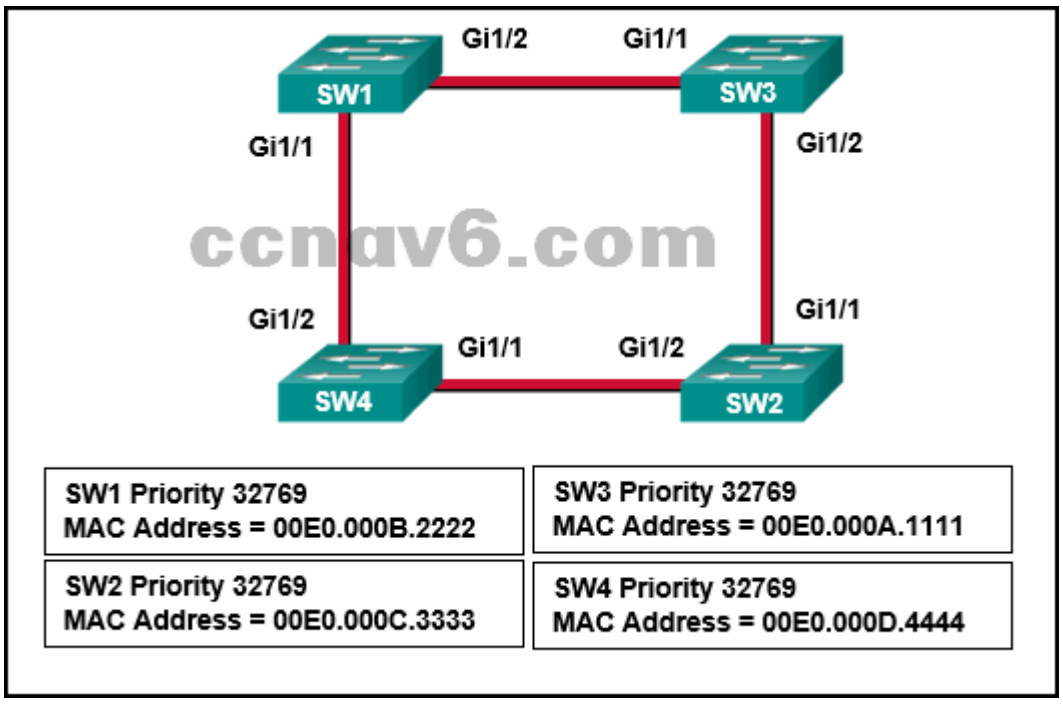
11. **Which protocol provides up to 16 instances of RSTP, combines many VLANs with the same physical and logical topology into a common RSTP instance, and provides support for PortFast, BPDU guard, BPDU filter, root guard, and loop guard?**
    - STP
    - PVST+
    - **MST***
    - Rapid PVST+

    MST is the Cisco implementation of MSTP, an IEEE standard protocol that provides up to 16 instances of RSTP and combines many VLANs with the same physical and logical topology into a common RSTP instance. Each instance supports PortFast, BPDU guard, BPDU filter, root guard, and loop guard. STP and RSTP assume only one spanning-tree instance for the entire bridged network, regardless of the number of VLANs. PVST+ provides a separate 802.1D spanning-tree instance for each VLAN that is configured in the network.

12. **Which port state will switch ports immediately transition to when configured for PortFast?**
    - learning
    - **forwarding***
    - blocking
    - listening

    PortFast allows a switch port to bypass the listening and learning states and transition immediately to the forwarding state.

13. **Refer to the exhibit. Which switch will be elected the root bridge and which switch will place a port in blocking mode? (Choose two.)**



- SW1 will become the root bridge.
- SW2 will get a port blocked.
- SW4 will become the root bridge.
- SW2 will become the root bridge.
- **SW3 will become the root bridge.***
- **SW4 will get a port blocked.***

The spanning-tree root bridge election process determines which switch becomes root bridge based first on the lowest priority number and then by lowest MAC address. Because all of the switches have the same priority value, SW3 becomes the root bridge based on lowest MAC address. To determine which ports are blocking or forwarding, first determine which ports become the root port on each switch. Then determine which port becomes the designated port for each link.

14. **What is an advantage of PVST+?**
    - PVST+ optimizes performance on the network through autoselection of the root bridge.
    - PVST+ reduces bandwidth consumption compared to traditional implementations of STP that use CST.
    - PVST+ requires fewer CPU cycles for all the switches in the network.
    - **PVST+ optimizes performance on the network through load sharing.***

    PVST+ results in optimum load balancing. However, this is accomplished by manually configuring switches to be elected as root bridges for different VLANs on the network. The root bridges are not automatically selected. Furthermore, having spanning-tree instances for each VLAN actually consumes more bandwidth and it increases the CPU cycles for all the switches in the network.

15. **To obtain an overview of the spanning tree status of a switched network, a network engineer issues the show spanning-tree command on a switch. Which two items of information will this command display? (Choose two.)**

- **The role of the ports in all VLANs.***
- **The root bridge BID.***
- The number of broadcasts received on each root port.
- The IP address of the management VLAN interface.
- The status of native VLAN ports.

The show spanning-tree command will display the status of STP for all VLANs that are defined on a switch and other information including the root bridge BID. It does not show the number of broadcast packets received on the ports. The IP address of the management VLAN interface is not related to STP and is displayed by the show running-configuration command.

16. **A network administrator is preparing the implementation of Rapid PVST+ on a production network. How are the Rapid PVST+ link types determined on the switch interfaces?**
    - Link types can only be determined if PortFast has been configured.
    - **Link types are determined automatically.***
    - Link types must be configured with specific port configuration commands.
    - Link types can only be configured on access ports configured with a single VLAN.

    When Rapid PVST+ is being implemented, link types are automatically determined but can be specified manually. Link types can be either point-to-point, shared, or edge.

17. **If no bridge priority is configured in PVST, which criteria is considered when electing the root bridge?**
    - highest MAC address
    - **lowest MAC address***
    - lowest IP address
    - highest IP address

    Only one switch can be the root bridge for a VLAN. The root bridge is the switch with the lowest BID. The BID is determined by priority and the MAC address. If no priority is configured then all switches use the default priority and the election of the root bridge will be based on the lowest MAC address.

18. **What is the outcome of a Layer 2 broadcast storm?**
    - ARP broadcast requests are returned to the transmitting host.
    - CSMA/CD will cause each host to continue transmitting frames.
    - **New traffic is discarded by the switch because it is unable to be processed.***
    - Routers will take over the forwarding of frames as switches become congested.

    When the network is saturated with broadcast traffic that is looping between switches, new traffic is discarded by each switch because it is unable to be processed.

19. **Open the PT Activity. Perform the tasks in the activity instructions and then answer the question. Which switch is the root bridge?**
    - **Switch_4**
    - Switch_1
    - Switch_3
    - Switch_2

    Click on each PC.
    Use the Terminal application.

Issue the command show spanning-tree.
The switch that is the root bridge will be stated in the root bridge MAC address field.

20. **In which two port states does a switch learn MAC addresses and process BPDUs in a PVST network? (Choose two.)**
    - disabledblocking
    - listening
    - **forwarding***
    - **learning***

    Switches learn MAC addresses at the learning and forwarding port states. They receive and process BPDUs at the blocking, listening, learning, and forwarding port states.

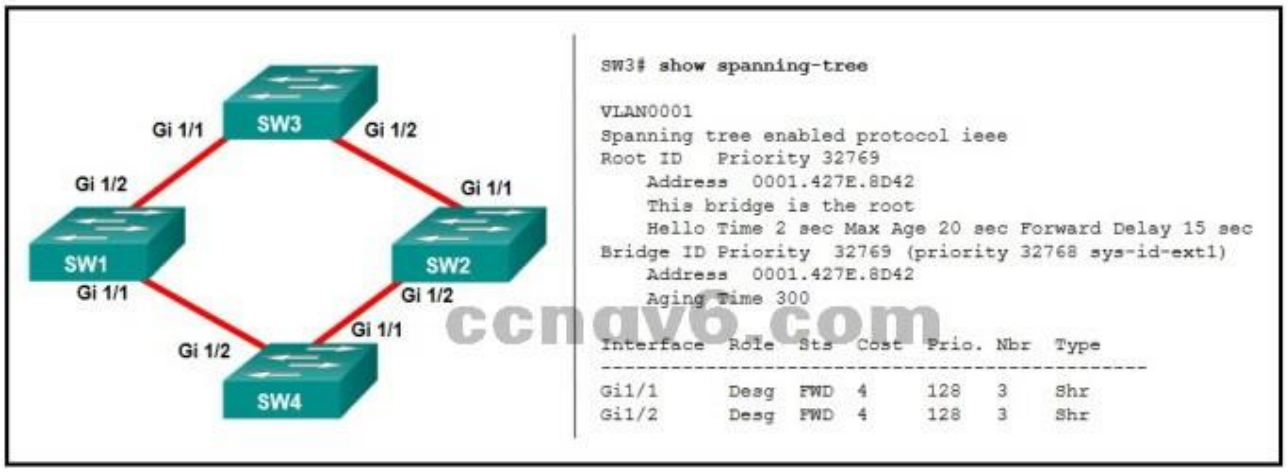
21. **Which Cisco switch feature ensures that configured switch edge ports do not cause Layer 2 loops if a port is mistakenly connected to another switch?**
    - PortFast
    - extended system ID
    - **BPDU guard***
    - PVST+

    If switch access ports are configured as edge ports using PortFast, BPDUs should never be received on those ports. Cisco switches support a feature called BPDU guard. When it is enabled, BPDU guard will put an edge port in an error-disabled state if a BPDU is received by the port. This will prevent a Layer 2 loop occurring. PVST+ is an implementation of the Spanning Tree Protocol. The extended system ID is a mechanism of including VLAN ID information in the bridge ID (BID) for each VLAN.

22. **What is a characteristic of a Layer 2 loop?**
    - **Broadcast frames are forwarded back to the sending switch.***
    - The Time-to-Live attribute of a frame is set to infinity.
    - Routers continually forward packets to other routers.
    - A switch is continually forwarding the same unicast frame.

    A Layer 2 loop occurs when broadcast frames are forwarded back to the sending switch via a backup link. Layer 2 frames do not have a Time-to-Live (TTL) attribute. Routers forward packets at Layer 3 (the network layer) not Layer 2.

23. **Refer to the exhibit. What is the role of the SW3 switch?**



- designated switch
- **root bridge***
- enabled bridge
- local bridge
- edge switch

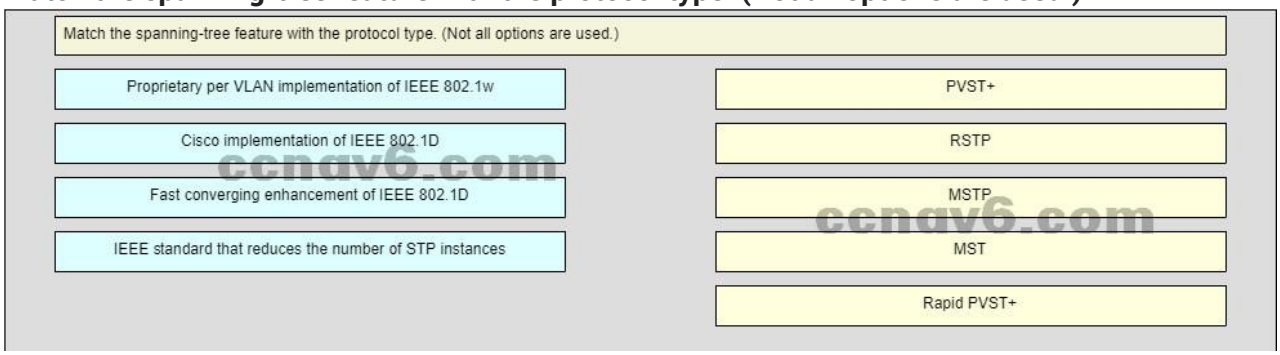
Switch SW3 is the STP root as can be seen in the show spanning-tree command output.

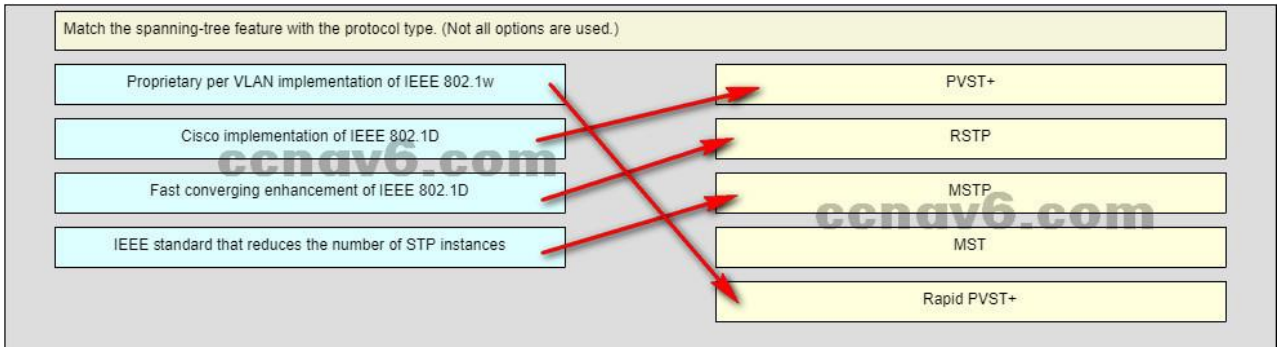
24. **Which three components are combined to form a bridge ID?**
- **MAC address***
- **extended system ID***
- IP address
- cost
- **bridge priority***
- port ID

The three components that are combined to form a bridge ID are bridge priority, extended system ID, and MAC address.

25. **Which RSTP ports are connected to end devices?**
- **edge ports***
- designated port
- strunk ports
- root ports

26. **Match the spanning-tree feature with the protocol type. (Not all options are used.)**





MST is the Cisco implementation of MSTP (IEEE 802.1s).

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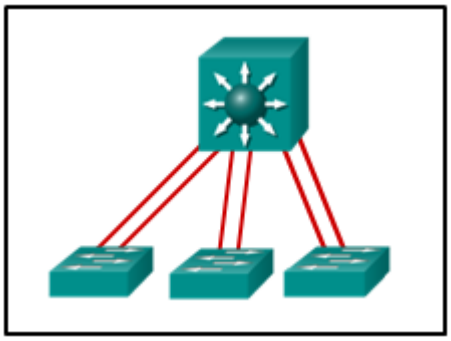
27. **Refer to the exhibit. Which switching technology would allow each access layer switch link to be aggregated to provide more bandwidth between each Layer 2 switch and the Layer 3 switch?**



- HSRP
- PortFast
- trunking
- **EtherChannel***

28. **What is the most cost-effective method of solving interface congestion that is caused by a high level of traffic between two switches?**
- increase uplink speed
- add more VLANs to reduce broadcast domains
- **aggregate ports by using EtherChannel***
- insert a router between the switches

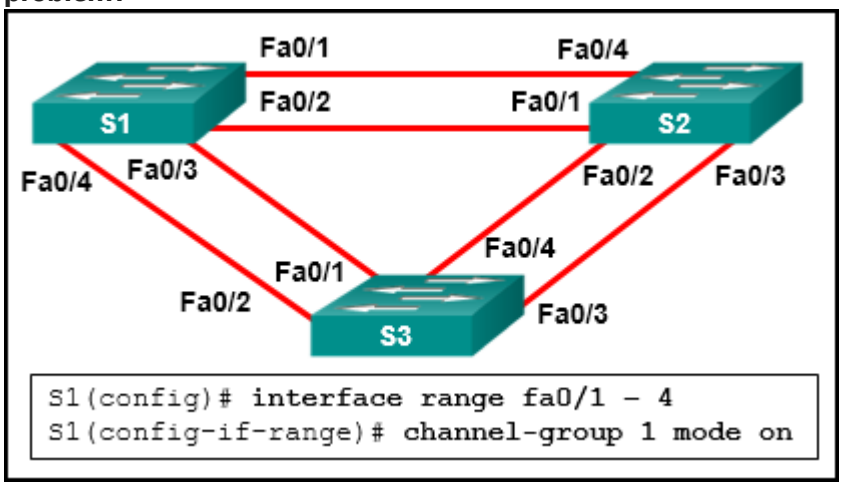
29. **Which two load balancing methods can be implemented with EtherChannel technology? (Choose two.)**
- destination MAC to destination IP
- destination IP to destination MAC
- **source MAC to destination MAC ***
- **source IP to destination IP***
- destination MAC to source MAC
- destination IP to source IP

30. **Which statement describes an EtherChannel implementation?**
- EtherChannel operates only at Layer 2.
- PAgP cannot be used in conjunction with EtherChannel.
- **A trunked port can be part of an EtherChannel bundle. ***
- EtherChannel can support up to a maximum of ten separate links.

31. **What is an advantage of using LACP?**
- increases redundancy to Layer 3 devices
- decreases the chance of a spanning-tree loop
- **allows automatic formation of EtherChannel links***
- provides a simulated environment for testing link aggregation
- decreases the amount of configuration that is needed on a switch for EtherChannel

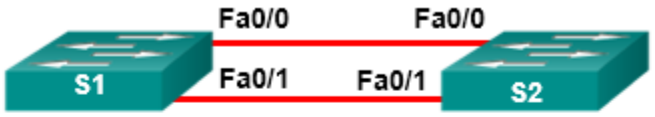
32. **Which statement is true regarding the use of PAgP to create EtherChannels?**
- It requires full duplex.
- **It is Cisco proprietary.***
- It requires more physical links than LACP does.
- It increases the number of ports that are participating in spanning tree.
- It mandates that an even number of ports (2, 4, 6, etc.) be used for aggregation.

33. **Which two protocols are link aggregation protocols? (Choose two.)**
    - **802.3ad***
    - **PAgP***
    - STP
    - EtherChannel
    - RSTP
34. **Which PAgP mode combination will establish an EtherChannel?**
    - switch 1 set to on; switch 2 set to desirable.
    - **switch 1 set to desirable; switch 2 set to desirable.***
    - switch 1 set to auto; switch 2 set to auto.
    - switch 1 set to auto; switch 2 set to on.
35. **Refer to the exhibit. The administrator tried to create an EtherChannel between S1 and the other two switches via the commands that are shown, but was unsuccessful. What is the problem?**



    - Traffic can only be sent to two different switches if EtherChannel is implemented on Gigabit Ethernet interfaces.
    - Traffic can only be sent to two different switches if EtherChannel is implemented on Layer 3 switches.
    - **Traffic cannot be sent to two different switches through the same EtherChannel link.***
    - Traffic cannot be sent to two different switches, but only to two different devices like an EtherChannel-enabled server and a switch.
36. **When a range of ports is being configured for EtherChannel, which mode will configure LACP so that it initiates the EtherChannel negotiation?**
    - **active***
    - auto
    - desirable
    - passive
37. **When a range of ports is being configured for EtherChannel by the use of PAgP, which mode will form the bundled channel only if the port receives PAgP packets from another device?**
    - active
    - **auto***
    - desirable
    - passive

38. **As the network administrator you have been asked to implement EtherChannel on the corporate network. What does this configuration consist of?**
    - providing redundant links that dynamically block or forward traffic
    - **grouping multiple physical ports to increase bandwidth between two switches***
    - grouping two devices to share a virtual IP address
    - providing redundant devices to allow traffic to flow in the event of device failure
39. **Refer to the exhibit. An EtherChannel was configured between switches S1 and S2, but the interfaces do not form an EtherChannel. What is the problem?**



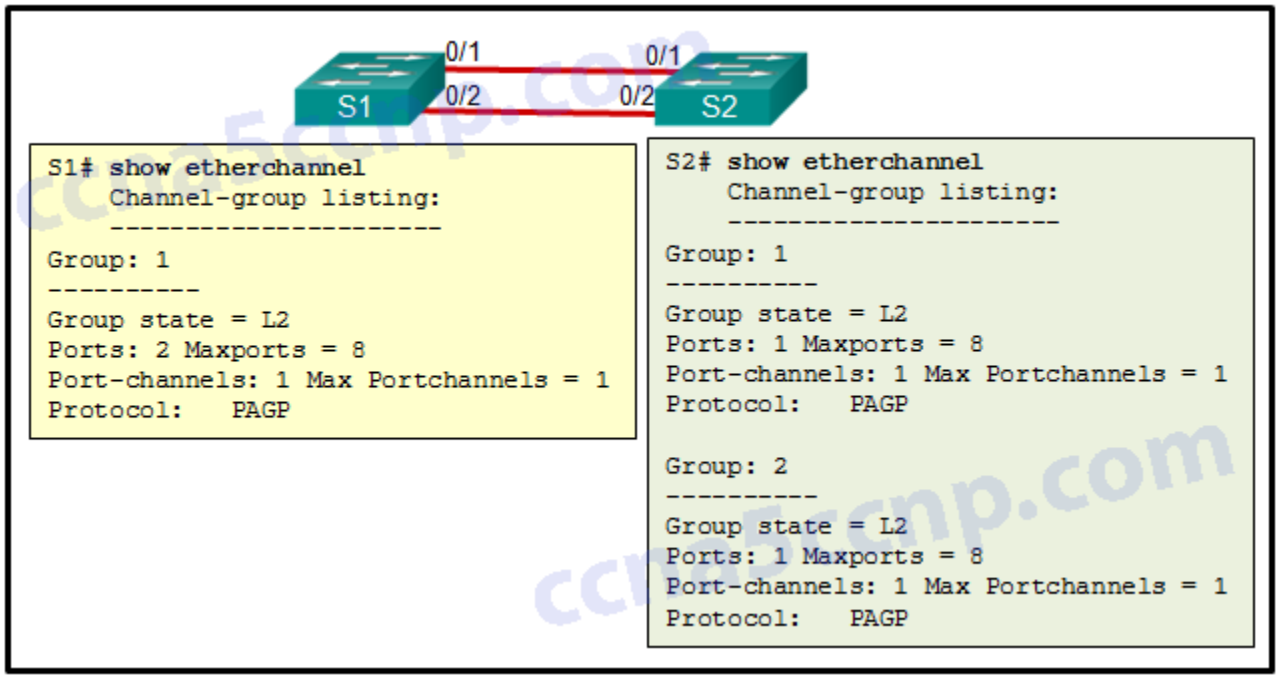

```
S1(config)# interface range FastEthernet0/0 - 1
S1(config-if-range)# channel-group 1 mode active
S1(config-if-range)# interface port-channel 1
S1(config-if)# switchport mode trunk
S1(config-if)# switchport trunk allowed vlan 1-5,10
```

```
S2(config)# interface range FastEthernet0/0 - 1
S2(config-if-range)# channel-group 1 mode active
S2(config-if-range)# interface port-channel 1
S2(config-if)# switchport mode trunk
S2(config-if)# switchport trunk allowed vlan 1,5,10
```

    - The interface port-channel number has to be different on each switch.
    - The switch ports were not configured with speed and duplex mode.
    - The switch ports have to be configured as access ports with each port having a VLAN assigned.
    - **The EtherChannel was not configured with the same allowed range of VLANs on each interface.***
40. **Which command will initiate EtherChannel interface configuration mode?**
    - channel-group group-identifier
    - **interface port-channel interface-identifier***
    - interface interface-identifier
    - interface range interface-identifier
41. **What is a best practice to use before beginning an EtherChannel implementation?**
    - Assign affected interfaces to VLAN 1.
    - Assign affected interfaces to the management VLAN.
    - **Shut down each of the affected interfaces.***
    - Enable each of the affected interfaces.
    - Assign affected interfaces to an unused VLAN.
42. **Which three options must match in order to establish an EtherChannel between two directly connected switches? (Choose three.)**
    - port numbers that are used for the EtherChannel
    - **VLAN memberships of the interfaces that are used for EtherChannel***
    - domain names on the switches
    - **speed of the interfaces that are used for EtherChannel ***
    - **duplex settings of the interfaces that are used for EtherChannel ***
    - port security settings on the interfaces that used for EtherChannel

43. **An EtherChannel link using LACP was formed between two switches, S1 and S2. While verifying the configuration, which mode combination could be utilized on both switches?**
    - S1-on and S2-passive
    - S1-passive and S2-passive
    - S1-on and S2-active
    - **S1-passive and S2-active***
44. **Refer to the exhibit. A network administrator has decided that an EtherChannel between ports 0/1 and 0/2 on switches S1 and S2 would help performance. After making the configuration, the administrator notices no performance gain. Based on the output that is shown, what two possible assumptions could a network administrator make? (Choose two.)**
    - The EtherChannel bundle is working.
    - **The EtherChannel bundle is not working. ***
    - **One of the ports on S2 was not configured correctly.***
    - Switch S2 did not use a compatible EtherChannel mode.
    - LACP and PAgP were both used to form the EtherChannel.
    - Switch S2 must be configured so that the maximum number of port channels is increased.
45. **The trunk link between two 2960 switches has reached its capacity. How can this be addressed in the most economical way?**
    - Increase the speed of the ports.
    - Decrease the size of the inter-switch collision domain by configuring additional VLANs.
    - **Combine physical ports into a high-speed logical link by configuring EtherChannel.***
    - Create additional broadcast domains by inserting a router between the switches.
46. **Which statement describes a characteristic of EtherChannel?**
    - It can combine up to a maximum of 4 physical links.
    - It can bundle mixed types of 100 Mb/s and 1Gb/s Ethernet links.
    - It consists of multiple parallel links between a switch and a router.
    - **It is made by combining multiple physical links that are seen as one link between two switches. ***
47. **What are two advantages of using LACP? (Choose two.)**
    - increases redundancy to Layer 3 devices
    - eliminates the need for the spanning-tree protocol
    - **allows automatic formation of EtherChannel links***
    - provides a simulated environment for testing link aggregation
    - decreases the amount of configuration that is needed on a switch for EtherChannel
    - **allows use of multivendor devices***
48. **Which three settings must match in order for switch ports to form an EtherChannel? (Choose three.)**
    - The switch port numbers that will be combined to form the EtherChannel must match.
    - **Non-trunk ports must belong to the same VLAN.***
    - The SNMP community strings must be configured the same.
    - **The interfaces must be configured to the same speed. ***
    - **The duplex settings of the switch ports on both sides of the physical link must match.***
    - Port security settings on the connected physical interfaces must be configured to the same violation mode.

49. **A network administrator is configuring an EtherChannel link between switches SW1 and SW2 by using the command SW1(config-if-range)# channel-group 1 mode passive. Which command must be used on SW2 to enable this EtherChannel?**
    - SW2(config-if-range)# channel-group 1 mode auto
    - **SW2(config-if-range)# channel-group 1 mode active***
    - SW2(config-if-range)# channel-group 1 mode passive
    - SW2(config-if-range)# channel-group 1 mode desirable
50. **Refer to the exhibit. A network administrator has decided that an EtherChannel between ports 0/1 and 0/2 on switches S1 and S2 would help performance. After making the configuration, the administrator notices no performance gain. Based on the output that is shown, what two assumptions can the network administrator make? (Choose two.)**



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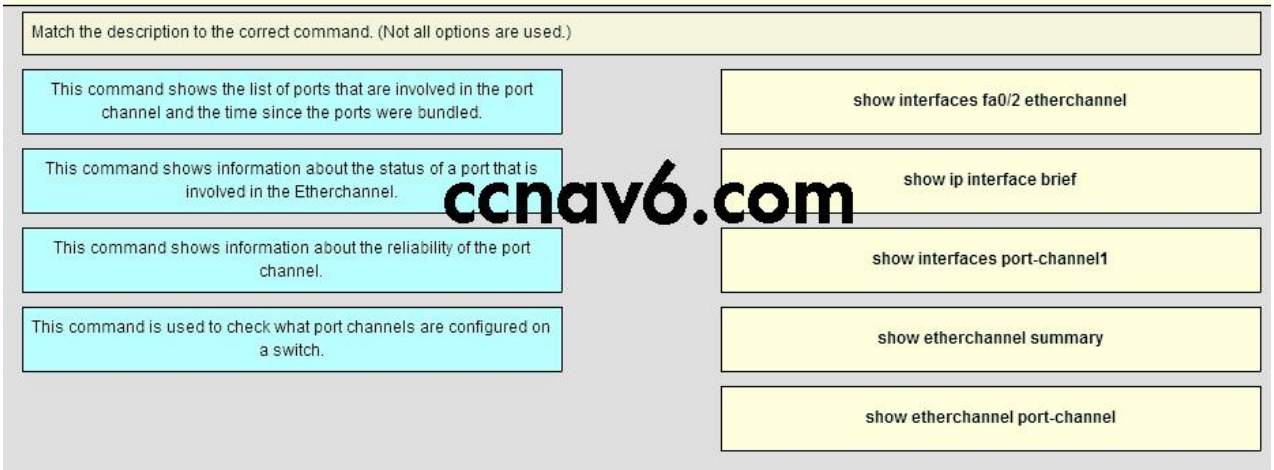
- The EtherChannel bundle is working.
- **The EtherChannel bundle is not working. ***
- **One of the ports on S2 was not configured correctly.***
- Switch S2 did not use a compatible EtherChannel mode.
- LACP and PAgP were both used to form the EtherChannel.
- Switch S2 must be configured so that the maximum number of port channels is increased.

51. **Refer to the exhibit. A network administrator issued the show etherchannel summary command on the switch S1. What conclusion can be drawn?**

```
S1# show etherchannel summary
Flags:  D - down        P - in port-channel
        I - stand-alone s - suspended
        H - Hot-standby (LACP only)
        R - Layer3      S - Layer2
        U - in use      f - failed to allocate aggregator
        u - unsuitable for bundling
        w - waiting to be aggregated
        d - default port

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

Group  Port-channel  Protocol    Ports
------+-------------+-----------+-----------------------------------

1      Po1(SD)           PAgP    Fa0/1(I)  Fa0/2(I)  Fa0/3(I)
```


- The EtherChannel is suspended.
- **The EtherChannel is not functional.***
- The port aggregation protocol PAgP is misconfigured.
- FastEthernet ports Fa0/1, Fa0/2, and Fa0/3 do not join the EtherChannel.

52. **Match the description to the correct command. (Not all options are used.)**



Place the options in the following order:

This command shows information about the status of the port involved in the Etherchannel. -> show interfaces fa0/2 etherchannel

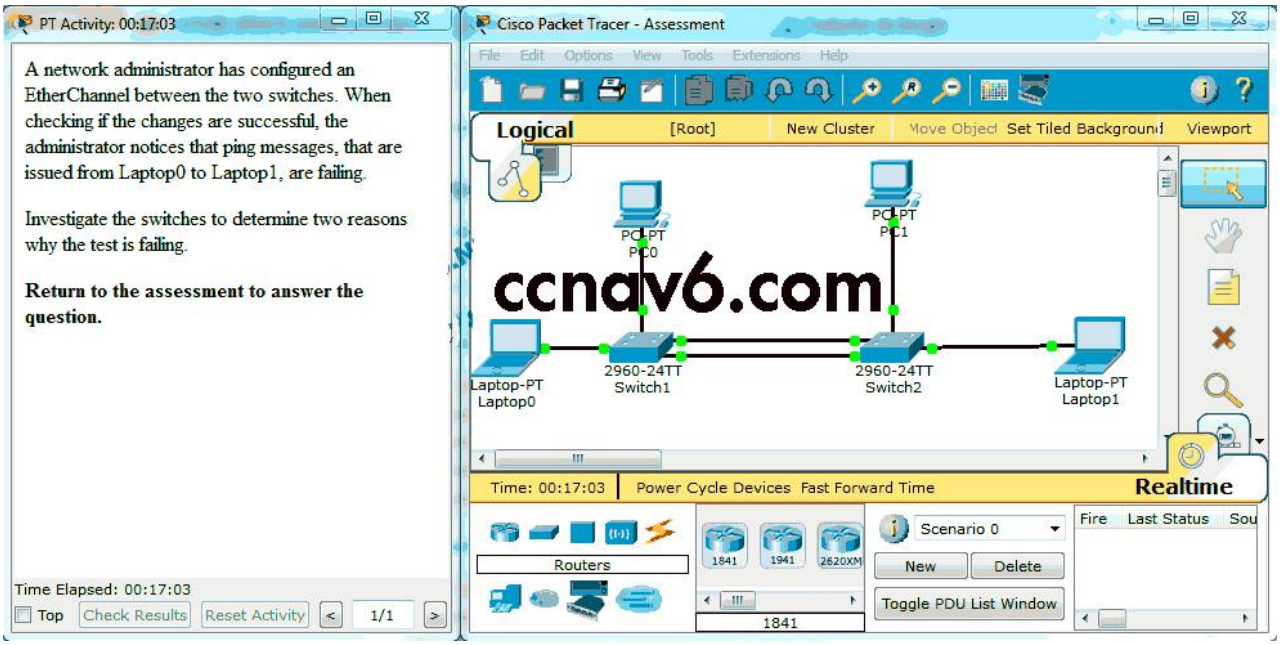
– not scored –

This command shows information about the reliability of the port-channel. -> show interfaces port-channel1

This command is used to check what port channels are configured on a switch. -> show etherchannel summary

This command shows the list of ports involved in the port channel and the time since the ports were bundled. -> show etherchannel port-channel

53. **Launch PT Hide and Save PT**



Open the PT Activity. Perform the tasks in the activity instructions and then answer the question. What are two reasons why the ping messages that are issued from Laptop0 towards Laptop1 are failing? (Choose two.)

- The wrong cable types are connecting the two switches.
- The channel group mode is not set correctly on the switches.
- The interface VLAN 1 is shut down on both switches.
- **The channel group should be configured as a trunk on each switch.***
- **The two interfaces on each of the switches belong to different VLANs.***