



**Vendor:** Cisco

**Exam Code:** 200-105

**Exam Name:** ICND2 - Interconnecting Cisco Networking  
Devices Part 2

**Version:** DEMO

### QUESTION 1

Refer to the exhibit. Why has this switch not been elected the root bridge for VLAN1?

```
Switch# show spanning-tree vlan 1
VLAN0001
  Spanning tree enabled protocol rstp
    Root ID    Priority    20481
              Address      0008.217a.5800
              Cost        38
              Port        1 (FastEthernet0/1)
              Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec

    Bridge ID   Priority    32769 (priority 32768 sys-id-ext 1)
              Address      0008.205e.6600
              Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time   300
```

Interface	Role	Sts	Cost	Prio.Nbr	Type
Fa0/1	Root	FWD	19	128.1	P2p
Fa0/4	Desg	FWD	38	128.1	P2p
Fa0/11	Altn	BLK	57	128.1	P2p
Fa0/13	Desg	FWD	38	128.1	P2p

- A. It has more than one interface that is connected to the root network segment.
- B. It is running RSTP while the elected root bridge is running 802.1d spanning tree.
- C. It has a higher MAC address than the elected root bridge.
- D. It has a higher bridge ID than the elected root bridge.

**Answer: D**

**Explanation:**

[http://www.cisco.com/en/US/tech/tk389/tk621/technologies\\_tech\\_note09186a008009482f.s.html](http://www.cisco.com/en/US/tech/tk389/tk621/technologies_tech_note09186a008009482f.s.html)  
When a switch receives a BPDU, it first compares priority, the lower number wins. If a tie, compare MAC, the smaller one wins. Here Switch has 32769 priority which is greater than 20481 so switch will not elect for root bridge. It says the bridge priority for Switch is 32769, and the root priority is 20481. Which means that some other switch has the lower priority and won the election for VLAN 1.

### QUESTION 2

Which two of these statements regarding RSTP are correct? (Choose two.)

- A. RSTP cannot operate with PVST+.
- B. RSTP defines new port roles.
- C. RSTP defines no new port states.
- D. RSTP is a proprietary implementation of IEEE 802.1D STP.
- E. RSTP is compatible with the original IEEE 802.1D STP.

**Answer: BE**

**Explanation:**

[http://www.cisco.com/en/US/tech/tk389/tk621/technologies\\_white\\_paper09186a0080094cfa.shtml](http://www.cisco.com/en/US/tech/tk389/tk621/technologies_white_paper09186a0080094cfa.shtml)  
Port Roles

The role is now a variable assigned to a given port. The root port and designated port roles

remain, while the blocking port role is split into the backup and alternate port roles. The Spanning Tree Algorithm (STA) determines the role of a port based on Bridge Protocol Data Units (BPDUs). In order to simplify matters, the thing to remember about a BPDU is there is always a method to compare any two of them and decide whether one is more useful than the other. This is based on the value stored in the BPDU and occasionally on the port on which they are received. This considered, the information in this section explains practical approaches to port roles.

#### Compatibility with 802.1D

RSTP is able to interoperate with legacy STP protocols. However, it is important to note that the inherent fast convergence benefits of 802.1w are lost when it interacts with legacy bridges.

### QUESTION 3

#### Drag and Drop Question

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

Drag the Frame Relay acronym on the left to match its definition on the right. (Not all acronyms are used.)	
CIR	a router is this type of device
DCE	the most common type of virtual circuit
DTE	provides status messages between DTE and DCE devices
LMI	identifies the virtual connection between the DTE and the switch
PVC	
SVC	
DLCI	

#### Answer:

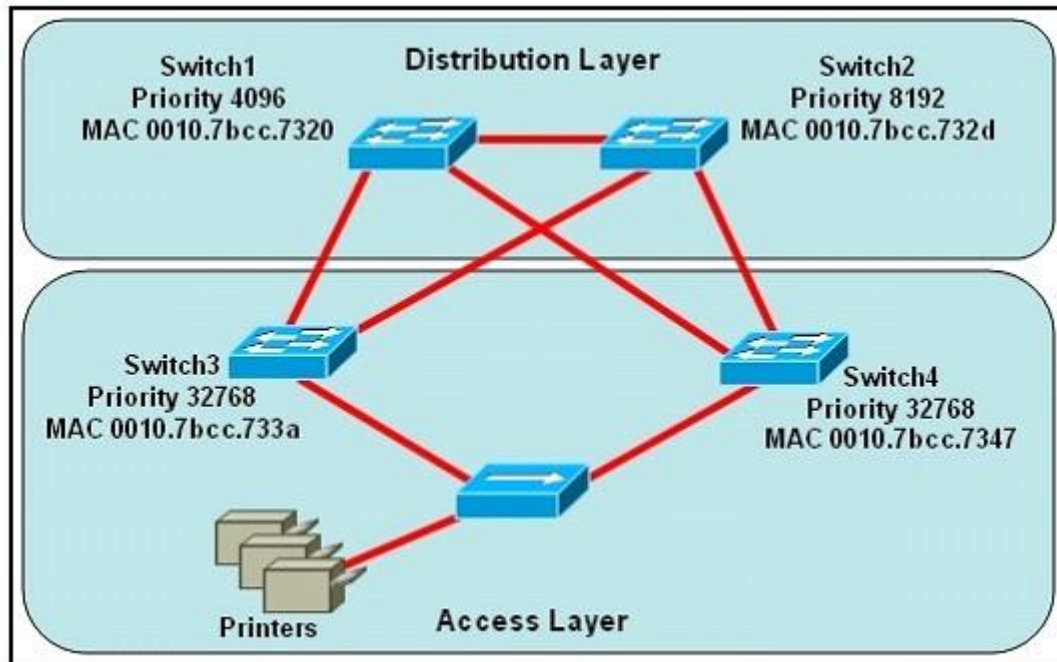
Drag the Frame Relay acronym on the left to match its definition on the right. (Not all acronyms are used.)	
CIR	DTE
DCE	PVC
DTE	LMI
LMI	DLCI
PVC	
SVC	
DLCI	

#### Explanation:

Enhanced Interior Gateway Routing Protocol (EIGRP) is a Cisco proprietary routing protocol, so it is vendor-specific. By default, EIGRP internal routes have an administrative distance value of 90. OSPF uses cost as its metric. By default, the cost of an interface is calculated based on bandwidth with the formula  $\text{cost} = \frac{100000000}{\text{bandwidth (in bps)}}$ . OSPF elects a DR on each broadcast and nonbroadcast multiaccess networks (like Ethernet and Frame Relay environments, respectively). It doesn't elect a DR on point-to-point link (like a serial WAN).

#### QUESTION 4

Refer to the exhibit. Which switch provides the spanning-tree designated port role for the network segment that services the printers?



- A. Switch1
- B. Switch2
- C. Switch3
- D. Switch4

**Answer: C**

#### Explanation:

First, the question asks what switch services the printers, so it can be Switch 3 or Switch 4 which is connected directly to the Printers.

Designated port is a port that is in the forwarding state. All ports of the root bridge are designated ports.

Switch 3 and Switch 4 has same priority so it will see on lowest MAC address and here switch 3 has lowest MAC address. So switch 3 segment will play a Designated port role. By comparing the MAC address of Switch 3 and Switch 4 we found that the MAC of Switch 3 is smaller. Therefore the interface connected to the Printers of Switch 3 will become designated interface and the interface of Switch 4 will be blocked.

#### QUESTION 5

Refer to the exhibit. Given the output shown from this Cisco Catalyst 2950, what is the reasons that interface FastEthernet 0/10 is not the root port for VLAN 2?

```
Switch# show spanning-tree interface fastethernet0/10
Vlan          Role Sts Cost      Prio.Nbr Type
-----
VLAN0001      Root FWD 19        128.1   P2p
VLAN0002      Altn BLK 19        128.2   P2p
VLAN0003      Root FWD 19        128.2   P2p
```

- A. This switch has more than one interface connected to the root network segment in VLAN 2.
- B. This switch is running RSTP while the elected designated switch is running 802.1d Spanning Tree.
- C. This switch interface has a higher path cost to the root bridge than another in the topology.
- D. This switch has a lower bridge ID for VLAN 2 than the elected designated switch.

**Answer: C**

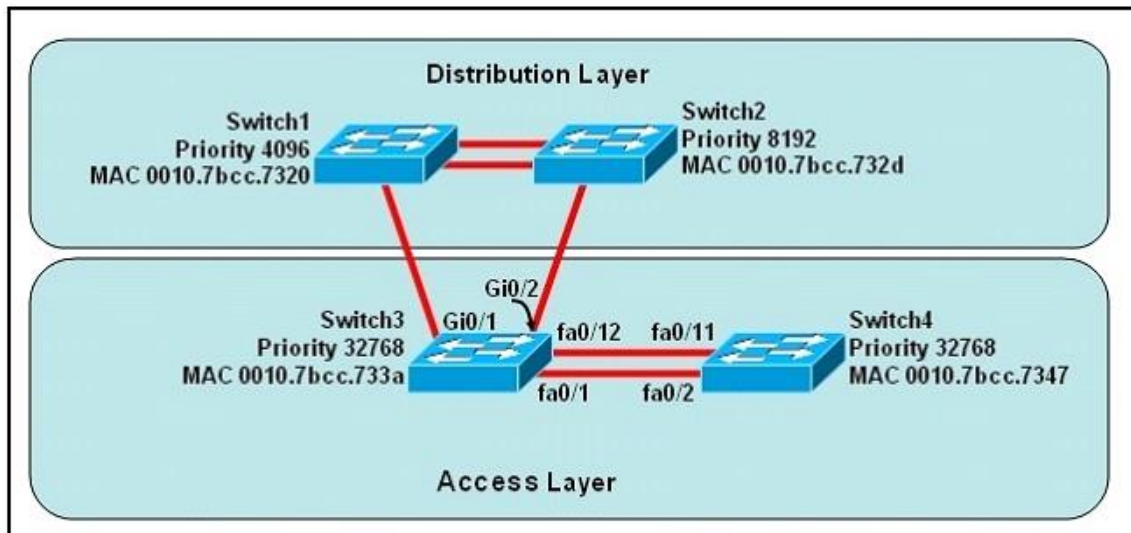
**Explanation:**

These four parameters are examined in order to make root bridge , root port , designated port. Other switch has lowest Sending Bridge ID or Sending Port ID so vlan 2 is not the root port.

1. A lower Root Bridge ID
2. A lower path cost to the Root
3. A lower Sending Bridge ID
4. A lower Sending Port ID

#### QUESTION 6

Refer to the exhibit. At the end of an RSTP election process, which access layer switch port will assume the discarding role?



- A. Switch3, port fa0/1
- B. Switch3, port fa0/12
- C. Switch4, port fa0/11
- D. Switch4, port fa0/2

- E. Switch3, port Gi0/1
- F. Switch3, port Gi0/2

**Answer: C**

**Explanation:**

In this question, we only care about the Access Layer switches (Switch3 & 4). Switch 3 has a lower bridge ID than Switch 4 (because the MAC of Switch3 is smaller than that of Switch4) so both ports of Switch3 will be in forwarding state. The alternative port will surely belong to Switch4. Switch4 will need to block one of its ports to avoid a bridging loop between the two switches.

But how does Switch4 select its blocked port?

Well, the answer is based on the BPDUs it receives from Switch3.

A BPDU is superior than another if it has:

1. A lower Root Bridge ID
2. A lower path cost to the Root
3. A lower Sending Bridge ID
4. A lower Sending Port ID

These four parameters are examined in order. In this specific case, all the BPDUs sent by Switch3 have the same Root Bridge ID, the same path cost to the Root and the same Sending Bridge ID. The only parameter left to select the best one is the Sending Port ID (Port ID = port priority + port index). In this case the port priorities are equal because they use the default value, so Switch4 will compare port index values, which are unique to each port on the switch, and because Fa0/12 is inferior to Fa0/1, Switch4 will select the port connected with Fa0/1 (of Switch3) as its root port and block the other port -> Port fa0/11 of Switch4 will be blocked (discarding role)

**QUESTION 7**

Which port state is introduced by Rapid-PVST?

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

**Answer: C**

**Explanation:**

Spanning Tree from PVST+ to Rapid-PVST Migration Configuration Example

Reference 1:

[http://www.cisco.com/en/US/products/hw/switches/ps708/products\\_configuration\\_example09186a00807b0670.shtml](http://www.cisco.com/en/US/products/hw/switches/ps708/products_configuration_example09186a00807b0670.shtml)

Reference 2:

[http://www.cisco.com/en/US/tech/tk389/tk621/technologies\\_white\\_paper09186a0080094cfa.shtml](http://www.cisco.com/en/US/tech/tk389/tk621/technologies_white_paper09186a0080094cfa.shtml)

PVST+ is based on IEEE802.1D Spanning Tree Protocol (STP). But PVST+ has only 3 port states (discarding, learning and forwarding) while STP has 5 port states (blocking, listening, learning, forwarding and disabled). So discarding is a new port state in PVST+.



STP (802.1D) Port State	RSTP (802.1w) Port State	Is Port Included in Active Topology?	Is Port Learning MAC Addresses?
Disabled	Discarding	No	No
Blocking	Discarding	No	No
Listening	Discarding	Yes	No
Learning	Learning	Yes	Yes
Forwarding	Forwarding	Yes	Yes

#### Background Information

802.1D Spanning Tree Protocol (STP) has a drawback of slow convergence. Cisco Catalyst switches support three types of STPs, which are PVST+, rapid-PVST+ and MST.

PVST+ is based on IEEE802.1D standard and includes Cisco proprietary extensions such as BackboneFast, UplinkFast, and PortFast. Rapid-PVST+ is based on IEEE 802.1w standard and has a faster convergence than 802.1D. RSTP (IEEE 802.1w) natively includes most of the Cisco proprietary enhancements to the 802.1D Spanning Tree, such as BackboneFast and UplinkFast. Rapid-PVST+ has these unique features:

Uses Bridge Protocol Data Unit (BPDU) version 2 which is backward compatible with the 802.1D STP, which uses BPDU version 0.

All the switches generate BPDUs and send out on all the ports every 2 seconds, whereas in 802.1D STP only the root bridge sends the configuration BPDUs.

Port Roles--Root port, designated port, alternate port and backup port.

Port States--Discarding, Learning, and Forwarding.

Port Types--Edge Port (PortFast), Point-to-Point and Shared port.

Rapid-PVST uses RSTP to provide faster convergence. When any RSTP port receives legacy 802.1D BPDU, it falls back to legacy STP and the inherent fast convergence benefits of 802.1w are lost when it interacts with legacy bridges.

#### QUESTION 8

A network administrator is troubleshooting an EIGRP problem on a router and needs to confirm the IP addresses of the devices with which the router has established adjacency.

The retransmit interval and the queue counts for the adjacent routers also need to be checked. What command will display the required information?

- A. Router# show ip eigrp adjacency
- B. Router# show ip eigrp topology
- C. Router#show ip eigrp interfaces
- D. Router#show ip eigrp neighbors

**Answer: D**

**Explanation:**

Implementing EIGRP

<http://www.ciscopress.com/articles/article.asp?p=1171169&seqNum=3>

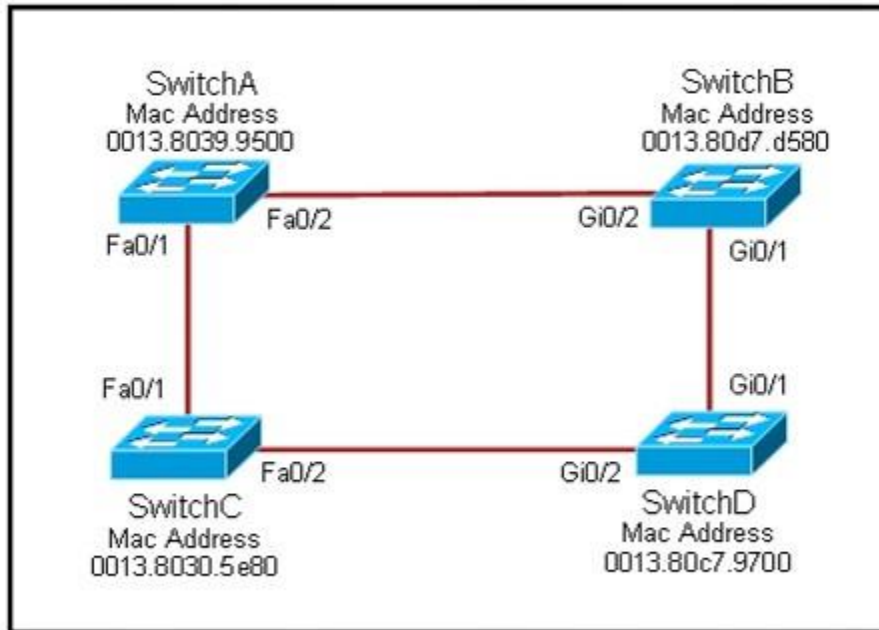
Below is an example of the show ip eigrp neighbors command. The retransmit interval (Smooth Round Trip Timer SRTT) and the queue counts (Q count, which shows the number of queued EIGRP packets) for the adjacent routers are listed:

```
R1#show ip eigrp neighbors
IP-EIGRP neighbors for process 1
H Address Interface Hold Uptime SRTT RTO Q Seq (sec) (ms) Cnt Num
0 10.10.10.2 Fa0/0 12 00:00:39 1282 5000 0 3
```

### QUESTION 9

Refer to the exhibit. Each of these four switches has been configured with a hostname, as well as being configured to run RSTP. No other configuration changes have been made.

Which three of these show the correct RSTP port roles for the indicated switches and interfaces? (Choose three.)



- A. SwitchA, Fa0/2, designated
- B. SwitchA, Fa0/1, root
- C. SwitchB, Gi0/2, root
- D. SwitchB, Gi0/1, designated
- E. SwitchC, Fa0/2, root
- F. SwitchD, Gi0/2, root

**Answer:** ABF

#### Explanation:

The question says "no other configuration changes have been made" so we can understand these switches have the same bridge priority. SwitchC has lowest MAC address so, it will become root bridge and 2 of its ports (Fa0/1 & Fa0/2) will be designated ports (DP). Because SwitchC is the root bridge the 2 ports nearest SwitchC on SwitchA (Fa0/1) and SwitchD (Gi0/2) will be root ports (RP) -> B and F are correct.

SwitchB must have a root port so which port will it choose? To answer this question we need to know about STP cost and port cost.

In general, "cost" is calculated based on bandwidth of the link. The higher the bandwidth on a link, the lower the value of its cost. Below are the cost values you should memorize:

Link speed Cost  
SwitchB will choose the interface with lower cost to the root bridge as the root port so we must calculate the cost on interface Gi0/1 & Gi0/2 of SwitchB to the root bridge. This can be calculated from the "cost to the root bridge" of each switch because a switch always advertises its cost to the root bridge in its BPDU. The receiving switch will add its local port cost value to the cost in the BPDU.

SwitchC advertises its cost to the root bridge with a value of 0. Switch D adds 4 (the cost value of 1Gbps link) and advertises this value (4) to SwitchB. SwitchB adds another 4 and learns that it can reach SwitchC via Gi0/1 port with a total cost of 8. The same process happens for SwitchA



and SwitchB learns that it can reach SwitchC via Gi0/2 with a total cost of 23 -> Switch B chooses Gi0/1 as its root port.

Now our last task is to identify the port roles of the ports between SwitchA & SwitchB. It is rather easy as the MAC address of SwitchA is lower than that of SwitchB so Fa0/2 of SwitchA will be designated port while Gi0/2 of SwitchB will be alternative port.

#### QUESTION 10

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

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

**Answer:** AD

#### **Explanation:**

Understanding Rapid Spanning Tree Protocol (802.1w)

[http://www.cisco.com/en/US/tech/tk389/tk621/technologies\\_white\\_paper09186a0080094cfa.shtml](http://www.cisco.com/en/US/tech/tk389/tk621/technologies_white_paper09186a0080094cfa.shtml)

Port States

There are only three port states left in RSTP that correspond to the three possible operational states. The 802.1D disabled, blocking, and listening states are merged into a unique 802.1w discarding state.

RSTP only has 3 port states which are discarding, learning and forwarding. When RSTP has converged there are only 2 port states left: discarding and forwarding.

STP (802.1D) Port State	RSTP (802.1w) Port State	Is Port Included in Active Topology?	Is Port Learning MAC Addresses?
Disabled	Discarding	No	No
Blocking	Discarding	No	No
Listening	Discarding	Yes	No
Learning	Learning	Yes	Yes
Forwarding	Forwarding	Yes	Yes

#### QUESTION 11

Which three statements about RSTP are true? (Choose three.)

- A. RSTP significantly reduces topology reconverging time after a link failure.
- B. RSTP expands the STP port roles by adding the alternate and backup roles.
- C. RSTP port states are blocking, discarding, learning, or forwarding.
- D. RSTP provides a faster transition to the forwarding state on point-to-point links than STP does.
- E. RSTP also uses the STP proposal-agreement sequence.
- F. RSTP uses the same timer-based process as STP on point-to-point links.

**Answer:** ABD

#### **Explanation:**

[http://www.cisco.com/en/US/tech/tk389/tk621/technologies\\_white\\_paper09186a0080094cfa.shtml](http://www.cisco.com/en/US/tech/tk389/tk621/technologies_white_paper09186a0080094cfa.shtml)

Convergence

Cisco enhanced the original 802.1D specification with features such as Uplink Fast, Backbone

Fast, and Port Fast to speed up the convergence time of a bridged network. The drawback is that these mechanisms are proprietary and need additional configuration.

#### Alternate and Backup Port Roles

These two port roles correspond to the blocking state of 802.1D. A blocked port is defined as not being the designated or root port. A blocked port receives a more useful BPDU than the one it sends out on its segment.

Remember that a port absolutely needs to receive BPDUs in order to stay blocked. RSTP introduces these two roles for this purpose.

#### Rapid Transition to Forwarding State

Rapid transition is the most important feature introduced by 802.1w. The legacy STA passively waited for the network to converge before it turned a port into the forwarding state. The achievement of faster convergence was a matter of tuning the conservative default parameters (forward delay and max\_age timers) and often put the stability of the network at stake. The new rapid STP is able to actively confirm that a port can safely transition to the forwarding state without having to rely on any timer configuration. There is now a real feedback mechanism that takes place between RSTP-compliant bridges. In order to achieve fast convergence on a port, the protocol relies upon two new variables: edge ports and link type.

### QUESTION 12

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

- A. Router(config)# router ospf 0
- B. Router(config)# router ospf 1
- C. Router(config)# router ospf area 0
- D. Router(config-router)# network 192.168.16.0 0.0.0.255 0
- E. Router(config-router)# network 192.168.16.0 0.0.0.255 area 0
- F. Router(config-router)# network 192.168.16.0 255.255.255.0 area 0

**Answer:** BE

#### Explanation:

In the router ospf

command, the ranges from 1 to 65535 so 0 is an invalid number - B is correct but A is not correct. To configure OSPF, we need a wildcard in the "network" statement, not a subnet mask. We also need to assign an area to this process - E is correct.

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