1-4(E). STP Problem Solving

SHOW COMMANDS

COMMAND	INFORMATION
`show spanning-tree [vlan 10]`	One Section per VLAN: • Root Subsection ○ Root Bridge Priority (sum of priority + VLAN) ○ Root Bridge MAC Address ○ Root Cost (cheapest path from here) ○ Our Root Port Interface ○ Timer Values • Bridge Subsection ○ Our Bridge Priority (sum and dissected in parens) ○ Our MAC Address ○ Timer Values (Hello, Max Age, Fwd Delay) Within Each VLAN Section, one line per local interface: • Port Role (Root, Designated, Alternate—AKA blocked other) • Port Status (Forwarding, Blocking) • Port Cost (Local Cost, NOT root cost for that port) • Port Priority (concat with "." and Interface #)
`show spanning-tree [vlan 10] root`	One line per VLAN: • Bridge ID of Root Switch (Sum of Priority+VLAN, then MAC) • Our root cost (including our root port's cost) • Our root port • Timers (Hello, Max Age, Fwd Delay)
`show spanning-tree [vlan 10] bridge`	One line per VLAN: • Our Bridge ID priority (summed & dissected), then MAC • Timers
`debug spanning-tree events`	Shows convergence

TROUBLESHOOTING ROOT SWITCH SELECTION

Root Switch is lowest priority, ties broken with lowest MAC (concatenation = BID). No further ties because the MAC is unique. Test likely to include SIM questions where you use show commands to discover the root (show spanning-tree vlan x; show spanning-tree vlan x root) or info needed to determine (priority? MAC?)

Strategy to Rule Out Switches

• Rule out switches with a Root Port—Ignored by most people. Every port on a root switch is designated because the root switch's cost is zero. Also, if your switch has a port leading to the root switch, you must not be the root switch.

`show spanning-tree [vlan 20]`
   Fifth line will say "This switch is root" if it is
   OR the Root ID section will have a Cost, telling how close you're getting to the root switch and the interfaces section will have an interface with a root role, telling you which way. NOTE the cost on an interface line in the interfaces section is the port cost, not the path cost to root!

`show spanning-tree [vlan 20] root`
   Root Port column will be empty if the bridge is root.

- In a sɪᴍ, follow the trail of root ports, possibly using cᴅᴘ to figure out who's on the other end.
- In a sɪᴍ, quickly find the ʀᴘ and ᴅᴘ ports (and root switch) on several switches to know most of what is knowable.

```
show spanning-tree vlan 20
```

ʀ ᴏ ᴏ ᴛ   ᴘ ᴏ ʀ ᴛ

Exam Strategy—Each non-root switch has *one* root port leading to the root switch.

- Direct Approach

```
show spanning-tree [vlan 20] root
show spanning-tree [vlan 20]
```

- Memorize IEEE port costs and look for any sign that the "spanning-tree cost" interface configuration command was used—the port cost in the interface section of show spanning-tree [vlan 10] will be non-standard
- Check current actual speed of a port (sᴛᴘ costs are based on that, not potential)

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Decision is for each collision domain (link, crossover-cable, hub, etc.). The lowest root-cost switch has a port designated to feed the link, ties broken by ʙɪᴅ. Within the same switch (double feeding a hub) ties broken by interface priority, then interface number.

Look Directly

```
show spanning-tree [vlan 20]
```
> *The list of interfaces at the bottom will show "desg" on designated ports. Check switches at each end of the line to see which is designated.*

Compare Root Costs of Switches—This begins to assume partial command availability or partial snippets of output from show commands.

```
show spanning-tree [vlan 20] root
```
> *The VLAN line has a cumulative "root cost" column.*

```
show spanning-tree [vlan 20]
```
> *Under the Root ID section, shows the root cost for the whole switch. Compare switches at each end of the line.*

Sum the Root Cost by Hand—over the entire path to the root

- Directly obtain port costs for summation

```
show spanning-tree [vlan 20]
```
> *Interface lines have port costs (assuming the root section on top, with root cost for the whole switch, wasn't available)*

- Manually reconstruct what the port costs must be
  - Look for default cost overrides by the "spanning-tree cost" interface command

```
show run interface [fa0/7]
```
> *See if there's a "spanning-tree cost" statement*

  - If defaults (100, 19, 4, 2), see what the *actual* port speed is so you can use defaults

```
show interfaces status
show interfaces [fa0/8]
```