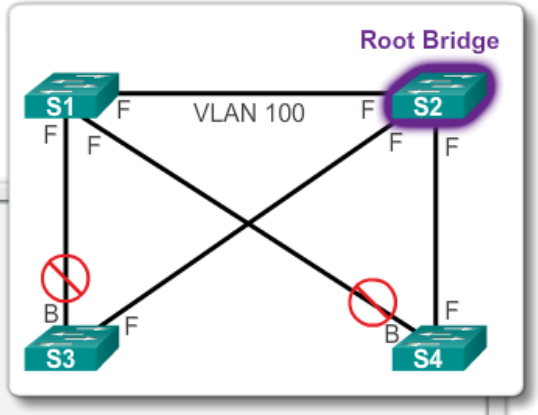
NET 363
Introduction to LANs

STP Configuration

Greg Brewster
DePaul University

STP Configuration Issues

View Spanning Tree Status



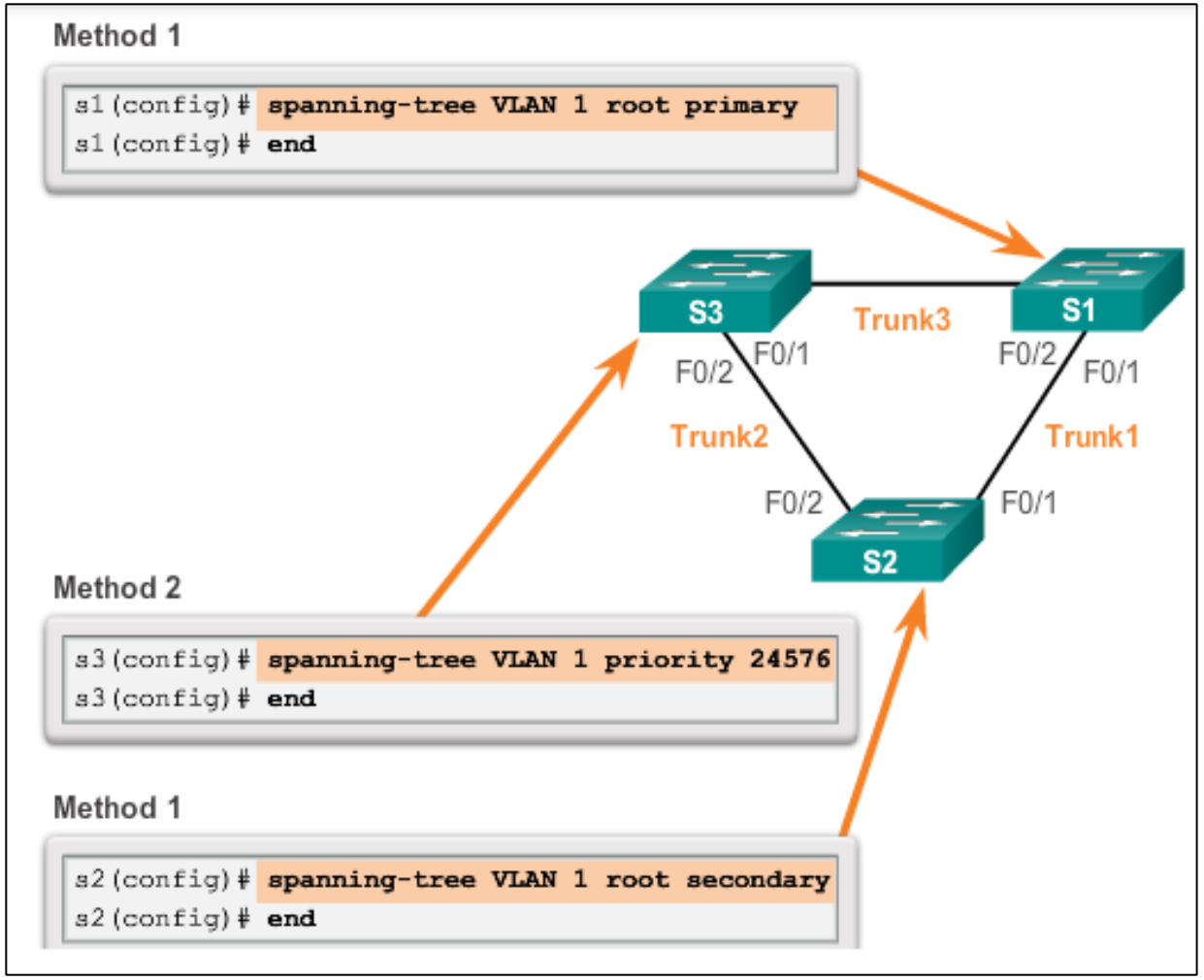

```
S1# show spanning-tree vlan 100

VLAN0100
 Spanning tree enabled protocol rstp
 Root ID     Priority    28772
             Address     0000.0c9f.3127
             Cost        2
             Port        88 (TenGigabit9/1)
             Hello Time  2 sec Max Age 20 sec Forward Delay 15 sec
 Bridge ID   Priority    28772 (priority 28672 sys-id-ext 100)
             Address     0000.0cab.3724
             Hello Time  2 sec Max Age 20 sec Forward Delay 15 sec
             Aging Time  300

Interface       Role Sts Cost      Prio.Nbr Type
---------       ------------      ------------------------------
Gi3/1           Desg FWD 4         128.72   P2p
Gi3/2           Desg FWD 4         128.80   P2p
Te9/1           Root FWD 2         128.88   P2p
```

PVST+ Configuration

Configuring the Bridge ID



PVST+ Configuration

Verifying the Root Switch and Bridge ID

```
S3# show spanning-tree
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID     Priority    24577
              Address     00A.0033.3333
              This bridge is the root
              Hello Time  2 sec Max Age 20 sec Forward Delay 15 sec
  Bridge ID   Priority    24577  (priority  24576  sys-id-ext  1)
              Address     000A.0033.3333
              Hello Time  2 sec Max Age 20 sec Forward Delay 15 sec
              Aging Time  300

Interface      Role    Sts    Cost      Prio.Nbr       Type
-------------  -----   ----   -----     ----------     ------
Fa0/1          Desg    FWD    4         128.1          p2p
Fa0/2          Desg    FWD    4         128.2          p2p
S3#
```

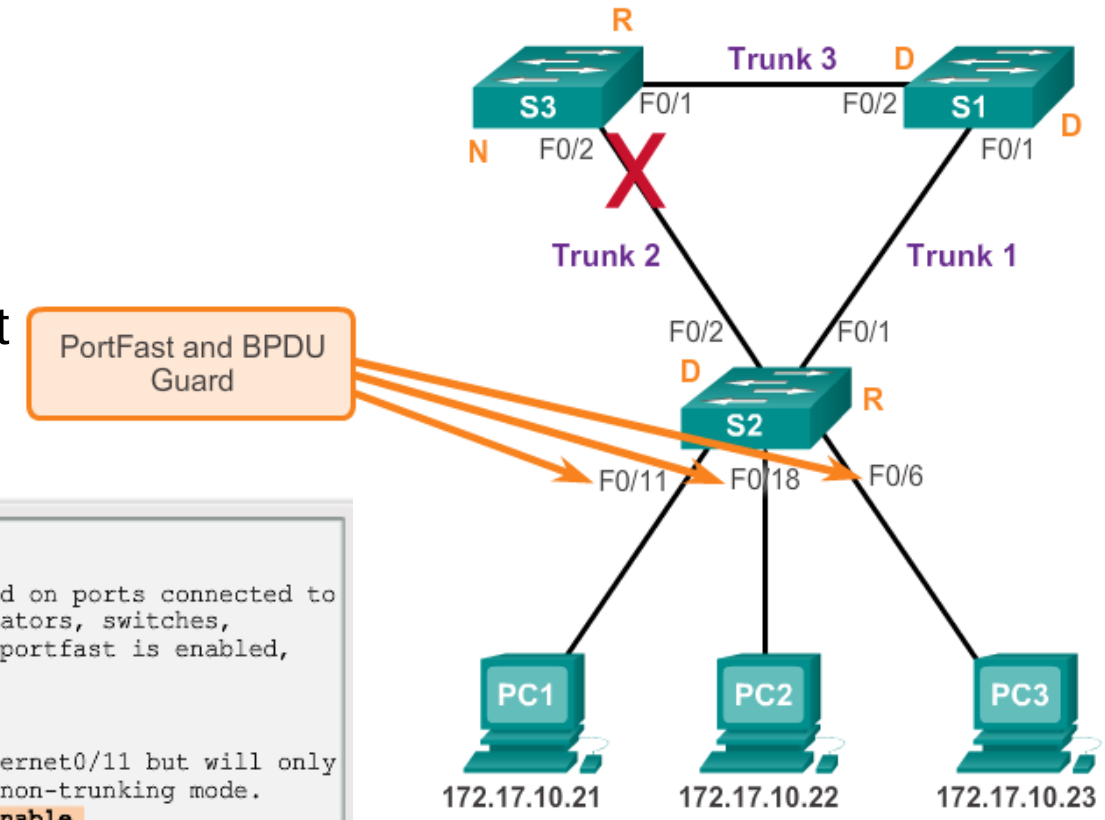
PVST+ Configuration

PortFast and BPDU Guard

- When a switch port is configured with PortFast that port transitions from blocking to forwarding state immediately.
- BPDU guard puts the port in an *error-disabled* state on receipt of a BPDU.

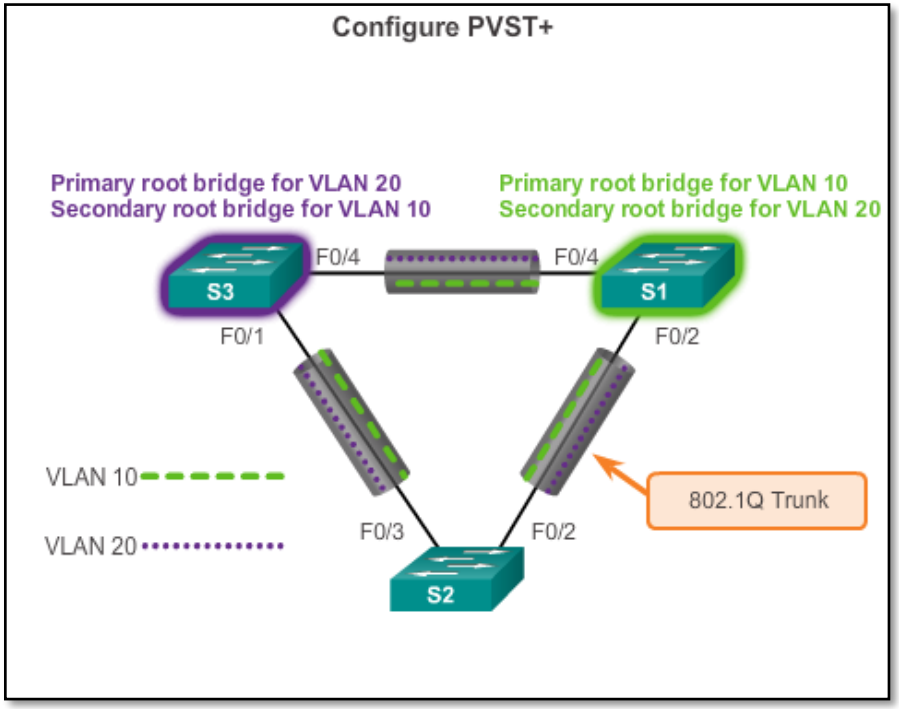
```
S2(config)# interface FastEthernet 0/11
S2(config-if)# spanning-tree portfast
%Warning: portfast should only be enabled on ports connected to
a single host. Connecting hubs, concentrators, switches,
bridges, etc... to this interface  when portfast is enabled,
can cause temporary bridging loops.
 Use with CAUTION

%Portfast has been configured on FastEthernet0/11 but will only
 have effect when the interface is in a non-trunking mode.
S2(config-if)# spanning-tree bpduguard enable
S2(config-if)# end
```



PVST+ Configuration

PVST+ Load Balancing



Configure PVST+

```
S3(config)# spanning-tree vlan 20 root primary
```

This command forces S3 to be the primary root for VLAN 20.

```
S3(config)# spanning-tree vlan 10 root secondary
```

This command forces S3 to be the secondary root for VLAN 10.

```
S1(config)# spanning-tree vlan 10 root primary
```

This command forces S1 to be the primary root for VLAN 10.

```
S1(config)# spanning-tree vlan 20 root secondary
```

This command forces S1 to be the secondary root for VLAN 20.

Admin forces VLAN Root Switches to split traffic on different VLANs over different paths -> Load Balancing.

Rapid PVST+ Configuration

Setting the Spanning Tree Mode

Rapid PVST+ is the Cisco implementation of RSTP. It supports RSTP on a per-VLAN basis.

```
S1# configure terminal
S1(config)# spanning-tree mode rapid-pvst
S1(config)# interface f0/2
S1(config-if)# spanning-tree link-type point-to-point
S1(config-if)# end
S1# clear spanning-tree detected-protocols
```

Cisco IOS Command Syntax	
Enter global configuration mode.	**configure terminal**
Configure Rapid PVST+ spanning-tree mode.	**spanning-tree mode rapid-pvst**
Enter interface configuration mode and specify an interface to configure. Valid interfaces include physical ports, VLANs, and port channels.	**interface** *interface-id*
Specify that the link type for this port is point-to-point.	**spanning-tree link-type point-to-point**
Return to privileged EXEC mode.	**end**
Clear all detected STP.	**clear spanning-tree detected-protocols**