



Key Attributes

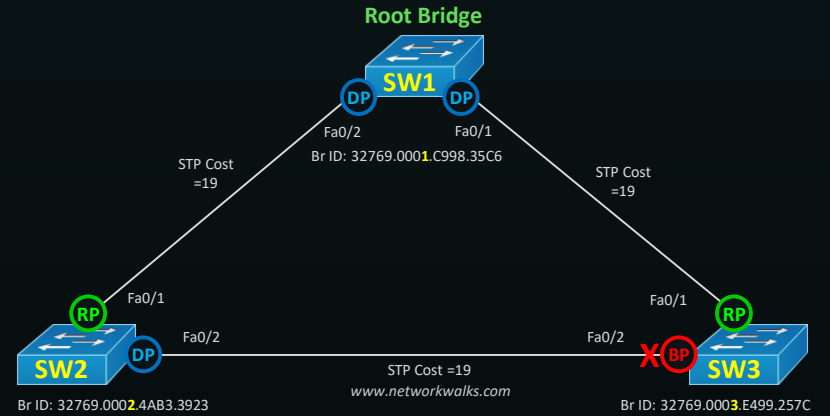
Protocol Type/Class: Network Protocol (Layer2)
Standards: IEEE 802.1D/W/S/Q, Cisco (Def on Cisco=PVST)
Function: L2 Loops Prevention, Adapt to network changes & failures
Algorithm: STP by Radia Perlman
Multicast Address: 01:80:C2:00:00:00
Port States: STP=5, RSTP=3
Port Roles: STP=3, RSTP=4

STP Operations

- 1. Elect Root Bridge (RB)**
 - First, one Switch is elected as Root Bridge which has lowest bridge ID
- 2. Select Root Ports (RP)**
 - One RP is selected on each Switch which has: Lowest cost to RB > Lowest Br ID of neighbor Switch
- 3. Select Designated Ports (DP)**
 - One DP is selected for each segment which has: Lowest cost to RB > Lowest sender Bridge ID > Lowest sender Port Priority > Lowest sender physical Port Number
- 4. Block all remaining Ports**
 - All remaining non-Root and non-Designated Ports are blocked

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STP Example Topology



Download the Packet Tracer Lab file of this STP Topology for practice: [Link](#)

STP Bridge ID

4	12	48
Pri	Ext Sys ID	MAC Address

Br ID = Priority.MAC

e.g. Br ID = 32768.AAAA.AAAA.AAAA

*Ext SysID is usually the VLAN no. in case of PVST

STP Path Selection Rules



1. Bridge with lowest Root ID becomes the root
2. Always prefer the neighbor with the lowest cost to root
3. Always prefer the neighbor with the lowest Bridge ID
4. Always prefer the lowest sender Port ID



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STP Port Roles

STP	RSTP
Root	Root
Designated	Designated
Blocking	Alternate
	Backup

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BPDU Types

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1. CBPDU (Configuration BPDU)

Used for Spanning Tree computation

2. TCN BPDU (Topology Change Notification BPDU)

Used to announce changes in the network topology



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STP Port States

STP	RSTP	BPDU	Duration
Disabled	Discarding	-	-
Blocking		Rx	20 sec
Listening		Rx/Tx	15 sec
Learning	Learning	Rx/Tx/Learn	15 sec
Forwarding	Forwarding	Rx/Tx/Learn/Fwd	-

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