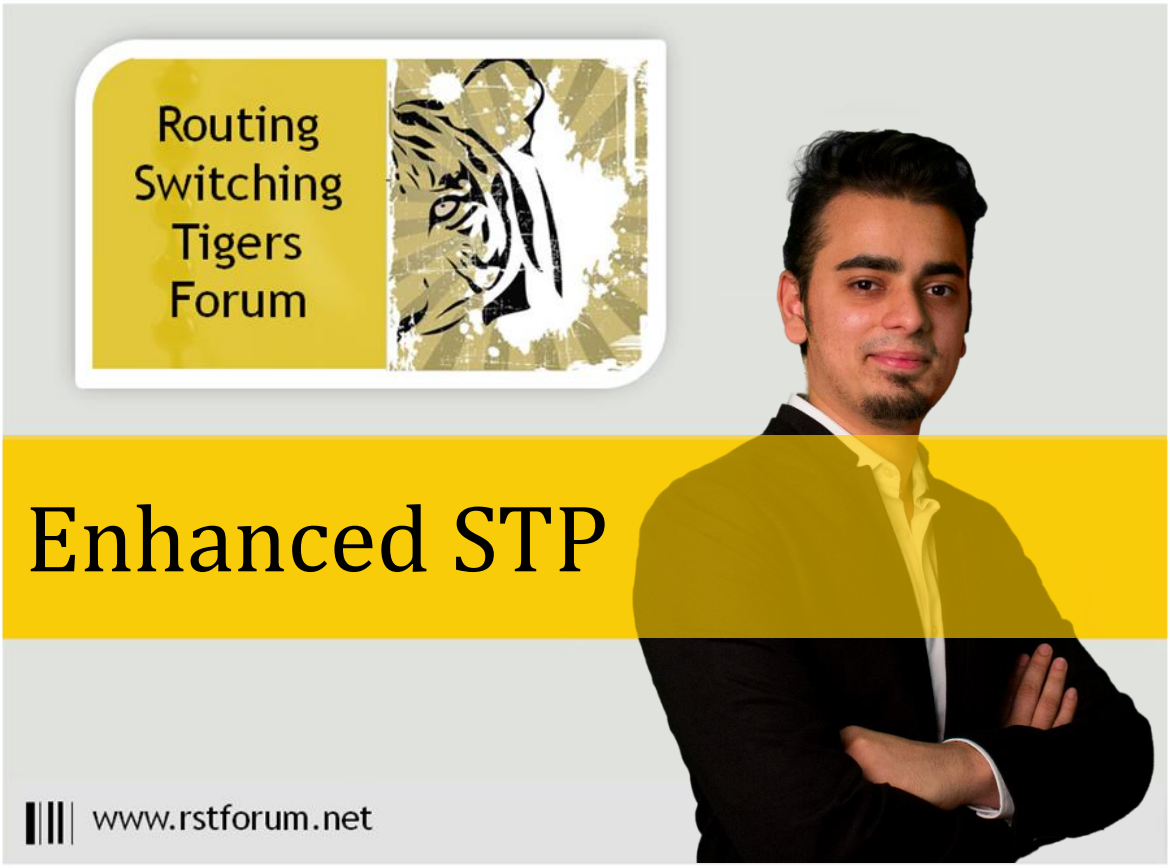
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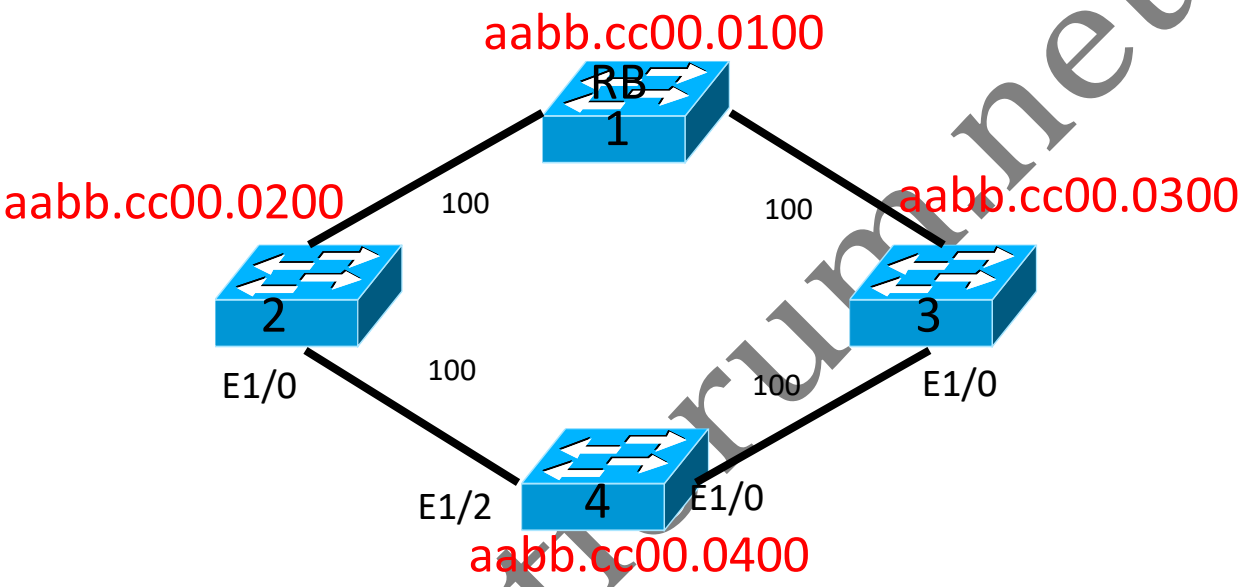
STP Topology



LAB 1: Configuration

Task 1: Configure Switches

Step 1. In the configuration mode of switch configure following command:

SW1:
hostname SW1

SW2:
hostname SW2

SW3:
hostname SW3

SW4:
hostname SW4

Step 2. Verify CDP neighbors and Interfaces:

SW2#show cdp neighbors

Device ID	Local Intrfce	Holdtme	Capability	Platform	Port ID
SW4	Eth 1/0	154	R S	Linux Uni	Eth 1/2
SW1	Eth 0/0	134	R S	Linux Uni	Eth 0/0

SW3#show cdp neighbors

Device ID	Local Intrfce	Holdtme	Capability	Platform	Port ID
SW4	Eth 1/0	154	R S	Linux Uni	Eth 1/0
SW1	Eth 0/0	134	R S	Linux Uni	Eth 1/0

SW4#show cdp neighbors

Device ID	Local Intrfce	Holdtme	Capability	Platform	Port ID
SW2	Eth 1/2	154	R S	Linux Uni	Eth 1/0
SW3	Eth 1/0	134	R S	Linux Uni	Eth 1/0

LAB 1: Configuration

Task 2: Verify Configuration

Step 1. Verify Spanning-Tree Protocols Behavior:

STP Path Selection:
Criteria: -
1. Lowest bridge ID is root bridge
2. Lowest path cost to root bridge
In case of a tie: -
3. Lowest sender bridge ID
4. Lowest sender port ID
5. Lowest port ID of receiving bridge

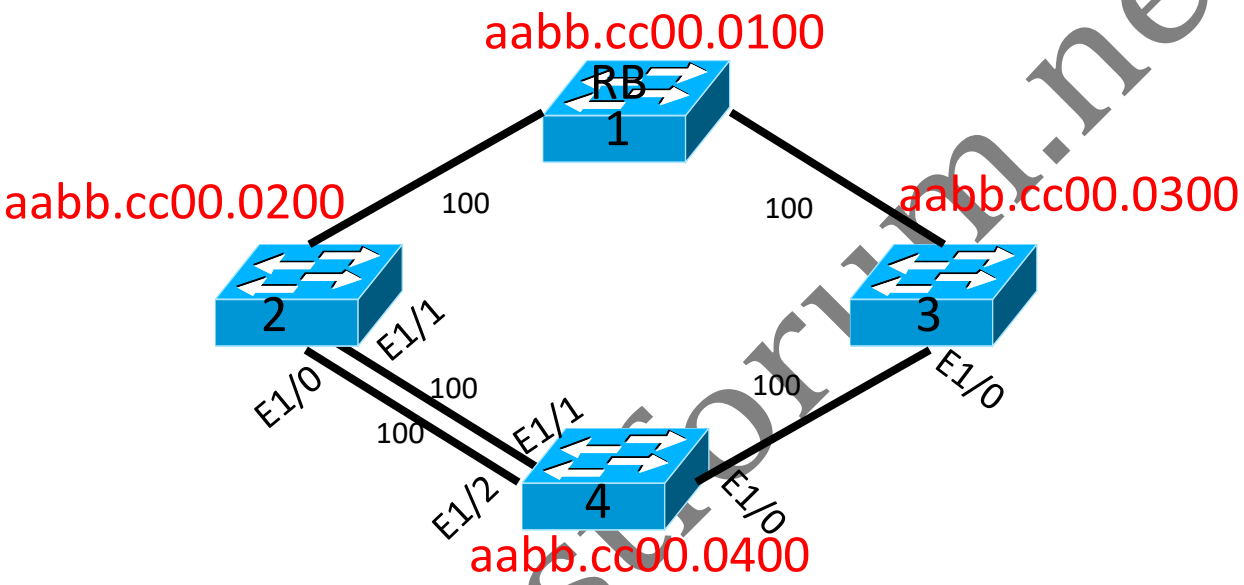
```
SW2#show spanning-tree
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    32769
             Address     aabb.cc00.0100
             Cost        100
             Port        1 (Ethernet0/0)
             Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    32769  (priority 32768 sys-id-ext 1)
             Address     aabb.cc00.0200
             Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time  300 sec

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Et0/0            Root FWD 100       128.1    Shr
Et0/1            Desg FWD 100       128.2    Shr
Et0/2            Desg FWD 100       128.3    Shr
Et0/3            Desg FWD 100       128.4    Shr
Et1/0            Desg FWD 100       128.5    Shr
Et1/2            Desg FWD 100       128.7    Shr
Et1/3            Desg FWD 100       128.8    Shr

SW3#show spanning-tree
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    32769
             Address     aabb.cc00.0100
             Cost        100
             Port        1 (Ethernet0/0)
             Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec
```

```
  Bridge ID  Priority    32769  (priority 32768 sys-id-ext 1)
             Address     aabb.cc00.0300
             Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time  300 sec

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Et0/0            Root FWD 100       128.1    Shr
Et0/1            Desg FWD 100       128.2    Shr
Et0/2            Desg FWD 100       128.3    Shr
Et0/3            Desg FWD 100       128.4    Shr
Et1/0            Desg FWD 100       128.5    Shr
Et1/1            Desg FWD 100       128.6    Shr
Et1/2            Desg FWD 100       128.7    Shr
Et1/3            Desg FWD 100       128.8    Shr

SW4#show spanning-tree
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    32769
             Address     aabb.cc00.0100
             Cost        200
             Port        7 (Ethernet1/2)
             Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    32769  (priority 32768 sys-id-ext 1)
             Address     aabb.cc00.0400
             Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time  300 sec

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Et0/0            Desg FWD 100       128.1    Shr
Et0/1            Desg FWD 100       128.2    Shr
Et0/2            Desg FWD 100       128.3    Shr
Et0/3            Desg FWD 100       128.4    Shr
Et1/0            Altn BLK 100       128.5    Shr
Et1/1            Desg FWD 100       128.6    Shr
Et1/2            Root FWD 100       128.7    Shr
Et1/3            Desg FWD 100       128.8    Shr
```

*On SW4 Port with lower sender bridge ID will become Root Port (SW4 is receiving same cost to RB from SW2 and SW3) Because interface E1/0 of SW4 is connected to SW3 its blocked and interface E1/2 of SW4 is connected to SW2 hence it will become root port.

LAB 1: Configuration

Task 2: Redundant Path STP Behavior :



Step 1. In the configuration mode of switch configure following command:

SW1:
hostname SW1

SW2:
hostname SW2

SW3:
hostname SW3

SW4:
hostname SW4

Step 2.Verify CDP neighbors and Interfaces:

```
SW2#show cdp neighbors
```

Device ID	Local Intrfce	Holdtme	Capability	Platform	Port ID
SW4	Eth 1/1	154	R S	Linux Uni	Eth 1/1
SW4	Eth 1/0	154	R S	Linux Uni	Eth 1/2
SW1	Eth 0/0	134	R S	Linux Uni	Eth 0/0

SW3#show cdp neighbors

Device ID	Local Intrfce	Holdtme	Capability	Platform	Port ID
SW4	Eth 1/0	154	R S	Linux Uni	Eth 1/0
SW1	Eth 0/0	154	R S	Linux Uni	Eth 1/0

SW4#show cdp neighbors

Device ID	Local Intrfce	Holdtme	Capability	Platform	Port ID
SW2	Eth 1/1	154	R S	Linux Uni	Eth 1/1
SW2	Eth 1/2	154	R S	Linux Uni	Eth 1/0
SW3	Eth 1/0	154	R S	Linux Uni	Eth 1/0

Step 3. Verify Spanning-Tree Protocols Behavior:

SW2#show spanning-tree
VLAN0001
 Spanning tree enabled protocol ieee
 Root ID Priority 32769
  Address aabb.cc00.0100
  Cost 100
  Port 1 (Ethernet0/0)
  Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

 Bridge ID Priority 32769 (priority 32768 sys-id-ext 1)
  Address aabb.cc00.0200
  Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
  Aging Time 300 sec

Interface	Role	Sts	Cost	Prio.Nbr	Type
Et0/0	Root	FWD	100	128.1	Shr
Et0/1	Desg	FWD	100	128.2	Shr
Et0/2	Desg	FWD	100	128.3	Shr
Et0/3	Desg	FWD	100	128.4	Shr
Et1/0	Desg	FWD	100	128.5	Shr
Et1/1	Desg	FWD	100	128.6	Shr
Et1/2	Desg	FWD	100	128.7	Shr
Et1/3	Desg	FWD	100	128.8	Shr

SW3#show spanning-tree
VLAN0001
 Spanning tree enabled protocol ieee

```
 Root ID    Priority    32769
            Address     aabb.cc00.0100
            Cost        100
            Port        1 (Ethernet0/0)
            Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec

 Bridge ID  Priority    32769  (priority 32768 sys-id-ext 1)
            Address     aabb.cc00.0300
            Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec
            Aging Time  300 sec

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Et0/0            Root FWD 100       128.1    Shr
Et0/1            Desg FWD 100       128.2    Shr
Et0/2            Desg FWD 100       128.3    Shr
Et0/3            Desg FWD 100       128.4    Shr
Et1/0            Desg FWD 100       128.5    Shr
Et1/1            Desg FWD 100       128.6    Shr
Et1/2            Desg FWD 100       128.7    Shr
Et1/3            Desg FWD 100       128.8    Shr

SW4#show spanning-tree
VLAN0001
 Spanning tree enabled protocol ieee
 Root ID    Priority    32769
            Address     aabb.cc00.0100
            Cost        200
            Port        7 (Ethernet1/2)
            Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec
 Bridge ID  Priority    32769  (priority 32768 sys-id-ext 1)
            Address     aabb.cc00.0400
            Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec
            Aging Time  300 sec
Interface        Role Sts Cost      Prio.Nbr  Type
---------------- ---- --- --------- -------- --------------------------------
Et0/0            Desg FWD 100       128.1    Shr
Et0/1            Desg FWD 100       128.2    Shr
Et0/2            Desg FWD 100       128.3    Shr
Et0/3            Desg FWD 100       128.4    Shr
Et1/0            Altn BLK 100       128.5    Shr
Et1/1            Altn BLK 100       128.6    Shr
Et1/2            Root FWD 100       128.7    Shr
Et1/3            Desg FWD 100       128.8    Shr
```

*When we have multiple path between switches then the path with lower sender port ID will become Root Port. EG: - Interface E1/0 of SW4 is connected to SW3 hence its blocked. Interface E1/2 and Interface E1/1 of SW4 is connected to Interface E1/0 and E1/1 of SW2 respectively. Hence only Interface E1/2 of SW4 will become Root Port rest will be blocked