The Root Bridge Election

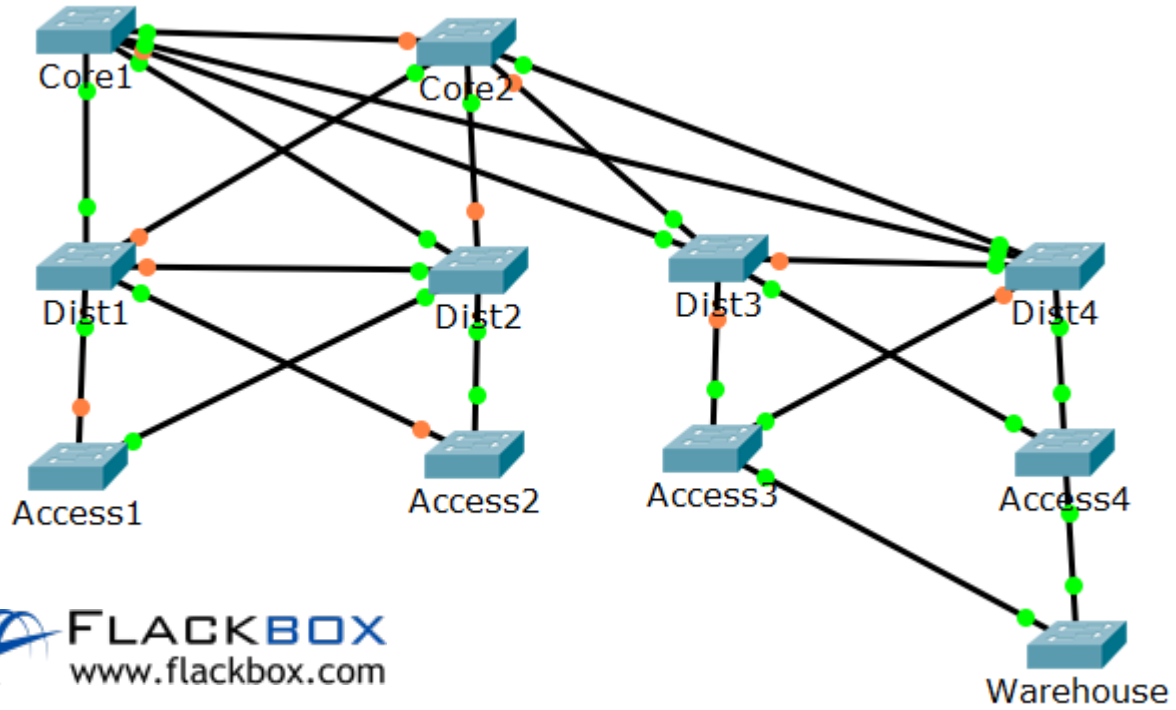
- Because Spanning Tree selects paths pointing towards the root bridge, it acts as a centre point of the LAN
- Best practice is to ensure a pair of high-end core switches are selected as the 1st and 2nd most preferred Root Bridge

The Root Bridge Election

- You can manipulate the Root Bridge election by setting Bridge priority
- The default value is 32768, with the lowest number being most preferred
- In the case of a tie the switch with the lowest MAC address will be selected
- This is liable to be the oldest switch

Suboptimal Root Bridge

- All switches are left with the default Bridge Priority in this example
- The switch with the lowest MAC address becomes the Root Bridge
- This is the old switch in the warehouse
- It has low bandwidth links and limited CPU and memory



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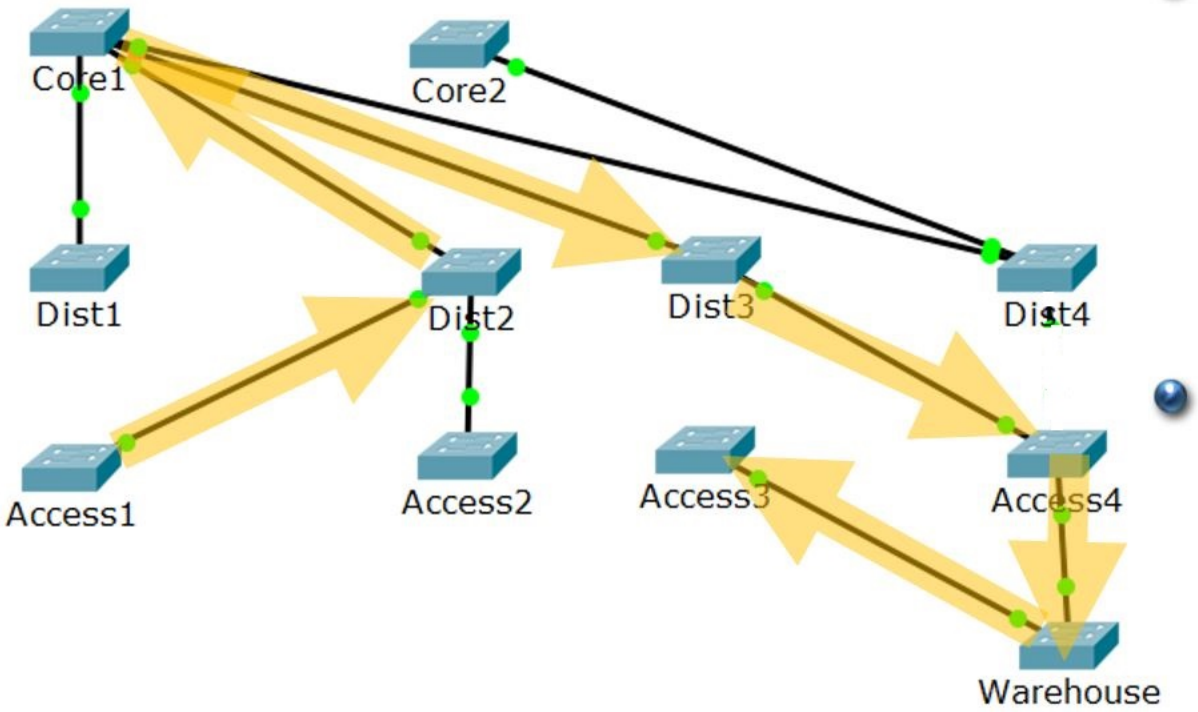
Suboptimal Root Bridge

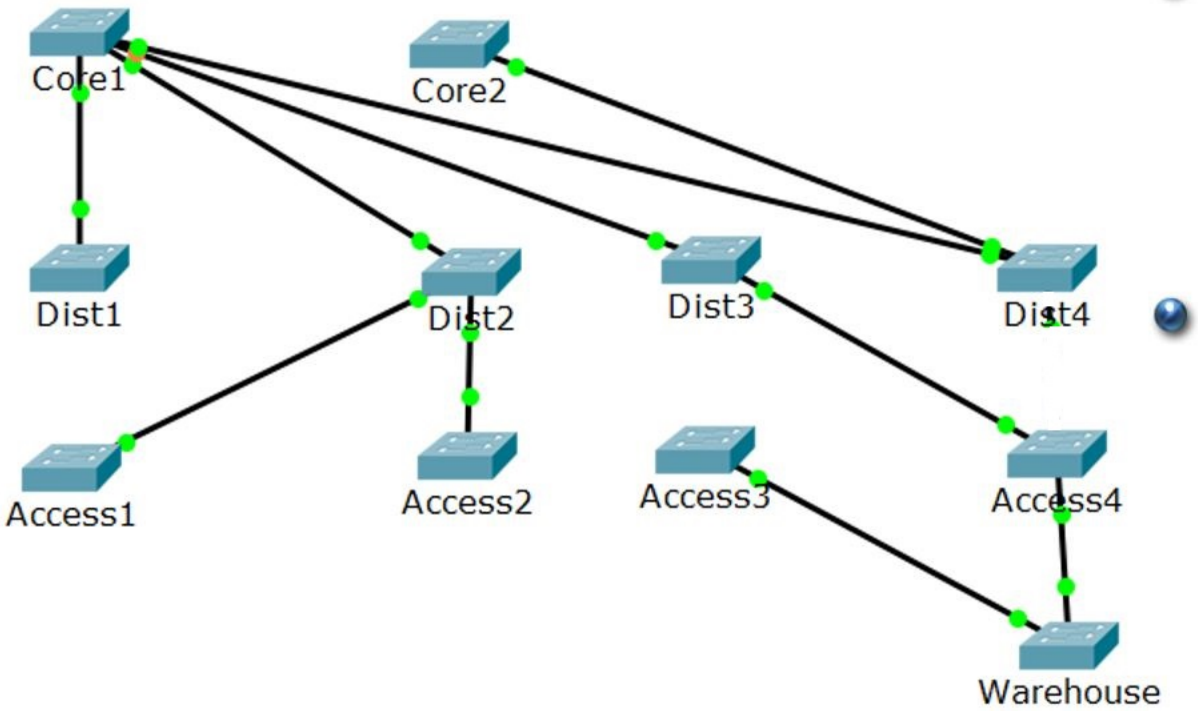
```
Warehouse#show spanning-tree vlan 1
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID     Priority    32769
              Address     0001.634B.E247
              This bridge is the root
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32769  (priority 32768 sys-id-ext 1)
              Address     0001.634B.E247
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------
Fa0/1            Desg FWD 19        128.1    P2p
Fa0/2            Desg FWD 19        128.2    P2p
```

Suboptimal Root Bridge



- Traffic from a PC connected to Access1 to another PC connected to Access3 goes along the path Acc1 > Dist2 > Core1 > Dist3 > Acc4 > Warehouse > Acc3
- This is 7 hops, including through the old switch in the warehouse

Suboptimal Root Bridge



- All traffic between different pairs of distribution switches will go over an indirect path and transit the old switch in the warehouse
- This is likely to congest its links, CPU and RAM and will lead to suboptimal performance

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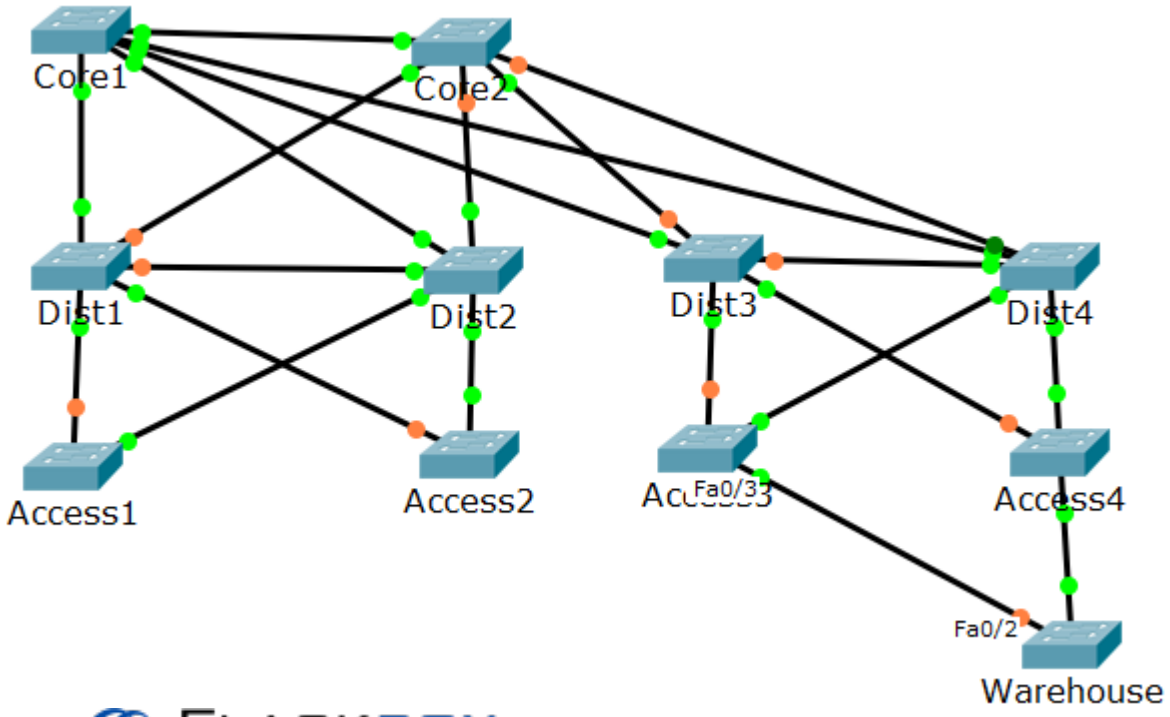
Root Bridge Primary Configuration

```
Core1(config)#spanning-tree vlan 1 root primary
```



- Configures the Core1 switch to be the Root Bridge
- This will set a Bridge Priority of 24576

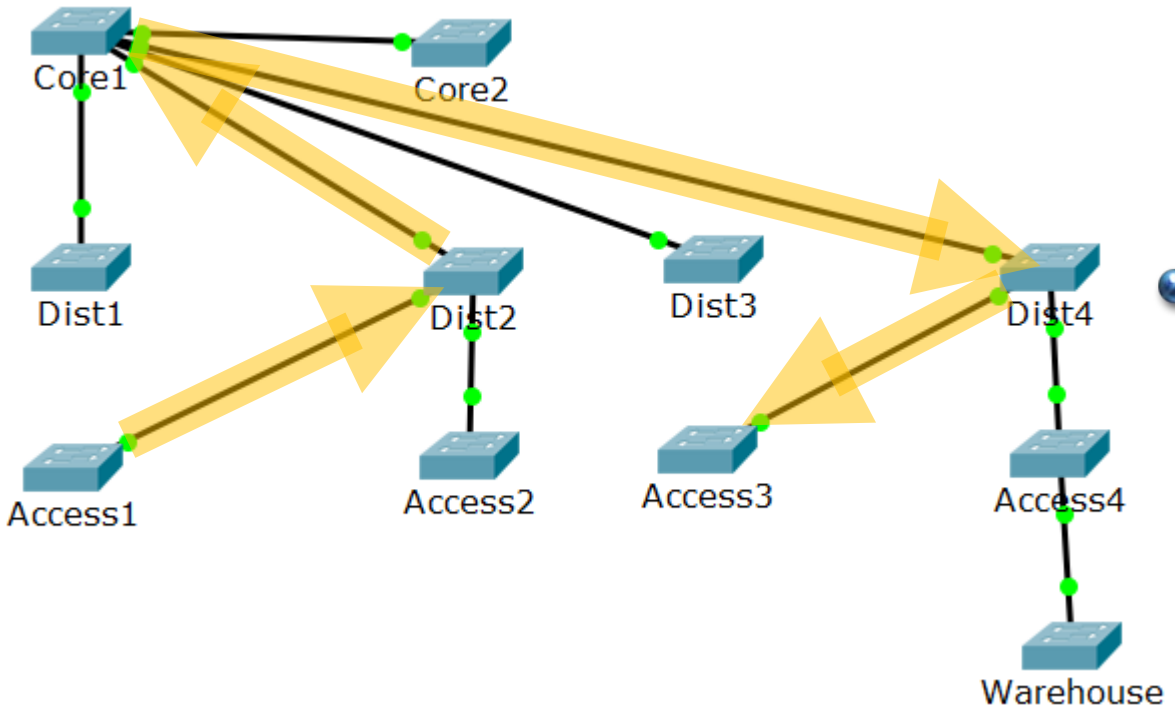
Root Bridge Primary Verification

```
Core1#show spanning-tree vlan 1
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID     Priority    24577
              Address     0090.0CA0.3902
              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     0090.0CA0.3902
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------
Gi0/2            Desg FWD 4         128.26   P2p
Fa0/21           Desg FWD 19        128.21   P2p
Fa0/24           Desg FWD 19        128.24   P2p
```

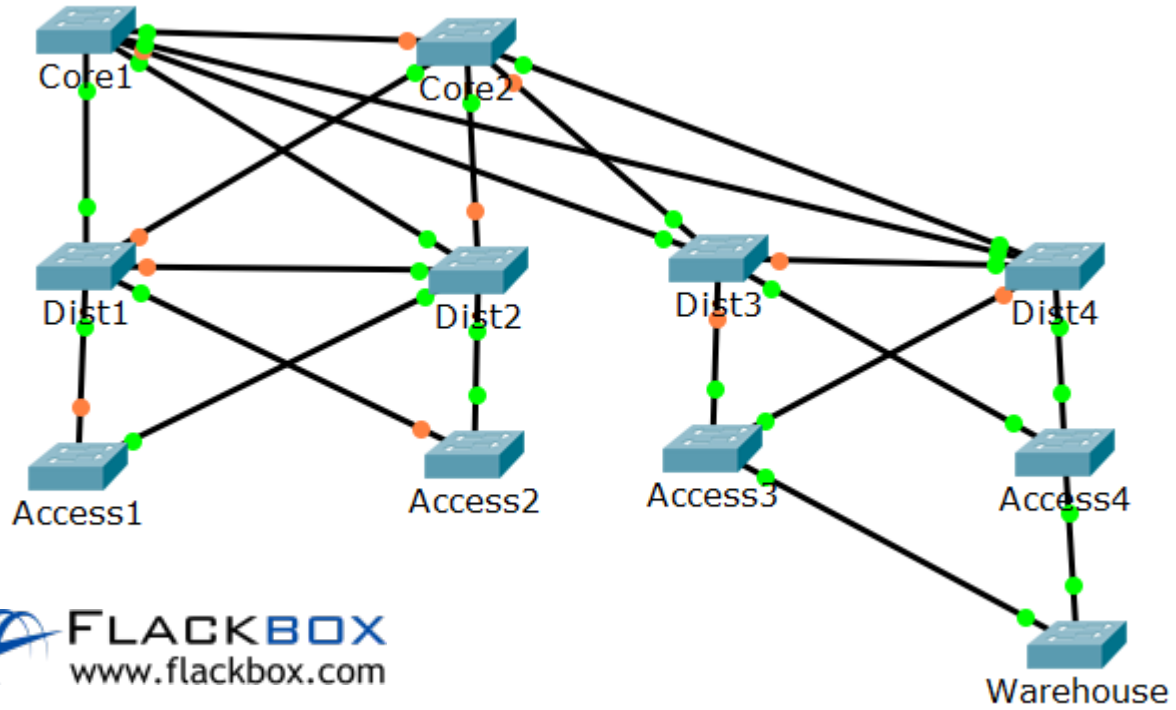
Optimal Root Bridge



- Traffic from a PC connected to Access1 to another PC connected to Access3 goes along the path Acc1 > Dist2 > Core1 > Dist4 > Acc3
- This is 5 hops along the most direct path through the core

Root Bridge Failover

- If the Core1 switch fails, we want to ensure traffic still goes through the most direct centralised path
- We need to configure Core2 to be next most preferred as the Root Bridge



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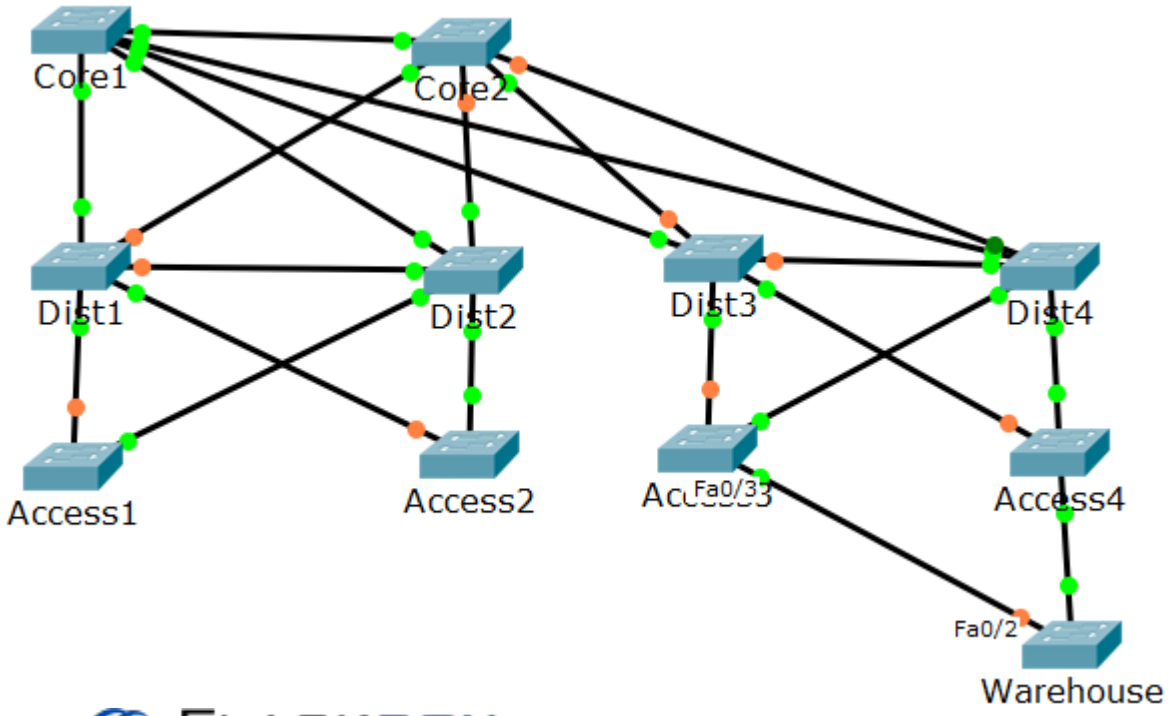
Root Bridge Secondary Configuration

```
Core2(config)#spanning-tree vlan 1 root secondary
```



- Configures the Core2 switch to be the next most preferred Root Bridge after Core1
- This will set a Bridge Priority of 28672

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Root Bridge Secondary Verification

```
Core2#show spanning-tree vlan 1
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID     Priority    24577
              Address     0090.0CA0.3902
              Cost        4
              Port        26(GigabitEthernet0/2)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    28673  (priority 28672 sys-id-ext 1)
              Address     0090.0C16.7A9B
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------
Fa0/24           Desg FWD 19        128.24   P2p
Fa0/21           Desg FWD 19        128.21   P2p
Gi0/2            Root FWD 4         128.26   P2p
```