

# Brocade + Cisco Spanning Tree Integration

Bill Laycock  
Systems Engineer



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# Multivendor Networking Integration

- Heterogeneous networks increasing in numbers
- Protocol interoperability imperative for network functionality/stability
- Must understand vendor default behavior
- Need interoperability and/or migration with proprietary implementations



# Agenda

- Brocade + Cisco Default STP Implementations
- Brocade + Cisco Default STP – Make It Work!
- Brocade + Cisco Rapid Spanning Tree Implementations
- Brocade + Cisco Rapid STP – Make It Work!
- Summary

# What This Does Not Cover

- Single instance Spanning Tree
- Single instance Rapid Spanning Tree
- MSTP 802.1s



# Brocade Default STP Implementation

Fastiron 7.x +

- Brocade support 2 Image Types:
  - Router Based (included base L3 functionality + others with license)
  - Switch Based (L2 functionality only)
- Brocade Router code DOES NOT enable STP by default
  - STP must be configured to be enabled
- Brocade Switch code DOES enable STP by default
  - 802.1D Spanning Tree instance Per VLAN
  - BPDU transmitted with associated VLAN ID
  - BPDU destination MAC to STP standard 0180.c200.0000



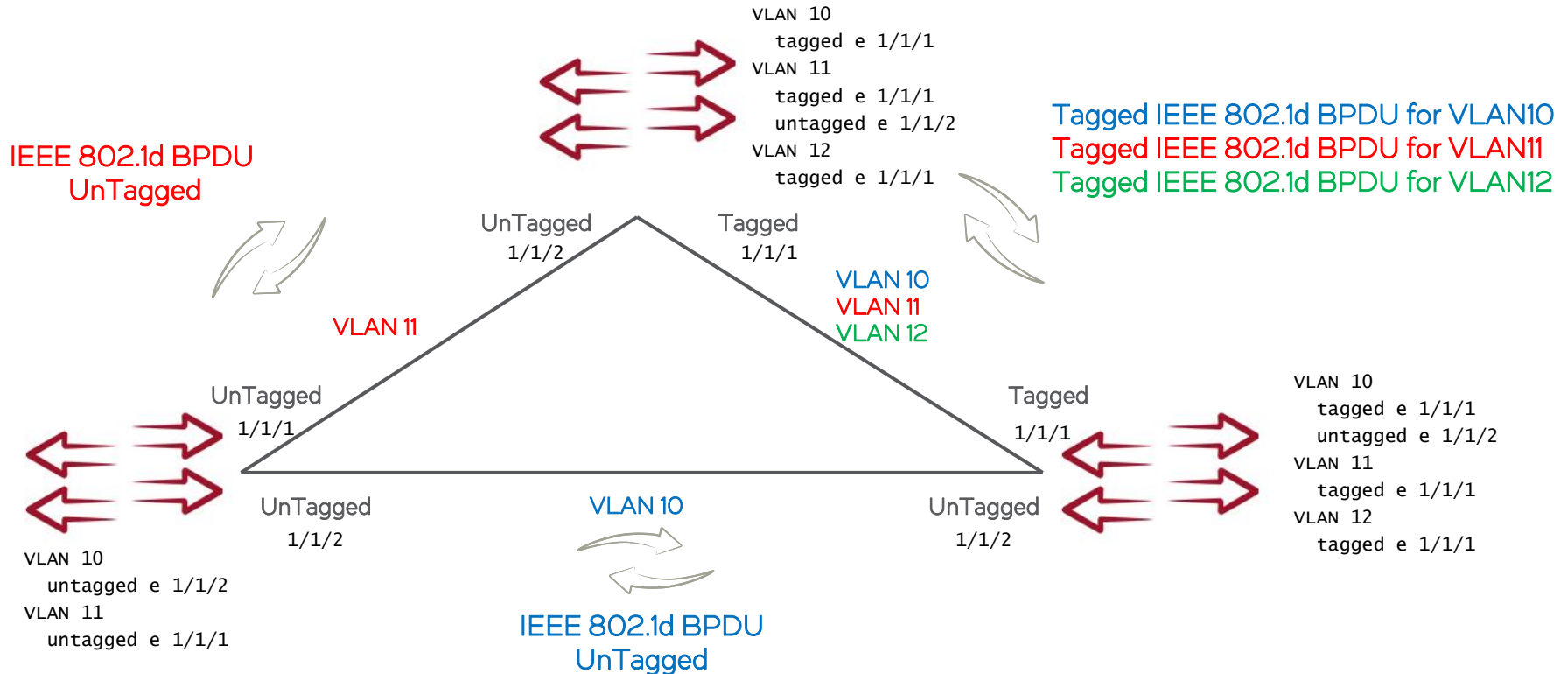
# Brocade Default VLAN Implementation

Fastiron 7.x +

- Properties
  - Always UnTagged and cannot be tagged to an interface
  - Container for unconfigured interfaces
  - Default value = VLAN 1
  - Can (and should) be manually configured
- In order to use VLAN 1 as a regular VLAN & place on Tagged interface, default-vlan-id must be configured to manually (preferably an unused VLAN ID)
- All Tagged traffic will be sent with 802.1q VLAN ID unless Dual-Mode configured on interface

# Brocade Default STP Implementation

Switch Code + 802.1q





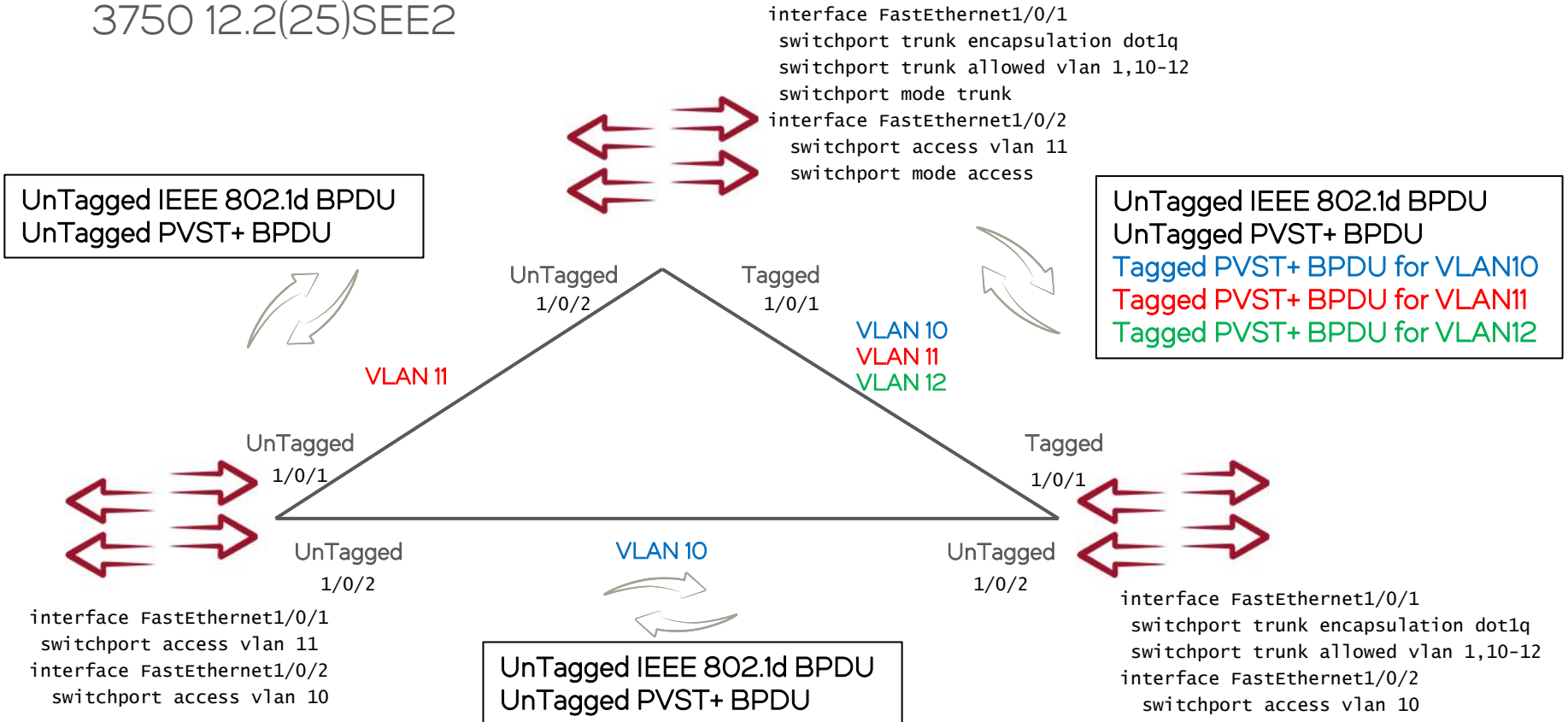
# Cisco Default STP Implementation

Tested on 3750 running 12.2(25)SEE2

- Cisco implements PVST+
  - Spanning Tree instance Per VLAN
  - BPDUs Sent
    - Untagged IEEE 802.1D BPDU
    - Untagged PVST+ BPDU for Native VLAN (1 Default)
    - Tagged PVST+ BPDUs per VLAN ID
  - IEEE BPDU destination MAC to STP standard 0180.c200.0000
  - PVST+ BPDU destination MAC to proprietary 01:00:0c:cc:cc:cd

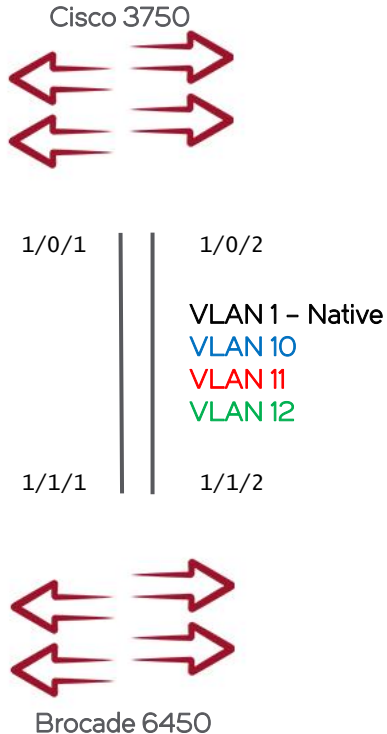
# Cisco Default STP Implementation

3750 12.2(25)SEE2



# Make It Work! Cisco Elected Root Bridge

## Important Notes



## Brocade Switch Integration

- Automatically detects Cisco PVST+ BPDUs
- Converts to Cisco PVST+ implementation
- Sends Cisco PVST+ compatible BPDUs for each VLAN

## Match Cisco Native VLAN to Brocade Dual-Mode VLAN

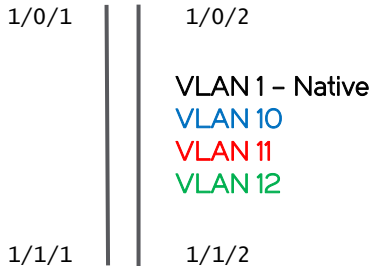
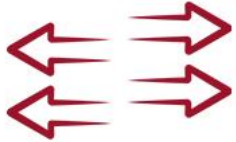
- Cisco sends untagged BPDUs for Native VLAN
- Brocade by default does not process untagged BPDUs on an exclusively tagged interface
- Configured Dual-Mode on Brocade interface that matches Cisco Native VLAN

## Modify Brocade Default VLAN to an unused VLAN ID

# Make It Work! Cisco Elected Root Bridge

## Config Snippets

Cisco 3750



### Cisco Config Snippet

```
spanning-tree mode pvst
spanning-tree extend system-id
spanning-tree vlan 1,10-12 priority 0
!
vlan 10-12

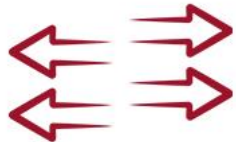
interface FastEthernet1/0/1
 switchport trunk encapsulation dot1q
 switchport trunk allowed vlan 1,10-12
 switchport mode trunk

interface FastEthernet1/0/2
 switchport trunk encapsulation dot1q
 switchport trunk allowed vlan 1,10-12
 switchport mode trunk
```

### Brocade Config Snippet

```
vlan 1 by port
 tagged ethe 1/1/1 to 1/1/3
 !
vlan 10 by port
 tagged ethe 1/1/1 to 1/1/3
 !
vlan 11 by port
 tagged ethe 1/1/1 to 1/1/3
 !
vlan 12 by port
 tagged ethe 1/1/1 to 1/1/3
 !
default-vlan-id 499
 !
 !
interface ethernet 1/1/1
 dual-mode 1
 !
interface ethernet 1/1/2
 dual-mode 1
```

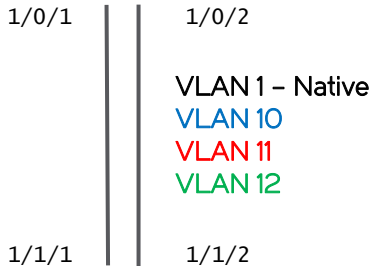
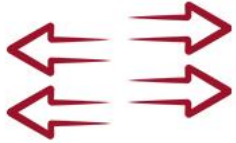
Brocade 6450



# Make It Work! Cisco Elected Root Bridge

## Working Show Commands VLAN 1

Cisco 3750



### Cisco Show Commands

```
Switch#show span vlan 1
```

```
VLAN0001
```

```
Spanning tree enabled protocol ieee
```

```
Root ID Priority 1  
Address 0019.557b.7e80
```

```
This bridge is the root
```

```
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
```

```
Bridge ID Priority 1 (priority 0 sys-id-ext 1)
```

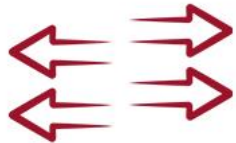
```
Address 0019.557b.7e80
```

```
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
```

```
Aging Time 300
```

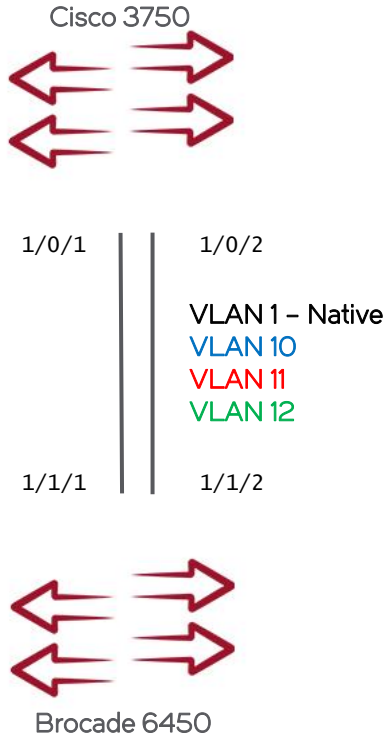
Interface	Role	Sts	Cost	Prio.Nbr	Type
Fa1/0/1	Desg	FWD	19	128.3	P2p
Fa1/0/2	Desg	FWD	19	128.4	P2p

Brocade 6450



# Make It Work! Cisco Elected Root Bridge

## Working Show Commands VLAN 1



### Brocade Show Command

```
ICX6450-24P Switch#show span vlan 1
```

```
STP instance owned by VLAN 1
```

```
Global STP (IEEE 802.1D) Parameters:
```

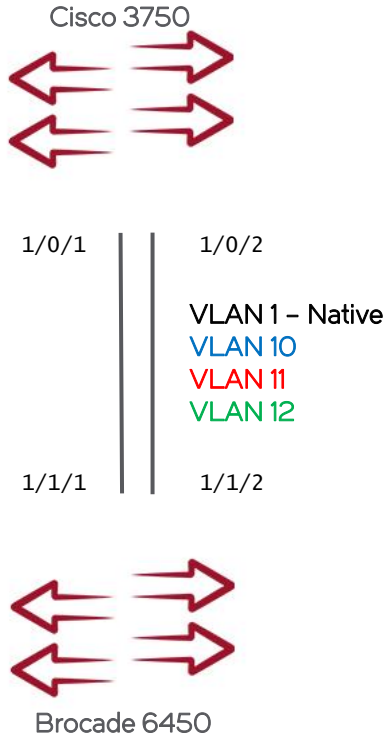
VLAN ID	Root ID	Root Cost	Root Port	Prio	Max Age	He-ll	Ho-ld	Fwd dly	Last Chang	Chg cnt	Bridge Address
1	00010019557b7e80	19	1/1/1	8000	20	2	1	15	1214	1	748ef8834200

```
Port STP Parameters:
```

Port Num	Prio	Path Cost	State	Fwd Trans	Design Cost	Designated Root	Designated Bridge
1/1/1	80	19	FORWARDING	2	0	00010019557b7e80	00010019557b7e80
1/1/2	80	19	BLOCKING	0	0	00010019557b7e80	00010019557b7e80

# Make It Work! Cisco Elected Root Bridge

Show Commands VLAN 10 (remaining VLANs omitted for brevity)



## Cisco Show Commands

```
Switch#show span vlan 10
```

```
VLAN0010
```

```
Spanning tree enabled protocol ieee
```

```
Root ID    Priority    10  
Address    0019.557b.7e80
```

```
This bridge is the root
```

```
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
```

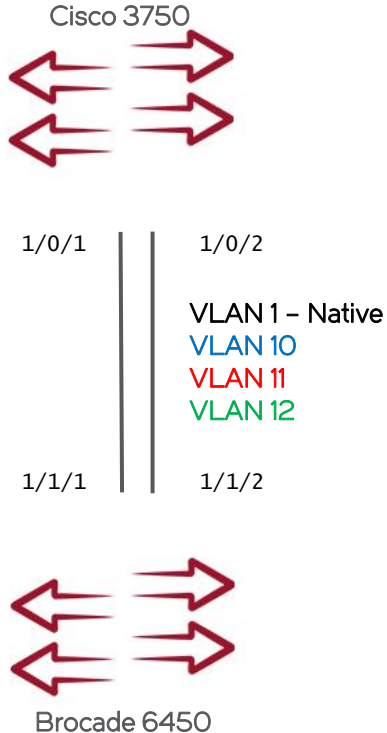
```
Bridge ID  Priority    10    (priority 0 sys-id-ext 10)
```

```
Address    0019.557b.7e80  
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec  
Aging Time 300
```

Interface	Role	Sts	Cost	Prio.Nbr	Type
Fa1/0/1	Desg	FWD	19	128.3	P2p
Fa1/0/2	Desg	FWD	19	128.4	P2p

# Make It Work! Cisco Elected Root Bridge

Show Commands VLAN 10 (remaining VLANs omitted for brevity)



## Brocade Show Command

```
ICX6450-24P Switch#show span vlan 10
```

```
STP instance owned by VLAN 10
```

```
Global STP (IEEE 802.1D) Parameters:
```

VLAN ID	Root ID	Root Cost	Root Port	Prio	Max Age	He- llo sec	Ho- ld sec	Fwd dly sec	Last Chang sec	Chg cnt	Bridge Address
10	000a0019557b7e80	19	1/1/1	8000	20	2	1	15	1513	1	748ef8834200

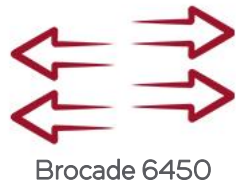
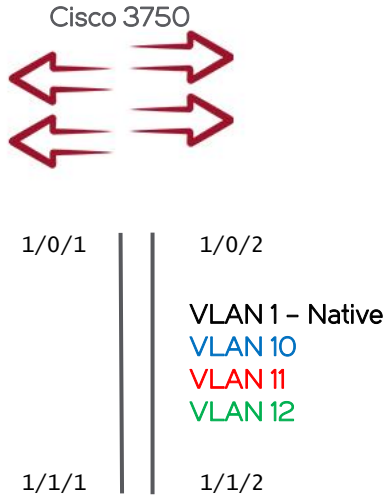
```
Port STP Parameters:
```

Port Num	Prio	Path rity	Cost	State	Fwd Trans	Design Cost	Designated Root	Designated Bridge
1/1/1	80	19		FORWARDING	2	0	000a0019557b7e80	000a0019557b7e80
1/1/2	80	19		BLOCKING	0	0	000a0019557b7e80	000a0019557b7e80



# Make It Work! Brocade Elected Root Bridge

## Config Snippets



### Cisco Config Snippet

```
spanning-tree mode pvst
spanning-tree extend system-id
!
vlan 10-12

interface FastEthernet1/0/1
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 1,10-12
switchport mode trunk

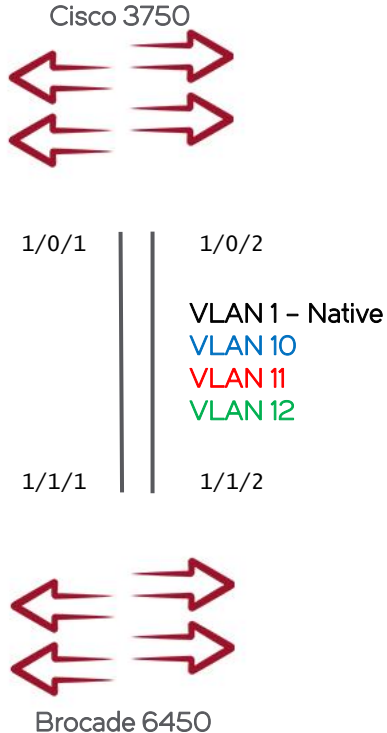
interface FastEthernet1/0/2
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 1,10-12
switchport mode trunk
```

### Brocade Config Snippet

```
vlan 1 by port
tagged ethe 1/1/1 to 1/1/3
spanning-tree priority 0
!
vlan 10 by port
tagged ethe 1/1/1 to 1/1/3
spanning-tree priority 0
!
vlan 11 by port
tagged ethe 1/1/1 to 1/1/3
spanning-tree priority 0
!
vlan 12 by port
tagged ethe 1/1/1 to 1/1/3
spanning-tree priority 0
!
default-vlan-id 499
!
!
interface ethernet 1/1/1
dual-mode 1
!
interface ethernet 1/1/2
dual-mode 1
```

# Make It Work! Brocade Elected Root Bridge

## Working Show Commands VLAN 1



### Cisco Show Commands

```
Switch#show span vlan 1
```

```
VLAN0001
```

```
Spanning tree enabled protocol ieee
```

```
Root ID Priority 0
```

```
Address 748e.f883.4200
```

```
Cost 19
```

```
Port 3 (FastEthernet1/0/1)
```

```
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
```

```
Bridge ID Priority 32769 (priority 32768 sys-id-ext 1)
```

```
Address 0019.557b.7e80
```

```
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
```

```
Aging Time 300
```

```
Interface Role Sts Cost Prio.Nbr Type
```

```
-----
```

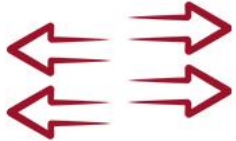
```
Fa1/0/1 Root FWD 19 128.3 P2p
```

```
Fa1/0/2 Altn BLK 19 128.4 P2p
```

# Make It Work! Brocade Elected Root Bridge

## Show Commands VLAN 1

Cisco 3750



### Brocade Show Command

```
ICX6450-24P Switch#show span vlan 1
```

```
STP instance owned by VLAN 1
```

```
Global STP (IEEE 802.1D) Parameters:
```

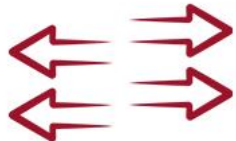
VLAN ID	Root ID	Root Cost	Root Port	Prio	Max Age	He-ll	Ho-ld	Fwd dly	Last Chng	Chg cnt	Bridge Address
1	0000748ef8834200	0	Root	0000	20	2	1	15	163	4	748ef8834200

```
Port STP Parameters:
```

Port Num	Prio	Path Cost	State	Fwd Trans	Design Cost	Designated Root	Designated Bridge
1/1/1	80	19	FORWARDING	2	0	0000748ef8834200	0000748ef8834200
1/1/2	80	19	FORWARDING	1	0	0000748ef8834200	0000748ef8834200

1/0/1 | 1/0/2  
VLAN 1 - Native  
VLAN 10  
VLAN 11  
VLAN 12

1/1/1 | 1/1/2

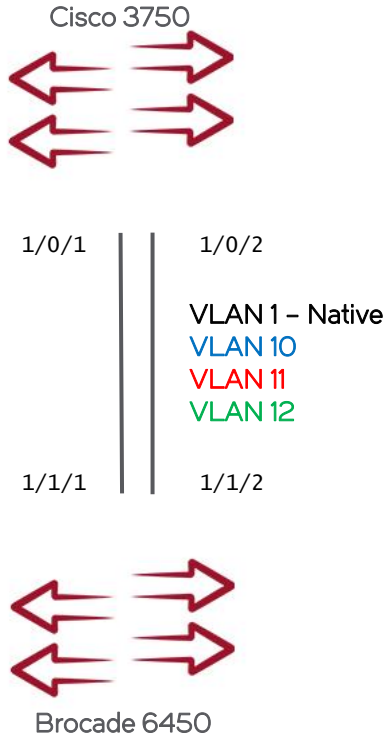


Brocade 6450



# Make It Work! Brocade Elected Root Bridge

Show Commands VLAN 10 (remaining VLANs omitted for brevity)



## Cisco Show Commands

```
Switch#show span vlan 10
```

```
VLAN0010
```

```
Spanning tree enabled protocol ieee
```

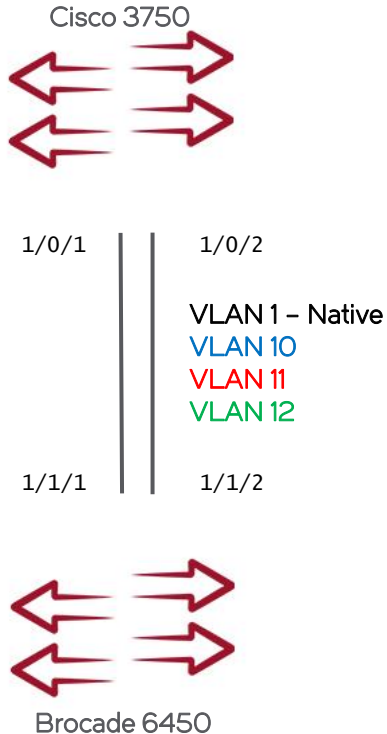
```
Root ID      Priority    0  
            Address    748e.f883.4200  
            Cost      19  
            Port      3 (FastEthernet1/0/1)  
Hello Time   2 sec    Max Age 20 sec    Forward Delay 15 sec
```

```
Bridge ID    Priority    32778 (priority 32768 sys-id-ext 10)  
            Address    0019.557b.7e80  
Hello Time   2 sec    Max Age 20 sec    Forward Delay 15 sec  
Aging Time   300
```

Interface	Role	Sts	Cost	Prio.Nbr	Type
Fa1/0/1	Root	FWD	19	128.3	P2p
Fa1/0/2	Altn	BLK	19	128.4	P2p

# Make It Work! Brocade Elected Root Bridge

Show Commands VLAN 10 (remaining VLANs omitted for brevity)



## Brocade Show Command

```
ICX6450-24P Switch#show span vlan 10
```

```
STP instance owned by VLAN 10
```

```
Global STP (IEEE 802.1D) Parameters:
```

VLAN ID	Root ID	Root Cost	Root Port	Prio	Max Age	He- llo sec	Ho- ld sec	Fwd dly sec	Last Chng sec	Chg cnt	Bridge Address
10	0000748ef8834200	0	Root	0000	20	2	1	15	302	4	748ef8834200

```
Port STP Parameters:
```

Port Num	Prio	Path rity	Cost	State	Fwd Trans	Design Cost	Designated Root	Designated Bridge
1/1/1	80	19		FORWARDING	2	0	0000748ef8834200	0000748ef8834200
1/1/2	80	19		FORWARDING	1	0	0000748ef8834200	0000748ef8834200

# Brocade 802.1w Implementation

Fastiron 7.x +

- Brocade Switch implements 802.1w Rapid Spanning Tree
  - 802.1w Spanning Tree instance Per VLAN
  - BPDU transmitted with associated VLAN ID
  - BPDU destination MAC to STP standard 0180.c200.0000
- Same format as Per VLAN 802.1d except:
  - BPDU Type set to Rapid Spanning Tree within message
  - Other negotiation flags within message

# Cisco Rapid PVST+ Implementation

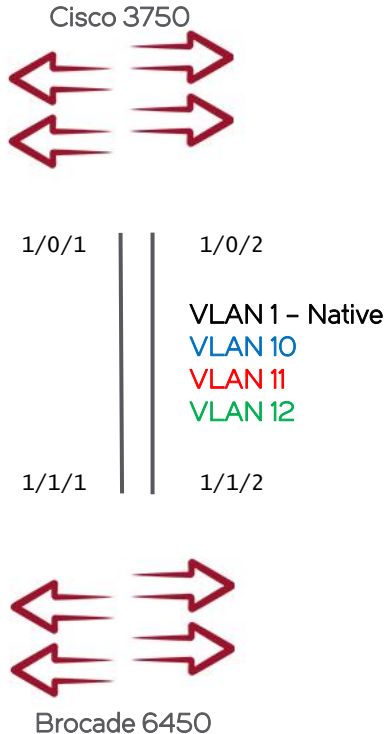
Tested on 3750 running 12.2(25)SEE2

- Cisco implements Rapid PVST+ per VLAN
  - BPDUs Sent
    - Untagged IEEE 802.1D BPDU
    - Untagged PVST+ BPDU for Native VLAN (1 Default)
    - Tagged PVST+ BPDUs per VLAN ID
  - IEEE BPDU destination MAC to STP standard 0180.c200.0000
  - PVST+ BPDU destination MAC to proprietary 01:00:0c:cc:cc:cd
- BPDUs have same format as PVST+ except:
  - BPDU Type set to Rapid Spanning Tree within message
  - Other negotiated flags within message



# Make It Work! Cisco Elected Root Bridge

## Important Notes



## Brocade Switch Integration

- Automatically detects Cisco Rapid PVST+ BPDUs
- Converts to Cisco RPVST+ implementation
- Sends Cisco RPVST+ compatible BPDUs for each VLAN

## Match Cisco Native VLAN to Brocade Dual-Mode VLAN

- Cisco sends untagged BPDUs for Native VLAN
- Brocade by default does not process untagged BPDUs on an exclusively tagged interface
- Configured Dual-Mode on Brocade interface that matches Cisco Native VLAN

## Modify Brocade Default VLAN to an unused VLAN ID



# Make It Work! Cisco Elected Root Bridge

## Config Snippets

### Cisco Config Snippet

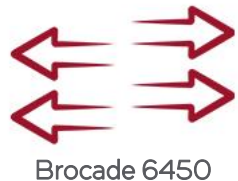
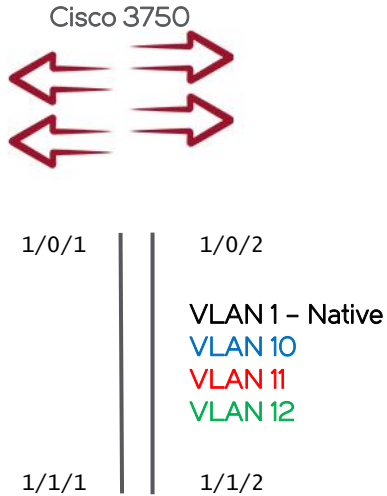
```
spanning-tree mode rapid-pvst
spanning-tree extend system-id
spanning-tree vlan 1,10-12 priority 0
!
vlan 10-12

interface FastEthernet1/0/1
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 1,10-12
switchport mode trunk

interface FastEthernet1/0/2
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 1,10-12
switchport mode trunk
```

### Brocade Config Snippet

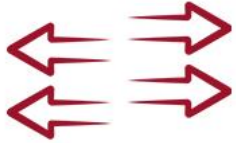
```
vlan 1 by port
tagged ethe 1/1/1 to 1/1/3
spanning-tree 802-1w
!
vlan 10 by port
tagged ethe 1/1/1 to 1/1/3
spanning-tree 802-1w
!
vlan 11 by port
tagged ethe 1/1/1 to 1/1/3
spanning-tree 802-1w
!
vlan 12 by port
tagged ethe 1/1/1 to 1/1/3
spanning-tree 802-1w
!
default-vlan-id 499
!
interface ethernet 1/1/1
dual-mode 1
spanning-tree 802-1w admin-pt2pt-mac
!
interface ethernet 1/1/2
dual-mode 1
spanning-tree 802-1w admin-pt2pt-mac
```



# Make It Work! Cisco Elected Root Bridge

## Working Show Commands VLAN 1

Cisco 3750



1/0/1 | 1/0/2

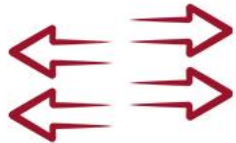
VLAN 1 - Native

VLAN 10

VLAN 11

VLAN 12

1/1/1 | 1/1/2



Brocade 6450

### Cisco Show Commands

```
Switch#show span vlan 1
```

```
VLAN0001
```

```
Spanning tree enabled protocol rstp
```

```
Root ID Priority 1  
Address 0019.557b.7e80
```

```
This bridge is the root
```

```
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
```

```
Bridge ID Priority 1 (priority 0 sys-id-ext 1)
```

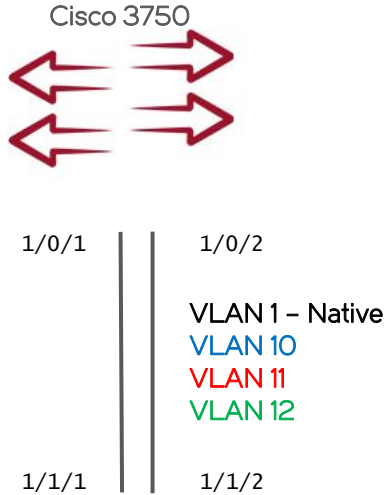
```
Address 0019.557b.7e80  
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec  
Aging Time 300
```

Interface	Role	Sts	Cost	Prio.Nbr	Type
Fa1/0/1	Desg	FWD	19	128.3	P2p
Fa1/0/2	Desg	FWD	19	128.4	P2p



# Make It Work! Cisco Elected Root Bridge

## Working Show Commands VLAN 1



### Brocade Show Command

```
ICX6450-24P Switch#show 802-1w vlan 1
```

```
--- VLAN 1 [ STP Instance owned by VLAN 1 ] -----
```

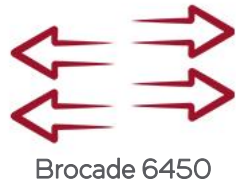
Bridge IEEE 802.1W Parameters:

Bridge Identifier	Bridge MaxAge	Bridge Hello	Bridge FwdDly	Force Version	tx Hold
hex	sec	sec	sec	Default	cnt
8000748ef8834200	20	2	15	Default	3

RootBridge Identifier	RootPath Cost	DesignatedBridge Identifier	Root Port	Max Age	Fwd Dly	Hel lo
hex		hex		sec	sec	sec
00010019557b7e80	200000	00010019557b7e80	1/1/1	20	15	2

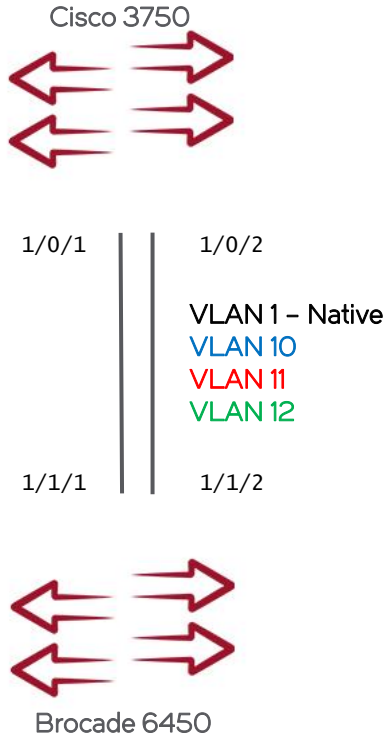
Port IEEE 802.1W Parameters:

Port Num	Pri	PortPath Cost	P2P Mac	Edge Port	Role	State	Designated cost	Designated bridge
1/1/1	128	200000	T	F	ROOT	FORWARDING	0	00010019557b7e80
1/1/2	128	200000	T	F	ALTERNATE	DISCARDING	0	00010019557b7e80



# Make It Work! Cisco Elected Root Bridge

Show Commands VLAN 10 (remaining VLANs omitted for brevity)



## Cisco Show Commands

```
Switch#show span vlan 10
```

```
VLAN0010
```

```
Spanning tree enabled protocol rstp
```

```
Root ID    Priority    10  
Address    0019.557b.7e80
```

```
This bridge is the root
```

```
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
```

```
Bridge ID  Priority    10    (priority 0 sys-id-ext 10)
```

```
Address    0019.557b.7e80
```

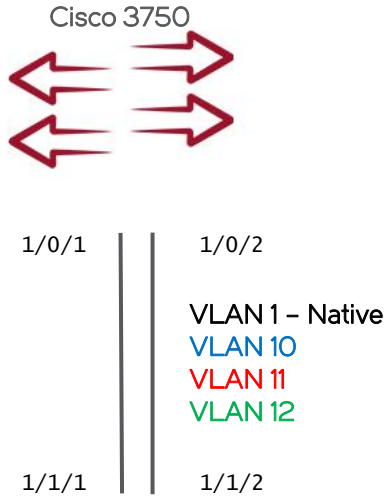
```
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
```

```
Aging Time 300
```

Interface	Role	Sts	Cost	Prio.Nbr	Type
Fa1/0/1	Desg	FWD	19	128.3	P2p
Fa1/0/2	Desg	FWD	19	128.4	P2p

# Make It Work! Cisco Elected Root Bridge

Show Commands VLAN 10 (remaining VLANs omitted for brevity)



## Brocade Show Command

ICX6450-24P Switch#show 802-1w vlan 10

--- VLAN 10 [ STP Instance owned by VLAN 10 ] -----

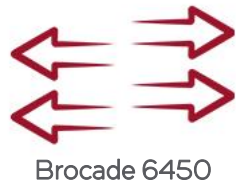
Bridge IEEE 802.1W Parameters:

Bridge Identifier	Bridge MaxAge	Bridge Hello	Bridge FwdDly	Force Version	tx Hold
hex	sec	sec	sec	Default	cnt
8000748ef8834200	20	2	15	Default	3

RootBridge Identifier	RootPath Cost	DesignatedBridge Identifier	Root Port	Max Age	Fwd Dly	Hel lo
hex		hex		sec	sec	sec
000a0019557b7e80	200000	000a0019557b7e80	1/1/1	20	15	2

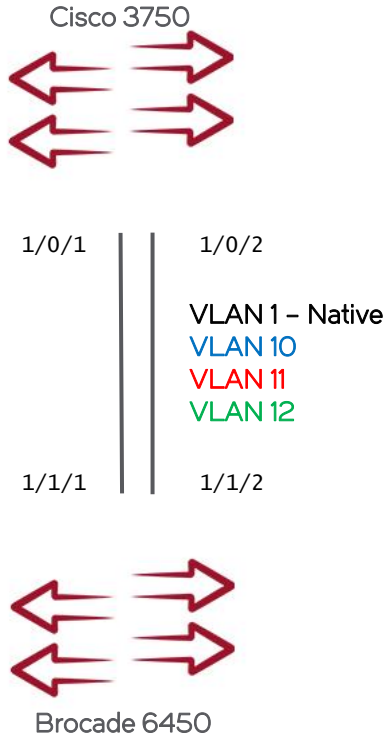
Port IEEE 802.1W Parameters:

Port Num	Pri	PortPath Cost	P2P Mac	Edge Port	Role	State	Designated cost	Designated bridge
1/1/1	128	200000	T	F	ROOT	FORWARDING	0	000a0019557b7e80
1/1/2	128	200000	T	F	ALTERNATE	DISCARDING	0	000a0019557b7e80



# Make It Work! Brocade Elected Root Bridge

## Config Snippets



### Cisco Config Snippet

```
spanning-tree mode rapid-pvst
spanning-tree extend system-id
!
vlan 10-12

interface FastEthernet1/0/1
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 1,10-12
switchport mode trunk

interface FastEthernet1/0/2
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 1,10-12
switchport mode trunk
```

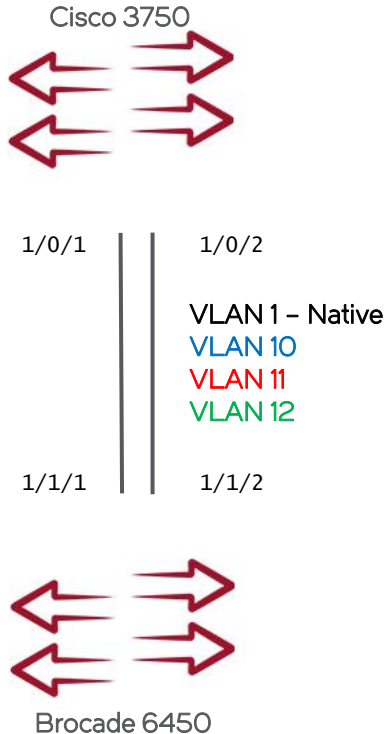
### Brocade Config Snippet

```
vlan 1 by port
tagged ethe 1/1/1 to 1/1/3
spanning-tree 802-1w
spanning-tree 802-1w priority 0
!
vlan 10 by port
tagged ethe 1/1/1 to 1/1/3
spanning-tree 802-1w
spanning-tree 802-1w priority 0
!
vlan 11 by port
tagged ethe 1/1/1 to 1/1/3
spanning-tree 802-1w
spanning-tree 802-1w priority 0
!
vlan 12 by port
tagged ethe 1/1/1 to 1/1/3
spanning-tree 802-1w
spanning-tree 802-1w priority 0
!
default-vlan-id 499

interface ethernet 1/1/1
dual-mode 1
span 8 admin-pt2pt-mac
!
interface ethernet 1/1/2
dual-mode 1
span 8 admin-pt2pt-mac
```

# Make It Work! Brocade Elected Root Bridge

## Working Show Commands VLAN 1



### Cisco Show Commands

```
Switch#show span vlan 1
```

```
VLAN0001
```

```
Spanning tree enabled protocol rstp
```

```
Root ID Priority 0
```

```
Address 748e.f883.4200
```

```
Cost 19
```

```
Port 3 (FastEthernet1/0/1)
```

```
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
```

```
Bridge ID Priority 32769 (priority 32768 sys-id-ext 1)
```

```
Address 0019.557b.7e80
```

```
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
```

```
Aging Time 300
```

```
Interface Role Sts Cost Prio.Nbr Type
```

```
-----
```

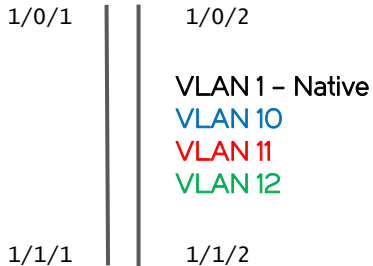
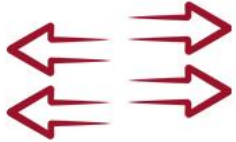
```
Fa1/0/1 Root FWD 19 128.3 P2p
```

```
Fa1/0/2 Altn BLK 19 128.4 P2p
```

# Make It Work! Brocade Elected Root Bridge

## Show Commands VLAN 1

Cisco 3750



### Brocade Show Command

```
ICX6450-24P Switch#show 802-1w vlan 1
```

```
--- VLAN 1 [ STP Instance owned by VLAN 1 ] -----
```

Bridge IEEE 802.1W Parameters:

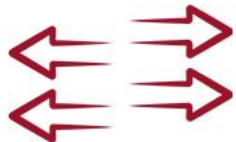
Bridge Identifier	Bridge MaxAge	Bridge Hello	Bridge FwdDly	Force Version	tx Hold
hex	sec	sec	sec	Default	cnt
0000748ef8834200	20	2	15	Default	3

RootBridge Identifier	RootPath Cost	DesignatedBridge Identifier	Root Port	Max Age	Fwd Dly	Hel lo
hex		hex		sec	sec	sec
0000748ef8834200	0	0000748ef8834200	Root	20	15	2

Port IEEE 802.1W Parameters:

Port Num	Pri	PortPath Cost	P2P Mac	Edge Port	Role	State	Designated cost	Designated bridge
1/1/1	128	200000	T	F	DESIGNATED	FORWARDING	0	0000748ef8834200
1/1/2	128	200000	T	F	DESIGNATED	FORWARDING	0	0000748ef8834200

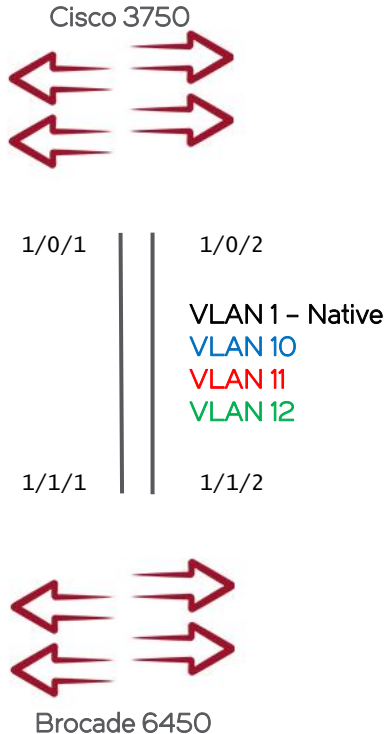
Brocade 6450





# Make It Work! Brocade Elected Root Bridge

Show Commands VLAN 10 (remaining VLANs omitted for brevity)



## Cisco Show Commands

```
Switch#show span vlan 10
```

```
VLAN0010
```

```
Spanning tree enabled protocol rstp
```

```
Root ID      Priority    0  
            Address    748e.f883.4200  
            Cost      19  
            Port      3 (FastEthernet1/0/1)  
            Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
```

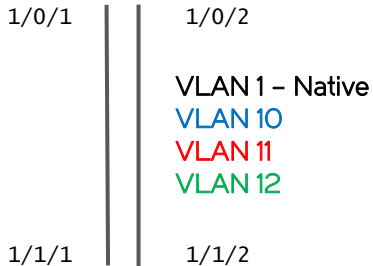
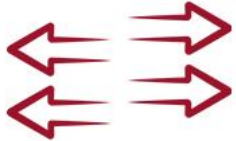
```
Bridge ID    Priority    32778 (priority 32768 sys-id-ext 10)  
            Address    0019.557b.7e80  
            Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec  
            Aging Time 300
```

Interface	Role	Sts	Cost	Prio.Nbr	Type
Fa1/0/1	Root	FWD	19	128.3	P2p
Fa1/0/2	Altn	BLK	19	128.4	P2p

# Make It Work! Brocade Elected Root Bridge

## Show Commands VLAN 10

Cisco 3750



### Brocade Show Command

```
ICX6450-24P Switch#show 802-1w vlan 10
```

```
--- VLAN 10 [ STP Instance owned by VLAN 10 ] -----
```

Bridge IEEE 802.1W Parameters:

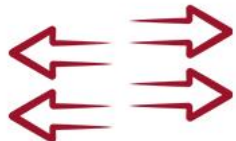
Bridge Identifier	Bridge MaxAge	Bridge Hello	Bridge FwdDly	Force Version	tx Hold
hex	sec	sec	sec	Default	cnt
0000748ef8834200	20	2	15	Default	3

RootBridge Identifier	RootPath Cost	DesignatedBridge Identifier	Root Port	Max Age	Fwd Dly	Hel lo
hex		hex		sec	sec	sec
0000748ef8834200	0	0000748ef8834200	Root	20	15	2

Port IEEE 802.1W Parameters:

Port Num	Pri	PortPath Cost	P2P Mac	Edge Port	Role	State	Designated cost	Designated bridge
1/1/1	128	200000	T	F	DESIGNATED	FORWARDING	0	0000748ef8834200
1/1/2	128	200000	T	F	DESIGNATED	FORWARDING	0	0000748ef8834200

Brocade 6450



# Summary

- Brocade + Cisco Default Implementations provide STP instances Per VLAN
- Brocade automatically detects Cisco BPDUs and adjusts
- Match Brocade Dual-Mode to Cisco Native VLAN
- Brocade + Cisco further support Rapid STP enhancements

Thank you