Ruckus ICX - Extreme Spanning-tree Interoperability

This document show the steps necessary to run IEEE 802.1w (RSTP) in a mixed Ruckus ICX and Extreme switched network. Since spanning-tree needs to be end-to-end in the network for optimal loop prevention, we need to run a version of spanning-tree that is compatible with all the switches in the network. Spanning-tree 802.1d is compatible across most switch vendors and usually on by default, but we want to use a version with faster convergence. RSTP is the best choice, but the standard is not standard across all switch vendors. For this configuration, we will use a Per-VLAN RSTP on both the Extreme and Ruckus switches with the ICX as the root.

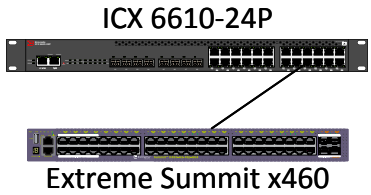
We will set the root priority for the ICX to 8192 decimal (2000 Hex) and leave the Extreme as the default 32768 decimal (8000 Hex).

Note: *Extreme is set to Single instance 802.1d by default with the Default instance "s0".*

Equipment Used

Model	Software Version
Brocade ICX 6610	FI 8.0.30ga
Extreme Summit x460	15.6.2.12

Network Topology



****

Spanning-tree Status before configuration:

Here you can see the Extreme switch is the root:

```
* X460G2-48p-G4.1 # show stpd detail
Stpd: s0                Stp: DISABLED           Number of Ports: 54
Rapid Root Failover: Disabled
Operational Mode: 802.1D                        Default Binding Mode: 802.1D
802.1Q Tag: (none)
Ports: 1,2,3,4,5,6,7,8,9,10,
       11,12,13,14,15,16,17,18,19,20,
       21,22,23,24,25,26,27,28,29,30,
       31,32,33,34,35,36,37,38,39,40,
       41,42,43,44,45,46,47,48,49,50,
       51,52,53,54
Participating Vlans: Default
Auto-bind Vlans: Default
Bridge Priority: 32768
BridgeID:               80:00:00:04:96:99:ee:41
Designated root:        00:00:00:00:00:00:00:00
RootPathCost: 0         Root Port: ----
MaxAge: 0s              HelloTime: 0s           ForwardDelay: 0s
CfgBrMaxAge: 20s        CfgBrHelloTime: 2s      CfgBrForwardDelay: 15s
Topology Change Time: 35s                       Hold time: 1s
Topology Change Detected: FALSE                 Topology Change: FALSE
Number of Topology Changes: 0
Time Since Last Topology Change: 0s
```

Note: Root cost is 0.

****

ICX Configuration

Here are the current VLANs on the Brocade:

```
SSH@Lab-6610#sh vlan br

System-max vlan Params: Max(4095) Default(64) Current(64)
Default vlan Id :1499
Total Number of vlan Configured :7
VLANs Configured :10 20 27 30 40 1000 1499

SSH@Lab-6610#
```

Enter enable, then configuration mode.

Enter the following commands:

```
SSH@Lab-6610(config)#vlan 10
SSH@Lab-6610(config-vlan-10)#spanning-tree 802-1w
SSH@Lab-6610(config-vlan-10)#
SSH@Lab-6610(config-vlan-10)#spanning-tree 802-1w priority 8192
SSH@Lab-6610(config-vlan-10)#
SSH@Lab-6610(config-vlan-10)#vlan 20
SSH@Lab-6610(config-vlan-20)#
SSH@Lab-6610(config-vlan-20)#spanning-tree 802-1w
SSH@Lab-6610(config-vlan-20)#
SSH@Lab-6610(config-vlan-20)#spanning-tree 802-1w priority 8192
SSH@Lab-6610(config-vlan-20)#
SSH@Lab-6610(config-vlan-20)#vlan 30
SSH@Lab-6610(config-vlan-30)#
SSH@Lab-6610(config-vlan-30)#spanning-tree 802-1w
SSH@Lab-6610(config-vlan-30)#
SSH@Lab-6610(config-vlan-30)#spanning-tree 802-1w priority 8192
SSH@Lab-6610(config-vlan-30)#
SSH@Lab-6610(config-vlan-30)#vlan 40
SSH@Lab-6610(config-vlan-40)#
SSH@Lab-6610(config-vlan-40)#spanning-tree 802-1w
SSH@Lab-6610(config-vlan-40)#
SSH@Lab-6610(config-vlan-40)#spanning-tree 802-1w priority 8192
SSH@Lab-6610(config-vlan-40)#
```

Note: We set the Priority to 8192 decimal to make this the root switch.

Verify the Spanning-tree configuration on the Brocade:

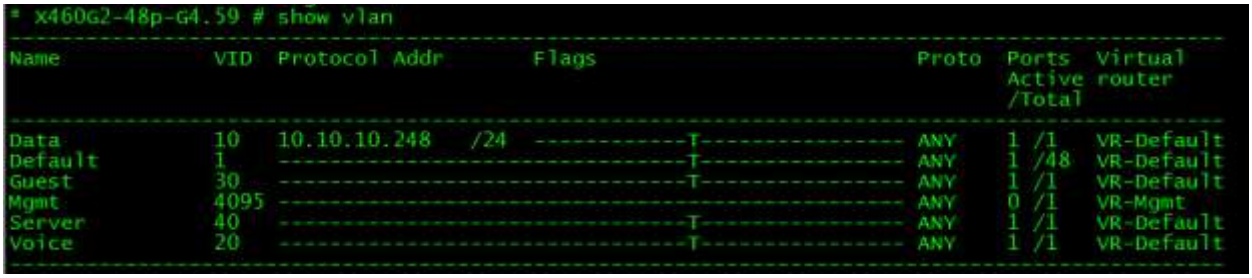
```
--- VLAN 10 [ STP Instance owned by VLAN 10 ] ----------------------------

Bridge IEEE 802.1W Parameters:

Bridge            Bridge Bridge Bridge Force    tx
Identifier        MaxAge Hello  FwdDly Version  Hold
hex               sec    sec    sec             cnt
2000cc4e2413f470  20     2      15     Default  3

RootBridge        RootPath  DesignatedBri-   Root   Max Fwd Hel
Identifier        Cost      dge Identifier   Port   Age Dly lo
hex                         hex                      sec sec sec
2000cc4e2413f470  0         2000cc4e2413f470 Root   20  15  2

Port IEEE 802.1W Parameters:
```

Note: The Bridge Identifier is the priority in Hex and the MAC Address and the root cost is 0. You will see this on the HP as the Root MAC Address.

****

Extreme Summit Configuration

Here are the current VLANs on the Extreme Summit:



```
* x460G2-48p-G4.59 # show vlan
-------------------------------------------------------------------------------
Name            VID  Protocol Addr       Flags                     Proto  Ports  Virtual
                                                                           Active router
                                                                           /Total
-------------------------------------------------------------------------------
Data            10   10.10.10.248   /24  ----------T---------------- ANY    1 /1   VR-Default
Default         1    ----------------------------T---------------- ANY    1 /48  VR-Default
Guest           30   ----------------------------T---------------- ANY    1 /1   VR-Default
Mgmt            4095 ------------------------------------------------ ANY    0 /1   VR-Mgmt
Server          40   ----------------------------T---------------- ANY    1 /1   VR-Default
Voice           20   ----------------------------T---------------- ANY    1 /1   VR-Default
-------------------------------------------------------------------------------
```

Enter the following configuration at the command line to configure RPVST:

 # Create seperate instance for each VLAN
 # Data_VLAN
create stpd RSTP_Data
configure stpd RSTP_Data mode dot1w
 # Voice_VLAN
create stpd RSTP_Voice
configure stpd RSTP_Voice mode dot1w
 # Guest_VLAN
create stpd RSTP_Guest
configure stpd RSTP_Guest mode dot1w
 # Server_VLAN
create stpd RSTP_Server
configure stpd RSTP_Server mode dot1w
configure stpd s0 add vlan Default ports 48 pvst-plus
 # Set STP type for the ports
configure stpd RSTP_Data add vlan Data ports 48 pvst-plus
configure stpd RSTP_Voice add vlan Voice ports 48 pvst-plus
configure stpd RSTP_Guest add vlan Guest ports 48 pvst-plus
configure stpd RSTP_Server add vlan Server ports 48 pvst-plus
 # Configure VLAN tags for the STP Instance and enable
configure stpd s0 tag 1
configure stpd RSTP_Data tag 10
enable stpd RSTP_Data
configure stpd RSTP_Voice tag 20
enable stpd RSTP_Voice
configure stpd RSTP_Guest tag 30
enable stpd RSTP_Guest
configure stpd RSTP_Server tag 40
enable stpd RSTP_Server

Verify Spanning-tree on the Extreme:

show stpd detail

```
* X460G2-48p-G4.60 # show stpd detail
Stpd: RSTP_Data         Stp: ENABLED            Number of Ports: 1
Rapid Root Failover: Disabled
Operational Mode: 802.1W                        Default Binding Mode: EMISTP
802.1Q Tag: 10
Ports: 48
Participating Vlans: Data
Auto-bind Vlans: (none)
Bridge Priority: 32768
BridgeID:               80:00:00:04:96:99:ee:41
Designated root:        20:00:cc:4e:24:13:f4:70
RootPathCost: 20000     Root Port: 48
MaxAge: 20s             HelloTime: 2s           ForwardDelay: 15s
CfgBrMaxAge: 20s        CfgBrHelloTime: 2s      CfgBrForwardDelay: 15s
Topology Change Time: 35s                       Hold time: 1s
Topology Change Detected: FALSE                 Topology Change: FALSE
Number of Topology Changes: 2
Time Since Last Topology Change: 2295s
```

Note: *The Root Path Cost is 20000 and not 0 and the Root MAC Address is the MAC of the ICX 6610. The priority of the root is 8192 and the root port is 48 (this is the port connecting the ICX 6610).*