3. Switch Virtualization

Switch Configuration - OpenFlow Configuration

It is possible to configure multiple virtual OpenFlow swithces on the Pronto Switch. For a more detailed explanation, look at the presentation at: Pronto_Virtualization.pdf

1 - The first step is to create a bridge for each virtual switch desired:

```
ovs-vsctl add-br br0 -- set bridge br0 datapath_type=pica8 protocols=OpenFlow10
ovs-vsctl add-br br1 -- set bridge br1 datapath_type=pica8 protocols=OpenFlow10
ovs-vsctl add-br br2 -- set bridge br2 datapath_type=pica8 protocols=OpenFlow10
```

2 - The next step is to add to each bridge the ports that will be used:

```
ovs-vsctl add-port br0 ge-1/1/1 vlan_mode=trunk -- set Interface ge-1/1/1 type=pica8
ovs-vsctl add-port br0 ge-1/1/2 vlan_mode=trunk -- set Interface ge-1/1/2 type=pica8
ovs-vsctl add-port br0 ge-1/1/3 vlan_mode=trunk -- set Interface ge-1/1/3 type=pica8
ovs-vsctl add-port br0 ge-1/1/4 vlan_mode=trunk -- set Interface ge-1/1/4 type=pica8

ovs-vsctl add-port br1 ge-1/1/5 vlan_mode=trunk -- set Interface ge-1/1/5 type=pica8
ovs-vsctl add-port br1 ge-1/1/6 vlan_mode=trunk -- set Interface ge-1/1/6 type=pica8
ovs-vsctl add-port br1 ge-1/1/7 vlan_mode=trunk -- set Interface ge-1/1/7 type=pica8
ovs-vsctl add-port br1 ge-1/1/8 vlan_mode=trunk -- set Interface ge-1/1/8 type=pica8

ovs-vsctl add-port br2 ge-1/1/9 vlan_mode=trunk -- set Interface ge-1/1/9 type=pica8
ovs-vsctl add-port br2 ge-1/1/10 vlan_mode=trunk -- set Interface ge-1/1/10 type=pica8
ovs-vsctl add-port br2 ge-1/1/11 vlan_mode=trunk -- set Interface ge-1/1/11 type=pica8
ovs-vsctl add-port br2 ge-1/1/12 vlan_mode=trunk -- set Interface ge-1/1/12 type=pica8
```

> (i) It's possible to add as many ports as the operator wants to each bridge (virtual OpenFlow switch).

3 - Verify if the ports were correctly added to each bridge, for example:

```
ovs-ofctl show br0
...
```

The command should show an output similar to this one:

```
root@PicOS-OVS#ovs-ofctl show br0
OFPT_FEATURES_REPLY (xid=0x2): dpid:678c089e0162d735
n_tables:254, n_buffers:256
capabilities: FLOW_STATS TABLE_STATS PORT_STATS STP ARP_MATCH_IP
actions: OUTPUT SET_VLAN_VID SET_VLAN_PCP SET_DL_SRC SET_DL_DST ENQUEUE
 1(ge-1/1/1): addr:08:9e:01:62:d7:35
     config:     0
     state:      LINK_DOWN
     current:    10MB-HD COPPER AUTO_NEG
     advertised: 10MB-HD 10MB-FD 100MB-HD 100MB-FD 1GB-FD COPPER AUTO_NEG
     supported:  10MB-HD 10MB-FD 100MB-HD 100MB-FD 1GB-FD COPPER AUTO_NEG
     speed: 10 Mbps now, 1000 Mbps max
 2(ge-1/1/2): addr:08:9e:01:62:d7:35
     config:     0
     state:      LINK_UP
     current:    1GB-FD COPPER AUTO_NEG
     advertised: 10MB-HD 10MB-FD 100MB-HD 100MB-FD 1GB-FD COPPER AUTO_NEG
     supported:  10MB-HD 10MB-FD 100MB-HD 100MB-FD 1GB-FD COPPER AUTO_NEG
     peer:       10MB-HD 10MB-FD 100MB-HD 100MB-FD 1GB-FD COPPER
     speed: 1000 Mbps now, 1000 Mbps max
 3(ge-1/1/3): addr:08:9e:01:62:d7:35
     config:     0
     state:      LINK_DOWN
     current:    10MB-HD COPPER AUTO_NEG
     advertised: 10MB-HD 10MB-FD 100MB-HD 100MB-FD 1GB-FD COPPER AUTO_NEG
     supported:  10MB-HD 10MB-FD 100MB-HD 100MB-FD 1GB-FD COPPER AUTO_NEG
     speed: 10 Mbps now, 1000 Mbps max
 LOCAL(br0): addr:08:9e:01:62:d7:35
     config:     0
     state:      LINK_UP
     current:    10MB-FD COPPER
     supported:  10MB-FD COPPER
     speed: 10 Mbps now, 10 Mbps max
OFPT_GET_CONFIG_REPLY (xid=0x4): frags=normal miss_send_len=0
root@PicOS-OVS#
```

4 - Set the controller of the bridges to FlowVisor

```
ovs-vsctl set-controller br0 tcp:10.X.0.101:6633
ovs-vsctl set-controller br1 tcp:10.X.0.101:6633
ovs-vsctl set-controller br2 tcp:10.X.0.101:6633
```