Multipoint EVC (ELAN) Test Case Document.

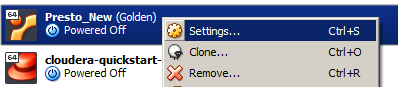
**Prerequisites -**

**Prerequisite 1 - Additional three Network interfaces attached to VM.**

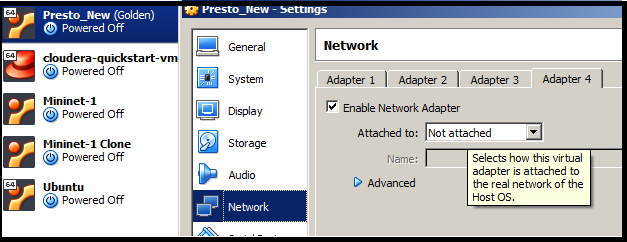
* As we are creating network topology with three end points (external interfaces) to establish EVPL service, we need three interfaces attached to the VM for the simulation.

Shutdown MEF-DEV VM.

From Virtualbox Manager, Right Click on MEF\_DEV VM and select settings option as mentioned below.



Under settings, Click Network tab from left hand side menu. Select Adapter and check Enabled box.



Note - *Adapter 2 and Adapter 3 are configured in similar way as mentioned in the screenshot and after above step, total 4 interfaces attached to the VM. (Adapter 1 --> NAT, Adapter 2,3,4 --> Enabled but NOT attached to any network as shown in screenshot.)*

**Prerequisite 2 - Clean ODL build with latest code and two below mentioned features installed.**

Freshly build unimgr setup from branch stable-nitrogen in ***https://github.com/santanude/unimgr*** to local /home/mef-dev directory with **odl-unimgr-ovs-driver** and odl-**unimgr-legato-api** features already installed on the karaf.

Start VM from Oracle Virtual Box and **login as mef-dev/mef-dev**

Open two LXTerminals (CLI) - One for Karaf and other one for Mininet

Open Postman Client.

Open Firefox Web browser.

# Start Karaf -

*Form CLI prompt of VM, Change directory to karaf startup script.*

#cd unimgr/karaf/target/assembly/bin

#./karaf

*Wait until Karaf loads completely and fetches port conflict error on the console.(this is known issue and can be ignored.)*

# Start Mininet Custom Multipoint Topology script -

*Form CLI prompt of VM, Change directory to Mininet Custom topology script.*

#cd unimgr/resources

*Start Custom topology script and attach external interfaces to OF Switches.*

#sudo python create\_topology\_multipoint.py 127.0.0.1 enp0s8 enp0s9 enp0s10

enter super user password mef-dev

*Wait till Mininet prompt shows up, issue pingall from mininet prompt and* ***it should succeed****.*

mininet>pingall

Open Web browser and hit url http://localhost:8080/index.html#/topology make sure topology is intact.

# Check default Flows OpenFlow switches -

**Once Network topology gets created and connected with Open Daylight controller, default flows gets propagated in the network, we can check and verify the same using following commands on S1, S2 & S3.**

#sudo ovs-ofctl -O OpenFlow13 dump-flows s1

# sudo ovs-ofctl -O OpenFlow13 dump-flows s2

#sudo ovs-ofctl -O OpenFlow13 dump-flows s3

#sudo ovs-ofctl -O OpenFlow13 dump-flows s4

**Output should be as follows -**

**#sudo ovs-ofctl -O OpenFlow13 dump-flows s1**

cookie=0x2b00000000000002, duration=161.686s, table=0, n\_packets=33, n\_bytes=2805, priority=100,dl\_type=0x88cc actions=CONTROLLER:65535

cookie=0x2b00000000000006, duration=156.305s, table=0, n\_packets=0, n\_bytes=0, priority=2,in\_port=enp0s3 actions=output:"s1-eth2",output:"s1-eth1",CONTROLLER:65535

cookie=0x2b00000000000007, duration=156.283s, table=0, n\_packets=24, n\_bytes=1904, priority=2,in\_port="s1-eth2" actions=output:enp0s3,output:"s1-eth1"

cookie=0x2b00000000000008, duration=156.283s, table=0, n\_packets=12, n\_bytes=952, priority=2,in\_port="s1-eth1" actions=output:enp0s3,output:"s1-eth2",CONTROLLER:65535

cookie=0x2b00000000000002, duration=161.686s, table=0, n\_packets=0, n\_bytes=0, priority=0 actions=drop

**#sudo ovs-ofctl -O OpenFlow13 dump-flows s2**

cookie=0x2b00000000000000, duration=161.686s, table=0, n\_packets=33, n\_bytes=2805, priority=100,dl\_type=0x88cc actions=CONTROLLER:65535

cookie=0x2b00000000000000, duration=156.406s, table=0, n\_packets=0, n\_bytes=0, priority=2,in\_port=enp0s8 actions=output:"s2-eth2",output:"s2-eth1",CONTROLLER:65535

cookie=0x2b00000000000001, duration=156.368s, table=0, n\_packets=24, n\_bytes=1904, priority=2,in\_port="s2-eth2" actions=output:enp0s8,output:"s2-eth1"

cookie=0x2b00000000000002, duration=156.357s, table=0, n\_packets=12, n\_bytes=952, priority=2,in\_port="s2-eth1" actions=output:enp0s8,output:"s2-eth2",CONTROLLER:65535

cookie=0x2b00000000000000, duration=161.687s, table=0, n\_packets=0, n\_bytes=0, priority=0 actions=drop

**#sudo ovs-ofctl -O OpenFlow13 dump-flows s3**

cookie=0x2b00000000000001, duration=161.687s, table=0, n\_packets=33, n\_bytes=2805, priority=100,dl\_type=0x88cc actions=CONTROLLER:65535

cookie=0x2b00000000000003, duration=156.359s, table=0, n\_packets=0, n\_bytes=0, priority=2,in\_port=enp0s9 actions=output:"s3-eth2",output:"s3-eth1",CONTROLLER:65535

cookie=0x2b00000000000004, duration=156.359s, table=0, n\_packets=24, n\_bytes=1904, priority=2,in\_port="s3-eth2" actions=output:enp0s9,output:"s3-eth1"

cookie=0x2b00000000000005, duration=156.328s, table=0, n\_packets=12, n\_bytes=952, priority=2,in\_port="s3-eth1" actions=output:enp0s9,output:"s3-eth2",CONTROLLER:65535

cookie=0x2b00000000000001, duration=161.687s, table=0, n\_packets=0, n\_bytes=0, priority=0 actions=drop

**#sudo ovs-ofctl -O OpenFlow13 dump-flows s4**

cookie=0x2b00000000000003, duration=161.502s, table=0, n\_packets=96, n\_bytes=8160, priority=100,dl\_type=0x88cc actions=CONTROLLER:65535

cookie=0x2b00000000000009, duration=156.301s, table=0, n\_packets=12, n\_bytes=952, priority=2,in\_port="s4-eth3" actions=output:"s4-eth2",output:"s4-eth1"

cookie=0x2b0000000000000a, duration=156.301s, table=0, n\_packets=12, n\_bytes=952, priority=2,in\_port="s4-eth2" actions=output:"s4-eth3",output:"s4-eth1"

cookie=0x2b0000000000000b, duration=156.226s, table=0, n\_packets=12, n\_bytes=952, priority=2,in\_port="s4-eth1" actions=output:"s4-eth3",output:"s4-eth2"

cookie=0x2b00000000000003, duration=161.502s, table=0, n\_packets=0, n\_bytes=0, priority=0 actions=drop

**Delete Flows on S1, S2 and S3 OpenFlow switches-**

**This step is required to remove the defaults flows propagated from ODL to OFSwitches in order to route the traffic from EVPL service once it is created.**

*Open CLI and issue following commands for removing default flows.*

# sudo ovs-ofctl -O OpenFlow13 del-flows s1

# sudo ovs-ofctl -O OpenFlow13 del-flows s2

# sudo ovs-ofctl -O OpenFlow13 del-flows s3

*Verify S1 and S2 returns no flows.*

#sudo ovs-ofctl -O OpenFlow13 dump-flows s1

# sudo ovs-ofctl -O OpenFlow13 dump-flows s2

# sudo ovs-ofctl -O OpenFlow13 dump-flows s3

*Make sure flows on S4 are intact.*

#sudo ovs-ofctl -O OpenFlow13 dump-flows s4

*Issue pingall from mininet prompt and* ***it should fail****.*

# Create ELAN service using postman.

Open Postman collection in Postman Client.

Hit Step 0, 1 sequentially.

Hit Step 2 - Multipoint to Multipoint EVC.

Hit Step 3A and confirm that connectivity service is created.

# Verify new flows are propagated on OFSwiches after creating EVPL Service.

On CLI prompt, issue following commands to check new Flows are created on S1 and S2.

#sudo ovs-ofctl -O OpenFlow13 dump-flows s1

# sudo ovs-ofctl -O OpenFlow13 dump-flows s2

# sudo ovs-ofctl -O OpenFlow13 dump-flows s3

**Make sure output of the command should be as follows and field marked in yellow.**

#**sudo ovs-ofctl -O OpenFlow13 dump-flows s1**

cookie=0x0, duration=6.598s, table=0, n\_packets=0, n\_bytes=0, priority=20,in\_port="s1-eth2",dl\_vlan=301 actions=pop\_vlan,output:"s1-eth1"

cookie=0x0, duration=6.615s, table=0, n\_packets=2, n\_bytes=170, priority=10,in\_port="s1-eth2" actions=drop

cookie=0x0, duration=6.585s, table=0, n\_packets=0, n\_bytes=0, priority=20,in\_port="s1-eth1" actions=push\_vlan:0x8100,set\_field:4397->vlan\_vid,set\_queue:202,output:"s1-eth2"

cookie=0x0, duration=6.608s, table=0, n\_packets=0, n\_bytes=0, priority=0 actions=drop

**#sudo ovs-ofctl -O OpenFlow13 dump-flows s2**

cookie=0x0, duration=8.556s, table=0, n\_packets=0, n\_bytes=0, priority=20,in\_port="s2-eth2",dl\_vlan=301 actions=pop\_vlan,output:"s2-eth1"

cookie=0x0, duration=8.679s, table=0, n\_packets=2, n\_bytes=170, priority=10,in\_port="s2-eth2" actions=drop

cookie=0x0, duration=8.368s, table=0, n\_packets=0, n\_bytes=0, priority=20,in\_port="s2-eth1" actions=push\_vlan:0x8100,set\_field:4397->vlan\_vid,set\_queue:200,output:"s2-eth2"

cookie=0x0, duration=8.614s, table=0, n\_packets=0, n\_bytes=0, priority=0 actions=drop

**#sudo ovs-ofctl -O OpenFlow13 dump-flows s2**

cookie=0x0, duration=7.234s, table=0, n\_packets=0, n\_bytes=0, priority=20,in\_port="s3-eth2",dl\_vlan=301 actions=pop\_vlan,output:"s3-eth1"

cookie=0x0, duration=7.269s, table=0, n\_packets=2, n\_bytes=170, priority=10,in\_port="s3-eth2" actions=drop

cookie=0x0, duration=7.213s, table=0, n\_packets=0, n\_bytes=0, priority=20,in\_port="s3-eth1" actions=push\_vlan:0x8100,set\_field:4397->vlan\_vid,set\_queue:201,output:"s3-eth2"

cookie=0x0, duration=7.255s, table=0, n\_packets=0, n\_bytes=0, priority=0 actions=drop

# Verify ELAN service is established.

To verify now H1,H2 and H3 can communicate with each other, issue pingall command from mininet prompt. It should succeed.

mininet>pingall

Output should be as follows.

mininet> pingall

\*\*\* Ping: testing ping reachability

h1 -> h2 h3

h2 -> h1 h3

h3 -> h1 h2

\*\*\* Results: 0% dropped (6/6 received)

# Delete ELAN Service

To Delete ELAN service, use Postman collection.

From postman Collection hit Step 4 to delete the EVPL service.

Hit Step 3A to check and verify that the service is deleted from ODL.

# Verify flows are updated on OFSwiches after deleting EVPL Service.

From CLI prompt, issue following commands to check and verify the flows on S1 and S2 are modified and vlan tags are removed from the existing flows.

#sudo ovs-ofctl -O OpenFlow13 dump-flows s1

# sudo ovs-ofctl -O OpenFlow13 dump-flows s2

# sudo ovs-ofctl -O OpenFlow13 dump-flows s3

Output should be as follows. Make sure there is no dl\_vlan=301 tag after deleting the EVPL.

**#sudo ovs-ofctl -O OpenFlow13 dump-flows s1**

cookie=0x0, duration=497.979s, table=0, n\_packets=100, n\_bytes=8500, priority=10,in\_port="s1-eth2" actions=drop

cookie=0x0, duration=497.972s, table=0, n\_packets=0, n\_bytes=0, priority=0 actions=drop

**# sudo ovs-ofctl -O OpenFlow13 dump-flows s2**

cookie=0x0, duration=500.054s, table=0, n\_packets=100, n\_bytes=8500, priority=10,in\_port="s2-eth2" actions=drop

cookie=0x0, duration=499.989s, table=0, n\_packets=0, n\_bytes=0, priority=0 actions=drop

**# sudo ovs-ofctl -O OpenFlow13 dump-flows s3**

cookie=0x0, duration=498.655s, table=0, n\_packets=100, n\_bytes=8500, priority=10,in\_port="s3-eth2" actions=drop

cookie=0x0, duration=498.641s, table=0, n\_packets=0, n\_bytes=0, priority=0 actions=drop

# Verify H1, H2 and H3 are not able to communicate as ELAN service is removed.

From mininet prompt, try pingall and it should fail.

Output should be as follows.

mininet> pingall

\*\*\* Ping: testing ping reachability

h1 -> X X

h2 -> X X

h3 -> X X

\*\*\* Results: 100% dropped (0/6 received)

mininet>