WIM
and dynamic inter-datacenter connectivity using OSM

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Scenario

PoP-A (VIM)

VNF-1

Linux Br

Phy. Int.

VLAN-A

Provider Network

VNF-1

PoP-B (VIM)

VNF-2

Linux Br

Phy. Int.

VLAN-B

Provider Network

Switch A

Port

Switch B

Port

VLAN rewrite

Virtual Link

SDN Network
Scope

- **WIM/SDN integration** for controlling WAN links

- What this feature is **NOT**:  
  - Automatic multi-site placement  
  - Automatic WAN slicing

(although it is an enabler)
Feature 5945

- Enable dynamic connectivity setup in multi-site Network Services
- Debuted as experimental feature in OSM Release FIVE

- Abstraction Layer (black-box approach) – delegation
- Plugin-based:
  - T-API connector currently in development
  - Supports different connector running independently <> Coexisting domains
Responsibilities

- **WIM Engine:**
  - Find available WIMs
  - Check feasibility
  - Decompose and schedule the work in a series of tasks

- **WIM Thread**
  - Coordinate threaded execution of tasks (e.g. pre-conditions, re-scheduling)
  - Extract parameters from different parts of the RO (e.g. VLAN)

- **WIM Connector**
  - Abstract external WIM / SDN calls to a common API
Control Flow

- NS scanning
  - Identify required VLD <> WAN links
- WIM selection / feasibility analysis
- “Wish List”
- Collect data from local networks
- WIM/SDN communication via WIM Connectors
Step 1: Register the VIMs

```
--config "{"external_connections":[
  {"condition": {
    "provider:physical_network": "provider",
    "provider:network_type": "vlan"},
  "vim_external_port": {
    "switch": "openflow:1",
    "port": "1"}}
]}
```

```
--config "{"external_connections":[
  {"condition": {
    "provider:physical_network": "provider",
    "provider:network_type": "vlan"},
  "vim_external_port": {
    "switch": "openflow:4",
    "port": "13"}}
]}
```
Step 2: Register the WIM

```
step 2: register the wim

osm wim-create
   --name wim-demo
   --url ${WIM_URL}
   --user ${WIM_USER}
   --password ${WIM_PWD}
   --wim_type odl
   --description "Demo WIM"
   --wim_port_mapping ./wim_ports.yaml
```

WIM specific information (how to recognize/operate the endpoint)

```
---
datacenter_name: "openstack-test-1"
pop_wan_mappings:
  - pop_switch_dpid: "openflow:1"
pop_switch_port: 1
  wan_service_endpoint_id: "0000-0000-0000-0001"
  wan_service_mapping_info:
    mapping_type: direct-connect

-datacenter_name: "openstack-test-2"
pop_wan_mappings:
  - pop_switch_dpid: "openflow:4"
pop_switch_port: 13
  wan_service_endpoint_id: "0000-0000-0000-0002"
  wan_service_mapping_info:
    mapping_type: direct-connect
```
VIM External connection point vs WIM port mapping

VIM External connection point
How the VIMs speak to the external world
Demo scenario

PoP-A (VIM)
VNF-1
Linux Br
Phy. Int.
VLAN-A
Provider Network

PoP-B (VIM)
VNF-2
Linux Br
Phy. Int.
VLAN-B
Provider Network

SDN Controller (WIM)
VLAN rewrite

Switch A
Port
Switch B
Port

Virtual Link

SB-API
NB-API

openstack
openstack

Virtual Link

SDN Network
Step 3:

Do your regular On-Boarding / re-use NSDs/VNFs that are already there
Step 4: Tell OSM where to place VNFs

```
osm ns-create \
s--ns_name multi-site-ns-1 \
s--nsd_name cirros_2vnf_ns \
s--vim_account openstack-test-1 \
s--config '{vnf: [

{member-vnf-index: "1", vim_account: openstack-test-1},
{member-vnf-index: "2", vim_account: openstack-test-2}

]}'

EOS
```
Step 5:

Wait
Behind the Scenes

- The WIM tells the SDN controller what needs to be done:
  - In this case:
    - Path computation
    - VLAN transcoding

- After the WAN Link is established, the VNFs should have connectivity between them
WIM Connector – B.Y.O.

- Check Credentials
- Create Connectivity Service
- Get Connectivity Service Status
- Edit Connectivity Service
- Delete Connectivity Service
- Clear All Connectivity Services
- Get All Active Connectivity Services

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Opportunities Improvement/Collaboration

- VLD requirements
- Feasibility check
- WIM selection
- Layer 3, Layer 0 etc.
- Local network
Thank you!

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