

WIM

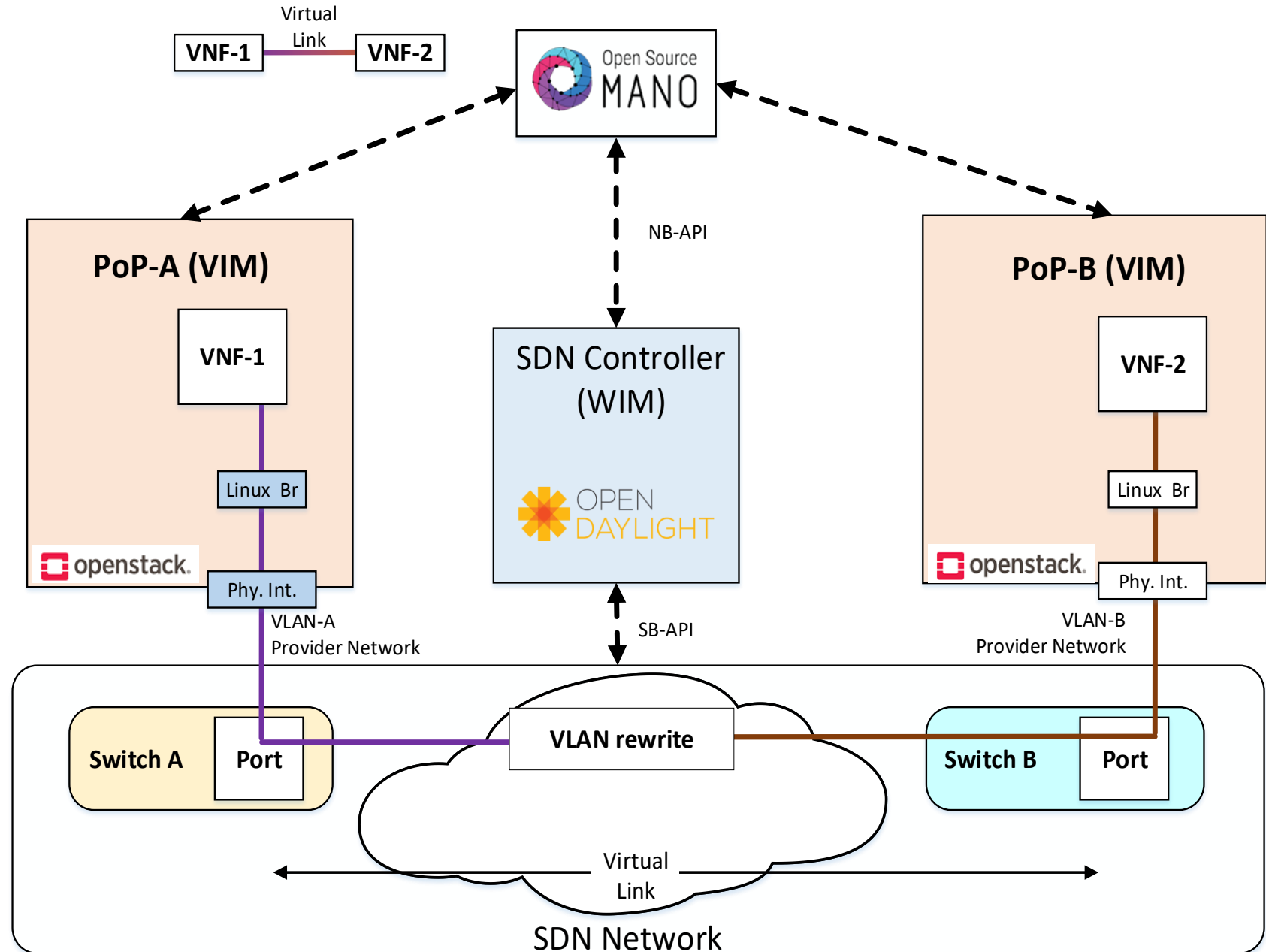
and dynamic inter-datacenter connectivity
using OSM

Anderson Bravalheri, Abubakar Siddique Muqaddas, Navdeep Uniyal
{a.bravalheri, abubakar.muqaddas, navdeep.uniyal} @bristol.ac.uk

bristol.ac.uk



Scenario



Scope

- WIM/SDN **integration** for controlling WAN links
- What this feature is **NOT**:
 - Automatic multi-site placement
 - Automatic WAN slicing

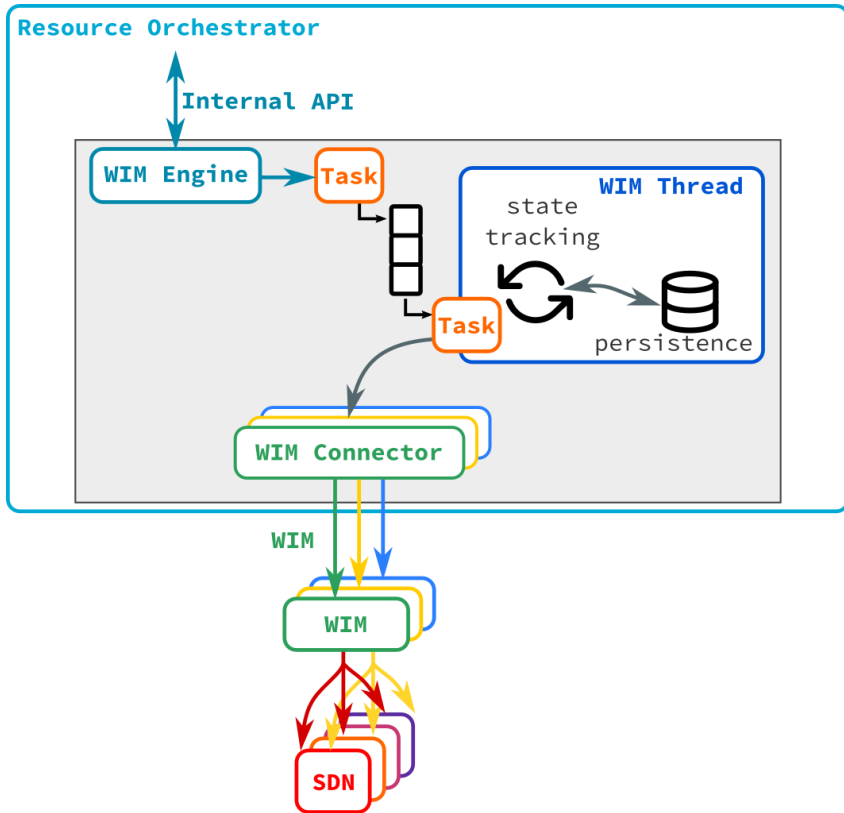
*(although it is an **enabler**)*

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

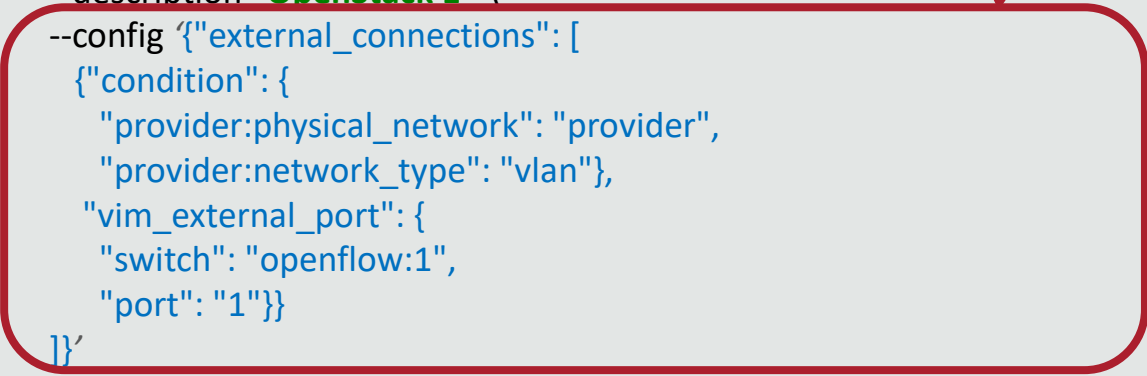
- NS scanning
 - Identify required VLD <> WAN links
- WIM selection / feasibility analysis
- “Wish List”
- Collect data from local networks
- WIM/SDN communication via WIM Connectors

DEMO

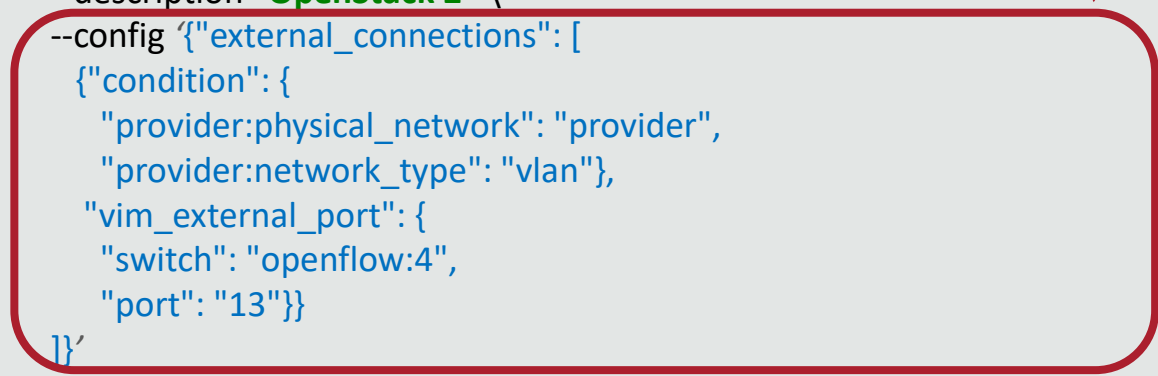
Step 1: Register the VIMs

Tell OSM how the VIMs speak to the external world

```
osm vim-create \  
--name openstack-test-1 \  
--auth_url http://${DC1_HOST}:5000/v2.0 \  
--tenant ${DC1_TENANT} \  
--user ${DC1_USER} \  
--password ${DC1_PWD} \  
--account_type openstack \  
--description "OpenStack 1" \  
--config {"external_connections": [  
  {"condition": {  
    "provider:physical_network": "provider",  
    "provider:network_type": "vlan",  
    "vim_external_port": {  
      "switch": "openflow:1",  
      "port": "1"}}  
  ]}
```



```
osm vim-create \  
--name openstack-test-2 \  
--auth_url http://${DC2_HOST}:5000/v2.0 \  
--tenant ${DC2_TENANT} \  
--user ${DC2_USER} \  
--password ${DC2_PWD} \  
--account_type openstack \  
--description "OpenStack 2" \  
--config {"external_connections": [  
  {"condition": {  
    "provider:physical_network": "provider",  
    "provider:network_type": "vlan",  
    "vim_external_port": {  
      "switch": "openflow:4",  
      "port": "13"}}  
  ]}
```



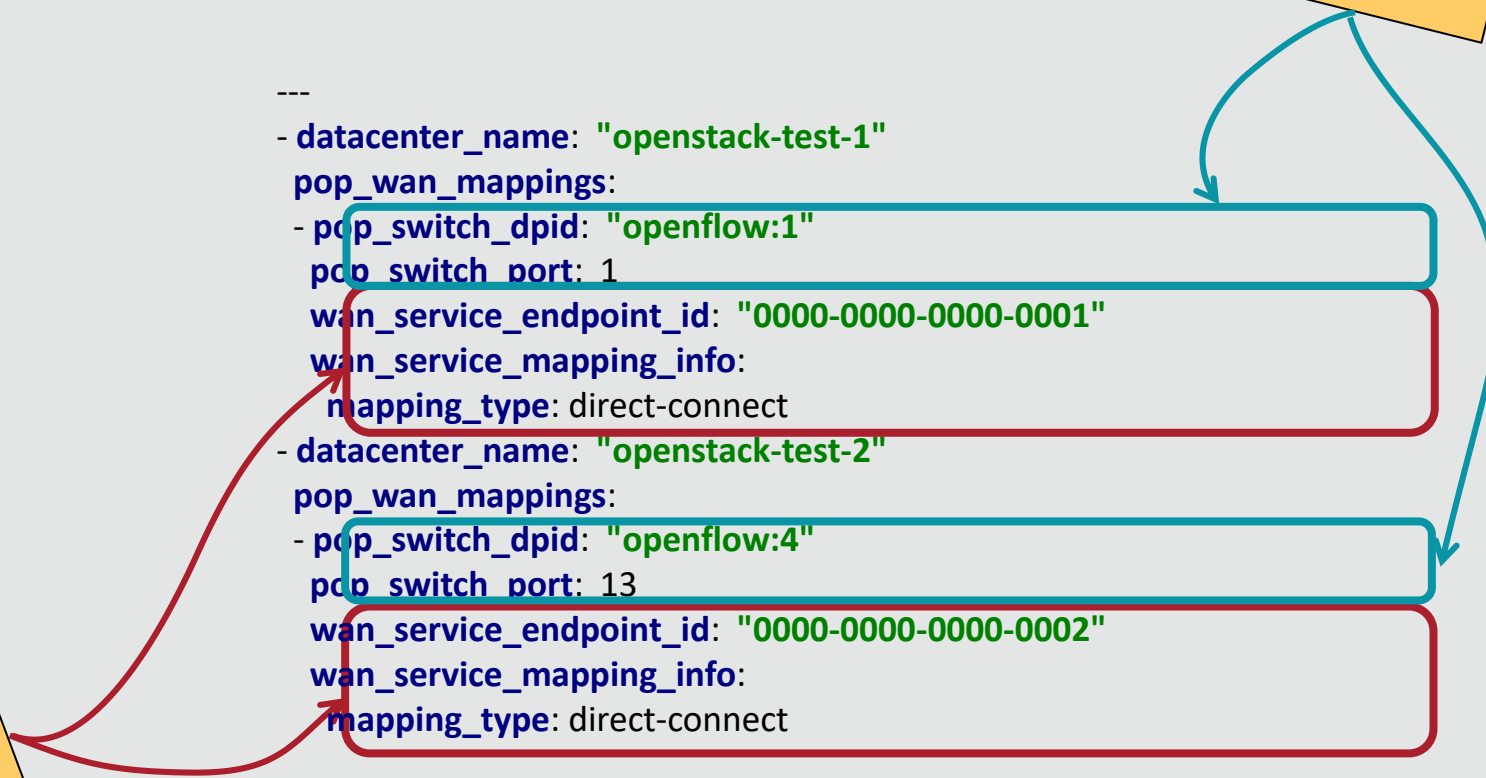
Step 2: Register the WIM

```
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
```

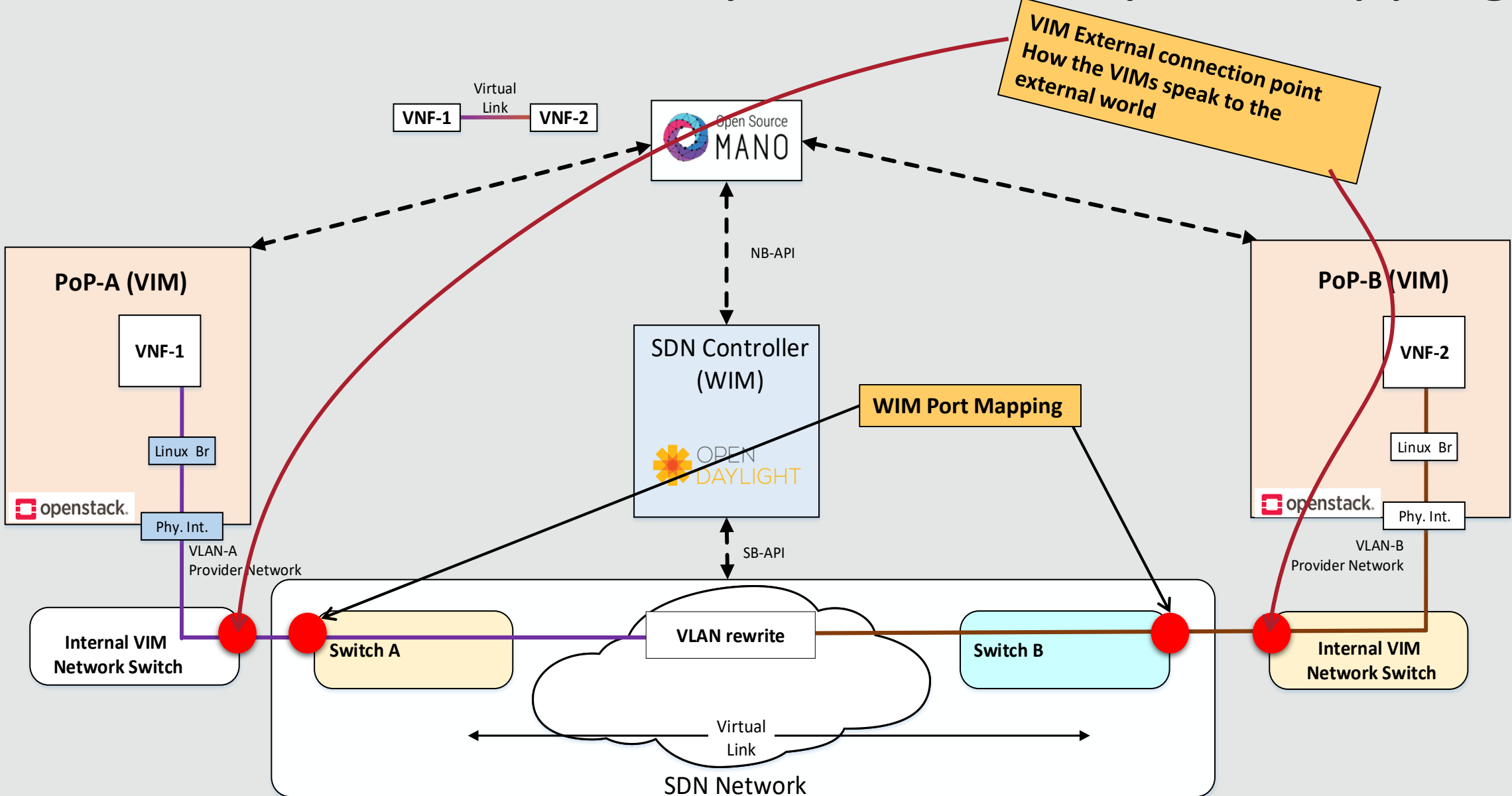
WIM specific information
(how to recognize/operate the
endpoint)

```
---  
- 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
```

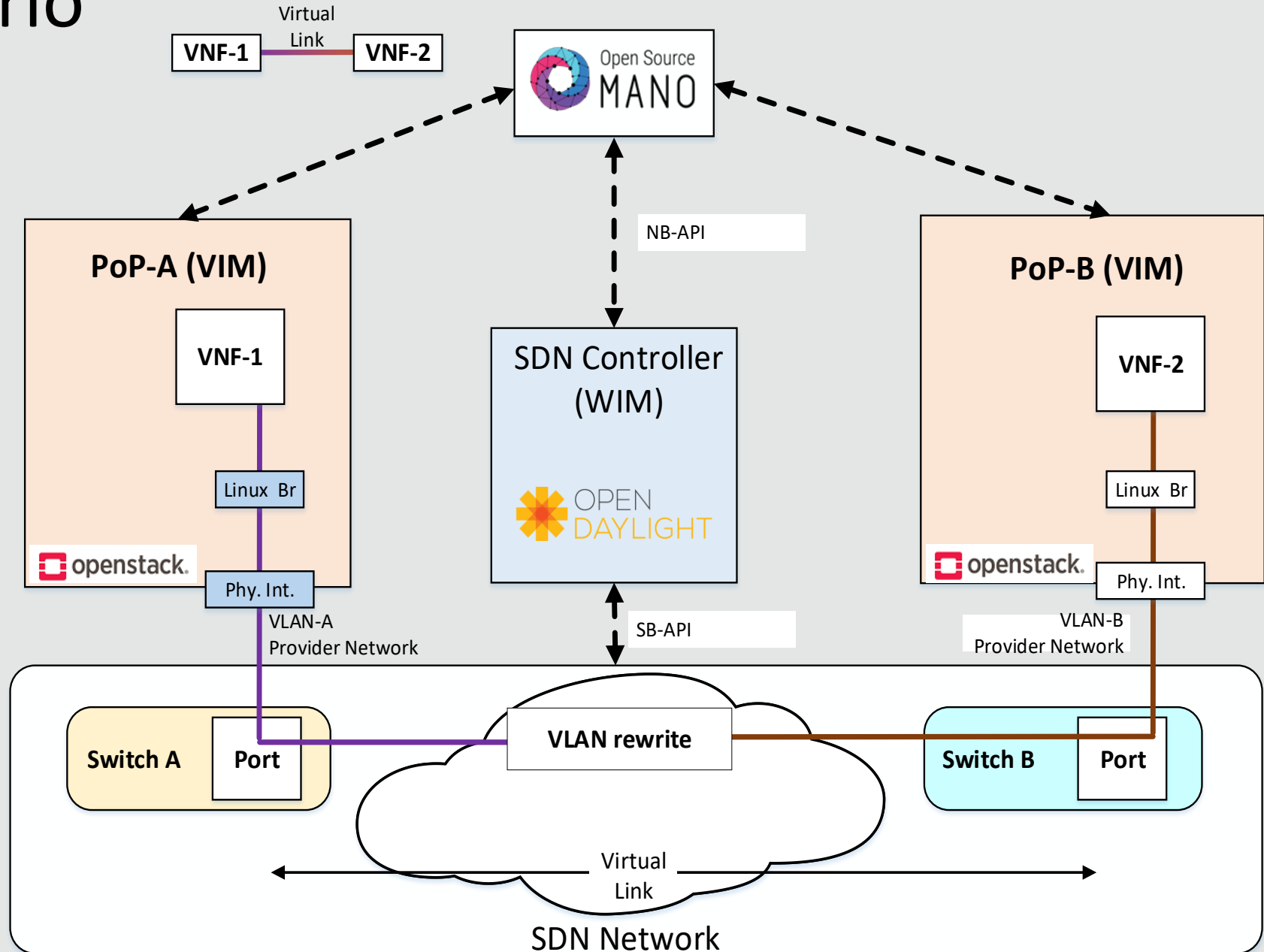
Relate to the VIM external ports



VIM External connection point vs WIM port mapping



Demo scenario



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 \  
  --ns_name multi-site-ns-1 \  
  --nsd_name cirros_2vnf_ns \  
  --vim_account openstack-test-1 \  
  --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

Opportunities Improvement/Collaboration

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

Thank you!

highperformance-networks@bristol.ac.uk

twitter.com/bristol_smart

twitter.com/networksbristol