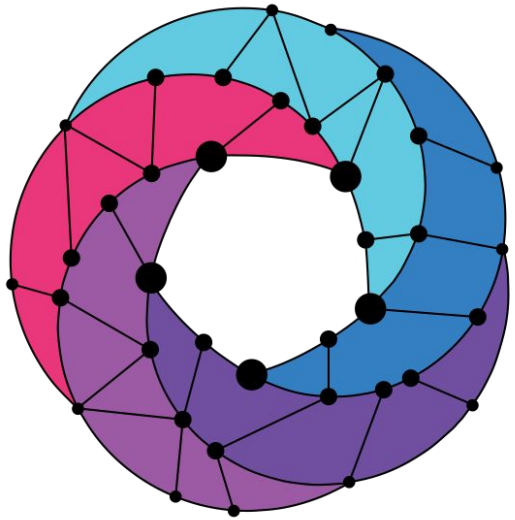


Open Source MANO

OSM Hackfest – Session 4.2

Modeling EPA capabilities: SR-IOV

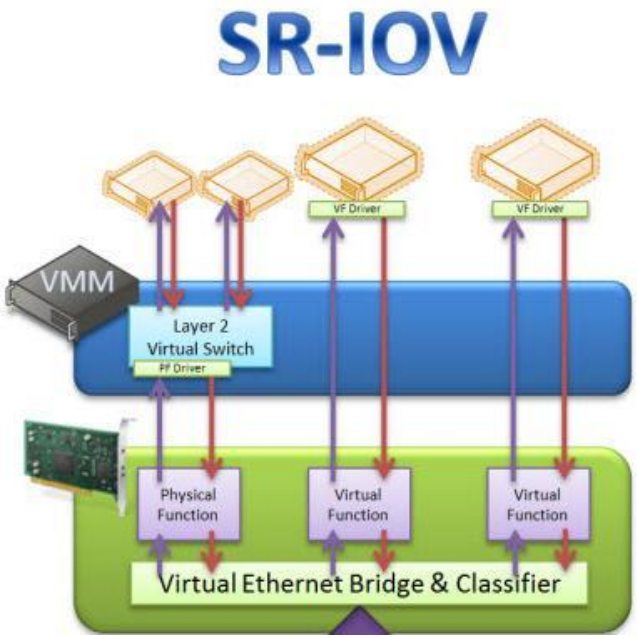
Gianpietro Lavado (Whitestack)

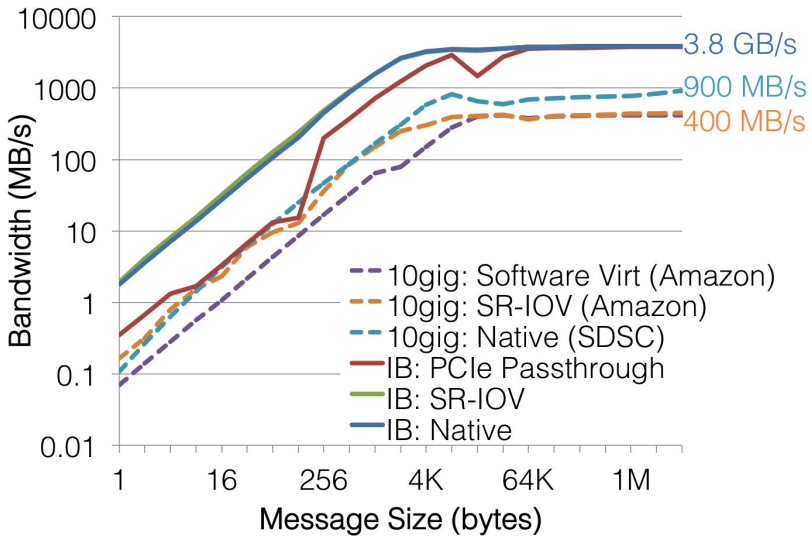
© ETSI 2019

ETSI

What is SR-IOV?

SR-IOV allows VNFs to have direct access to a virtualized PCI of a NIC, thus giving it better throughput.





SDSC Early SR-IOV results

Note: *Enabling SR-IOV requires a node reload for reconfiguration of the IOMMU virtualization mode. It also requires physical interfaces to be dedicated to this feature.*

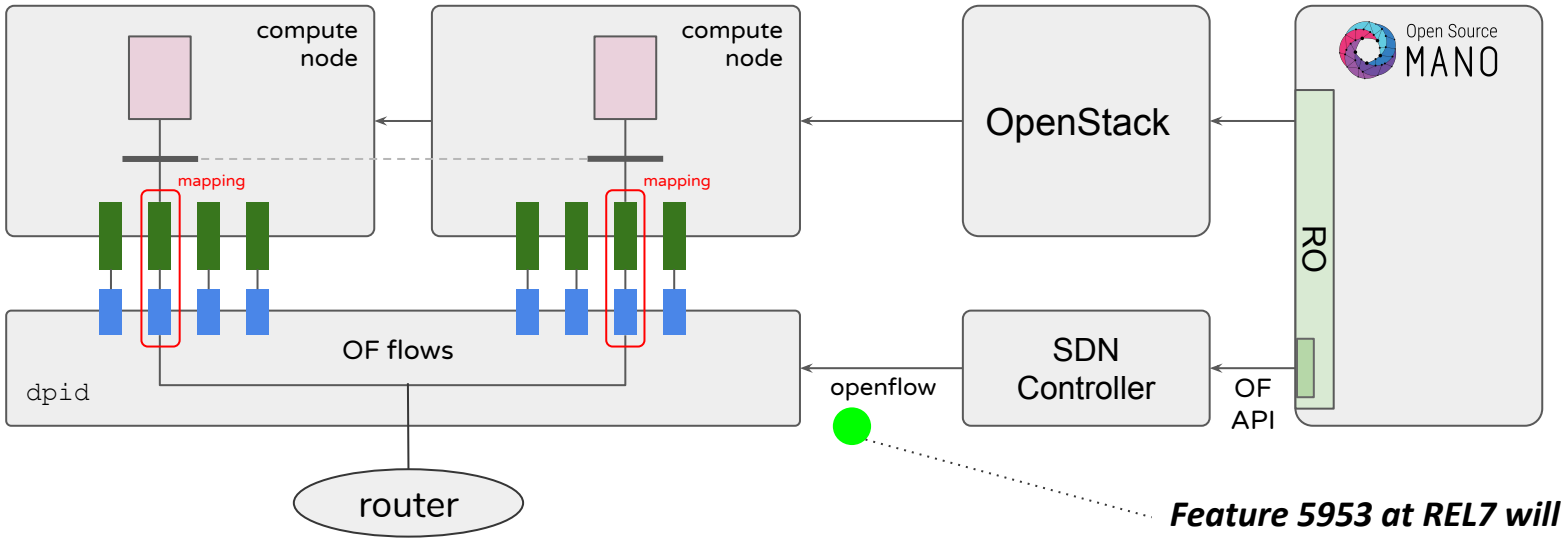
© ETSI 2019

SR-IOV + SDN Assist:
Enabling the chaining of **high performance** VNFs

1. OSM orquestrates SR-IOV

   → Proper assignment of I/O physical interfaces to the VM (VFs = Virtual Functions)

1. OSM SDN Assist gives the ability to create L2 connections between VFs
   - Interconnecting VMs
   - Attaching external traffic sources



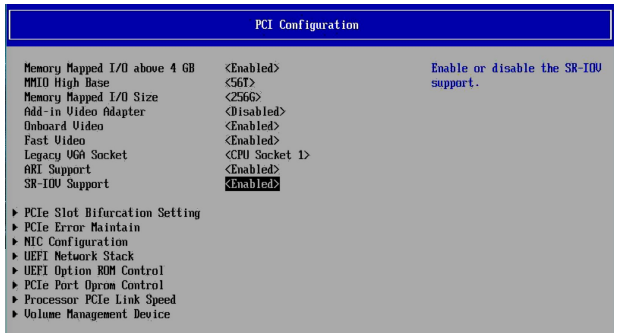
Feature 5953 at REL7 will implement higher level protocols

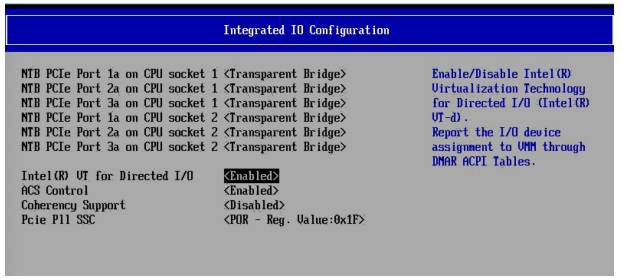
© ETSI 2019

Pre-provisioning SR-IOV at OpenStack (once)

Typical steps for enabling SR-IOV in am x86 compute node, include:

1. Activate IOMMU (Grub), SR-IOV and Intel-VTd (BIOS)
2. Configure the VFs that your NICs will support (CLI)
3. Install the SR-IOV Agent at OpenStack
4. Change Nova configuration to whitelist the NIC(s)
5. Enable SR-IOV at ML2 (Neutron) configuration
6. Map the physnet names to NICs in the SR-IOV agent configuration.





Reference: https://docs.openstack.org/neutron/rocky/admin/config-sriov.html

© ETSI 2019

Comparing SR-IOV provisioning (per VM/NS)

Open Source MANO

Provisioning SR-IOV with OpenStack

1. Create a network that uses the SR-IOV physnet

```
openstack network create --provider-network-type=vlan
--provider-physical-network=physnet2 --provider-segment=110
sriov-vlan110
```

1. Create the corresponding subnet

```
openstack subnet create --no-dhcp --network=sriov-vlan110
--subnet-range=11.0.0.0/24 sriov-vlan110-subnet
```

1. Create a port with the direct binding at the subnet

```
openstack port create --network sriov-vlan110 --vnic-type=direct
--binding-profile trusted=true sriov-vlan110-port01
```

1. Launch the VM using that port

```
openstack server create --flavor m1.large --image bionic --nic
port-id=sriov-vlan110-port01 vm01
```

1. Repeat as needed, then configure the switches

Automating SR-IOV connectivity for the complete NS with OSM

1. Add the VIM that includes the physnet (once)

```
osm vim-create --name VIMSRIOV --user user --password password --auth_url
http://172.21.7.5:5000/v3 --tenant tenant --account_type openstack --config
'{dataplane_physical_net: physnet2, microversion: 2.32}'
```

1. Model your VNF(s) to use SR-IOV instead of VIRTIO

```
interface:
-   name: dataVDU
    type: EXTERNAL
    virtual-interface:
        type: SR-IOV
```

1. Launch your NS, OSM will take care of everything, including VLD interconnectivity if the fabric was pre-configured with SDN Assist.

More info on SDN Assist:
https://osm.etsi.org/wikipub/index.php/EPA_and_SDN_assist

Note: In all cases, the image you use should have the driver for supporting the physical NIC

© ETSI 2019

A basic example of SR-IOV in OSM

Open Source MANO

You could clone the Hackfest-basic as the baseline for building:

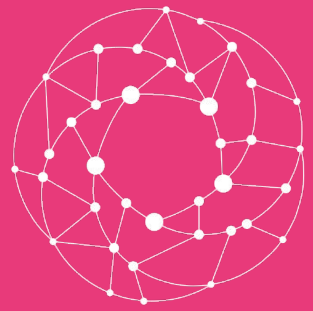
```
vnfd:vnfd-catalog:
    vnfd:
    -   connection-point:
        -   name: vnf-cp0
        -   name: vnf-cp1
        id: hackfest_basic-vnf-sriov
        mgmt-interface:
            cp: vnf-cp0
        vdu:
        -   cloud-init-file: cloud.config
            count: '1'
            id: hackfest_basic-VM
            image: bionic_wsvf
            interface:
            -   external-connection-point-ref: vnf-cp0
                name: vdu-eth0
                type: EXTERNAL
            -   external-connection-point-ref: vnf-cp1
                name: vdu-eth1
                type: EXTERNAL
                virtual-interface:
                    type: SR-IOV
            name: hackfest_basic-VM
            vm-flavor:
                memory-mb: '2048'
                storage-gb: '30'
                vcpu-count: '2'
```

http://osm-download.etsi.org/ftp/osm-6.0-six/8th-hackfest/packages/hackfest-basic-vnf-sriov.tar.gz

```
nsd:nsd-catalog:
    nsd:
    -   constituent-vnfd:
        -   member-vnf-index: '1'
            vnfd-id-ref: hackfest_basic-vnf-sriov
        id: hackfest_basic-ns-sriov
        name: hackfest_basic-ns-sriov
        version: '1.0'
        vld:
        -   id: mgmtnet
            mgmt-network: 'true'
            name: mgmtnet
            short-name: mgmtnet
            type: ELAN
            vim-network-name: management
            vnfd-connection-point-ref:
            -   member-vnf-index-ref: '1'
                vnfd-connection-point-ref: vnf-cp0
                vnfd-id-ref: hackfest_basic-vnf-sriov
        -   id: sriov_vld
            name: sriov_vld
            short-name: sriov_vld
            type: ELAN
            vnfd-connection-point-ref:
            -   member-vnf-index-ref: '1'
                vnfd-connection-point-ref: vnf-cp1
                vnfd-id-ref: hackfest_basic-vnf-sriov
```

http://osm-download.etsi.org/ftp/osm-6.0-six/8th-hackfest/packages/hackfest-basic-ns-sriov.tar.gz

© ETSI 2019

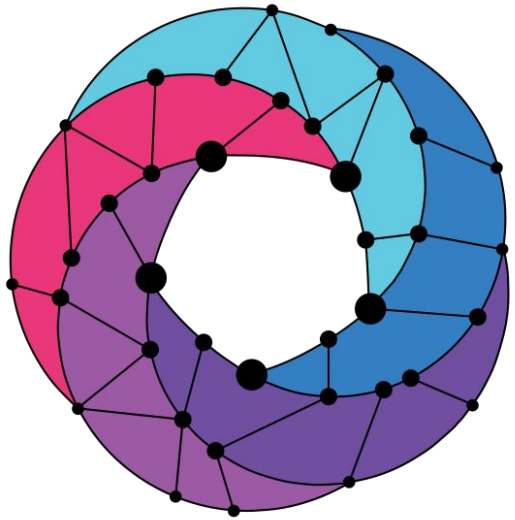


Open Source
MANO

Demo time!

© ETSI 2019

ETSI



Open Source MANO

Find us at:

osm.etsi.org

osm.etsi.org/wikipub

© ETSI 2019

ETSI