PCI Passthrough / SR-IOV

PCI Passthrough

nova.conf　　　　　　　　　　　　　.　　　　　　　Passthrough　　　　　[]
　　　　.

```
[filter_scheduler]
enabled_filters = AvailabilityZoneFilter, ComputeFilter,
ComputeCapabilitiesFilter, ImagePropertiesFilter,
ServerGroupAntiAffinityFilter, ServerGroupAffinityFilter,
PciPassthroughFilter
available_filters = nova.scheduler.filters.all_filters

[pci]
passthrough_whitelist = [{ "devname": "ens6", "physical_network": "physnet2"
}, { "vendor_id": "10de", "product_id": "13c2" }]
alias = { "vendor_id":"10de", "product_id":"13c2", "device_type":"type-PF",
"name":"GTX970" }
```

Openstack SR-IOV

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

QoS(Quality of Service)　　　　　max_burst_kbps(　　　　　max_kbps)　　　　　　　　　.
　max_kbps　Mbps　　　　　　　　.

SR-IOV　　　　　　　　　　　　　　　　　　　　　　　　　　.
　　　neutron.conf　　　　　　　　　　　.

```
[securitygroup]
firewall_driver = noop
```

SR-IOV　OpenStack Dashboard(horizon)　　　　　　　　　　　.　　　　　CLI　　API
　SR-IOV　　　　　　　　　　　　.

Network Interface

Mellanox CONNECTX-4/CONNECTX-5/CONNECTX-6 SR-IOV

- https://enterprise-support.nvidia.com/s/article/HowTo-Configure-SR-IOV-for-ConnectX-4-Connect X-5-ConnectX-6-with-KVM-Ethernet

Intel X550 SR-IOV

- https://forum.proxmox.com/threads/enabling-sr-iov-for-intel-nic-x550-t2-on-proxmox-6.56677/

SR-IOV

1.   IOMMU

```
grubby --update-kernel=ALL --args="intel_iommu=on iommu=pt"
grubby --update-kernel=ALL --args="amd_iommu=on iommu=pt"

dracut -f -v
```

2. SR-IOV device

```
echo "echo '8' > /sys/class/net/ens6/device/sriov_numvfs" >> /etc/rc.local
```

kolla-ansible

globals.yml

/etc/kolla/globals.yml

```
...
enable_neutron_sriov: "yes"
...
```

neutron

/etc/kolla/config/neutron/tp-compute3/sriov_agent.ini tp-compute3
SR-IOV

```
[sriov_nic]
physical_device_mappings = sriovnet1:ens6
exclude_devices =
```

```
[securitygroup]
firewall_driver = neutron.agent.firewall.NoopFirewallDriver
```

/etc/kolla/config/neutron/ml2_conf.ini

```
[ml2]
type_drivers = flat,vlan,vxlan,geneve
tenant_network_types = vxlan
mechanism_drivers = ovn,openvswitch,l2population,sriovnicswitch
extension_drivers = port_security

[ml2_type_vlan]
network_vlan_ranges = physnet1,sriovnet1

[ml2_type_flat]
flat_networks = physnet1,sriovnet1

[ml2_type_vxlan]
vni_ranges = 1:1000
```
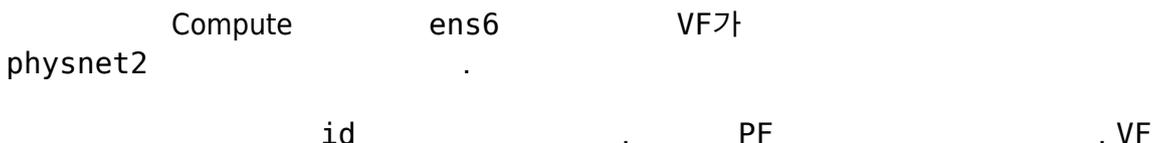
nova

/etc/kolla/config/nova.conf

  - GPU Passthrough

```
[pci]
passthrough_whitelist = { "vendor_id": "10de", "product_id":"20f1" }
```

  - SR-IOV

```
[pci]
passthrough_whitelist = { "devname": "ens6", "physical_network": "physnet2"
}
```

Compute   ens6   VF
physnet2   .

                id   ,   PF   . VF
  .

```
passthrough_whitelist = { "vendor_id": "8086", "product_id":"1563",
"physical_network": "physnet2" }
```

          Passthrough

```
[pci]
passthrough_whitelist = [{ "devname": "ens6", "physical_network": "physnet2"
}, { "vendor_id": "10de", "product_id": "13c2" }]
alias = { "vendor_id":"10de", "product_id":"13c2", "device_type":"type-PF",
"name":"GTX970" }
```

3. Launching instances with SR-IOV ports

```
openstack network create --provider-physical-network sriovnet1 \
    --provider-network-type vlan --provider-segment 319 \
    sriov-net

openstack subnet pool create --share --pool-prefix 10.33.19.0/24 \
--default-prefix-length 24 shared-default-subnetpool-v4

openstack subnet create --network sriov-net \
    --subnet-pool shared-default-subnetpool-v4 \
    sriov-subnet

net_id=$(openstack network show sriov-net -c id -f value)

openstack port create --network $net_id --vnic-type direct sriov-port

port_id=$(openstack port show sriov-port -c id -f value)

openstack server create --availability-zone sriov --flavor c1_r2_d30 --image
rhel8 \
    --nic port-id=$port_id test-sriov
```