

Managing Networking with Neutron

LINUX AUTHOR AND TRAINER



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Objectives



Networking objects

Neutron services

Flat networks

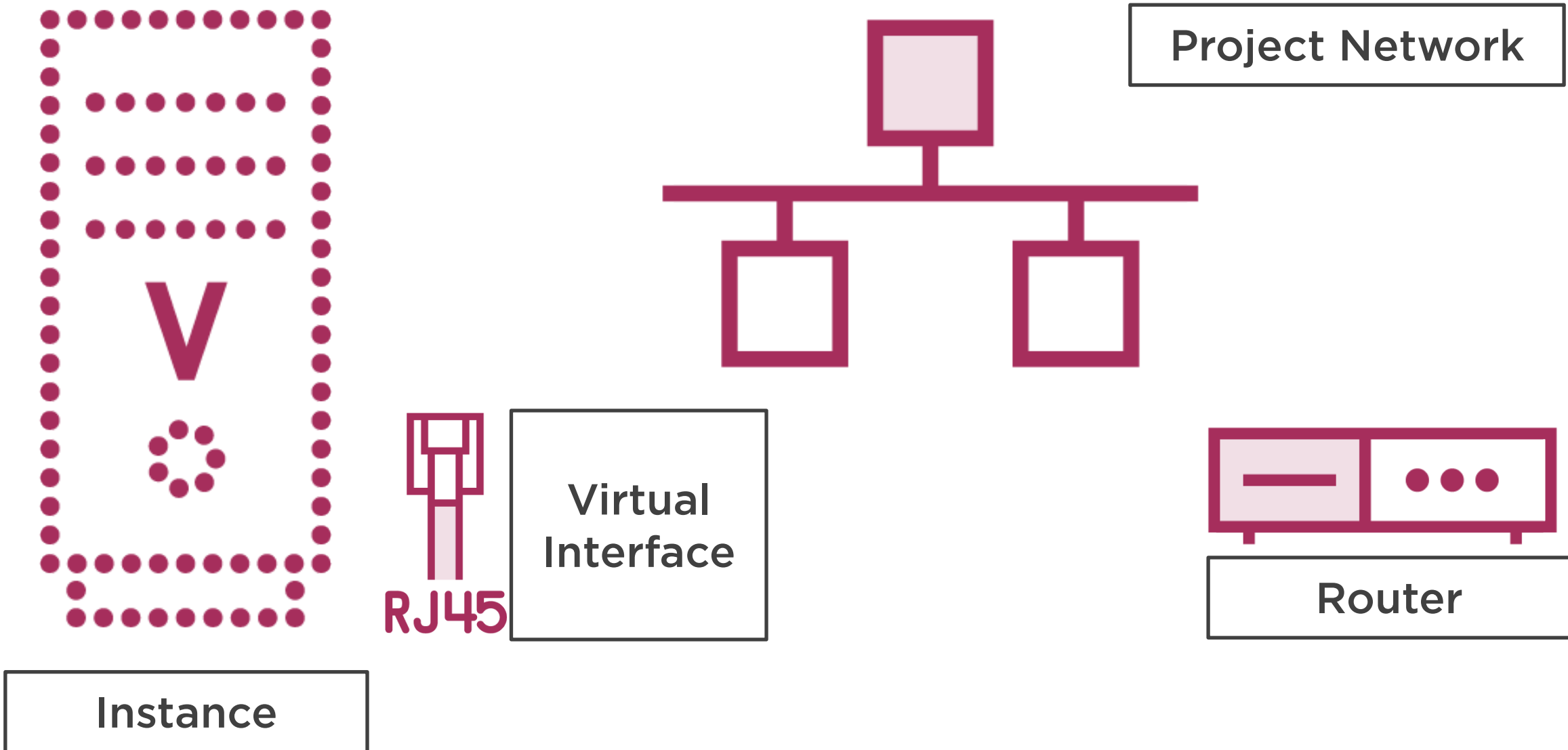
VXLAN networks

Security groups

Floating IPs



Networking Components



Instances

Instances in OpenStack are the Virtual Machines, of course, this is a virtual environment and to connect the instance to the rest of the world we have virtual network components.



Virtual Interfaces

VIFs (Virtual Interfaces) or vNICs (Virtual Network Interface Cards) appear in the instance and connect it to the project network. The connection is made through a port and VIFs are seen in the instance only.



Port

Ports in Neutron represent the connection from a VIF to the virtual network. Ports will be used by routers and instances.

\$ neutron port-list



Project Network

Project or tenant networks are created and managed by the project admins. Having separate project networks means that a company's servers do not have to be on the same network as other servers from other organizations. Networks will also have one or more subnets associated with them.

\$ neutron net-list



Subnet

Each subnet provides logical separation of devices through IP Addresses. The subnet will have a CIDR address, i.e. (172.16.0.0/16) and an allocation range; addresses that can be used on that network.

```
$ neutron subnet-list
```



Routers

Neutron routers act in the same way as physical routers and provide an interconnection between networks.

\$ neutron router-list



```
# systemctl status neutron-*
```

Neutron Services

Depending on how OpenStack has been configured, different services will show.



```
# ovs-vsctl -V  
# ovs-vsctl add-br b1  
# ovs-vsctl del-br b1  
# ovs-vsctl show
```

Open vSwitch

Open vSwitch is not part of Neutron but is used by OpenStack and many other virtualization systems. It provides software based multilayer switching that you may expect in dedicated hardware devices



br-int

Integration Bridge: Each OpenStack host has a single integration bridge. This bridge allows for all VIFs to be connected to the bridge. The OVS Neutron Agent creates br-int



br-ex

External Bridge: This bridge allows connection with the external network. A physical NIC from the host will be connected to this bridge



br-tun

Tunnel Bridge: This bridge allows for the termination of tunnel endpoints where GRE or VXLAN tunnels are created.

```
# grep -o '^[^#]*' \  
    /etc/neutron/plugins/ml2/openvswitch_agent.ini
```

View Configuration

Using **grep** we can view the uncommented and effective lines in the configuration.



Flat Networks

Flat networks were the network type provided with the original nova networking. With flat networks all projects connect to the same network and the outside world. It is hard to protect internal services that do not need to face the internet. Additionally, security is reduced as all instances share the same network no matter the owner of the instance.




```
type_drivers = vxlan,flat
```

Enable Flat Networks

If you needed to enable Flat Networks edit the file:

`/etc/neutron/plugins/ml2/ml2_conf.ini`



VXLAN Networks

Virtual Extensible LAN (**VXLAN**) are the default in the PackStack install. It is an encapsulation protocol for running an overlay network on existing Layer 3 infrastructure. An overlay network is a virtual network that is built on top of existing network Layer 2 and Layer 3 technologies to support elastic compute architectures.



Configure Networking



```
# openstack security group list
# openstack security group show default
# openstack security group rule list default
# openstack security group rule create --proto icmp
default
# openstack security group rule \
create --proto tcp --dst-port 22 default
```

SECURITY GROUPS

Security groups are used to control access to instances. They consist of firewall rules maintained by Neutron. The default rules exist as standard. Adding ICMP allows us to ping instances and SSH allows remote access to the systems.

```
# neutron floatingip-list  
# neutron floatingip-create external  
# neutron floatingip-list  
# neutron port-list
```

Floating IP Addresses

Floating IP addresses are assigned to the internet facing interface of the router and allows for SNAT, Secure Network Address Translation. Access to the private IP addresses via public addresses.



Security Groups and Floating IPs



Networking Objects



Networks

Subnets

Routers

DHCP-Agents

Virtual Interfaces

Ports



Services



openstack-status

systemctl status neutron-*

ovs-vsctl



Reconfigure Networking



External network, no DHCP

External subnet to match your physical network

Allocation range of addresses not used by DHCP or static devices

Demo project network and subnet using DHCP

Demo router



Security Groups



Contain firewall rules

openstack security group list

openstack security group rule list default

...create --proto tcp --dst-port 22 default



Floating IP



Assigned to external network from allocation range

Used with SNAT to connect to private internal IPs

neutron floatingip-list

neutron floatingip-create external

Next up: Virtual Machine
Management with Nova

