OVN and BGP

A Friendship Forged in OpenStack Neutron

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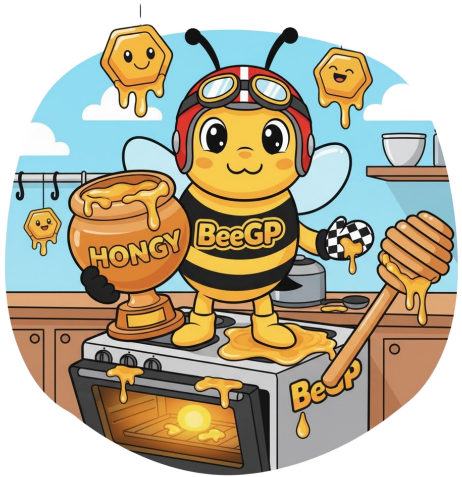
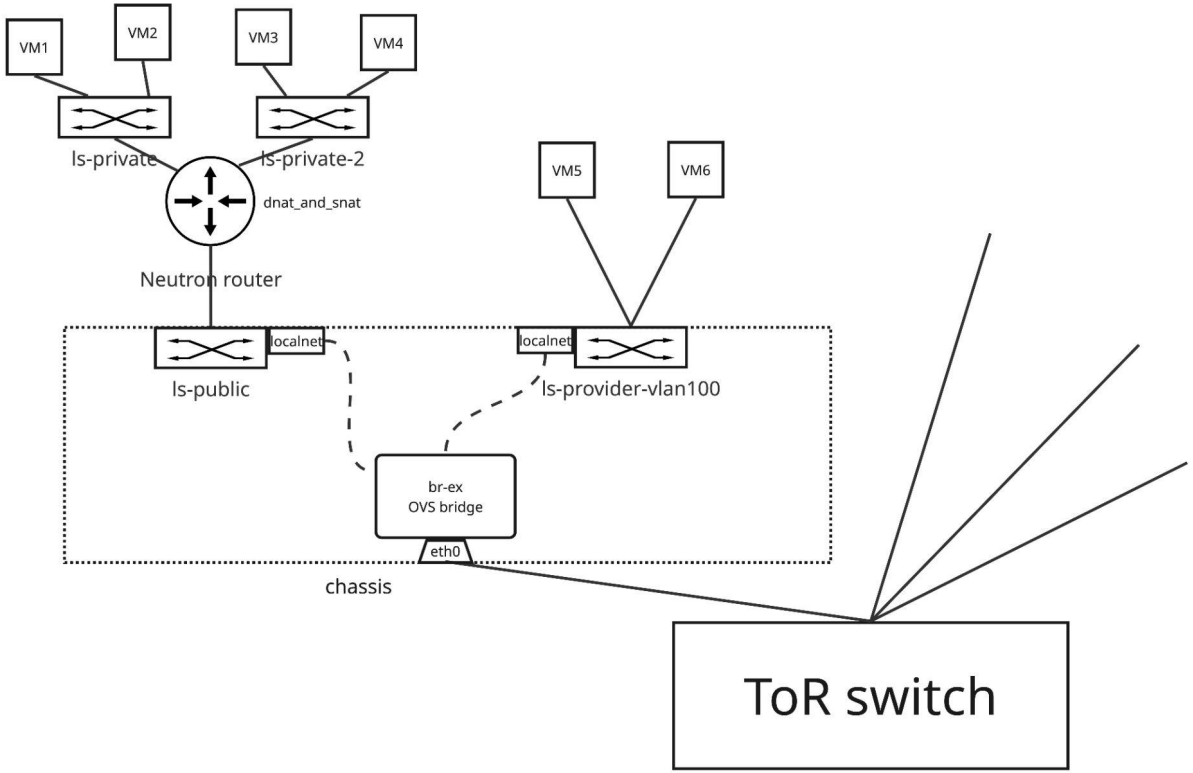
What we'll discuss today



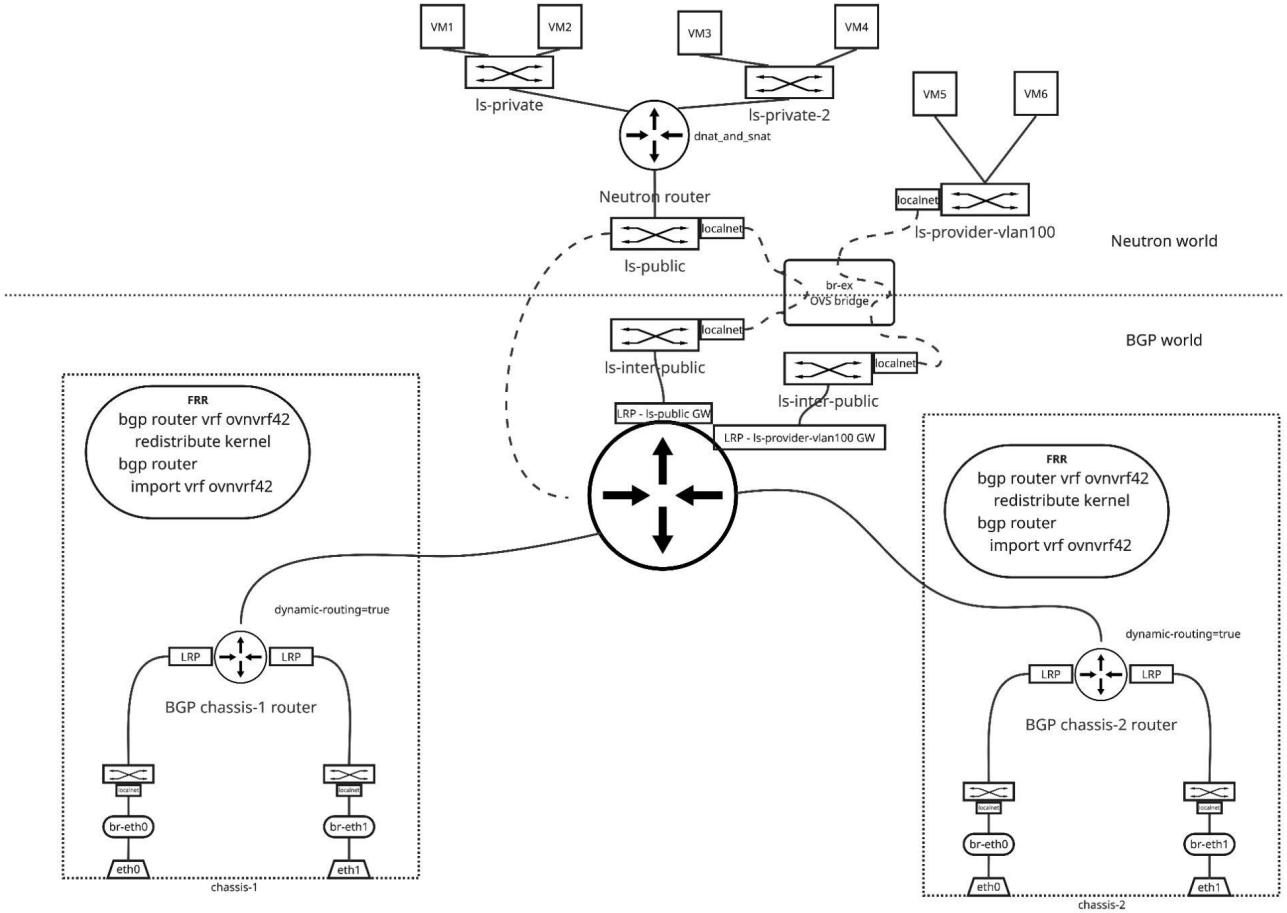
Source: Generated with Gemini 2.5

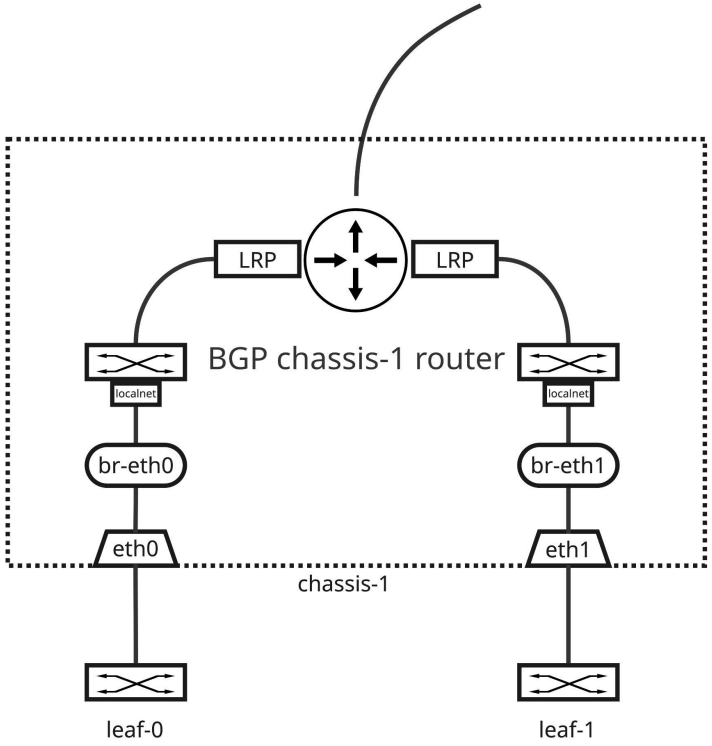
- How OpenStack works with L2
- Design of BGP in Neutron with OVN
- Implementation
- Demo
- Q&A

Neutron with L2



Neutron with OVN BGP



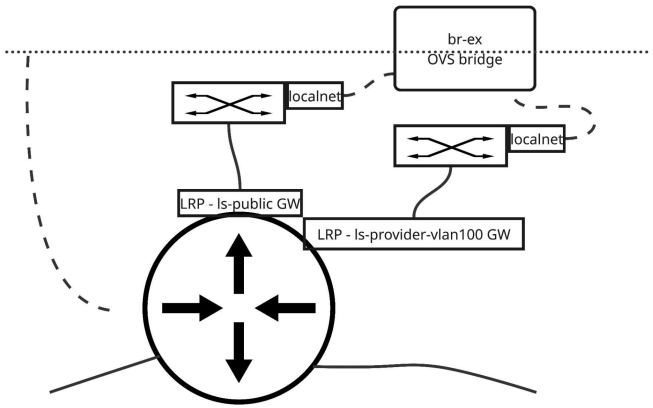


Router Policies (used for the ingress traffic):

```
action     : reroute
match      : "inport==\"bgp-lrp-bgp-lr-chassis-1-to-bgp-ls-controller-br-eth0\""
nexthops   : ["169.254.0.2"]          <---- IP of the LRP on the main BGP router
priority   : 10

action     : reroute
match      : "inport==\"bgp-lrp-bgp-lr-chassis-1-to-bgp-ls-controller-br-eth1\""
nexthops   : ["169.254.0.2"]
priority   : 10
```

Static Routes (used for the egress traffic):

```
ip_prefix       : "0.0.0.0/0"
nexthop         : "100.64.0.1"          <---- IP of the peering leaf
output_port     : bgp-lrp-bgp-lr-chassis-1-to-bgp-ls-controller-br-eth0
policy          : dst-ip

ip_prefix       : "0.0.0.0/0"
nexthop         : "100.65.0.1"          <---- IP of the other peering leaf
output_port     : bgp-lrp-bgp-lr-chassis-1-to-bgp-ls-controller-br-eth1
policy          : dst-ip
```



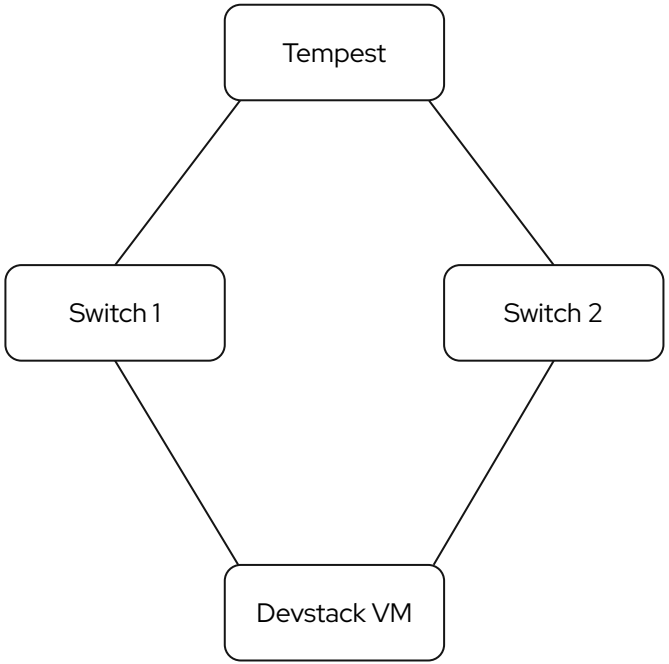
Static Routes:

```
ip_prefix       : "172.24.5.1/24"       <----- Neutron public network subnet
nexthop         : "172.24.5.1"          <----- Neutron subnet gateway IP
output_port     : bgp-lrp-bgp-lr-main-to-bgp-ls-interconnect-neutron-5d3d6abd-b7e1-4dfb-a8b2-5a9776e65432
policy          : dst-ip


ip_prefix       : "0.0.0.0/0"
nexthop         : "1.1.1.1"             <----- Fake IP to pass logical flow to the next table
output_port     : []
policy          : dst-ip
```

Router Policies:

```
action      : reroute
match       :
"inport==\"bgp-lrp-bgp-lr-main-to-bgp-ls-interconnect-neutron-5d3d6abd-b7e1-4dfb-a8b2-5a9776e65432\" &&
is_chassis_resident(\"cr-bgp-lrp-bgp-lr-main-to-bgp-lr-chassis-1\")"
nexthops    : ["169.254.0.1"]
priority    : 10

action      : reroute
match       :
"inport==\"bgp-lrp-bgp-lr-main-to-bgp-ls-interconnect-neutron-5d3d6abd-b7e1-4dfb-a8b2-5a9776e65432\" &&
is_chassis_resident(\"cr-bgp-lrp-bgp-lr-main-to-bgp-lr-chassis-2\")"
nexthops    : ["169.254.1.1"]
priority    : 10
```

- Neutron ovn-bgp service plugin running in a neutron-periodic-worker
  - OVS events monitoring OVN resources calling a reconciler
  - Hierarchical set of ovsdbapp commands
    - E.g. full sync -> chassis sync -> peer sync -> chassis peer logical switch -> localnet port
- OVN agent ovn-bgp extension implementing openflow and reporting to OVN DBs


Tempest
Switch 1
Switch 2
Devstack VM

- Neutron spec: https://opendev.org/openstack/neutron-specs/src/branch/master/specs/2025.2/ovn-bgp-integration.rst
- Neutron patch series: https://review.opendev.org/q/topic:"bug/2111276"
- Neutron WIP patch - Tempest tests with BGP: https://review.opendev.org/c/openstack/neutron/+/962188

Thank you

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