OVN for OPNFV

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Agenda

• Pre-OVN
• What is OVN?
• OpenStack & OVN
• OVN on ETSI NFV Architecture
• ovn4nfv proposal
Pre-OVN

• No abstraction of logical networks
  – Configure both the tunnels and flow rules
  – Manage ovsdb and Open Flow connections
• Manage complex flow rules
  – Flow priorities
  – Flow explosion
• OVS – unit of distributed switch with complex state stored in neutron plugin
• No support for ARP Suppression or Multicast optimizations
What is OVN? – Native virtual networking for OVS

• Local controller
• Logical network abstraction
  – Simplifies overlay setup
• Supports:
  – Logical L2/L3
  – Security groups/ACLs
  – Multicast optimizations
• L3/ACLs are faster when implemented using OVN
• Support for Containers
• ARP Suppression
OVN Architecture

Adapted from [1]
The Magic! – Logical Flows -> Physical Flows

- Distributed transformation using ovn-controller
- Divide & Conquer
  - ovn-controller uses multiple tables
    - Table 0, Physical -> Logical ingress port mapping
    - Table 16 – 31, Ingress logical flows tables
    - Table 32 – 47, Send packet to local or remote hypervisor
    - Table 48 – 63, Egress logical flow tables
    - Table 64, Logical -> Physical egress port mapping
  - Meta-data is passed between tables
    - tunnel key, logical dpid, logical in port & out port, VLAN ID
Big picture – what is happening?

• OpenStack neutron plugin focus on OpenStack API
  – Security Groups/Rules for logical networks
  – Container Integration
  – DVR/L3

• OVN development
  – Solving the hard networking problems
  – Simpler API for neutron plugin developers
  – Functionality of neutron agents moving into OVN

Neutron and OVN => Agentless lean networking
OpenStack & OVN

• networking-ovn - https://git.openstack.org/openstack/networking-ovn.git
  – networking-ovn updates Northbound DB with logical flow rules in response to neutron api calls
  – ovn-controller updates chassis id, interface id and tunnel listen ip address in Southbound DB
  – ovn-northd updates Southbound DB with logical flow rules
  – ovn-controller takes updates from Southbound DB and transforms them to rules for the local Open vSwitch
  – ovn-controller updates ovsdb-server and ovs-vswitchd
OVN on ETSI NFV Architecture
Constructs for ETSI NV

<table>
<thead>
<tr>
<th>Constructs</th>
<th>ovn</th>
<th>networking-ovn</th>
<th>OpenStack Target Release</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logical L2</td>
<td>supports</td>
<td>supports</td>
<td>Mitaka (April 7th 2016)</td>
</tr>
<tr>
<td>DHCP agent</td>
<td>coming soon</td>
<td>coming soon</td>
<td>Mitaka</td>
</tr>
<tr>
<td>L3/DVR</td>
<td>supports</td>
<td>coming soon</td>
<td>Mitaka</td>
</tr>
<tr>
<td>ACLs</td>
<td>supports</td>
<td>supports</td>
<td>Mitaka</td>
</tr>
<tr>
<td>SFC</td>
<td>needs work</td>
<td>needs work</td>
<td>Mitaka (high risk)</td>
</tr>
<tr>
<td>LBaaS</td>
<td>needs work</td>
<td>needs work</td>
<td>TBD</td>
</tr>
<tr>
<td>multi-site</td>
<td>needs work</td>
<td>needs work</td>
<td>TBD</td>
</tr>
<tr>
<td>HA</td>
<td>needs more work</td>
<td>needs more work</td>
<td>TBD</td>
</tr>
</tbody>
</table>
SFC – The most desired feature for NFV

- **Plan** – Implement networking-sfc api in networking-ovn
- Design discussions on openvswitch & neutron mailing list
- Would like Tacker to support networking-sfc api driver
ovn4nfv – Let’s turn it on in OPNFV

- Project name: ovn4nfv (proposal stage)
- Category: Collaborative Development
  - Contribute to upstream projects: openvswitch, networking-ovn, tacker and networking-sfc
- Project Goal: This project will enable OVN as another option for network control in OPNFV
- Committers: Vikram Dham, Russell Bryant, Lingli Deng, Wenjing Chu, Gal Sagie
ovn4nfv - Schedule

• B release
  – PoC showcasing L2/L3/DHCP agents
  – Investigate SFC implementation options

• C release
  – Include OVN & networking-ovn in Genesis
  – Enable L2/L3/DHCP agents
  – SFC development
  – Enable in Pharos labs
  – Investigate requests from requirements project

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OVN for OPNFV
Participate

- Contributors welcome!
  - Exciting work
- Users/ Service Providers/ Telcos welcome!
  - Option to use a lean network controller
Credits

- Russell Bryant for valuable feedback
- OVN, networking-ovn and networking-sfc developer communities
Q & A

Thanks
References

5. http://blog.russellbryant.net/