

OVN, VER. 1.1

Duration: 5 days

DESCRIPTION

OVN course covers OVN – Open Virtual Network for Open vSwitch. Open vSwitch allows “network programming” on servers (typically hypervisors). Application can push flows into Open vSwitch bridges and they behave according to these rules (comparing to traditional L2 bridges). Using flows, it is possible to implement switching, routing, ACL etc. Application that pushes flows can be simple application or complex distributed application which can e.g. implement logical network (switches, routers) on multiple hypervisors. OVN is one such application. It is making progress and it is used more and more instead of some other approaches – e.g. it can replace default network implementation in Openstack neutron.

In this course, we will first give brief Open vSwitch overview with some labs. Next, OVN concepts are described. OVN features and underlying implementation is analyzed in theory and in number of labs. Logical switches are created, distributed routing is configured and explained, connection to external networks is analyzed, as well as e.g. NAT, ACL, DHCP and other features. This is done in number of steps so attendees should be familiar with OVN concepts at the end of this part which take most of time. Next, Openstack neutron implementation with OVN is described. Here, instead of manually creating switches, routers, ACL in OVN, Openstack plugin will create these objects as they correspond to Openstack objects. Using knowledge in previous part, attendees will analyze Openstack generated OVN configuration and will be ready to troubleshoot possible issues. Also, they will be ready to optimally

configure Openstack – e.g. configuring distributed FIP or scheduling routers on particular hosts.

PREREQUISITES

In short, this course assumes that attendees are operators (not end users of Openstack) on existing linux/openstack implementations with OVS but without OVN or they have similar knowledge. OVN can be used in other implementations, e.g. with containers. In this case, this course is also applicable as it provides detail overview of OVN networking in Part2.

CONTENT

OVS intro
OVN intro

PART1: OVS AND OPENFLOW

Openflow protocol

OVSDB protocol

OVS lab intro

Openvswitch

- Introduction
- Non openflow usage of openvswitch, labs
 - Linux veth pair, network namespaces
 - Using veth pair vs patches
- Openflow usage of openvswitch, labs
 - Default behavior
 - Example with vlan tag manipulation
 - Using remote controller
 - OVSDB protocol
- Overlay tunneling: VXLAN

PART2: MANUAL OVN CONFIGURATION AND DETAILS OF OPERATION

Lab intro

OVN chassis configuration

OVN L2 and principles of operation

- OVN logical switching
- Geneve tunneling in logical switching
- Southbound flows
- OVN trace
- OVS flows generated by controller
- Flooding
- L2 port security
- Tables in northbound and southbound databases

OVN internal L3

- OVN distributed logical routing
- OVN trace of routed packet
- OVS flows with distributed routing
- OVS flows trace

OVN external L3 connectivity

- External connectivity to the flat network
 - Scheduling gateway router port – nonredundant mode – Option1
 - Scheduling gateway router port – nonredundant mode – Option2
 - Scheduling gateway router port – redundant mode
- External connectivity to VLAN

Other features

- NAT
 - SNAT
 - NAT
- ACL
 - ACL – intro
 - ACL – statefull

- ACL – statefull ovn-trace
- ACL – allow incoming traffic
- Portgroup
- detrace
- DHCP
 - DHCP trace
- Localport

Container tagging and Openstack trunk ports

PART3: OPENSTACK WITH OVN

Openstack lab intro

Remove openvswitch implementation components and neutron objects

Install OVN components

Configure OVN

Use Openstack with OVN

Self-service networks logical bridging

- Create network and verify underlying implementation
- Attach instance and verify underlying implementation and metadata implementation
- Security groups implementation
- Attach another instance on other hypervisor
- Test switching and verify tunneling

Self-service networks logical routing

DHCP implementation

Provider networking and logical routing

FIP implementation

- Centralized FIP
- Distributed FIP

Trunk ports in OVN

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