Challenges in considering SDN network management

draft-gu-sdnrg-network-management-consideration-01

Rong Gu (Presentor)

Chen Li

Yan Zhuang

Background

- Datacenters based on SDN/NFV deployment with large scale

  Openstack K version, KVM hypervisor, vendor's controller and SDN forwarding nodes including SDN gateway (centralized/distributed), SDN TOR, VAS nodes or self-developed controller based on ODL

  ➢ Public cloud with 2000 computing nodes with virtualized hypervisor

  ➢ Private cloud with 3000 computing nodes including servers of virtualized hypervisor and bare-metal servers

- Changes when SDN/NFV is brought in

  ➢ Serval levels: underlay layer/ overlay layer & physical layer/logical layer/service layer

    - Large-scale information

    - Fault precisely located

    - Topology display

  ➢ Auto-configuration and Auto-management

  ➢ OAM considering new encapsulation technology such as VxLAN/NSH...

Challenge in the management architecture

- Network management is deployed on the application layer for management information collection and network visualization.
  - ➤ Tenant management: tenants' logical network with monitoring and detection with service awareness.
  - ➤ Administrator management: overall management of network including network monitoring, detection with log and alarm reported.

- Related Openstack project
  - ➤ Heat: main project in the Openstack Orchestration program for managing lifecycle of infrastructure and applications within OpenStack clouds.
  - ➤ Telemetry: the project aims at data collection on the utilization of physical and virtual resources in use case of metering, monitoring, and alarming.

- Consideration
  - ➤ Telemetry has not been widely accepted by vendors. Similar mechanism may be realized by OAM???
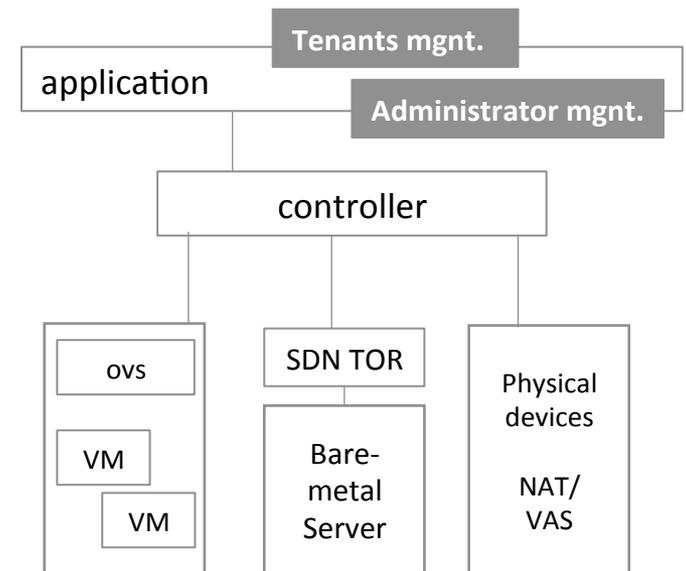
# Challenge in information collection

- Information collection is required to be extensible, standard and with high performance from devices to the information collection platform.
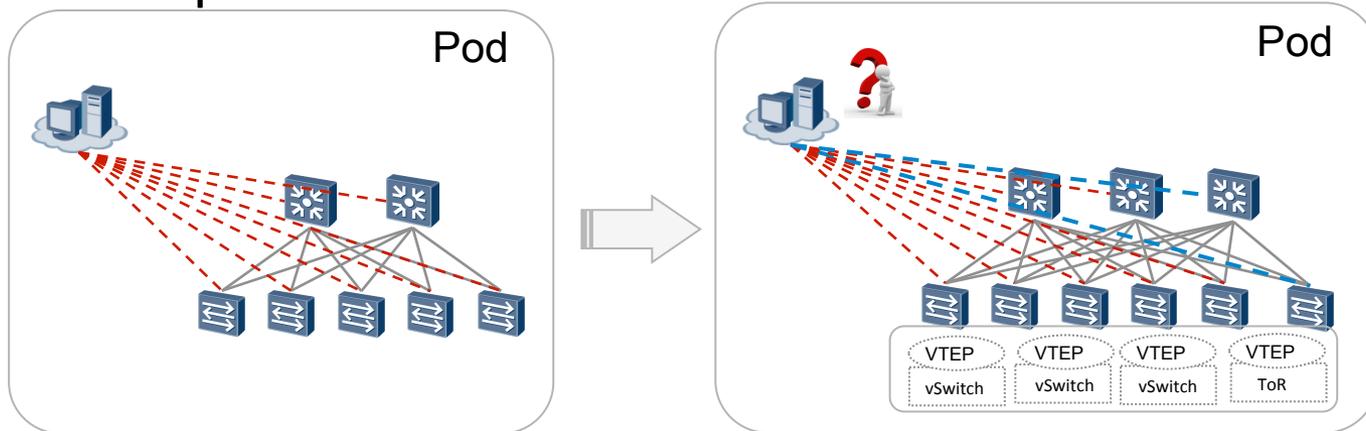
> **Extensible:** Network is scale-out with thousands of computing nodes and ten thousands of virtual machines, especially docker included.

> **Standard:** Management information and technology are not well defined or formatted in some of devices including vtep, controller, VAS devices and multi-level networks.

> **High performance:** Management platform needs to be with high performance.

Challenge in multiple layer topology display

- Topology should be displayed dynamically in tenants' side and administrator' side.
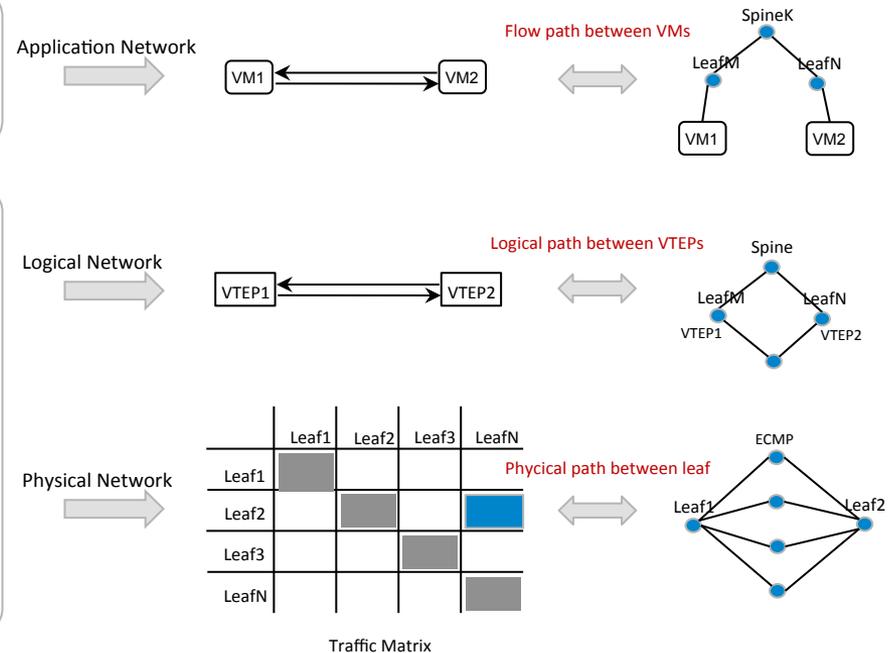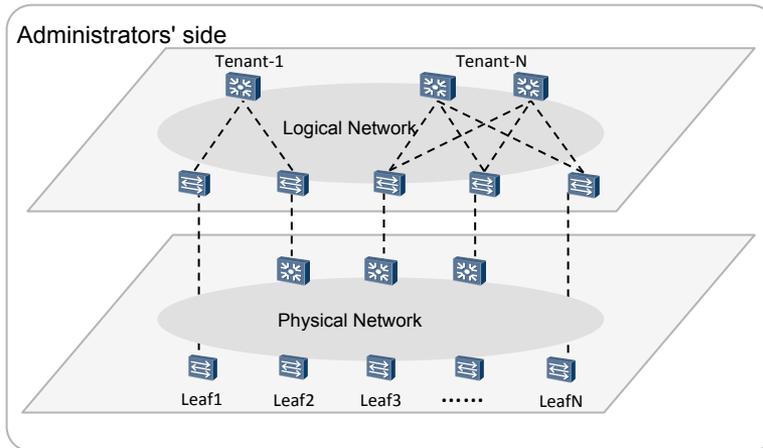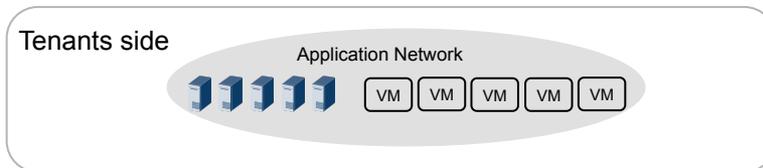
- Consideration:
  - ➢ Application network should be mapping with logical network and finally mapping with physical network.

Challenge in network monitoring

- ## Several levels of monitoring:
  - ➤ Tenants management: Application network
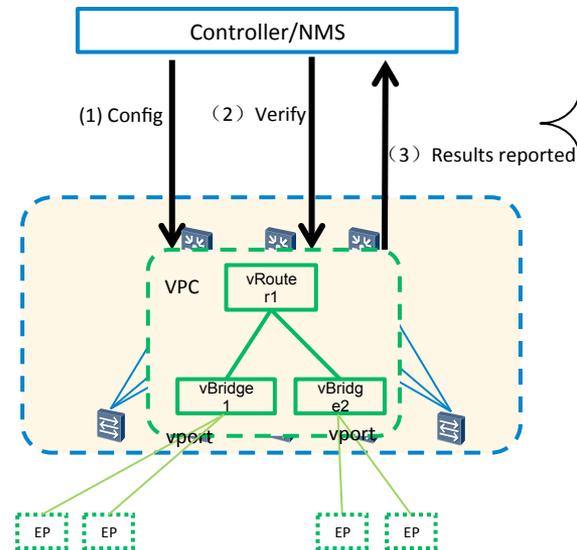 - ➤ Administrator management: logical and physical network
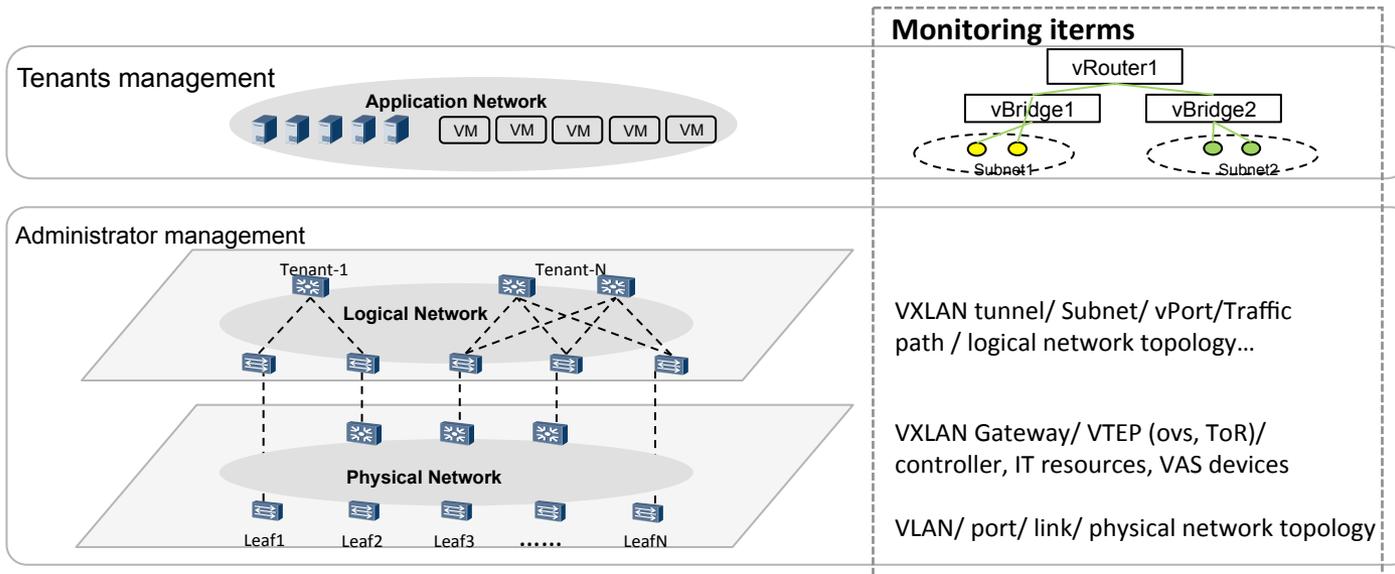
- ## Consideration:
  - ➤ Physical network can be monitored by traditional mechanism, while there are some mechanism for the application network and logical network monitoring???

Challenge in E2E detection and precise fault location

- ## Items in detection:

  - ➢ Detection in the application network:
    - ◆ Inner VPC (Virtual private cloud) detection
    - ◆ VPC and VPC detection
    - ◆ Service function chain detection
  - ➢ Detection in the logical network:
    - ◆ VTEP-VTEP detection
    - ◆ VTEP-SDN Gateway detection
  - ➢ Detection in the physical network:
    - ◆ Traditional detections such as ping or trace route are used as usual.

- ## Consideration:

  - ➢ Physical network can be detected by traditional mechanism, while there are some mechanism for the application network and logical network detection???
  - ➢ Performance indicators such as packet-loss and time delay should be received in the detection
  - ➢ Combined with the mapping topology, fault found out in the detection should be precisely located.

Considerations about log and alarm

- Several levels of log and alarm:
  - ➢ Application network should be defined
  - ➢ Logical network should be defined
  - ➢ Physical network as usual

- Log and alarm of physical network can use the traditional one, while those of the application network and logical network should be defined.

Summary and reference

- SDN network management in Cloud DC should be considered into aspects:
  - ➤ Management architecture
  - ➤ Information collection
  - ➤ Topology visualization
  - ➤ Monitoring and detection requirements
  - ➤ Fault location
  - ➤ Log and alarm

- Reference
  - ➤ OAM DT (RTGWG)
    - ◆ draft-ooamdt-rtgwg-ooam-requirement-01
    - ◆ Draft-ooamdt-rtgwg-ooam-gap-analysis-02
  - ➤ SFC WG
    - ◆ draft-ietf-sfc-oam-framework-01
  - ➤ Lime WG
    - ◆ Draft-ietf-lime-yang-oam-model-07
  - ➤ Etc.

Next step

- Further alignment with the RG charter
  - ➢ Management principles
  - ➢ Management models
  - ➢ Etc.

- Suggestion from the meeting participants

MANY THANKS

Rong Gu

gurong@chinamobile.com

Chen Li

lichenyj@chinamobile.com

Yan Zhuang

Zhuangyan.zhuang@Huawei.com