Challenges in considering SDN network management

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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

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