Problem statement of SDN and NFV co-deployment in cloud datacenters

draft-gu-sdnrg-problem-statement-of-sdn-nfv-in-dc-01
draft-gu-sdnrg-decoupling-scheme-hypervisor-SDN-00

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Introduction

- Problems found out in SDN/NFV co-deployment in cloud datacenters have been presented in this draft due to practical practice.
- Changes from -00 to -01
  - **Virtualized platforms**: details talking about in the draft-gu-sdnrg-decoupling-scheme-hypervisor-SDN-00
  - **Network architecture**: some changes when bare-metal servers are introduced
  - **Interface standardization**: NBI & SBI, especially open-source devices (ODL/ONOS) are popular
  - **Virtualization high availability**
  - **Benchmark standardization**
  - **Extension of network**: openstack \ controller \ forwarding devices limitations
  - **DCI**: SDN datacenters and traditional datacenters
  - **Practical practice experience**

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Network architecture:

- **SDN GW Load balancer Firewall**
- **Internet**
- **Core switch**
- **Router**
- **ToR**
- **OPENSTACK Controller**
- **Switch for management**
- **Server for storage**
- **Virtualized server**
- **Bare-metal server**

- **VTEP**: SDN ToR and vsw
- **Openstack**: ironic and neutron module with horizon undeveloped
- **Openstack version**: network limitations
- **Test benchmark**
Virtualized platform:

- In private cloud, some commercial hypervisors other than KVM is used.

- **Problems:**
  - Integrations of SDN controller with different hypervisors
  - Relationship between open-vsw or SDN vsw and vsw bonding on the hypervisor
  - Two solutions and their limitations:
    1. private interfaces of hypervisor
    2. the bottleneck of virtual machines
Virtualized platform:

① Substitution of virtual switch belongs to SDN network

- openstack
  - nova
    - Controller driver
  - neutron
    - virtual switch driver
- SDN controller
- VMware ESXi hypervisor
  - virtual switch
    - switch agent
  - nova compute
    - VM1
    - VM2
    - VM3

Private interface of hypervisor
Cooperate with hypervisor

② Virtual machine added acting as the virtual switch

- openstack
  - nova
    - Controller driver
  - neutron
    - virtual switch driver
- SDN controller
- VMware ESXi hypervisor
  - virtual switch
    - switch agent
  - nova compute
    - VM1
    - VM2
    - VM3
    - VM as vsw

All traffic goes through vm as vsw which can be the bottleneck
Extension of network and DCI

In the near future:

• Extension of network

  Number of servers and virtual machines supported by SDN network is related with openstack, controller, and all forwarding devices. In fact, it takes a long time in building flow table on controllers, such as 300 VMs co-built about 25 minutes after the improvement. How about 3000 vms, 30000 vms? How about bare-metal servers without testing environment?

• Datacenter inter-connection

  SDN cloud datacenters belongs to different vendors inter-connection; Traditional cloud datacenters and SDN cloud datacenters inter-connection with SDN devices equipped.
Questions

- Would you like to share your practice experience?

- Would you like to participate and contribute to this work?

- How can all the problems summarized in building this informational draft?
Next Step···

Solicit comments and suggestions···
MANY THANKS

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