

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

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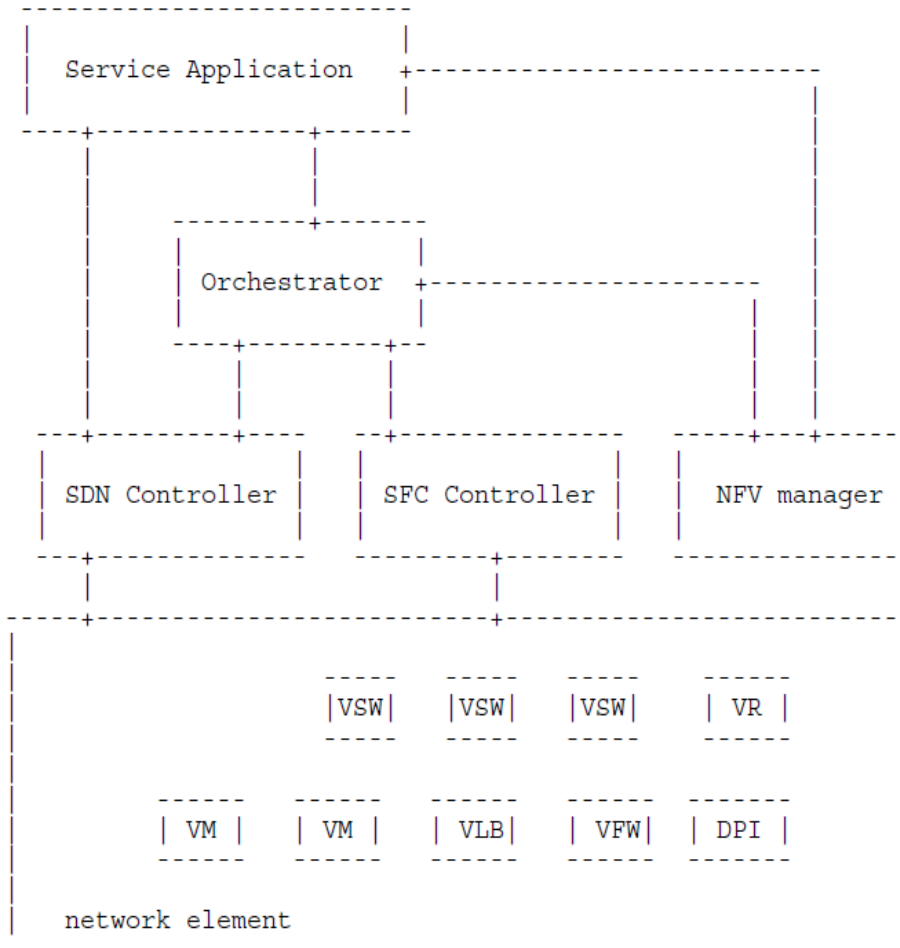
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Introduction

- SDN and NFV technology co-deployed in public and private cloud DCs
- Resolution test conducted aiming at the co-deployment of SDN and NFV
- Key problems to be working on

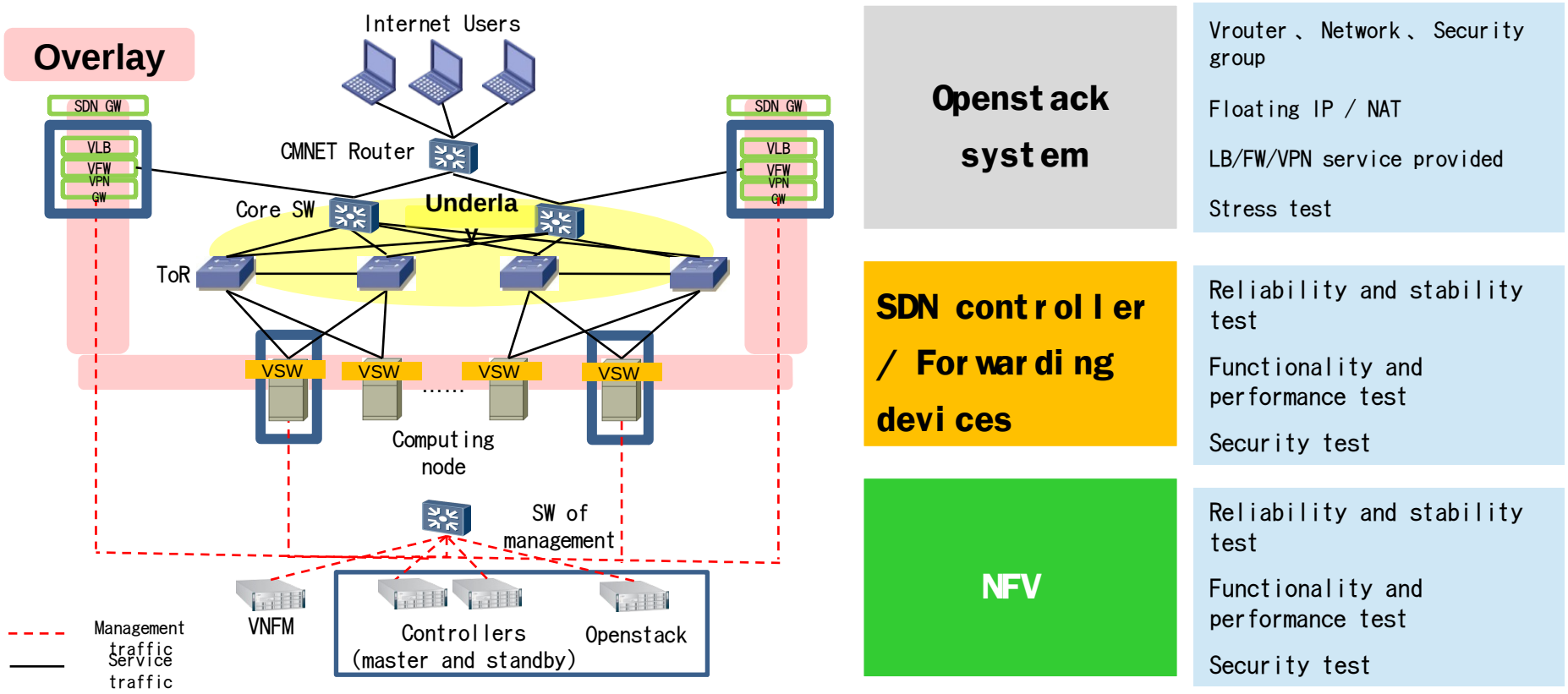
SDN-NFV usecase in cloud datacenters



- Service application:
 - Service requirement
- Orchestrator:
 - Orchestration
- SDN controller:
 - In charge of SDN data path and network
- SFC controller:
 - In central control of sfc
- NFV manager:
 - NFV lifecycle management
- Network elements:
 - Resource instances

Resolution test of SDN-NFV in cloud dc

—Test topology



According to the test, SDN and NFV technology has been mature already for the commercial deployment in operators' network.

Performances of SDN controllers, forwarding devices have been improved with function of NFV included.

There are some key problems remained.

Resolution test of SDN-NFV in cloud dc

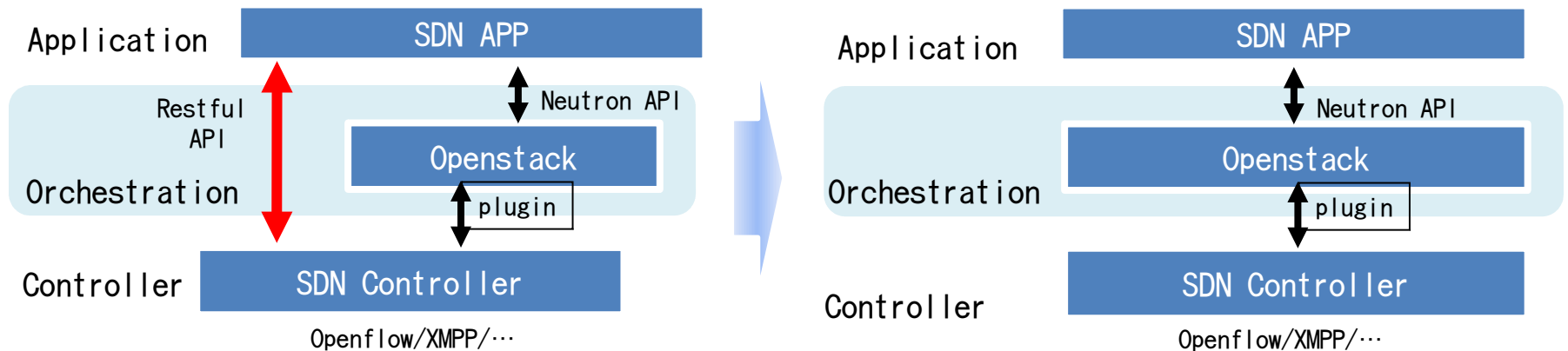
—Test cases

System	System	Controller	For war di ng devi ces	NFV (vLB / vFW / VPN)
Router and network	Firewall functionality	Load balance and reliability of multi-controllers	OAM	ACL Health check
Security group	Firewall HA	Speed of the flow table forwarded and built	Stability	Master and standby of FW Load balance
Floating IP	Load balancer functionality	Capacity of flow table in controller	Performance of vsw	Throughput Session sticky
N:1 NAT	Load balancer HA	Maximum of vsw supported by controller		New connection maximum Multi-VIP
Bandwidth limitation of floating IP and NAT	IPSec functionality	Security of South-bound Interface		Co-connection maximum Performance of unique vlb
Bandwidth limitation of VM	IPSec HA	Security		Number of vfw in one server Number of vlb in one server
Traffic statistics of VM	SSL functionality		Performance of the Gateway	Performance of unique vfw SSL performance
V-motion of VM	Traffic Mirroring	Account security		
Metadata function	Security group stress test	Authority security		
Router and Network stress test		IP protocol security		
		Password security		
		Log security		

Problems and aspects to be considered

——Interface standardization

- The interface of OpenStack is incomplete.
 - Physical servers are out of the scope of openstack.
 - Neutron API has not been incomplete when considering some services such as traffic re-direction and service orchestration of service chain.
 - The plugins of LBaaS, FWaaS and some others are limited into one vendors.
- With the help of SDN application, the extend restful API is necessary. Anyway, we hope openstack can include all the APIs.



Problems and aspects to be considered

——Network architecture and virtualized platform

- SDN, NFV and openstack are all included in the DC, while co-operation of orchestration, SDN controller and SFC controller are not quite clear.
 - The architecture of VNF from multi-vendors are not supported without integration.
 - SDN and openstack has been researched deeply while NFV and openstack hasn't. NFV function has been limited.
- The virtualized platform KVM has been widely used while other platforms such as Xen and VMWARE ESXI need to be further researched on.

Problems and aspects to be considered

——HA, benchmark and practice experience

- Telecom Systems requires 99.999% reliability, while virtualization technology brings extra challenges for high availability in NFV
 - Divide high availability problem in NFV scenarios into three layers: hardware layer, NFV platform layer, and service layer.
 - Each layer should work together to provide overall high availability
 - Common API should be defined for NFV platforms to provide carrier grade high availability feature for VNF services.
- Standardized benchmark on SDN and NFV with different methods of encapsulation, different realization mechanism of SDN controller and etc.
- Practical practice experience such as network architecture selected and different deployments is eager to be shared.

Conclusion

- SDN and NFV technology has been planned to be co-deployed in the cloud datacenters. Through the resolution test, we have found out that key problems on network architecture, virtualized platform, standard interfaces, high availability and practice guidance exist.
- Any comments and advices are welcomed.

Thank you

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