

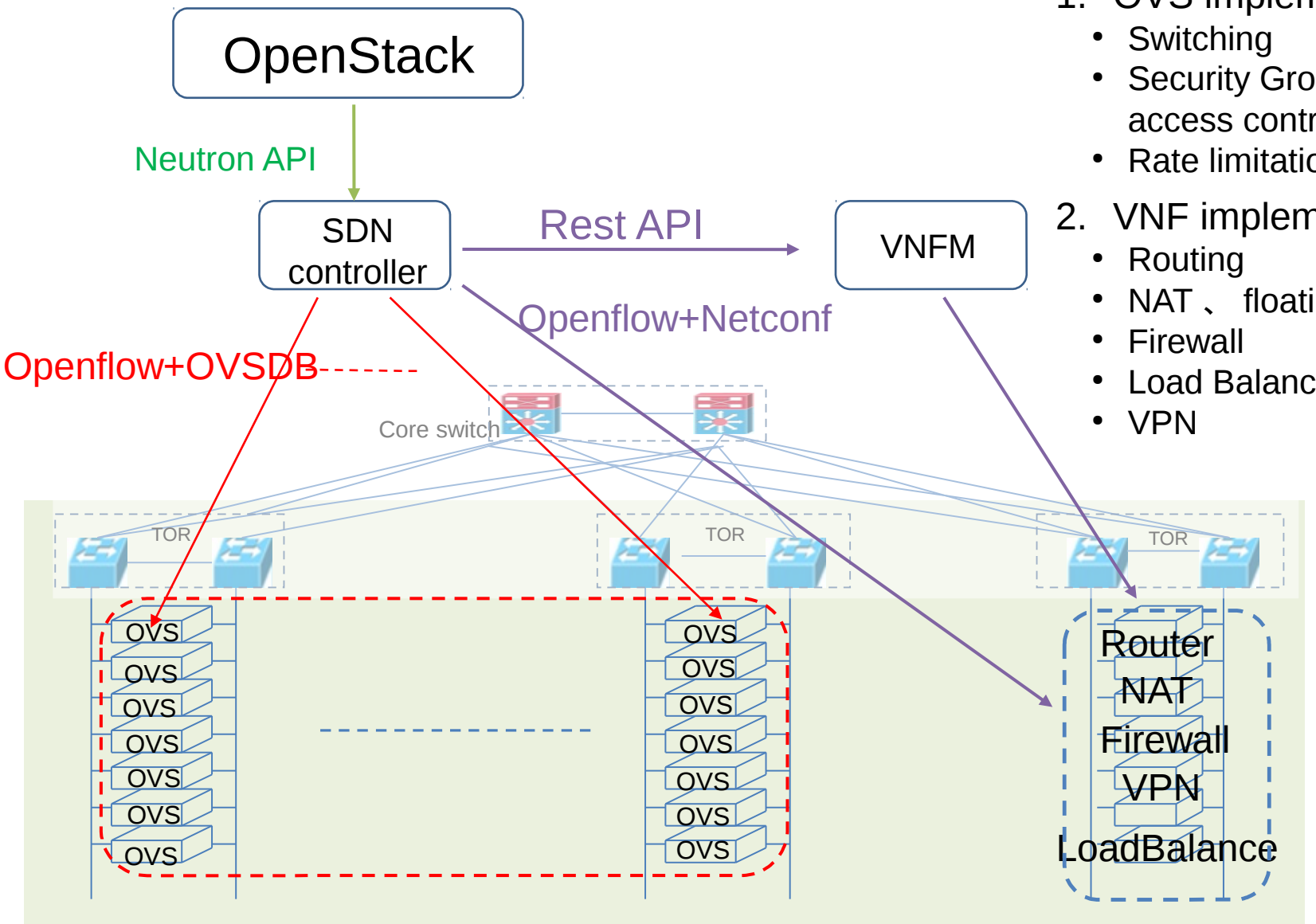
Practice of deploying SDN and VNFs in the data center

Jinzhu Wang

Introduction

- **SDN** decouples the network control from forwarding and makes the network programmable. **NFV** uses the technologies of IT virtualization to virtualize entire classes of network node functions as the VNF.
- Deploying SDN and VNFs in the data center can make the network more flexible and increase the network utilization
- First introduces a practice of deployment of SDN and VNFs in the data center, and then discusses how SDN and VNFs can be combined in the data center

Deployment of SDN and VNFs



- 1. OVS implements:
 - Switching
 - Security Group for access control
 - Rate limitation
- 2. VNF implements:
 - Routing
 - NAT 、floatingIP
 - Firewall
 - Load Balance
 - VPN

Compute Node

Compute Node

Network Node
VNF

Interfaces

- Interface between SDN controller and OVS (well standardization)

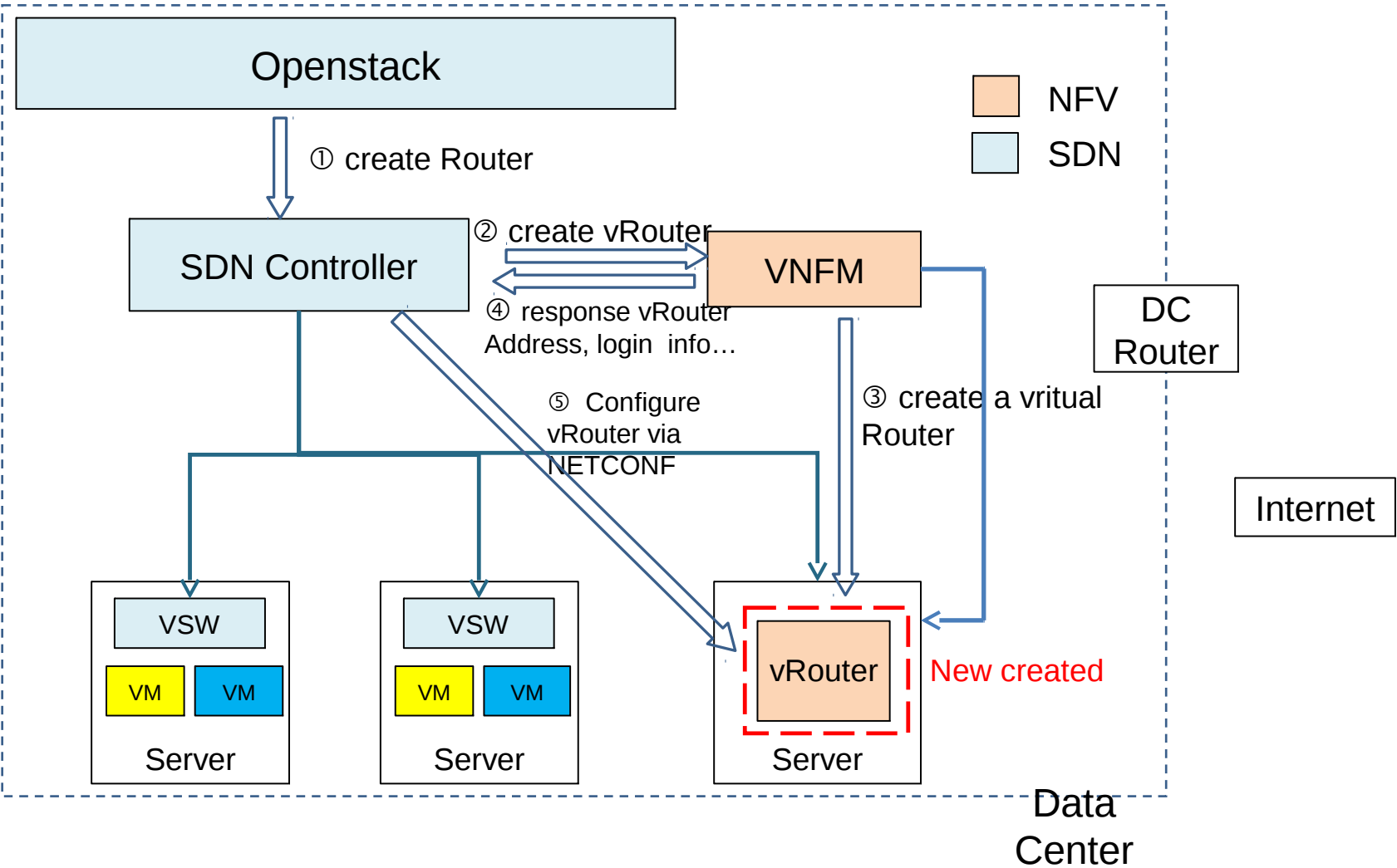
OVSDB: protocol for configuring the OVS.

OPENFLOW: protocol for setting flow entry to OVS, which takes charge of data forwarding.

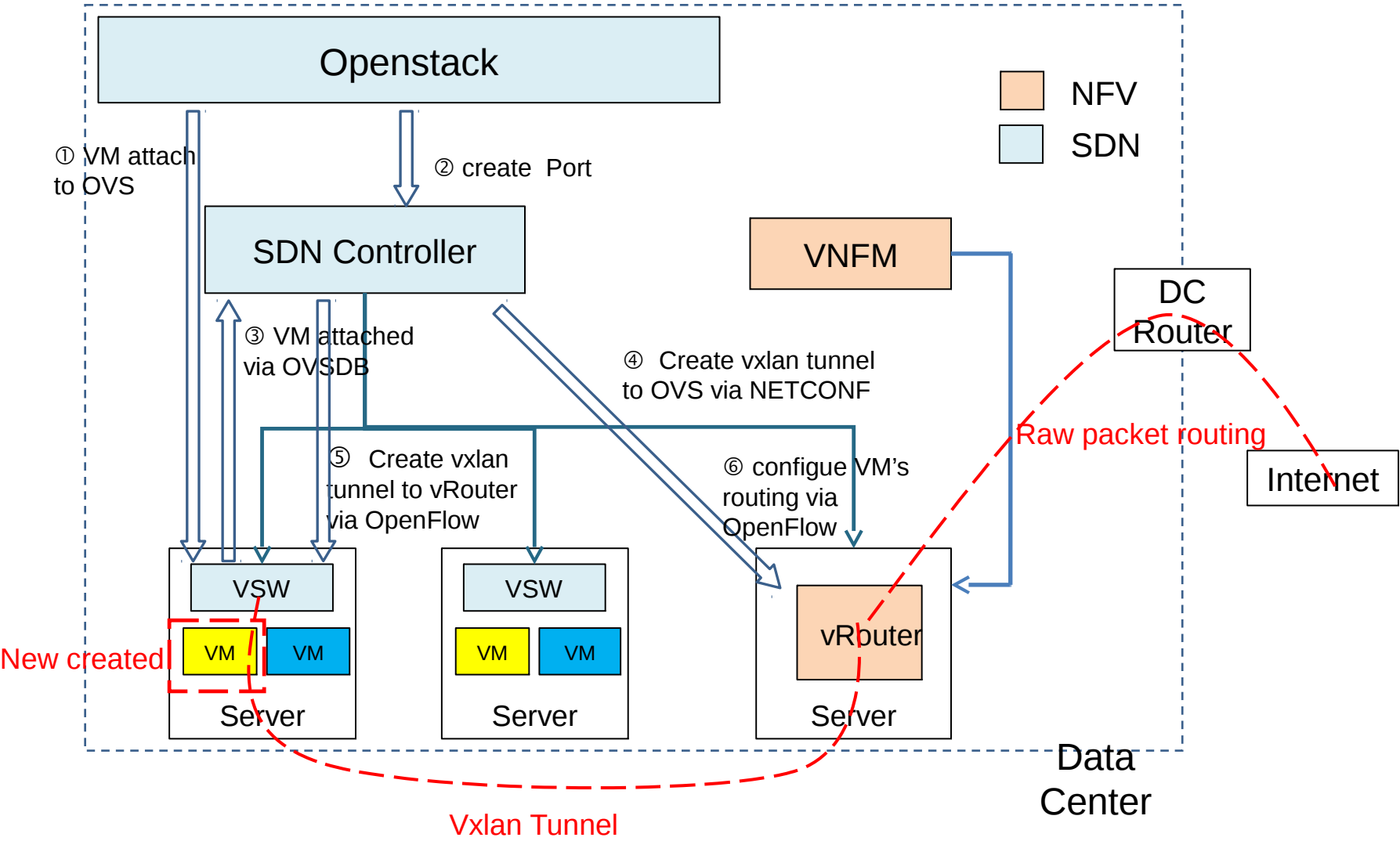
- Interface between SDN controller and VNFM (not well standardization)

NETCONF/RESTCONF/REST API: Yang model extension is defined and the REST API is vendor specific.

Example: Step 1, create a virtual Router

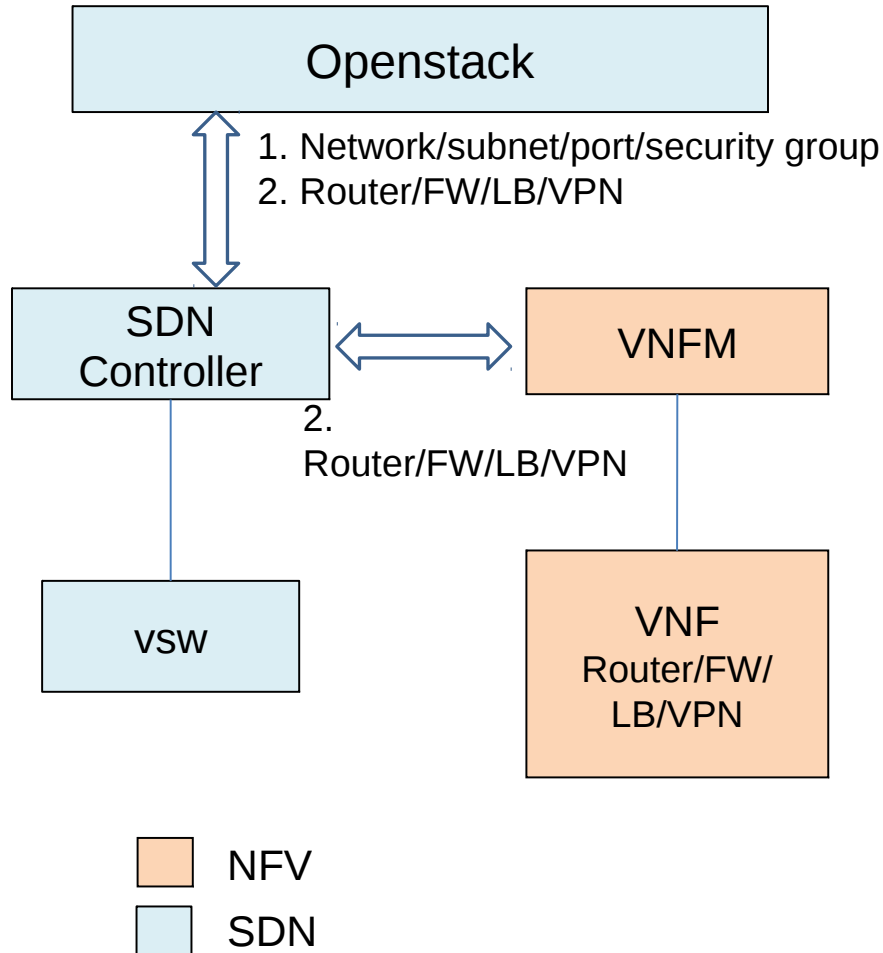


Example: Step 2, create a VM



Combinations of SDN controller and VNFs

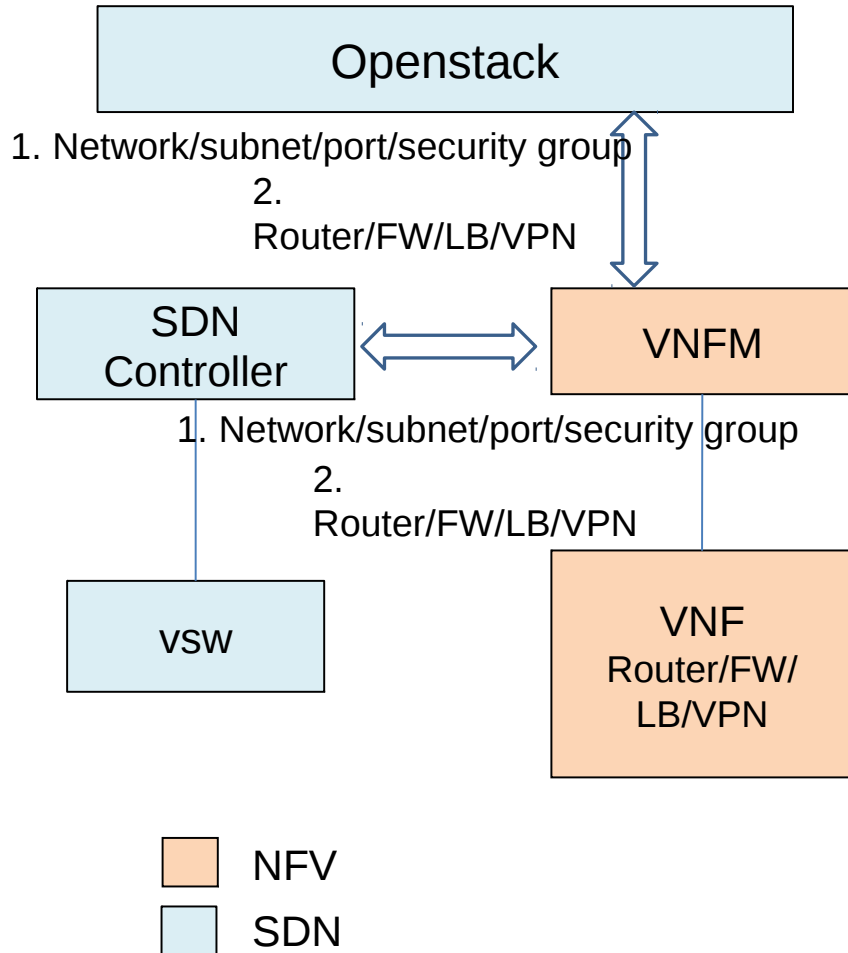
Option 1: Openstack -> SDN controller -> VNFM



- OPENSTACK sends all events to the SDN controller
 - SDN controller interworks with VNFM to handle VNF related events.
 - Easy to deploy.
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- Note that our current deployment (SDN controller connects to VNF) is slightly different from the option1. We will move to option1 in our next deployment

Combinations of SDN controller and VNFs

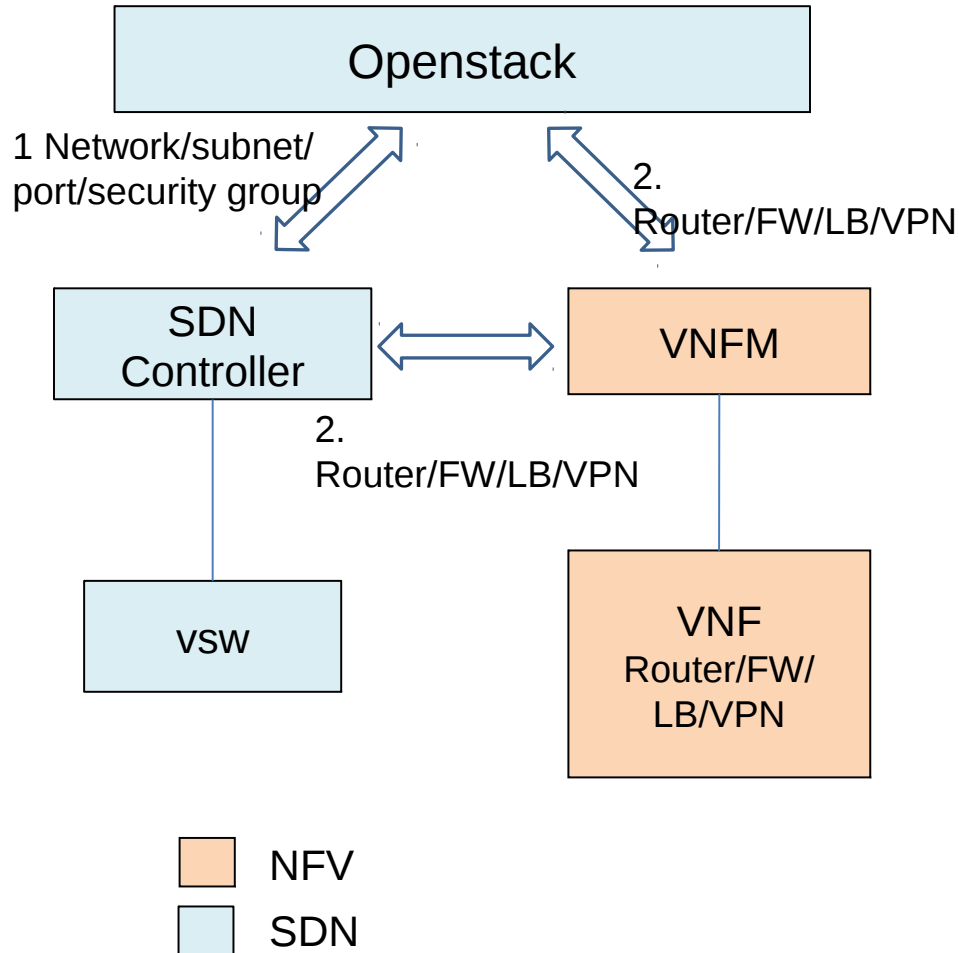
Option 2: Openstack -> VNFM -> SDN controller



- OPENSTACK sends all events to the VNFM
- VNFM interworks with SDN controller to handle VNF related events
- VNFM forwards VM-related events to SDN controller
- VNFM more complex and inefficient (handling the OVS related events makes no sense to VNFM)

Combinations of SDN controller and VNFs

Option 3: Openstack -> 1. SDN controller 2. VNFM



- OPENSTACK sends VM-related events to the SDN controller, sends VNF-related events to the VNFM
- VNFM interworks with SDN controller to handle VNF related events
- Needs a good cooperation (standardization) between Openstack, SDN controller and VNFM
- Currently hard to deploy since SDN controller and VNFM from different vendors and there is no good standardization interface between SDN controller and VNFM

Thank you