

**CHINA**  
*OpenStack Days*

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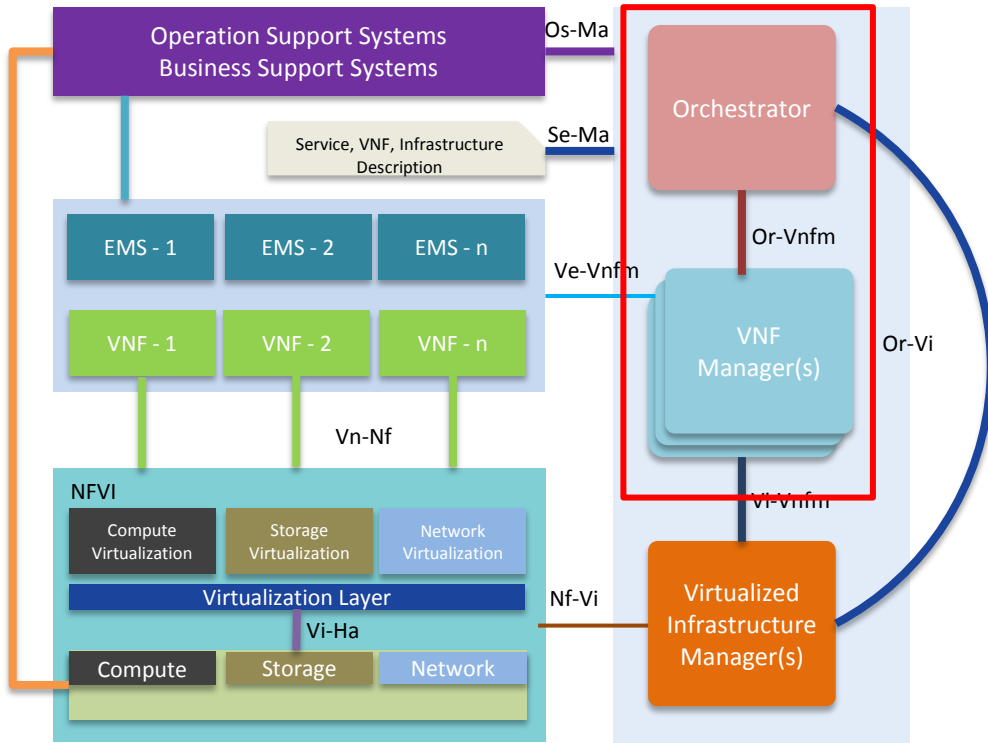
**IT大咖说**  
知识分享平台

# Tacker VNF 编排和管理实战

闫兴安(**China Mobile**), 龚永生(**99cloud**)



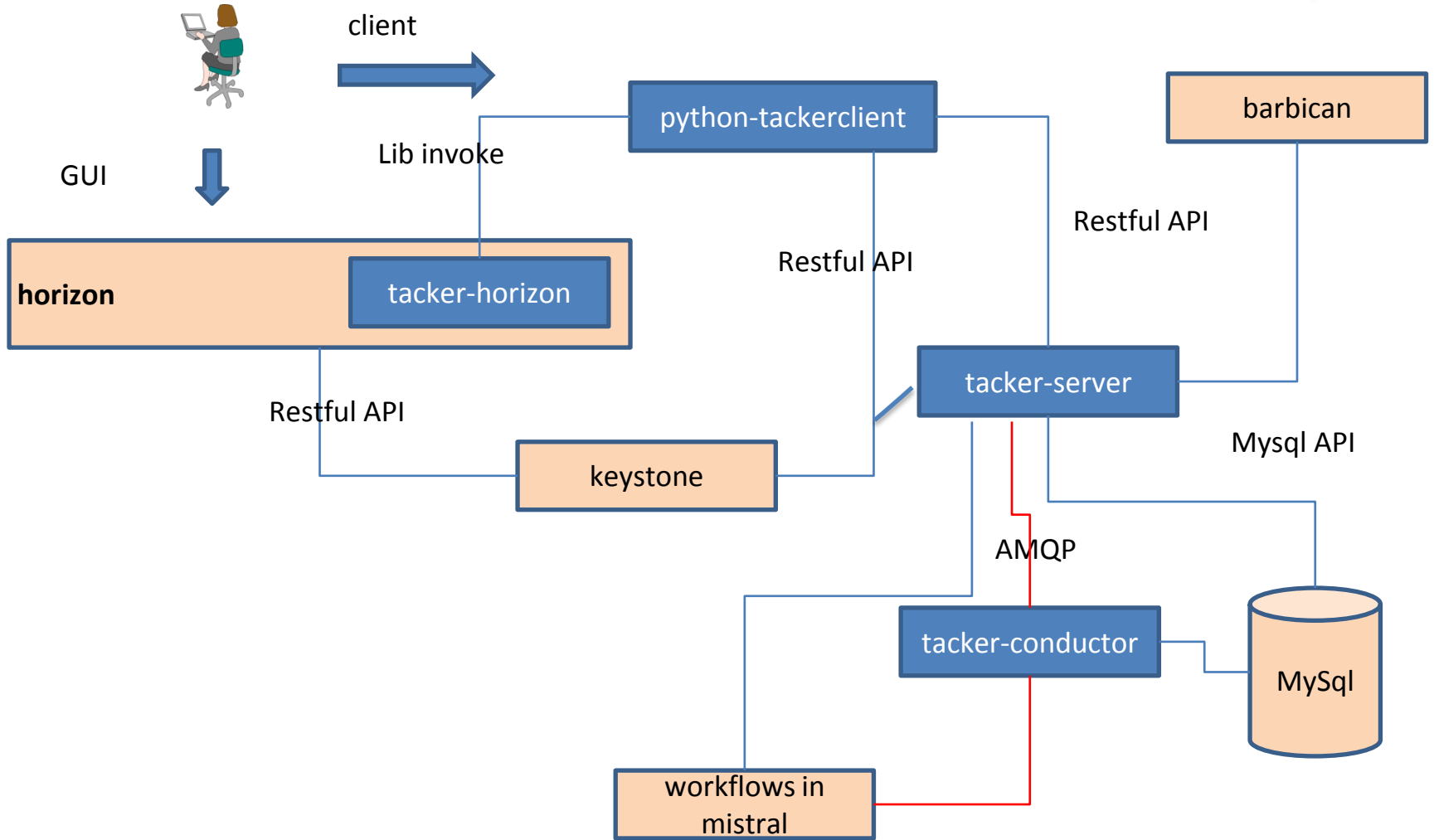
# Introduction



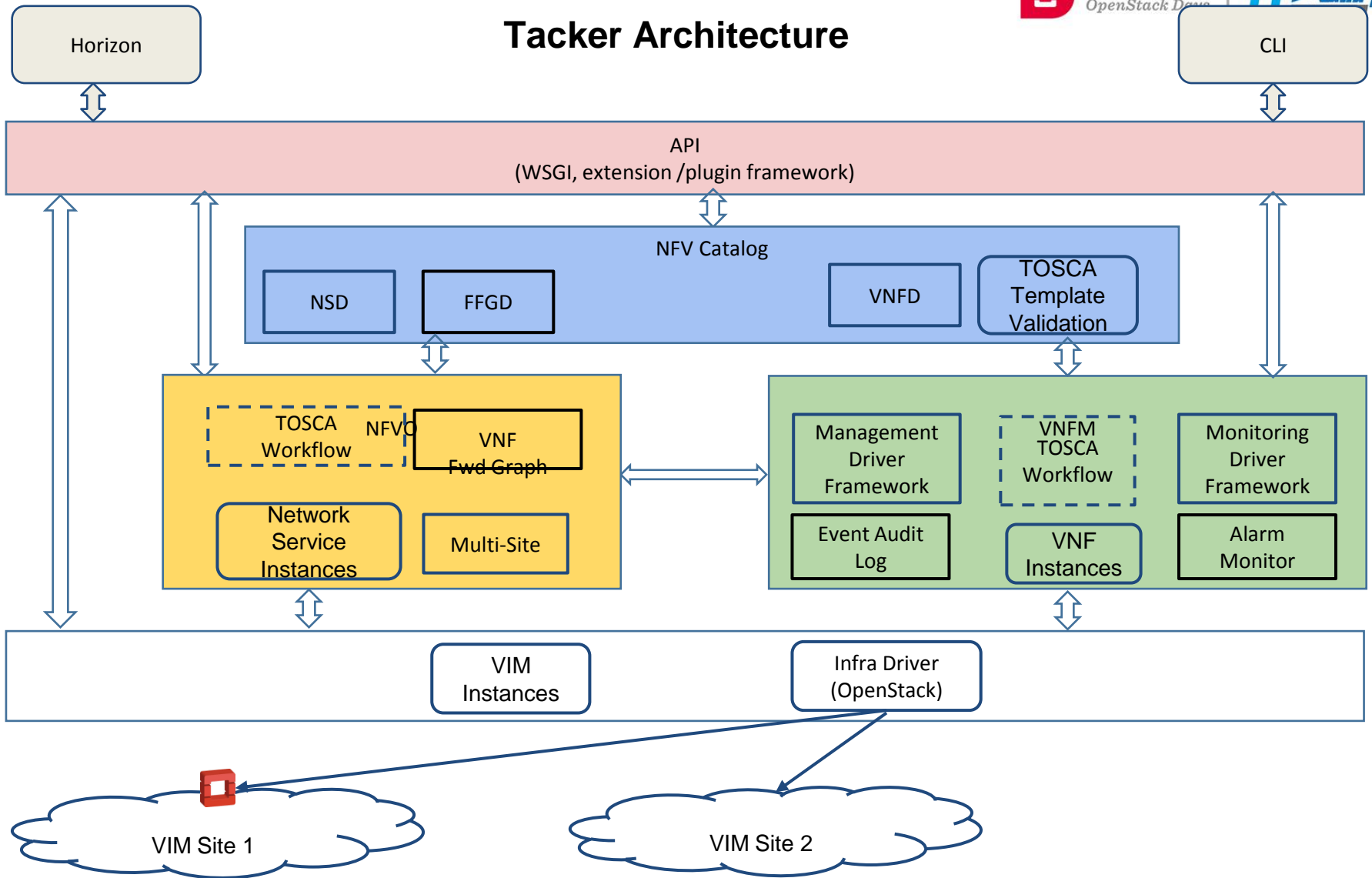
Tacker – Official OpenStack project for NFV Orchestration and VNF Management using standards based architectures.  
Current version: 0.7.0  
Release - Ocata

## Project Overview

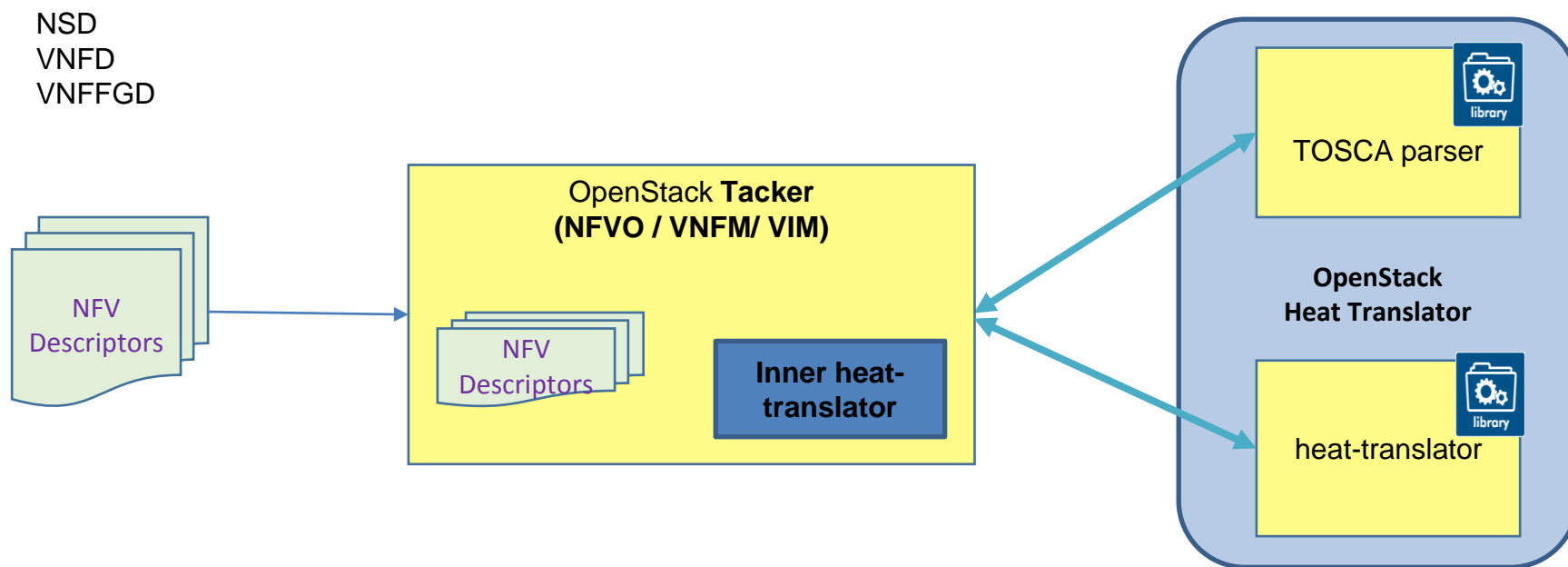
- Started on NFV Orchestration early 2015
- Announced in OpenStack Vancouver Summit – May, 2015
- First release in Kilo with basic VNF life-cycle management
- Second release in Liberty with Monitoring Framework
- Accepted into OpenStack Big-Tent in March, 2016
- Part of official OpenStack Mitaka.
- Closely work with OPNFV and standards bodies like ETSI NFV and OASIS TOSCA



# Tacker Architecture

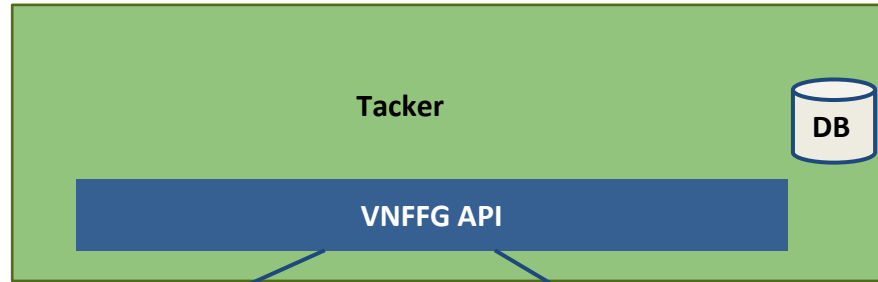
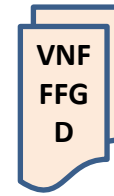


# Closely integrated third party libraries



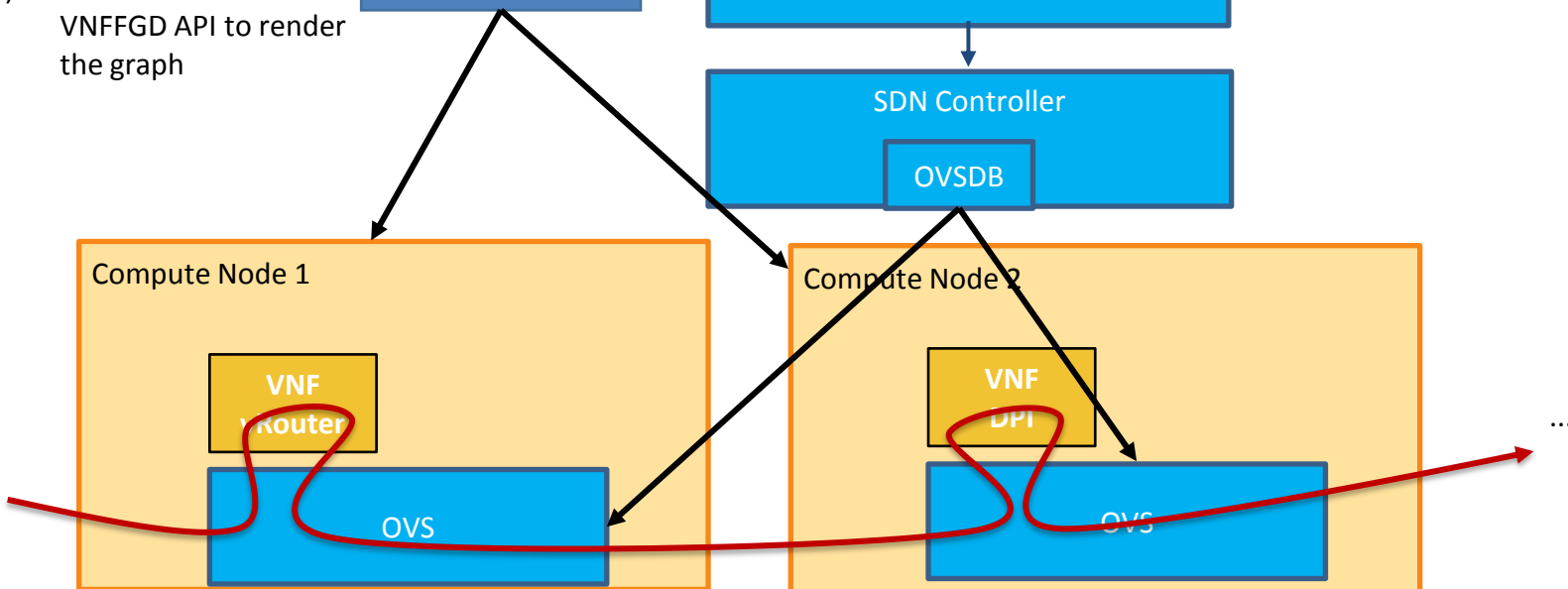
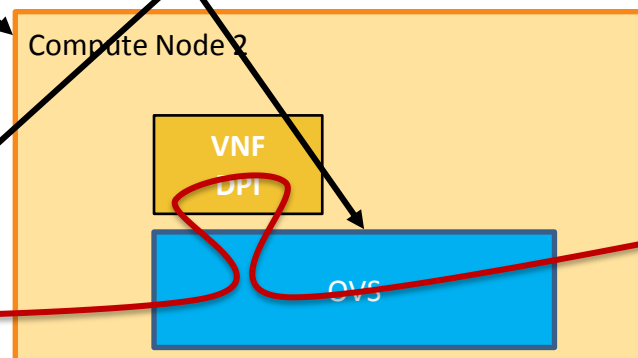
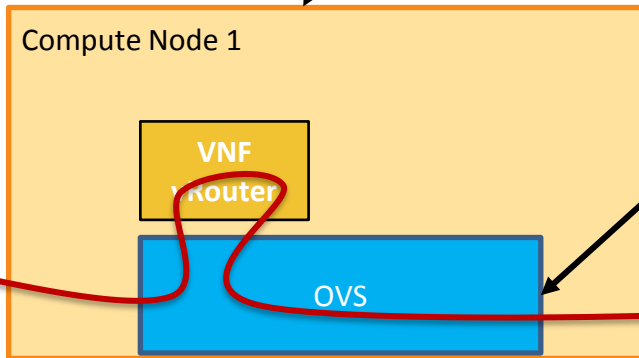
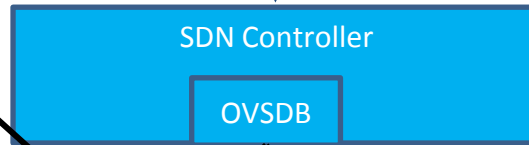
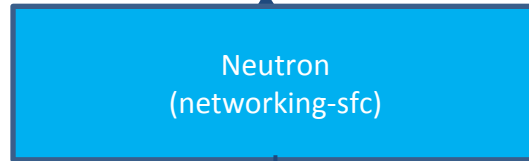
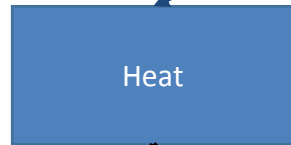
# VNFFG

Templates

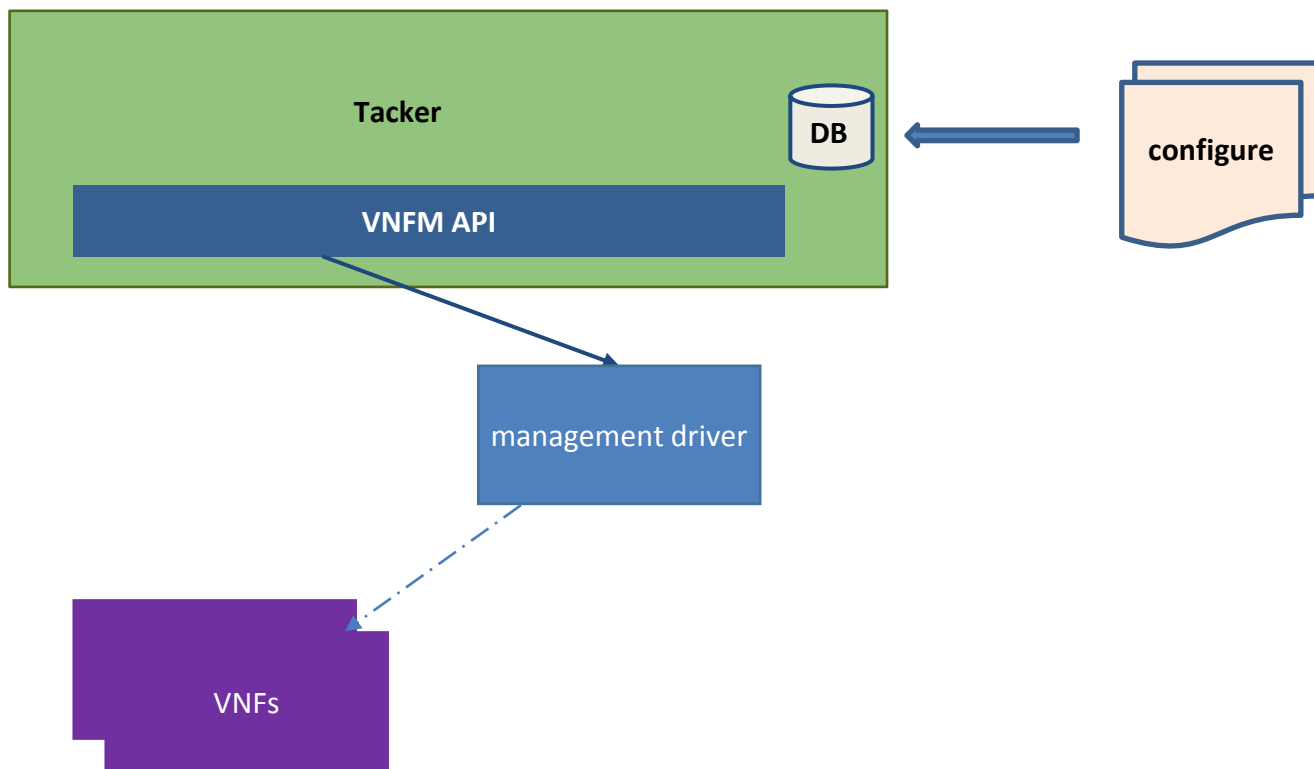


Workflow:

- 1) Onboard NSD, FGD, VNFD to Catalog
- 2) Instantiate 2 or more VNFs from Catalog
- 3) Invoke Tacker VNFFGD API to render the graph



# VNFs management and configure





## 中移（苏州）软件技术有限公司 中国移动苏州研发中心

- 中国移动一级子公司，总投资31.72亿，注册资本6亿
- 坐落在美丽的苏州太湖之滨，现有正式员工700人，远期规模4500人，园区规划占地480亩
- 主要负责云计算、大数据、IT支撑系统以及部分应用产品等开发和应用
- 主要产品已经在集团一级私有云、公有云、省级资源池中广泛应用

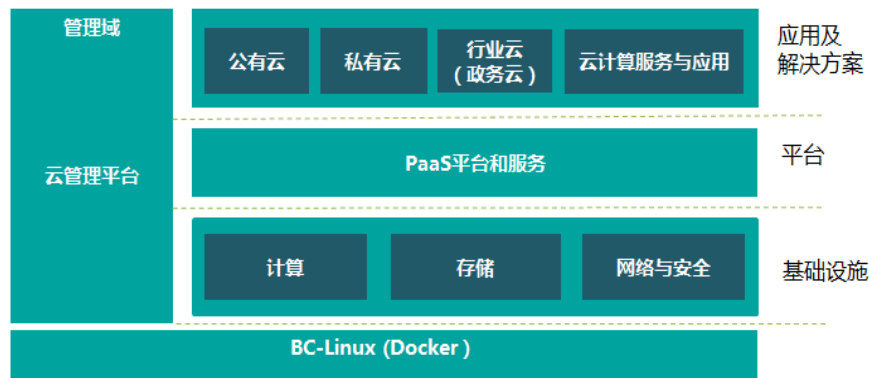


苏小研  
微信号：cmcc\_sxy

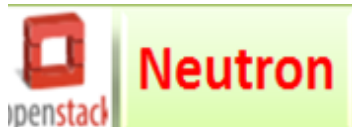
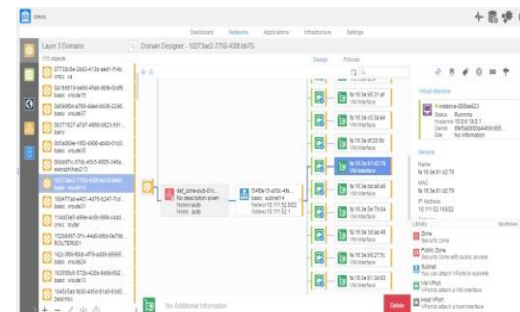
## 云计算产品部

- 提供云计算相关的标准化和定制化产品及解决方案；
- 提供构建云计算资源池的集成服务和运营支撑服务；
- 提供云计算咨询及应用云化迁移服务；

云计算各项产品和服务已经在移动公有云、移动集团一级私有云及多个省/专业公司项目中商用，累计部署规模超过**12000**台服务器。



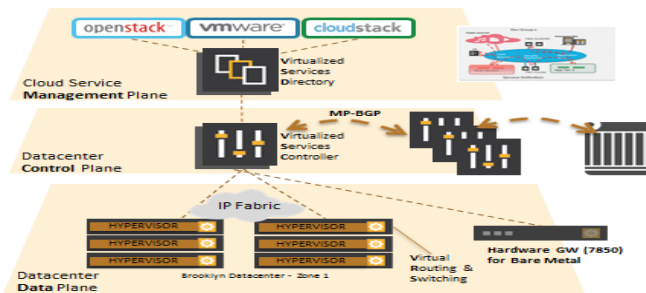
OSS/BSS



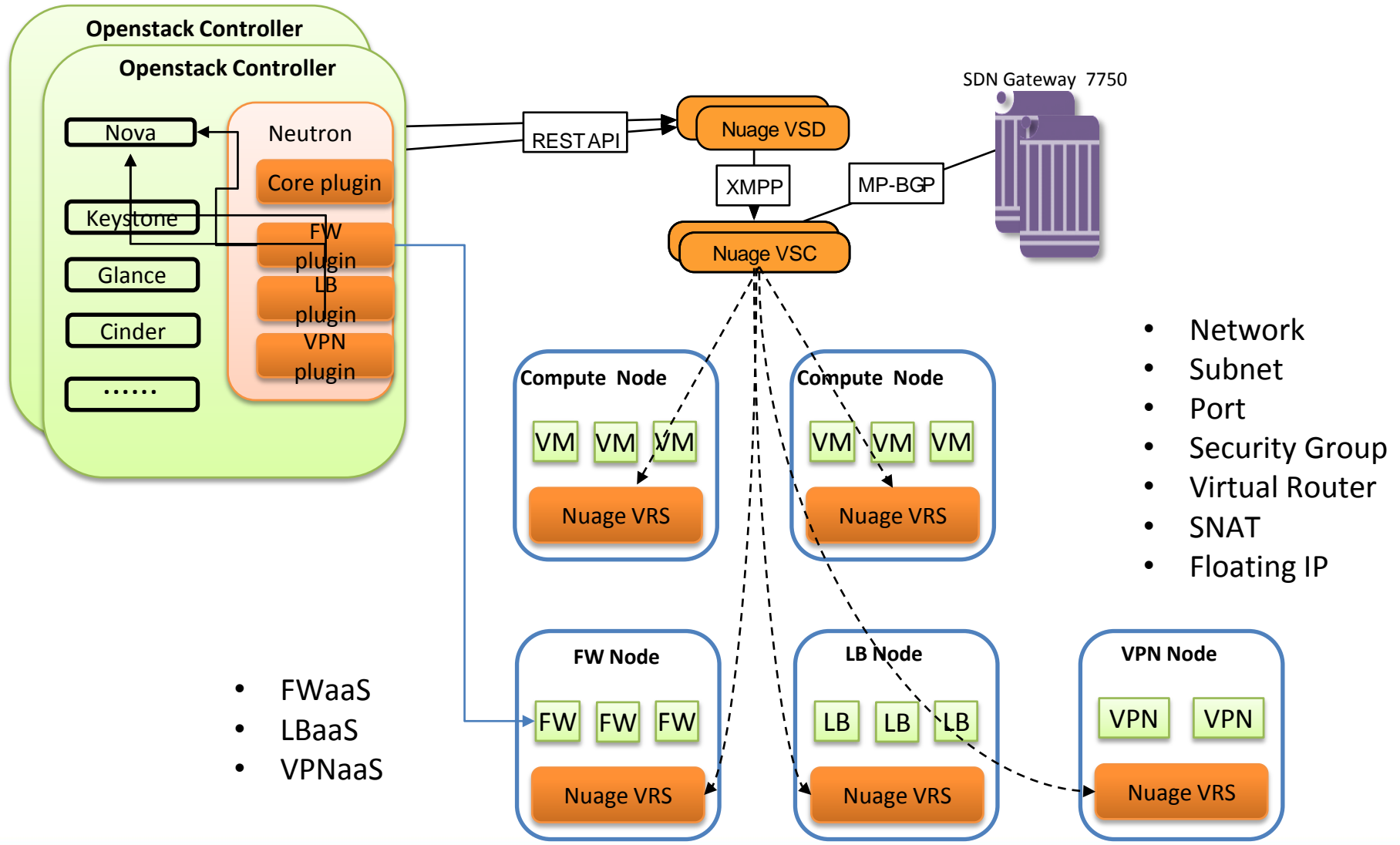
Service Control Tier

- Network, Subnet, Port
- Security Group
- Virtual Router
- Floating IP
- Virtual Firewall
- Virtual Load Balancer
- VPN
- Qos

SDN and NFV

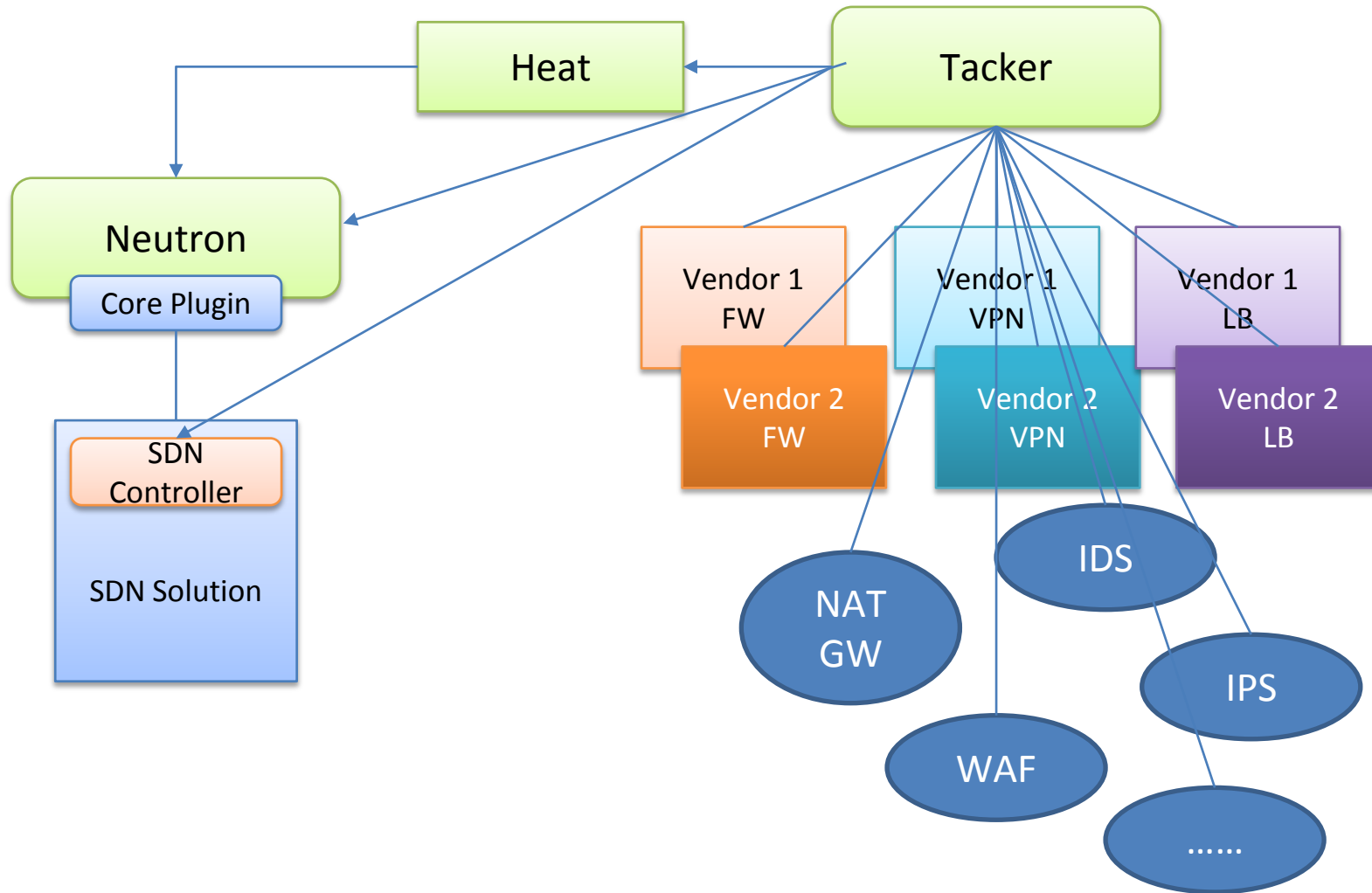


- Firewall ZONE
- Load Balancer ZONE
- VPN ZONE






- SDN与NFV紧耦合，一个SDN厂家难以支持多个厂家VNF
- Neutron Plugin中，不支持一个网元的多厂家
- Neutron Plugin的VNF功能有限
- 有些网元没有plugin，比如WAF，IPS
- 不支持弹性扩缩容
- 不支持跨DC

Tacker能否解决这些痛点？



- SDN与NFV解藕
- 支持多厂家的VNF
- 支持弹性伸缩
- 支持跨DC

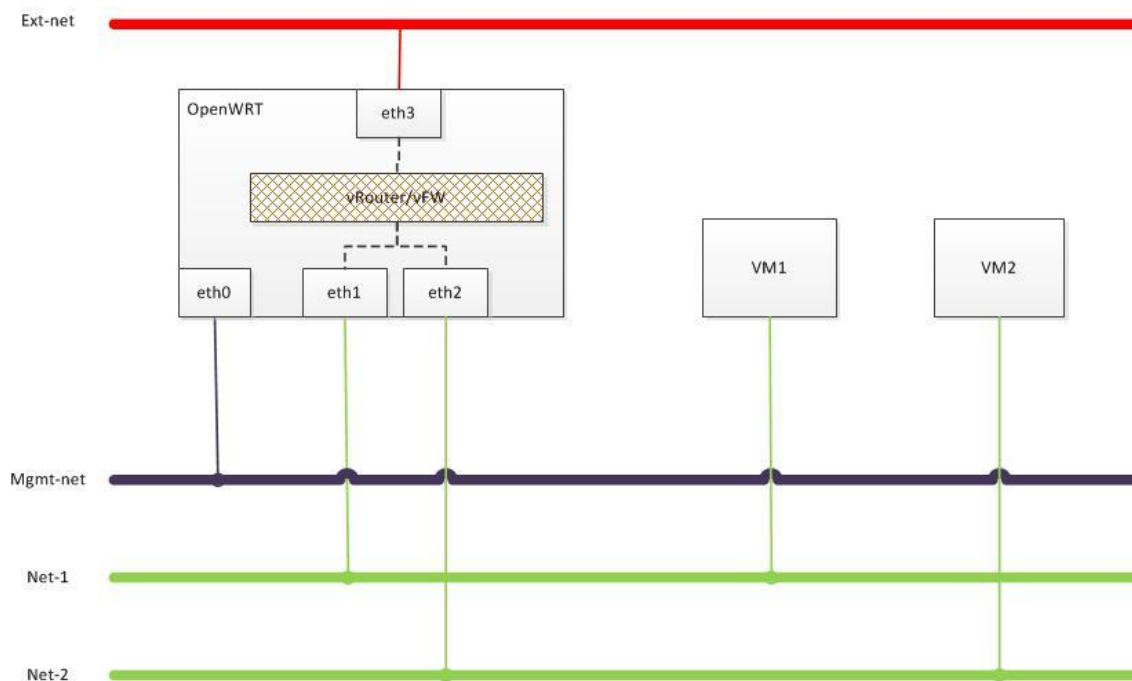
## ●Tacker网元集成、设计

- ✓ 基于openwrt实现vrouter, vfw  ✓ 动态配置mgmt-driver
- ✓ 基于LVS + haproxy实现vLB  ✓ 弹性伸缩
- ✓ 集成Hillstone的waf+slb  ✓ VNFFG 服务链

## ●Tacker社区贡献-Pike

- ✓ patch排名第二
- ✓ 合并3个spec, 实现一个spec
- ✓ 提交22个bug, fix 10个

- 通过Tacker启动openwrt虚机作为vrouter网元
- 通过mgmt-driver对openwrt的network和firewall进行动态配置





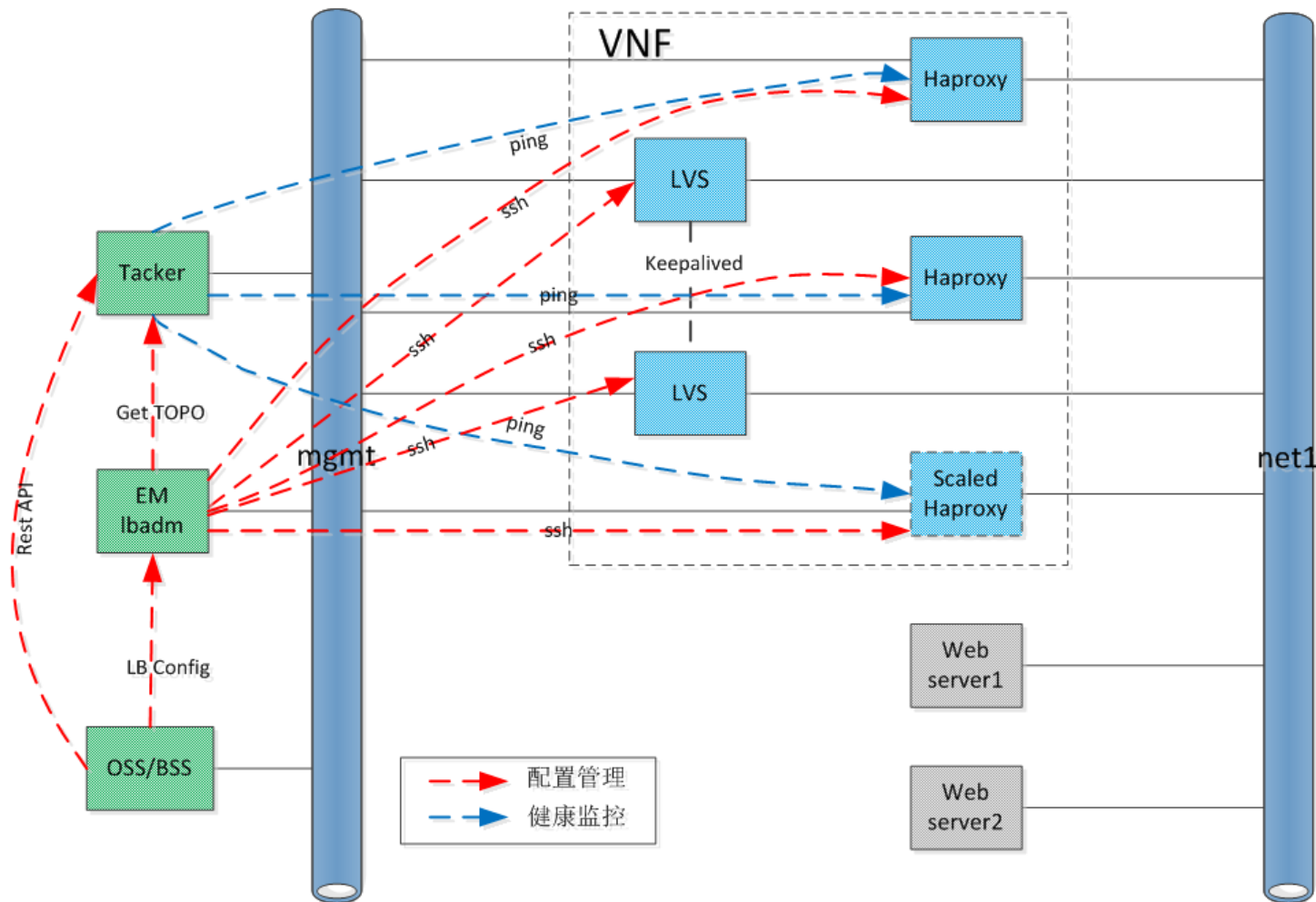
```
# tacker vnf-create --vnfd-template openwrt-vrouter-vnfd.yaml --vim-name VIM0 --vim-region-name  
RegionOne --config-file openwrt-config.yaml openwrt-vrouter
```

```
tosca_definitions_version: tosca_simple_profile_for_nfv_1_0_0  
description: Demo example  
metadata:  
  template_name: sample-tosca-vnfd  
topology_template:  
  node_templates:  
    VDU1:  
      type: tosca.nodes.nfv.VDU.Tacker  
      properties:  
        image: openwrt_vrouter  
        flavor: openwrt_vrouter  
        availability_zone: nova  
        mgmt_driver: openwrt  
        config: |  
          param0: key1  
          param1: key2  
    CP1:  
      type: tosca.nodes.nfv.CP.Tacker  
      properties:  
        management: true  
        order: 0  
        anti_spoofing_protection: false  
      requirements:  
        - virtualLink:  
            node: VL1  
        - virtualBinding:  
            node: VDU1
```

```
    CP2:  
      ...  
    CP3:  
      ...  
    CP4:  
      ...  
    VL1:  
      type: tosca.nodes.nfv.VL  
      properties:  
        network_name: net-mgmt-v832  
        vendor: Tacker  
    VL2:  
      type: tosca.nodes.nfv.VL  
      properties:  
        network_name: yxa-net1  
        vendor: Tacker  
    VL3:  
      type: tosca.nodes.nfv.VL  
      properties:  
        network_name: yxa-net2  
        vendor: Tacker  
    VL4:  
      type: tosca.nodes.nfv.VL  
      properties:  
        network_name: yxa-ext-net  
        vendor: Tacker
```

```
# tacker vnf-update --config-file openwrt-config1-allow-icmp-input.yaml openwrt-vrouter  
# tacker vnf-update --config-file openwrt-config2-allow-lan-to-wan .yaml openwrt-vrouter
```

<pre>vdus: VDU1:   config:     network:         package network        config interface 'loopback'         option ifname 'lo'         option proto 'static'         option ipaddr '127.0.0.1'         option netmask '255.0.0.0'        config interface 'mgmt_net'         option ifname 'eth0'         option proto 'dhcp'        config interface 'net1'         option ifname 'eth1'         option proto 'dhcp'        config interface 'net2'         option ifname 'eth2'         option proto 'dhcp'        config interface 'ext_net'         option ifname 'eth3'         option proto 'dhcp'</pre>	<pre>firewall:     package firewall   config defaults     option syn_flood '1'     option input 'ACCEPT'     option output 'ACCEPT'     option forward 'ACCEPT'   config zone     option name 'mgmt_net'     option network 'mgmt_net'     option input 'ACCEPT'     option output 'ACCEPT'     option forward 'REJECT'   config zone     option name 'lan'     list network 'net1 net2'     option input 'ACCEPT'     option output 'ACCEPT'     option forward 'ACCEPT'   config zone     option name 'ext_net'     list network 'ext_net'     option input 'REJECT'     option output 'ACCEPT'     option forward 'REJECT'     option masq '1'     option mtu_fix '1'</pre>
---	--



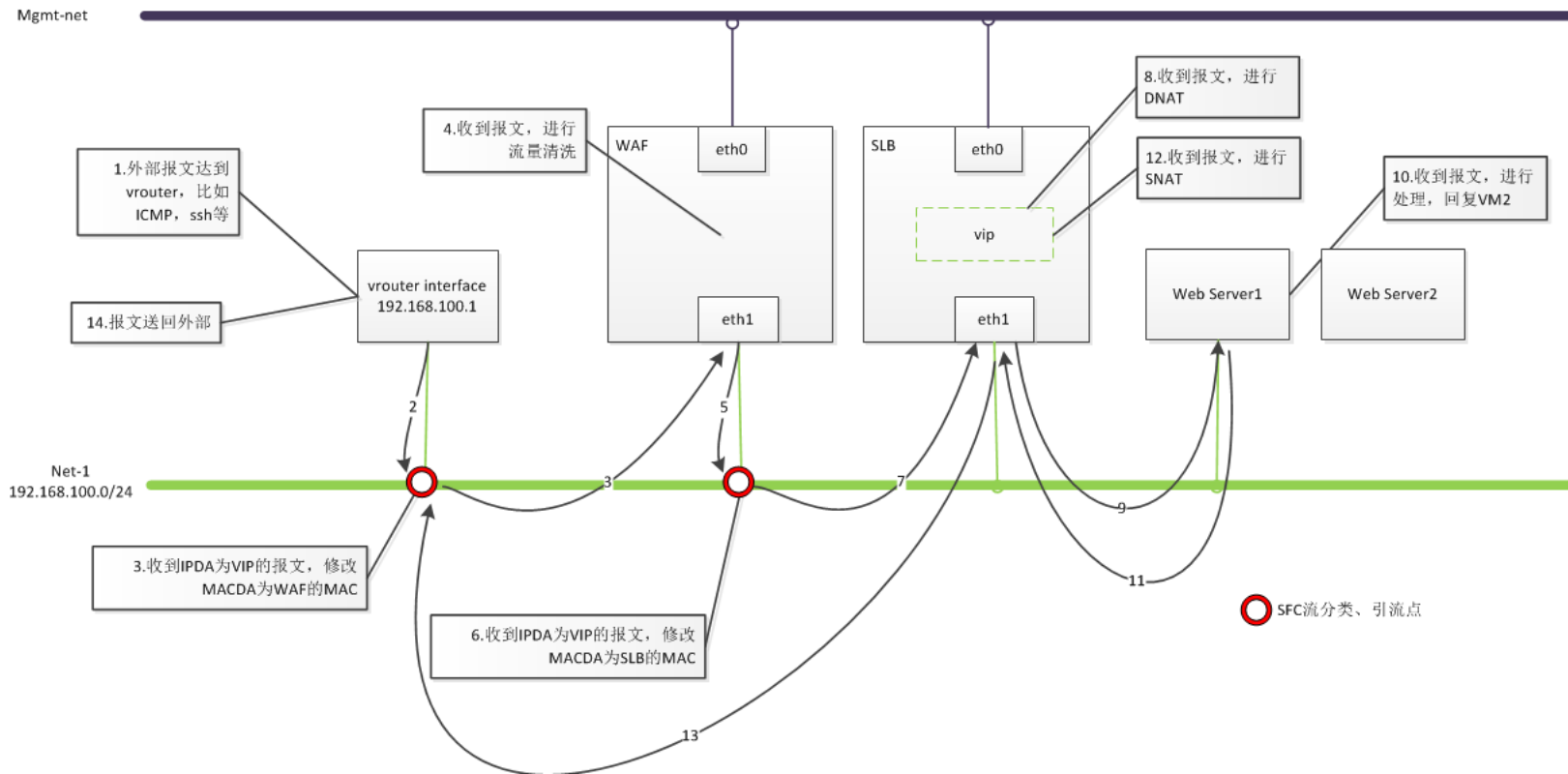
- Tacker 通过ceilometer、aodh对haproxy虚拟机进行监控、告警
- Tacker自动创建或者删除网元
- EM监测到scale事件，同步配置到LVS和haproxy网元

## TOPO.yaml

```
node
vip: 192.168.1.4
lvs1:
  mgmt_ip: 10.254.8.10
  svc_ip: 192.168.1.5
lvs2:
  mgmt_ip: 10.254.8.11
  svc_ip: 192.168.1.6
haproxy1:
  mgmt_ip: 10.254.8.12
  svc_ip: 192.168.1.7
haproxy2:
  mgmt_ip: 10.254.8.13
  svc_ip: 192.168.1.8
```

```
lb:      LB.yaml
listener1:
  protocol: http
  protocol_port: 80
  lb_method: roundrobin
  session_persistence:
    type: HTTP_COOKIE
    cookie_name: my_cookie
  connection_limit: 5000
  members:
    VM1:
      address: 192.168.1.20
      protocol_port: 8080
      weight: 1
    VM2:
      address: 192.168.1.21
      protocol_port: 8080
      weight: 2
  health_monitor:
    type: HTTP
    delay: 20
    timeout: 5
    max_retries: 3
    http_method: GET
    url_path: /health
    expected_codes: 200
```

# 网元三、Hillstone Waf + slb



```
# tacker vnf-create --vnfd-name vnfd-waf --vim-name VIM0 --vim-region-name RegionOne vnf-waf
# tacker vnf-create --vnfd-name vnfd-slb --vim-name VIM0 --vim-region-name RegionOne vnf-slb

# tacker vnffgd-create --vnffgd-file vnffgd-waf-slb.yaml vnffgd-waf-slb
# tacker vnffg-create --vnffgd-name vnffgd-waf-slb vnffg-waf-slb
```

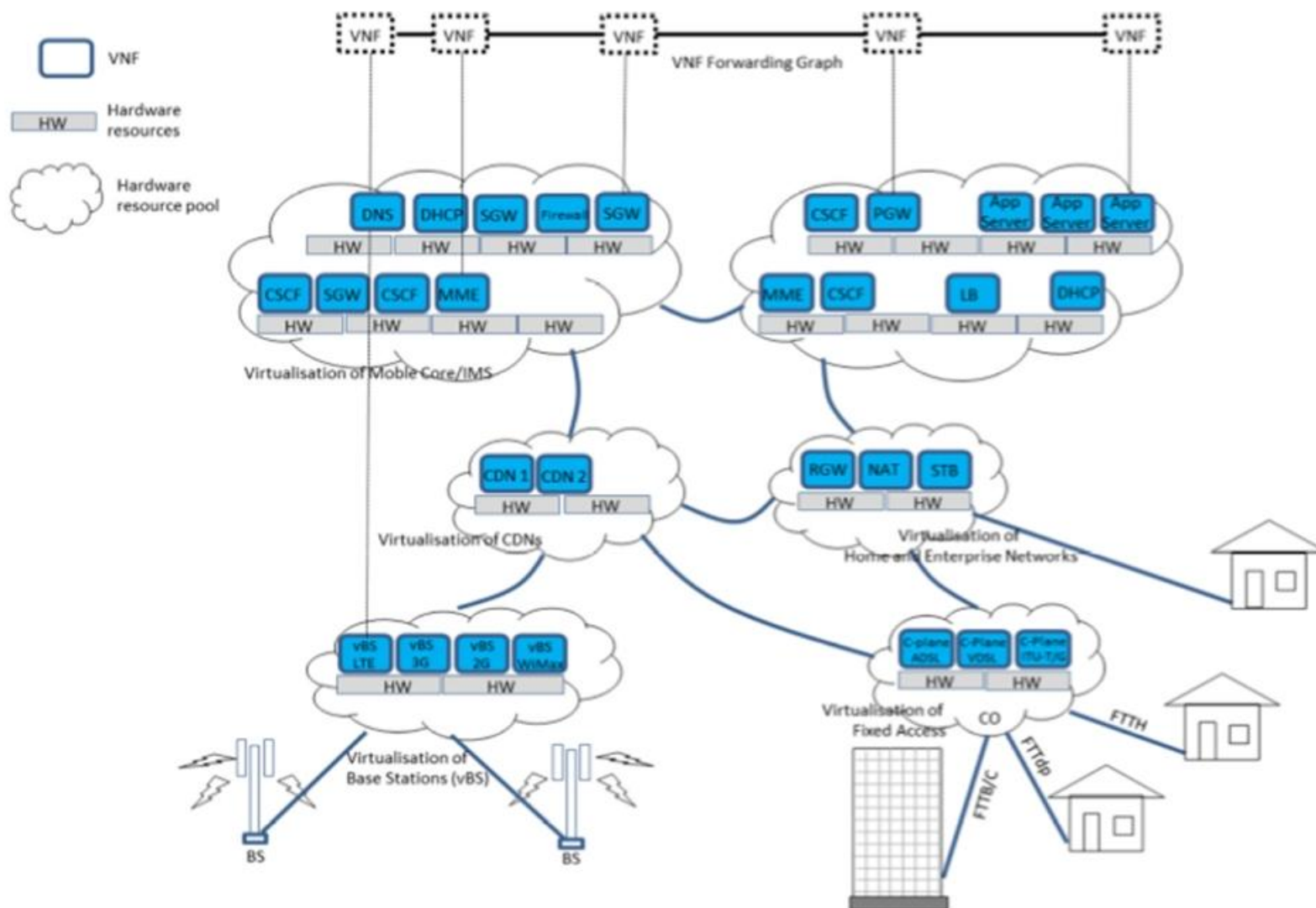
```
tosca_definitions_version: tosca_simple_profile_for_nfv_1_0_0
description: Sample VNFFG template
topology_template:
  description: Sample VNFFG template
  node_templates:
    Forwarding_path1:
      type: tosca.nodes.nfv.FP.Tacker
      description: creates path (gateway->waf->slb->servers)
      properties:
        id: 52
        policy:
          type: ACL
          criteria:
            - network_src_port_id: 1d058e59-2ea8-4f02-8f5e-3b81b8b9306b
            - destination_port_range: 8000-8000
            - ip_proto: 6
            - ip_dst_prefix: 192.168.100.253/32
        path:
          - forwarder: vnfd-waf
            capability: CP13
          - forwarder: vnfd-slb
            capability: CP23
```

## VNFFGD

```
groups:
  VNFFG1:
    type: tosca.groups.nfv.VNFFG
    description: EXT to WEB
    properties:
      vendor: tacker
      version: 1.0
      number_of_endpoints: 2
      dependent_virtual_link: [VL13,VL23]
      connection_point: [CP13,CP23]
      constituent_vnfs: [vnfd-waf,vnfd-slb]
    members: [Forwarding_path1]
```

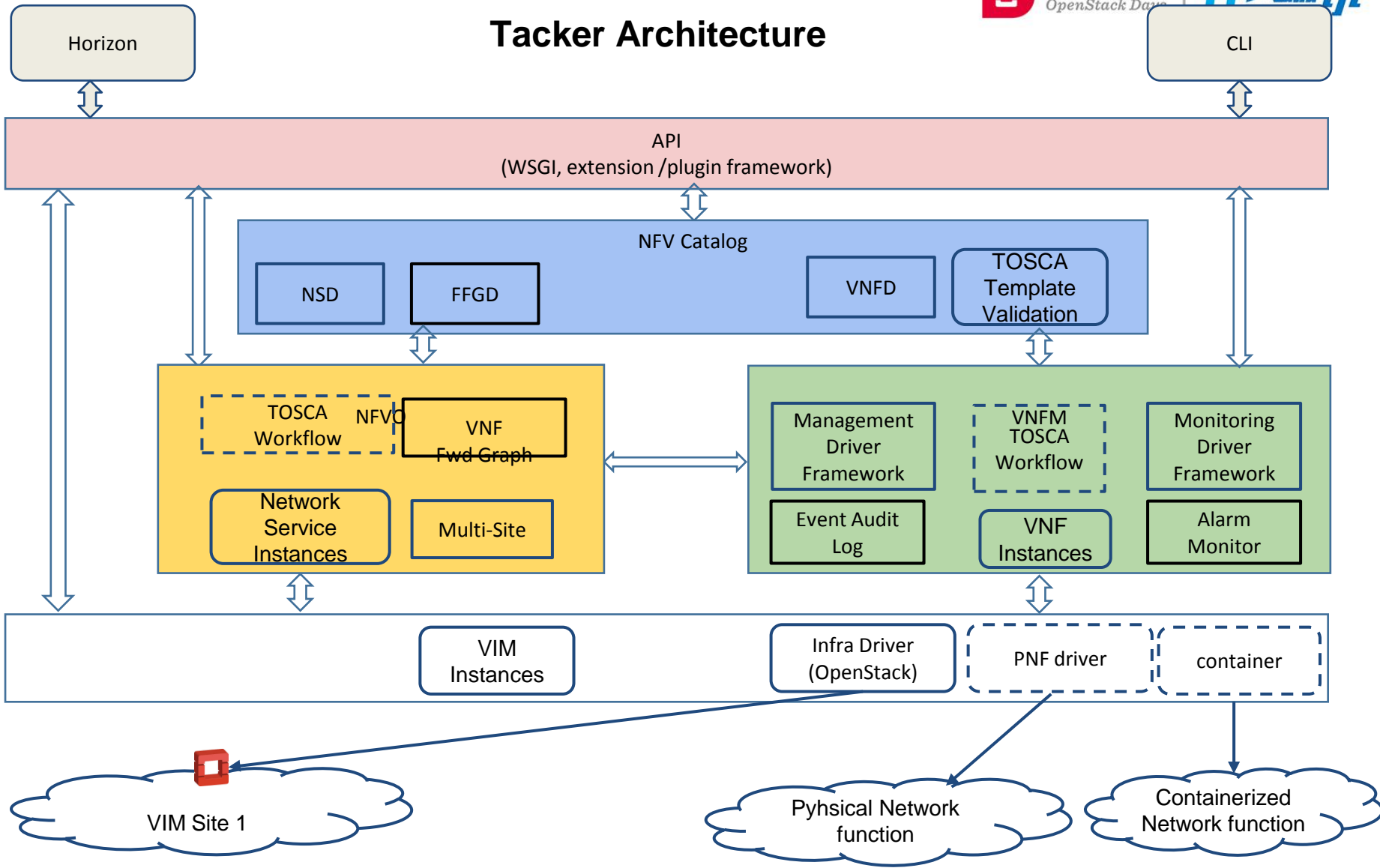
- VNFM mgmt-driver 单一
  - 支持灵活、通用的 driver
  - 集成更多的网元
  - Scale 后自动同步配置
- Networking-sfc 不稳定
  - ✓ 流表丢失
- NS 功能不完善
  - 集成 VNFFG
- VNFFG
  - ✓ 支持 VNF scaling/healing

# 能否应用到电信云？



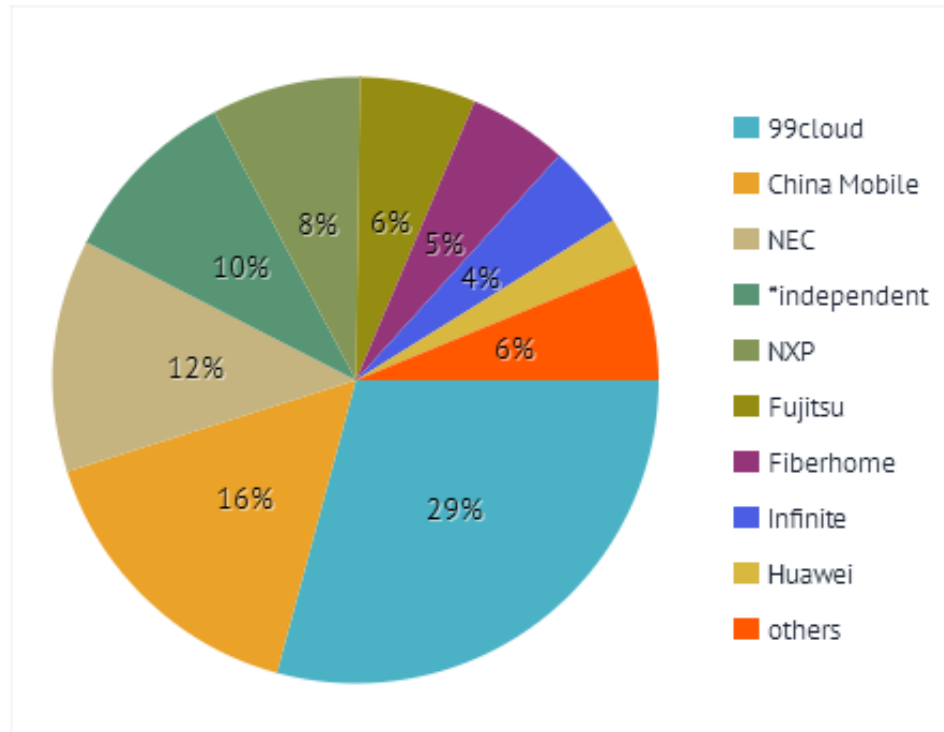


# Tacker Architecture



# Tacker Stackalytics - Pike

Contribution by companies



any kind of contribution is welcomed!

# THANK YOU