

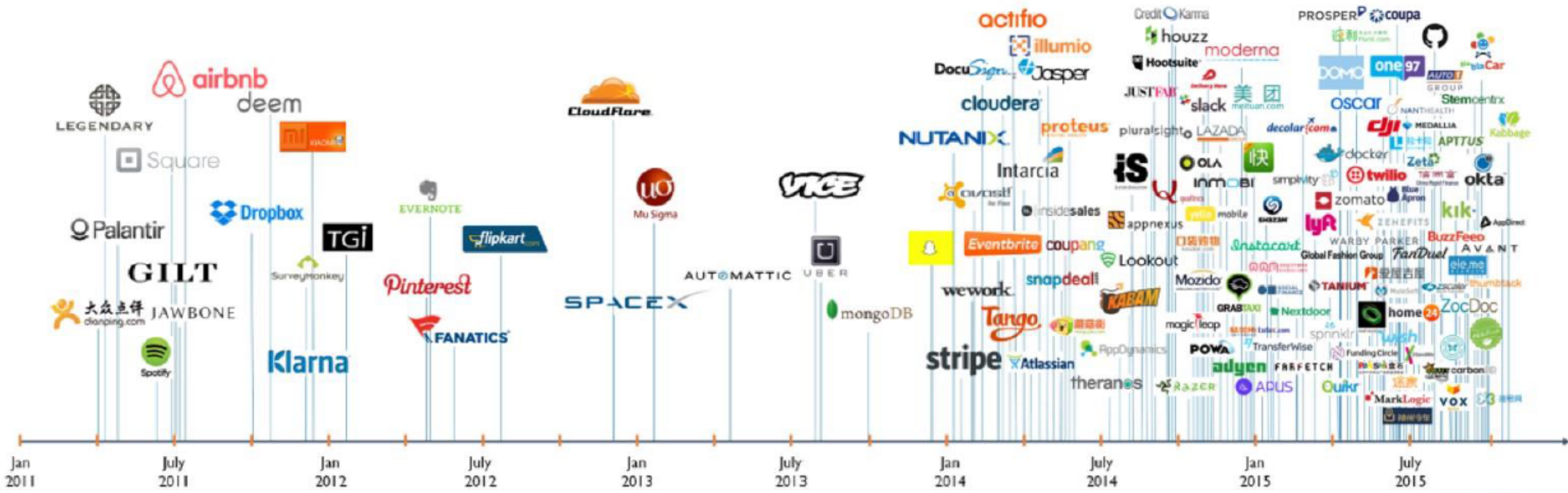
➤ SDN Practice and Implementation for Inspur Cloud Platform

Yanjun Li

inspur 浪潮

- **Background**
- Inspur SDN Controller Architecture
- Implementation for Core modules
- Open Source Contribution

Internet Application Landscape



Huge Requirements for Network In Cloud Era

Digital Disruption

63 million new devices will access Internet per second till 2020 year.

Lack of Business insight & informatization

Complication

Networking OPEX is 3 times of Networking CAPEX

Inefficient and Frequent failure
Networking Operation & Management

Security

Average security detection period is 6 months

Security attack everywhere

Most Important Value for Networking Technology

Networking should be complicated.

For Inspur Not for you.

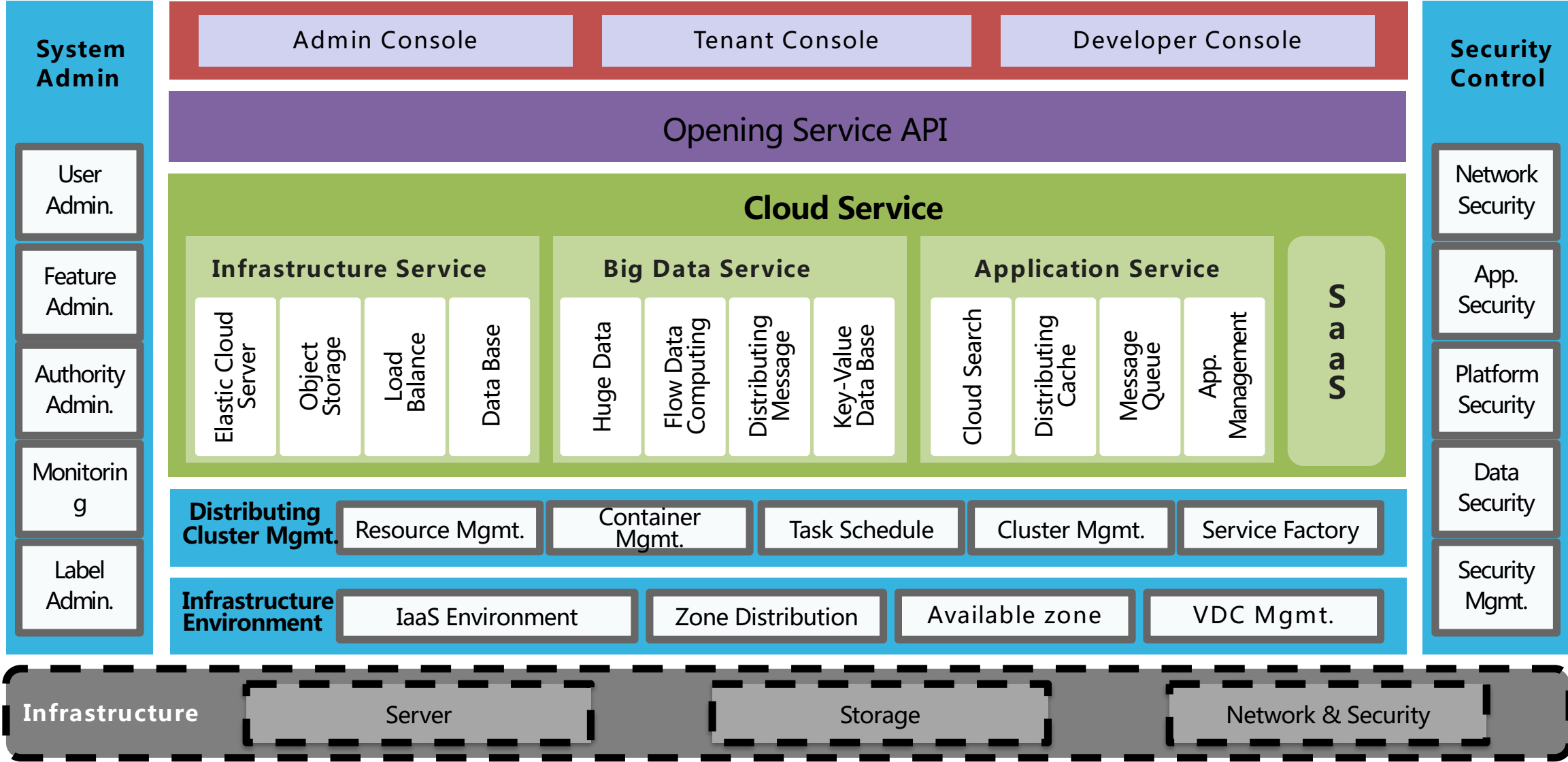
Old way of doing things **Pre-SDN**

- VLANs
- MAC addresses
- IP addresses
- Subnets
- ACLs
- Routing Policies
- Manual Service Chaining
- VRFs
- Devices
- Ports
- OS-specifics

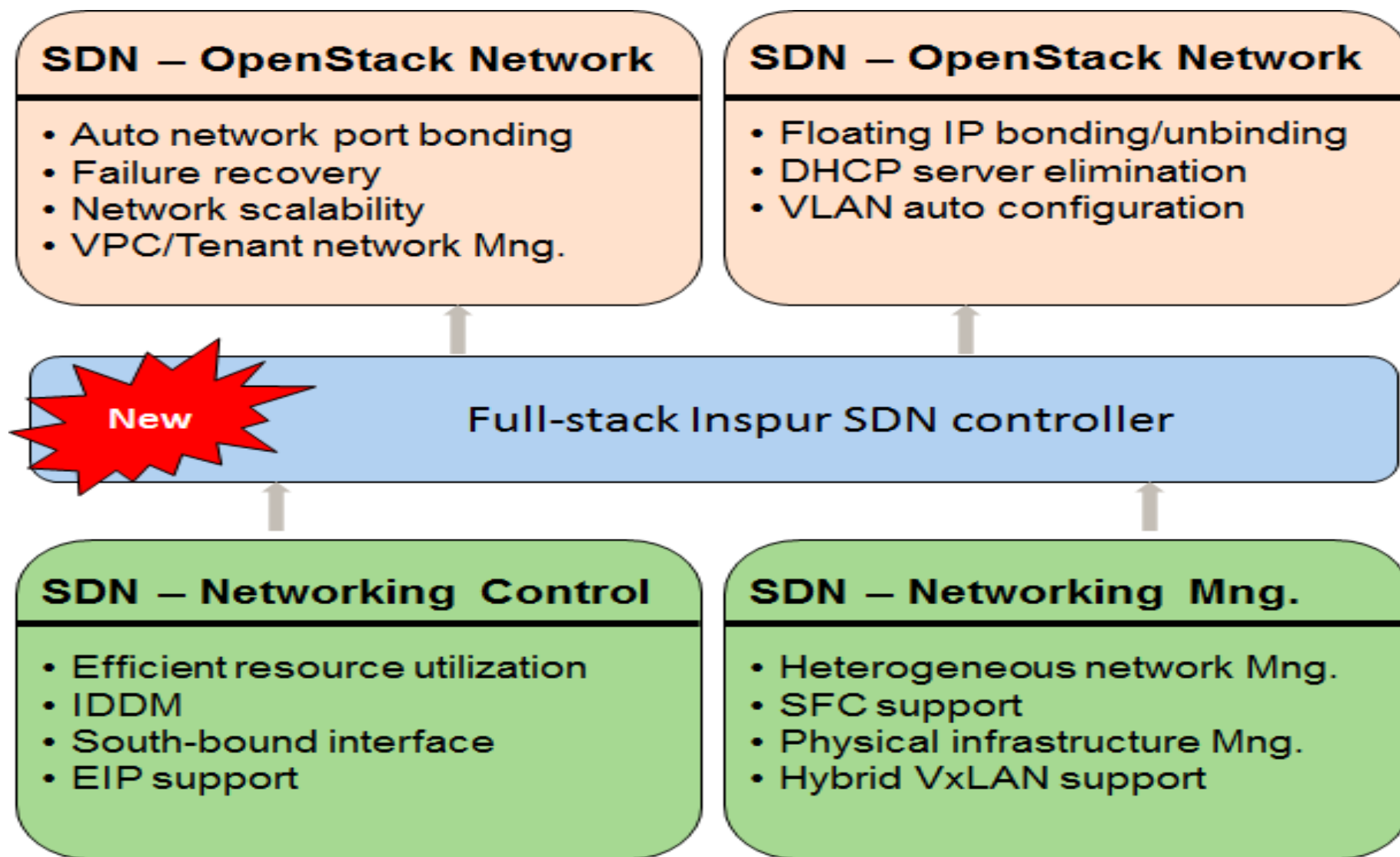
New way of doing things **SDN**

- Virtual networks
- Connections
- Security Policies
- Connectivity Policies
- Service Chaining

Inspur Cloud Platform



SDN Requirements for Inspur Cloud Platform



- Background
- **Inspur SDN Controller Architecture**
- Implementation for Core modules
- Open Source Contribution

Inspur Cloud Networking Controller



Cloud Path (HNI)

- ⊙ Heterogeneous Hybrid Net
- ⊙ Convergence
- ⊙ Compatibility



Cloud Chain (SFC)

- ⊙ Transparency
- ⊙ Multi-Chain
- ⊙ Cross nodes
- ⊙ Multi-Protocol



Cloud Controller (QoS+TC)

- ⊙ Traffic Control
- ⊙ ACL
- ⊙ QoS
- ⊙ Failure Analysis



Cloud Decision (AI)

- ⊙ Intent
- ⊙ Auto Heal
- ⊙ Visualization
- ⊙ Auto Optimization

Cloud Network
VPC (Virtual Private Cloud)

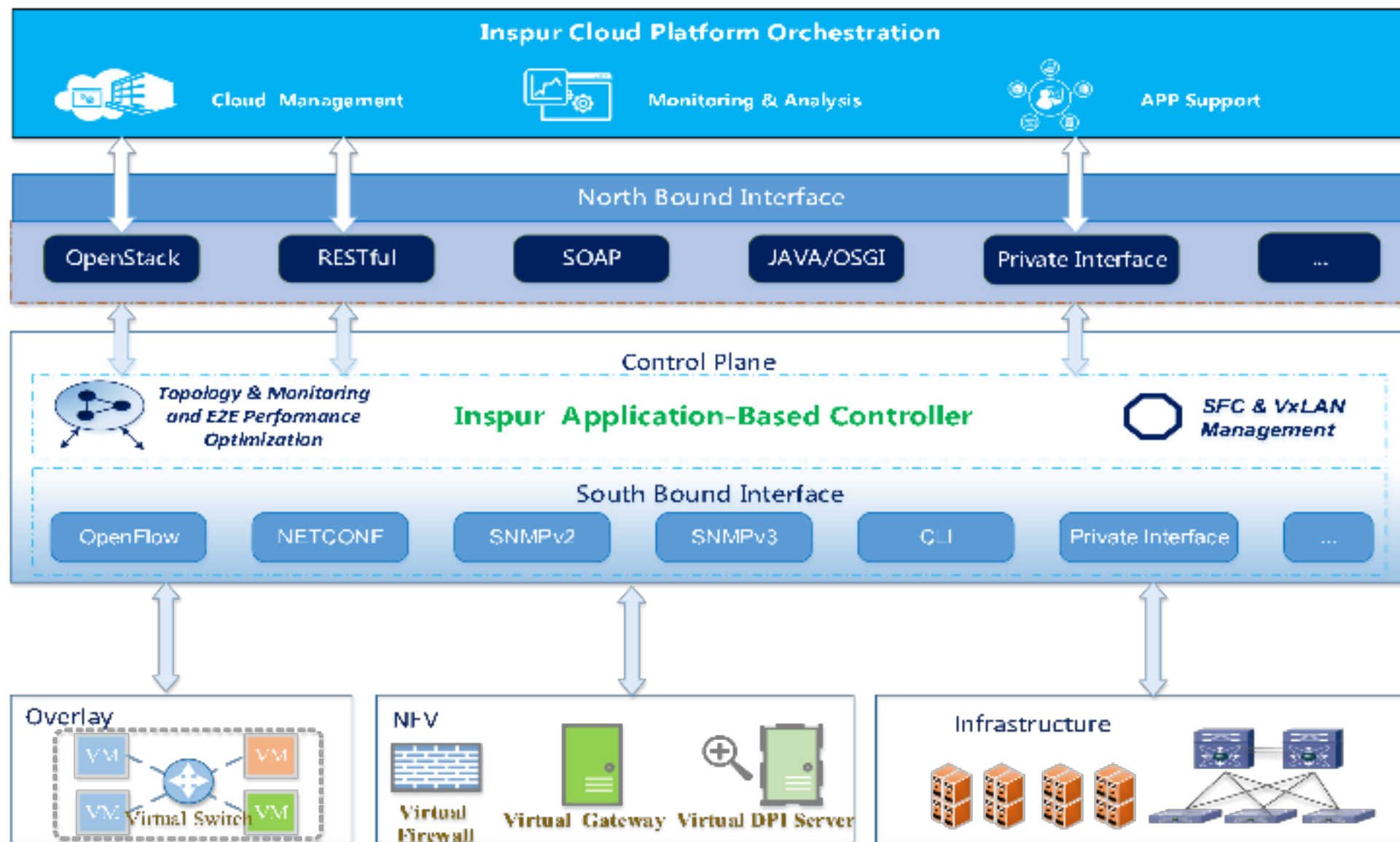
Cloud Domain OS
ICD NOS(Inspur Cloud Domain NOS)

Cloud Map
IDDM(Inspur Device Discovery & Management)

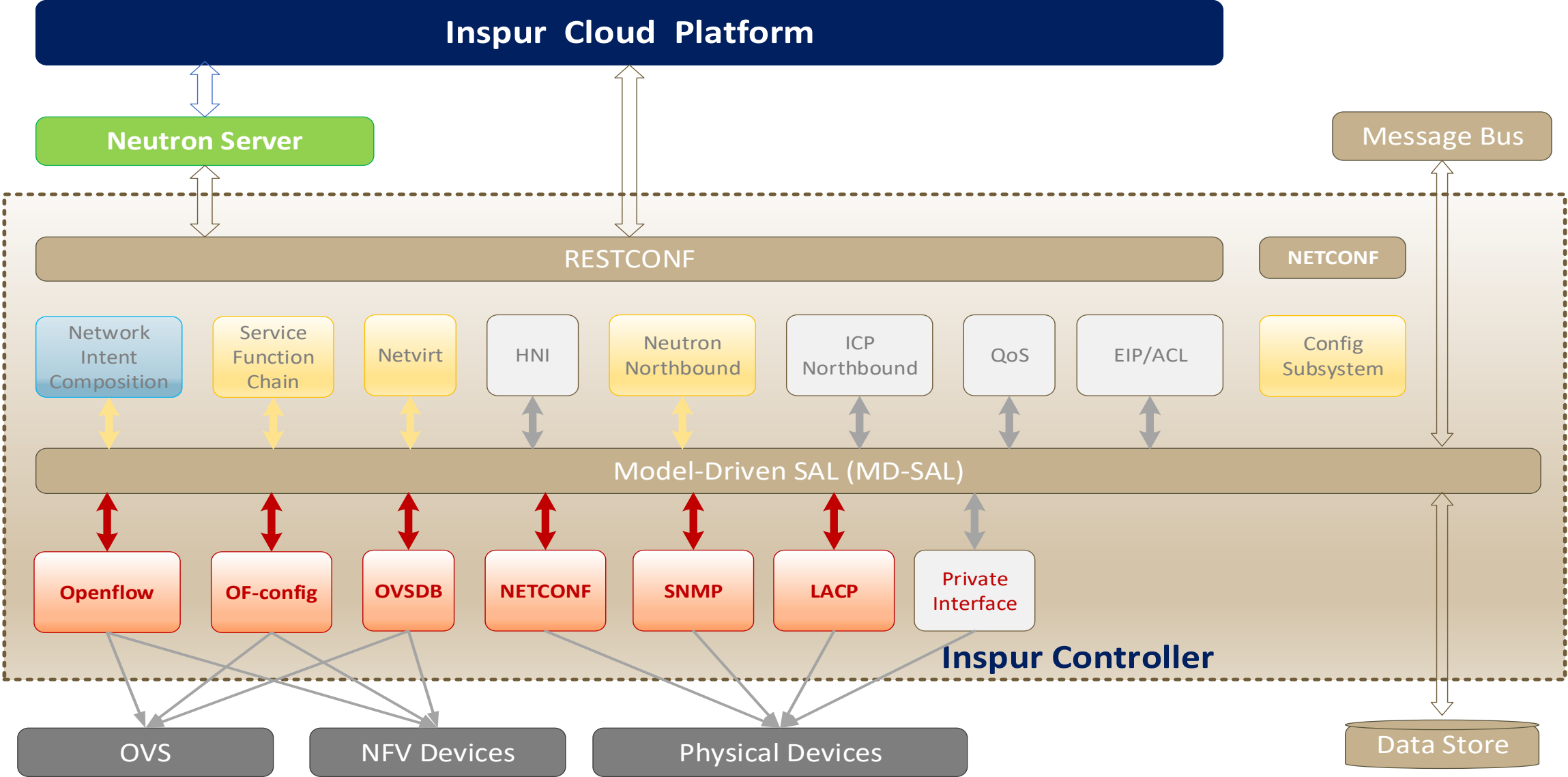
Infrastructure

Subnet Topology	Subnet Management	Subnet IP	Connection Configuration	Subnet Routing	Metering
VLAN Management	IP Allocation	Networking Resource Pool	IP Utilization Ratio	Traffic Statistics	Traffic Distribution Statistics
Device Discovery	Device Status	Device Connection Topology	System Preinstall	Device Management	Inventory Correlation

Inspur SDN Controller Architecture

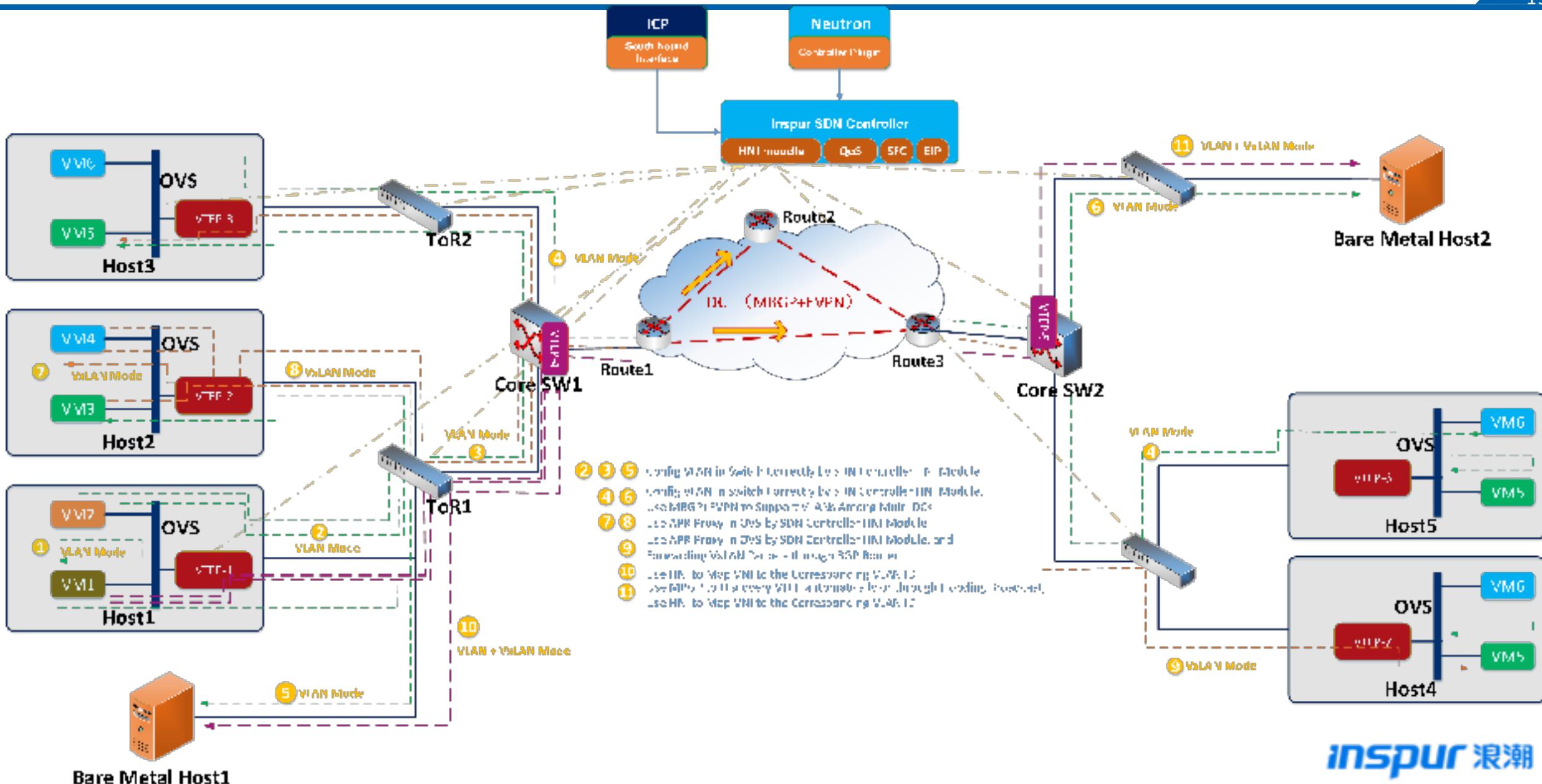


Inspur SDN Implementation Based on OpenDayLight

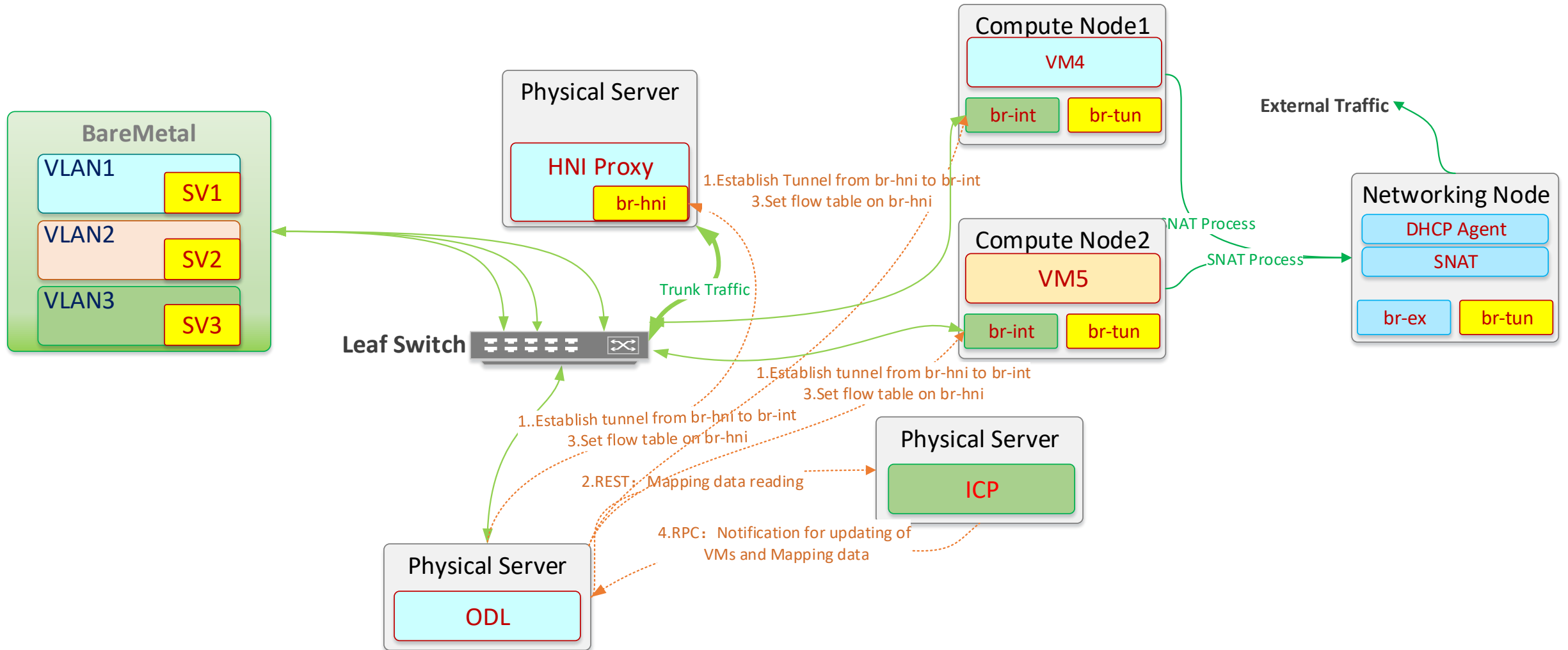


- Background
- Inspur SDN Controller Architecture
- **Implementation for Core modules**
- Open Source Contribution

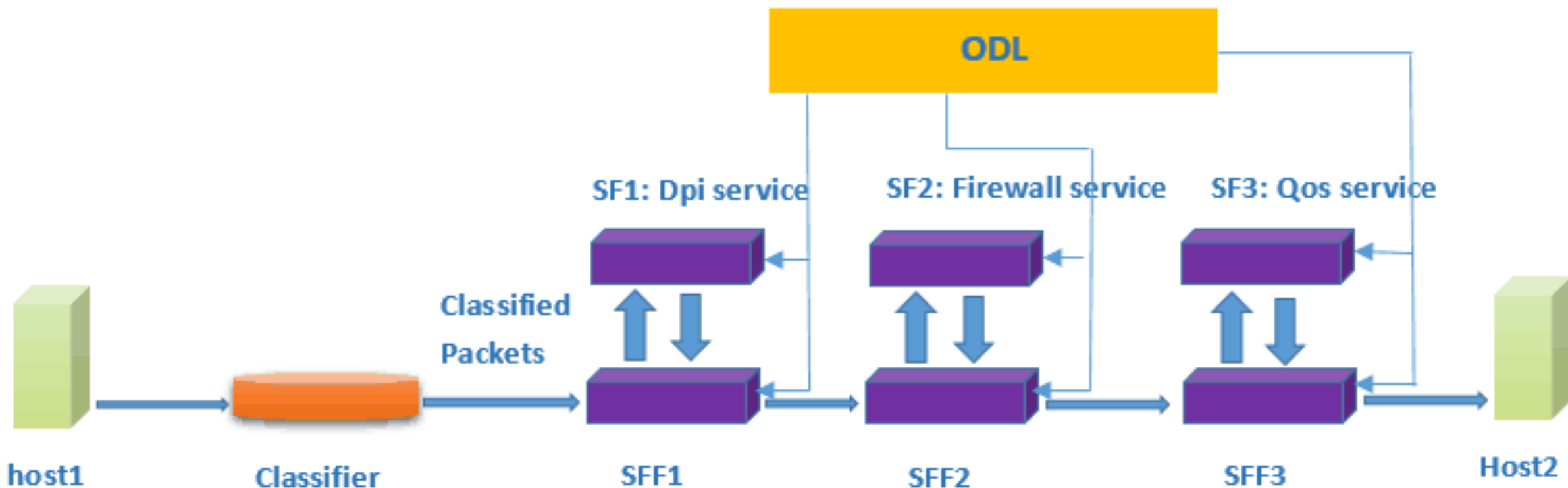
HNI Module for VxLAN & VLAN Interconnection



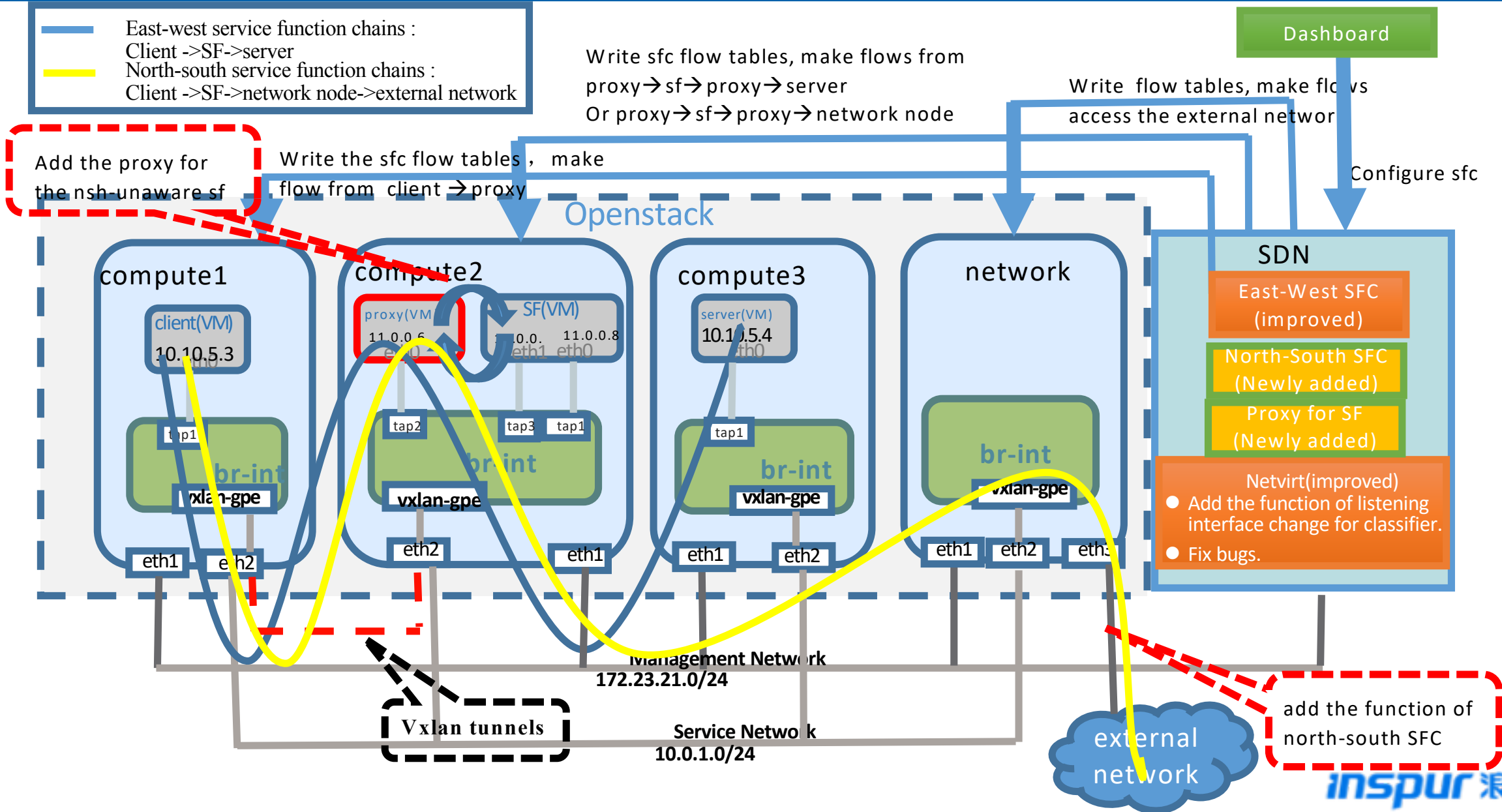
HNI Module Implementation



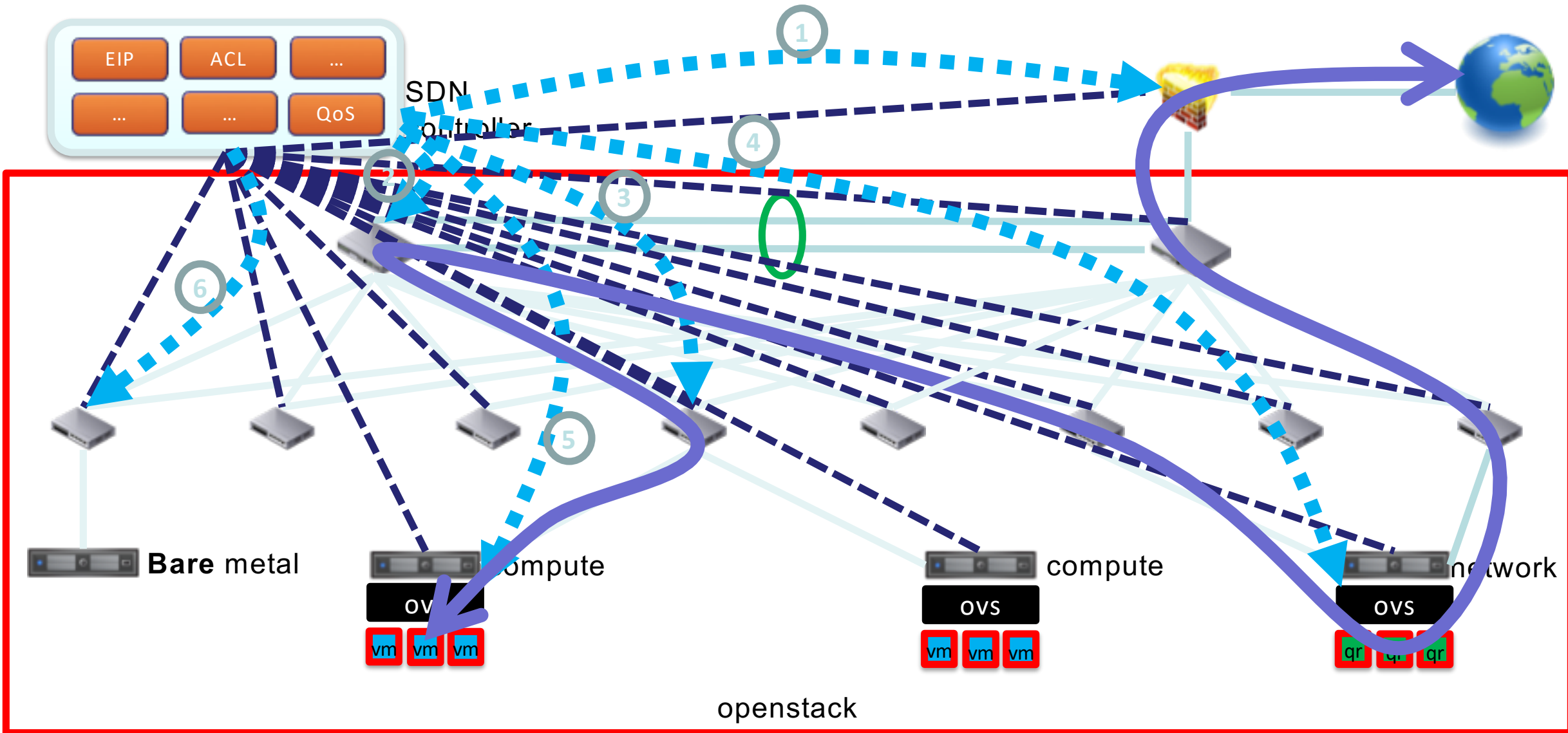
SFC (Service Function Chain)



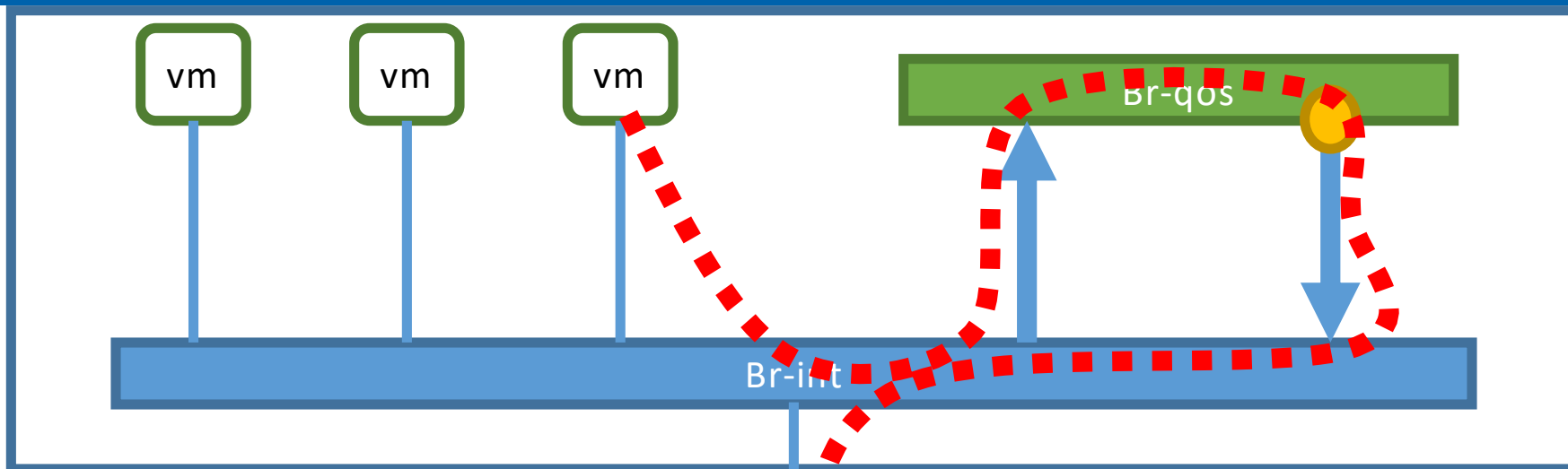
SFC Module Implementation



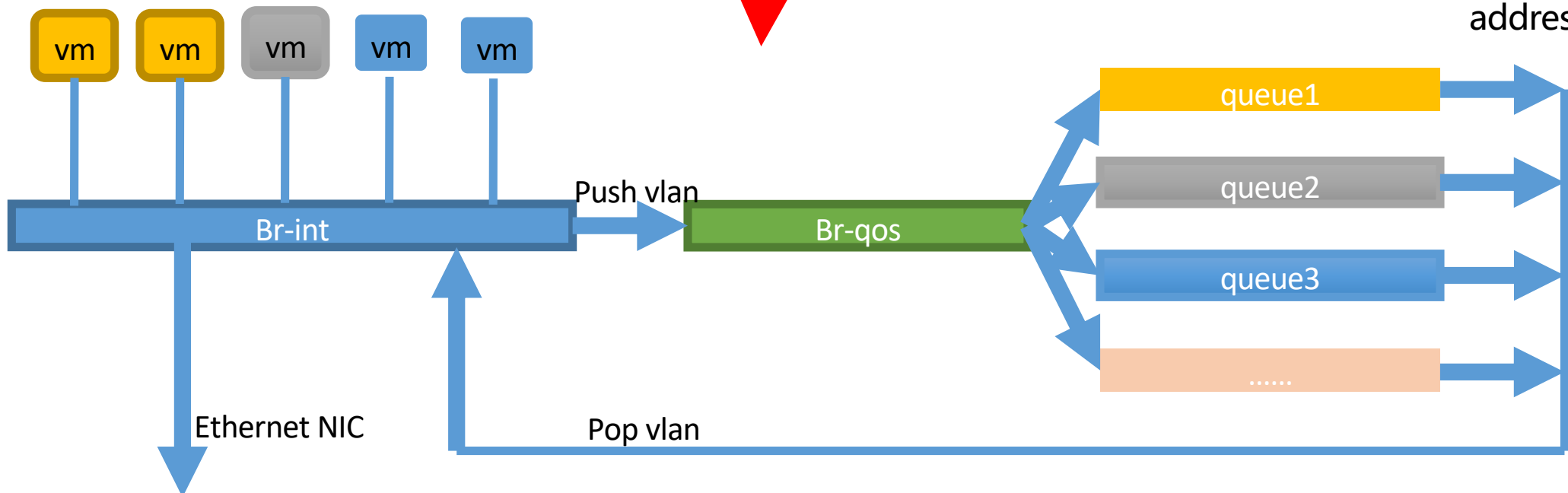
Distributed QoS Mechanism



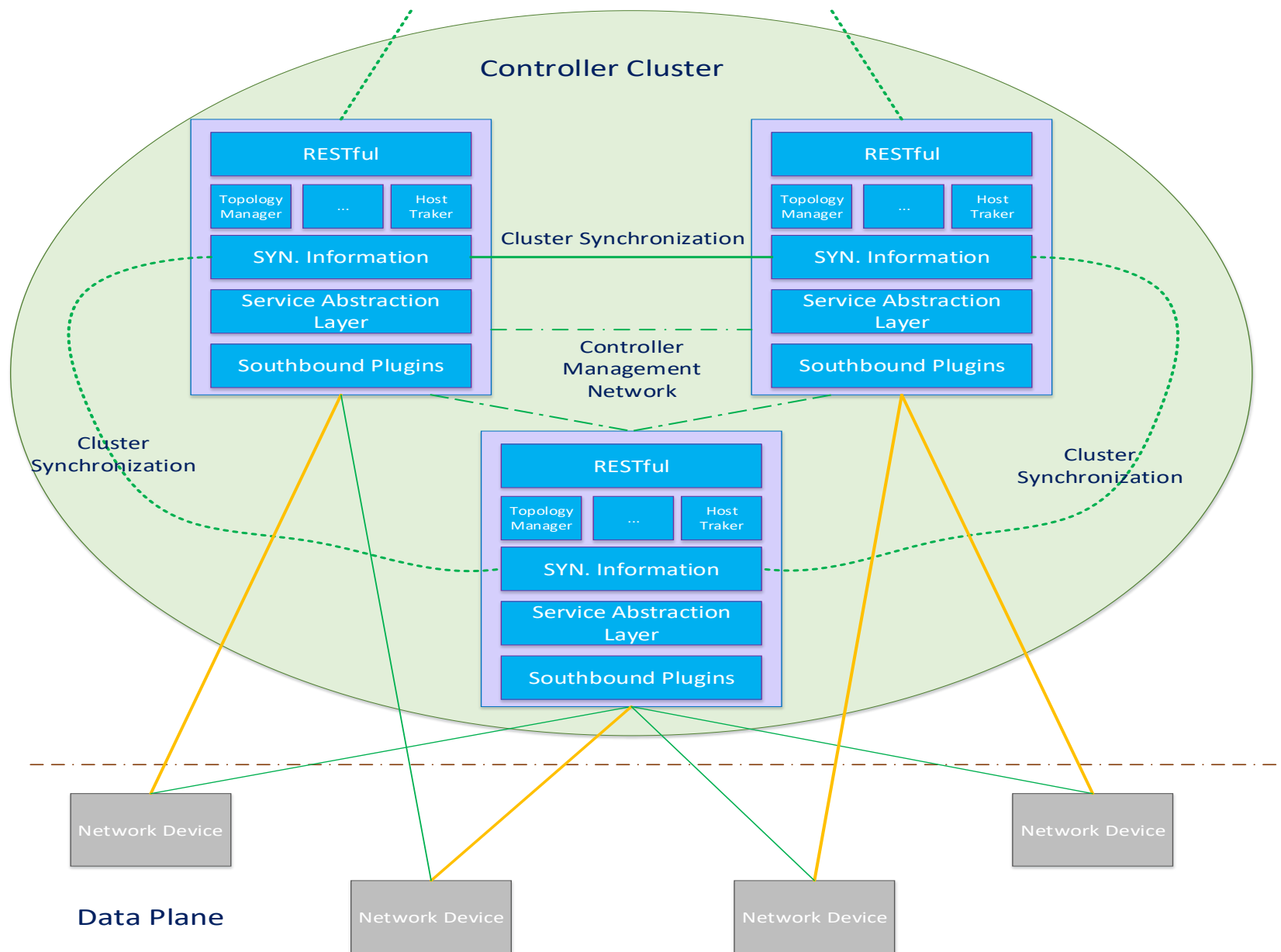
QoS Module Implementation



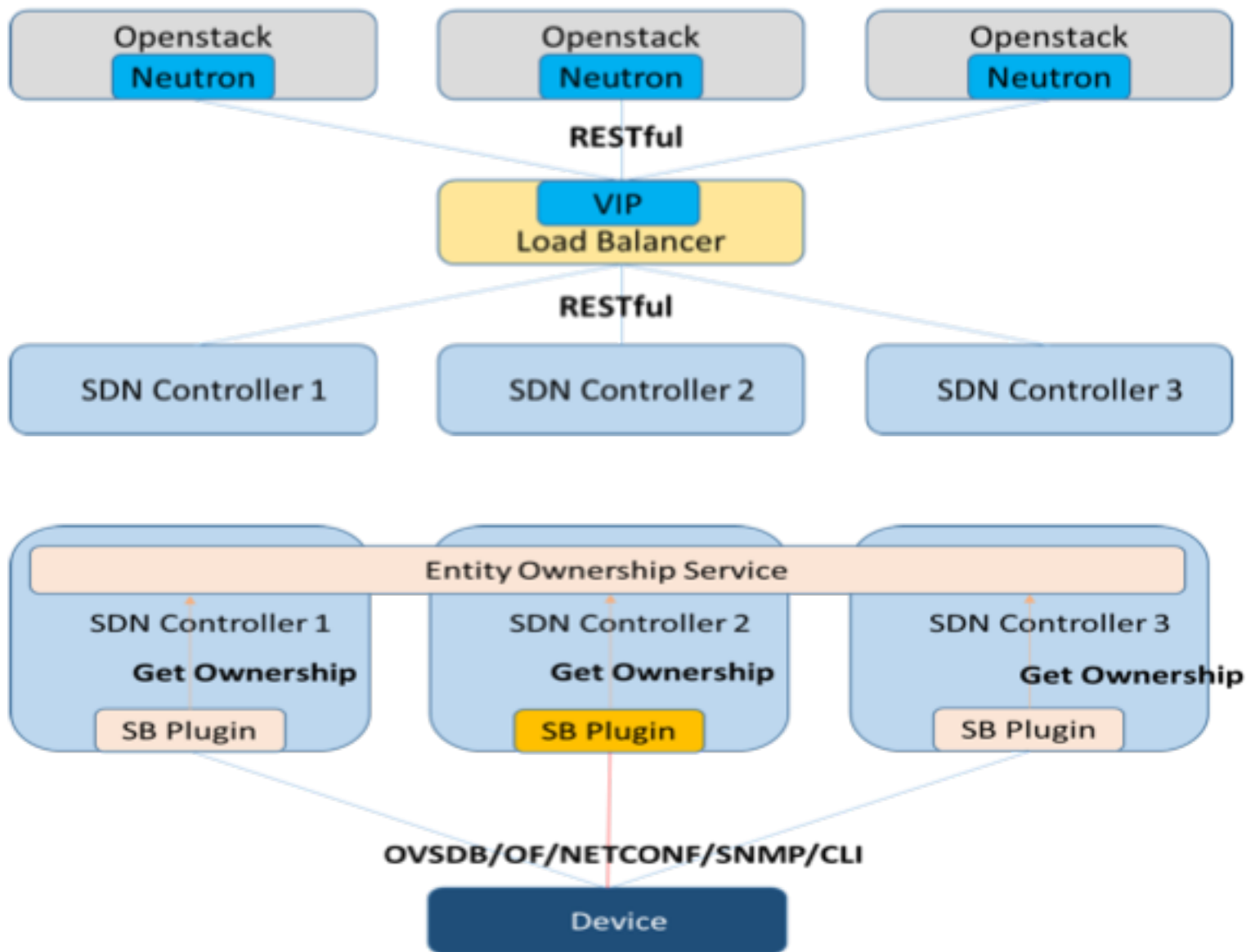
- QoS Rate limiter
- Depend on Inspur Controller
- Support North-south and West-east traffic rate limit
- Support dynamic QoS configuration
- Recognize different traffic according to destination IP address matching



Controller Cluster Architecture



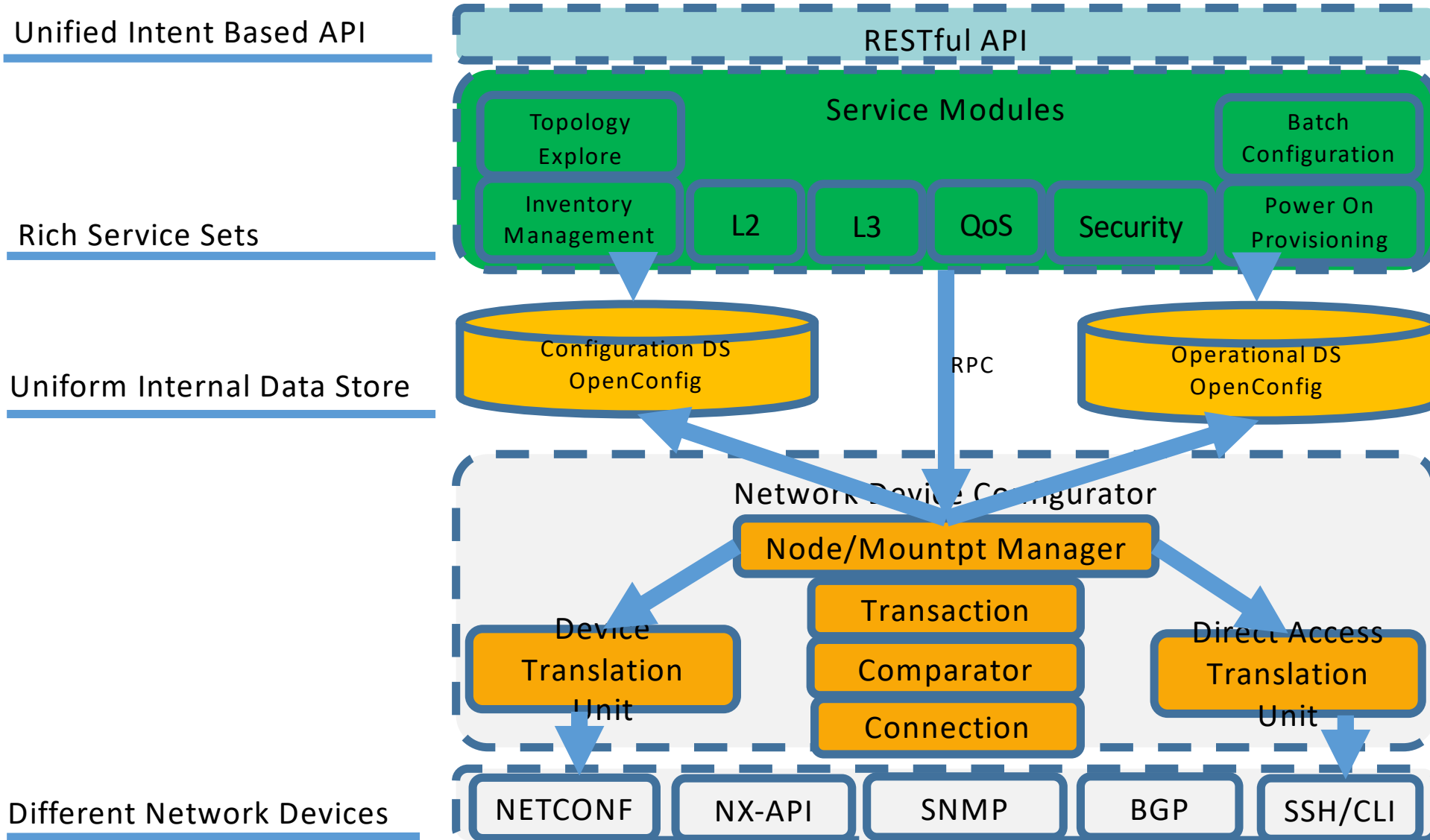
Cluster Implementation



Northbound Interface

Southbound LB

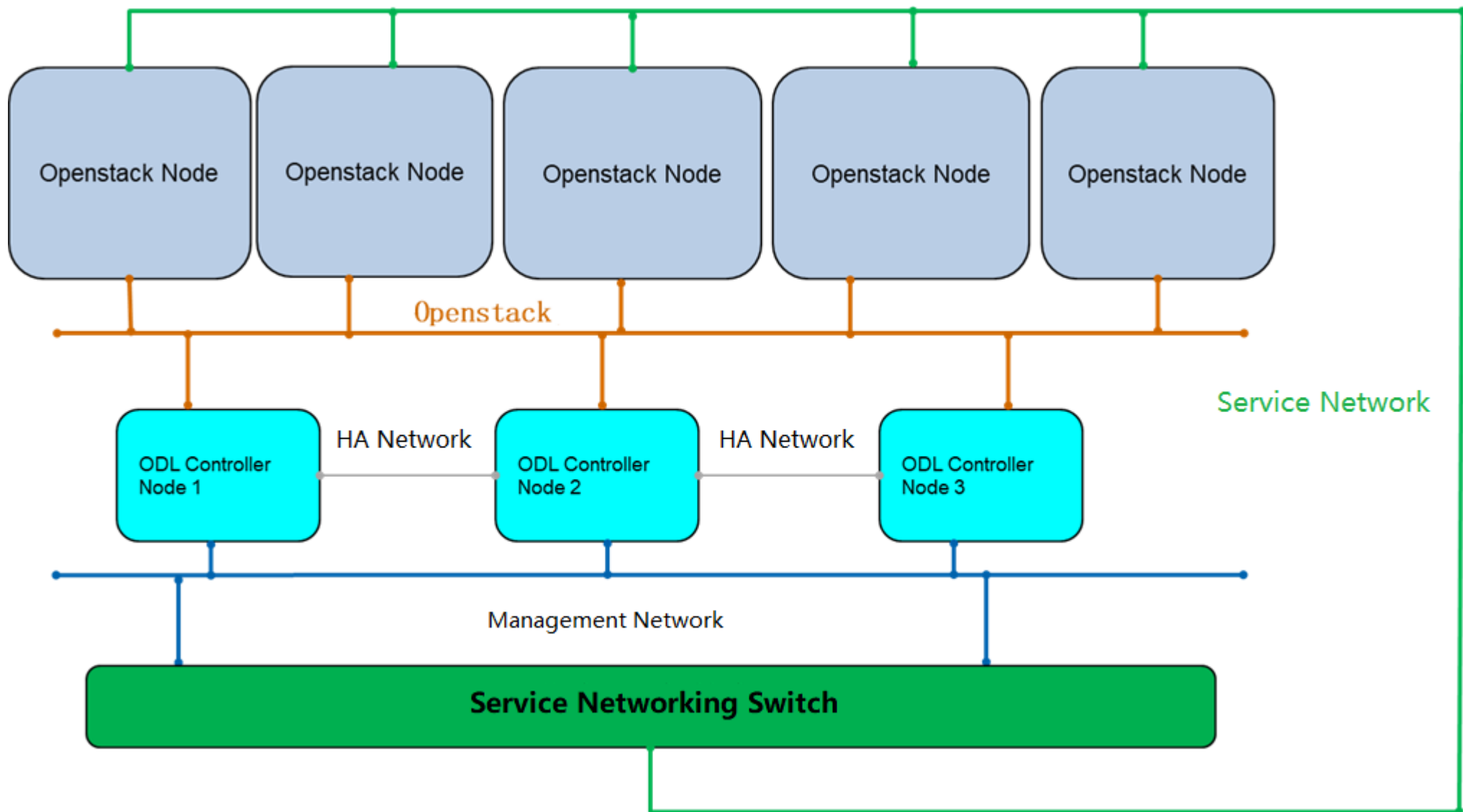
Underlay Management and Configuration



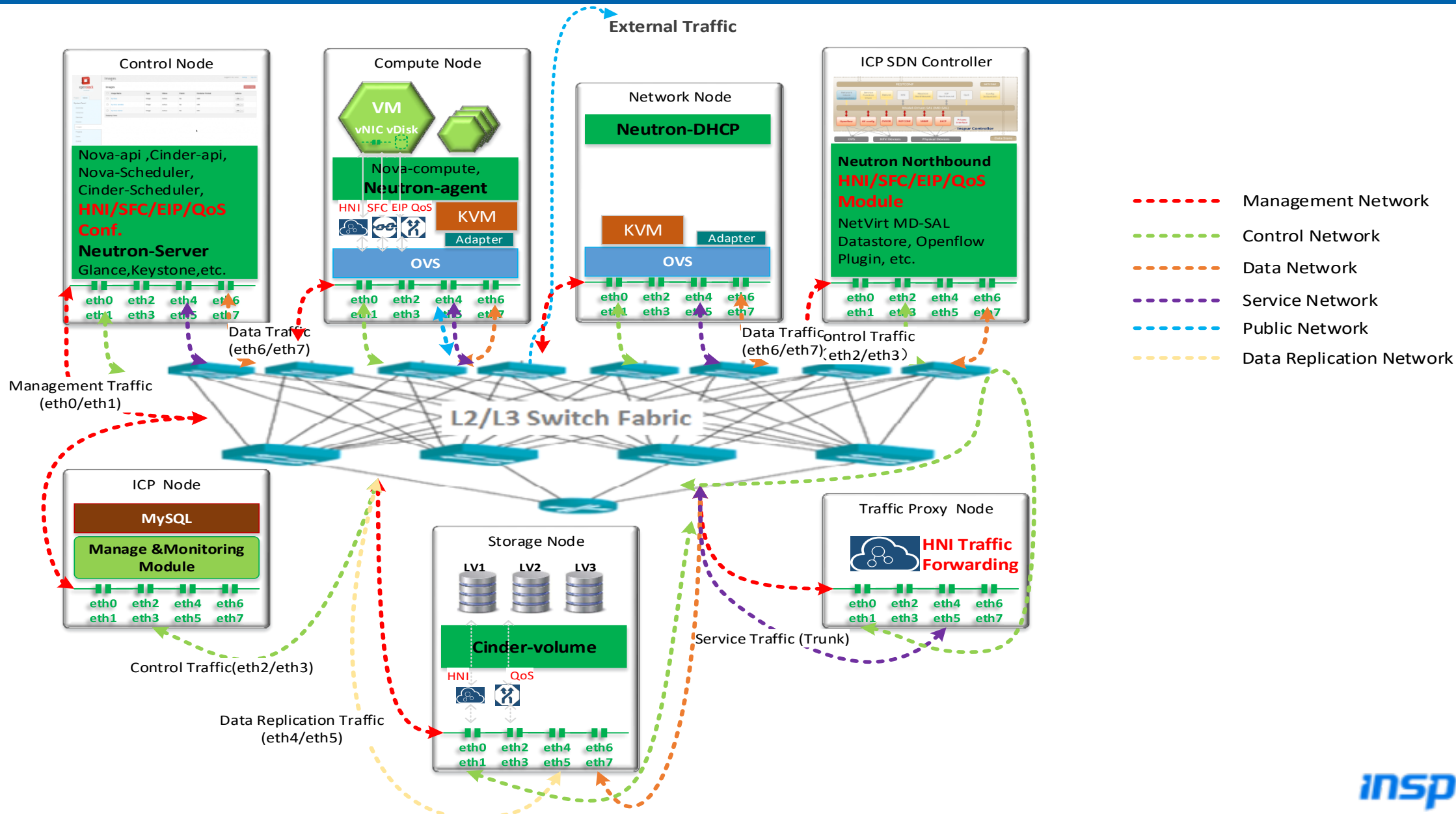
Feature Summary

- ▶ HNI module
 - ▶ Provide L2 interconnection between VxLAN and VLAN
 - ▶ VM migration support and seamless scalability
- ▶ SFC feature
 - ▶ Fix Netvirt module' s bugs related to SFC
 - ▶ Enhanced North-South service traffic control
 - ▶ Enable multiple traffic control mode
- ▶ QoS module
 - ▶ Distributed and dynamic QoS mechanism
 - ▶ Fine-granularity QoS guarantee
- ▶ Cluster support
- ▶ Underlay auto-management and auto-configuration

SDN Kernel Module Testbed



Network Traffic Model

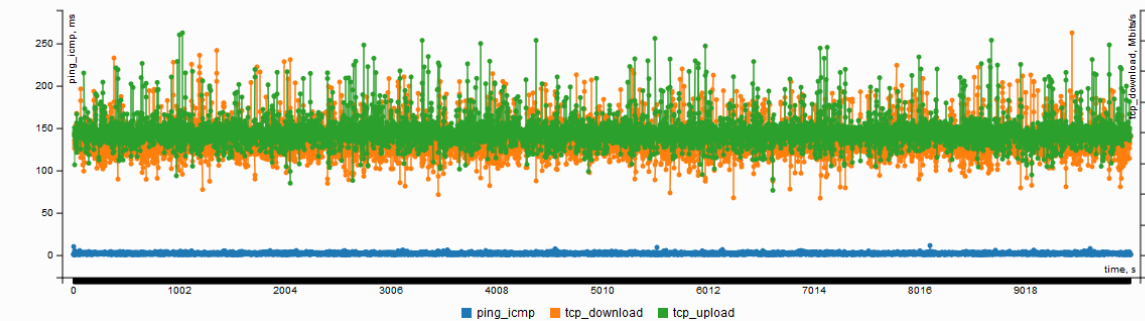


Performance Results

Records

Scenario	Test Case	Concurrency	Host / Compute Node	Agent	Status
OpenStack L2	Bi-directional	2	compute21	shaker_muapto_master_0	success

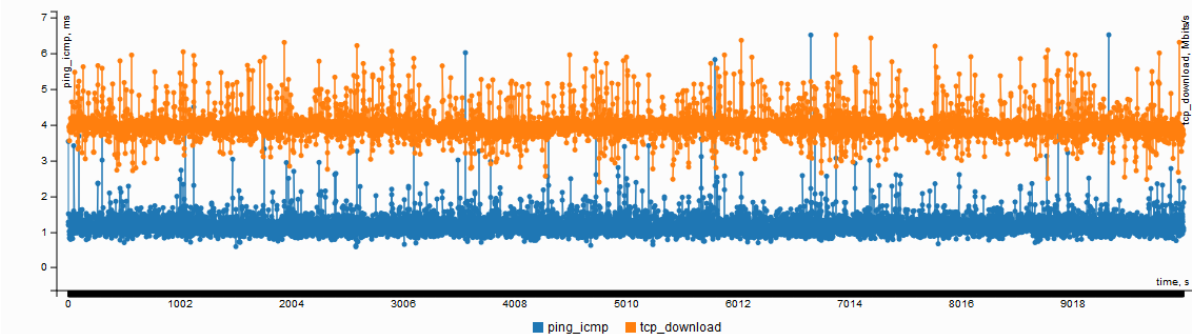
Execution Summary



Records

Scenario	Test Case	Concurrency	Host / Compute Node	Agent	Status
OpenStack L2	Download	2	compute21	shaker_muapto_master_0	success

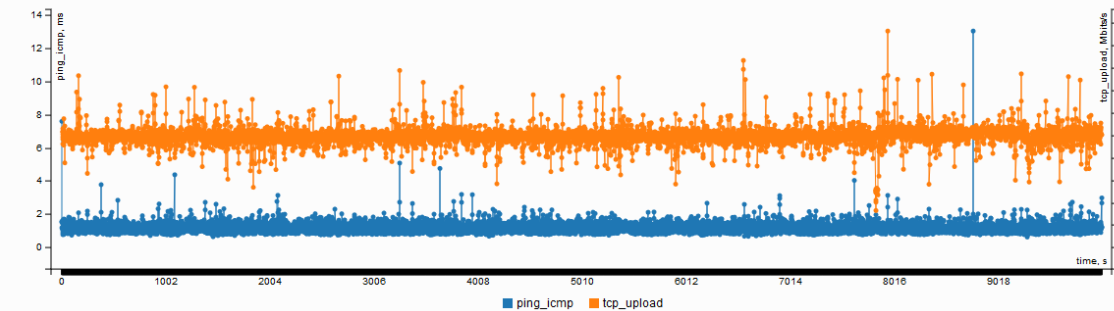
Execution Summary



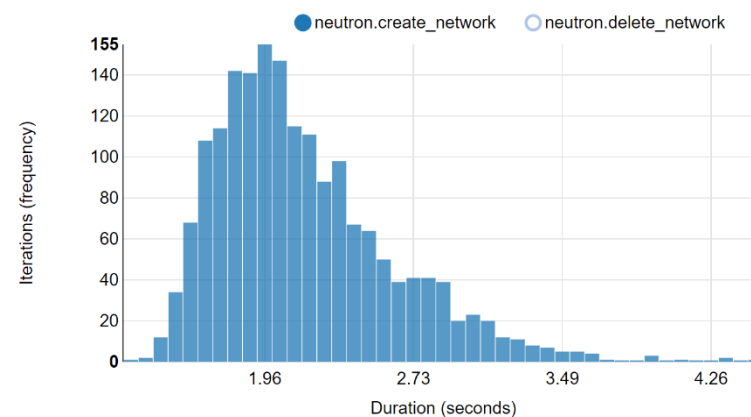
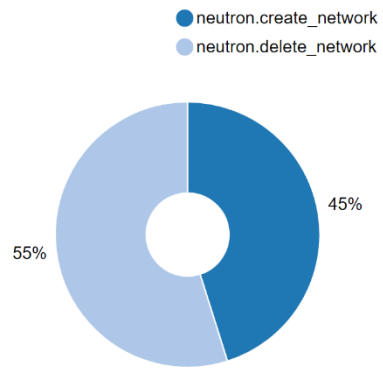
Records

Scenario	Test Case	Concurrency	Host / Compute Node	Agent	Status
OpenStack L2	Upload	2	compute21	shaker_muapto_master_0	success

Execution Summary



Distribution



- Background
- Inspur SDN Controller Architecture
- Implementation for Core modules
- **Open Source Contribution**

Embrace Convergence and Open Source

Cloud Computing



Standard

Opening Technical Architecture

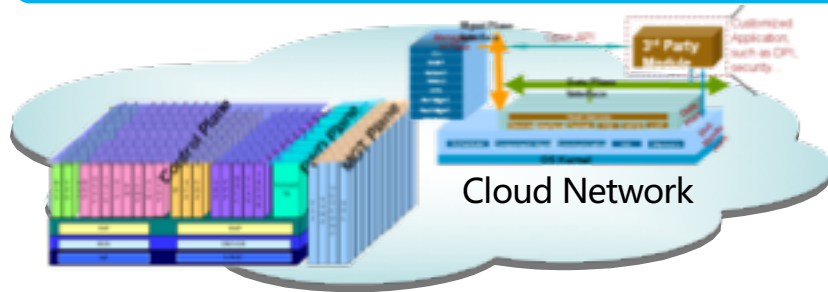


Participate Many Standard organizations ,
OpenStack **Gold Member** , Patents &
Standards related to Cloud Computing Rank
First in China

Hardware

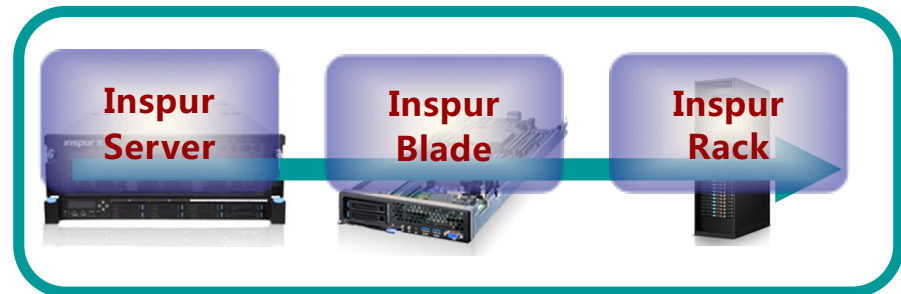
Software

ICP for Future Cloud DC



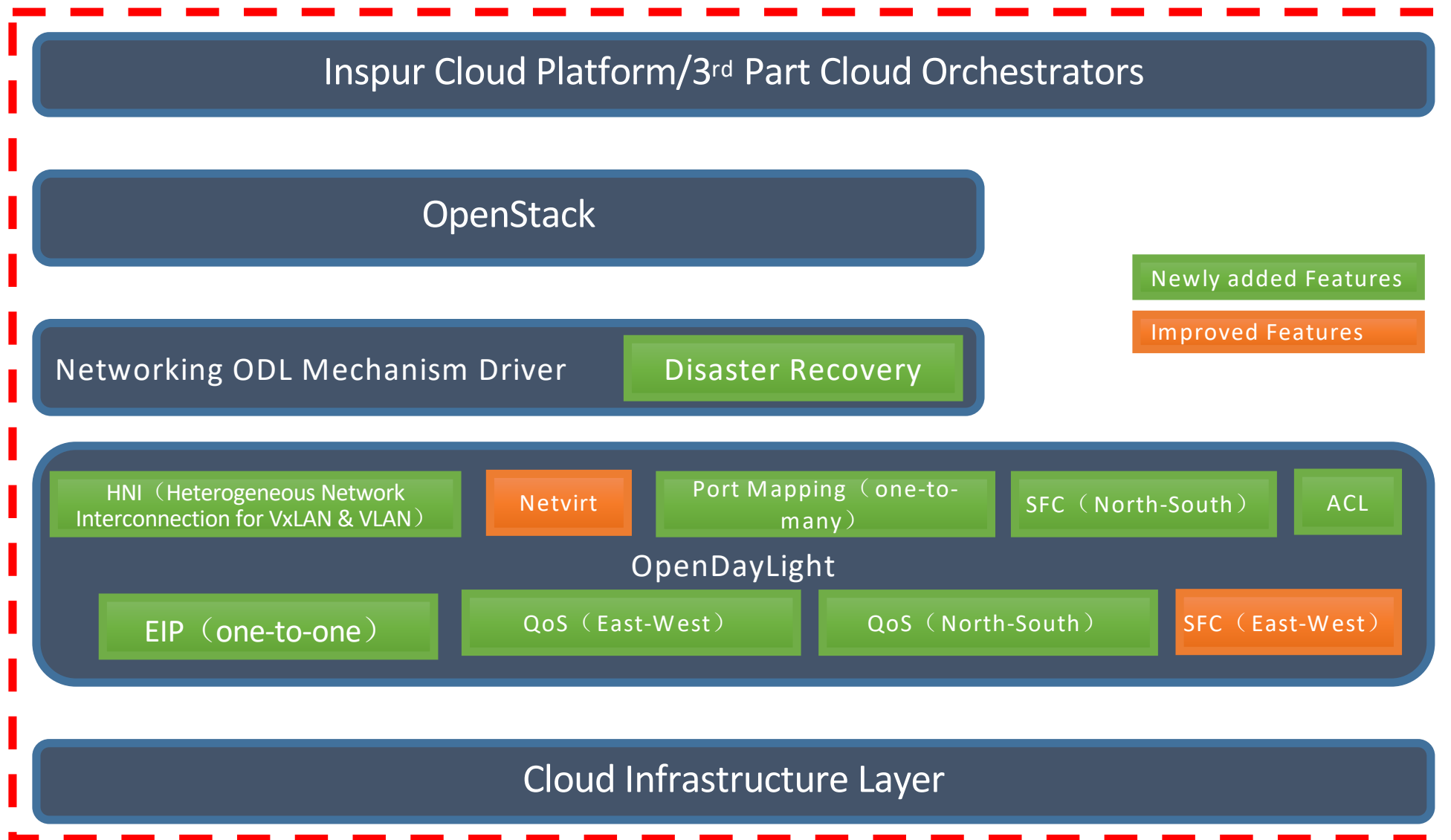
Multi-Layer virtualization and Convergent Architecture

Series of Inspur Server



Inspur Server Products

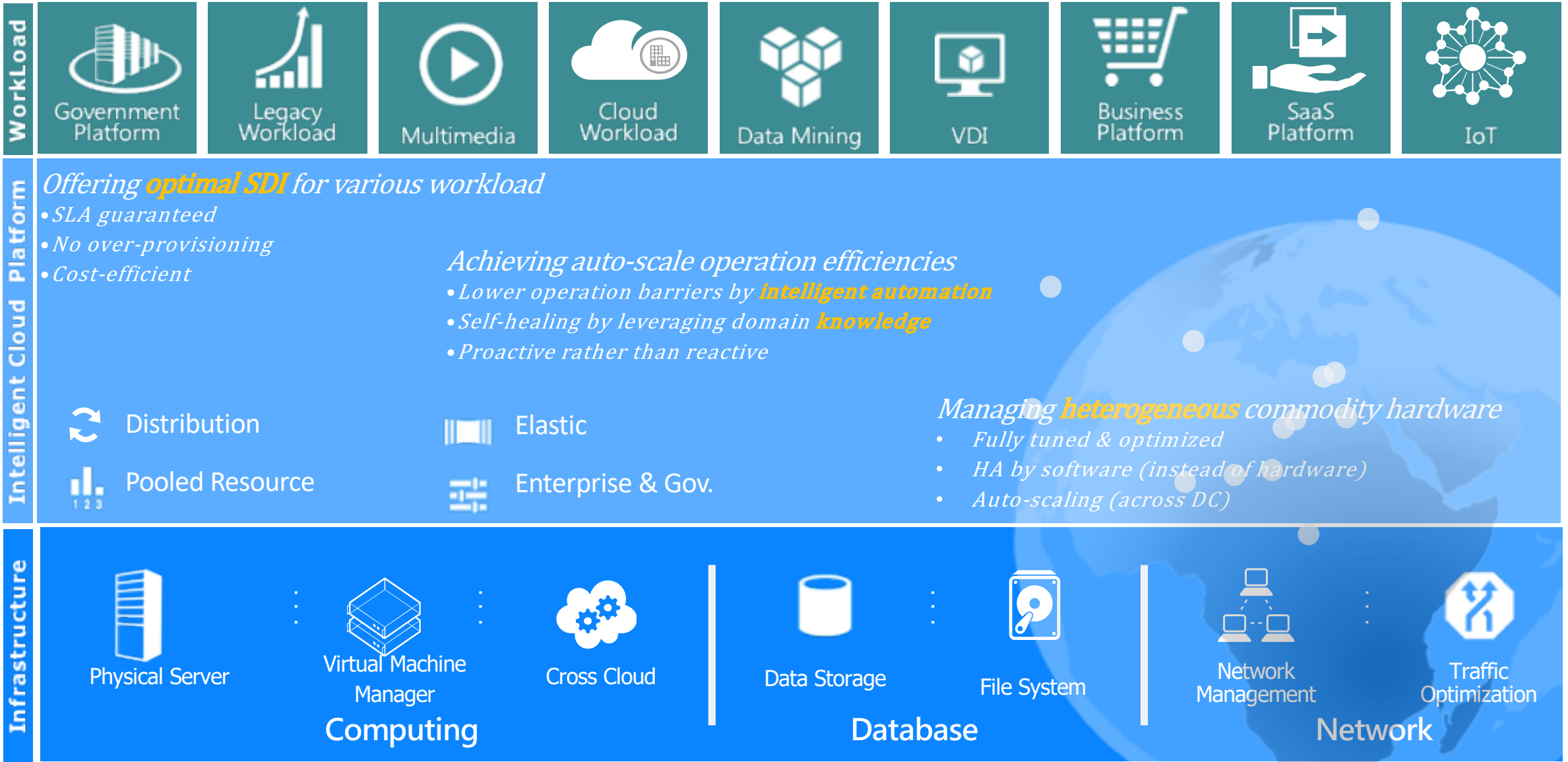
Inspur Contributions for Open Source Solution on SDN



Recent Delivery to OpenDayLight Community

- Committed 5 bugs on Netvirt to OpenDayLight Community (Done)
- Fixed 3 bugs on Netvirt / SFC module (Done)
- Contribute codes to existing projects (Doing)
 - Patch1: add the function of north-south SFC
 - Patch2: add the proxy for nsh-unaware service function
- New projects proposal (Doing)
 - EIP + QoS
 - HNI
 - Infrastructure Management
 - Cluster

Inspur SDDC in Cloud Era



THANK YOU !



inspur 浪潮