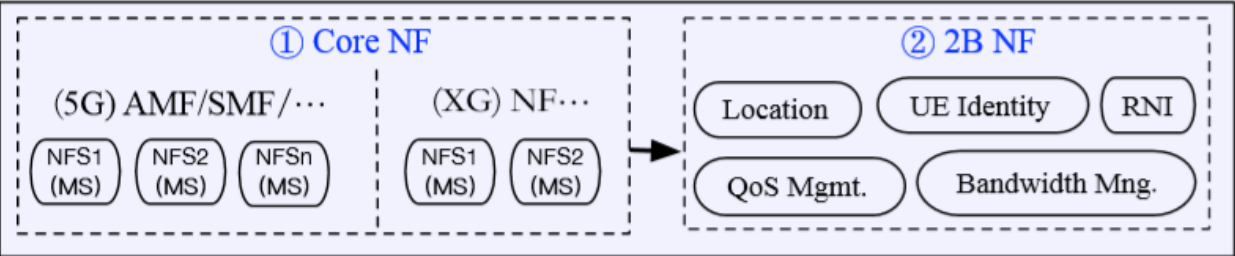


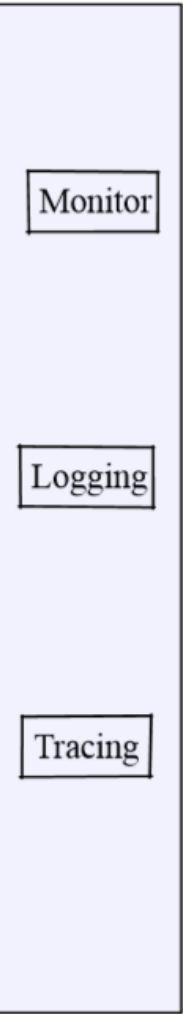
Orchestration & Automation



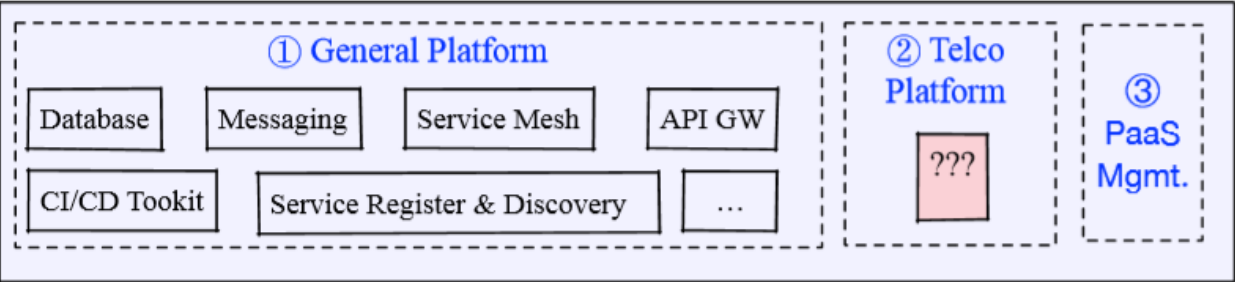
Cloud Native NF



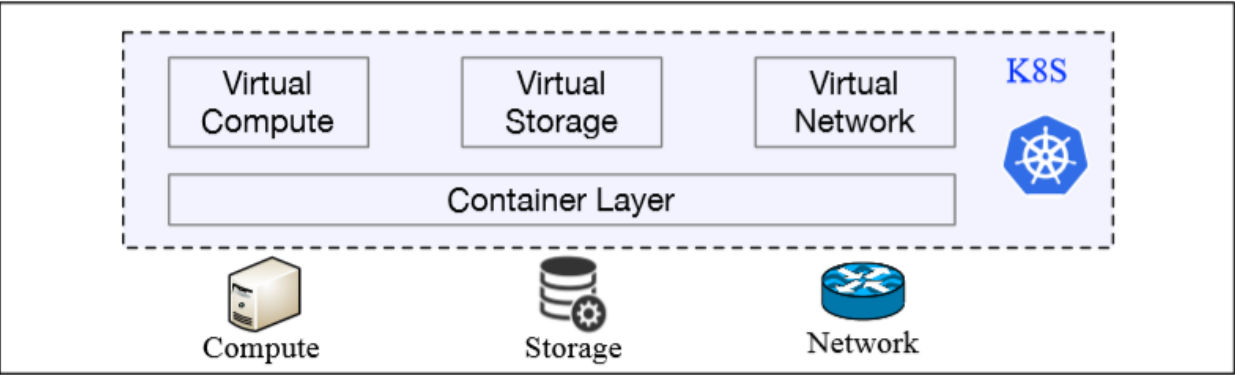
Operation



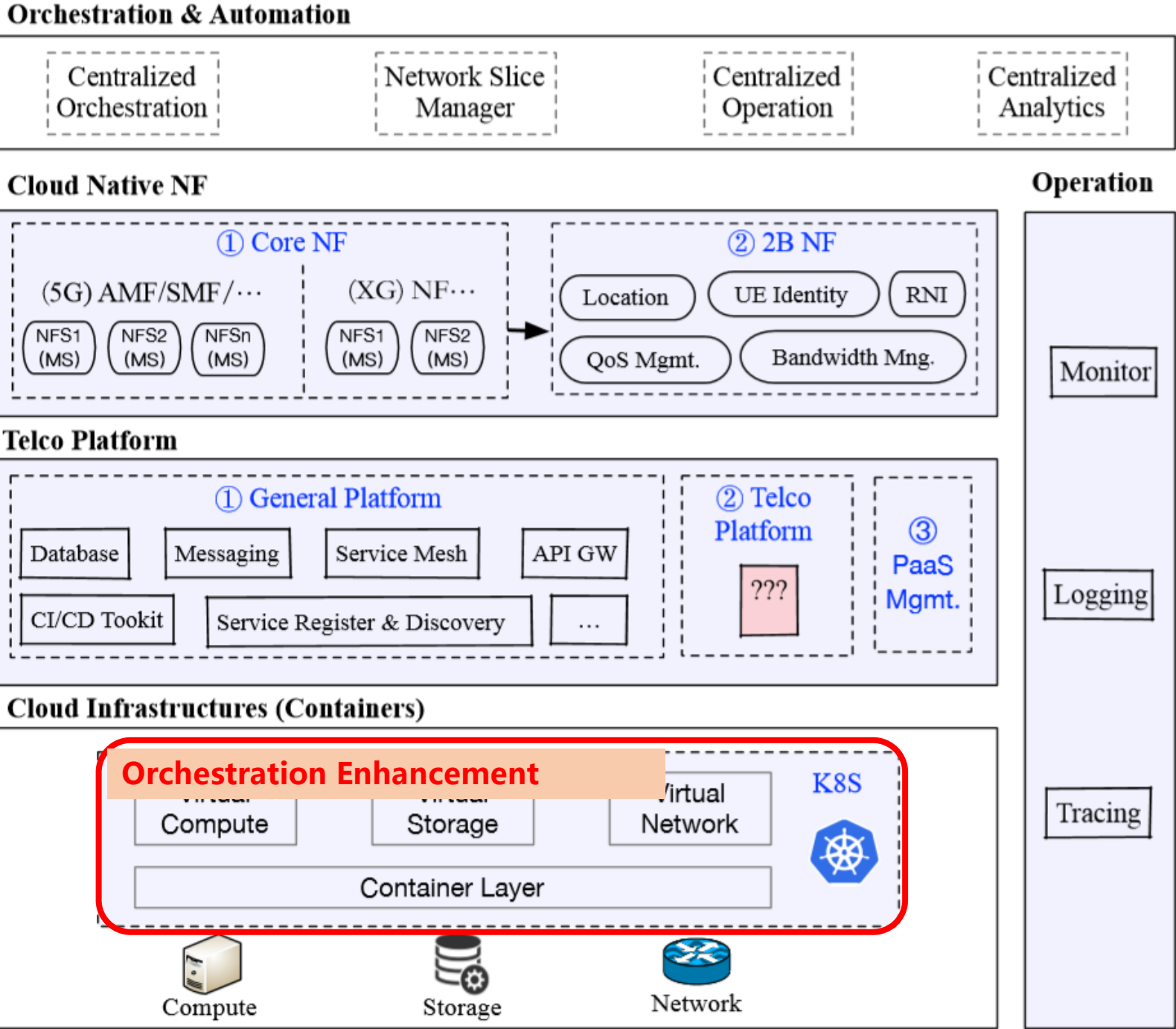
Telco Platform



Cloud Infrastructures (Containers)



 Within XGVela Scope



Orchestration Challenges

Kubernetes has become the de facto standard for container orchestration, however there still exists some telco challenges to be solved:

- **Multi-network connectivity**
 - multis
- **Service function chaining**
- **Specific scheduling policies**
- **Deterministic performances**
- **Accelerated data plane**

目标用户：运营商、设备商

- 1) 开发和创造：便于运营商和设备商构建新的**电信能力**
- 2) 接口：便于运营商及设备商**暴露电信服务**供用户使用

电信能力：Telco platform

电信服务：Cloud Native NF Services

Orchestration & Automation

Centralized
Orchestration

Network Slice
Manager

Centralized
Operation

Centralized
Analytics

Cloud Native NF

① Core NF

(5G) AMF/SMF/...

NFS1 (MS) NFS2 (MS) NFSn (MS)

(XG) NF...

NFS1 (MS) NFS2 (MS)



② 2B NF

Location

UE Identity

RNI

QoS Mgmt.

Bandwidth Mng.

Operation

Monitor

Logging

Tracing

Telco Platform

General Platform Enhancement

Database

Messaging

Service Mesh

API GW

CI/CD Toolkit

Service Register & Discovery

...

② Telco Platform

???

③ PaaS Mgmt.

Cloud Infrastructures (Containers)

Virtual
Compute

Virtual
Storage

Virtual
Network

K8S



Container Layer



Compute



Storage



Network

General Platform Challenges

Tools provided by open sourced projects are driven by IT industry, not designed to address the requirements of telco industry:

- **Service Mesh**

-- traffic hijacking by iptables (low performance)

-- do not support multi-network interface

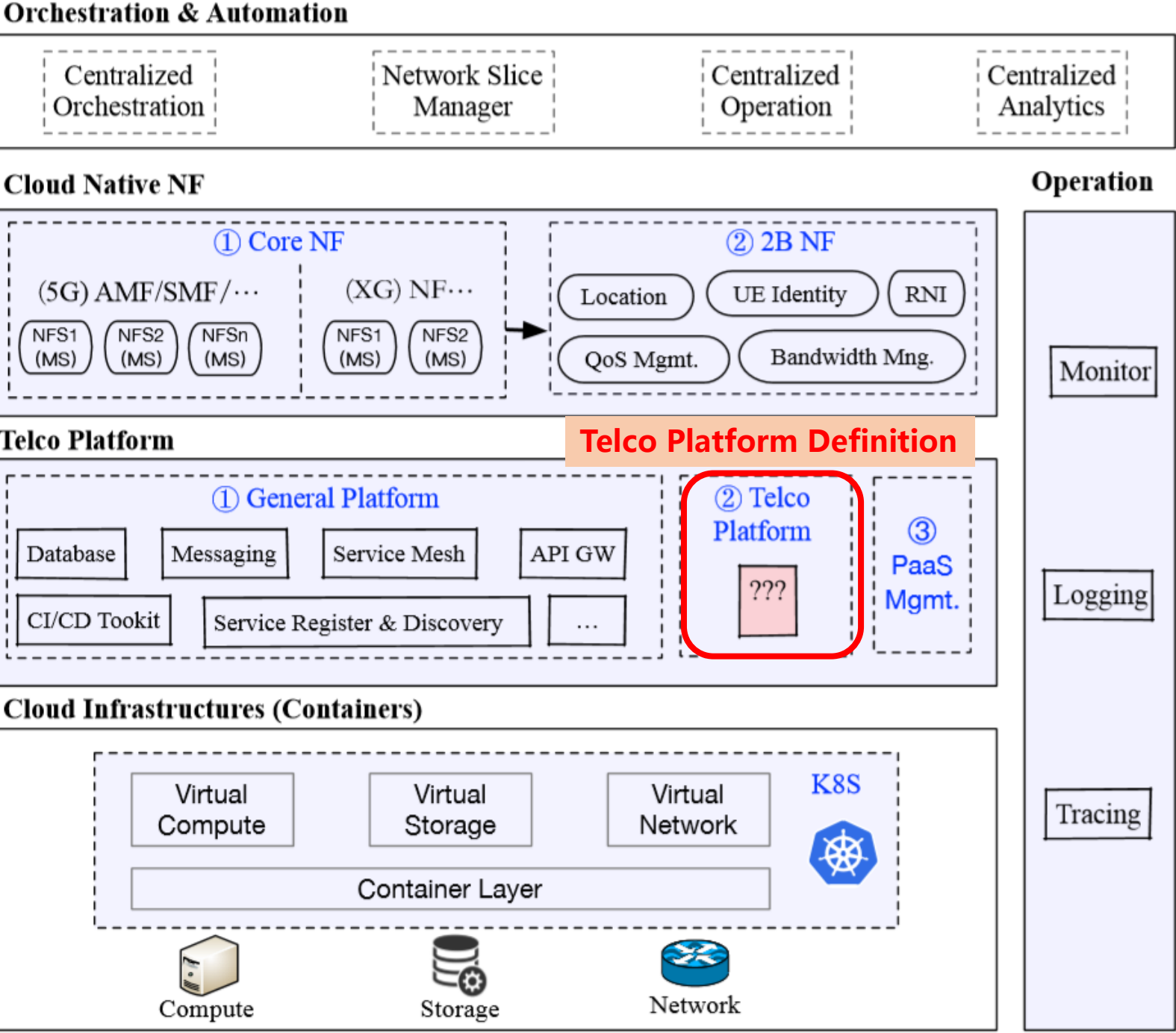
- **Load Balance**

-- IT (TCP/HTTP, hundreds millisecond delay jitter)

-- CT (TCP/HTTP/UDP/SCTP/GTP, millisecond delay jitter)

- **Others (?)**

-- Abstract common functions from NF,
Reliability? Performance?



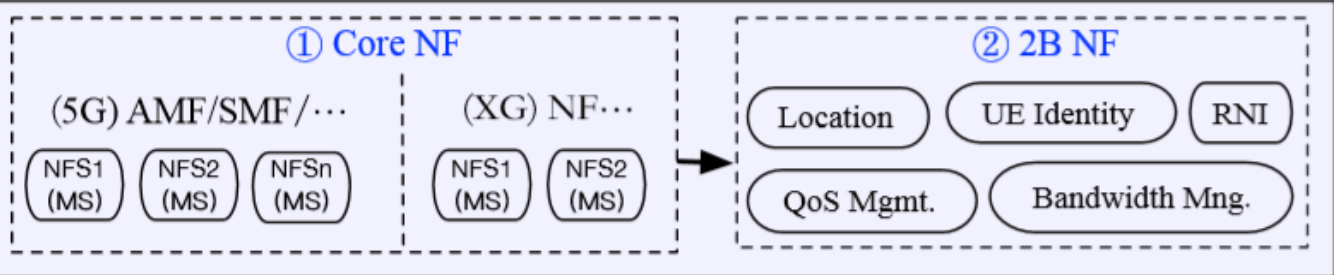
Telco Platform Challenges

- 1. What kind of component can be defined as a telco platform function?—**telco specific** (five 9 LB? HA? OMU?)
- 2. For 5GC, is there already any telco components can be abstracted from core network function?
- 3. Enhanced general platform is enough or not to support core network?

Orchestration & Automation



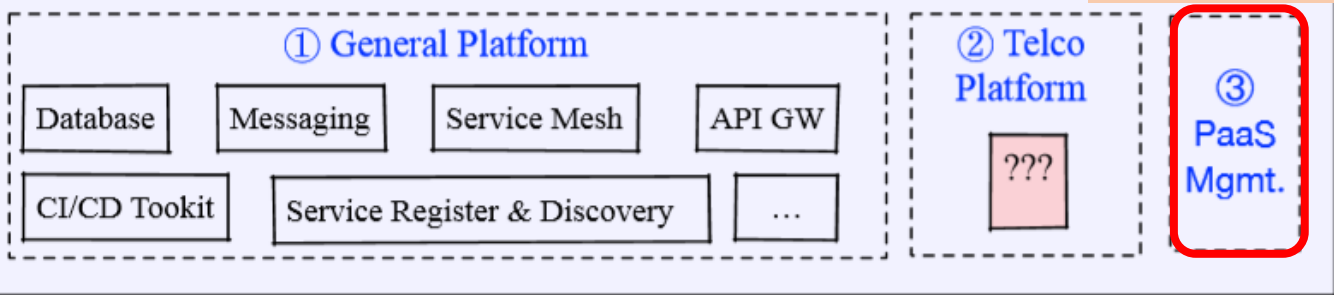
Cloud Native NF



Operation

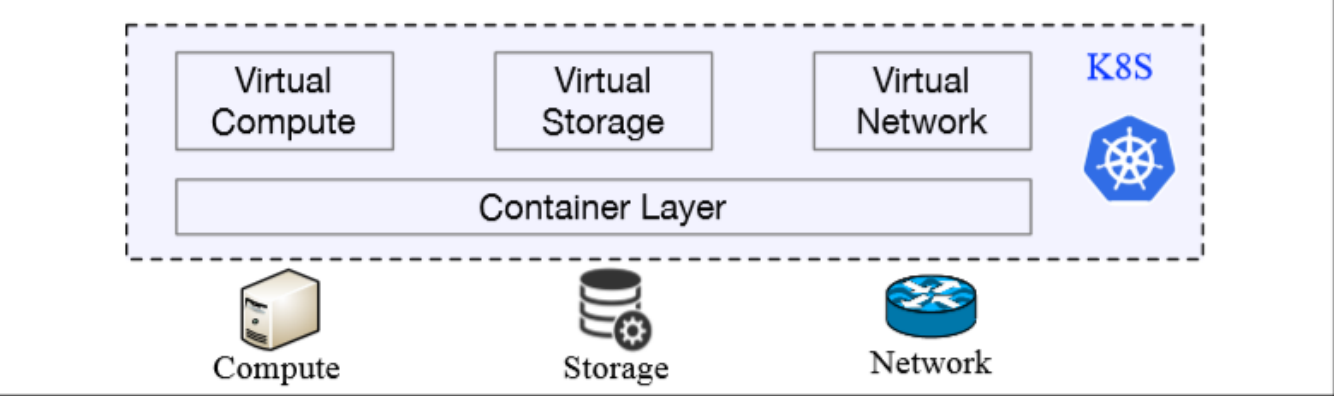


Telco Platform



PaaS Manager ?

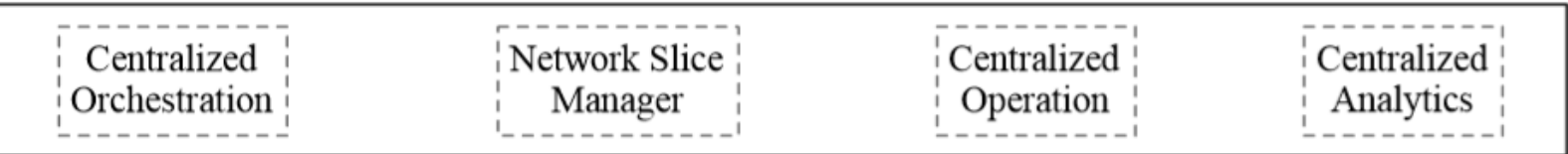
Cloud Infrastructures (Containers)



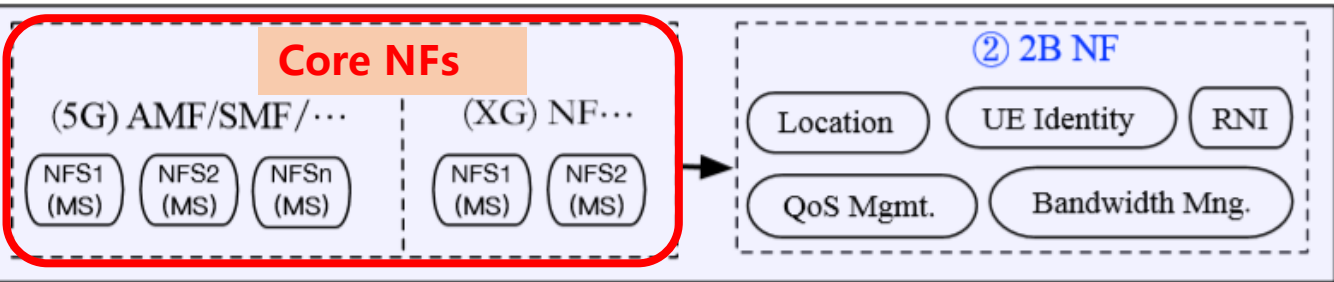
PaaS Management Challenges :

If we creative more telco platform functions, **a new PaaS management tool** is needed to manage the whole Telco Platform Layer (General+Telco)?

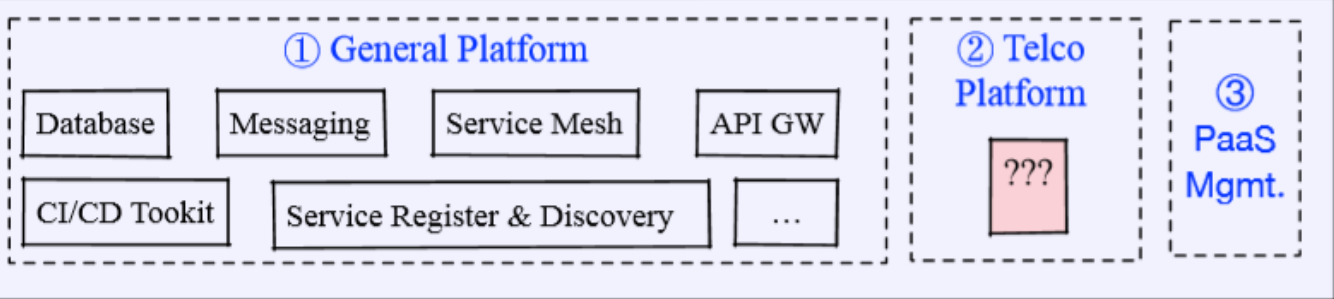
Orchestration & Automation



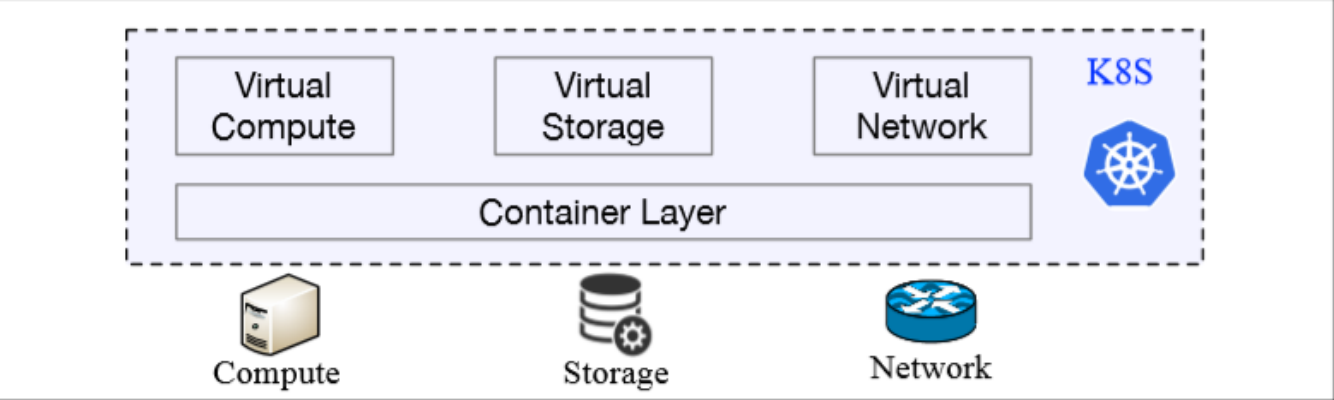
Cloud Native NF



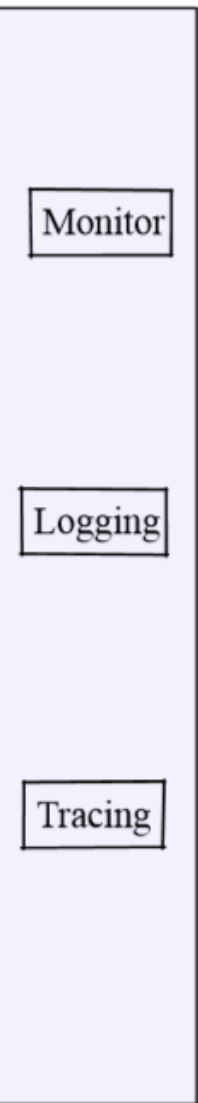
Telco Platform



Cloud Infrastructures (Containers)



Operation



Core network functions challenges:

More vendors establish the 5GC by microservices, components and abilities can be provided through standard APIs for assembling.

- No standards for microservice redesign?
- How to achieve this on an open source PaaS platform while still reserve operators' and vendors' core value?
- Components of 5GC can be extracted as telco platform?
- Creative more XG NFs?

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2B NFs

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① General Platform

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② Telco Platform

???

③ PaaS Mgmt.

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K8S



Container Layer



Compute



Storage



Network

2B network functions challenges:

1. Unified interface encapsulation.

Expose core network ability (Location, UE Identity, QoS Mgmt., etc.) to industrial users and enterprise users through standard APIs

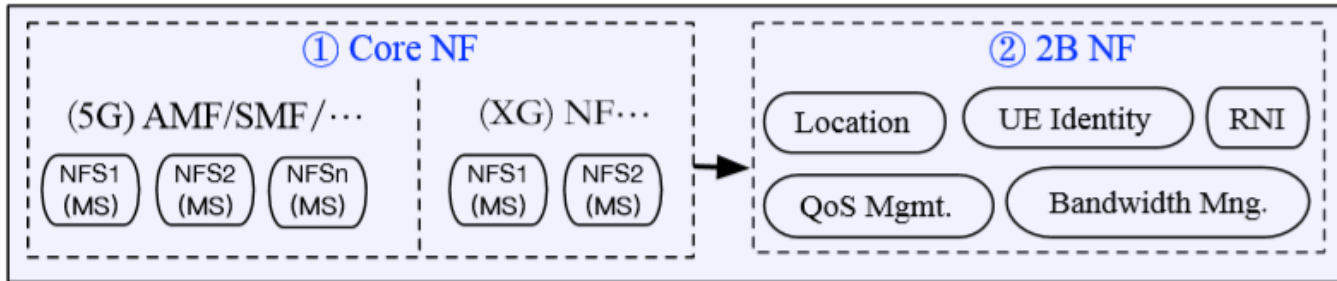
2. More than exposing existing network capacity...

Creative more 2B NFs from the telco platform?

Orchestration & Automation

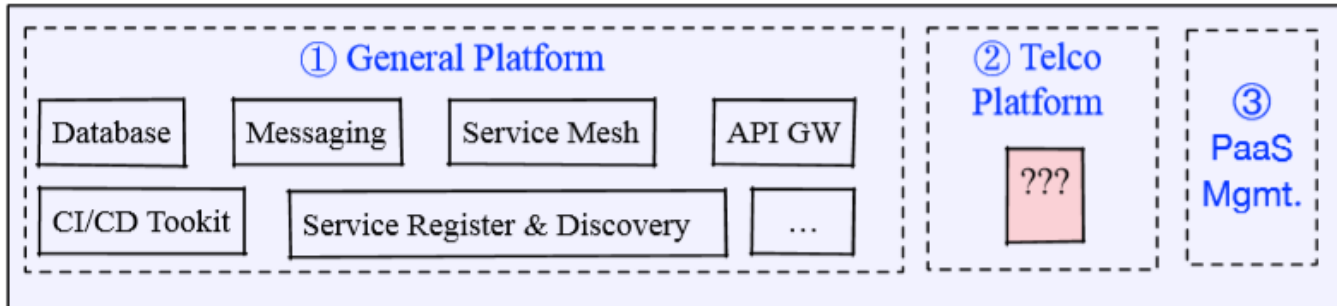


Cloud Native NF

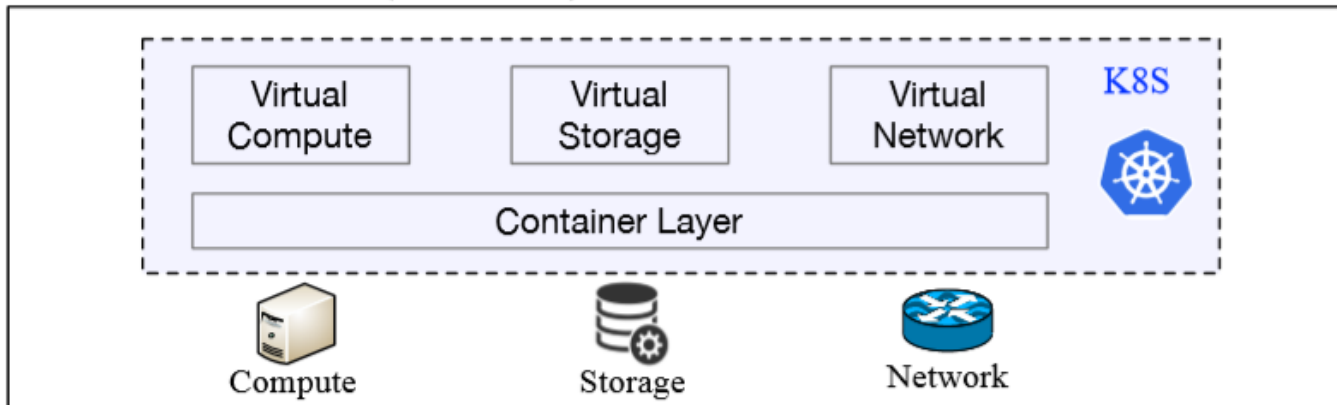


Operation Challenges

Telco Platform



Cloud Infrastructures (Containers)



Monitor

Logging

Tracing

O&M Challenges:

- Some excellent observation and analyzation software are designed for IT industry.
- Prometheus** has become the de-facto standard for visibility in Kubernetes environments, **how to use Prometheus at scale?**
- Different kinds of VNFs (vswitch, vFW, vDNS, etc.) need metrics from different dimensions?