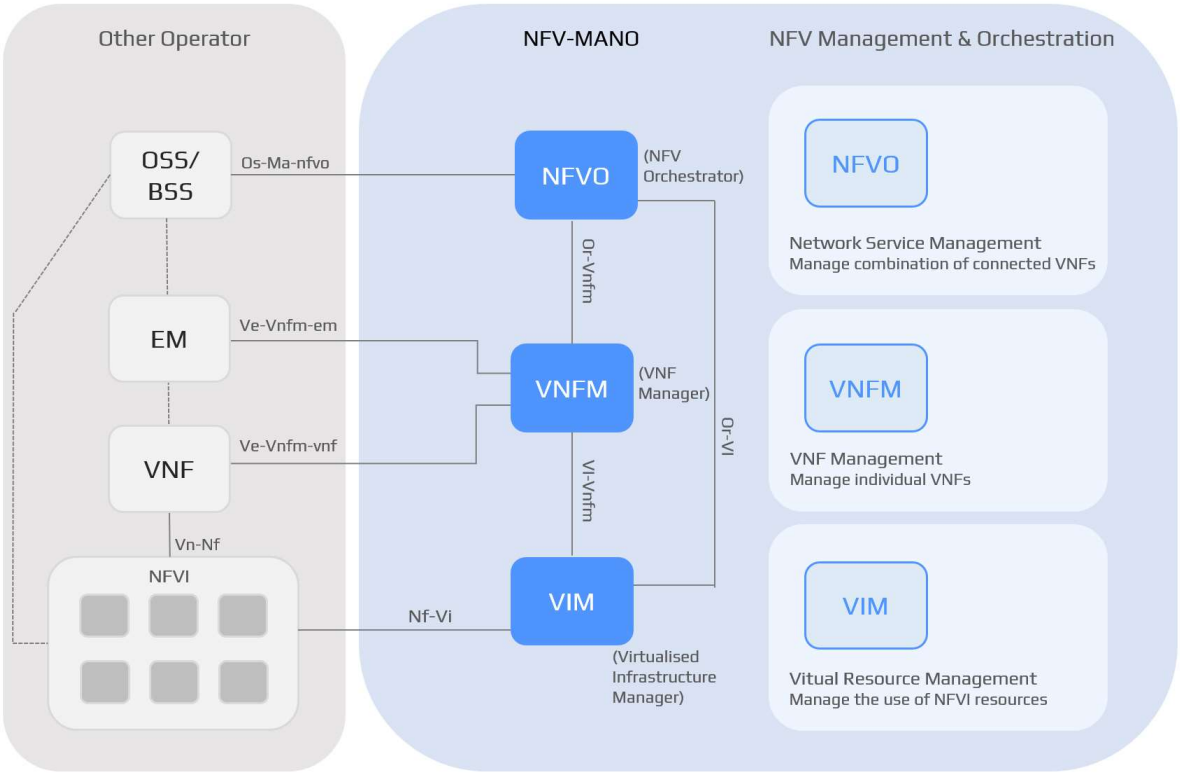
Cloud

MANO

1. Description

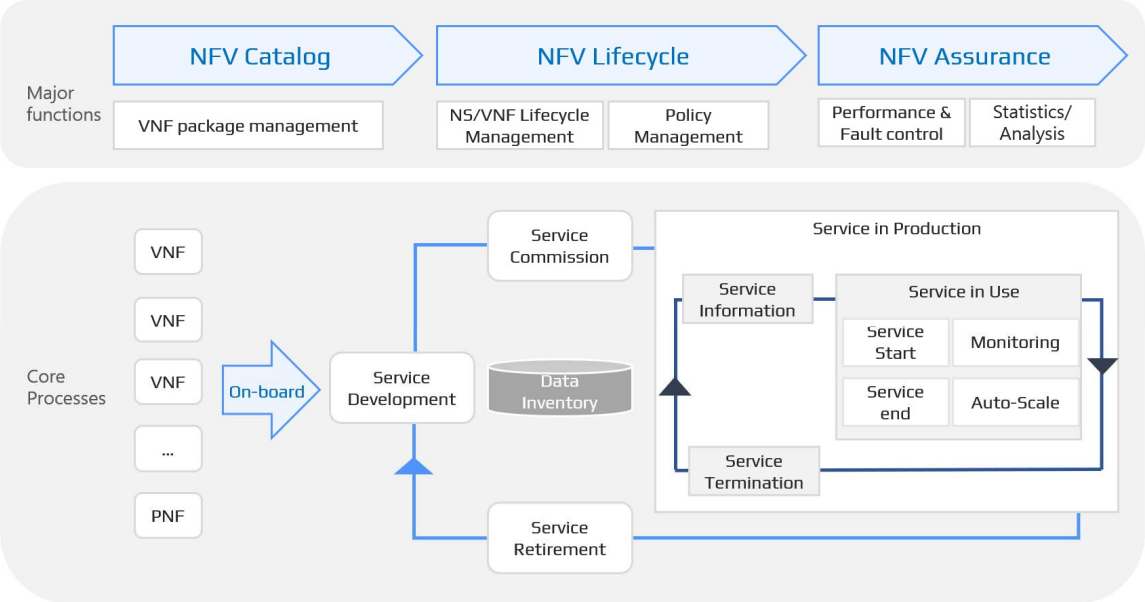
NFV MANO Solution is a solution that implements ETSI standard architecture, NFV MANO(Management and Orchestration), to operate network service equipment in a virtual computing environment where hardware(computing, network, and storage) is abstracted.



[Figure 1] ETSI NFV MANO Architecture

2. Value

NFV MANO Solution provides NFV-based network service operation function.



[Figure 2] NFV-based Network Service operation functions

● NFV Catalog management

· Manage VNF configuration information

· Handle VNF configuration settings

· Update VNF software information

● NFV Lifecycle management

· Supervise VNF instance lifecycle

· Manage VNF instance configuration information

● NFV Assurance management

· Manage assurance indicator per each VNF instance

· Set policy for VNF auto-scale and TCA

· Track resource usage, statistics, and alarms for VNF instance

- Operation information visualization

· Visualize operating status of NFVI and VNF

· Provide detailed information on NFVI and VNF

· Display resource usage and statistics for NFVI, VNF, and VNFC

3. Key Features

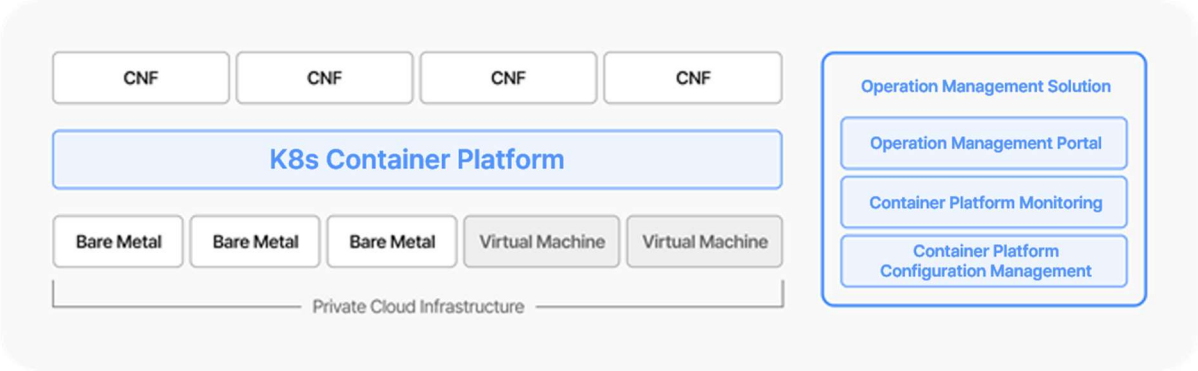
- Separately manage OS image and software package for VNF Application
- Backup and re-load configuration information of VNF Instance
- Auto scale-in/out based on VNF indicator
- Real-time migration
- Evacuate host
- Rebuild VNFC instance
- Rollback VNF life cycle
- Enable software update for VNF instance via Web UI
- Monitor VNF Instance status and performance
- Provide VNF agent for efficient VNF development
- Provide network acceleration feature(DPDK, SRIOV, etc.)

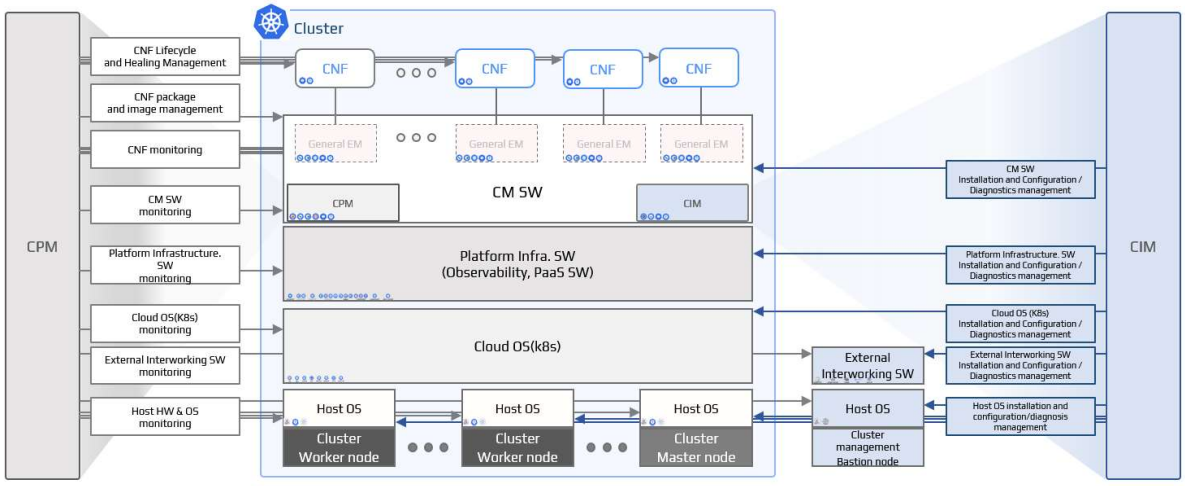
K8S CM

1. Description

CM(Container Platform Management Solution) operates on Kubernetes container platform. It monitors the platform, manages its configuration, and oversees CNF applications, including CNF package management, lifecycle management, healing management, and resource authorization.

CM is an expansion solution for container platforms, optimized for mobile communication environments. It enhances stability of container platform configuration by using OpenShift(OCP, OKD) to provide K8s cluster availability checks and configuration management. It also offers CNF distribution management optimized for mobile communication system management and user-friendly container platform monitoring feature.





[Figure 2] NFV-based Network Service operation functions

2. Key Features

● Container platform environment/configuration management

· Manage container platform SW configuration

· Manage container platform node Host OS configuration

· Manage container platform redundancy configuration

· Check container platform configuration status

● Container platform monitoring

· Monitor container platform configuration software

· Monitor container platform node(hardware)

· Monitor software which external interworks with container platform

· Manage CNF cluster resource usage and access control

· Manage CNF package and image

· Manage CNF lifecycle

· Manage CNF healing

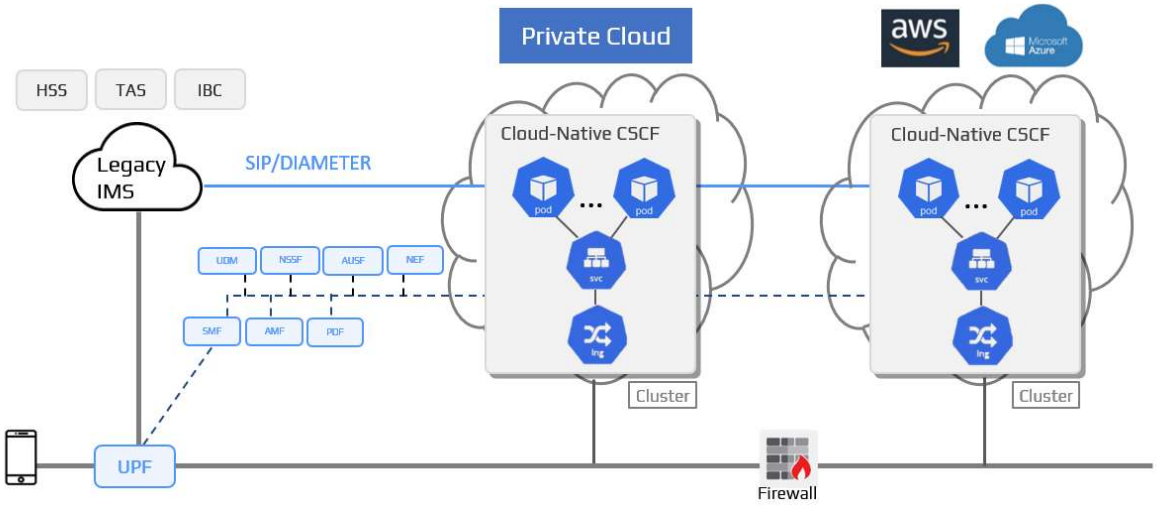
● Centralized operational management portal

· Manage, monitor, and handle CNF application for container platform infrastructure through a centralized operational management portal

CLOUD-NATIVE CSCF

1. Solution Overview

We've enhanced CSCF system by transitioning it to Micro Service Architecture and implementing it on K8S platform. This transformation has evolved CSCF into cloud-based system, providing our client with Cloud-Native CSCF system that prioritizes system stability and operational convenience.



2. Key features

● Scalability

. Independent Component Scale

- Loose coupling between call processing modules

. Individual call processing module expansion

- Metric based scaling

. Scaling processing for each pod

. Defined and utilized IMS-specific metric(TPS, PPS, Session)

● Fault Isolation

. Separate Pods by interface

- Separate interworking protocol (traffic) processing pod

- Provide redundancy function with all-active structure

. Segmentation of database

- Separate Registration/Call DB by function

- High Availability with Active/Standby structure

- Prevent failure propagation by segmenting module by function

● ZTO/ZTP

. Auto Scale

- Support auto scaling (HPA) for each pod based on collected metrics

. Auto Recovery

- Restart abnormal pod using Liveness Probe-based health check and Kublet

- Unified Configuration Management

3. Benefits

● Provide stability through Micro Services Architecture

● Maximize resource efficiency compared to PNF/VNF

● Eliminate hardware dependency

● Enable rapid deployment on Cloud