

Evolution to Cloud Native

남 기 범

Open Infra Days Korea 2018

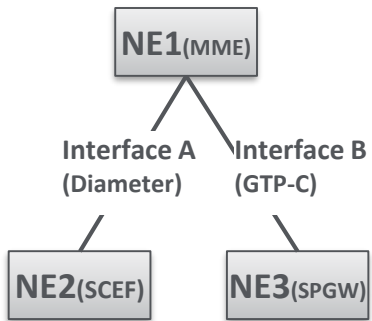
Telco NFV 와 IT Cloud 비교

IT는 micro service, platform service, open source, DevOps, Automation, AI를 통한 혁신

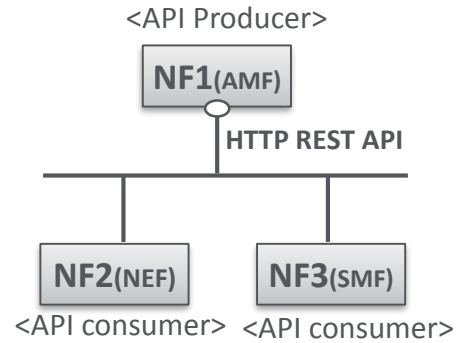
구분	Telco NFV	IT Cloud
App 형태	VM 기반 big size	Container 기반 micro size (micro service)
HA	1:1, N:1 이중화	all active
App 배치	특정 Host의 NUMA를 고려 배치 (이중화, 성능 향상 고려)	H/W에 자유로운 App 배치
App 구조	App과 DB 통합 구조 (Stateful, 성능 향상)	App과 DB 분리 구조 (Stateless, DB platform service)
App 생성시간	수 분	수 초
App 개발시간	수 개월	수 주 (platform service와 open source를 활용하여 개발 기간 단축)
App 제공시간	긴 서비스 제공시간 (수개월) (배포/시험/초도/확대, 매뉴얼작업)	짧은 서비스 제공시간 (수분) (DevOps 배포/시험/운영 일체화, 자동화 수행)
App 운영시간	긴 운영 시간 (6개월~1년)	짧은 운영 시간 (10여분)
App 위치	edge / core 분산 cloud	central big cloud
App 지능화	초기 단계	확대 단계

5G Telco Network을 위한 요구사항

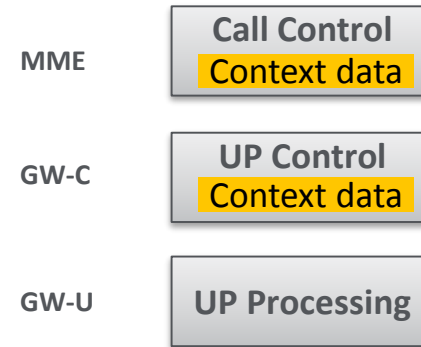
4G Point-to-Point IF



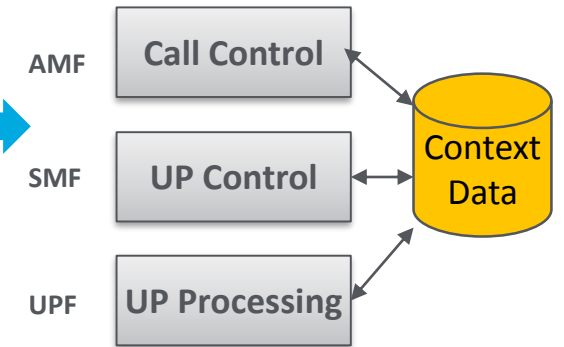
5G SBI



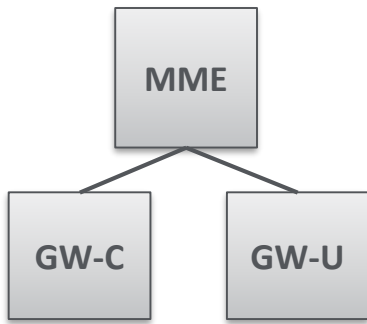
4G Stateful



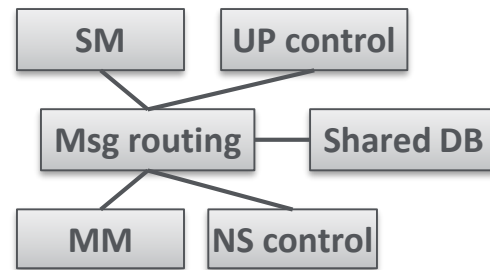
5G Stateless



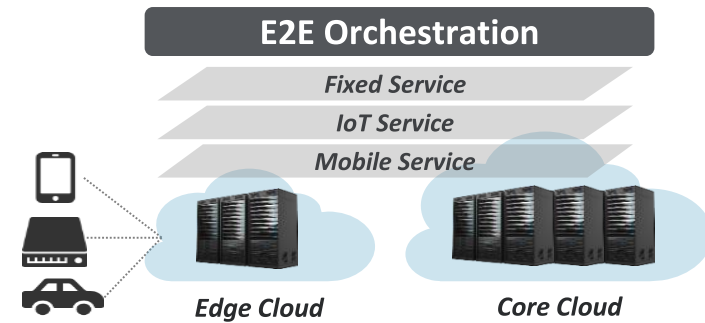
4G Big Function



5G Function Decomposition



Network Slicing



진화 방향

가상화 운영 환경



Hybrid 가상화 운영 환경

OpenStack only



Platform service

ETSI NFV 표준



Open source 중심

장비 자동 생성

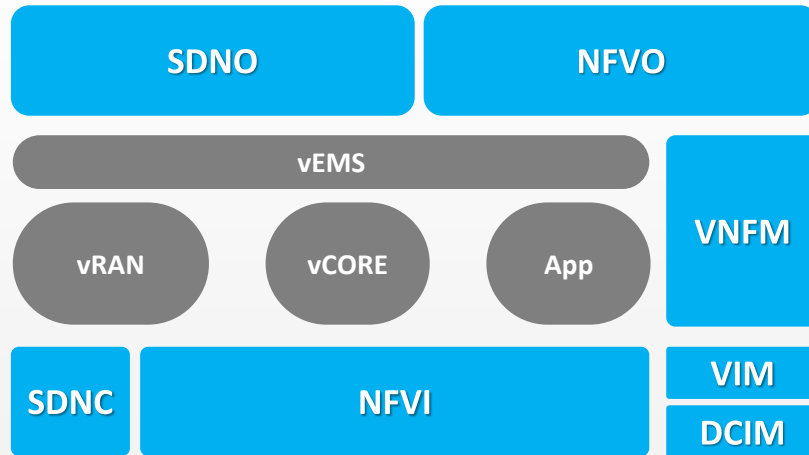


AI 기반 자동 운영

Hybrid 가상화 운영 환경

Container 기반 micro service와 가상화 장비를 함께 운영하는 환경

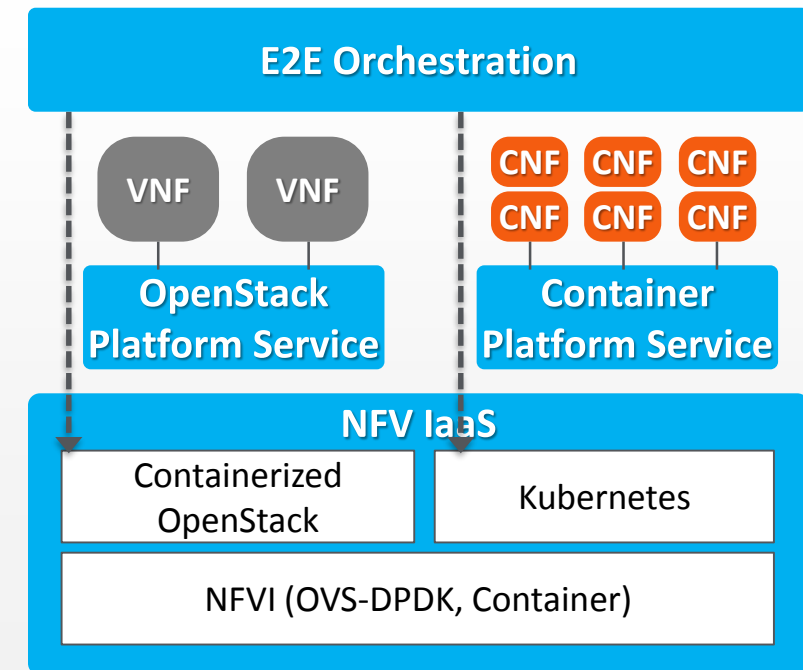
ETSI NFV 표준 기반 가상화 환경



- NFVO : NFV Orchestrator
- SDNO : SDN Orchestrator
- VNFM : VNF Management

- VIM : Virtualized Infra. Manager
- DCIM : Data Center Infra. Manager

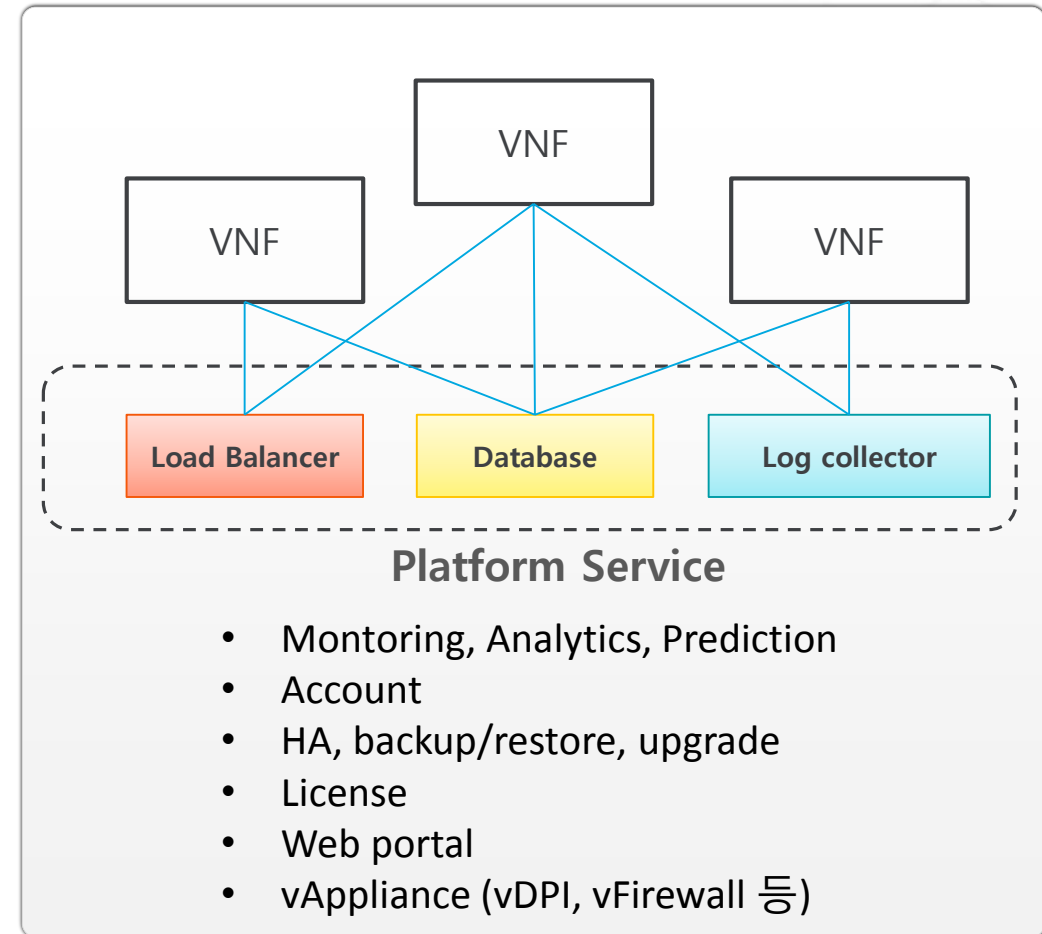
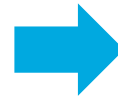
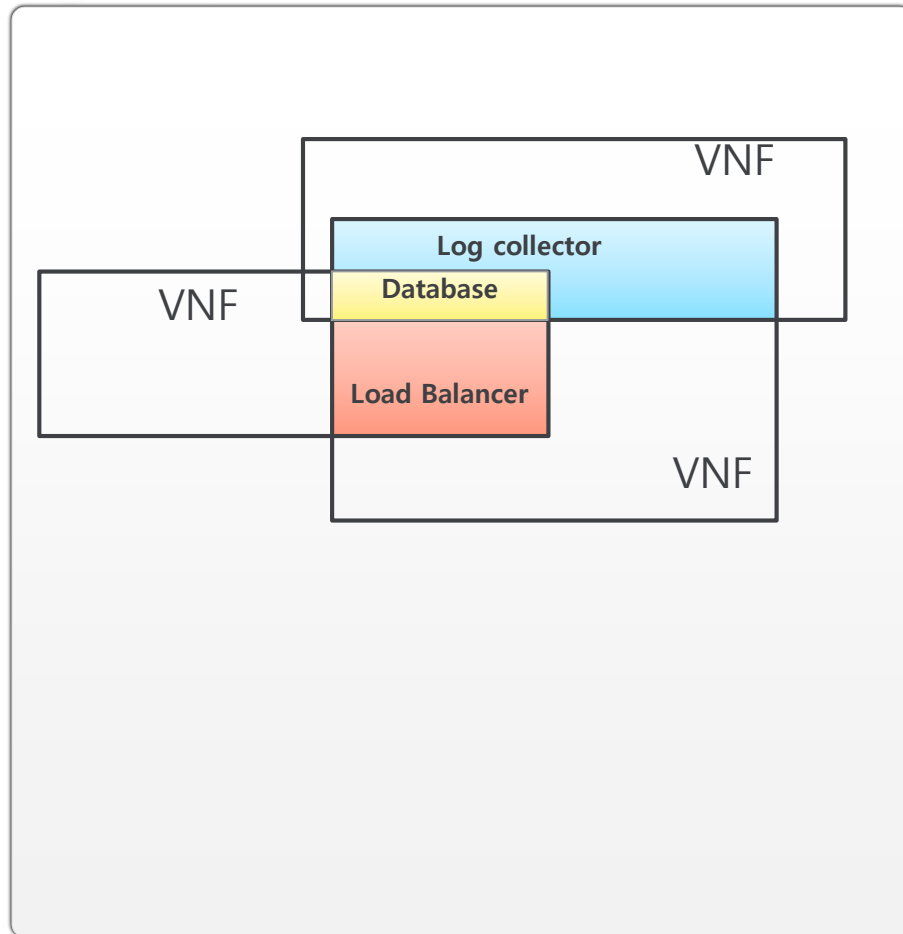
Open source 기반 Hybrid 가상화 환경



- NFVO : NFV Orchestrator
- SDNO : SDN Orchestrator
- VNF : Virtual Network Function
- CNF : Containerized Network Function

Platform service

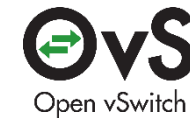
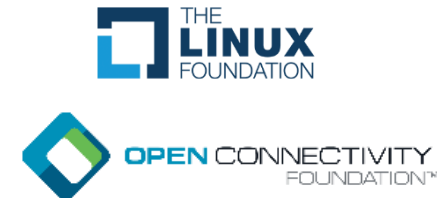
Platform service 에 의한 빠른 VNF 개발과 안정적인 운영



Active Participation in Open Source Communities

- Platinum member of LFN(ONAP)
- Partner member of ONF
- Hosted 2017 ONOS build event
- Platinum sponsor of 2018 OpenStack Korea Event

3,000 Contributors and 580,000 Patches for 2017



AI based Network Automation

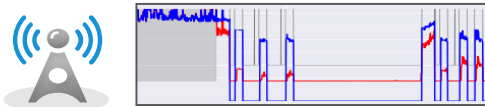
Network Automation & Customer Management

Environmental Conditions



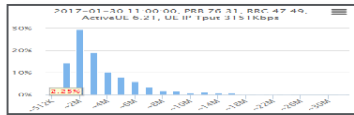
Temperature, Humidity, . . .

System Logs



VSWR, Current, Call Log, ...

Network KPI



Statistics, Alarm, Notification, ...

User Experience

Voice

Call Duration, Mute Count, MOS, ...

Video

Resolution, Watch Time, Stalling Count, ...

Data

Big Data
Processing

Abnormality Detection
& Prediction

Big Data Analytics

Feature
Extraction

Recommendations



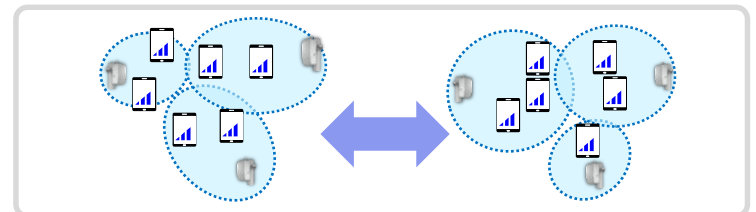
HW Fault Prediction



Sick Cell Detection



Automatic Network Optimization



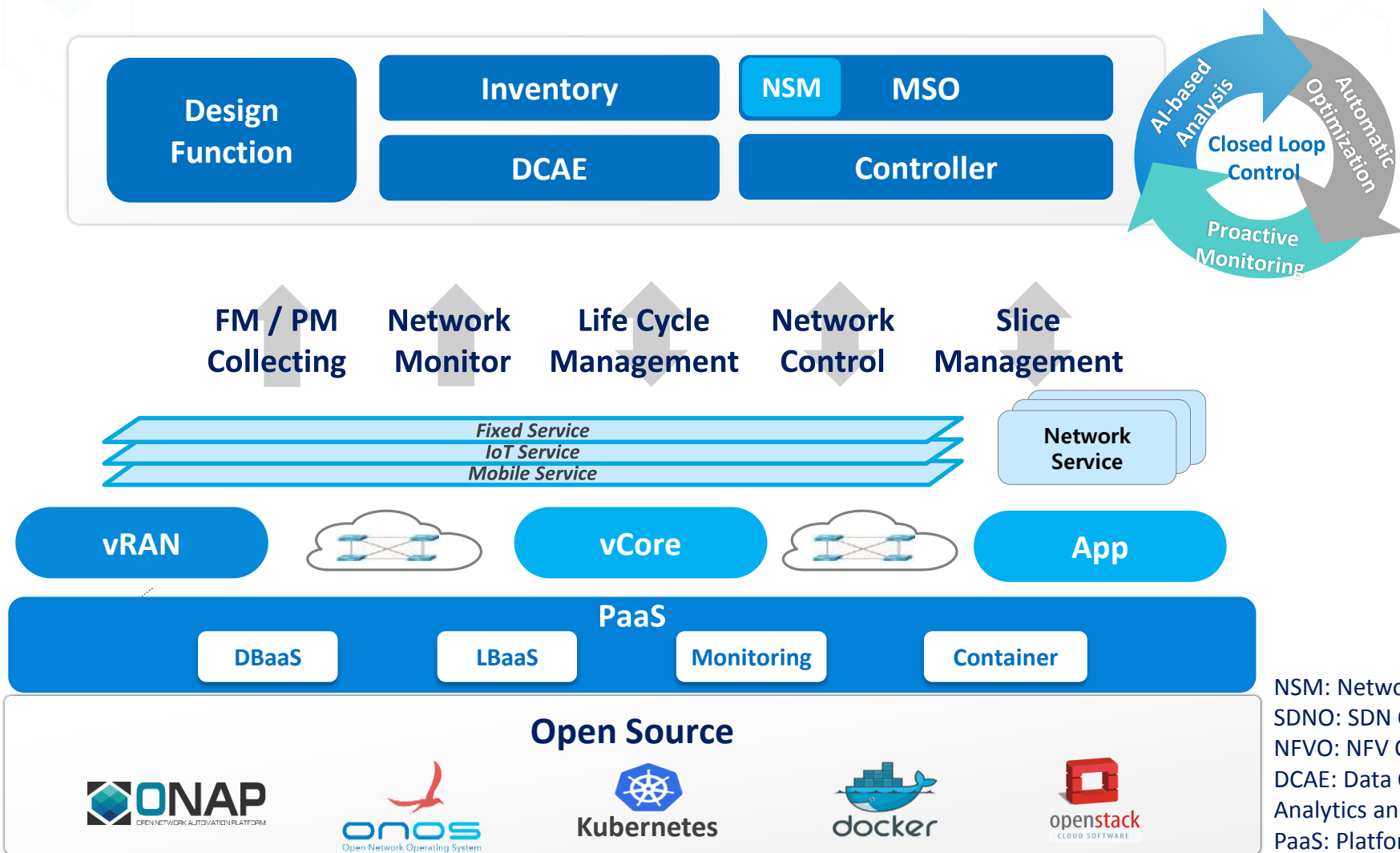
Customer Management

Churn Monitoring & Prediction



Service Experience Index Monitoring per User
AI-assisted Churn Prediction

Automated Network Self Operation



NSM: Network Slicing Manager
SDNO: SDN Orchestrator
NFVO: NFV Orchestrator
DCAE: Data Collection, Analytics and Events
PaaS: Platform as a service

SAMSUNG