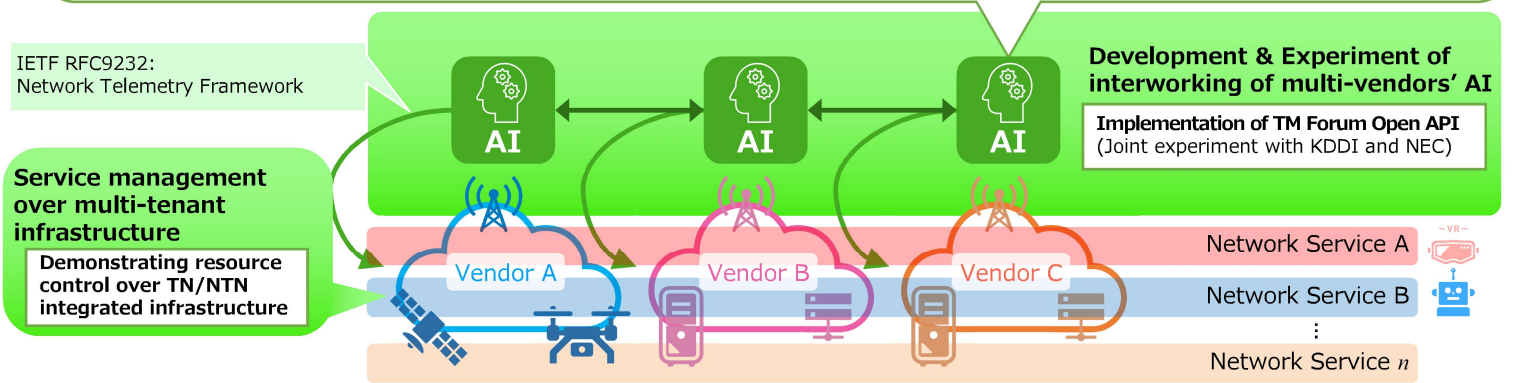
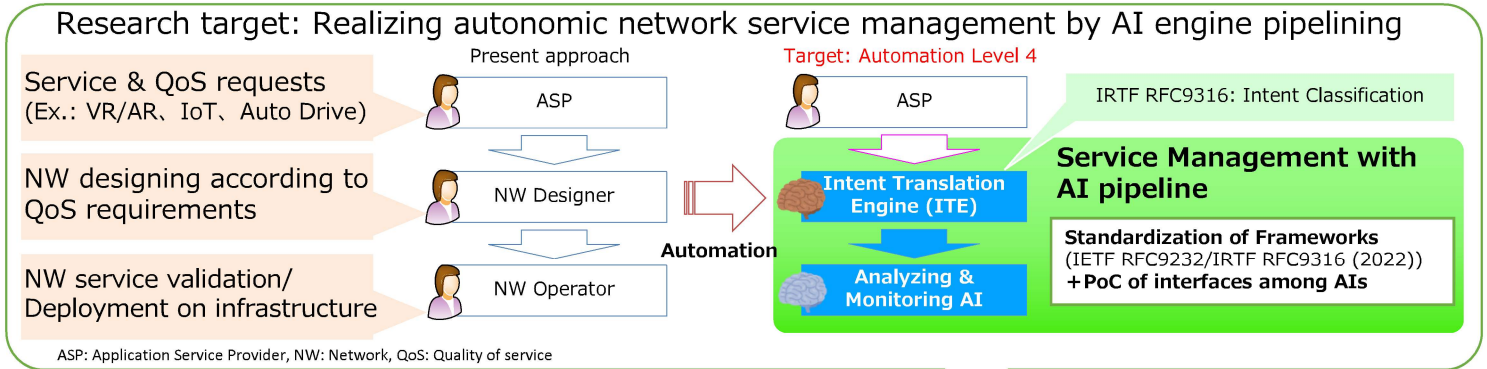


Autonomic Service Management

National Institute of Information and Communications Technology (NICT), Japan

Autonomic Service Management toward B5G/6G

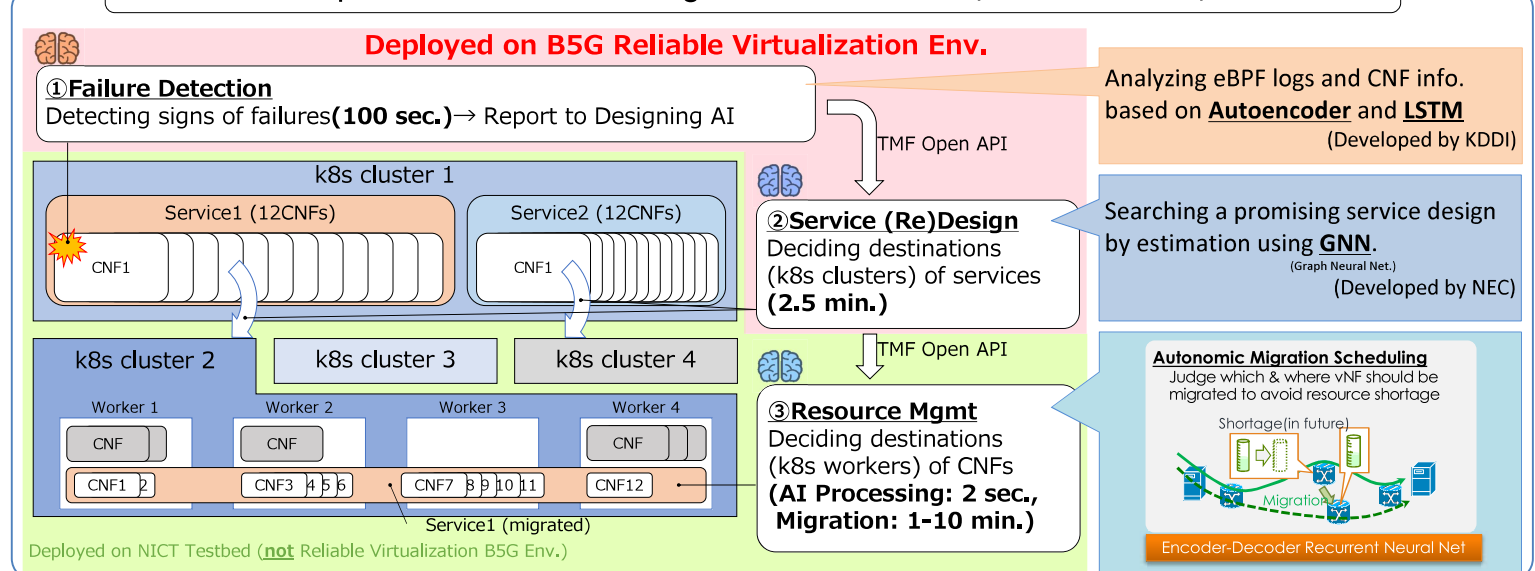


Interworking of Multi-vendors' AI via TMF Open API

Management by multiple AI

- Combination of 3 companies
 - ▷ Monitor & predict failures
 - ▷ Redesign services to avoid
 - ▷ Resource arbitration & service reconstruction
- Interfaces between each AI based on TMF Open APIs
 - ▷ Failure prediction via Service Problem Management API
 - ▷ Service migration plans via Service Ordering API

Experiment of Interworking Multi-vendors' AI (KDDI/NEC/NICT)



Autonomic Service Management

National Institute of Information and Communications Technology (NICT), Japan

Intent Classification & Translation

What is "Intent"?

- **Intent** defines not "How" should be, but "What" should be offered for networks (services).
- **Intent** differs from detailed orders, such as *commands*, *rules*, and *policies*.
- **Intent** enables non-expert operators to offer unique network services by their own policies.

Written based on Intent Classification

Solution	Carrier networks, Enterprise networks, DC networks
Intent User	Customer, Subscriber, End user, NW operator, App. developer, etc.
Intent Type	SLA guarantee, Network (re)configuration, Policy definition, Resource management
Intent Scope	Connectivity, Application QoS, Security/Privacy, Storage, Computing
Network Scope	Radio Access, Transport Access, VNF/PNF, Physical Cloud edge/core, Logical, Campus
...	...

Cf. IETF RFC 9316

Intent Based Networking (IBN)

QoS Request

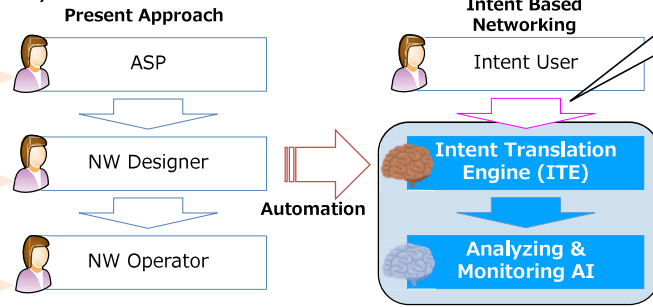
Ex.
- Guarantee 1080p (FHD) video streaming for subscribers

Network Service Design

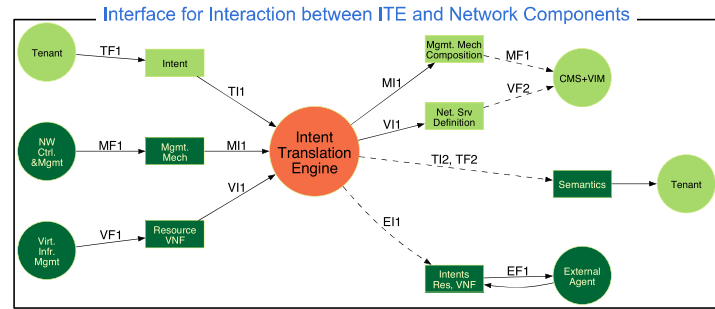
Ex.
- Set VNFs, Video conversion, cache, etc.
- Routing, Traffic Engineering, etc.

Deployment

Ex.
- Set routing table, Resource provision, Starting up VNFs, etc.



Intent Translation Engine (ITE) & Interface



CMS: Control Management System

Interface between tenants and ITE

TF1 formats intents introduced in the ITE
TI1 formats and transmits an intent to the ITE
TF2 formats declarations of intent semantics
TI2 publishes the intent semantics

Information of management mechanisms

- MF1:**
- Management system formats declarations of mechanisms
- ITE formats compositions
- MI1:**
- Management system publishes mechanisms to implement policies and network services

Information of resources and VNFs

VF1 formats declarations of network resources and VNFs
VI1 is used to publish network resources and VNFs
VF2 formats network service descriptor (NSD)

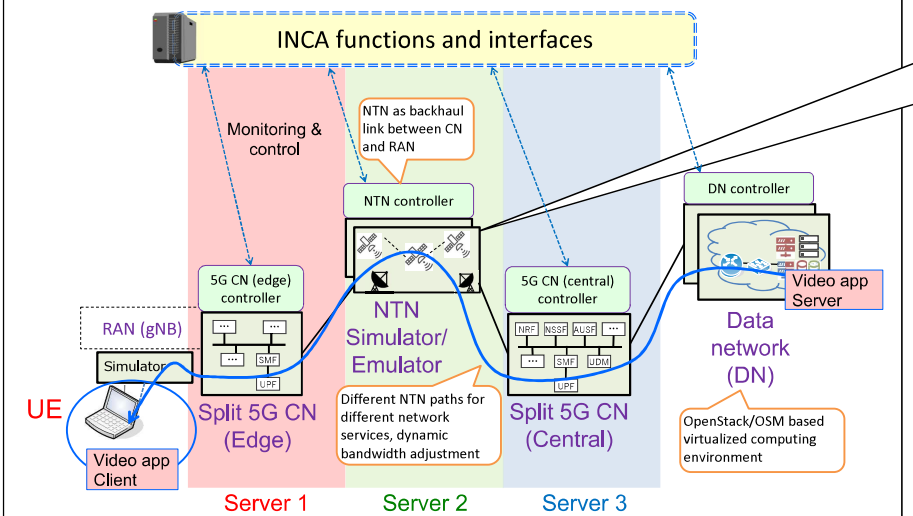
Information of intents, resources and VNFs

EF1 formats declarations of network intents, network resources and VNFs
EI1:
- ITE allows external agents to provide intents and retrieve information
VF2 formats network service descriptor (NSD)

Cf. IETF I-D

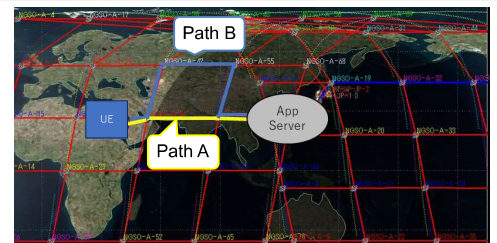
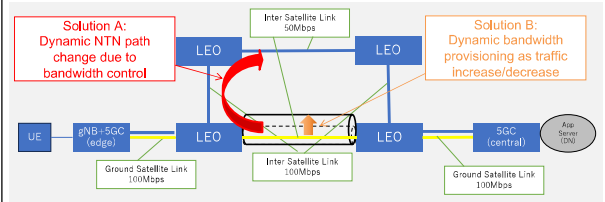
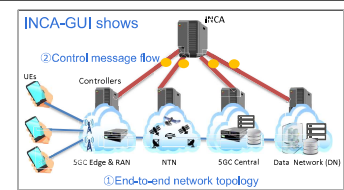
TN/NTN Integrated Network Control Architecture (INCA)

INCA Demonstration Environment (VM)



INCA's features

- Network service creation with appropriate amount of TN/NTN resources based on QoS requirements
- Dynamic control of TN/NTN resources to maintain QoS.



Two paths: both through different LEOs (Visualized by System Tool Kit (STK))