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# Roadmap of Intent-driven CCVPN use-case in R11

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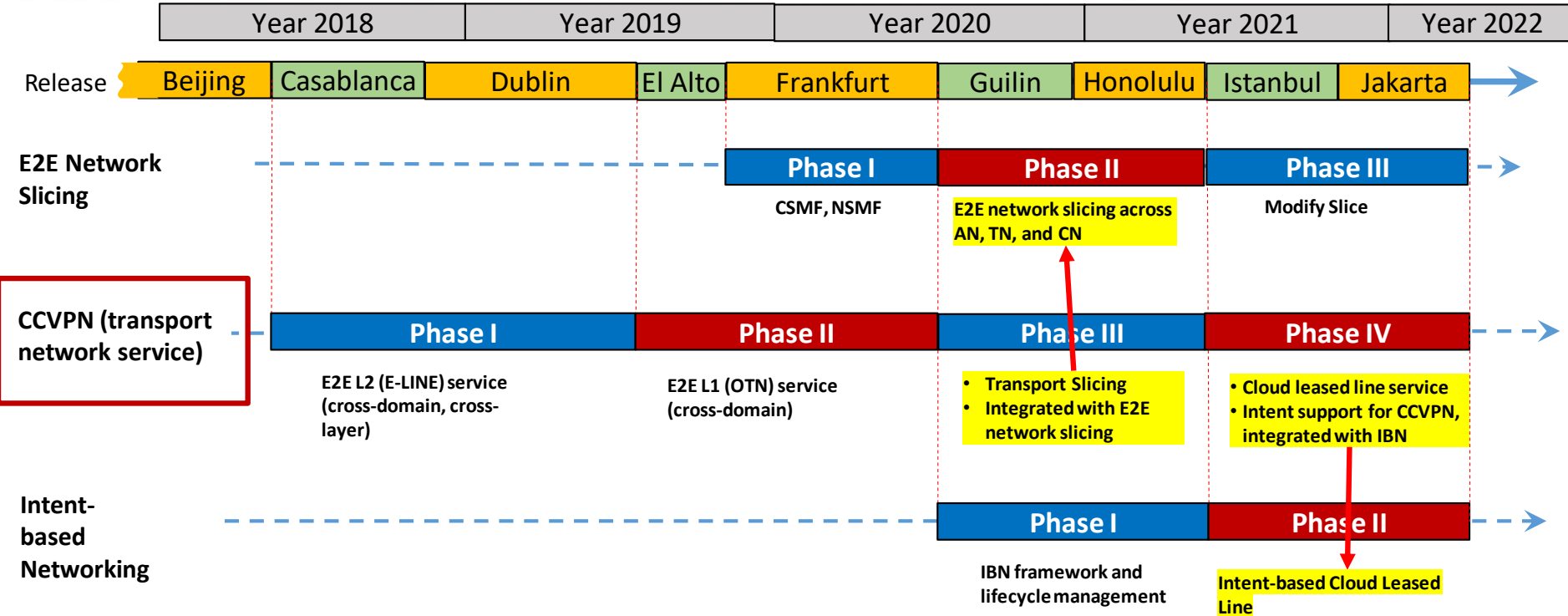
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- History of CCVPN and its evolution
- Transport slicing solution overview
- ETSI ZSM framework alignment
- Intent-based cloud leased line solution overview
- Future direction and Kohn Release Requirements
- Design Changes in Kohn Release
  - FR1: E-LINE support for cloud leased line
  - FR2: CCVPN closed-loop enhancement
  - FR3: Align TN interface with latest IETF TN slice model
  - FR4: Open source IETF/ACTN network controller simulator

# History of CCVPN and its evolution



# Recap of Transport Slicing Feature Highlights

- Built an architecture for Transport Slicing
  - Standards-based, model-driven, aligned with ETSI ZSM Framework
  - Can be integrated with E2E Network Slicing (as TN NSSMF), yet without losing the generality of CCVPN
- Implemented the following TN NSSMF operations on TN NSSI
  - Allocate
  - Deallocate
  - Activate
  - Deactivate
  - Modify

# E2E Orchestration of Network Slicing

Transport slicing solution needs to be:

- X-haul agnostic
- Consumer agnostic
- Self-contained and deployable
- Federated solution

Align with IETF and ZSM

ONAP

CSMF

NSMF

3<sup>rd</sup> Party RAN NSSMF

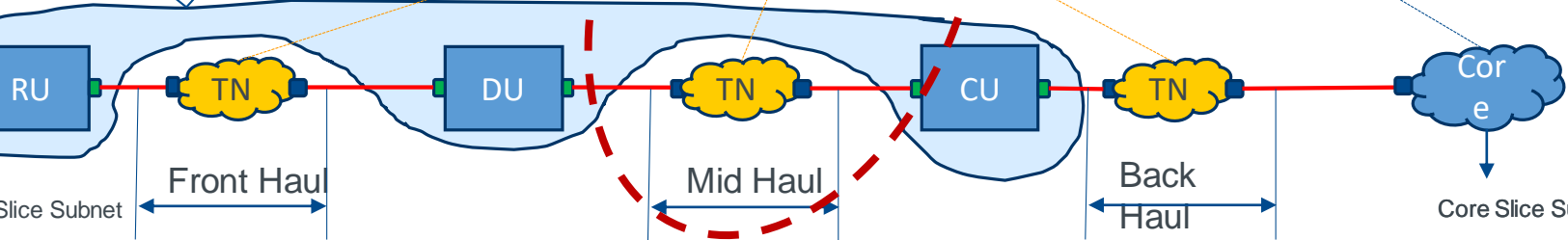
RAN NSSMF

TN NSSMF

Core NSSMF

Configure RU, DU, CU

Transport Network Configurations



RAN Slice Subnet

Front Haul

Transport Slice Subnet 1

Mid Haul

Transport Slice Subnet 2

Back Haul

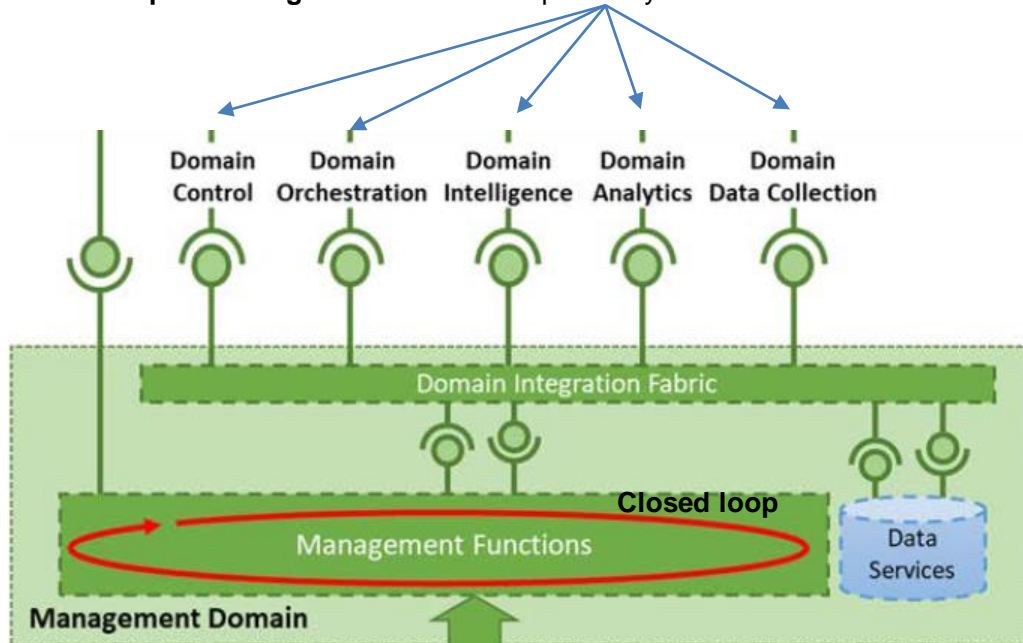
Transport Slice Subnet 3

Core

Core Slice Subnet

# CCVPN developed as ESTI ZSM Management Domain

Transport management services exposed by CCVPN to its consumers.



CCVPN can be implemented as a **Transport Management Domain**, which offers management services via standardized interfaces and also offers closed loop capability.

This modular design enables CCVPN services to be consumed by or work with other use-cases. E.g., The IBN use-case can consume CCVPN management services to deliver a complete E2E intent solution.



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# Intent-based Networking Concepts

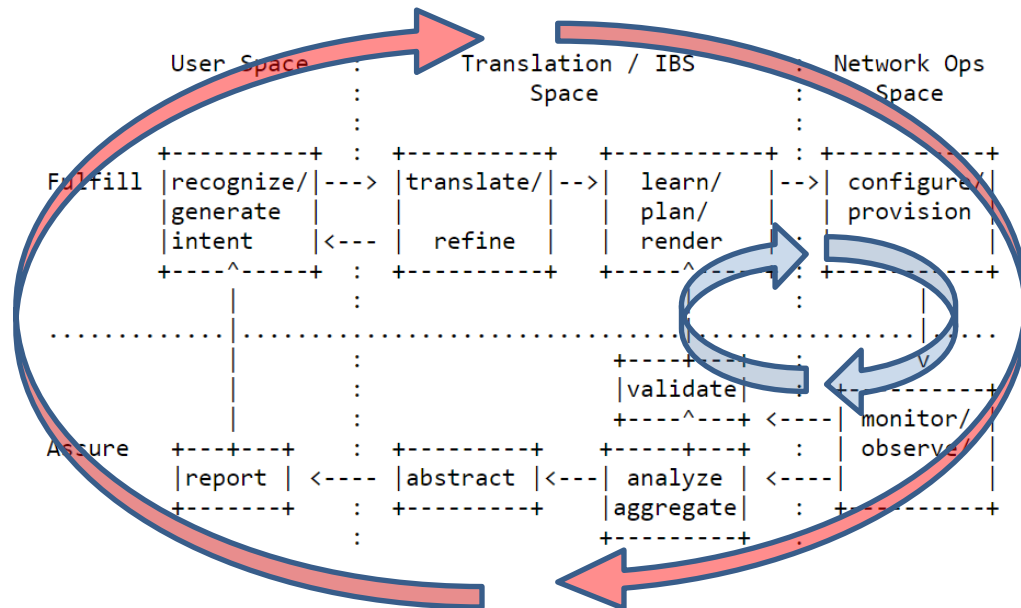


Figure 1: Intent Life-cycle

Based on draft-irtf-nmrg-ibn-concepts-definitions [1]:

- **Intent Fulfillment**
  - Intent ingestion and interaction with users
  - Intent translation
  - Orchestration: configure/provision
- **Intent Assurance**
  - Performance data monitoring
  - Intent compliance assessment
    - continuously monitor & compare actual vs. intended configs
  - Intent compliance actions: learn/plan/render
  - Abstraction and reporting
- **Intent Control Loops**
  - “Inner” loop: classic zero-touch closed loop within a management domain
  - “Outer” loop: E2E service manage domain closed loop; intent exchange – involves end user

[1] <https://tools.ietf.org/html/draft-irtf-nmrg-ibn-concepts-definitions-03>

# How IBN and CCVPN work together to offer an E2E intent solution

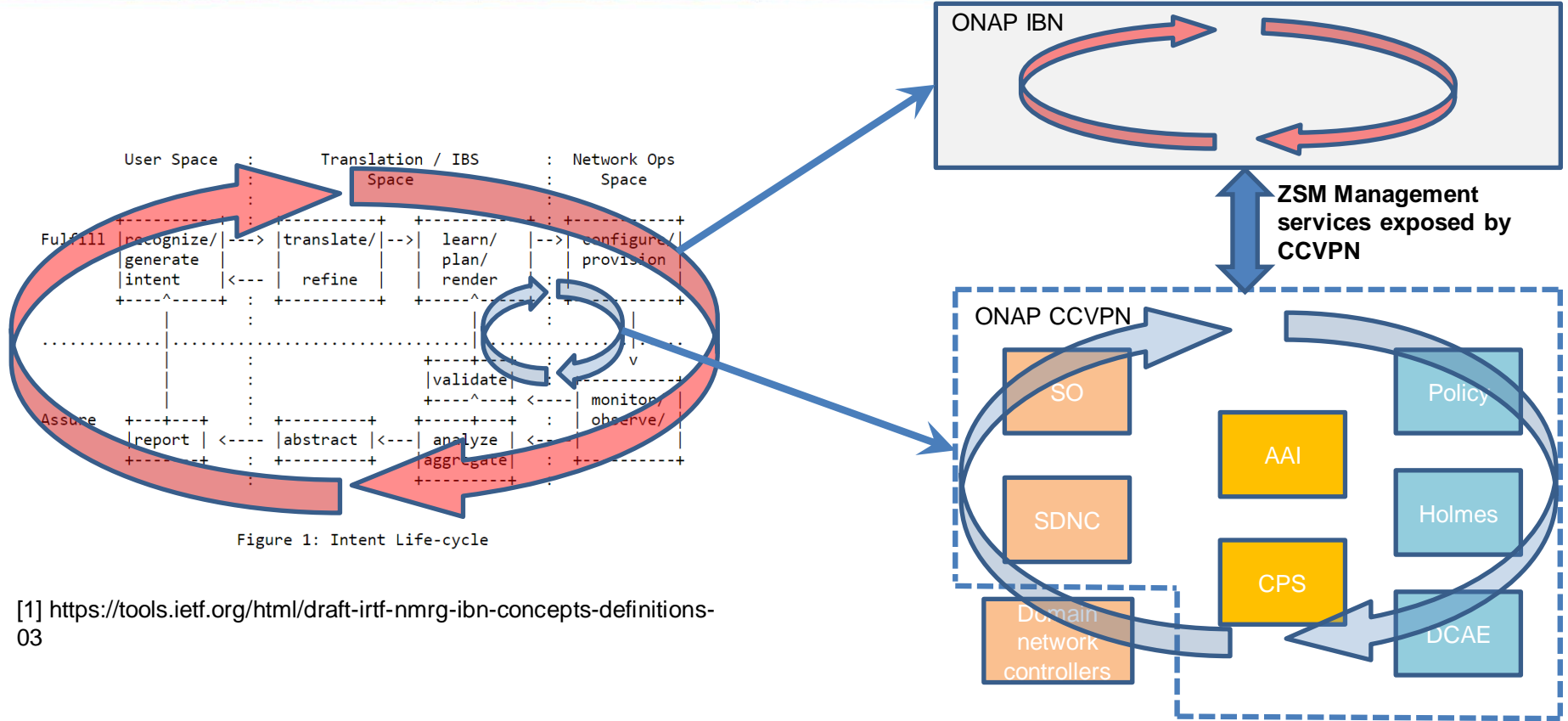


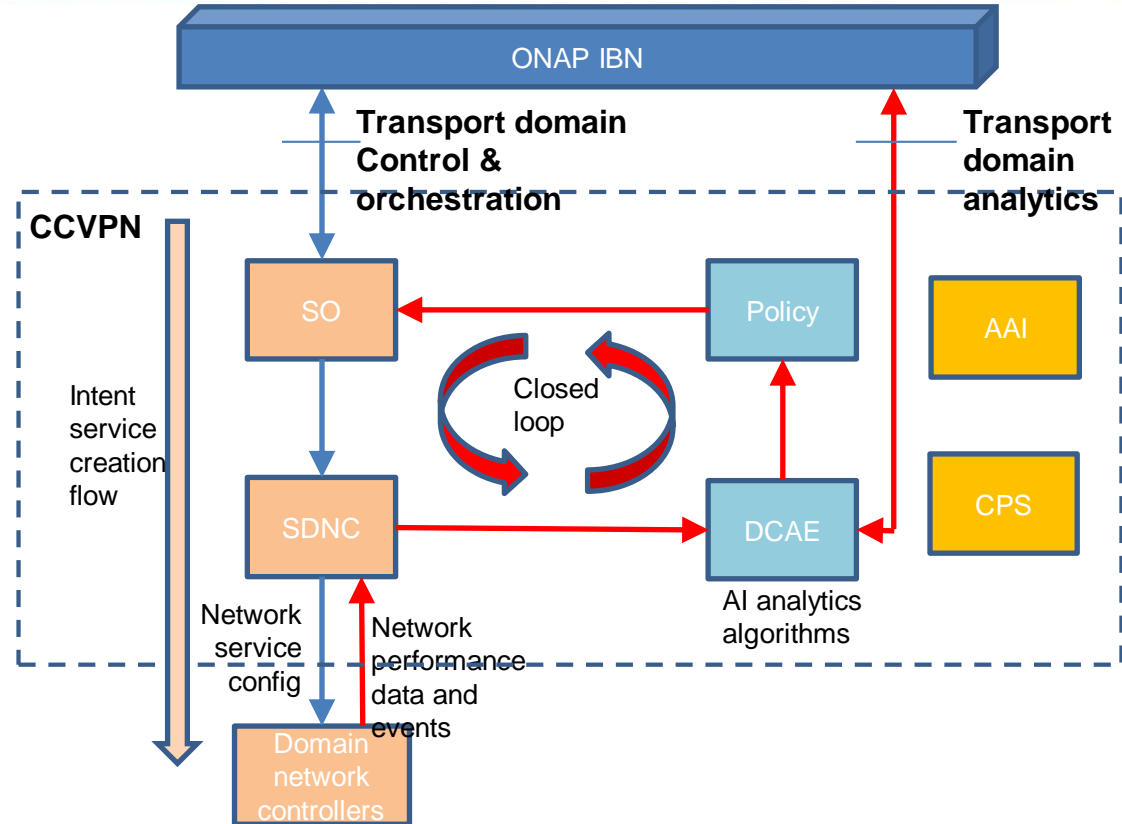
Figure 1: Intent Life-cycle

[1] <https://tools.ietf.org/html/draft-irtf-nmrg-ibn-concepts-definitions-03>

# Proposed CCVPN Architecture as Transport MD supporting Intent

IBN and CCVPN, when federated together, may offer the complete implementation of an **Intent-Based System (IBS)**.

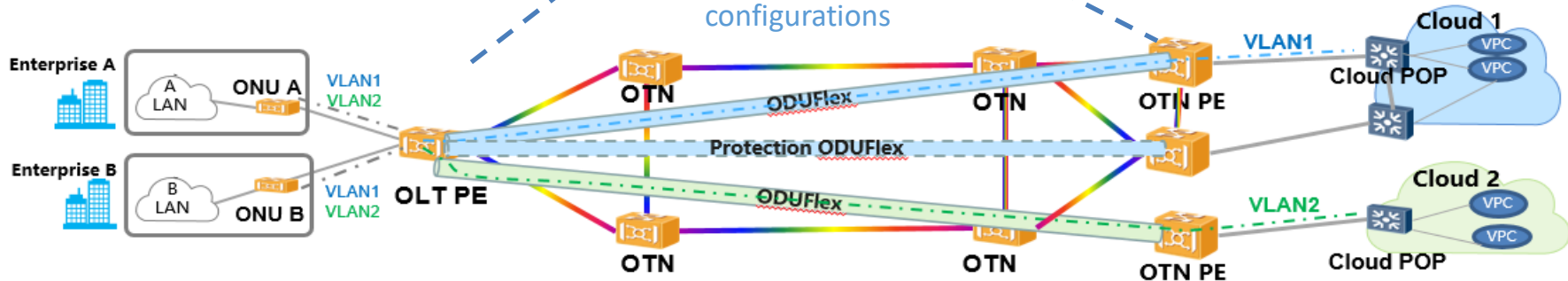
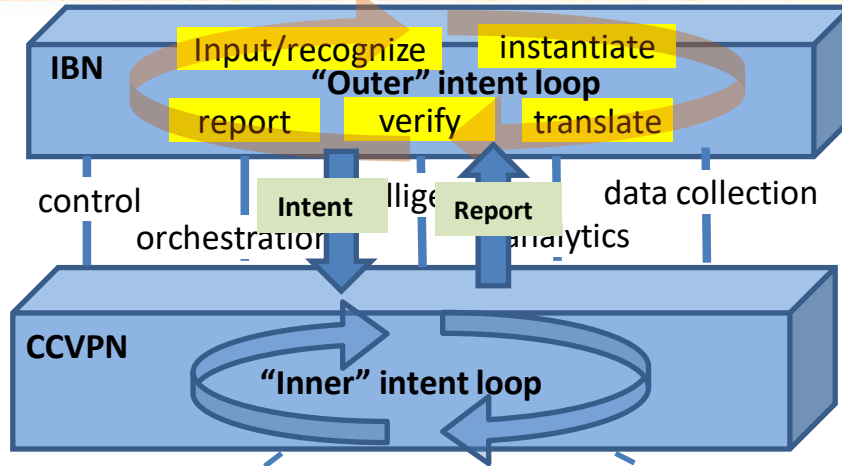
CCVPN (or Transport MD) offers the so-called “**Service Intent**”. Its NBI is a model-driven, intent-like interface. And it enables closed-loop to support service assurance.



# CCVPN Support for IBN: Intent-based Cloud Leased Line

IBN use case, which provides E2E service management for Intent

CCVPN use case, which provides transport networking support to the IBN use case



- Support for the **Cloud Leased Line** service
  - **FR1:** E-LINE (P2P connection) support for the cloud leased line service delivery
- **Closed-loop automation** of CCVPN services
  - **FR2:** Closed-loop enhancement in DCAE: Enhance slice analysis MS to use DCAE SDK dmaap-client lib
- CCVPN support for **Transport Slicing**
  - **FR3:** TN NSSMF NBI enhancement to align with latest IETF specification (SO changes)
  - **FR4:** Open source IETF/ACTN network domain controller simulator

# Kohn: continuation and extension of Istanbul and Jakarta

Requirements/Features	Istanbul	Jakarta	Kohn
Support for <a href="#">Intent-Based Networking</a>	Create architectural framework to support the IBN	Support user-triggered Intent modification closed-loop	
Support for <a href="#">Cloud Leased Line (CLL)</a> service	CLL service delivery (create, delete, and modify) using E-TREE service model	Support CLL traffic protection and UI display of CLL	CLL enhancement <b>(FR1)</b>
CCVPN <a href="#">closed-loop</a> operations	Closed-loop framework for CLL	Closed-loop enhancement in DCAE and Policy	Closed-loop enhancement <b>(FR2)</b>
Support for E2E Network Slicing (i.e., <a href="#">Transport Slicing</a> )		Closed-loop framework to support Transport Slicing	<ul style="list-style-type: none"><li>- Align TN interface with latest IETF TN slice model <b>(FR3)</b></li><li>- Open source IETF/ACTN network controller simulator <b>(FR4)</b></li></ul>



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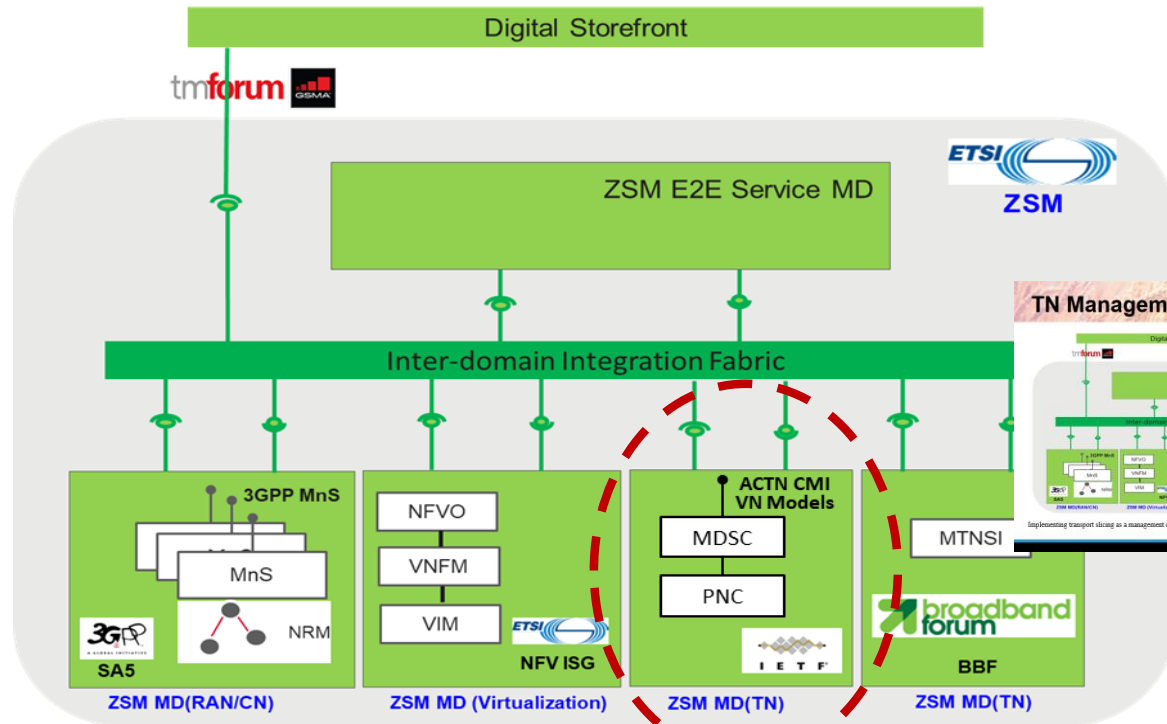
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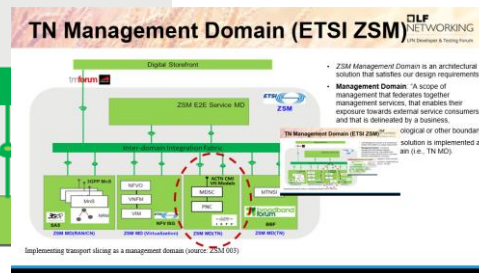
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# TN Management Domain (ETSI ZSM)



- *ZSM Management Domain* is an architectural solution that satisfies our design requirements
- **Management Domain:** “A scope of management that federates together management services, that enables their exposure towards external service consumers, and that is delineated by a business,



logical or other boundary”.  
solution is implemented as an (i.e., TN MD).

Implementing transport slicing as a management domain (source: ZSM 003)

# Demo Setup

