



**OLF**

NETWORKING

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LFN Developer & Testing Forum

## ONAP: Automation of Intent-based Cloud Leased Line Service

Host: Hesam Rahimi (Huawei)  
Members: Dong Wang (China Telecom); Keguang He (CMCC);  
Henry Yu (Huawei); Prof. Chungang Yang (Xidian University)

### LFN Developer & Testing Forum

Time	Topic	Title	Presenters
09:30-09:40	1	Introduction of Intent-driven CCVPN usecase in R10	Dong Wang
09:40-10:10	2	Demo of Intent-driven CCVPN usecase in R10	Dong Wang Demo in China Telecom's Lab
10:10-10:30	3	Roadmap of Intent-driven CCVPN usecase in R11	Hesam Rahimi
10:30-11:00		Break	
11:00-11:30	4	Support general intent model and general intent interface in ONAP	Keguang He
11:30-12:00	5	Academic Review of Intent-based Networking	Dr. Ying Ouyang Prof. Chungang Yang



# **DLF** NETWORKING

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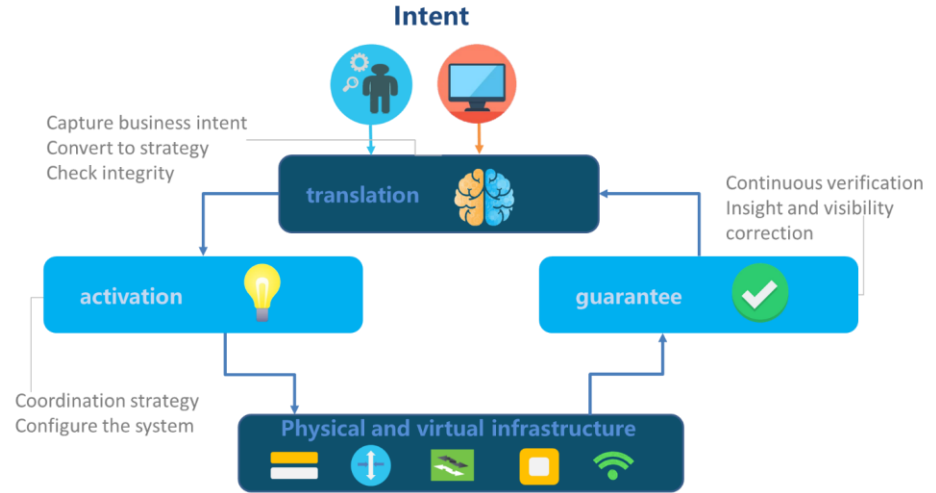
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## **Introduction of Intent-driven CCVPN usecase in R10**

Dong Wang (China Telecom)  
Henry Yu (Huawei)  
Lei Shi (Asiainfo)

# Intent-based Networking (IBN)

- Intent-based networking (IBN) is a self-driving network that uses **decoupling network control logic** and **closed-loop orchestration techniques** to automate application intents.
- An IBN is an intelligent network, which can **automatically convert, verify, deploy, configure, and optimize** itself to achieve target network state according to the intent of the operators, and can **automatically solve abnormal events** to ensure the network reliability.



A high-level framework of Intent-based Networking

- ITU-T Y.IBN-reqts "Scenarios and requirements of Intent-Based Network for network evolution".
- L. Pang, C. Yang, *et.al*, "A Survey on Intent-Driven Networks," in *IEEE Access*, vol. 8, pp. 22862-22873, 2020.

# Collaborations among Academics, SDOs and ONAP

Academics



- A Survey on Intent-Driven Networks
- A Brief Survey and Implementation on Refinement for Intent-Driven Networking

Academic exchanges



Open-source

Align with Multi-SDO

SDOs



IETF/IRTF:

- Intent-Based Networking - Concepts and Definitions
- Intent Classification



ETSI ZSM/ENI:

- ZSM 011 Intent-driven autonomous networks; Generic aspects
- ENI 008 InTent Aware Network Autonomicity (ITANA)



TMF:

- IG1234 Intent Oriented Customer Engagement (IoCE) Guide
- IG1253 Intent in Autonomous Networks



3GPP SA5:

- TS 28.312 Intent driven management services for mobile networks
- TR 28.812 Study on scenarios for Intent driven management services for mobile networks



ITU-T:

- Scenarios and Requirements of Intent-Based Network for network evolution
- functional architecture of NGN evolution by adoption of Intent-Based Network



CCSA:

- 2015B58 Network Intelligent Capability Enhancement for SDN/NFV: Study of Key Technologies of Intent Network

## Autonomous Networks Multi-SDO Initiative

Who we are

SDO	Group/Project	SDO	Role
3GPP	SA5	IETF	WG on AN
CCSA	TC7	ITU-T	FG-AN
ETSI	ENI, F5G, MEC, NFV, PDL, TC INT/AFI, ZSM	Linux Foundation*	ONAP
GSMA	Future Networks	NGMN	Automation
IEEE	Future Networks	TM Forum	AN Project

\*Open Source Community

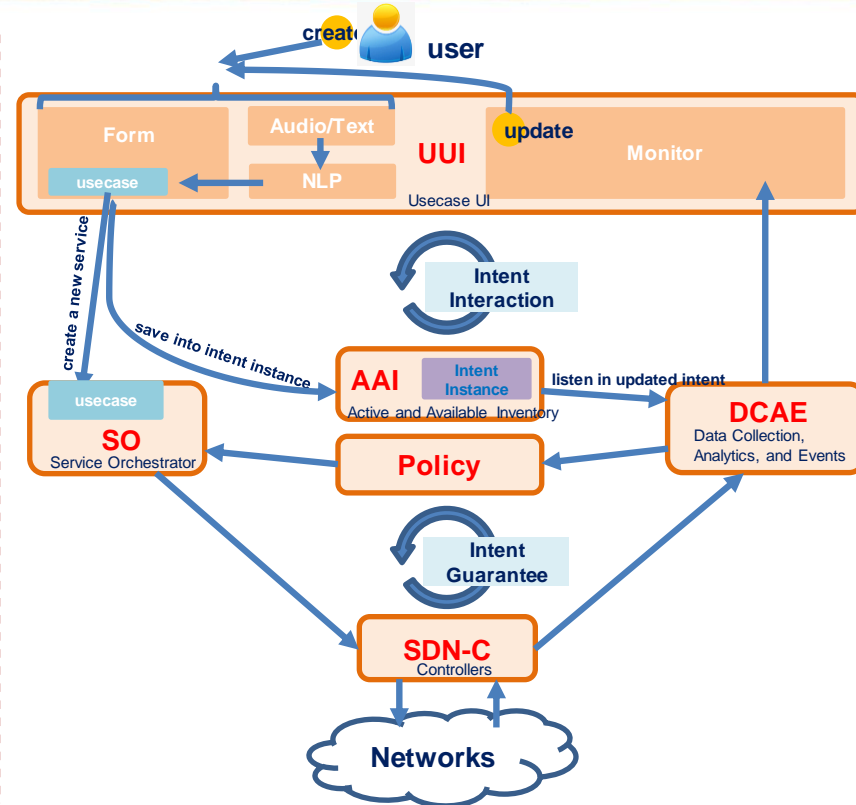
# Architecture of Intent-driven Closed-loop Autonomous Networks based on ONAP Projects

## Key Functions and Developments of Intent-based Networking

- ✓ **REQ-453/ONAPARC-641** Smart Operator Intent Translation in UII based on IBN - R8 5G Slicing Support
- ✓ **REQ-861/ONAPARC-701** Smart Intent Guarantee based on IBN - R9 Intent Instance
- ✓ **REQ-1074/ONAPARC-729** Smart Intent Guarantee based on Closed-loop in R10
- ✓ **REQ-1075/ONAPARC-730** Network Services without Perception for Users based on IBN
- **REQ-1214** Maintenance and Enhancement of Intent-driven Closed-loop Autonomous Networks in R11

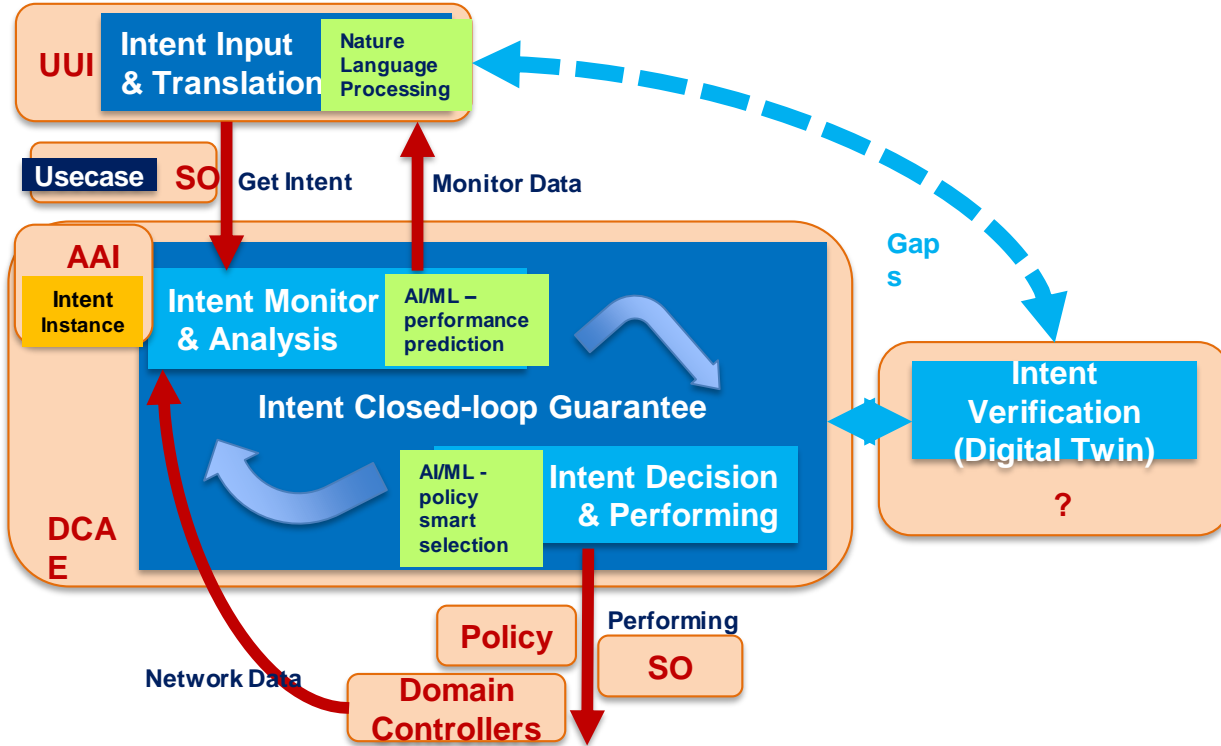
## Collaborations and Outputs with SDOs (ETSI ZSM / ITU-T):

- ✓ **ETSI ZSM PoC 003:** Automation of Intent-based cloud leased line service
- ✓ **ITU-T:** Scenarios and Requirements of Intent-Based Network for network evolution; functional architecture of NGN evolution by adoption of Intent-Based Network; signalling architecture of Intent-Based Network for network evolution



Architecture of Intent-driven Closed-loop Autonomous Networks

# Enable AI/ML for Intent-driven Autonomous Networks in ONAP



## Key Features

### AI/ML Algorithms

- ❑ Nature Language Processing
- ❑ STT (Speech to Text)
- Prediction
- Decision-making

### AI/ML Frameworks

- TensorFlow
- PyTorch

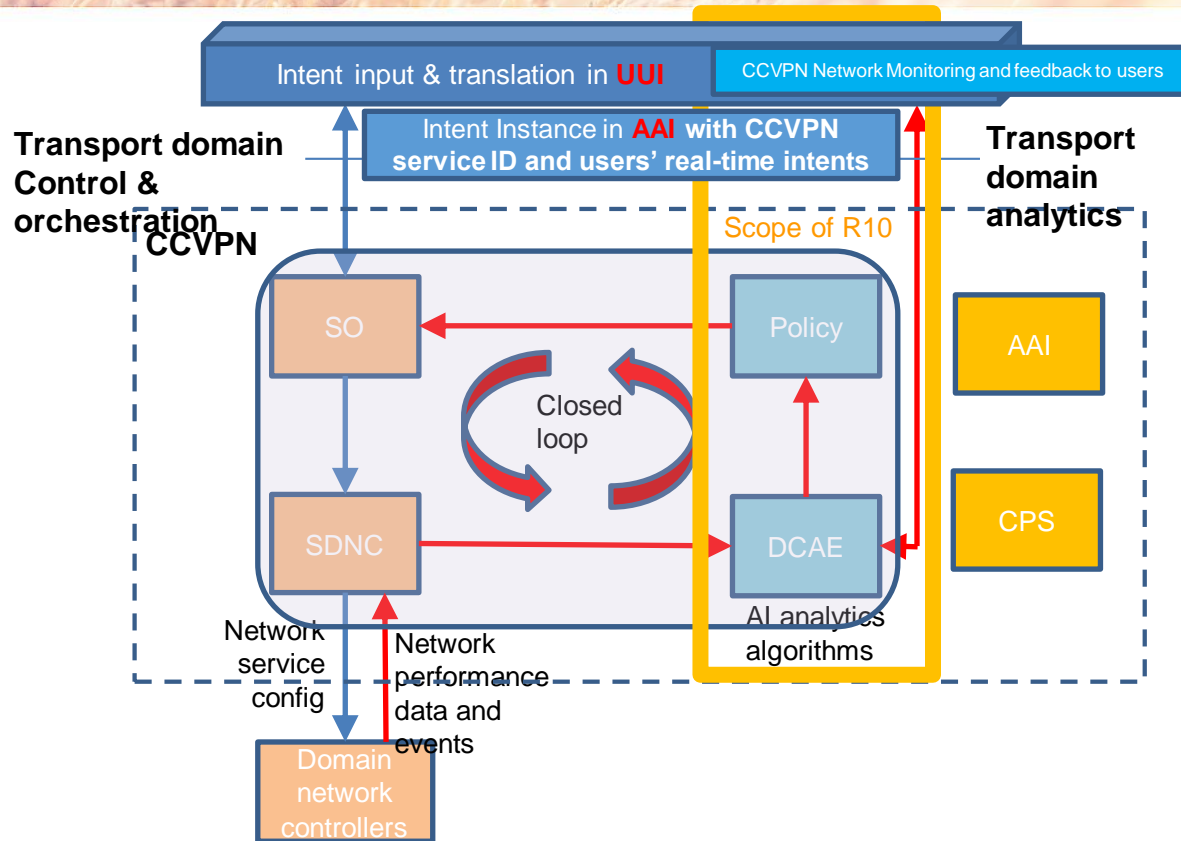
### AI/ML Platform

- ✓ Acumos AI



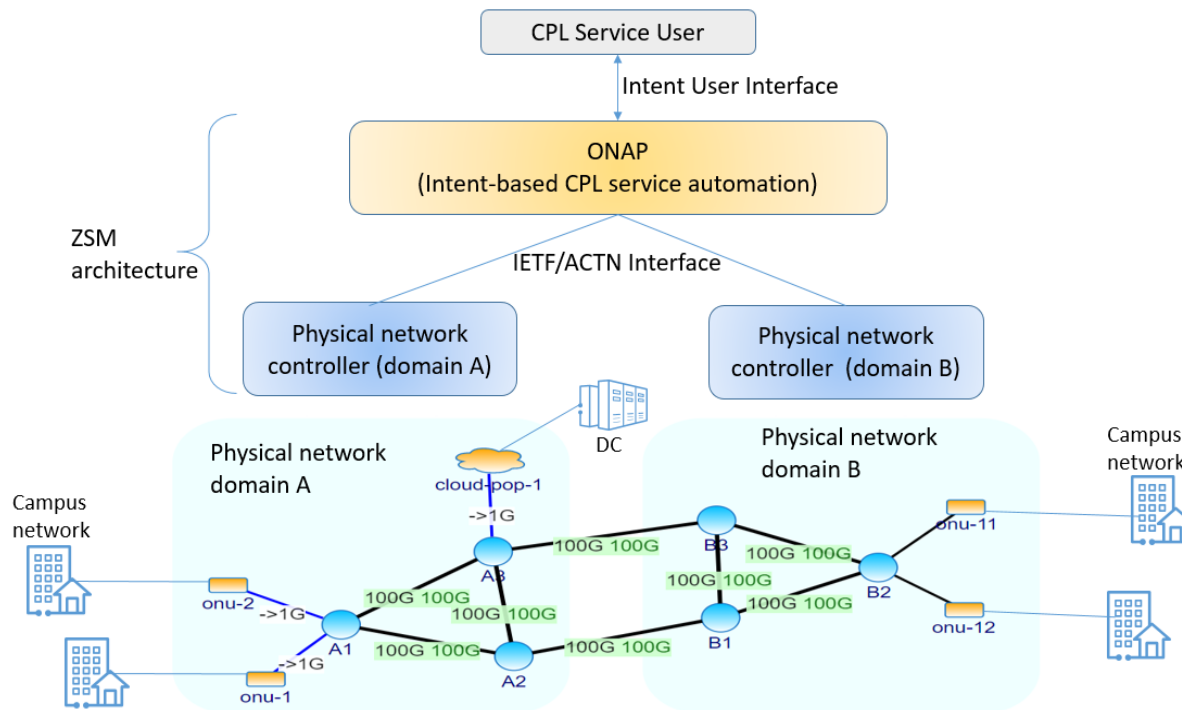
<https://www.acumos.org/>

# Intent-driving CCVPN Closed-loop (R10)





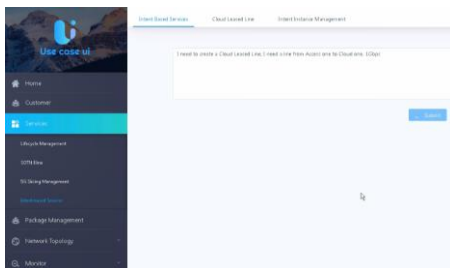
# Demo: Automation of Intent-based cloud leased line service



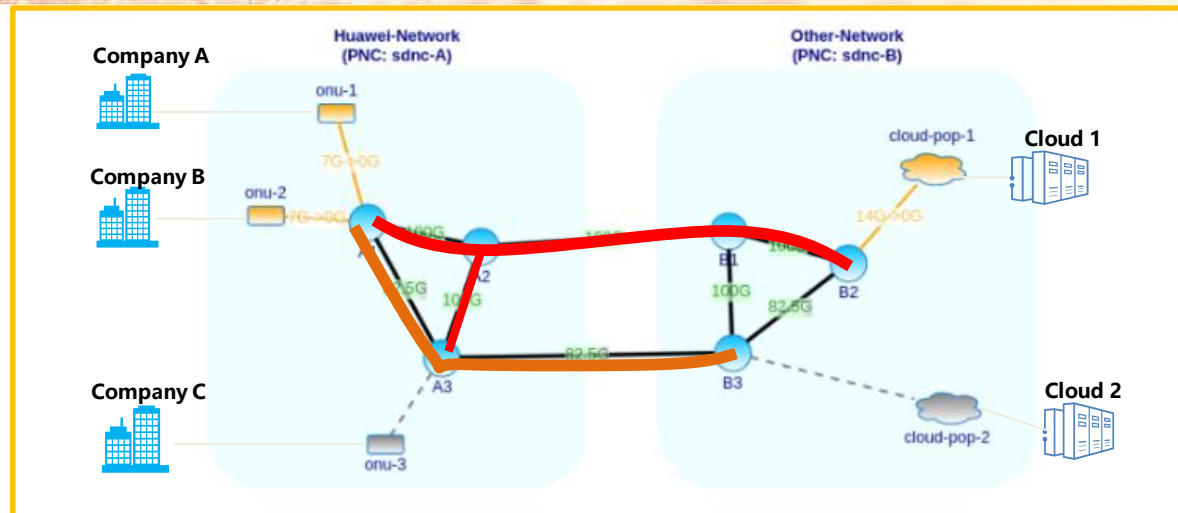
ETSI ZSM PoC 003: Automation of Intent-based cloud leased line service

# Content of the Demo

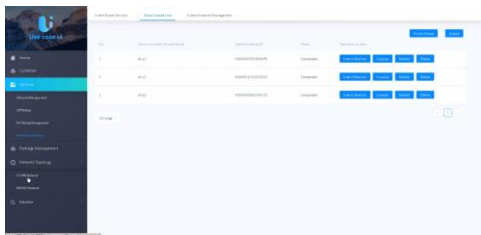
## 1. Create Cloud Leased Lines



Text: I need to create a Cloud Leased Line. From Company A to Cloud one, 1Gbps.



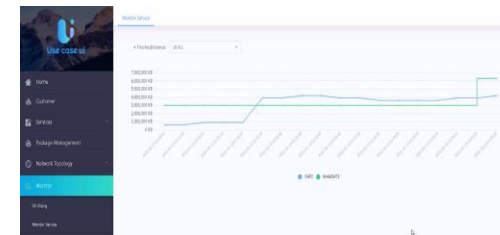
## 2. Closed-loop operation of CLL



## 3. User modify bandwidth of CLL



## 4. Bandwidth Monitor & Guarantee



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