Network Management Intent - One of IBN Use Cases

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Chungang Yang (guideyang2050@163.com)
Danyang Chen (chendanyang@chinamobile.com) Presenter
Kehan Yao (yaokehan@chinamobile.com)
Motivation & Background

Ubiquitously connection
- Highly heterogeneous
- Dynamic network infrastructure

Various applications
- Augmented reality,
- Virtual reality,
- Ubiquitous instant communications
- Pervasive intelligence

Complex system
- Complexity network scenarios,
- Complexity services,
- Uncountable degrees of freedom
- Complexity of network management

Global mobile subscriber forecast [1]

Traditional network management methods are insufficient to keep up with the growing requirements

How to manage the network efficiently?

Motivation for Intent-driven Network Management

**SNMP (Simple Network Management Protocol)**

The first network management techniques for small-scale networks focus on the **configuration details** of network devices.

**PBNM (Policy-based Network Management)**

It can transform business requires and processes into **policies** that configure and control networks.

**IDNM (Intent-driven Network Management)**

With the improvement of the network service capabilities and the diversification of user demands, network management needs to be adapted to **user services at a higher level**, and IDNM has emerged.

C. E. Shannon and W. Weaver, Recent Contribution to The Mathematical Theory of Communications, 1964.
SMART = A Set of Intelligence + Closed Control Loops (CCL)

**Intent**

- Translation
- Verification

**Policy**

- Implement
- Verification

**Configuration**

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The Advantages of the “SMART” Architecture

• A Specific intent-driven network management architecture that can be used for sense diversified service intents with various scenarios, objectives, and preferences.

• This framework can achieve zero touch management within time-bound, which can handle the complex services in a fully automatic manner.

• The SMART framework adapts to various complex network environments and is scalable, also avoiding network reconstruction.

Use Case: Intent-driven Dynamic Service Function Chain (SFC)

**Intent:** Establish a standard-level video service from user R in Beijing to user U in Nanjing. Time request: 2019-09-03 11:25 to 2020-11-07 08:20.

Intent is input in natural language at the webpage.

JavaScript Object Notation (JSON) type


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Use Case: Intent-driven Dynamic Service Function Chain (SFC)


The JSON request is divided into SFC and constructs the SFC request

OpenStack schedules network resources, constructs subnets and ports, and generates two-dimensional space topology.

Future Directions

- More Wider Applications
- Cyber Space
- Smart Grids
- ICT Supply Chains
- Tactical communication network

A specific system design of IBN, taking Intent based SFC as an example.

A system demo was proposed in the side meeting, if interested, you’re very welcome to contact us for the link.

We’re willing to contribute to a merging IBN use cases draft, and also we see that it’s meaningful to compare and analyze different use cases in a single draft.

Any comments?

Thanks!