Draft Recommendation ITU-T Y.NGNe-IBN-arch

Functional architecture of NGN evolution by adoption of Intent-Based Network

Summary

This draft Recommendation provides the general functional architecture of NGNe by adoption of the Intent-Based Network, specifies its functional entities and defines the detailed functionalities of these functional entities. In addition, reference points will also be addressed in this draft Recommendation.

Keywords

<TBD>

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1. Scope

This draft Recommendation provides the general functional architecture of NGNe by adoption of the Intent-Based Network, specifies its functional entities and defines the functionalities of these functional entities. In addition, reference points will also be addressed in this draft Recommendation. Intent-Based Network is a high level network which support traditional network management system and also incorporate new technologies including software defined networking and network function virtualization especially from the network evolution perspective. This draft Recommendation builds on Y.IBN-reqts, and the content of this draft recommendation is aligned with Y.IBN-reqts and ITU-T Y.IMT2020-IBNMO.

2. References

The following ITU-T Recommendations and other references contain provisions, which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T Y.IBN-reqts] *scenarios and requirements of Intent-Based Network for network evolution*

[ITU-T Y.IMT2020-IBNMO] *Intent-based network management and orchestration for network slicing in IMT-2020 networks and beyond*

3. Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

[TBD]

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

[TBD]

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

5 Conventions

In this Recommendation:

The keywords "is required to" indicate a requirement which must be strictly followed and from which no deviation is permitted, if conformance to this Recommendation is to be claimed.

The keywords "is recommended" indicate a requirement which is recommended but which is not absolutely required. Thus, this requirement need not be present to claim conformance.

The keywords "can optionally" indicate an optional requirement which is permissible, without implying any sense of being recommended. This term is not intended to imply that the vendor's implementation must provide the option, and the feature can be optionally enabled by the network operator/service provider. Rather, it means the vendor may optionally provide the feature and still claim conformance with this Recommendation.

6 Background and motivations

[Editor's Note] This clause provides an overview of the background, purpose of Intent-Based Network and principles of the framework..

7 General Architecture of NGNe by adoption of Intent-Based Network

[Editor's Note] This section will provide the general architecture of NGNe by adoption of Intent-Based Network, detailed functionalities of its subcomponents will be addressed in later clauses

7.1 Overview

The Intent-Based Network is a high level network which support traditional network management system and also incorporate new technologies including software defined networking, network function virtualization and AI especially from the network evolution perspective. The Figure 1 illustrates the framework of the Intent-based Network (Y.IBN-reqts).

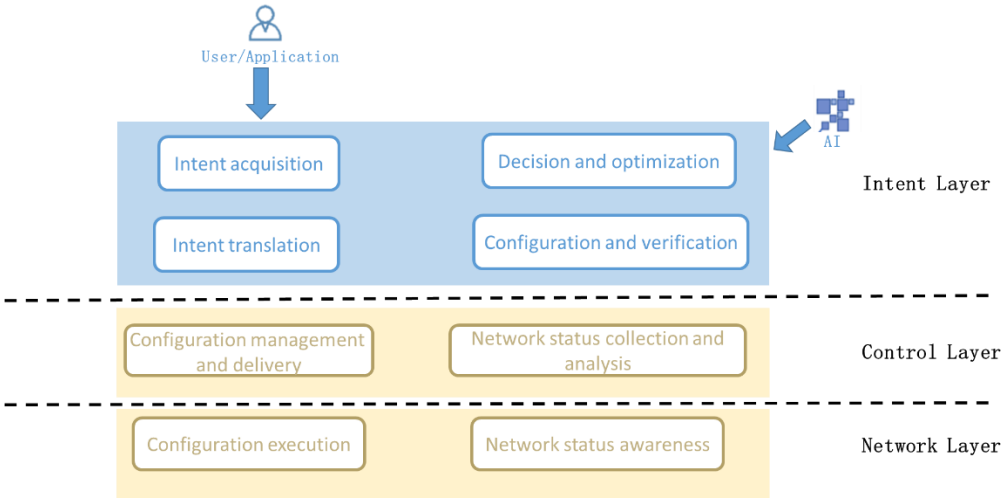

Figure 1 framework of the Intent-based Network (Y.IBN-reqts)

8 Functional architecture of NGNe by adoption of Intent-Based Network

[Editor's Note] functionality of different functional entities of NGNe by adoption of Intent-Based Network will be addressed in this clause, contributions are welcomed.

9 Reference points of NGNe by adoption of Intent-Based Network

[Editor's Note] This clause will address reference points of NGNe by adoption of Intent-Based Network

9.1 Internal reference points

[Editor's Note]: Internal reference points of NGNe by adoption of Intent-Based Network will be addressed in this clause, contributions are welcomed.

9.2 External reference points

[Editor's Note]: External reference points of NGNe by adoption of Intent-Based Network will be addressed in this clause, contributions are welcomed.

10 Security considerations

[Editor's Note] security considerations of the functional architecture of the Intent-Based Network except for the general security issues of the Intent-Based Network will be addressed in this clause, contributions are welcomed.

<TBD>

Annex 1

A.1 justification for proposed draft new Recommendation ITU-T Y.NGNe-IBN-arch

Question:	2/13	**Proposed new ITU-T Recommendation**	Virtual, 5-16 July 2021	
Reference and title:	Draft Recommendation ITU-T Y.NGNe-IBN-arch," Functional architecture of NGNe by adoption of Intent-Based Network for network evolution "			
Base text:			**Timing:**	2023-Q4
Editor(s):	Xin Zhang, China Telcom, zhangxin8@chinatelecom.cn Huan Deng, China Telcom, denghuan@chinatelecom.cn Qiong Sun, China Telecom, sunqiong@chinatelecom.cn		**Approval process:**	AAP

Scope (defines the intent or object of the Recommendation and the aspects covered, thereby indicating the limits of its applicability):

This draft Recommendation provides the general functional architecture of NGNe by adoption of the Intent-Based Network, specifies its functional entities and defines the functionalities of these functional entities. In addition, reference points will also be addressed in this draft Recommendation. Intent-Based Network is a high level network which support traditional network management system and also incorporate new technologies including software defined networking and network function virtualization especially from the network evolution perspective. This draft Recommendation builds on Y.IBN-reqts, and the content of this draft recommendation is aligned with Y.IBN-reqts and ITU-T Y.IMT2020-IBNMO.

Summary (provides a brief overview of the purpose and contents of the Recommendation, thus permitting readers to judge its usefulness for their work):

With the vigorous development of Internet and application, as well as the dual promotion of technology and demand, the network is undergoing a huge change, and the new technology that may affect the development trend of network in the next decade or even 30 years is undoubtedly " the Intent-Based Network " (IBN). The Intent-Based network is a new networking model, which defines the intent and how to translate the intent into the corresponding network strategy and distribute it to the actual network, and can continuously monitor the network status information and judge whether the user's intent is realized. If the intent is not realized, the system will retranslate the user's intent through artificial intelligence and automation technology to meet the user's intent. The Intent-Based Network can be summarized as a closed-loop network architecture which can be built and operated automatically based on human business intent under the condition of grasping the global state of the network. According to the definition of the Intent-Based Network, the workflow of Intent-Based Network mainly includes automatically transforming business strategy into necessary network configuration and result verification, automatic configuration of the network, perception of network status, service guarantee and automatic optimization. Based on the characteristics of Intent-Based Network, more flexible network control and strategies can be easily loaded on the network.

ITU-T SG13 has already initiated a work item on Intent-Based network, focusing on the study of scenarios and requirements of Intent-Based Network for network evolution in Question 2/13.The Scenarios、workflow and requirements of the Intent-Based Network for network evolution are introduced in the draft, which lays the foundation for the following study of the Intent-Based Network. However, as the key part of the research on the architecture of the NGNe based on Intent-Based Network has not been studied, and it is very important in the implementation and realization of Intent-Based Network in NGNe. Therefore, it is of great significance to study the functional architecture of NGNe by adoption of the Intent-Based Network.

As a result, we propose to continue the research of the Intent-Based Network especially concerning the implementation and realization in NGNe in Q2 which is responsible for the NGN evolution with new technologies including SDN、NFV and AI

Relations to ITU-T Recommendations or to other standards (approved or under development):

(1) Relations to Y.IBN-reqts “scenarios and requirements of Intent-Based Network for network evolution”

This ongoing draft recommendation of Q2/13 specifies the scenarios、workflow and requirements of the Intent-Based Network, which lays the foundation for the following study of the Intent-Based Network. This new Recommendation proposes to continue the research of the Intent-Based Network especially the implementation and realization it in NGNe, thus to study the functional architecture of NGNe by adoption of Intent-Based Network.

(2) Relations to ITU-T Y.IMT2020-IBNMO “Intent-based network management and orchestration for network slicing in IMT-2020 networks and beyond”

This ongoing draft aims to describe the intent-based network management and orchestration for network slicing in IMT-2020 networks and beyond. This draft recommendation focuses on the management and orchestration for network slicing, and aims to specify the architecture of intent-based management and orchestration in IMT-2020 networks and beyond. However, the main purpose of this new recommendation is to introduce the functional architecture of NGNe by adoption of Intent-based network. Therefore, there would be no overlap between those two documents.

(3) Relations to draft-irtf-nmrg-ibn-concepts-definitions-01

This document clarifies the definition of "intent" and provides an overview of the intent. The document explains the life cycle of intent, so that everyone can understand the intent more clearly. It focuses on distinguishing several confusing concepts: Intent, Policy, and Service Models, which promotes the understanding of terms, concepts, and provides a basis for future research related to intent. The content of the document does not include the functional architecture, which is an important step to the implement of the intent-based network. So, the main aim of this new recommendation is to introduce the functional architecture of NGNe by adoption of the Intent-based network.

(4) Relations to 3GPP TS 28.312 “Intent driven management services for mobile networks”

The document describes the concept, use cases, requirements and solutions for the intent driven management for service or network management based on the 5G scenarios. But the functional architectural research is not within the scope of the document, so the major objective of the new recommendation is to focus on the study of functional architecture of NGNe by adoption of the Intent-based network which is irrelevant to 3GPP..

Liaisons with other study groups or with other standards bodies:

IETF,3GPP

Supporting members that are committing to contributing actively to the work item:

China Telecom, AsiaInfo Technologies (China) INC. , ZTE Corporation