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SERIES Y: GLOBAL INFORMATION
INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS
AND NEXT-GENERATION NETWORKS

Next Generation Networks – Enhancements to NGN

Network intelligence capability enhancement – Functional architecture

Recommendation ITU-T Y.2302

ITU-T

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Recommendation ITU-T Y.2302

Network intelligence capability enhancement – Functional architecture

Summary

Recommendation ITU-T Y.2302 specifies the functional architecture for network intelligence capability enhancement (NICE). NICE, which is based on next generation network (NGN) technology, contains a set of enhanced capabilities to intelligently provide services according to the requirements of users and application providers. It enables operators to assign specific network resources according to these requirements and dynamically adjust them based on several factors, such as multi-dimensional awareness, traffic optimization and cooperation between different access networks. NICE supports interfaces for users and applications enabling on-demand resource and service provision.

History

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Network intelligence capability enhancement, next generation network, NGN, NICE, NICE provider.

* To access the Recommendation, type the URL <http://handle.itu.int/> in the address field of your web browser, followed by the Recommendation's unique ID. For example, <http://handle.itu.int/11.1002/1000/11830-en>.

FOREWORD

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

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Recommendation ITU-T Y.2302

Network intelligence capability enhancement – Functional architecture

1 Scope

This Recommendation specifies the functional architecture for network intelligence capability enhancement (NICE). NICE (see [ITU-T Y.2301]), which is based on next generation network (NGN) technology, contains a set of enhanced capabilities to intelligently provide services according to the requirements of users and application providers. It enables operators to assign specific network resources according to these requirements and dynamically adjust them based on several factors, such as multi-dimensional awareness, traffic optimization and cooperation between different access networks. It supports interfaces for users and applications enabling on-demand resource and service provision.

This Recommendation defines the functional architecture of NICE, which includes the definition of functional entities, the reference points between different functional entities, the service procedures and security considerations.

Note that network management functionality is outside the scope of this Recommendation.

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.2001] Recommendation ITU-T Y.2001 (2004), *General overview of NGN*.
- [ITU-T Y.2011] Recommendation ITU-T Y.2011 (2004), *General principles and general reference model for Next Generation Networks*.
- [ITU-T Y.2012] Recommendation ITU-T Y.2012 (2010), *Functional requirements and architecture of next generation networks*.
- [ITU-T Y.2111] Recommendation ITU-T Y.2111 (2008), *Resource and admission control functions in next generation networks*.
- [ITU-T Y.2201] Recommendation ITU-T Y.2201 (2009), *Requirements and capabilities for ITU-T NGN*.
- [ITU-T Y.2240] Recommendation ITU-T Y.2240 (2011), *Requirements and capabilities for next generation network service integration and delivery environment*.
- [ITU-T Y.2301] Recommendation ITU-T Y.2301 (2013), *Network intelligence capability enhancement – Requirements and capabilities*.
- [ITU-T Y.2701] Recommendation ITU-T Y.2701 (2007), *Security requirements for NGN release 1*.
- [ITU-T Y.2702] Recommendation ITU-T Y.2702 (2008), *Authentication and authorization requirements for NGN release 1*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 application [b-ITU-T Y.101]: A structured set of capabilities, which provide value-added functionality supported by one or more services.

3.1.2 application provider [ITU-T Y.2012]: A general reference to a provider that offers applications to the customers making use of the services capabilities provided by the NGN.

3.1.3 charging [b-ITU-T Q.825]: The set of functions needed to determine the price assigned to the service utilization.

3.1.4 content [b-ITU-T H.780]: A combination of audio, still image, graphic, video, or data.

NOTE – A variety of formats is classified as the "data" (e.g., text, encoded values, multimedia description language introduced by ITU-T H.760).

3.1.5 context [b-ITU-T Y.2002]: The information that can be used to characterize the environment of a user.

NOTE – Context information may include where the user is, what resources (devices, access points, noise level, bandwidth, etc.) are near the user, at what time the user is moving, interaction history between person and objects, etc. According to specific applications, context information can be updated.

3.1.6 context awareness [ITU-T Y.2201]: A capability to determine or influence a next action in telecommunication or process by referring to the status of relevant entities, which form a coherent environment as a context.

3.1.7 identity [ITU-T Y.2720]: Information about an entity that is sufficient to identify that entity in a particular context.

3.1.8 identity management [ITU-T Y.2720]: Set of functions and capabilities (e.g., administration, management and maintenance, discovery, communication exchanges, correlation and binding, policy enforcement, authentication and assertions) used for:

- assurance of identity information (e.g., identifiers, credentials, attributes),
- assurance of the identity of an entity (e.g., users/subscribers, groups, user devices, organizations, network and service providers, network elements and objects, and virtual objects), and
- enabling business and security applications.

3.1.9 media [ITU-T Y.2012]: One or more of audio, video, or data.

3.1.10 network intelligence capability enhancement (NICE) [ITU-T Y.2301]: An enhancement for NGNs supporting some intelligent capabilities for the provisioning of services according to requirements of users and application providers. These intelligent capabilities (termed as "NICE capabilities") enable operators to assign and dynamically adjust specific network resources based on the requirements, as well as support interfaces for users and applications enabling on-demand resource and service provision.

3.1.11 NGN [ITU-T Y.2001]: A packet-based network able to provide telecommunication services and able to make use of multiple broadband, QoS-enabled transport technologies and in which service-related functions are independent from underlying transport-related technologies. It enables unfettered access for users to networks and to competing service providers and/or services of their

choice. It supports generalized mobility which will allow consistent and ubiquitous provision of services to users.

3.1.12 service [b-ITU-T Y.2091]: A set of functions and facilities offered to a user by a provider.

3.1.13 service provider [b-ITU-T M.1400]: A general reference to an operator that provides telecommunication services to customers and other users either on a tariff or contract basis. A service provider may or may not operate a network. A service provider may or may not be a customer of another service provider.

3.1.14 user [ITU-T Y.2201]: A user includes end user [b-ITU-T Y.2091], person, subscriber, system, equipment, terminal (e.g., FAX, PC), (functional) entity, process, application, provider, or corporate network.

3.2 Terms defined in this Recommendation

None.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

3GPP	3rd Generation Partnership Project
AAA	Authentication, Authorization and Accounting
ANI	Application Network Interface
ASF	Application Support Function
BSS	Business Support System
CA-FE	Content and context Analysis Functional Entity
CD-FE	Content and context Detection Functional Entity
ID	Identity
IDMF	Identity Management Function
IDP	Identity Provider
IP	Internet Protocol
IM	Instant Messaging
NGN	Next Generation Network
NICE	Network Intelligence Capability Enhancement
NNI	Network to Network Interface
OE-FE	Open Environment Functional Entity
PC-FE	Policy Control Functional Entity
PE-FE	Policy Enforcement Functional Entity
PCC	Policy and Charging Control
P2P	Peer-to-Peer
QoS	Quality of Service
RACF	Resource and Admission Control Function
SCF	Service Control Function