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INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS
AND NEXT-GENERATION NETWORKS

Next Generation Networks – Enhancements to NGN

Network intelligence capability enhancement – Requirements and capabilities

Recommendation ITU-T Y.2301



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Recommendation ITU-T Y.2301

Network intelligence capability enhancement – Requirements and capabilities

Summary

Recommendation ITU-T Y.2301 specifies the requirements and capabilities of network intelligence capability enhancement (NICE), an enhancement for NGNs supporting some intelligence capabilities for the provisioning of services according to the requirements of users and application providers.

NICE capabilities aim to support the following features: 1) awareness features: user, application and network awareness with content and context analysis; 2) on-demand provision features: user self-assignment of service subscription and network resources, and user on-demand service of quality assurance; 3) optimization features: traffic management based on intelligent traffic scheduling; 4) openness features: invocation of the above features by third-party application providers; 5) cooperation features: network coordination between policy control capabilities of different access networks.

History

Edition	Recommendation	Approval	Study Group
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Keywords

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

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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In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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Recommendation ITU-T Y.2301

Network intelligence capability enhancement – Requirements and capabilities

1 Scope

This Recommendation specifies the requirements and capabilities for the network intelligence capability enhancement (NICE), which enhances NGNs in supporting some intelligence capabilities for the provisioning of services according to the requirements of users and application providers.

The requirements are provided from a high-level perspective. Functional requirements for the different capabilities of NICE are outside of 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.2012] Recommendation ITU-T Y.2012 (2010), *Functional requirements and architecture of next generation networks*.
- [ITU-T Y.2111] Recommendation ITU-T Y.2111 (2011), *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.2701] Recommendation ITU-T Y.2701 (2007), *Security requirements for NGN release 1*.
- [ITU-T Y.2720] Recommendation ITU-T Y.2720 (2009), *NGN identity management framework*.

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 are classified as "data" (e.g., text, encoded values, multimedia description language introduced by [b-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 media stream [ITU-T Y.2012]: A media stream can consist of audio, video, or data, or a combination of any of them. Media stream data conveys user or application data (i.e., a payload) but not control data.

3.1.11 network virtualization [b-ITU-T Y.3011]: A technology that enables the creation of logically isolated network partitions over shared physical networks so that heterogeneous collections of multiple virtual networks can simultaneously coexist over the shared networks. This includes the aggregation of multiple resources in a provider and appearing as a single resource.

3.1.12 NGN [b-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.

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

3.1.14 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.

3.1.15 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

This Recommendation defines the following term:

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

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

API	Application Programming Interface
BRAS	Broadband Remote Access Server
DPI	Deep Packet Inspection
DSL	Digital Subscriber Loop
DSLAM	Digital Subscriber Line Access Multiplexer
HD	High Definition
ID	Identity
IdM	Identity Management
IM	Instant Messaging
NGN	Next Generation Network
NICE	Network Intelligence Capability Enhancement
OS	Operating System
P2P	Peer-to-Peer
QoS	Quality of Service
RACF	Resource and Admission Control Functions
RAN	Radio Access Network
SR	Service Router
SUP	Service User Profile
TCP	Transmission Control Protocol
UE	User Equipment
URL	Universal Resource Locator
WiFi	Wireless Fidelity
WLAN	Wireless Local Area Network

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.