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

Next Generation Networks – Frameworks and functional architecture models

Terms and definitions for Next Generation Networks

ITU-T Recommendation Y.2091

ITU-T Y-SERIES RECOMMENDATIONS

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

GLOBAL INFORMATION INFRASTRUCTURE	
General	Y.100–Y.199
Services, applications and middleware	Y.200–Y.299
Network aspects	Y.300–Y.399
Interfaces and protocols	Y.400–Y.499
Numbering, addressing and naming	Y.500–Y.599
Operation, administration and maintenance	Y.600–Y.699
Security	Y.700–Y.799
Performances	Y.800–Y.899
INTERNET PROTOCOL ASPECTS	
General	Y.1000–Y.1099
Services and applications	Y.1100–Y.1199
Architecture, access, network capabilities and resource management	Y.1200–Y.1299
Transport	Y.1300–Y.1399
Interworking	Y.1400–Y.1499
Quality of service and network performance	Y.1500–Y.1599
Signalling	Y.1600–Y.1699
Operation, administration and maintenance	Y.1700–Y.1799
Charging	Y.1800–Y.1899
NEXT GENERATION NETWORKS	
Frameworks and functional architecture models	**Y.2000–Y.2099**
Quality of Service and performance	Y.2100–Y.2199
Service aspects: Service capabilities and service architecture	Y.2200–Y.2249
Service aspects: Interoperability of services and networks in NGN	Y.2250–Y.2299
Numbering, naming and addressing	Y.2300–Y.2399
Network management	Y.2400–Y.2499
Network control architectures and protocols	Y.2500–Y.2599
Security	Y.2700–Y.2799
Generalized mobility	Y.2800–Y.2899

For further details, please refer to the list of ITU-T Recommendations.

ITU-T Recommendation Y.2091

Terms and definitions for Next Generation Networks

Summary

ITU-T Recommendation Y.2091 contains terms and definitions and a framework relevant to providing a general understanding of Next Generation Networks and a guide for the development of NGN documents including Recommendations in the ITU.

Source

ITU-T Recommendation Y.2091 was approved on 1 March 2007 by ITU-T Study Group 13 (2005-2008) under the ITU-T Recommendation A.8 procedure.

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.

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CONTENTS

ITU-T Recommendation Y.2091

Terms and definitions for Next Generation Networks

1 Scope

This Recommendation contains terms and definitions and a framework relevant to providing a general understanding of Next Generation Networks and a guide for the development of NGN documents in the ITU.

This Recommendation is not simply a compendium of terms and definitions. The primary purpose of this Recommendation is to provide a context for the use of certain terms and definitions to avoid misunderstandings in NGN activities. Thus, the definitions are arranged in a specific order and certain necessary relationships are illustrated. Additionally, explanatory notes are also included where deemed appropriate.

This Recommendation uses terms and definitions, which are considered particularly suitable and applicable to NGN work and that have already been defined in published ITU-T Recommendations. Additionally, where new terms were required they have been defined in 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 E.164] ITU-T Recommendation E.164 (2005), *The international public telecommunication numbering plan.*

[ITU-T G.722] ITU-T Recommendation G.722 (1988), *7 kHz audio-coding within 64 kbit/s.*

[ITU-T G.805] ITU-T Recommendation G.805 (2000), *Generic functional architecture of transport networks.*

[ITU-T G.809] ITU-T Recommendation G.809 (2003), *Functional architecture of connectionless layer networks.*

[ITU-T G.902] ITU-T Recommendation G.902 (1995), *Framework Recommendation on functional access networks (AN) – Architecture and functions, access types, management and service node aspects.*

[ITU-T G.993.1] ITU-T Recommendation G.993.1 (2004), *Very high speed digital subscriber line transceivers.*

[ITU-T H.248.1] ITU-T Recommendation H.248.1 (2005), *Gateway control protocol: Version 3.*

[ITU-T M.3050.1] ITU-T Recommendation M.3050.1 (2007), *Enhanced Telecom Operations Map (eTOM) – The business process framework.*

[ITU-T Q.825] ITU-T Recommendation Q.825 (1998), *Specification of TMN applications at the Q3 interface: Call detail recording.*

[ITU-T Q.1703] ITU-T Recommendation Q.1703 (2004), *Service and network capabilities framework of network aspects for systems beyond IMT-2000.*

[ITU-T Q.1706] ITU-T Recommendation Q.1706/Y.2801 (2006), *Mobility management requirements for NGN*.

[ITU-T Q.1742.1] ITU-T Recommendation Q.1742.1 (2002), *IMT-2000 references to ANSI-41 evolved core network with cdma2000 access network.*

[ITU-T Q.1761] ITU-T Recommendation Q.1761 (2004), *Principles and requirements for convergence of fixed and existing IMT-2000 systems*.

[ITU-T T.120] ITU-T Recommendation T.120 (2007), *Data protocols for multimedia conferencing*.

[ITU-T T.137] ITU-T Recommendation T.137 (2000), *Virtual meeting room management for multimedia conferencing audio-visual control*.

[ITU-T X.200] ITU-T Recommendation X.200 (1994) | ISO/IEC 7498-1:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: The basic model*.

[ITU-T X.462] ITU-T Recommendation X.462 (1996) | ISO/IEC 11588-3:1997, *Information technology – Message Handling Systems (MHS) Management: Logging information*.

[ITU-T Y.101] ITU-T Recommendation Y.101 (2000), *Global Information Infrastructure terminology: Terms and definitions*.

[ITU-T Y.110] ITU-T Recommendation Y.110 (1998), *Global Information Infrastructure principles and framework architecture*.

[ITU-T Y.1001] ITU-T Recommendation Y.1001 (2000), *IP Framework – A framework for convergence of telecommunications network and IP network technologies*.

[ITU-T Y.1411] ITU-T Recommendation Y.1411 (2003), *ATM-MPLS network interworking – Cell mode user plane interworking*.

[ITU-T Y.2001] ITU-T Recommendation Y.2001 (2004), *General overview of NGN*.

[ITU-T Y.2011] ITU-T Recommendation Y.2011 (2004), *General principles and general reference model for next generation networks*.

[ITU-T Y.2012] ITU-T Recommendation Y.2012 (2006), *Functional requirements and architecture of the NGN release 1*.

[ITU-T Y.2021] ITU-T Recommendation Y.2021 (2006), *IMS for Next Generation Networks*.

[ITU-T Y.2031] ITU-T Recommendation Y.2031 (2006), *PSTN/ISDN emulation architecture*.

[ITU-T Y.2111] ITU-T Recommendation Y.2111 (2006), *Resource and admission control functions in Next Generation Networks*.

[ITU-T Y.2171] ITU-T Recommendation Y.2171 (2006), *Admission control priority levels in Next Generation Networks*.

[ITU-T Y.2261] ITU-T Recommendation Y.2261 (2006), *PSTN/ISDN evolution to NGN*.

[ITU-T Y.2262] ITU-T Recommendation Y.2262 (2006), *PSTN/ISDN emulation and simulation*.

[ITU-T Y.2271] ITU-T Recommendation Y.2271 (2006), *Call server-based PSTN/ISDN emulation*.

[ITU-T Z.100 Sup.1] ITU-T Recommendation Z.100 Supplement 1 (1997), *SDL+ methodology: Use of MSC and SDL (with ASN.1).*

3 Fundamental NGN definitions

The following three definitions define the fundamental nature of an NGN.

next generation network (NGN) [ITU-T Y.2001]: A packet-based network able to provide telecommunication[1] 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.

NGN service stratum [ITU-T Y.2011]: That part of the NGN which provides the user functions that transfer service-related data and the functions that control and manage service resources and network services to enable user services and applications.

NGN transport stratum [ITU-T Y.2011]: That part of the NGN which provides the user functions that transfer data and the functions that control and manage transport resources to carry such data between terminating entities.

Visual representation of the relationship between these definitions is shown in Figure 1:

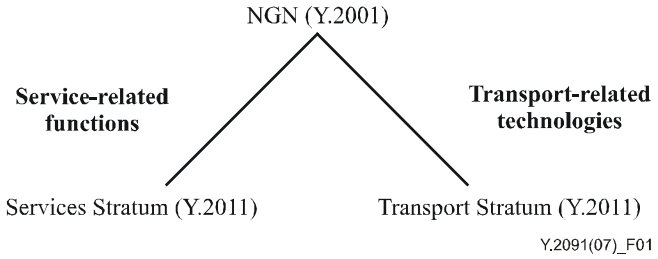

Figure 1 – Defined fundamental components of an NGN

4 Modes of communication for NGN

The layering principles of [ITU-T X.200], *Information technology – Open Systems Interconnection – Basic Reference Model: The Basic Model* apply.

In this respect, any (N)-layer may offer a connection-mode service, a connectionless-mode service, or both, to the (N+1)-layer, using the service or services provided by the (N–1)-layer.

4.1 connection-mode service [ITU-T X.200]

A connection is an association established for the transfer of data between two or more peer-(N)-entities. This association binds the peer-(N)-entities together with the (N–1)-entities in the next lower layer. The ability to establish and release a connection and to transfer data over it is provided to the (N)-entities in a given (N)-layer by the next lower layer as a connection-mode service. The use of a connection-mode service by peer-(N)-entities proceeds through three distinct phases:

a) connection establishment;

b) data transfer; and

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[1] Telecommunication as defined in the ITU Constitution provision 1012 and in the International Telecommunication Regulations (ITR): Any transmission, emission or reception of signs, signals, writing, images and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic systems.

c) connection release.

4.2 connectionless-mode service [ITU-T X.200]

Connectionless-mode transmission is the transmission of a single unit of data from a source service-access-point to one or more destination service-access-points without establishing a connection. A connectionless-mode service allows an entity to initiate such a transmission by the performance of a single service access.

5 The transport stratum for NGN

The transport stratum has both vertically layered and horizontal dimensions.

5.1 Vertical aspects

The following terms and definitions of [ITU-T G.805] apply to the vertical layering principles for "connection-mode" operation.

5.1.1 Connection-mode

layer network [ITU-T G.805]: A "topological component" that represents the complete set of access groups of the same type which may be associated for the purpose of transferring information.

client/server relationship [ITU-T G.805]: The association between layer networks that is performed by an "adaptation" function to allow the link connection in the client layer network to be supported by a trail in the server layer network.

trail [ITU-T G.805]: A "transport entity" which consists of an associated pair of "unidirectional trails" capable of simultaneously transferring information in opposite directions between their respective inputs and outputs.

NOTE 1 – This could be regarded as a "connection" trail to distinguish it from the "connectionless trail" defined in [ITU-T G.809].

path layer network [ITU-T G.805]: A "layer network" which is independent of the transmission media and which is concerned with the transfer of information between path layer network "access points".

transmission media layer network [ITU-T G.805]: A "layer network" which may be media dependent and which is concerned with the transfer of information between transmission media layer network "access points" in support of one or more "path layer networks".

transport [ITU-T G.805]: The functional process of transferring information between different locations.

transport entity [ITU-T G.805]: An architectural component which transfers information between its inputs and outputs within a layer network.

transport network [ITU-T G.805]: The functional resources of the network which conveys user information between locations.

NOTE 2 – In accordance with [ITU-T G.805], the NGN context of the NGN transport stratum, the term transport has the wider scope than "transmission" or "first mile" access networks.

5.1.2 Connectionless mode

The following terms and definitions of [ITU-T G.809] apply to the vertical layering principles for "connectionless" [ITU-T X.200] layer networks.

layer network [ITU-T G.809]: A "topological component" that represents the complete set of access groups of the same type which may be associated for the purpose of transferring information.

client/server relationship [ITU-T G.809]: The association between layer networks that is performed by an "adaptation" function to allow the "flow" in the client layer network to be supported by a trail in the server layer.

connectionless trail [ITU-T G.809]: A "transport entity" responsible for the transfer of information from the input of a flow termination source to the output of a flow termination sink. The integrity of the information transfer may be monitored.

transport [ITU-T G.809]: The functional process of transferring information between different locations.

transport entity [ITU-T G.809]: An architectural component which transfers information between its inputs and outputs within a layer network.

transport network [ITU-T G.809]: The functional resources of the network which conveys user information between locations.

With the exception of "trail" it can be seen that certain definitions apply equally well to connection mode as well as to connectionless mode.

NOTE 1 – A client is the user or consumer of services.

NOTE 2 – A server is the provider of services.

NOTE 3 – A client may in turn be a server to another higher layer client.

5.1.3 Visual illustration of client and server layer networks

Figure 2 illustrates the relationship between client and server layer networks.

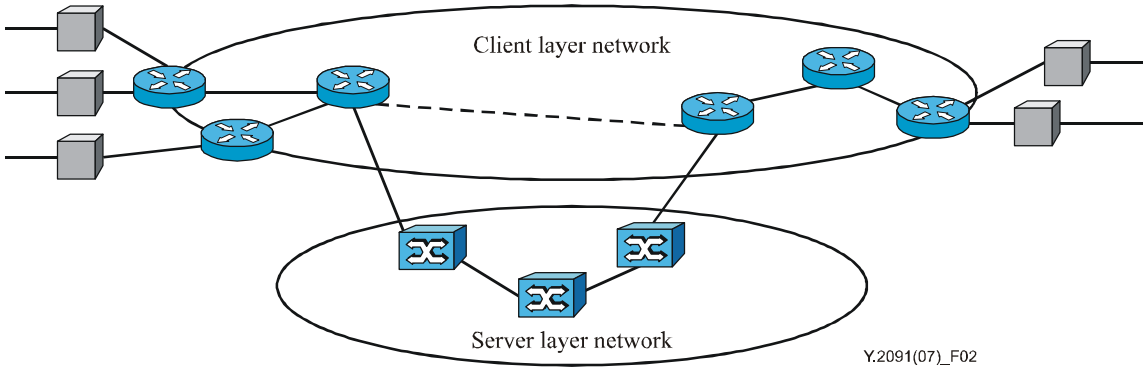

Figure 2 – Illustration of client and server layer networks

NOTE – As indicated in [ITU-T Y.2011], the NGN transport stratum is implemented by a recursion of multiple layer networks as described in [ITU-T G.805] and [ITU-T G.809]. From an architectural perspective, each layer in the transport stratum is considered to have its own user, control and management planes.

5.1.4 User, control and management planes

plane [ITU-T G.993.1]: A category that identifies a collection of related objects, e.g., objects that execute similar or complementary functions; or peer objects that interact to use or to provide services in a class that reflects authority, capability, or time period.

transport plane [ITU-T G.993.1]: The transport plane provides bidirectional or unidirectional transfer of user information, from one location to another. It can also provide transfer of some control and network management information. The transport plane is layered; it is equivalent to the transport network defined in [ITU-T G.805].

user plane [ITU-T G.993.1]: A classification for objects whose principal function is to provide transfer of end-user information: user information may be user-to-user content (e.g., a movie), or private user-to-user data.

NOTE 1 – In the case of client/server layer networks, the client is the "user".

NOTE 2 – In some cases, the term data plane is also used instead of user plane.

control plane [ITU-T Y.2011]: The set of functions that controls the operation of entities in the stratum or layer under consideration, plus the functions required to support this control.

management plane [ITU-T Y.2011]: The set of functions used to manage entities in the stratum or layer under consideration, plus the functions required to support this management.

5.2 Horizontal

The transport stratum comprises the horizontal components shown in Figure 3:

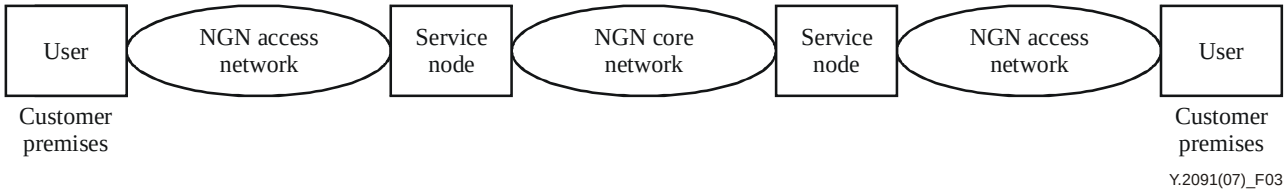

Figure 3 – General horizontal components

NGN access network [ITU-T Y.101]: Implementation comprising those entities (such as cable plant, transmission facilities, etc.) which provide the required transport capabilities for the provision of telecommunications services between a service node interface (SNI) and each of the associated user-network interfaces (UNIs).

access gateway [ITU-T Y.2261]: A unit that allows end users with various accesses (e.g., PSTN, ISDN, V5.x) connection to the packet node of NGN.

NOTE – The AG may be embedded in an access node, which serves also other access interfaces (e.g., xDSL, LAN). Such access nodes are also known as multi-service access nodes (MSAN).

service [ITU-T Z.100 Sup.1]: A set of functions and facilities offered to a user by a provider.

For service node the following definitions apply:

service node (SN) [ITU-T G.902]: Network element that provides access to various switched and/or permanent telecommunication services. In case of switched services, the SN is providing access call and connection control signalling, and access connection and resource handling.

service node interface (SNI) [ITU-T G.902]: Interface which provides customer access to a service node.

service platform (SP) [ITU-T G.902]: Equipment which allows users to gain access and systems to communicate to the NGN through networks, used to describe the terminal device (i.e., TEs: PC, telephone, mobile phone, etc.) and the server (i.e., application server, media server, etc.) employed by the service application.

6 Architecture for NGN

access border gateway [ITU-T Y.2271]: A packet gateway between an access network and a core network.

call server [ITU-T Y.2271]: The core element of a CS-based PSTN/ISDN emulation component, which is responsible for call control, media resource control, call routing, user profile and

subscriber authentication, authorization and accounting. Depending on its role, the behaviour of the call server may be different. In these cases, the role of call server is identified for example as "Access call server", "Breakout call server", "IMS call server", "Routing call server" or "Gateway call server".

functional architecture [ITU-T Y.2012]: A set of functional entities and the reference points between them used to describe the structure of an NGN. These functional entities are separated by reference points, and thus, they define the distribution of functions.

NOTE 1 – The functional entities can be used to describe a set of reference configurations. These reference configurations identify which reference points are visible at the boundaries of equipment implementations and between administrative domains.

functional entity [ITU-T Y.2012]: An entity that comprises an indivisible set of specific functions. Functional entities are logical concepts, while groupings of functional entities are used to describe practical, physical implementations.

interconnection border gateway [ITU-T Y.2271]: A unit responsible for packet interworking between two service provider's core networks.

interworking [ITU-T Y.1411]: The term "interworking" is used to express interactions between networks, between end systems, or between parts thereof, with the aim of providing a functional entity capable of supporting an end-to-end communication. The interactions required to provide a functional entity rely on functions and on the means to select these functions.

media gateway [ITU-T H.248.1]: The media gateway converts media provided in one type of network to the format required in another type of network. For example, a MG could terminate bearer channels from a switched circuit network (e.g., DS0s) and media streams from a packet network (e.g., RTP streams in an IP network). This gateway may be capable of processing audio, video and [ITU-T T.120] alone or in any combination, and will be capable of full duplex media translations. The MG may also play audio/video messages and perform other IVR functions, or may perform media conferencing.

media gateway controller [ITU-T H.248.1]: Controls the parts of the call state that pertain to connection control for media channels in a media gateway.

media server [ITU-T Y.2271]: A network element providing the media resource processing function for telecommunication services in NGN.

reference point [ITU-T Y.2012]: A conceptual point at the conjunction of two non-overlapping functional entities that can be used to identify the type of information passing between these functional entities.

NOTE 2 – A reference point may correspond to one or more physical interfaces between pieces of equipment.

remote user access module (RUAM) [ITU-T Y.2261]: A unit that physically terminates subscriber lines and converts the analogue signals into a digital format. The RUAM is physically remote from the local exchange.

residential gateway [ITU-T Y.2271]: A unit that interworks PSTN/ISDN user equipments to a packet network. A residential gateway is located at the customer premises.

signalling gateway [ITU-T Y.2261]: A unit that provides out-of-band call control signalling conversion between the NGN and other networks (e.g., between a call server in NGN and a STP or SSP in SS7).

topology [ITU-T Y.2012]: Information that indicates the structure of a network. It contains the network address and routing information.

trunking media gateway (TMG) [ITU-T Y.2261]: A unit that provides interfaces between the packet nodes of the NGN and the circuit-switched nodes (e.g., transit exchange, local exchange, international exchange) of PSTN/ISDN for bearer traffic. The TMG provides any needed conversion to the bearer traffic.

user access module (UAM) [ITU-T Y.2261]: A unit that physically terminates subscriber lines and converts the analogue signals into a digital format. The UAM is collocated with a local exchange, and is connected to the local exchange.

voice over IP gateway [ITU-T Y.2031]: A SIP-based gateway that connects legacy terminals to the NGN. When connecting analogue lines, the voice over IP gateway includes at least an analogue telephone adaptor (ATA). A voice over IP gateway (VGW) plays the role of an IMS UE with regard to the P-CSCF.

7 IP-related capabilities for NGN

Internet [ITU-T Y.101]: A collection of interconnected networks using the Internet protocol which allows them to function as a single, large virtual network.

IP transfer capability [ITU-T Y.1001]: The set of network capabilities provided by the Internet protocol (IP) layer. It may be characterized by the traffic contract as well as performance attributes supported by control and management functions of the underlying protocol layers. Examples of IP transfer capability include basic best effort IP packet delivery and the capability provided by Intserv, and Diffserv framework defined by the IETF.

PSTN/ISDN emulation [ITU-T Y.2271]: Provides PSTN/ISDN service capabilities and interfaces using adaptation to an IP infrastructure.

NOTE 1 – Not all service capabilities and interfaces have to be present to provide an emulation.

PSTN/ISDN simulation [ITU-T Y.2262]: Provides PSTN/ISDN-like service capabilities using session control over IP interfaces and infrastructure.

NOTE 2 – This definition allows for the possibility of simulation providing a complete mapping of the PSTN/ISDN service set (complete simulation).

8 Mobility for NGN

A number of base terms have been adopted. Relationship between basic terms used for mobility is shown in Figure 4.

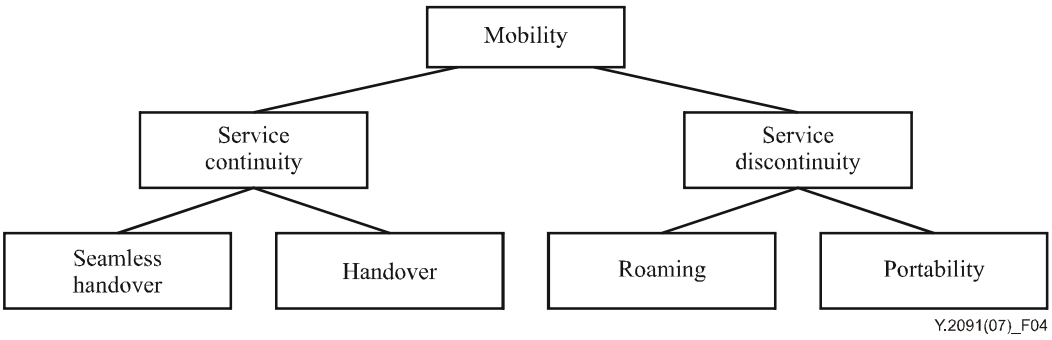

Figure 4 – Relationship between mobility terms

mobility [ITU-T Y.2001]: The ability for the user or other mobile entities to communicate and access services irrespective of changes of the location or technical environment. The degree of service availability may depend on several factors including the access network capabilities, service

level agreements between the user's home network and the visited network (if applicable), etc. Mobility includes the ability of telecommunication with or without service continuity.

NOTE 1 – In [ITU-T Y.2001] this is called generalized mobility.

nomadism [ITU-T Q.1761]: Ability of the user to change his network access point on moving; when changing the network access point, the user's service session is completely stopped and then started again, i.e., there is no session continuity or hand-over possible. It is assumed that normal usage pattern is that users shut down their service session before moving to another access point.

network mobility [ITU-T Q.1703]: The ability of a network, where a set of fixed or mobile nodes are networked to each other, to change, as a unit, its point of attachment to the corresponding network upon the network's movement itself.

personal mobility [ITU-T Q.1706]: This is the mobility for those scenarios where the user changes the terminal used for network access at different locations. The ability of a user to access telecommunication services at any terminal on the basis of a personal identifier, and the capability of the network to provide those services delineated in the user's service profile.

terminal mobility [ITU-T Q.1706]: This is the mobility for those scenarios where the same terminal equipment is moving or is used at different locations. The ability of a terminal to access telecommunication services from different locations and while in motion, and the capability of the network to identify and locate that terminal.

portability [ITU-T Q.1742.1]: Mechanism that allows a user to retain the same directory number, regardless of the subscribed-to service provider. Number portability may be limited to specific geographical areas. In the context of the All-IP network, the term "number portability" refers specifically to ITU-T E.164 numbers used for telephony.

roaming [ITU-T Q.1706]: This is the ability of users to access services according to their user profile while outside of their subscribed home network, i.e., by using an access point of a visited network.

NOTE 2 – This requires the capability for access to the visited network, the existence of an interface between home network and visited network, as well as a roaming agreement between the respective network operators.

visited network [ITU-T Y.2021]: The network that is local to the customer in a roaming configuration.

handover [ITU-T Q.1706]: The ability to provide services with some impact on their service level agreements to a moving object during and after movement.

mobility management [ITU-T Q.1706]: The set of functions used to provide mobility.

NOTE 3 – These functions include authentication, authorization, location updating, paging, download of user information and more.

service continuity [ITU-T Q.1706]: The ability for a mobile object user to maintain an ongoing service, including current states, such as user's network environment and session for a service.

seamless service [ITU-T Q.1706]: The service that will prevent users experiencing any service disruptions while changing point of attachment.

9 Roles, players, value-added chain, etc., for NGN

role [ITU-T Y.110]: A role is a business activity which fits in a value chain. The role is constrained by the smallest scale of business activity which could exist independently in the industry and so a marketplace will exist for every relationship between roles.

player [ITU-T Y.110]: A player is an organization, or individual, which undertakes one or more roles. The player can be a commercial company, a government agency, a non-governmental organization, a charity or an individual.

value chain, complete value chain, and primary value chain [ITU-T Y.110]: A "tree" of roles are connected together to make an end good/service. The total set of roles involved in producing an end good/service are and the way they pass intermediate goods/services between the roles is called the complete value chain. The set of roles which form the only principle activity of a generally recognized industry which produces the end good/service are the primary value chain. All the other roles in the complete value chain will be providing support goods/services for roles in the primary value chain.

10 User, customer, subscriber, client, provider, etc., for NGN

In a service context, it is usual to consider the party supplying the service and the party using the service. Unfortunately we have a number of terms in common use, some of which can be regarded as synonyms depending on the context in which they are used. Further, unlike many previous environments where it was clear where there was only one simple relationship between these two parties, the NGN environment enables an arbitrary recursion of these relationships.

customer [ITU-T M.3050.1]: The customer buys products and services from the enterprise or receives free offers or services. A customer may be a person or a business.

NOTE 1 – There could be many users per customer.

home network [ITU-T Y.2021]: The network to which a mobile user is normally connected, or the service provider with which the mobile user is associated, and where the user's subscription information is managed.

subscriber [ITU-T M.3050.1]: The person or organization responsible for concluding contracts for the services subscribed to and for paying for these services.

NOTE 2 – There could be many end users per subscriber.

end user [ITU-T M.3050.1]: The end user is the actual user of the products or services offered by the enterprise. The end user consumes the product or service. See also subscriber.

domain [ITU-T Y.110]: A collection of physical or functional entities which are owned and operated by a player and can include entities from more than one role. The extent of a domain is defined by a useful context and one player can have more than one domain.

11 Telecommunications, services, applications, etc., for NGN

telecommunication: Any transmission, emission or reception of signs, signals, writing, images and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic systems (as defined in the ITU Constitution provision 1012 and in the International Telecommunication Regulations ITR).

session: A temporary telecommunications relationship among a group of objects in the service stratum that are assigned to collectively fulfil a task for a period of time. A session has a state that may change during its lifetime. Session-based telecommunications may, but need not be, assisted by intermediaries (see mediated services). Session-based telecommunications can be one-to-one, one-to-many, many-to-one, or many-to-many.

service [ITU-T Z.100 Sup.1]: A set of functions and facilities offered to a user by a provider.

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

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.

media flow [ITU-T Y.2111]: A unidirectional media stream, which is specified by two endpoint identifiers and bandwidth, as well as class of service if needed.

session-based services: Services where one or more sessions are required for the service.

non-session-based services: Services where a session is not required for the service.

mediated services [ITU-T Y.2012]: Services that are based on intermediate service stratum facilities provided by one or more service providers.

non-mediated services [ITU-T Y.2012]: Services that are not based on intermediate service stratum facilities provided by any service provider.

application network interface [ITU-T Y.2012]: Interface which provides a channel of interactions and exchanges between Applications and NGN elements. The ANI offers capabilities and resources needed for realization of applications.

accounting [ITU-T X.462]: The action of collecting information on the operations performed within a system and the effects thereof.

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

12 Quality of service for NGN

quality of service class: Identifies the category of the information that is received and transmitted in the U-plane.

absolute QoS [ITU-T Y.2111]: Traffic delivery with numerical bounds on some or all of the QoS parameters. These bounds may be physical limits, or enforced limits such as those encountered through mechanisms like rate policing. The bounds may result from designating a class of network performance objectives for packet transfer.

relative QoS [ITU-T Y.2111]: Traffic delivery without absolute bounds on the achieved bandwidth, packet delay or packet loss rates. It describes the circumstances where certain classes of traffic are handled differently from other classes of traffic, and the classes achieve different levels of QoS.

stream [ITU-T T.137] or [ITU-T Y.2012]: A flow of real-time information of a specific media type (e.g., audio) and format (e.g., [ITU-T G.722]) from a single source to one or more destinations.

technology dependent resource control functions [ITU-T Y.2111]: The functions that require specific knowledge of the link-layer technology in use in order to perform resource control.

technology independent resource control functions [ITU-T Y.2111]: The RACF functions that do not require specific knowledge of the link-layer technology in use in order to perform resource control.

gate [ITU-T Y.2111]: A construct used to enable or disable the forwarding of IP packets based on the policy decision. A gate is identified by the classifier (e.g., IPv4 5-tuple) and direction of a media flow or a group of media flows that are in conformance to the same set of policy decisions.

gate control [ITU-T Y.2111]: The operation of opening or closing a gate. When a gate is open, the packets in the media flows are allowed to pass through; when a gate is closed, the packets in the media flows are not allowed to pass through.

firewall working mode selection [ITU-T Y.2111]: The operation of selecting the packet inspection mode (e.g., IP, TCP/UDP header, or higher layer) of packet-filtering-based firewall for accepting or rejecting the packets of a media flow based on related service and security requirements.

13 Identification and location for NGN (including numbering, naming, addressing, routing, etc.)

identifier: An identifier is a series of digits, characters and symbols or any other form of data used to identify subscriber(s), user(s), network element(s), function(s), network entity(ies) providing services/applications, or other entities (e.g., physical or logical objects). Identifiers can be used for registration or authorization. They can be either public to all networks, shared between a limited number of networks or private to a specific network (private IDs are normally not disclosed to third parties).

address: An address is the identifier for a specific termination point and is used for routing to this termination point.

name: A name is the identifier of an entity (e.g., subscriber, network element) that may be resolved/translated into an address.

network address translation [ITU-T Y.2111]: The operation by which IP addresses are translated (mapped) from one address domain to another address domain.

network address port translation (NAPT) [ITU-T Y.2111]: The operation by which IP addresses and transport or port identifiers such as TCP and UDP port numbers are translated (mapped) from one address domain to another address domain.

network address translator (NAT) [ITU-T Y.2111]: An entity that implements network address translation or NAPT functions. It consists of two types of NATs: near-end NAT that can be controlled by the operators directly, and far-end (remote) NAT that cannot be controlled by the operators directly.

NAPT control [ITU-T Y.2111]: The operation of providing network address mapping information and NAPT policy rules to a near-end NAT in the media flow.

NAT traversal [ITU-T Y.2111]: The operation of adapting the IP addresses so that the packets in the media flow can pass through far-end (remote) NAT.

Annex A

Alphabetical index

(This annex forms an integral part of this Recommendation)

Definition	Clause
role	9
seamless service	8
service	5.2 and 11
service continuity	8
service node	5.2
service node interface	5.2
service platform	5.2
session	11
session-based services	11
signalling gateway	6
stream	12
subscriber	10
technology dependent resource control functions	12
technology independent resource control functions	12
telecommunication	11
terminal mobility	8
topology	6
trail	5.1.1
transmission media layer network	5.1.1
transport	5.1.1 and 5.1.2
transport entity	5.1.1 and 5.1.2
transport network	5.1.1 and 5.1.2
transport plane	5.1.4
transport stratum	5
trunking media gateway	6
user access module	6
user plane	5.1.4
value chain	9
visited network	8
voice over IP gateway	6

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Series D	General tariff principles
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