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

Next Generation Networks – Generalized mobility

Framework of the mobile virtual private network service in next generation networks

Recommendation ITU-T Y.2811

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Recommendation ITU-T Y.2811

Framework of the mobile virtual private network service in next generation networks

Summary

Recommendation ITU-T Y.2811 describes the functional architecture of the mobile virtual private network (VPN) service based on the host-based mobility framework in next generation networks (NGNs), and defines the corresponding reference points. This Recommendation focuses on remote access VPNs and community-based VPNs where mobile user equipment (MUE) is directly involved. The high-level mobile VPN service procedures on the functional architecture are also described.

History

Edition	Recommendation	Approval	Study Group
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Mobile VPN, NGN.

FOREWORD

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Recommendation ITU-T Y.2811

Framework of the mobile virtual private network service in next generation networks

1 Scope

There are several types of virtual private network (VPN) services such as remote access VPN (or client-to-server VPN), site-to-site VPN, community-based VPN, etc. This Recommendation focuses on the mobile VPN framework in NGN based on the host-based mobility framework in which mobile UEs are directly involved in the VPN. The mobile VPN framework is based on the mobility-related ITU-T Recommendations [ITU-T Q.1706], [ITU-T Q.1707], [ITU-T Q.1708], [ITU-T Q.1709] and [ITU-T Y.2018], as well as on the VPN requirements described in [ITU-T Y.2215]. This Recommendation covers the following:

- requirements of mobile VPN;
- mobile VPN architecture in terms of high-level functions, functional architecture and reference points;
- high-level mobile VPN procedures based on host-based mobility.

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.

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|----------------|---|
| [ITU-T G.1000] | Recommendation ITU-T G.1000 (2001), <i>Communications Quality of Service: A framework and definitions</i> . |
| [ITU-T M.1400] | Recommendation ITU-T M.1400 (2006), <i>Designations for interconnections among operators' networks</i> . |
| [ITU-T Q.1706] | Recommendation ITU-T Q.1706/Y.2801 (2006), <i>Mobility management requirements for NGN</i> . |
| [ITU-T Q.1707] | Recommendation ITU-T Q.1707/Y.2804 (2008), <i>Generic framework of mobility management for next generation networks</i> . |
| [ITU-T Q.1708] | Recommendation ITU-T Q.1708/Y.2805 (2008), <i>Framework of location management for NGN</i> . |
| [ITU-T Q.1709] | Recommendation ITU-T Q.1709/Y.2806 (2008), <i>Framework of handover control for NGN</i> . |
| [ITU-T X.1035] | Recommendation ITU-T X.1035 (2007), <i>Password-authenticated key exchange (PAK) protocol</i> . |
| [ITU-T Y.101] | Recommendation ITU-T Y.101 (2000), <i>Global Information Infrastructure terminology: Terms and definitions</i> . |
| [ITU-T Y.2001] | Recommendation ITU-T Y.2001 (2004), <i>General overview of NGN</i> . |
| [ITU-T Y.2011] | Recommendation ITU-T Y.2011 (2004), <i>General principles and general reference model for Next Generation Networks</i> . |

- [ITU-T Y.2012] Recommendation ITU-T Y.2012 (2006), *Functional requirements and architecture of the NGN release 1*.
- [ITU-T Y.2014] Recommendation ITU-T Y.2014 (2008), *Network attachment control functions in next generation networks*.
- [ITU-T Y.2018] Recommendation ITU-T Y.2018 (2009), *Mobility management and control framework and architecture within the NGN transport stratum*.
- [ITU-T Y.2091] Recommendation ITU-T Y.2091 (2007), *Terms and definitions for Next Generation Networks*.
- [ITU-T Y.2111] Recommendation ITU-T Y.2111 (2006), *Resource and admission control functions in Next generation Networks*.
- [ITU-T Y.2215] Recommendation ITU-T Y.2215 (2009), *Requirements and framework for the support of VPN services in NGN, including the mobile environment*.
- [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 [ITU-T Y.101]: A structured set of capabilities, which provide value-added functionality supported by one or more services.

3.1.2 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 – 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.

3.1.3 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.

3.1.4 host-based mobility management [ITU-T Q.1707]: A mobility management scheme in which the MM signalling is performed based on (or controlled by) the user equipment (UE).

3.1.5 mobility [ITU-T Q.1706]: The ability for the user or other mobile entities to communicate and access services irrespective of changes of the location or technical environment.

3.1.6 next generation network (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.

3.1.7 quality of service (QoS) [ITU-T G.1000]: The collective effect of service performances, which determine the degree of satisfaction of a user of the service.

3.1.8 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 (see also clause 7.1 of [ITU-T Y.2011]).

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

3.1.10 service provider [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.

3.1.11 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 (see also clause 7.1 of [ITU-T Y.2011]).

3.1.12 virtual private network (VPN) [ITU-T Y.2215]: A VPN is a communication network, built over public and/or private network resources, used to support controlled and secure communications within a group of users as if they were on a private network.

3.2 Terms defined in this Recommendation

None.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

BID	Binding Identification
e-MCF	enterprise Mobility Control Function
e-NAF	enterprise Network Attachment Function
e-RACF	enterprise Resource Admission and Control Function
GW	Gateway
HBM	Host-Based Mobility
IKE	Internet Key Exchange
IPsec	Internet Protocol security
MLM-FE	Mobility Location Management Functional Entity
MM	Mobility Management
MMCF	Mobility Management and Control Functions
MOBIKE	Mobile IKE
MP-t-MP	Multipoint-to-Multipoint
MUE	Mobile User Equipment
NACF	Network Attachment Control Functions
NGN	Next Generation Network
PAK	Password-Authenticated Key exchange
PD-FE	Policy Decision Functional Entity
P-t-P	Point-to-Point
PW	Password