

International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Y.2058

(11/2011)

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

Next Generation Networks – Frameworks and functional
architecture models

Roadmap for IPv6 migration from the perspective of the operators of next generation networks

Recommendation ITU-T Y.2058



International
Telecommunication
Union

Document Sharing Hub

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
IPTV over NGN	Y.1900–Y.1999

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
Smart ubiquitous networks	Y.2600–Y.2699
Security	Y.2700–Y.2799
Generalized mobility	Y.2800–Y.2899
Carrier grade open environment	Y.2900–Y.2999
Future networks	Y.3000–Y.3099

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

Recommendation ITU-T Y.2058

Roadmap for IPv6 migration from the perspective of the operators of next generation networks

Summary

Recommendation ITU-T Y.2058 specifies multiple phases for next generation network (NGN) operators to migrate from an Internet protocol version 4 (IPv4)-based NGN to an Internet protocol version 6 (IPv6)-based NGN. The migration includes five phases from a pure IPv4-based NGN to a pure IPv6-based NGN. General functional requirements of migration are given as are specific functional requirements for each phase.

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T Y.2058	2011-11-29	13

Keywords

IPv6, IPv6-based NGN, IPv6 migration, NGN, NGN operator.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

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.

NOTE

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

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at <http://www.itu.int/ITU-T/ipr/>.

© ITU 2012

All rights reserved. No part of this publication may be reproduced, by any means whatsoever, without the prior written permission of ITU.

Table of Contents

		Page
1	Scope	1
2	References.....	1
3	Definitions	1
	3.1 Terms defined elsewhere	1
	3.2 Terms defined in this Recommendation.....	2
4	Abbreviations and acronyms	2
5	Conventions	2
6	Features of IPv6 migration in NGNs	2
	6.1 Communication scenarios in IPv6 migration for NGN operators	2
	6.2 Available transition mechanisms for NGN operator deployment	3
	6.3 Function architecture of NGNs in the IPv6 migration period	5
7	Phases of IPv6 migration in NGNs.....	6
	7.1 Phase 0: NGN with IPv4	6
	7.2 Phase 1: Connecting IPv6-based NGNs across an IPv4-based NGN.....	7
	7.3 Phase 2: Connecting IPv6-based NGNs and IPv4-based NGNs across a dual-stack NGN	8
	7.4 Phase 3: Connecting IPv4-based NGNs through IPv6-based NGNs	9
	7.5 Phase 4: Fully migrated IPv6-based NGN	9
8	Functional requirements of IPv6 migration for NGN operators.....	10
	8.1 General functional requirements to support IPv6 migration for NGN operators	10
	8.2 Functional requirements of each IPv6 migration phase for NGN operators..	11
9	Security Considerations.....	13
	Bibliography.....	14

Recommendation ITU-T Y.2058

Roadmap for IPv6 migration from the perspective of the operators of next generation networks

1 Scope

The objective of this Recommendation is to specify multiple phases for NGN operators to migrate from an IPv4-based NGN to an IPv6-based NGN.

The scope of this Recommendation includes:

- identification of IPv6 migration phases for NGN operators;
- IPv6 migration scenarios of each phase for NGN operators;
- functional requirements of each phase for NGN operators.

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 (2006), *Functional requirements and architecture of the NGN release 1*.
- [ITU-T Y.2053] Recommendation ITU-T Y.2053 (2008), *Functional requirements for IPv6 migration in NGN*.
- [ITU-T Y.2091] Recommendation ITU-T Y.2091 (2007), *Terms and definitions for Next Generation Networks*.
- [ITU-T Y.2701] Recommendation ITU-T Y.2701 (2007), *Security requirements for NGN release 1*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 host [b-ITU-T Y.1540]: A computer that communicates using the Internet protocols. A host implements routing functions (i.e., it operates at the IP layer) and may implement additional functions including higher layer protocols (e.g., TCP in a source or destination host) and lower layer protocols (e.g., ATM).

3.1.2 router [b-ITU-T Y.1540]: A host that enables communication between other hosts by forwarding IP packets based on the content of their IP destination address field.