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TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

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

Next Generation Networks – Future networks

Future networks: Objectives and design goals

Recommendation ITU-T Y.3001

ITU-T Y-SERIES RECOMMENDATIONS

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GENERATION NETWORKS**

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



Recommendation ITU-T Y.3001

Future networks: Objectives and design goals

Summary

Recommendation ITU-T Y.3001 describes objectives and design goals for future networks (FNs). In order to differentiate FNs from existing networks, four objectives have been identified: service awareness, data awareness, environmental awareness, and social and economic awareness. In order to realize these objectives, twelve design goals have been identified: service diversity, functional flexibility, virtualization of resources, data access, energy consumption, service universalization, economic incentives, network management, mobility, optimization, identification, reliability and security. This Recommendation assumes that the target timeframe for FNs falls approximately between 2015 and 2020. Appendix I describes technologies elaborated in recent research efforts that are likely to be used as an enabling technology for each design goal.

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T Y.3001	2011-05-20	13

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.

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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/>.

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Recommendation ITU-T Y.3001

Future networks: Objectives and design goals

1 Scope

This Recommendation describes objectives and design goals for future networks (FNs). The scope of this Recommendation covers:

- Fundamental issues to which insufficient attention was paid in designing current networks, and which are recommended to be the objectives of future networks (FNs)
- High-level capabilities and characteristics that are recommended to be supported by future networks (FNs)
- Target timeframe for future networks (FNs).

Ideas and research topics of future networks (FNs) that are important and may be relevant to future ITU-T standardization are included in Appendix I.

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 F.851] Recommendation ITU-T F.851 (1995), *Universal Personal Telecommunication (UPT) – Service description (service set 1)*.
- [ITU-T Y.2001] Recommendation ITU-T Y.2001 (2004), *General overview of NGN*.
- [ITU-T Y.2019] Recommendation ITU-T Y.2019 (2010), *Content delivery functional architecture in NGN*.
- [ITU-T Y.2091] Recommendation ITU-T Y.2091 (2008), *Terms and definitions for Next Generation Networks*.
- [ITU-T Y.2205] Recommendation ITU-T Y.2205 (2011), *Next Generation Networks – Emergency telecommunications – Technical considerations*.
- [ITU-T Y.2221] Recommendation ITU-T Y.2221 (2010), *Requirements for support of ubiquitous sensor network (USN) applications and services in the NGN environment*.
- [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 term defined elsewhere:

3.1.1 identifier [ITU-T Y.2091]: 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).



3.2 Terms defined in this Recommendation

This Recommendation defines the following terms.

3.2.1 component network: A single homogeneous network which, by itself, may not provide a single end-to-end global telecommunication infrastructure.

3.2.2 future network (FN): A network able to provide services, capabilities, and facilities difficult to provide using existing network technologies. A future network is either:

- a) A new component network or an enhanced version of an existing one, or
- b) A heterogeneous collection of new component networks or of new and existing component networks that is operated as a single network.

NOTE 1 – The plural form "Future Networks" (FNs) is used to show that there may be more than one network that fits the definition of a future network.

NOTE 2 – A network of type b may also include networks of type a.

NOTE 3 – The label assigned to the final federation may, or may not, include the word "future", depending on its nature relative to any preceding network and similarities thereto.

NOTE 4 – The word "difficult" does not preclude some current technologies from being used in future networks.

NOTE 5 – In the context of this Recommendation, the word "new" applied to a component network means that the component network is able to provide services, capabilities, and facilities that are difficult or impossible to provide using existing network technologies.

3.2.3 service universalization: A process to provide telecommunication services to every individual or group of people irrespective of social, geographical, and economical status.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

CDN	Content Distribution Network
ET	Emergency Telecommunications
FN	Future Network
ICT	Information and Communication Technology
IC	Integrated Circuit
ID	Identifier
IP	Internet Protocol
OCDM	Optical Code Division Multiplexing
P2P	Peer-to-Peer
QoE	Quality of Experience
QoS	Quality of Service
SoA	Service-oriented Architecture

5 Conventions

This Recommendation uses "is recommended" to indicate the main points to be taken into account in the standardization of FNs. Detailed requirements and their degree ("required", "recommended", or "optional") need further study.