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Multimedia telephony over distributed service networking

Recommendation ITU-T Y.2083

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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
Enhancements to NGN	Y.2300–Y.2399
Network management	Y.2400–Y.2499
Network control architectures and protocols	Y.2500–Y.2599
Packet-based 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.3499
CLOUD COMPUTING	Y.3500–Y.3999

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Recommendation ITU-T Y.2083

Multimedia telephony over distributed service networking

Summary

Recommendation ITU-T Y.2083 describes the distributed service networking (DSN) functional architecture intended to support multimedia telephony (MMTel) services based on the DSN service requirements. The main objective of this Recommendation is to define a high level MMTel service architecture over DSN and a set of capabilities and information flows which support MMTel services.

History

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Distributed service networking, DSN, multimedia telephony, MMTel.

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Table of Contents

		Page
1	Scope.....	1
2	References.....	1
3	Definitions	2
	3.1 Terms defined elsewhere	2
	3.2 Terms defined in this Recommendation.....	2
4	Abbreviations and acronyms	2
5	Conventions	3
6	Functional architecture	3
7	Basic communication procedures	4
	7.1 Application level procedures	4
	7.2 Overlay level procedures	7
8	Overload control considerations in MMTel	17
	8.1 Overload control flows by using a backup node	17
	8.2 Overload control by initiating a node joining.....	22
9	Supplementary services support	22
10	Mobility support	22
11	Interworking	22
12	Charging	23
13	Security considerations	23
14	Network management.....	23
	Bibliography.....	24

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Recommendation ITU-T Y.2083

Multimedia telephony over distributed service networking

1 Scope

This Recommendation specifies a cost-effective, flexible, scalable and reliable system which provides multimedia telephony (MMTel) services to users connected to a distributed service networking (DSN) network. It describes the requirements and functional architecture for supporting MMTel services over DSN, defines detailed information flows related to MMTel service provisioning, node management and overload control. It also describes the support for supplementary services, mobility, interworking, charging, and network management in an MMTel system over DSN.

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 M.3060] Recommendation ITU-T M.3060/Y.2401 (2006), *Principles for the Management of Next Generation Networks*.
- [ITU-T Q.1706] Recommendation ITU-T Q.1706/Y.2801 (2006), *Mobility management requirements for NGN*.
- [ITU-T Q.1707] Recommendation ITU-T Q.1707/Y.2804 (2008), *Generic framework of mobility management for next generation networks*.
- [ITU-T Q.1708] Recommendation ITU-T Q.1708/Y.2805 (2008), *Framework of location management for NGN*.
- [ITU-T Q.1709] Recommendation ITU-T Q.1709/Y.2806 (2008), *Framework of handover control for NGN*.
- [ITU-T Y.2012] Recommendation ITU-T Y.2012 (2010), *Functional requirements and architecture of next generation networks*.
- [ITU-T Y.2080] Recommendation ITU-T Y.2080 (2012), *Functional architecture for distributed service networking*.
- [ITU-T Y.2173] Recommendation ITU-T Y.2173 (2008), *Management of performance measurement for NGN*.
- [ITU-T Y.2206] Recommendation ITU-T Y.2206 (2010), *Requirements for distributed service networking capabilities*.
- [ITU-T Y.2211] Recommendation ITU-T Y.2211 (2007), *IMS-based real-time conversational multimedia services over NGN*.
- [ITU-T Y.2233] Recommendation ITU-T Y.2233 (2010), *Requirements and framework allowing accounting and charging capabilities in NGN*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 control node [b-ITU-T Y Suppl.10]: A DSN node which provides service control and transport control functionalities.

3.1.2 distributed service networking [ITU-T Y.2206]: An overlay network which provides distributed and manageable capabilities to support various multimedia services.

3.1.3 DSN node [ITU-T Y.2206]: A node used in DSN providing distributed functionalities, including distributed routing and distributed storage.

3.1.4 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.

3.1.5 user profile [ITU-T Y.2080]: In the context of the DSN functional architecture, a collection of information that specifies the subscribed services and access privileges related to a DSN service user. The data in the user profile is called user profile data.

NOTE – A user profile may include the following attributes: user ID and other data related to authentication and authorization, user preferences, service status, service class, usage and/or contribution information, or subscriber accounting characteristics, etc.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 admitting node: During the process of node joining, the admitting node of the joining node is responsible for the portion of the namespace which will reside in the joining node.

3.2.2 bootstrap node: During the process of node joining, the bootstrap node of the joining node is the node that the joining node contacts. The bootstrap node validates the joining node's credentials and forwards the connecting request from the joining node to its admitting node.

3.2.3 proxy node: The proxy node of user equipment (UE) is the first contact point of UE. The proxy node locates the serving node and forwards session control messages between the serving node and UE.

3.2.4 responsible node: During the process of node leaving, the responsible node of the leaving node is the node that should take over the portion of the namespace that the leaving node is currently responsible for.

3.2.5 serving node: The serving node of UE is the DSN node which processes session control messages from UE. It is responsible for a range of user profile storage, and supports user authentication, session initiation and termination.

NOTE – The different descriptions of nodes are a relative concept; the DSN node is homogenous, and a node may act as different kinds of nodes depending on different sessions, different joining nodes, etc. For example, a node may act as a serving node to a certain end-user function (EF), but may also act as a proxy node to another EF.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

DSN	Distributed Service Networking
EF	End-user Function
ID	Identification
IMS	IP Multimedia Subsystem
MMTel	Multimedia Telephony
NEF	Node Enrolment Function
NGN	Next Generation Network
P2P	Peer-to-Peer
QoS	Quality of Service
RLF	Resource Location Function
SCF	Service Control Function
SIP	Session Initiation Protocol
UE	User Equipment

5 Conventions

Within this Recommendation, the keywords "multimedia telephony" and "MMTel" indicate the same service as "IP multimedia subsystem (IMS) based real time conversational multimedia services" defined in [ITU-T Y.2211].

6 Functional architecture

Figure 6-1 depicts a functional architecture, based on the distributed service networking (DSN) architecture of [ITU-T Y.2080], which can be used to support multimedia telephony (MMTel) services. The service control function (SCF) includes registration, authentication, authorization, media resources controlling and service user profiles, and it interacts with the resource location function (RLF) for resource location. All the DSN nodes in the MMTel service overlay have the same functional capabilities, including RLF and SCF. DSN nodes need to be enrolled by a node enrolment function (NEF) to construct the MMTel service overlay. The related functions and reference points are identified in [ITU-T Y.2080].

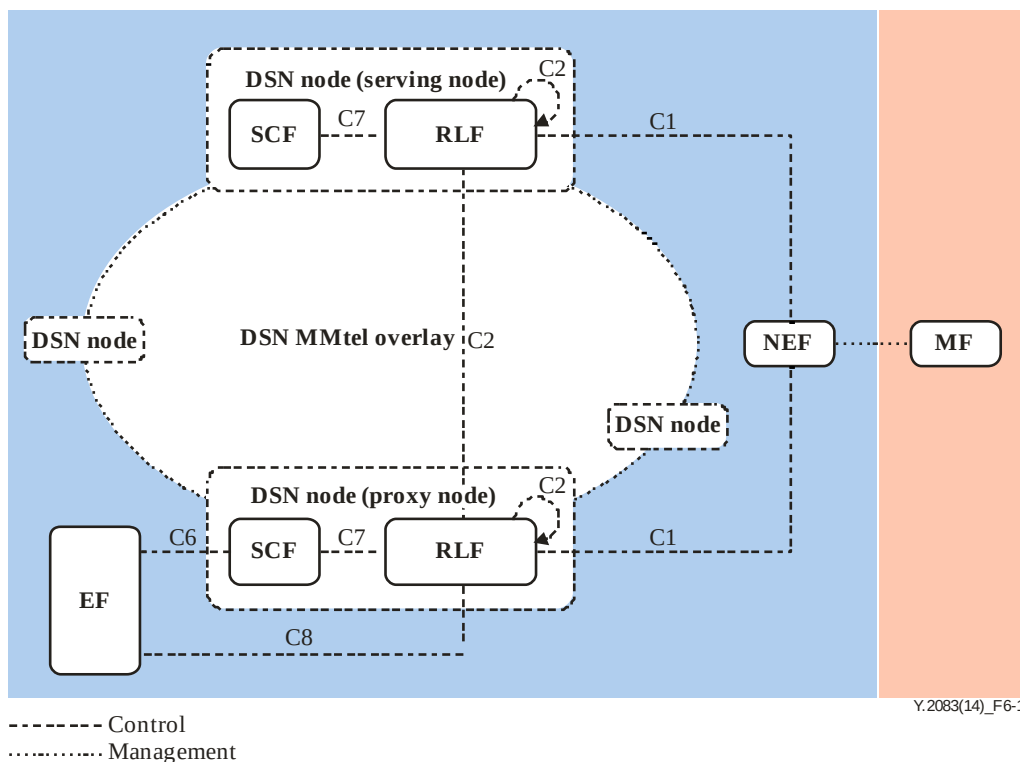


Figure 6-1 – MMTel service architecture over DSN

7 Basic communication procedures

The MMTel service allows multimedia conversational communications between two or more users. It provides for the real-time bidirectional conversational transfer of voice, video or optionally other types of data.

The MMTel communication is point to point between communicating terminals, or between a terminal and a network entity. This communication is usually symmetric, but in special cases the media components present in each direction may be different, or they may be the same, but with different bit rates and quality of service (QoS). Normally, the MMTel communication service is realised by a session control protocol.

According to whether a session control function is included, the procedures for MMTel communication can be categorized as application level procedures and overlay level procedures. The application level procedures consist of the user registration and session related procedures such as session initiation and session termination (release). The overlay level procedures contain the node management procedures which include node joining and node leaving.

7.1 Application level procedures

This clause describes the DSN application level procedures which implement the basic communication services including user registration, session initiation and session release.

NOTE 1 – The term "user" in the following procedure represents DSN user equipment (UE). The end-user function (EF) is a most primary function of DSN UE, which supports access to the DSN overlay network and service by exchanging session initiation protocol (SIP) messages with the SCF of a proxy node. UE may also include other functions.

The detailed procedures are described as follows. For easy understanding, the description of procedures in this Recommendation use the SIP protocol as an example, but are not limited to SIP.