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INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS
AND NEXT-GENERATION NETWORKS

Next Generation Networks – Service aspects:
Interoperability of services and networks in NGN

Capabilities of multi-connection to support enhanced multimedia telephony services

Recommendation ITU-T Y.2254



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Recommendation ITU-T Y.2254

Capabilities of multi-connection to support enhanced multimedia telephony services

Summary

Recommendation ITU-T Y.2254 describes requirements for network transport and service layer capabilities to support enhanced multimedia telephony (eMMTel) services over the multi-connection functional architecture.

The capabilities of multi-connection to support the eMMTel services encompass, at least, the following functions, such as service control function, security and charging function, policy and transport function, as well as the corresponding information flows.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
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eMMTel service, multi-connection architecture, NGN.

* To access the Recommendation, type the URL <http://handle.itu.int/> in the address field of your web browser, followed by the Recommendation's unique ID. For example, <http://handle.itu.int/11.1002/1000/11830-en>.

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Recommendation ITU-T Y.2254

Capabilities of multi-connection to support enhanced multimedia telephony services

1 Scope

This Recommendation describes the capabilities of multi-connection to support the enhanced multimedia telephony service (eMMTel).

The scope of this Recommendation includes scenarios, service features, requirements, functional architecture, information flows and other aspects such as security and charging for eMMTel services over the multi-connection functional architecture.

It is noted that eMMTel service in this Recommendation applies the IMS-based NGN environment.

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 Q.1706] Recommendation ITU-T Q.1706/Y.2801 (2006), *Mobility management requirements for NGN*.
- [ITU-T X.200] Recommendation ITU-T X.200 (1994) | ISO/IEC 7498-1:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: The basic model*.
- [ITU-T X.800] Recommendation ITU-T X.800 (1991), *Security architecture for Open Systems Interconnection for CCITT applications*.
- [ITU-T Y.2001] Recommendation ITU-T Y.2001 (2004), *General overview of NGN*.
- [ITU-T Y.2027] Recommendation ITU-T Y.2027 (2012), *Functional architecture of multi-connection*.
- [ITU-T Y.2233] Recommendation ITU-T Y.2233 (2008), *Requirements and framework allowing accounting and charging capabilities in NGN*.
- [ITU-T Y.2251] Recommendation ITU-T Y.2251 (2011), *Multi-connection requirements*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 connection [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.

3.1.2 confidentiality [ITU-T X.800]: The property that information is not made available or disclosed to unauthorized individuals, entities, or processes.

3.1.3 data integrity [ITU-T X.800]: The property that data has not been altered or destroyed in an unauthorized manner.

3.1.4 denial of service [ITU-T X.800]: The prevention of authorized access to resources or the delaying of time-critical operations.

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 multi-connection [ITU-T Y.2251]: The functionality which provides capability to the user equipment (UE) and network to maintain more than one access network connection simultaneously.

NOTE 1 – All connections are coordinated to provide service to higher layer entities.

NOTE 2 – In a multi-connection communications at least one UE is required to be a multi-connection UE.

3.1.7 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.

3.1.8 offline charging [ITU-T Y.2233]: Charging mechanism where charging information does not affect, in real-time, the service rendered.

3.1.9 online charging [ITU-T Y.2233]: Charging mechanism where charging information can affect, in real-time, the service rendered and therefore a direct interaction of the charging mechanism with resource/session/service control is required.

3.1.10 threat [ITU-T X.800]: A potential violation of security.

3.2 Terms defined in this Recommendation

This Recommendation defines the following term:

3.2.1 MC-eMMTel (eMMTel service over multi-connection): A service over multi-connection which provides real-time bidirectional conversational transfer of multiple media types (e.g., audio, video, data) between two or more terminals simultaneously.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

3G	3rd Generation
AAA	Authentication, Authorization, Accounting
CDR	Charging Data Record
CS	Circuit Switched
eMMTel	Enhanced Multimedia Telephony Services
ID	Identification
IM	Instant Messenger
IM-FE	Instant Message Functional Entity
IMS	IP Multimedia Subsystem
IP	Internet Protocol
MAS-F	Multi-connection Application Support Function

MCF	Multi-connection Control Function
MC-FE	Multi-connection Coordination Functional Entity
MMF	Multi-connection Media Function
MMS	Multimedia Messaging Service
MMTel	Multimedia Telephony Services
MPC-FE	Multi-connection Policy Control Functional Entity
MR-FE	Multi-connection Registration Functional Entity
MSISDN	Mobile Subscriber International ISDN/PSTN number
MSRP	Message Session Relay Protocol
MT-FE	Multimedia Telephony Functional Entity
MUE	Multi-connection User Equipment
MUP-FE	Multi-connection User Profile Functional Entity
NAB-FE	Network Address Book Functional Entity
OCS	Online Charging System
PR-FE	Presence and Group Management Functional Entity
PS	Packet Switched
QoS	Quality of Service
RTP	Real-time Transport Protocol
SCF	Service Control Function
SDP	Session Description Protocol
SIP	Session Initiation Protocol
SMS	Short Messaging Service
SRTP	Secure Real-time Transport Protocol
TF	Transport Function
UE	User Equipment
UNI	User-to-Network Interface
VoIP	Voice over Internet Protocol

5 Conventions

In this Recommendation:

The keywords "is required to" indicate a requirement which must be strictly followed and from which no deviation is permitted if conformance to this document is to be claimed.

The keywords "is prohibited from" indicate a requirement which must be strictly followed and from which no deviation is permitted if conformance to this document is to be claimed.

The keywords "is recommended" indicate a requirement which is recommended but which is not absolutely required. Thus this requirement need not be present to claim conformance.

The keywords "is not recommended" indicate a requirement which is not recommended but which is not specifically prohibited. Thus, conformance with this specification can still be claimed even if this requirement is present.

The keywords "can optionally" indicate an optional requirement which is permissible, without implying any sense of being recommended. This term is not intended to imply that the vendor's implementation must provide the option and the feature can be optionally enabled by the network operator/service provider. Rather, it means the vendor may optionally provide the feature and still claim conformance with the specification.

6 Description of service features

6.1 Service definition

MMTel is a global standard based service on NGN/IMS, offering converged, fixed and mobile real-time multimedia communication using the media capabilities such as voice, real-time video, text, file transfer and sharing of pictures, audio and video clips.

eMMTel is a set of mash-up services; it allows the combination of several services. eMMTel provides a new user experience over a multi-connection network; e.g., enriched call, enhanced file transfer, enhanced content sharing and enhanced messaging.

6.2 Enriched call

Enriched call can be split into two media load paths: one is the path carrying the video traffic load and the other is the path carrying the voice traffic load. They can be provided by the enhanced multimedia communication services, and are carried by the operator's existing network (CS or PS) through the PS network and CS network, respectively. The signalling path based on multi-connection architecture provides technical implementations for the connection of the multimedia bearer path establishment, modification, release, etc.

6.3 Enhanced file transfer

The enhanced file transfer function allows the user to exchange different types of files during an ongoing or not ongoing session.

When the user receives the offered files, he or she is required to accept or reject them. The acceptance procedure shall include an indication about the receiving file size and type. The user shall have the ability to save the transferred files.

a) Enhanced file transfer related to the call:

During the ongoing call, this service provides the user with a file transfer service simultaneously. The call media and file transfer media are transmitted through different networks/accesses (e.g., the call media transfer through the 2G and file transfer media through 3G or WLAN). The CS call release terminates the file transfer session, but the file transfer session release does not affect the 2G-network call.

b) Enhanced file transfer unrelated to the call:

This function provides the user with a file transfer service independent of the call on multiple connections, e.g., via WLAN and 3G.

6.4 Enhanced content sharing

Enhanced content sharing is a service that provides the user with the ability to share different types of content, e.g., photo, video, music, etc.

Enhanced content sharing includes two scenarios: content sharing during a voice call and content sharing without a voice call.

a) Content sharing during a voice call:

In this scenario, the content sharing service is related to the call. It is automatically terminated upon call completion. The service is only provided to two parties, i.e., multiparty sharing is not supported. Both video and image sharing are unidirectional.

b) Content sharing without a voice call:

In this scenario, the content sharing service is independent of the call, therefore it is possible to use the content sharing service without a voice call. If the receiving user has multiple devices, the content sharing requests are sent to all those devices.

In addition, the user can decide to accept the shared content on a different device rather than the one he or she is using for the voice call, for instance, another device may have better display capabilities.

6.5 Enhanced messaging

Enhanced messaging provides the user with the ability to exchange text or multimedia messages.

Enhanced messaging includes two scenarios: call related enhanced messaging and call independent enhanced messaging.

Call related enhanced messaging services are supported by the multi-connection architecture; e.g., two parties send a multi-media message and the phone call is transmitted through the CS network, while the messages are transmitted through the PS network.

Enhanced messaging also supports standalone message function, one-to-one chat function and group chat function.

a) Standalone message:

The standalone message function may be considered as an evolution of SMS/MMS messaging services, because it provides better features; e.g., no restriction of message size, more content types, and display reports for text messages. It includes both text and multi-media messaging services and provides interworking capability with SMS/MMS.

b) One-to-one chat:

The one-to-one chat function enables users to exchange messages between two users instantly. It provides a more real-time experience. It includes delivery and display notifications, and allows reaching users while they are offline.

c) Group chat:

The group chat function enables users to exchange messages between several users instantly. It can be converted from one-to-one chat by adding new users.

7 Architecture of eMMTel over multi-connection

The diagram below presents the architecture of the eMMTel service over the multi-connection architecture; see [ITU-T Y.2027].