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LTE;  
5G;  
IMS Multimedia telephony communication service and  
supplementary services;  
Stage 3  
(3GPP TS 24.173 version 15.4.0 Release 15)**



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# Foreword

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# 1 Scope

The present document provides the protocol details for multimedia telephony communication service and associated supplementary services in the IP Multimedia (IM) Core Network (CN) subsystem based on the requirements from 3GPP TS 22.173 [2].

Multimedia telephony and supplementary services allow users to establish communications between them and enrich that by enabling supplementary services.

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# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications"
- [2] 3GPP TS 22.173: "IP Multimedia Core Network Subsystem (IMS) Multimedia Telephony Service and supplementary services; Stage 1"
- [3] 3GPP TS 24.604: "Communication Diversion (CDIV); Protocol specification using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification "
- [4] 3GPP TS 24.605: "Conference (CONF) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".
- [5] 3GPP TS 24.606: "Message Waiting Indication (MWI) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".
- [6] 3GPP TS 24.607: "Originating Identification Presentation (OIP) and Originating Identification Restriction (OIR) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".
- [7] 3GPP TS 24.608: "Terminating Identification Presentation (TIP) and Terminating Identification Restriction (TIR) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".
- [8] 3GPP TS 24.610: "Communication HOLD (HOLD) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".
- [9] 3GPP TS 24.611: "Anonymous Communication Rejection (ACR) and Communication Barring (CB) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".
- [10] 3GPP TS 24.629: "Explicit Communication Transfer (ECT) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".
- [11] 3GPP TS 24.623: "Extensible Markup Language (XML) Configuration Access Protocol (XCAP) over the Ut interface for Manipulating Simulation Services".
- [12] 3GPP TS 26.114: "IP Multimedia Subsystem (IMS); Multimedia telephony; Media handling and interaction".
- [13] 3GPP TS 24.229: "Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3".



- [14] 3GPP TS 24.247: "Messaging using the IP Multimedia (IM) Core Network (CN) subsystem; Stage 3".
- [15] Void
- [16] IETF RFC 3841 (August 2004): "Caller Preferences for the Session Initiation Protocol (SIP)".
- [17] 3GPP TS 24.647: "Advice Of Charge (AOC) using IP Multimedia (IM)Core Network (CN) subsystem; Protocol Specification".
- [18] 3GPP TS 24.654: "Closed User Group (CUG) using IP Multimedia (IM) Core Network (CN) subsystem, Protocol Specification".
- [19] 3GPP TS 24.239: "IP Multimedia Subsystem (IMS) Flexible alerting supplementary service".
- [20] 3GPP TS 24.238: "Session Initiation Protocol (SIP) based user configuration; stage 3".
- [21] 3GPP2 C.S0055-A: "Packet Switched Video Telephony Services".
- [22] ETSI TS 181 005: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Service and Capability Requirements".
- [23] 3GPP TS 24.615: "Communication Waiting (CW) using IP Multimedia (IM) Core Network (CN) subsystem, Protocol Specification".
- [24] 3GPP TS 24.642: "Completion of Communications to Busy Subscriber (CCBS) Completion of Communications by No Reply (CCNR) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".
- [25] 3GPP TS 24.182: "IP Multimedia Subsystem (IMS) Customized Alerting Tones (CAT); Protocol specification".
- [26] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification".
- [27] 3GPP TS 24.183: "IP Multimedia Subsystem (IMS) Customized Ringing Signal (CRS); Protocol specification".
- [28] IETF RFC 3362 (August 2002): "Real-time Facsimile (T.38) - image/t38 MIME Sub-type Registration".
- [29] 3GPP TS 24.259: "Personal Network Management (PNM); Stage 3".
- [30] 3GPP TS 24.390: "Unstructured Supplementary Service Data (USSD) using IP Multimedia (IM) Core Network (CN) subsystem IMS; Stage 3".
- [31] IETF RFC 6809 (November 2012): "Mechanism to Indicate Support of Features and Capabilities in the Session Initiation Protocol (SIP)".
- [32] 3GPP TS 24.167: "3GPP IMS Management Object (MO); Stage 3".
- [33] 3GPP TS 23.221: "Architectural requirements".
- [34] Void.
- [35] 3GPP TS 24.628: "Common Basic Communication procedures using IP Multimedia (IM) Core Network (CN) subsystem; Protocol Specification".
- [36] 3GPP TS 24.275: "Management Object (MO) for basic communication part of IMS multimedia telephony (MMTEL) communication service".
- [37] 3GPP TS 22.011: "Service accessibility".
- [38] 3GPP TS 31.102: "Characteristics of the Universal Subscriber Identity Module (USIM) application".

- [39] 3GPP TS 24.196: "Technical Specification Group Core Network and Terminals; Enhanced Calling Name".
- [40] 3GPP TS 24.008: "Mobile Radio Interface Layer 3 specification; Core Network Protocols; Stage 3".
- [41] 3GPP TS 23.122: "Non-Access-Stratum functions related to Mobile Station (MS) in idle mode".
- [42] 3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".

## 3 Definitions, symbols and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TS 21.905 [1] apply.

**MMTEL voice:** a multimedia telephony communication session as described in subclause 5.2 with only audio or only real-time text or only both audio and real-time text.

**MMTEL video:** a multimedia telephony communication session as described in subclause 5.2 with video.

For the purposes of the present document, the following terms and definitions given in 3GPP TS 22.011 [37] apply:

**3GPP PS data off**  
**3GPP PS data off exempt service**

For the purposes of the present document, the following terms and definitions given in 3GPP TS 24.229 [13] apply:

**3GPP PS data off status**

For the purposes of the present document, the following terms and definitions given in 3GPP TS 23.122 [41] apply:

**Equivalent Home PLMN (EHPLMN)**  
**Home PLMN (HPLMN)**  
**Visited PLMN (VPLMN)**

For the purposes of the present document, the following terms and definitions given in 3GPP TS 24.501 [42] apply:

**NG-RAN**

### 3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

CS	Circuit Switched
CN	Core Network
ICSI	IMS Communication Service Identifier
IP	Internet Protocol
IM	IP Multimedia
MMTEL	Multimedia Telephony
NG-RAN	Next Generation Radio Access Network
PS	Packet Switched
UDP	User Datagram Protocol
UDPTL	UDP Transport Layer

## 4 Overview of multimedia telephony communication service and associated supplementary services in the IP Multimedia (IM) Core Network (CN) subsystem

### 4.1 General

In accordance with the service definition and requirements in 3GPP TS 22.173 [2], the IMS multimedia telephony communication service specified herein allows multimedia conversational communication between two or more end points. An end point is typically located in a UE, but can also be located in a network entity.

As for traditional circuit-switched telephony, the protocols for the IMS multimedia Telephony communication service allow a user to connect to any other user, regardless of operator and access technology.

The IMS multimedia Telephony communication service consists of two principal parts: a basic communication part, and an optional supplementary services part.

#### 4.1A Roles

##### 4.1A.1 Multimedia telephony participant

A UE shall implement the role of a multimedia telephony participant.

##### 4.1A.2 Multimedia telephony application server

An application server shall implement the role of a multimedia telephony application server. Various application server usages are called out by references to the various supplementary services, see subclause 4.3. It is an implementation decision on how to allocate the functionality to one or more application servers.

### 4.2 Overview of basic communication part

The basic communication part of an IMS multimedia telephony communication service session is realised by a single SIP session. It utilises media capabilities and flexibility provided by the SIP protocol and the 3GPP IMS specifications. In accordance with the service definition in 3GPP TS 22.173 [2], media capabilities include RTP-based transfer of voice, real-time video, real-time text and data, and UDPTL-based transfer of fax (IETF RFC 3362 [28]), as well as TCP/MSRP-based transfer of text, arbitrary files and sharing of media files with predefined formats.

To ensure interoperability, media handling (including codecs and formats) is fully specified for RTP-based and MSRP-based transfer in:

- 3GPP TS 26.114 [12] for 3GPP systems;
- 3GPP2 C.S0055-A [21] for 3GPP2 systems; and
- ETSI TS 181 005 [22] (codecs) and 3GPP TS 26.114 [12] (formats and other media handling) for fixed-broadband accesses.

The service is highly dynamic in terms of media component usage: the protocols allow a communication session to start with one or more media components, and components can then be added and/or removed during the communication session. The protocols allow both one-way and two ways transfer between end points. Full duplex speech, and speech combined with other media components, are typical media cases but the protocols do not mandate the use of speech in all sessions.