

**Telecommunications and Internet Protocol  
Harmonization Over Networks (TIPHON) Release 5;  
Service Capability Definition;  
Service Capabilities for a Multi Media Call**

---



---

Reference

RTR/TISPAN-02015-TIPHON\_R5

---

Keywords

IP, service, telephony, VoIP

**ETSI**

650 Route des Lucioles  
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C  
Association à but non lucratif enregistrée à la  
Sous-Préfecture de Grasse (06) N° 7803/88

---

**Important notice**

Individual copies of the present document can be downloaded from:

<http://www.etsi.org>

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at

<http://portal.etsi.org/tb/status/status.asp>

If you find errors in the present document, send your comment to:

[editor@etsi.org](mailto:editor@etsi.org)

---

**Copyright Notification**

No part may be reproduced except as authorized by written permission.  
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2004.  
All rights reserved.

**DECT™**, **PLUGTESTS™** and **UMTS™** are Trade Marks of ETSI registered for the benefit of its Members.  
**TIPHON™** and the **TIPHON logo** are Trade Marks currently being registered by ETSI for the benefit of its Members.  
**3GPP™** is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

# Contents

Intellectual Property Rights .....	5
Foreword.....	5
Introduction .....	5
1 Scope .....	6
2 References .....	6
3 Definitions and abbreviations.....	6
3.1 Definitions .....	6
3.2 Abbreviations .....	7
4 Service capability model .....	7
4.1 Groupings .....	7
4.2 Other entities in the model .....	7
4.2.1 TIPHON User .....	7
5 Profile service capabilities.....	8
5.1 Profile data element.....	8
5.1.1 Profile .....	8
5.2 Service capabilities.....	8
5.2.1 Register .....	8
5.2.2 Attach.....	8
5.2.3 Authenticate .....	9
5.2.4 Get user status .....	9
5.2.5 Deregister.....	9
5.2.6 Transfer.....	9
5.2.7 Authorize .....	9
5.2.8 Set user status .....	9
5.2.9 Interrogate location .....	9
5.2.10 Update location.....	9
5.2.11 Update service status .....	9
5.2.12 Add service to profile .....	9
5.2.13 Remove service from profile .....	9
6 Call service capabilities.....	10
6.1 Overview .....	10
6.2 Call attribute definitions .....	10
6.2.1 Call Identity .....	10
6.2.2 Call descriptor.....	10
6.2.3 Call charge record.....	11
6.2.4 Call data record.....	11
6.3 Service capabilities.....	11
6.3.1 Call setup .....	11
6.3.2 Call identity delivery .....	11
6.3.3 Modify destination.....	11
6.3.4 Modify call priority.....	11
6.3.5 Call clear-down .....	12
6.3.6 Call join .....	12
6.3.7 Interrogate call .....	12
7 Bearer service capabilities.....	12
7.1 Overview .....	12
7.2 Bearer information elements .....	12
7.2.1 Bearer identity .....	12
7.2.2 Bearer descriptor.....	12
7.3 Bearer service capabilities.....	13
7.3.1 Create.....	13

7.3.2	Modify .....	14
7.3.3	Delete.....	14
7.3.4	Join.....	14
8	Media service capabilities .....	14
8.1	Media data attributes .....	14
8.1.1	Media descriptor .....	14
8.2	Media service capabilities .....	14
8.2.1	Set media encode .....	14
8.2.2	Clear media encode.....	14
9	Message service capabilities .....	15
9.1	Message data elements .....	15
9.2	Service capabilities.....	15
9.2.1	Create message .....	15
9.2.2	Message retrieve .....	16
9.2.3	Set message status.....	16
9.2.4	Get message status.....	16
9.2.5	Delete message .....	16
10	Event handler service capabilities .....	16
10.1	Event handler data elements.....	16
10.1.1	Event identity.....	16
10.1.2	Event descriptor .....	16
10.2	Service capabilities.....	17
10.2.1	Set condition .....	17
10.2.2	Clear condition.....	17
History	.....	18

---

## Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<http://webapp.etsi.org/IPR/home.asp>).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

---

## Foreword

This Technical Report (TR) has been produced by ETSI Technical Committee Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN).

---

## Introduction

This edition of TS 101 878 differs from previous editions in the following key areas:

- It has been modified to technical report format.
- Only textual descriptions of the capabilities are given serving as requirements for the definition of the service capabilities in meta-protocol using semi-formal tools (UML, ASN.1, SDL where appropriate).
- Service capabilities have been added to better support harmonization with the service suite of UMTS.
- Attribute names have been reviewed for consistency and presented in plain English (i.e. no programming constructs are used).

---

# 1 Scope

The present document, specifies the requirements for the range of service capabilities necessary to implement the services identified in TR 101 301 [1]. Service capabilities are invoked either singly or in combination by independent applications to construct recognized or novel communication services.

The requirements expressed in the present document apply to all TIPHON-compliant products and are realized in the service capability meta-protocols specified in TS 101 882 [2].

---

# 2 References

For the purposes of this technical report (TR) the following references apply:

- [1] ETSI TR 101 301: "Telecommunications and Internet Protocol Harmonization over Networks (TIPHON) Release 3; Release Definition; TIPHON Release 3 Definition".
- [2] ETSI TS 101 882: "TIPHON Release 5; Protocol Framework Definition and Interface Requirement Definition; General".
- [3] ITU-T Recommendation E.164: "The international public telecommunication numbering plan".
- [4] ETSI TS 123 228: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); IP Multimedia Subsystem (IMS); Stage 2 (3GPP TS 23 228 version 5.10.0 Release 5)".
- [5] IETF RFC 2543: "SIP: Session Initiation Protocol."
- [6] ITU-T Recommendation H.323: "Packet-based multimedia communications systems".
- [7] ETSI TS 102 165-2: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 4; Protocol Framework Definition; Methods and Protocols for Security; Part 2: Counter Measures".
- [8] ETSI TS 101 329-2: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 3; End-to-end Quality of Service in TIPHON systems; Part 3: Signalling and control of end-to-end Quality of Service (QoS)".

---

# 3 Definitions and abbreviations

## 3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

**service application:** technical description which, when combined with a commercial arrangement, specifies a service

**service capability:** specified function that is used either alone or in combination with other service capabilities to realize a complete service application

NOTE: A single service capability may be used in more than one service application.

## 3.2 Abbreviations

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

ASN.1	Abstract Syntax Notation 1
EMTEL	EMERgency TELecomunications
IMS	IP Multi-media Subsystem
ISDN	Integrated Services Digital Network
QoS	Quality of Service
SDL	Specification and Description Language
SIP	Session Initiation Protocol
SpOa	Service point of Attachment
UML	Unified Modelling Language
UMTS	Universal Mobile Telephony Service
VPN	Virtual Private Network

---

## 4 Service capability model

### 4.1 Groupings

Service capabilities are grouped according to the information they manipulate.

Analysis of the suite of services required for the support of UMTS-IMS (ETSI TS 123 228 [4]) and examination of the current provision of those services in the ISDN and the Internet for SIP: RFC 2543 [5] and ITU-T Recommendation H.323 [6]), suggest that the following groupings of service capabilities are required:

- Profile: the information and actions required to support operations on the user profile, e.g. registration and authentication.
- Call: the information and actions required for the establishment, modification, and clearing of a multi-media connection between two (or more) users, e.g. call setup and call release.
- Bearer: the information and actions required for control of connection based service domain operations, e.g. create and join.
- Media: the information and actions required to enable communications payload encoding and characterization, e.g. allocate media encoding.
- Message: the information and actions required for control of message handling in the service domain, e.g. storage and retrieval.
- Event handler: the information and actions required to capture events and trigger responses to those events.

### 4.2 Other entities in the model

#### 4.2.1 TIPHON User

The TIPHON user is an entity, generally outside of the TIPHON model, that initializes and terminates transactions such as telephone calls.

**NOTE:** Although there are signals required to be sent to the user these do not form capabilities as defined in other parts of the present document. Therefore other than recognizing the existence of the TIPHON user as an entity in the system that uses service capabilities no further specification of the TIPHON user is given.

---

## 5 Profile service capabilities

The profile group contains those service capabilities required to examine, establish or modify data relating to the provision of services against a named user.

### 5.1 Profile data element

#### 5.1.1 Profile

The profile contains the following data elements:

- Current location of the user.
- Current status of the user, e.g. busy, reachable, not-reachable.
- The identity of the user to whom the profile refers (may be considered as profile owner).
- Authentication data. Specific details of this element are to be found in TS 102 165-2 [7].
- A list of services to which the user can be attached.

For each service in the list of services there is also a "service descriptor" element that defines additional elements specific to the service:

- Service name:
  - Identifies the service.
- Service status:
  - Indicates the status of each service (may be different from the overall status found in the "Current status" element).
- Service authorization:
  - Used to verify the authorization of the user to use the service.
- Service provider identity:
  - Indicates the identity of the server providing the service (the identity of the Service point of Attachment (SpoA)).
- Service specific parameters:
  - Additional data maintained in the profile that may be used to shape how the service is hosted (and may be used to populate bearer or call descriptors when combined in a particular application). An example may be the "forwarded to number" information for call forwarding services.

### 5.2 Service capabilities

#### 5.2.1 Register

The *register* service capability allows a user to activate the profile and to request the provision of a specific service at a specific location. If successful the user receives service attachment credentials including the identity of the SpoA.

#### 5.2.2 Attach

The *attach* service capability allows the user to attach to a service provider using credentials received during registration.



### 5.2.3 Authenticate

The *authenticate* service capability formally validates the identity of a user or service provider.

### 5.2.4 Get user status

The *get user status* service capability allows an authorized user to query the current status of a user (the requesting user or another).

### 5.2.5 Deregister

The *deregister* service capability terminates the user registration.

### 5.2.6 Transfer

The *transfer* service capability moves a users profile from one location to another.

### 5.2.7 Authorize

The *authorize* service capability is used to establish a users permission to use a specified service.

### 5.2.8 Set user status

The *set user status* service capability allows a user to change the current status of a user profile (where the status may take a number of values including Available, Do-not-disturb, Not available).

### 5.2.9 Interrogate location

The *interrogate location* service capability returns the current location maintained in the profile belonging to the user identified as its owner.

### 5.2.10 Update location

The *update location* service capability updates the current location maintained in the profile belonging to the user identified as its owner.

### 5.2.11 Update service status

The *update service status* service capability modifies the service status where the service status may take values including available and unavailable.

### 5.2.12 Add service to profile

The *add service to profile* service capability adds a service to the profile of the user.

### 5.2.13 Remove service from profile

The *remove service from profile* service capability removes a service from the profile of the user.

---

## 6 Call service capabilities

### 6.1 Overview

The call group contains those service capabilities required to manage an end-to-end connection between two parties, or between many parties, where the topology of the connection may be point-to-point, point-to-multipoint, broadcast and/or point-to-multipoint.

### 6.2 Call attribute definitions

#### 6.2.1 Call Identity

A call identity is assigned when a call is established and is used as a unique identifier of the call in subsequent operations. The call identity may include additional attributes to qualify the identity (e.g. operator verified, user supplied).

#### 6.2.2 Call descriptor

The call descriptor identifies and specifies the call using the following attributes:

- Call Type:
  - Variation of simple call type that may have extended or modified behaviour.
- Called User Identifier:
  - Identity of the called party. May be of numeric, alpha or alphanumeric format.
- Calling User Identifier:
  - Identity of the calling party. May be of numeric, alpha or alphanumeric format.
- Identity Presentation Restriction Indication:
  - Indicator of whether the calling party identity should be offered to the called party
- Priority:
  - Priority to be used for call processing/retention. Used, for example, in emergency calls (e112) and EMTEL calls
- QoS Service Class:
  - As defined in TS 101 329-2 [8], offered as a shorthand for user to network signalling
- Redirect To Address:
  - Destination of calls being redirected using the redirect capability.
- Return Party User Identifier:
  - Used to replace the calling users identity with a preferred identity for return calls

NOTE: Requires identity to be presented to called party.

- Service Provider Preference: Used to indicate a preference for service provider. May be used to join a VPN too.

### 6.2.3 Call charge record

A call charge record contains data relating to the current cost of a call (for use during or after a call) or to the balance available (on a pre-paid account for example) and contains the following elements (not all of which will be required in each transaction):

- Call identity.
- Start time.
- Charge rate.
- Stop time.
- Call charge.
- Account balance.

### 6.2.4 Call data record

A call data record is used for auditing or accounting purposes and contains the following elements (not all of which will be required in each transaction):

- Call identity.
- Start time.
- Stop time.
- Calling user identity.
- Called user identity.

## 6.3 Service capabilities

### 6.3.1 Call setup

The *call setup* service capability establishes a call between two end points. The established call shall be characterized by the information elements in the supplied call descriptor.

On completion, the *call setup* service capability shall provide the invoking application with a unique identity to be used in all subsequent service capability invocations related to the established call.

### 6.3.2 Call identity delivery

The *call identity delivery* service capability delivers to an authorized user the identity of a party involved in an establishing or established call.

### 6.3.3 Modify destination

The *modify destination* service capability changes one of the end-points of a call to another called user address based upon an event (for example to change called party when called party is busy, to perform park and retrieve operations).

### 6.3.4 Modify call priority

The *modify call priority* service capability modifies the priority assigned to a call (may be used to set Emergency priority on a dialled call).

### 6.3.5 Call cleardown

The *call cleardown* service capability closes the call with the specified identity by removing the end-to-end connection.

### 6.3.6 Call join

The *call join* service capability joins two or more calls sharing a common end-point.

### 6.3.7 Interrogate call

The *interrogate call* service capability returns the value of a user-specific attribute such as the contents of the call charge record to the invoking user or application.

---

## 7 Bearer service capabilities

### 7.1 Overview

The bearer group contains those service capabilities required to manage a transport plane connection or set of transport plane connections (in the case of asymmetric and multi-point calls).

### 7.2 Bearer information elements

#### 7.2.1 Bearer identity

Assigned when a bearer is established and used as a unique identifier in subsequent deletion and join operations.

#### 7.2.2 Bearer descriptor

The bearer descriptor identifies and specifies the transport plane connection using the following attributes:

- Bearer type:
  - Identifies the format of the bearer. This may be one of the following: Unidirectional; Bidirectional symmetric; Bidirectional asymmetric.
- Communication configuration:
  - Describes the spatial arrangement for transferring information between two or more access points. It completes the structure associated with a telecommunication service as it associates the relationship between the access points involved and the flow of information between these access points and may take values including but not restricted to: point-to-point (default value in TIPHON); point-to-multipoint, broadcast.
- Establishment of communication:
  - Describes the mode of establishment of the bearer object and may take values including but not restricted to: on demand (default value in TIPHON for connection oriented services), reserved, permanent.
- Information transfer capability:
  - Describes the capability associated with the transfer of different types of information and may take a number of values including but not restricted to: unrestricted digital information, speech, 3,1 kHz audio, 7 kHz audio (unrestricted digital information with tones and announcements), 15 kHz audio, video.

- Information transfer mode:
  - Describes the operational mode for transferring (transporting and switching) user information and may take (at least) the following values: circuit, packet, ATM.
- Information transfer rate:
  - Describes either the bit rate (circuit mode) or the throughput (packet mode). It refers to the transfer of digital information at the access points.
- QoS parameters:
  - As defined in TS 101 329-2 [8], details the QoS in terms of delay, packet/bit rate, packet/bit loss rate, packet jitter, and the integrity requirement.
- Structure:
  - Refers to the capability to deliver information to the destination access point or reference point in a structure (e.g. time interval for circuit mode, service data unit for packet mode) that was presented in a corresponding signal structured at the origin (access point or reference point). This may take values including but not restricted to:
    - 8 kHz integrity;
    - service data unit integrity (for packet mode connections);
    - time slot sequence integrity (for TDM connections);
    - restricted differential time delay (for packet mode connections where jitter is observed);
    - unstructured.
- Type of user information:
  - Describes the user information presented to the bearer and may take values including but not restricted to:
    - speech;
    - sound;
    - text;
    - facsimile;
    - text-facsimile;
    - videotex;
    - video;
    - text-interactive;
    - SMS.

## 7.3 Bearer service capabilities

### 7.3.1 Create

The *bearer create* service capability establishes a bearer between two points for the purpose of carrying user data. The established bearer shall be characterized by the information elements in the supplied bearer descriptor.

On completion, the *bearer create* service capability shall provide the invoking application with a unique identity to be used in all subsequent service capability invocations related to the established bearer.

### 7.3.2 Modify

The *bearer modify* service capability modifies an established bearer.

### 7.3.3 Delete

The *bearer delete* service capability clears a previously established bearer and identified by its bearer identity.

### 7.3.4 Join

The *bearer join* service capability allows two or more bearers sharing a common end-point to be joined at that end-point.

---

## 8 Media service capabilities

The media group contains those service capabilities required to establish and teardown media encoding facilities.

### 8.1 Media data attributes

#### 8.1.1 Media descriptor

The media descriptor defines the media encoding requirement.

- Media type:
  - Identifies the form of presenting information to a user, e.g. voice, fax, video.

NOTE: This is equivalent to the "type of user information" element in the bearer grouping (see clause 7.2.2).

- Codec:
  - Contains the QoS parameters required to support a particular codec.

### 8.2 Media service capabilities

#### 8.2.1 Set media encode

The *set media encode* service capability establishes the media encoding and decoding requirements for a particular media type. These requirements shall be characterized by information elements in the supplied media attributes.

This service capability shall ensure that an appropriate media-encoder is allocated to the invoking application and shall return to that application the characteristics required to transport the requested media encoding. It shall also return a unique identifier which should be used in all subsequent service capability invocations related to the established media.

#### 8.2.2 Clear media encode

The *clear media encode* service capability releases any media encoding and decoding resources allocated by the *set media encode* service capability.

---

## 9 Message service capabilities

The message group contains those service capabilities required for control of message handling including storage, retrieval and maintenance.

### 9.1 Message data elements

The message is identified by the following data elements:

- Identifier:
  - Unique string identifying each message.
- Content type:
  - Indicates the form of the message. The message may be a signal (i.e. no additional content) or may contain some form of content (e.g. text, video).
- Contents:
  - Contains the data supplied as text and/or recorded media (e.g. voice) when the message is created.
- Owner:
  - Identifies the user for whom the message was intended at creation (addressee).
- Sender:
  - Identifies the user who creates the message.
- Timestamp:
  - Holds the date and time that the message was created.
- Status:
  - Identifies whether the message has been read or not.

### 9.2 Service capabilities

#### 9.2.1 Create message

The *create message* service capability creates a new message on request from a suitably authorized user or application. The message shall either be empty to indicate an event rather than to pass on information or contain the text and/or the media supplied by the invoking application. Once the message has been created, the following details of the message shall be sent to the intended recipient:

- Message senders' identity.
- Message content type:
  - Empty;
  - Dialed digits;
  - Text;
  - Media.
- Unique message identifier.

## 9.2.2 Message retrieve

The *message retrieve* service capability delivers the contents of an existing message to a suitable authorized user or application (normally the message recipient).

## 9.2.3 Set message status

The *set message status* service capability modifies the current status of an existing message. The only valid values of message status shall be "Read" and "Unread".

## 9.2.4 Get message status

The *get message status* service capability returns the current status of an existing message to a suitably authorized user or application.

## 9.2.5 Delete message

The *delete message* service capability removes an existing message on request from a suitably authorized user or application.

---

# 10 Event handler service capabilities

The event handler group contains those service capabilities required to track status and events occurring in different groups and to bind actions based upon these events.

## 10.1 Event handler data elements

### 10.1.1 Event identity

An event identity is assigned when a trigger condition is set up. The event identity is used to uniquely identify the established monitoring case described by the event descriptor.

### 10.1.2 Event descriptor

The event descriptor describes the event to be watched for and which service capabilities to invoke when it occurs. The event descriptor includes the following attributes:

- Monitored condition
  - The condition being monitored, this may be any state transition registered within the operation of any service capability of any of the other groups.
- Service capability to be invoked
  - The name of the service capability to be invoked when condition is triggered, this may be any service capability of any of the other groups.
- Service capability data
  - Describes the service capability to be invoked and gives all data necessary to invoke the service capability in the expected manner.



## 10.2 Service capabilities

### 10.2.1 Set condition

The *set condition* service capability sets a trigger based upon a condition related to the monitored group. The supplied event descriptor specifies the service capability to be invoked and the parameters to use when the condition is met.

A unique event identity identifying the installed event handler is returned to the invoking application, to be used in subsequent service capability invocations related to this event handler.

### 10.2.2 Clear condition

The *clear condition* service capability clears a previously set condition, identified by the supplied event identity.

---

## History

<b>Document history</b>		
V1.1.1	February 2002	Publication
V4.1.1	November 2003	Publication
V5.1.1	February 2004	Publication