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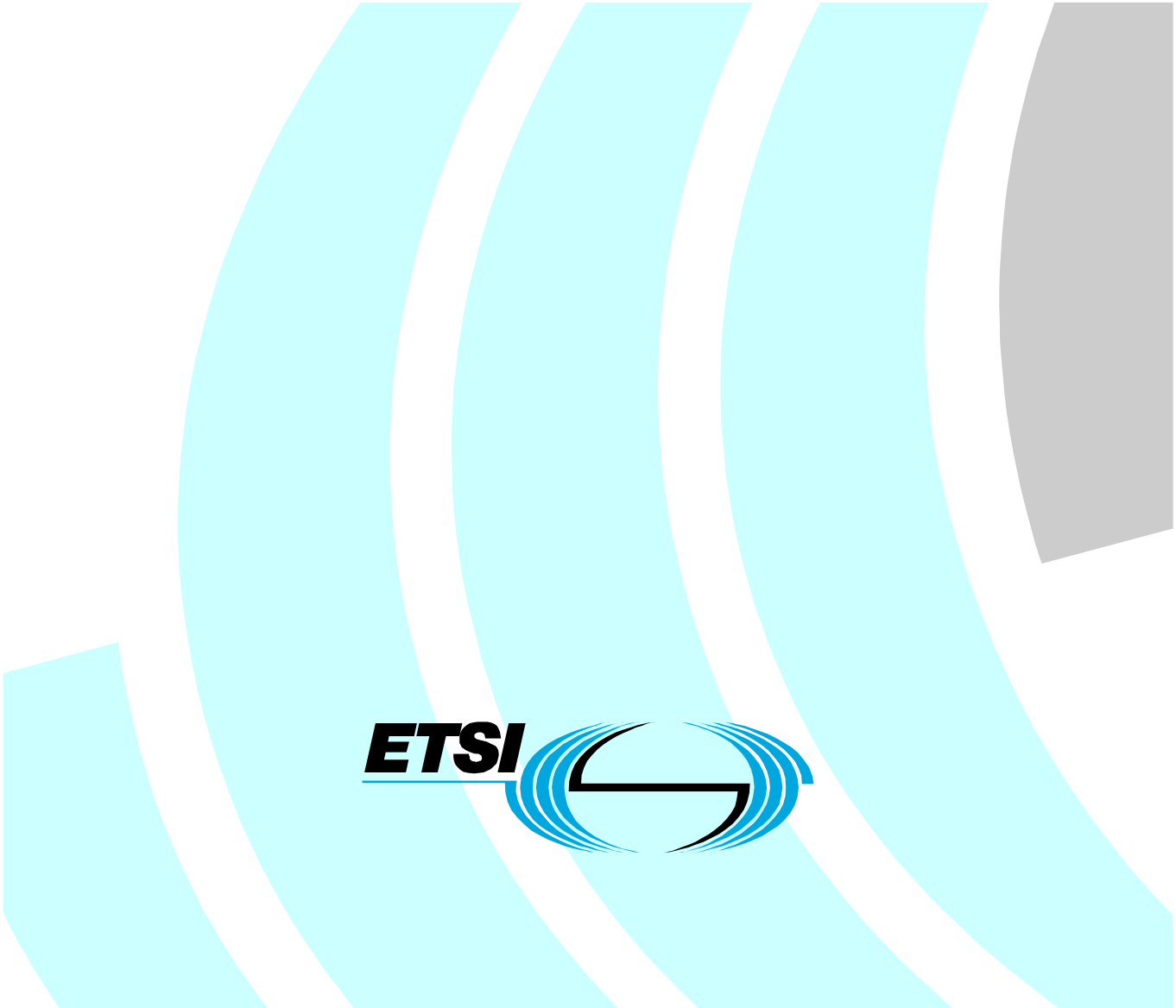
Technical Specification

Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); TIPHON/UMTS Harmonization: Guidelines for implementation of service capabilities



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Contents

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Foreword

This Technical Specification (TS) has been produced by ETSI Project Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON).

Introduction

The present document uses examples to show how TIPHON service capabilities can be used as building blocks to synthesize complete UMTS services, both basic services and supplementary services.

1 Scope

The present document specifies how UMTS IP Multimedia Subsystem (IMS) services can be realized using the TIPHON service capabilities specified in TS 101 878 [1] and TS 102 283 [2].

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 and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

[1] ETSI TS 101 878: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 4; Service Capability Definition; Service Capabilities for TIPHON Release 4".

[2] ETSI TS 102 283: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); TIPHON/UMTS Harmonization; Service capabilities for harmonization between TIPHON and 3G UMTS".

[3] ETSI TS 122 071: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Location Services (LCS); Stage 1 (3GPP TS 22.071)".

[4] ETSI TS 101 724: "Digital cellular telecommunications system (Phase 2+); Location Services (LCS); Functional description; Stage 2 (3GPP TS 03.71 Release 1999)".

[5] ETSI TR 129 998-6: "Universal Mobile Telecommunications System (UMTS); Open Service Access (OSA) Application Programming Interface (API) Mapping for Open Service Access; Part 6: User Location and User Status Service Mapping to MAP (3GPP TR 29.998-06 Release 5)".

3 Definitions and abbreviations

3.1 Definitions

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

bearer: logical association of functional entities in an IP telephony application and transport network which creates an end to end media flow for no longer than the duration of a call

domain: collection of physical or functional entities within an administrative domain which share a consistent set of policies and common technologies

end-user: entity using the services of an IP telephony service provider or transport network operator

interface: shared boundary between two communicating systems, devices or equipment

IP network: packet transport network comprising one or more transport domains each employing the IP protocol

IP telephony: any telephony related service that is supported on a managed IP Network

IP telephony service provider: service provider who offers IP telephony services

NOTE: The same business entity may act as both a transport network operator and an IP telephony service provider.

protocol: set of semantics, syntax and procedures, which govern the exchange of information across an interface

terminal: endpoint within the user equipment on which signalling and media flows originate and/or terminate

ticket: obtained through the registration session, when used in a call it provides the terminal/user with a means to show a valid registration exists

transport domain: collection of transport resources sharing a common set of policies, QoS mechanisms and transport technologies under the control of a transport network operator

transport network: collection of transport resources, which provide IP transport functionality

transport network operator: business entity operating a transport network

user equipment: equipment under the control of an end-user

user profile: service specific information about a user of a service application

3.2 Abbreviations

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

IMS	IP Multimedia Subsystem
IP	Internet Protocol
NUL	Network User Location
QoS	Quality of Service
UMTS	Universal Mobile Telecommunication System

4 Creation of services from service capabilities

The flexibility of the approach taken in TIPHON to define service capabilities rather than standardized services means that there may be many ways to construct the same potential service. The presentations of services in the present document are therefore examples that demonstrate the use of service capabilities and which do not emulate precisely the UMTS services.

4.1 Method overview

4.1.1 TIPHON Service capabilities

TS 101 878 [1] describes the set of TIPHON service capabilities and TS 102 283 [2] proposes additional service capabilities to complete the harmonization between TIPHON and UMTS. The full range of defined and proposed TIPHON service capabilities is as follows:

- Call:
  - setup;
  - clear down;
  - re-direct;
  - join;
  - identity delivery;
  - set priority;

- interrogate;
- location delivery;
- set condition;
- clear condition;
- route.

- Bearer:
  - optimize;
  - create;
  - delete;
  - modify;
  - join;
  - set condition;
  - clear condition.
- Profile:
  - register;
  - attach;
  - deregister;
  - detach;
  - authenticate;
  - authorize;
  - transfer;
  - set status;
  - get status;
  - set condition;
  - clear condition.
- Media:
  - clear media encode;
  - create transport;
  - clear transport;
  - set media encode.

- Message:
  - create;
  - retrieve;
  - delete;
  - set status;
  - get status.

4.2 Example of a multimedia service

The following example shows how TIPHON service capabilities may be used to construct a multimedia call.

4.2.1 Operation invocation sequence for the example multimedia call

Figure 1 shows the example multimedia call. It is important to note that this example shows how a non-standardized application may use TIPHON standardized service capabilities to synthesize an example multimedia service. Note that either User may be a UMTS user. Figure 1 conforms to the UML conventions for an operation invocation sequence diagram.

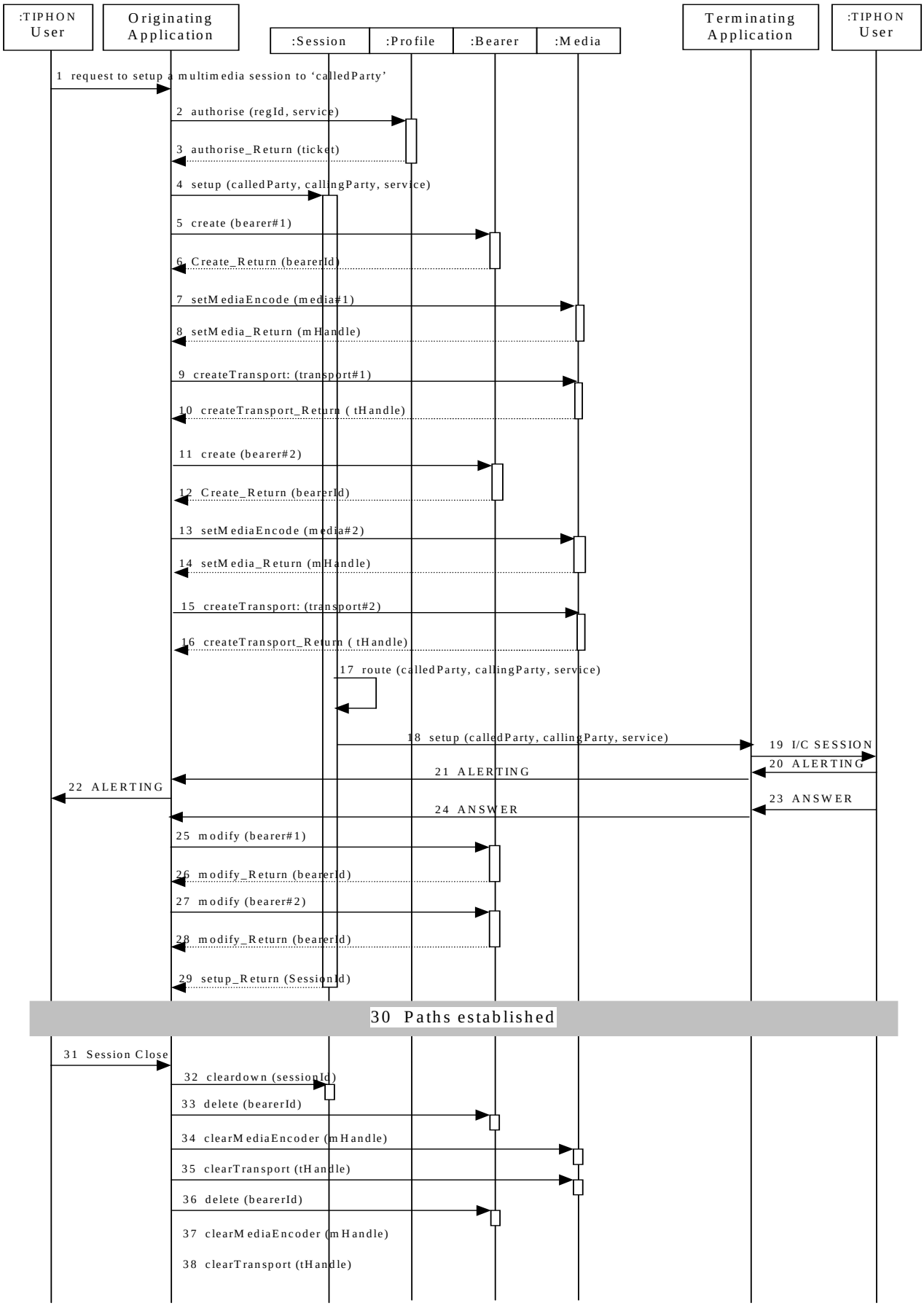

Figure 1: Example operation invocation sequence for the multimedia call

Table 1 describes the class object invocations for the multimedia call example. The parameters that are supplied to and returned by each operation are identified.

Table 1: Explanation of operation invocation sequences for an example call

#	Operation	class	Parameters	Comments
1				The TIPHON/UMTS User requests a session to a given called party
2	authorize	Profile	user identity, service capability to be authorized	
3	authorize_Return	Profile	authorization ticket	
4	Setup	Session	calling user identifier, called user identifier, session identity, service type, service provider preference, QoS service class, authorization token	
5	create	Bearer	bearer characteristics	This bearer is created for Medium#1
6	create_Return	Bearer	bearer identifier	This bearer is created for Medium#1
7	setMediaEncode	Media	media type, media attributes, transport characteristics	This media encoder is set for Medium#1
8	setMedia_Return	Media	media identifier	This media encoder is set for Medium#1
9	createTransport	Media	transport descriptor	This transport is created for Medium#1
10	createTransport_Return	Media	transport identifier	This transport is created for Medium#1
11	create	Bearer	bearer characteristics	This bearer is created for Medium#2
12	create_Return	Bearer	bearer identifier	This bearer is created for Medium#2
13	setMediaEncode	Media	media type, media attributes, transport characteristics	This media encoder is set for Medium#2
14	setMedia_Return	Media	media identifier	This media encoder is set for Medium#2
15	createTransport	Media	transport descriptor	This transport is created for Medium#2
16	createTransport_Return	Media	transport identifier	This transport is created for Medium#2
17	Route	Session	calling user identifier, called user identifier, service provider preference, QoS service class, next network name	Obtain routing for the next instance of session
18	setup	Session	calling user identifier, called user identifier, session identity, service type, service provider preference, QoS service class, bearer information	Next instance of setup
19				Terminating application informs called party terminal of an incoming session
20				Called party terminal informs the terminating application that the called user is being alerted
21				The terminating application informs the originating application that the called user is being alerted
22				The originating application informs the calling party that the called user is being alerted

#	Operation	class	Parameters	Comments
23				The called party answers the session and informs the terminating application
24				The terminating application informs the originating application that the called user has answered. This message may include the bearer information of the called party (Note that this information may be received in Alerting message)
25	Modify	Bearer	Bearer characteristics (address of called party, port identity, Codec)	This modifies the original bearer#1 created, and provides the bearer information of called party to calling party's bearer class.
26	Modify_Return	Bearer		The bearer modify is confirmed for bearer#1
27	Modify	Bearer	Bearer characteristics (address of called party, port identity, Codec)	This modifies the original bearer#2 created, and provides the bearer information of called party to calling party's bearer class.
28	Modify_Return	Bearer		The bearer modify is confirmed for bearer#2
29	setup_Return	Session	session identifier	
30				The path is established
31				The calling party closes the session
32	cleardown	Session	session identifier	The session for Media#1 and #2 is closed
33	delete	Bearer	bearer identifier	The bearer for Medium#1 is deleted
34	clearMediaEncode	Media	media identifier	The media encoder for Medium#1 is cleared
35	clearTransport	Media	transport identifier	The transport for Medium#1 is cleared
36	delete	Bearer	bearer identifier	The bearer for Medium#2 is deleted
37	clearMediaEncode	Media	media identifier	The media encoder for Medium#2 is cleared
38	clearTransport	Media	transport identifier	The transport for Medium#2 is cleared

4.3 UMTS location service

The UMTS location service determines (TS 122 071 [3]), stores and provides access to a set of information pertaining to the location of a user. Whilst various methods are described in UMTS specifications for location determination (TS 101 724 [4]), these are outside the scope of TIPHON/UMTS harmonization. This example addresses access to (geodetic) Location Information. The Network User Location (NUL) described in TR 129 998-6 [5] provides location information, based on network-related information. Using the NUL functions, an application programmer can request the VLR number, the Location Area Identifier, geodetic Location Information and the Cell Global Identification and other mobile telephony specific location information, if the network is able to support the corresponding capability. The geodetic Location Information is technology independent and the following example shows how the TIPHON service capabilities may be used to construct a location service.

4.3.1 Operation invocation sequence for the location service

Figure 2 shows the operation invocation sequence for the UMTS location service (TS 122 071 [3]) showing how it could be synthesized using TIPHON service capabilities.

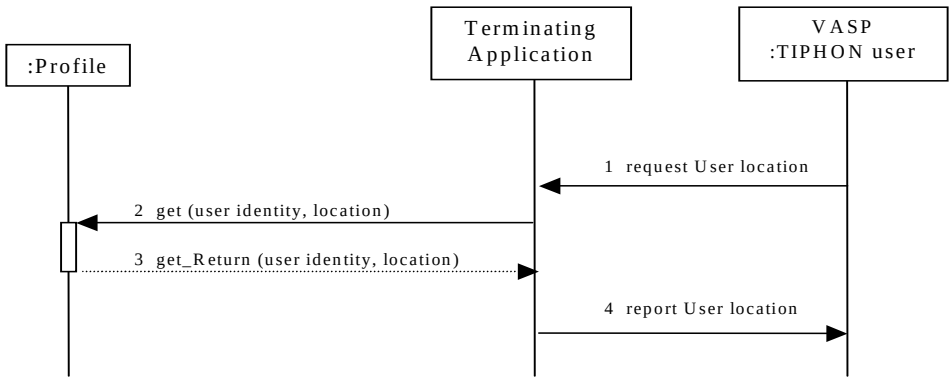

Figure 2: Example operation invocation sequence for the location service

Table 2: Explanation of the operation invocations

#	Operation	Class	Parameters	Comments
1				The location of the service provider's service user is requested
2	get	Profile	user identifier, location	
3	get_Return	Profile	user identifier, location, time of location data, location uncertainty	
4				The Service Provider is informed of the location of the service provider's service user

Periodic location reporting could be realized using a similar method.

4.4 Location Based Information services

Location-Based Information services allow subscribers to access information for which the information is filtered and tailored based on the location of the requesting user. Service requests may be initiated on demand by subscribers, or automatically when triggering conditions are met, and may be a singular request or result in periodic responses.

The following subsections provide some examples of possible location based information services.

4.4.1 Navigation example

A three-part navigation example has been selected to show a location based information service. In the example described below, a graphic map is provided to the traveller prior to the commencement of the journey, and updates to the route are made (possibly using a messaging service) during the journey so as to guide the traveller away from traffic congestion.

The scenario begins by the user requesting his service provider give him details of a route from his current location to his chosen destination. The journey may involve places where there is a potential for traffic congestion. The user receives from the service provider the appropriate instructions for the journey and these instructions are downloaded into the user's computer. As an option, the service provider may request the terminal characteristics determined during registration.

The scenario continues with the user changing his status to bar incoming multimedia sessions and by sending a message to the service provider informing him that he is ready to commence the journey. To track the movement of the user, the service provider requests the current location of the user on a frequent basis e.g. every few minutes. The User's computer makes use of the location data to guide the user along the previously supplied route.

The scenario finishes when there is a traffic congestion that has developed further along the route. The service provider is continuously aware of the location of the user (by frequently requesting the location of his service user) and is able to revise the route to find an alternative to avoid the congestion. The user is informed of the route change and the updated guidance information can be e.g. plain text, symbols with text information (e.g. turn + distance) or symbols on the map display or be given as verbal instructions to aid navigation. All these latter operations are options in the service offered by the service provider.

The navigation example scenario has been selected to illustrate how the capabilities proposed for TIPHON/UMTS harmonization as described in TS 101 878 [1] and TS 102 283 [2] can be used to construct a location based information service (TS 122 071 [3]). It should be noted that whilst UMTS does not specify the detailed operation of a location based information service, this example described in the present document has been developed to show characteristics of the service.

The navigation application is used to guide the user to his/her destination. The destination can be input to the terminal, which gives guidance how to reach the destination. The guidance information can be e.g. plain text, symbols with text information (e.g. turn + distance) or symbols on the map display. The instructions may also be given verbally to the users by using a voice call.

The navigation example can be accomplished through carrying a mobile terminal that has location technology capabilities down to a few feet. In UMTS, this service can either be menu driven from a handset using SIM Application Toolkit or a WAP based terminal with a map application running - similar to a GPS system. A central server may handle all mapping of locations, and may save specific locations (i.e. favourite fishing holes) TS 122 071 [3].

4.4.2 Operation invocation sequence for part 1 navigation example

The scenario begins by the user requesting his service provider give him details of a route from his current location to his chosen destination. The journey may involve places where there is a potential for traffic congestion. The user receives from the service provider the appropriate instructions for the journey and these instructions are downloaded into the user's computer.

Figure 3 shows the operation invocation sequence for part 1 of the example dynamic route finder service showing how it could be synthesized using TIPHON and UMTS service capabilities. Figure 3 conforms to the UML conventions for an operation invocation sequence diagram.

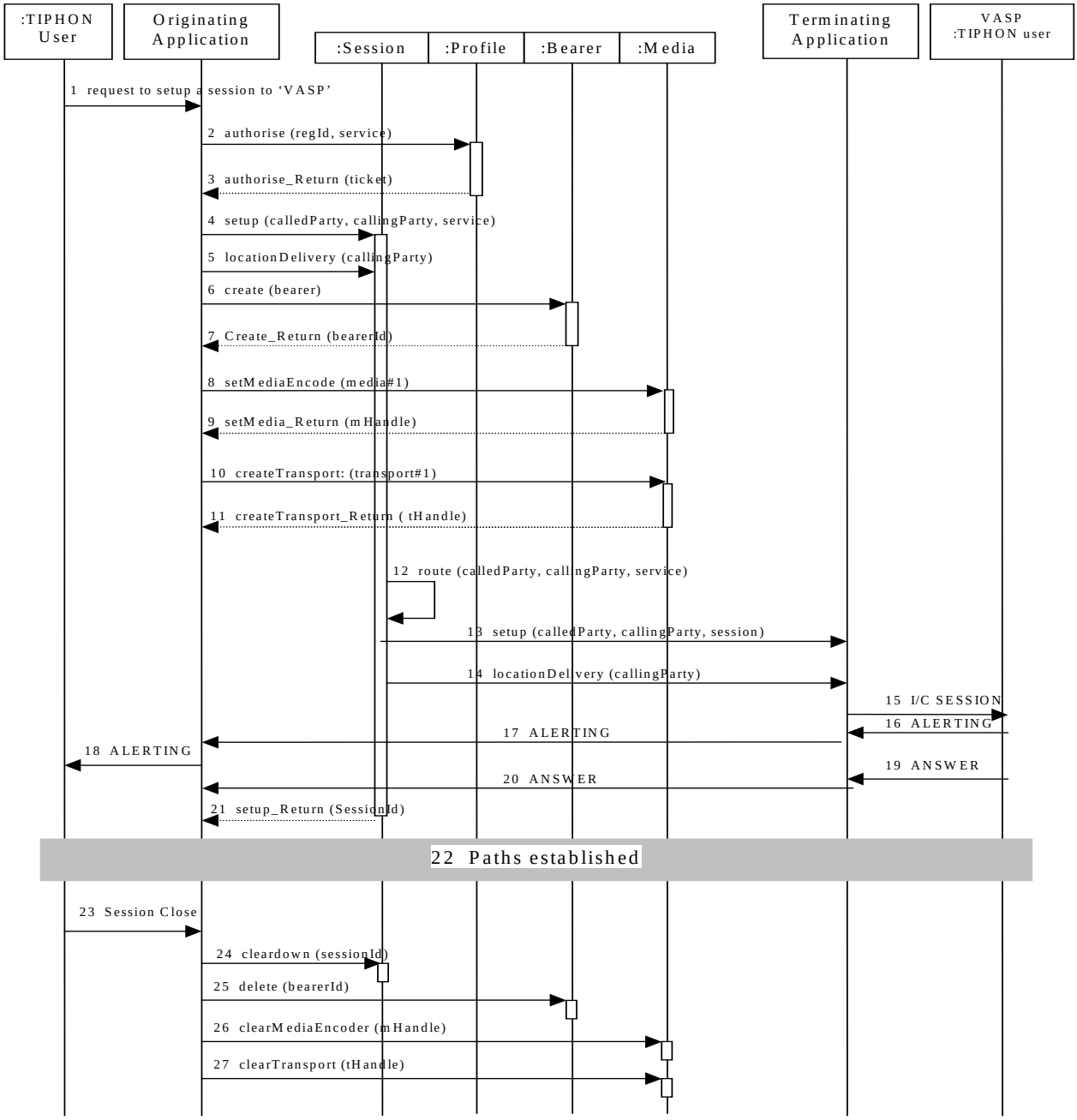

Figure 3: Example operation invocation sequence for part 1 of the service

Table 3: Explanation of the operation invocations

#	Operation	Class	Parameters	Comments
1				The TIPHON/UMTS User (calling user) requests a location-based service to a service provider (called user)
2	authorize	Profile	user identity, service capability to be authorized	
3	authorize_Return	Profile	authorization ticket	
4	setup	Session	calling user identifier, called user identifier, session identity, service type, service provider preference, QoS service class	
5	locationDelivery	Session	calling user identifier, location, time of location data, location uncertainty	The location information stored in the user profile is included in the location delivery operation
6	create	Bearer	bearer characteristics	
7	create_Return	Bearer	bearer identifier	
8	setMediaEncode	Media	media type, media attributes, transport characteristics	A media encoder may be required
9	setMedia_Return	Media	media identifier	
10	createTransport	Media	transport descriptor	
11	createTransport_Return	Media	transport identifier	
12	route	Session	calling user identifier, called user identifier, service provider preference, QoS service class, next network name	
13	setup	Session	calling user identifier, called user identifier, session identity, service type, service provider preference, QoS service class	Next instance of setup
14	locationDelivery	Session	calling user identifier, location, time of location data, location uncertainty	Next instance of locationDelivery
15				Terminating application informs service provider of an 'incoming session'
16				The service provider platform informs the terminating application that the service provider is being alerted
17				The terminating application informs the originating application that the service provider is being alerted
18				The originating application informs the service user that the service provider is being alerted
19				The service provider answers the session and informs the terminating application
20				The terminating application informs the originating session class that the service provider has answered
21	setup_Return	Session	Session identifier	

#	Operation	Class	Parameters	Comments
22				The path is established. On receipt of the service request and location information, the service provider responds with the necessary information to the service user.
23				The service user closes the session
24	cleardown	Session	session identifier	Session cleared
25	delete	Bearer	Bearer identifier	Bearer deleted
26	clearMediaEncode	Media	Media identifier	Media encoder deleted
27	clearTransport	Media	transport identifier	Transport deleted

4.4.3 Operation invocation sequence for part 2 of the navigation example

The scenario (part 2) continues with the user changing his status to bar incoming multimedia sessions and by sending a message to the service provider informing him that he is ready to commence the journey. To track the movement of the user, the service provider requests the current location of the user on a frequent basis e.g. every few minutes. The User's computer makes use of the location data to guide the user along the previously supplied route.

Figure 4 shows the operation invocation sequence for part 2 of the example dynamic route finder service showing how it could be synthesized using TIPHON and UMTS service capabilities.

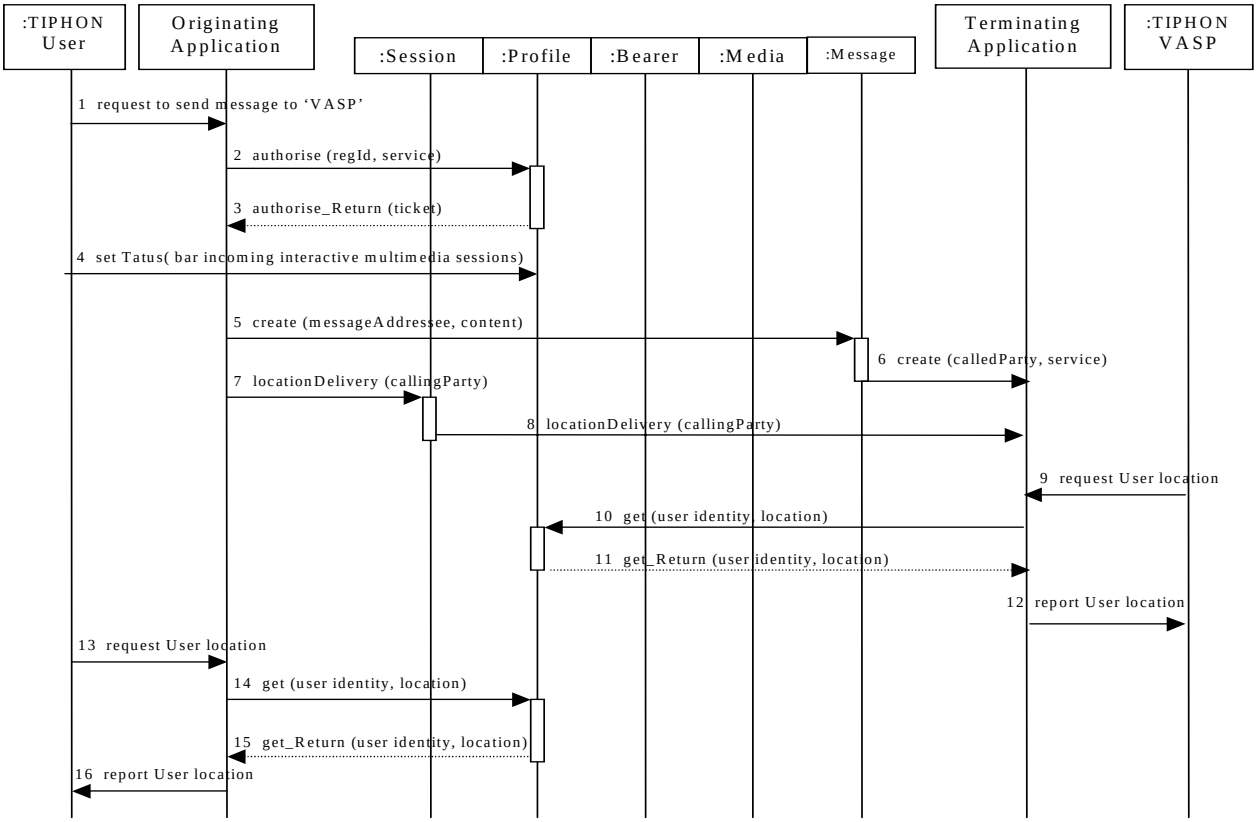

Figure 4: Example operation invocation sequence for part 2 of the service

Table 4: Explanation of the operation invocations

#	Operation	Class	Parameters	Comments
1				The TIPHON/UMTS User (calling user) requests to send a message to the service provider (called user)
2	authorize	Profile	user identity, service capability to be authorized	
3	authorize_Return	Profile	authorization ticket	
4	setStatus	Profile	User identity, value to be set	To bar incoming multimedia sessions but still allow voice calls
5	create	Message	Message contents, message addressee, message sender	
6	create	Message	Message contents, message addressee, message sender	
7	locationDelivery	Session	calling user identifier, location, time of location data, location uncertainty	
8	locationDelivery	Session	calling user identifier, location, time of location data, location uncertainty	Next instance of locationDelivery
9				After a given interval determined by the service provider, the location of the service provider's service user is requested
10	get	Profile	user identifier, location	
11	get_Return	Profile	user identifier, location, time of location data, location uncertainty	
12				The Service Provider is informed of the location of the service provider's service user
13				The Service Provider's service user requests his location
14	get	Profile	user identifier, location	
15	get_Return	Profile	user identifier, location, time of location data, location uncertainty	
16				The Service Provider's service user is informed of his location
NOTE: Operations 8 to 11 are repeated to keep the service provider informed of the location of his user. Operations 12 to 15 are repeated to enable appropriate directions to be given along the journey.				

4.4.4 Operation invocation sequence for part 3 of the navigation example

The scenario (part 3) concludes when there is a traffic congestion that has developed further along the route. The service provider is continuously aware of the location of the user (by frequently requesting the location of his service user) and is able to revise the route to find an alternative to avoid the congestion. The user is informed of the route change Figure 5 shows the operation invocation sequence for the final part of the example dynamic route finder service showing how it could be synthesized using TIPHON and UMTS service capabilities.

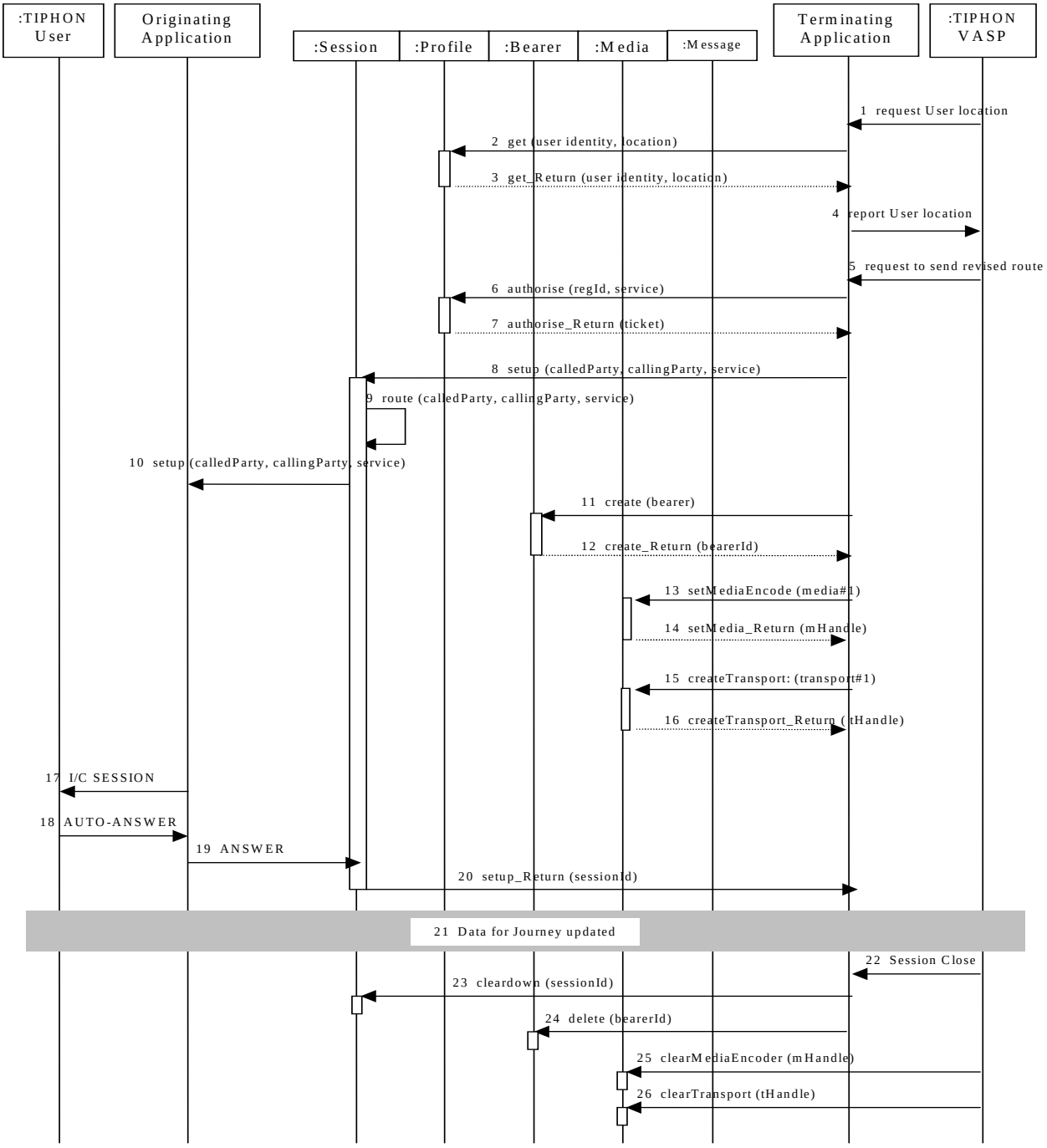

Figure 5: Example operation invocation sequence for part 3 of the service

Table 5: Explanation of the operation invocations

#	Operation	Class	Parameters	Comments
1				The service provider requests the location-of his service user
2	Get	Profile	user identifier, location,	
3	get_Return	Profile	user identifier, location, timestamp, location uncertainty	
4				Report user location to service provider
5				Service provider identifies traffic congestion along the planned route and sets up a session to update journey to avoid congestion
6	authorize	Profile	user identity, service capability to be authorized	
7	authorize_Return	Profile	authorization ticket	
11	create	Bearer	bearer characteristics	
12	create_Return	Bearer	bearer identifier	
13	setMediaEncode	Media	media type, media attributes, transport characteristics	A media encoder may be required
14	setMedia_Return	Media	media identifier	
15	createTransport	Media	transport descriptor	
16	createTransport_Return	Media	transport identifier	
8	setup	Session	calling user identifier, called user identifier, session identity, service type, service provider preference, QoS service class	
9	route	Session	calling user identifier, called user identifier, service provider preference, QoS service class, next network name	
10	setup	Session	calling user identifier, called user identifier, session identity, service type, service provider preference, QoS service class	Next instance of setup
17				The terminating application informs the user's terminal of the incoming session
18				The terminal auto answers the incoming session
19				The application sends the answer signal
20	setup_Return	Session	session identifier	
21				The path is established. On receipt of the service request and location information, the service provider responds with the necessary information to the service user.
22				The service provider closes the session
23	cleardown	Session	session identifier	Session cleared
24	delete	Bearer	bearer identifier	Bearer deleted
25	clearMediaEncode	Media	media identifier	Media encoder deleted
26	clearTransport	Media	transport identifier	Transport deleted

History

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