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Universal Mobile Telecommunications System (UMTS);
Service aspects;
UMTS service scenarios
(UMTS 22.77 version 0.0.3)

UMTS

Universal Mobile

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Contents

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Foreword

This Technical Report (TR) has been produced by ETSI Special Mobile Group (SMG).

1 Scope

This Technical Report describes a number of possible UMTS scenarios. The Technical Report is intended to provide an understanding of how UMTS systems may work. The scenarios provided are not the only solutions, there are other possibilities. A description of the process is given as opposed to the architecture. Other UMTS standard documents and reports are referenced for more detailed information.

2 References

References may be made to:

a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or

b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or

c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or

d) publications without mention of a specific version, in which case the latest version applies.

A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] EN 301 234 (V2.1 onwards): "Example 1".

3 Definitions, symbols and abbreviations

3.1 Definitions

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

3.2 Symbols

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

3.3 Abbreviations

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

VHE   Virtual Home Environment

4 Scenarios

The following issues will be considered:

- Registration Issues, this will include the following: registering a new subscriber account, terminating a subscriber account, subscriber changing/adding on a new SP.

- Communication Issues, this will include the following: using a UMTS terminal to make a POTS call, an Emergency call, and UMTS terminal call.

These scenarios are included to allow identification of areas that need to be standardised.

4.1 Registering a New Subscriber Account

The following entities are considered when registering new subscriber accounts:

- USIM;

- Terminal;

- SP information;

- User's Profiles (VHE).

4.1.1 USIM Requirements

The first issue is for the subscriber to obtain an activated IC card.

When the USIM is activated it contains a minimum set for example :

- the Service Providers address;

- a default service profile (VHE);

- Security features (see UMTS 22.15);

- Basic User Interface interpretation features;

- a means of downloading new applications;

- a means of selecting a network;

- a means of identifying its location to the service provider.

4.1.2 Service Provider Actions

The Service provider needs to maintain the following information.

- The service provider needs to know the relationship between the subscribers and the users, and what services the users are currently able to receive.

- At the time of registration a new subscriber account the means establishing an authentication regime for the subscriber's user base. This may be done by means of a Trusted Third Party or by direct methods.

- The service provider may also have to download applications. This may require the establishment of a secure signalling channel between the USIM and the Service provider.

- The service provider may be expected to establish a credit limit for each of the subscriber's users.

- The Service provider will define how network capabilities are to be signalled to the terminal.

  - The following are examples of the type of data stored in SP.

    - Persistent data is data which does not change very often. This includes Name, close user groupBilling Address, preferred Routing etc.

    - Transient data is data which may change regularly, such as Screening Profile, Location.

    - Real time data is data which needs to be accessed within a very short time in order to allow session set-up or other QOS affecting activity. These include Location information, service capabilities, screening profile.

    - Off Line data includes data which is not necessary for session handling but which is used for subscription management e.g. Name Billing Address.

- The subscriber/user database has two view points. One viewpoint is from the commercial and ergonomic aspect where his details need to be represented in a form which is suitable for display in a human readable form.

  The other is from the point of view of the network where the data needs to be stored in a form where speed, security and efficiency of access is the key factor.

- From a computing point of view the data representing the subscriber can be either transient or persistent. persistent data needs to be stored on some form of permanent storage, whereas transient data is only created at runtime.

This means that we need a three dimensional representation of user/subscriber information in standardised formats.

Table 1

Customers detail	Persistent/ Transient	Real Time/Off line	Machine Readable	Human Readable	Where it is needed	Service Decision
Who	P	R		+	Service	Y
where he lives	P	O		+	Marketing/Fraud	
works, travels	P	O		+	Marketing/Fraud	
who to send the bill to	P	O		+	Billing	
what format	P	O	+	+	Billing	
Membership what groups	P	R	+	+	Service	Y
individual, family, company, society, town, region	P	R	+	+	Service	Y
Calling profile	P	R	+		Fraud control/Marketing	Y
Personal communication directory	P	R	+	+	Service	Y
authentication procedures, voice prints, fingerprints, retinal scans, public keys	P	R	+		Service	Y
subscriber behaviour, billing history,	P	O	+		Marketing and Fraud	
billing detail	T	R	+	+	Billing	Y

Table 2

Terminal detail	Persistent/ Transient	Real Time/off line	Machine Readable	Human Readable	Where it is needed	Service Decision
Terminal addressing	P	R	+	+	Service	Y
bandwidth	T/P	R	+	+	Service	Y
terminal capabilities	P	R	+	+	Service	Y
error correction coding schemes,	P	R	+		Service	Y
routing restrictions, preferred routing schemes	P	R	+		Service	Y
Present terminal, locations	T	R	+		Service	Y
routing capability	P	R	+		Service	Y
Network parameters Quality of Service	P	R	+		Service	Y
Customer to Terminal usage mappings	P	R	+	+	Service	Y
Allowed subscription usage	P	R	+	+	Service	Y

4.1.3   Users Virtual Home Environment establishment.

The Virtual Home Environment defines the users profile which is maintained irrespective of the location or terminal, depending on Network and Terminal Limitations. Details of VHE are covered in UMTS 22.70. Below are examples, but not restricted to VHE data that are registered with SP at subscription.

Example of data in a users VHE will include but is not restricted to

-    Name addresses and numbers by which he is reachable;

-    The groups of which he is a member;

-    Billing and charging indication details;

-    Call screening profile;

-    Authentication procedures;

-    Billing history and normal behaviour profile;

-    Address books;

-    Terminal capabilities;

-    Preferred and restricted roaming schemes;

-    Allowed Terminal Usage.

4.2   Terminal Requirement

The following functions are required from all UMTS terminals (See UMTS 22.07 section 7):

4.3   Terminating a Subscriber account

4.4   Subscriber changing/adding on new SP

As example consider IC card with different USIM.

4.5   Subscriber registering to a new service.

Consider network selection and service selection issues

4.6   Subscriber registering with a Value Added SP.

5   Communication Scenarios

5.1   Emergency Calls

5.2   The POTS call (UMTS to POTS) <<for further study>>

The process of setting up a POTS call may involve the following steps:

-   A number or address will either be selected from an address book or input.

-   Call establishment by suitable means e.g. key sendThe terminal invokes the service capabilities necessary for the call either by means of a standard interface or service provider options.

-   The Quality of Service will be negotiated.

-   The inter-operator charging associated with the call is established.

-   The estimated cost per unit of consumption is made available to the user.

-   Call progress signals and COLP<<May want to think about this a little more??>> are returned to the user

-   Charging is started at the point in the call agreed between operators

-   Call Termination by suitable means e.g key end.

-   Billing records are created between Network operators and the service provider in the format and containing the parameters which have been standardised.

5.3   GSM Call (UMTS to GSM) <<for further study>>

5.4   A multimedia call <<for further study>>

5.4.1   Client Server

5.4.2   End to End

- Internet;

- Fixed Network.

A multimedia call to fred, 987123654, john, david@motorola

This will pass through the following stages

identify the Interworking functions to be used including the physical entities

a standardised negotiation session will take place (RSVP protocol?)

invocation of directory (response mode only)

(further study is needed here)

5.5   UMTS Terminal to UMTS Terminal <<for further study>>

Example IT terminal with radio interface.

For the purposes of this section the user is assumed to have a terminal which could be a Personal Digital Assistant with a radio interface or a PC with appropriate codec or via a TIPHON call. The display shows a series of icons which represent services available to the user.

5.6   Service Aspects

User brings his terminal to a network. He has the option of allowing the terminal to automatically choose to set up a VHE or to accept the local environment. Here she is unable to add new services to the set resident in her terminal.

- From the Network Point of View how to find the service providers.

    - A means of uniquely identifying service providers and how to route signalling traffic to them needs to be standardised, along with the means to retrieve this information from wherever it is stored.

- how to choose the NO

    - It could be possible that the network used for finding the SP is not the one chosen to set up a session. If this is the case, the user clears down and chooses the new network. The original network has to have a means of billing the SP for signalling traffic carried.

- how to identify that the bill will be accepted

    - Some mechanism needs to be standardised to identify that a service provider accepts the task of billing the subscriber for the charges raised.

- how to identify what charges will be raised by intermediate networks for signalling and traffic.

    - Where multiple different traffic routes are available the serving network needs to be able to establish which route is the cheapest path consistent with the security and Quality of Service parameters. In the case of on-line indication of charging the serving network needs to know how the intermediate networks increment their charging. These internetwork dialogues need to be standardised.

- how to interpret the session establishment logic (call setup)

  - Where a serving network is unable to interpret the session establishment logic a mechanism needs to be standardised to allow interrogation of a service provider, or to set up a default session to the service provider. If the network is unable to provide the same level of service as required by a particular service the service is refused.

- how to interpret the session closedown logic

  - Where a serving network is unable to interpret the session closedown logic a mechanism needs to be standardised to allow interrogation of an appropriate service provider and invocation of a default closedown .

- how to interpret Numbering and Naming <<need to talk to NA2 concerning this area, this is more of an open issues>>.

  - Standardisation of user addressing, subscriber addressing, network element addressing and numbering is described in a separate report. A standardised method of handling unknown addressing invoked in a network is required. A standardised method of using a directory service is required. Other addressing schemes need to be mapped into the standard.

- how to detect that the user has left the network and revoke his validation <<???>>

- how to route sessions?

  - Sessions may be established between users in the network and users in a network. The network needs to be able to identify how to set up the routing to the user in the network, taking any routing restrictions and preferred routing into account. If routing preferences or restrictions are to be offered a s a service option there is a need to standardise how these are to be indicated

- routing signalling

5.6.1   From the Service Provider Point of View

A service provider needs to know the following about a user who is located in a network.

- the location of the user and routing of incoming sessions

  - The mapping of the location and routing to a subscribers location a network needs to be standardised

- authentication of the user and his permitted services in the network

  - A method of identifying incontrovertibly a user in a network needs to be standardised, along with a secure means of accepting responsibility for his usage charges.

- The service provider may need to indicate on the terminal which services are available and which are not in the network. This transaction may need to be standardised.

- how modification of user / subscriber profile is to be managed

  - The subscriber may change a users profile while the user is in a network. The effects of this need to be standardised. The transaction between the service provider and the network needs to be standardised;

- how accounting for signalling traffic is to be managed

- how distribution of user interface logic for new services is to be managed

  - If new services are made available by the service provider an interaction between the terminal/user and the service provider may needs to be standardised. The manner of downloading services to the terminal needs to be standardised.

History

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<tr><th colspan="3">Document history</th></tr>
<tr><td><Version></td><td><Date></td><td><Milestone></td></tr>
<tr><td>0.0.1</td><td>24 Oct. 1997</td><td>First Draft</td></tr>
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