

**Source:** TSG SA1  
**Title:** CRs to 22.101 to implement the requirements for R2000 Part 2  
**Document for:** Approval  
**Agenda Item:** 7.1.3

**Note, either these CRs or the CRs in document SP-000430 should be approved.**

Spec	CR	Rev	Phase	Cat	Subject	Vers	New Vers	SA1 Doc. No.
22.101	042		R00	F	General corrections and clarifications to 22.101 for Release 2000	4.0.0	4.1.0	S1-000618
22.101	047		R00	C	Numbering Principles	4.0.0	4.1.0	S1-000597

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## CHANGE REQUEST

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**22.101 CR 042**

Current Version: **4.0.0**

GSM (AA.BB) or 3G (AA.BBB) specification number ?

? CR number as allocated by MCC support team

For submission to: **TSG#9**  
list expected approval meeting # here ?

for approval   
for information

strategic   
non-strategic  (for SMG use only)

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: <ftp://ftp.3gpp.org/Information/CR-Form-v2.doc>

**Proposed change affects:** (U)SIM  ME  UTRAN / Radio  Core Network   
(at least one should be marked with an X)

**Source:** SA1 **Date:** 11/7/00

**Subject:** General corrections and clarifications to 22.101 for Release 2000.

**Work item:** TEI

**Category:** F Correction  **Release:** Phase 2   
A Corresponds to a correction in an earlier release  Release 96   
(only one category shall be marked with an X) B Addition of feature  Release 97   
C Functional modification of feature  Release 98   
D Editorial modification  Release 99   
Release 00

**Reason for change:** CR contains corrective changes relevant to release 2000, CR does not add new requirements.

**Clauses affected:** 4.3, 4.5, 4.7, 5.2, 5.2.1, 10, 11.1.1, 12.2, 13

**Other specs affected:** Other 3G core specifications  ? List of CRs:  
Other GSM core specifications  ? List of CRs:  
MS test specifications  ? List of CRs:  
BSS test specifications  ? List of CRs:  
O&M specifications  ? List of CRs:

**Other comments:** An editorial CR moving Ch 12 shall be implemented, if approved, before this CR.



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## 4.3 Efficient Use of Network Resources

Service capabilities shall take account of the discontinuous and asymmetric nature of most teleservices and user applications in order to make efficient use of network resources (particularly radio resources).

Service capabilities shall be provided in a wide range of radio operating environments (where a radio environment is characterised in terms of propagation environment, mobile equipment relative speeds and traffic characteristics - see [2]). Although 3GPP aims to minimise the number of radio interfaces and to maximise commonality between them, it may utilise several radio interfaces, each optimised for different environments. Each radio interface might provide differing service capabilities. ~~For 3GPP release 99, a single specifications include UTRAN radio interface supporting two modes (TDD and FDD) is defined (UTRAN). The 3GPP Release 99 core network shall be capable of supporting the and GERAN as specified by ETSI SMC radio interface.~~

3GPP specifications shall provide a mechanism which will enable a piece of user equipment (UE) to adapt to different radio interfaces as necessary and to determine the service capabilities available. The specifications shall also provide a mechanism which will enable a UE to select radio interfaces capable of providing appropriate service capabilities.

## 4.4 Compatibility with Global Standards

3GPP specifications aim to be compatible with IMT-2000 and to provide global terminal mobility (roaming), enabling the user to take his/her terminal to different regions of the world and to be provided with services. It is probable that different regions of the world will adopt different radio interface technologies. IMT-2000, as a global standard, should therefore enable a IMT-2000 terminal to determine the radio interface technology and the radio interface standard used in a region. Global terminal roaming also requires the global standardisation of service capabilities. As far as possible the method of indication of the radio interface standard and available service capabilities shall be aligned with IMT-2000.

3GPP specifications shall enable users to access the services provided by their home environment in the same way via any serving network provided the necessary service capabilities are available in the serving network.

The 3GPP specifications will be available for the partner organisations to adopt as their regional standards. For example in Europe, ETSI may adopt them as standards for both GSM and UMTS.

## 4.5 Virtual Home Environment

~~The above general principles plus the service architecture principles stated in section 6 specify all the capabilities of the virtual home environment (VHE).~~

The 3GPP specifications aim to provide the user with a comprehensive set of services and features, which have the "same look and feel" wherever they are used. For further information see 3GPP 22.121 [2]. Especially the VHE shall provide for:

- a generic set of services / features and access capabilities, if the required service capabilities are available in the visited network;
- the means for serving network, home environments and user to re-use existing system capabilities to define their own specific features / services;
- user personalisation of features / services;
- a personalised service set being used via all access and transport networks, subject to physical limitations;
- the ability for the user to have access to personalised services from any suitable UE;
- regional or network based variations, enhancements to the basic services;
- future evolution of 3GPP specification itself.

## 4.6 Functionality of Serving Network and Home Environment

The following functionality shall be the responsibility of the home environment:

- User Authentication.
- SIM/USIM Issue.
- Billing.

- User Profile/VHE Management.

The following functionality shall be the responsibility of the serving network:

- Radio or other means of access.
- Transport and signalling.

The following functionality may be the responsibility of either the serving network, the home environment or an appropriate combination of both

- Service Control.
- QoS negotiation.
- Mobility management, including roaming.
- Automatic establishment of roaming agreements.

## 4.7 PLMN Architecture

The network is logically divided into a radio access network and a core network, connected via an open interface. From a functional point of view the core network is divided into a Packet Switched CN Domain, IP Multimedia (IM) CN subsystem and a Circuit Switched CN Domain. IM CN subsystem utilises PS CN domain (GPRS) bearer services. CS CN domain supports bearer independent transport. There is no difference in service offering or UE functionality due to different transport.

Networks and terminals may support only the PS domain, only the CS domain or both.

-For further information see TS 23.121 [20].

## 5 Principles for new service capabilities

### 5.1 General

3GPP specifications shall enable the user of a single terminal to establish and maintain several connections simultaneously. It shall efficiently cater for applications which have variable requirements relating to specific QoS parameters (e.g. throughput) whilst meeting other QoS targets. It shall also cater for applications which are able to take adapt to a range of variations in QoS.

### 5.2 Multimedia

UMTS-3GPP specifications shall support development of multimedia services and provide the necessary capabilities.

Multimedia services combine two or more media components (e.g. voice, audio, data, video, pictures) within one call. A multimedia service may involve several parties and connections (different parties may provide different media components) -and therefore flexibility is required in order to add and delete both resources and parties.

Multimedia services are typically classified as interactive or distribution services.

Interactive services are typically subdivided into conversational, messaging and retrieval services:

Conversational services are real time (no store and forward), usually bi-directional where low end to end delays (< 100 ms) and a high degree of synchronisation between media components (implying low delay variation) are required. Video telephony and video conferencing are typical conversational services."

Messaging services offer user to user communication via store and forward units (mailbox or message handling devices).

Messaging services might typically provide combined voice and text, audio and high resolution images.

Retrieval services enable a user to retrieve information stored in one or many information centres. The start at which an information sequence is sent by an information centre to the user is under control of the user. Each information centre accessed may provide a different media component, e.g. high resolution images, audio and general archival information. Distribution services are typically subdivided into those providing user presentation control and those without user presentation control.

Distribution services without user control are broadcast services where information is supplied by a central source and where the user can access the flow of information without any ability to control the start or order of presentation e.g. television or audio broadcast services.

Distribution services with user control are broadcast services where information is broadcast as a repetitive sequence and the ability to access sequence numbering allocated to frames of information enables the user (or the user's terminal) to control the start and order of presentation of information.

3GPP specifications shall support single media services (e.g. telephony) and multimedia services (e.g. video telephony). All calls shall have potential to become multimedia calls and there shall be no need to signal, in advance, any

~~requirement for any number of multimedia components. However, it shall be possible to reserve resources in advance to enable all required media components to be available.~~

## 5.2.1 Circuit Switched (CS) multimedia calls

The following basic requirements are to be supported for CS multimedia [24]:

- ? CS multimedia shall be based on a 3GPP specific subset of H.324M.
- ? All call scenarios shall be supported, i.e. Mobile Originating and Mobile Terminating call against Mobile, ISDN and PSTN call party.
- ? Single and multiple numbering schemes shall be supported.
- ? Speech fallback to TS 11 [14] shall be supported, i.e. if setup of the multimedia call fails the call will be set up as a speech call. At release '99 only fallback case supported is from '3.1kHz Ext. PLMN' to speech.
- ? CS Multimedia call is a Bearer Service, which utilises Synchronous Transparent Data service.
- ? Different bitrates as specified at 22.002 [21] shall be supported.
- ? Supplementary services apply to multimedia calls [as for Synchronous Transparent Data service](#) according to 22.004[5].

## 5.3 Service Management Requirements

There will be increased demands for better customer care and cost reductions in managing mobile networks due to :

- the provision of sophisticated personal communications services;
- the expansion of the customer base beyond the business user base;
- the separation between entities of home environment and serving network; and
- drives for 'one stop' billing for a range of services.

In existing mobile networks, Service Management has largely been concerned with the management of physical products (often from different vendors and having different network management interfaces). 3GPP specifications shall include standardised protocols enabling network management of functionality rather than network management of products and enabling:

- the support of Virtual Home Environment;
- management of user profiles;
- support of number portability;
- control, creation and subscription of service capabilities and services;
- provision of 'one stop' billing;
- quality of service.

## 10 Human Factors and user procedures

~~As defined in the Service Provision Concepts subclause of this 3GPP specification S should meet future communication requirements and shall be designed to be adaptable to provide new services as and when they are defined.~~

The User Interface (MMI) from the end user's point of view should be as flexible as possible while still meeting the general service requirements. In addition it should be capable of being updated so as to meet new services which are still to be envisaged.

In general the following principles should be encompassed:

- activation of services should be as simple as possible with minimum input expected from the user;
- feedback, to the user from the various services, should be meaningful;
- any error recovery procedures provided should be simple to understand and execute.

However, a detailed specification for the User Interface shall not be defined. In particular given the global nature of the third generation systems, for different regions of the world, different criteria will determine the implementation of the User Interface. Also it is unlikely that there will be a single common handset which will meet all the service requirements and therefore a common User Interface would be impractical.

Given the flexibility of the services, there should be a wide range of User Interface possibilities. These possibilities include simple terminals with a single on/off button through to complex terminals providing support to hearing/visually impaired users.

Control of supplementary services (TS 22.004 [5]), may use MMI procedures specified in TS 22.030 [6] and existing GSM MMI related UE features (Annex A) may also be used. In particular the following features are highly desirable for uniform UMTS-UE implementation where appropriate:

- ? Mapping of numeric keys to European alphabetic keys to ensure compatible mnemonic dialing as defined in TS 22.030 [6],
- ? "+" key function to enable one key international access as defined in Annex A
- ? Structure of the MMI as described in TS 22.030 [6]
- ? Presentation of IMEI (International Mobile Equipment Identity) as defined in TS 22.030 [6]

## 11 UICC, USIM and Terminal

This clause defines the functional characteristics and requirements of the User Service Identity Module (USIM). The USIM is an application residing on a UICC.

### 11.1 The USIM and User Profiles

#### 11.1.1 The SIM/USIM

Every SIM/USIM shall have a unique identity and shall be associated with one and only one home environment.

It shall be possible for a home environment to uniquely identify a user by the SIM/USIM.

The SIM/USIM shall be used to provide security features.

For access to services provided by PS or CS CN domains, ~~provided via a home environment~~, a valid SIM/USIM shall be required.

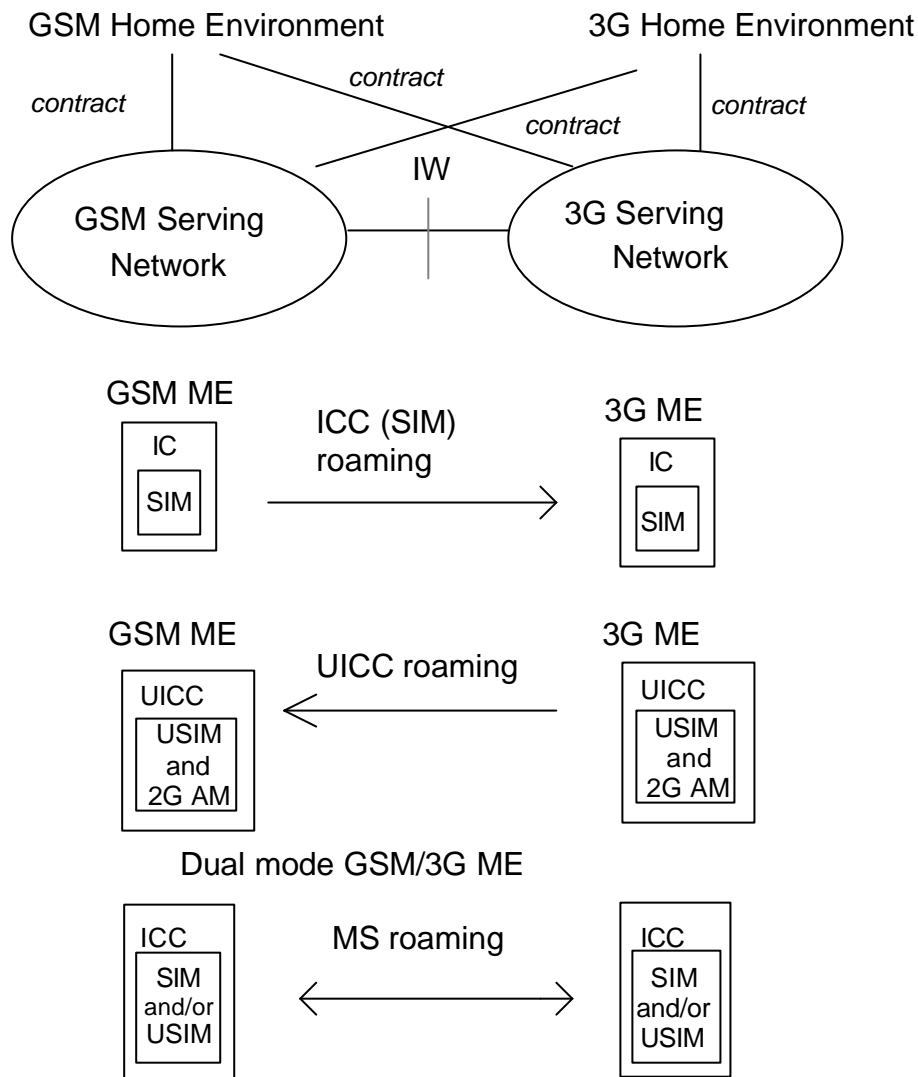
The SIM/USIM shall be able to support SIM Application Toolkit as specified in 3G TS 22.038 [3].

The SIM/USIM shall reside on a UICC, 3GPP specifications shall adopt both of the GSM SIM card physical formats.

Other formats may also be supported. SIM/USIM specific information shall be protected against unauthorised access or alteration.

It shall be possible to update USIM specific information via the air interface, in a secure manner.

Figure 4 shows as an example the support of roaming users between GSM and UMTS/3G home environment.



2G AM: 2G Access Module

[Figure 4 UICC roaming scenarios](#)

## 11.1.2 User Profiles

It shall be possible for a user to be associated with one or a number of user profiles, which the user can select and activate on a per call basis. The user profile contains information which may be used to personalise services for the user. It shall be possible for one or more user profiles associated with the same user to be active simultaneously so that the user may make or receive calls associated with different profiles simultaneously. Activation of profiles shall be done in a secure manner, for example with the use of a PIN.

For terminating calls the correct profile shall be indicated by the user address used (e.g. MSISDN), each profile will have at least one unique user address associated with it. For originating calls the user shall be able to choose from the available profiles, the appropriate one for the call. A profile identity will need to be associated with the call for accounting and billing purposes. User profile identities need not be standardised but a standardised means is required for indicating that a particular profile is being used.

Simultaneous use of the same user profile on multiple terminals for the same type of service shall not be allowed. User profiles associated with different home environments shall not share the same user address.

## 11.1.3 UICC usage in 2G Terminals

It shall be possible to use the UICC in 2G terminals to provide access to GSM networks. In order to achieve that option, it shall be possible to store a module containing 2G access functionalities on the UICC which shall be accessed via the standard GSM SIM-terminal interface.

### 11.1.4 Multiple USIMs per UICC

The standard shall support more than one USIM per UICC even when those USIMs are associated with different home environments. Only one of the USIMs or the SIM shall be active at a given time. While the UE is in idle mode, it shall be possible for the user to select/reselect one USIM application amongst those available on the UICC. At switch on, the Last Active USIM shall be automatically selected. The Last Active USIM shall be stored on the UICC. By default if there is no Last Active USIM defined in the UICC, the user shall be able to select the active USIM amongst those available on the UICC.

The standard must not prevent the coexistence of USIM applications, each associated with different home environments on the same UICC, so long as the security problems which arise from such a coexistence are solved.

## 11.2 The UICC

Access to services via GSM and 3G networks with a single UICC shall be possible.

### 11.2.1 The UICC and Applications other than the USIM

It shall be possible for the UICC to host other applications in addition to the USIM, see figure 3. Service providers, subscribers or users may need to establish additional data or processes on the UICC. Each application on an UICC shall reside in its own domain (physical or logical). It shall be possible to manage each application on the card separately. The security and operation of an application in any domain shall not be compromised by an application running in a different domain. Applications may need to use their own security mechanisms which are separate to those specified by 3GPP e.g. electronic commerce applications.

Examples of other UICC applications are: USIM, Phase 2+ SIM, off-line user applications like UPT, electronic banking, credit service, etc.

Applications should be able to share some information such as a common address book.

It shall be possible to address applications which reside on the UICC, via the air interface.

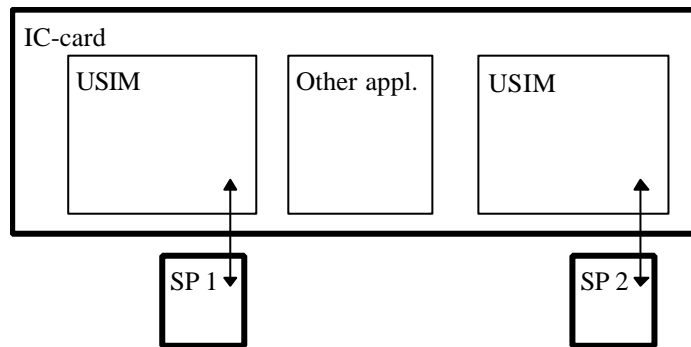


Figure 3 Example of a Multifunction UICC

## 11.3 Terminals and Multiple UICCs

A single terminal may support the use of multiple UICC (e.g with applications like USIM, SIM and/or banking, credit card,...). Only one UICC shall be active at a time to access a PLMN. In case the active UICC contains more than one USIM or SIM, the requirements of 11.1.4 shall apply.

If the UICC with the active USIM or SIM is removed from the mobile terminal during a call (except for emergency calls), the call shall be terminated immediately.

## 12 Evolution

### 12.1 Support of pre UMTS services

The 3GPP specifications shall be capable of supporting existing services in a manner which is transparent to the users of these services.

3GPP specifications shall provide some mechanisms which permit 2G users to roam easily onto 3G networks and access at least a minimum set of services. See Figure 4 for clarification.

3GPP specifications shall provide some mechanisms which permit 3G users to roam easily onto 2G systems and access at



least a minimum set of services.

## 12.2 Provision and evolution of services

Since a phased approach to the completion of has been adopted, the same general service principals shall apply to each phase.

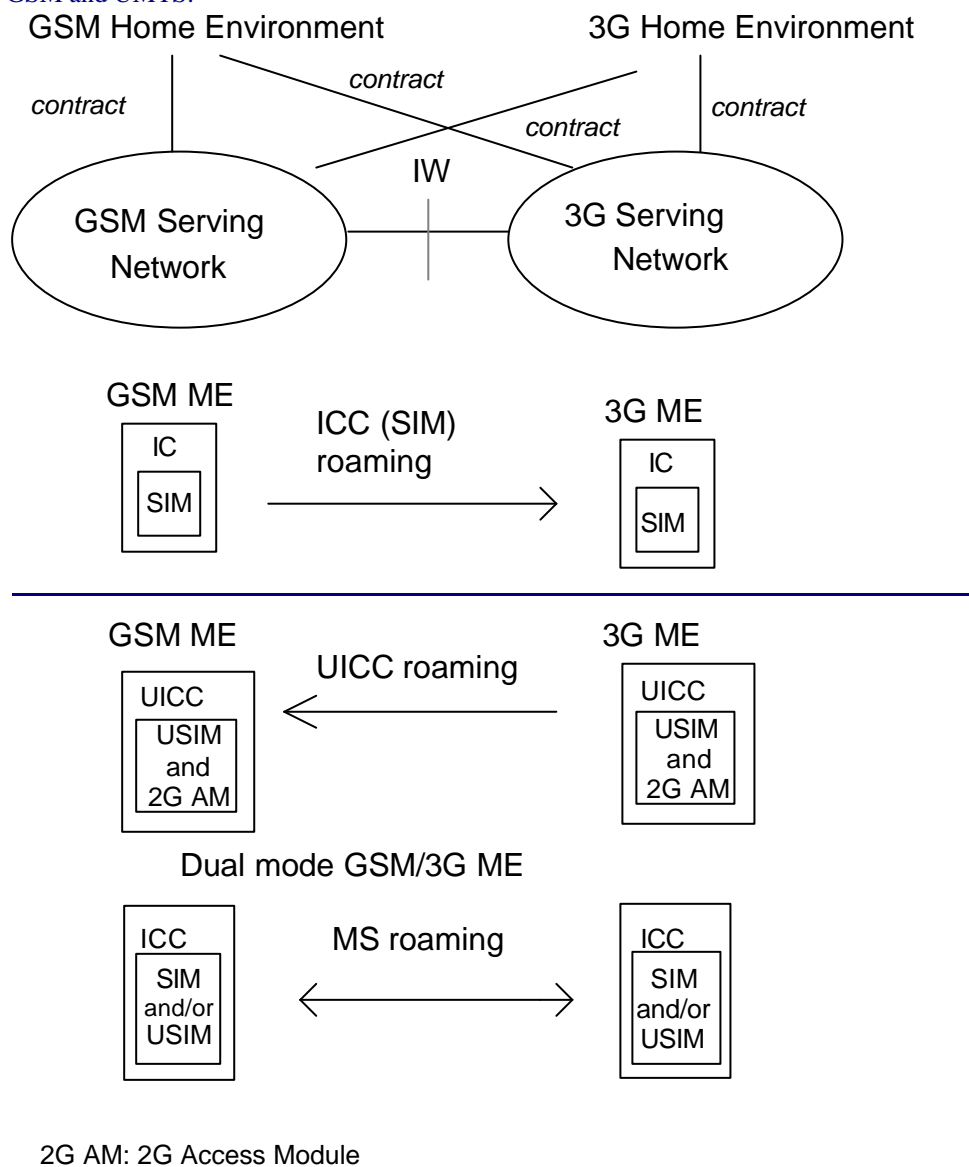
Networks shall be capable of providing a specified core set of capabilities. Responsibility for providing this core set of capabilities should lie with the serving network.

The core set of capabilities should permit home environment to offer a range of distinctive services including those which cannot be implemented on existing systems.

It shall be possible for the home environment to develop services with full roaming capability. It should not be necessary for users to subscribe to more than one home environment in order to receive a particular service. For example a company may market an in car navigation/location system which uses UMTS as the core network. As far as users of the navigation service are concerned, that company is their home environment.

The radio interface should not unnecessarily restrict the development of new services (within physical limitations).

The standard shall provide a mechanism which allows a UMTS terminal to be easily upgraded so that it can access new services which are within the physical limitations of the terminal. [Figure 4 shows as an example the support of roaming users between GSM and UMTS.](#)



**Figure 4 Roaming Users**

### 13 Types of features of UEs

3GPP specifications should support a wide variety of user equipment, i.e. setting any limitations on terminals should be avoided as much as possible. For example user equipment like hand-portable phones, personal digital assistants and

laptop computers can clearly be seen as likely terminals.

In order not to limit the possible types of user equipment they are not standardised. The UE types could be categorised by their service capabilities rather than by their physical characteristics. Typical examples are speech only UE, narrowband data UE, wideband data UE, data and speech UE, etc..

In order to enhance functionality split and modularity inside the user equipment the interfaces of UE should be identified. Interfaces like UICC-interface, PCMCIA-interface and other PC-interfaces, including software interfaces, should be covered by references to the applicable interface standards.

UEs have to be capable of supporting a wide variety of teleservices and applications provided in PLMN environment. Limitations may exist on UEs capability to support all possible teleservices and information types (speech, narrowband data, wideband data, video, etc.) and therefore functionality to indicate capabilities of a UE shall be specified. ~~UEs should be capable of supporting new supplementary services without any changes in UE.~~

The basic mandatory UE requirements are:

- ? Encrypted terminal-UICC interface;
- ? Support for GSM phase 2 and 2+ SIM cards, phase 1 5V SIM cards shall not be supported;
- ? Home environment and serving network registration and deregistration;
- ? Location update;
- ? Originating or receiving a connection oriented or a connectionless service;
- ? An unalterable equipment identification; IMEI, see TS 22.016 [12];
- ? Basic identification of the terminal capabilities related to services such as; the support for software downloading, application execution environment/interface, MExE terminal class, supported bearer services.
- ? Terminals capable for emergency calls shall support emergency call without a SIM/USIM.
- ? Support for the execution of algorithms required for encryption, for CS and PS services. Support for non encrypted mode is required;
- ? Support for the method of handling automatic calling repeat attempt restrictions as specified in TS 22.001 [4];
- ? At least one capability type shall be standardised for mobile terminals supporting the GRAN and UTRAN radio interfaces.
- ? Under emergency situations, it may be desirable for the operator to prevent UE users from making access attempts (including emergency call attempts) or responding to pages in specified areas of a network, see TS 22.011 [11];
- ? Ciphering Indicator for terminals with a suitable display;

The ciphering indicator feature allows the ME to detect that ciphering is not switched on and to indicate this to the user. The ciphering indicator feature may be disabled by the home network operator setting data in the SIM/USIM. If this feature is not disabled by the SIM, then whenever a connection is in place, which is, or becomes unenciphered, an indication shall be given to the user. Ciphering itself is unaffected by this feature, and the user can choose how to proceed;

- ? Support for PLMN selection.

Annex A describes a number of features which may optionally be supported by the ME.

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**22.101 CR 047**

Current Version: **4.0.0**

GSM (AA.BB) or 3G (AA.BBB) specification number ?

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Form: CR cover sheet, version 2 for 3GPP and SMG    The latest version of this form is available from: <ftp://ftp.3gpp.org/Information/CR-Form-v2.doc>

**Proposed change affects:**    (U)SIM     ME     UTRAN / Radio     Core Network   
*(at least one should be marked with an X)*

**Source:**    SA1    **Date:**    11/7/00

**Subject:**    Numbering Principles

**Work item:**    TEI

<b>Category:</b>	F Correction <input type="checkbox"/> A Corresponds to a correction in an earlier release <input type="checkbox"/> B Addition of feature <input type="checkbox"/> C Functional modification of feature <input checked="" type="checkbox"/> D Editorial modification <input type="checkbox"/>		<b>Release:</b>	Phase 2 <input type="checkbox"/> Release 96 <input type="checkbox"/> Release 97 <input type="checkbox"/> Release 98 <input type="checkbox"/> Release 99 <input type="checkbox"/> Release 00 <input checked="" type="checkbox"/>
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*(only one category shall be marked with an X)*

**Reason for change:**    Removal of "labelling" concept. Clarification on requirements on different domains.

**Clauses affected:**    3.1, 9

<b>Other specs affected:</b>	Other 3G core specifications <input type="checkbox"/> ? Other GSM core specifications <input type="checkbox"/> ? MS test specifications <input type="checkbox"/> ? BSS test specifications <input type="checkbox"/> ? O&M specifications <input type="checkbox"/> ?	List of CRs: <input type="text"/> List of CRs: <input type="text"/> List of CRs: <input type="text"/> List of CRs: <input type="text"/> List of CRs: <input type="text"/>
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**Other comments:**



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### 3 Definitions, symbols and abbreviations

## 3.1 Definitions

For the purposes of this TS, the following definitions apply:

**Authentication:** a property by which the correct identity of an entity or party is established with a required assurance. The party being authenticated could be a user, subscriber, home environment or serving network.

**Bearer:** a bearer capability of defined capacity, delay and bit error rate, etc.

**Bearer capability:** a transmission function which the user equipment requests to the network.

**Confidentiality:** the avoidance of disclosure of information without the permission of its owner.

**Home Environment:** the home environment is responsible for enabling a user to obtain services in a consistent manner regardless of the user's location or terminal used (within the limitations of the serving network and current terminal).

**IC Card:** a card holding an Integrated Circuit containing subscriber, end user, authentication and/or application data for one or more applications.

**Integrity:** (in the context of security) is the avoidance of unauthorised modification of information.

~~Label: A number or name as defined below.~~ **Mobility:** the ability for the user to communicate whilst moving independent of location.

**Multimedia service:** Multimedia services are services that handle several types of media such as audio and video in a synchronised way from the user's point of view. A multimedia service may involve multiple parties, multiple connections, and the addition or deletion of resources and users within a single communication session.

~~Name: A name is an alpha numeric label used for identification of end users and may be portable.~~

**Number:** A string of decimal digits that uniquely indicates the public network termination point. The number contains the information necessary to route the call to this termination point.

A number can be in a format determined nationally or in an international format. The international format is known as the International Public Telecommunication Number which includes the country code and subsequent digits, but not the international prefix.

**Number portability:** where the provision of directory numbers is independent of home environment and/or serving network.

**One Stop Billing:** one bill for all charges incurred using PLMN services.

**Quality of Service:** the collective effect of service performances which determine the degree of satisfaction of a user of a service. It is characterised by the combined aspects of performance factors applicable to all services, such as:

- service operability performance;
- service accessibility performance;
- service retention performance;
- service integrity performance;
- and other factors specific to each service.

**Roaming:** the ability for a user to function in a serving network.

**Security:** the ability to prevent fraud as well as the protection of information availability, integrity and confidentiality.

**Service:** is set of functions offered to a user by an organisation.

**Service Control:** is the ability of the user, home environment or serving environment to determine what a particular service does, for a specific invocation of that service, within the limitations of that service.

**Serving Network:** the serving network provides the user with access to the services of home environment.

**Subscriber:** the responsibility for payment of charges incurred by one or more users may be undertaken by another entity designated as a subscriber. This division between use of and payment for services has no impact on standardisation.

**Supplementary service:** is a service which modifies or supplements a basic telecommunication service. Consequently, it cannot be offered to a customer as a standalone service. It must be offered together with or in association with a basic telecommunication service. The same supplementary service may be common to a number of telecommunication services.

**Teleservice:** is a type of telecommunication service that provides the complete capability, including terminal equipment functions, for communication between users according to standardised protocols and transmission capabilities established by agreement between operators.

**User:** is a logical, identifiable entity which uses services.

**User Profile:** is the set of information necessary to provide a user with a consistent, personalised service environment, irrespective of the user's location or the terminal used (within the limitations of the terminal and the serving network).

**User Equipment:** is a combination of mobile equipment (ME) and SIM/USIM.

**USIM:** User Service Identity Module is an application residing on the IC-Card used for accessing services with

appropriate security.

**Virtual Home Environment:** the virtual home environment is a system concept for personalised service portability between serving networks and between terminals.

## 9 Numbering principles

~~The following section provides the requirements for numbering and identification of users:~~

~~Note: Labels are not required to be supported by the 3GPP release '99 specification.~~

~~General requirements are listed in the following:~~

- ~~— The user shall be able to initiate communications with another party using a label / number to identify that party. This might be a logical label / number referring to a job function, and advertising response line etc. and would be resolved into a real terminal address by the system transparently to the user. Labels / numbers shall be capable of being stored in an address book which shall be accessible from any terminal that the user is registered on. Labels / numbers may be used to identify groups as well as individual terminals or people and shall allow extended character sets.~~
- ~~— 3rd party services should be reached by a label. Based on the selected charging policy for this services the calling party or/and the home environment of the calling party needs to be uniquely identified.~~
- ~~— Users also have requirements with regard to addressing for receipt of communications. The user shall be able to have a label / number of different persona (e.g. business and personal), each of which can be managed independently.~~
- ~~— When receiving communications, the recipient shall perceive the caller's label / number in the appropriate role. For example, when making a call as chairman of an 3GPP committee, then that persona will be presented as the caller ID. When making a personal call, then the underlying persona would be presented.~~
- ~~— In order to permit interworking with legacy networks, address interworking with common legacy network addressing shall be supported. In principle, this shall include interworking with any networking addressing scheme, but ~~t~~The following network addressing schemes listed below shall specifically be supported at the relevant domains:~~
  - E.164,
  - E.168,
  - E.212,
  - X.121
  - Internet (including e.g. IP address and SIP ULR, e.g. sip:my.name@company.org)

## 9.1 Number portability

### 9.1.1 Requirements for CS CN domain

Some ~~labelling~~ / numbering schemes shall be fully independent of the supporting serving network and the home environment, allowing users to transfer this ~~label-number~~ to another home environment. For further information see TS 22.066 [7].

An MSISDN shall be allocated to each new user at the start of a subscription. This number may be allocated from one of several numbering domains. For example:

- home / serving environment numbering scheme;
- national numbering scheme;
- regional numbering scheme;
- global numbering scheme.

A user shall be able to move subscription from one home environment to another without changing the MSISDN provided that the new home environment offers service in the same geographic domain. It is envisaged that home environment s will be able to allocate MSISDNs from each of these domains as required.

## 9.1.2 Requirements for PS CN domain

None identified.

## 9.1.3 Requirements for IM CN subsystem

None identified.

Note: Portability of E.164 numbers within IM subsystem is envisaged and under further study.

## 9.2 Evolution path

Since 3GPP specifications aim to be aligned with IMT-2000, a primary goal in numbering is the provision of global user numbering in line with steps taken by the ITU - SG2.

The numbering scheme and network implementation chosen shall allow for international/global evolution.

## 9.3 User / USIM Identification

It is a requirement that the user can be uniquely identified by the home environment from which the service is being obtained. This identification may be unknown to the serving network on which the user is roaming.

Serving networks need to be able to communicate with, authenticate and commercially deal with the home environment associated with any SIM/USIM being registered on their network. This shall require a SIM/USIM identity scheme which uniquely identifies each SIM/USIM, and a mapping scheme which allows the USIM identity to be used as a identifier with the "owning" home environment.

Serving networks also require to be able to route efficiently any communication to and from SIM/USIMs (or rather the devices on which they are registered). An address scheme is therefore required for operators to access and map any outgoing or incoming communication to SIM/USIMs and thus devices on their networks

It shall be possible for several numbers to be associated with a single subscription on a single UICC.

## 9.4 Terminal Identification

It is a requirement that the terminal can be uniquely identified by the home environment and serving network. This shall require a terminal identity scheme which uniquely identifies each terminal, SEE ts 22.016[12].

## 9.5 Home Environment / Serving Network Identification

Serving networks need to be able to communicate with, authenticate and commercially deal with the home environment associated with any SIM/USIM being registered on their network. This shall require a SIM/USIM identity scheme which uniquely identifies each SIM/USIM, and a mapping scheme which allows the SIM/USIM identity to be used as a identifier with the "owning" home environment.

Home / serving environments need to route communication to the current location of the user. This shall require a identity scheme which uniquely identifies the serving environment and shall be used for routing purposes.

## ~~9.6 Service dependence / independence~~

~~Although a called party may be addressable via different means, he should be reachable independent of the medium.~~

~~This would require a new functionality which can map label / number (digits) for call routing purposes. Networks might only support basic functionality while advanced databases might be offered by 3rd parties.~~

~~3GPP specifications shall provide various methods to identify the service required, for example, via the number dialled or protocol headers. It shall be possible for the home environment to change serving network(s) without changing MSISDNs.~~

~~It shall be possible for several numbers to be associated with a single subscription on a single UICC.~~

## 9.67 Private numbering

A user may wish to use private numbers for the purposes of calling frequent numbers. Therefore there is a requirement for the use, by the user, of Private Numbering Plans (PNPs). These schemes may belong to the user himself, to a home environment or a third party.

~~In addition, the user shall be able to choose the means to address the identity of a dialled number. For instance the number required to be dialled may be addressed by a spoken name.~~

~~NOTE: This may well be considered as a function of the equipment used to access the service and as such is not required to be standardised. However, the provision of such a facility needs to be provided across all terminal types used; fixed and mobile.~~

## 9.89.7 Numbering schemes

### 9.78.1 Multiple numbering scheme

The standards shall support the possibility of allowing the bearer service associated with an MT call to be implicitly defined by the destination MSISDN, for example to use a different MSISDN to establish voice, fax or data . It will be possible for multiple MSISDNs to be associated with a single subscription.

### 9.8.2 Single numbering scheme

The standards shall support the possibility of allowing MT calls of different bearer types (eg voice, fax, data) to be routed to a single MSISDN. It is recognised that the implementation of this may depend on the availability of bearer information associated with an incoming call from the adjoining transit network. In particular the standards will support this possibility in the case of an adjoining ISDN transit network.

## 9.89 Optimal routing for CS CN domain

The implementation of the numbering scheme used shall allow for optimal routing; i.e. routing shall not take place simply on the number dialled. See TS 22.079 [8] for some scenarios.