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SERIES Q: SWITCHING AND SIGNALLING

Signalling requirements and protocols for IMT-2000

**IMT-2000 references to release 1999 of GSM
evolved UMTS core network with UTRAN access
network**

ITU-T Recommendation Q.1741.1

ITU-T Q-SERIES RECOMMENDATIONS
SWITCHING AND SIGNALLING

SIGNALLING IN THE INTERNATIONAL MANUAL SERVICE	Q.1–Q.3
INTERNATIONAL AUTOMATIC AND SEMI-AUTOMATIC WORKING	Q.4–Q.59
FUNCTIONS AND INFORMATION FLOWS FOR SERVICES IN THE ISDN	Q.60–Q.99
CLAUSES APPLICABLE TO ITU-T STANDARD SYSTEMS	Q.100–Q.119
SPECIFICATIONS OF SIGNALLING SYSTEM No. 4	Q.120–Q.139
SPECIFICATIONS OF SIGNALLING SYSTEM No. 5	Q.140–Q.199
SPECIFICATIONS OF SIGNALLING SYSTEM No. 6	Q.250–Q.309
SPECIFICATIONS OF SIGNALLING SYSTEM R1	Q.310–Q.399
SPECIFICATIONS OF SIGNALLING SYSTEM R2	Q.400–Q.499
DIGITAL EXCHANGES	Q.500–Q.599
INTERWORKING OF SIGNALLING SYSTEMS	Q.600–Q.699
SPECIFICATIONS OF SIGNALLING SYSTEM No. 7	Q.700–Q.799
Q3 INTERFACE	Q.800–Q.849
DIGITAL SUBSCRIBER SIGNALLING SYSTEM No. 1	Q.850–Q.999
PUBLIC LAND MOBILE NETWORK	Q.1000–Q.1099
INTERWORKING WITH SATELLITE MOBILE SYSTEMS	Q.1100–Q.1199
INTELLIGENT NETWORK	Q.1200–Q.1699
SIGNALLING REQUIREMENTS AND PROTOCOLS FOR IMT-2000	Q.1700–Q.1799
SPECIFICATIONS OF SIGNALLING RELATED TO BEARER INDEPENDENT CALL CONTROL (BICC)	Q.1900–Q.1999
BROADBAND ISDN	Q.2000–Q.2999

For further details, please refer to the list of ITU-T Recommendations.

ITU-T Recommendation Q.1741.1

IMT-2000 references to release 1999 of GSM evolved UMTS core network with UTRAN access network

Summary

This Recommendation identifies the IMT-2000 Family Member, "GSM evolved UMTS core network with UTRAN access network". This release of the family member is known to the Standards Development Organizations (i.e. ARIB, CWTS, ETSI, T1, TTA, TTC) as the "3GPP Release 1999".

Source

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FOREWORD

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CONTENTS

Page

1	Scope	1
2	References.....	1
2.1	Normative references.....	1
2.2	Informative references.....	4
3	Definitions	4
4	Abbreviations and acronyms	7
5	Introduction	14
6	Basic architecture for the UMTS IMT-2000 family member.....	14
7	Network entities.....	18
7.1	Gateway Mobile Switching Centre (GMSC)	18
7.2	Mobile Switching Centre and Visitor Location Register MSC/VLR (MSC/VLR).....	18
7.2.1	Mobile Switching Centre (MSC).....	18
7.2.2	Visitor Location Register (VLR).....	19
7.3	Home Location Register (HLR)	19
7.4	Authentication Centre (AuC)	20
7.5	Equipment Identity Register (EIR).....	20
7.6	Gateway GPRS Support Node (GGSN)	21
7.7	Serving GPRS Support Node (SGSN)	21
7.8	Gateway Mobile Location Centre (GMLC)	21
7.9	GPRS Service Switching Function (gprsSSF)	22
7.10	GSM Service Control Function (gsmSCF).....	22
7.11	GSM Service Switching Function (gsmSSF)	22
7.12	GSM Specialised Resource Function (gsmSRF).....	22
7.13	Gateway Location Register (GLR).....	22
7.14	Intermediate GPRS Serving Node (IM-GSN).....	22
7.15	Intermediate Mobile-services Switching Centre (IM-MSC).....	22
8	Interfaces.....	23
8.1	C-Interface (Gateway Mobile Switching Centre (GMSC) – Home Location Register (HLR)).....	23
8.2	D Interface (Visitor Location Register (VLR) – Home Location Register (HLR))	23
8.3	E Interface (Mobile Switching Centre (MSC) – Mobile Switching Centre (MSC)).....	23
8.4	F Interface (Mobile Switching Centre (MSC) – Equipment Identity Register (EIR))	24

	Page
8.5 G Interface (Visitor Location Register (VLR) – Visitor Location Register (VLR)).....	24
8.6 Gc Interface (Home Location Register (HLR) – Gateway GPRS Support Node (GGSN)).....	24
8.7 Gf Interface (Equipment Identity Register (EIR) – Serving GPRS Support Node (SGSN))	24
8.8 Gi Interface (Gateway GPRS Support Node (GGSN) – Public Network).....	24
8.9 GLa Interface (Gateway Location Register (GLR) – Home Location Register (HLR)).....	25
8.10 GLb Interface (Gateway Location Register (GLR) – Visitor Location Register (VLR)).....	25
8.11 GLc Interface (Gateway Location Register (GLR) – Serving GPRS Support Node (SGSN)).....	25
8.12 GLd Interface (Gateway Location Register (GLR) – Intermediate Mobile services Switching Centre (IM-MSC)).....	25
8.13 GLe Interface (Gateway Location Register (GLR) – Intermediate GPRS Serving Node (IM-GSN)).....	25
8.14 GLf Interface (Gateway Location Register (GLR) – Short Message Service-Gateway Mobile Switching Centre (SMS-GMSC))	25
8.15 GLg Interface (Intermediate Mobile-services Switching Centre (IM-MSC) – Short Message Service-Gateway Mobile Switching Centre (SMS-GMSC))	25
8.16 GLh Interface (Intermediate Mobile-services Switching Centre (IM-MSC) – Mobile Switching Centre (MSC))	26
8.17 GLi Interface (Intermediate Mobile-services Switching Centre (IM-MSC)– Gateway Mobile Location Centre (GMLC))	26
8.18 GLj Interface (Intermediate GPRS Serving Node (IM-GSN) – Gateway GPRS Support Node (GGSN)).....	26
8.19 GLk Interface (Intermediate GPRS Serving Node (IM-GSN) – Serving GPRS Support Node (SGSN)).....	26
8.20 Gn Interface (Gateway GPRS Support Node (GGSN) – Serving GPRS Support Node (SGSN)).....	26
8.21 Gp Interface (Serving GPRS Support Node (SGSN) – Public Network)	26
8.22 Gr Interface (Home Location Register (HLR) – Serving GPRS Support Node (SGSN))	27
8.23 Gs Interface (Mobile Switching Centre (MSC)/Visitor Location Register (VLR) – Serving GPRS Support Node (SGSN))	27
8.24 gsmSCF – HLR Interface	27
8.25 gsmSCF – gsmSRF Interface	27
8.26 gsmSSF – gsmSCF Interface.....	27
8.27 gprsSSF – gsmSCF Interface.....	27
8.28 H Interface (Home Location Register (HLR) – Authentication Centre (AuC)).....	28
8.29 IuBC Interface (Core Network (CN) – Radio Network Controller (RNC))...	28

8.30	IuCS Interface (Mobile Switching Centre (MSC) – Radio Network Controller (RNC))	28
8.31	IuPS Interface (Serving GPRS Support Node (SGSN) – Radio Network Controller (RNC))	28
8.32	Lc Interface (Gateway Mobile Location Centre (GMLC) – GSM Service Control Function (gsmSCF)).....	28
8.33	Le Interface (Gateway Mobile Location Centre (GMLC) – External LCS client).....	28
8.34	Lg Interface (Mobile Switching Centre (MSC)/Visitor Location Register (VLR) – Mobile Location Centre (MLC))	29
8.35	Lh Interface (Home Location Register (HLR) – Gateway Mobile Location Centre (GMLC)).....	29
8.36	Mobile Switching Centre (MSC) – gsmSCF Interface.....	29
8.37	PSTN Interface (Mobile Switching Centre (MSC)/Visitor Location Register (VLR) – Public Switching Telephone Network (PSTN)).....	29
9	Technical specifications structure.....	29
10	Technical specifications.....	36
10.1	21-series, Requirements specifications	36
10.2	22-series, Service aspects	38
10.3	23-series, Technical realization	65
10.4	24-series, Signalling protocols (User Equipment-Core Network)	95
10.5	26-series, Codecs (speech, video, etc.).....	110
10.6	27-series, Data	117
10.7	29-series, Signalling protocols (NSS)	123
10.8	31-series, UIM User Identity Module	130
10.9	32-series, Operation and Maintenance	132
10.10	33-series, Security aspects.....	141
10.11	35-series, Algorithm specifications	144

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IMT-2000 references to release 1999 of GSM evolved UMTS core network with UTRAN access network

1 Scope

This Recommendation identifies the IMT-2000 Family Member, "GSM evolved UMTS core network with UTRAN access network". This release of the family member is known to the Standards Development Organizations (i.e. ARIB, CWTS, ETSI, T1, TTA, TTC) as the "3GPP Release 1999".

The core network interfaces identified in this Recommendation and the radio interfaces identified in ITU-R Rec. M.1457 [1] constitute a complete system specification for the 3rd generation mobile system for terrestrial usage of this IMT-2000 family member .

It is the intent of the ITU-T that the references in this Recommendation are only to specifications which specify the network aspects of this IMT-2000 family member. In the event that a referenced specification also includes material that specifies any of the radio aspects of this IMT-2000 family member, ITU-R Rec. M.1457 [1], shall take precedence.

2 References¹

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

NOTE – The reference to a document within this Recommendation does not give it, as a standalone document, the status of a Recommendation.

2.1 Normative references

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- [2a] ETSI TS 123.002 (2001), *Network Architecture (Release 99)*.
- [2b] TTC JP-3GA-23.002(R99) (2001), *Network Architecture (Release 99)*.
- [2c] T1 T1.3GPP.23.002V340 (2001), *Network Architecture (Release 99)*.
- [2d] TTA TTAE.3G-23.002(R99) (2001), *Network Architecture (Release 99)*.
- [2e] CWTS CWTS-TSD-CN-23.002(R99) (2002), *Network Architecture (Release 99)*.

¹ Technical documents of Standards Development Organizations recognized under the provisions of ITU-T Rec. A.5 can be found under:

ARIB	at http://www.arib.or.jp
CWTS	at http://www.cwts.org/website/f/dt.html
ETSI	at http://www.etsi.org
T1	at http://www.t1.org
TTA	at http://www.tta.or.kr/Home/korean/
TTC	at http://www.ttc.or.jp

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- [10] ITU-T Recommendation E.164 (1997), *The international public telecommunication numbering plan*.
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- [13] ITU-T Recommendation I.420 (1988), *Basic user-network interface*.
- [14] ITU-T Recommendation I.460 (1999), *Multiplexing, rate adaptation and support of existing interfaces*.
- [15] ITU-T Recommendation X.30/I.461 (1993), *Support of X.21, X.21 bis and X.20 bis based Data Terminal Equipments (DTEs) by an Integrated Services Digital Network (ISDN)*.
- [16] ITU-T Recommendation X.31/I.462 (1995), *Support of packet mode terminal equipment by an ISDN*.
- [17] ITU-T Recommendation V.110/I.463 (2000), *Support by an ISDN of data terminal equipments with V-Series type interfaces*.
- [18] ITU-T Recommendation Q.65 (2000), *The unified functional methodology for the characterization of services and network capabilities including alternative object oriented techniques*.

- [19] ITU-T Recommendation Q.920 (1993), *ISDN user-network interface data link layer – General aspects.*
- [20] ITU-T Recommendation Q.921 (1997), *ISDN user-network interface – Data link layer specification.*
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- [22] ITU-T Recommendation Q.922 (1992), *ISDN data link layer specification for frame mode bearer services.*
- [23] ITU-T Recommendation Q.1214 (1995), *Distributed functional plane for intelligent network CS-1.*
- [24] ITU-T Recommendation T.31 (1995), *Asynchronous facsimile DCE control – Service Class 1.*
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- [34] ITU-T Recommendation V.32 (1993), *A family of 2-wire, duplex modems operating at data signalling rates of up to 9600 bit/s for use on the general switched telephone network and on leased telephone-type circuits.*
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2.2 Informative references

- [45a] ETSI TR 121.905 v.3.2.0 (2000), *3G Vocabulary.*
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- [45c] TTA TTAE.3G-21905 v.3.2.0 (2000), *3G Vocabulary.*

3 Definitions

The text is based on references [45a]-[45c].

This Recommendation defines the following terms:

3.1 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.

3.2 basic telecommunication service: This term is used as a common reference to both bearer services and teleservices.

3.3 bearer: An information transmission path of defined capacity, delay and bit error rate, etc.

3.4 bearer capability: A transmission function that the UE requests to the network.

3.5 bearer service: A type of telecommunication service that provides the capability of transmission of signals between access points.

3.6 call Detail Record (CDR): A formatted collection of information about a chargeable event (e.g. time of call set-up, duration of the call, amount of data transferred, etc.) for use in billing and accounting. For each party to be charged for parts of, or all charges of, a chargeable event, a separate CDR shall be generated, i.e. more than one CDR may be generated for a single chargeable event, e.g. because of its long duration, or because more than one charged party is to be charged.

3.7 charging: A function whereby information related to a chargeable event is formatted and transferred in order to make it possible to determine usage for which the charged party may be billed.

3.8 cipher key: A code used in conjunction with a security algorithm to encode and decode user and/or signalling data.

- 3.9 closed user group:** A group with a predefined set of members. Only defined members may participate in a closed user group.
- 3.10 handover:** The transfer of a user's connection from one radio channel to another (can be the same or different cell).
- 3.11 home environment:** The home environment is responsible for enabling a user to obtain UMTS services in a consistent manner regardless of the user's location or terminal used (within the limitations of the serving network and current terminal).
- 3.12 home PLMN:** PLMN where the Mobile Country Code (MCC) and Mobile Network Code (MNC) of the PLMN identity are the same as the MCC and MNC of the IMSI.
- 3.13 IC Card:** A card holding an Integrated Circuit containing subscriber, end user, authentication and/or application data for one or more applications.
- 3.14 interface:** The common boundary between two associated systems.
- 3.15 International Mobile Station Equipment Identity (IMEI):** An "International Mobile Station Equipment Identity" is a unique number that shall be allocated to each individual mobile station equipment in the PLMN and shall be unconditionally implemented by the Mobile Station (MS) manufacturer.
- 3.16 Iu:** Interconnection point between an RNC and a Core Network. It is also considered as a reference point.
- 3.17 Iub:** Interface between an RNC and a node B.
- 3.18 Iur:** A logical interface between two RNC. Whilst logically representing a point to point link between RNC, the physical realization may not be a point to point link.
- 3.19 MExE server:** A node supporting MExE services in the MExE service environment.
- 3.20 MExE service:** A service enhanced (or made possible) by MExE technology.
- 3.21 MExE service environment:** Depending on the configuration of the PLMN, the operator may be able to offer support to MExE services in various ways. Examples of possible sources are from traditional GSM nodes, IN nodes, operator specific nodes, operator franchised nodes and services provider nodes, together with access to nodes external (i.e. vendor-specific) to the PLMN depending on the nature of the MExE service. These nodes are considered to constitute the MExE service environment. The MExE service environment shall support direct MExE UE to MExE UE interaction of MExE services.
- 3.22 mobile number portability:** The ability for a mobile subscriber to change subscription network within the same country whilst retaining their original MSISDN(s).
- 3.23 Mobile Station (MS):** See user equipment.
- 3.24 multimedia service:** Services that handle several types of media such as audio and video in a synchronized 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.
- 3.25 open service architecture:** Concept for introducing a vendor independent means for introduction of new services.
- 3.26 OSA interface:** Standardized Interface used by application/clients to access service capability features.
- 3.27 performance:** The ability to track service and resource usage levels and to provide feedback on the responsiveness and reliability of the network.

3.28 PLMN area: The PLMN area is the geographical area in which a PLMN provides communication services according to the specifications to mobile users. In the PLMN area, the mobile user can set up calls to a user of a terminating network. The terminating network may be a fixed network, the same PLMN, another PLMN or other types of PLMN. Terminating network users can also set up calls to the PLMN. The PLMN area is allocated to a PLMN. It is determined by the service and network provider in accordance with any provisions laid down under national law. In general the PLMN area is restricted to one country. It can also be determined differently, depending on the different telecommunication services, or type of MS. If there are several PLMNs in one country, their PLMN areas may overlap. In border areas, the PLMN areas of different countries may overlap. Administrations will have to take precautions to ensure that border coverage is minimised in adjacent countries unless otherwise agreed.

3.29 public land mobile network: A telecommunications network providing mobile cellular services.

3.30 quality of service: The collective effect of service performance 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 retain ability performance;
- Service integrity performance; and
- Other factors specific to each service.

3.31 roaming: The ability for a user to function in a serving network different from the home network.

3.32 security: The ability to prevent fraud as well as the protection of information availability, integrity and confidentiality.

3.33 service capabilities: Bearers defined by parameters, and/or mechanisms needed to realise services. These are within networks and under network control.

3.34 service capability feature: Functionality offered by service capabilities that are accessible via the standardized application interface.

3.35 service capability server: Network functionality providing open interfaces towards the functionality offered by UMTS service capabilities.

3.36 subscriber: The responsibility for payment of charges incurrent 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 standardization.

3.37 supplementary service: A service which modifies or supplements a basic telecommunication service. Consequently, it cannot be offered to a user 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 basic telecommunication services.

3.38 telecommunication service: That which is offered by a PLMN operator or service provider to its customers in order to satisfy a specific telecommunication requirement. Telecommunication services are divided into two broad families: bearer services and teleservices.

3.39 teleservice: Is a type of telecommunication service that provides the complete capability, including terminal equipment functions, for communication between users according to standardized protocols and transmission capabilities established by agreement between operators.

3.40 Universal Mobile Telecommunications System (UMTS): The telecommunications system, incorporating mobile cellular and other functionality, that is the subject of standards

produced by Standardization Development Organization, that constitutes the 3G Partnership Project.

3.41 Universal Subscriber Identity Module (USIM): An application residing on the Universal Integrated Circuit Card used for accessing services provided by mobile networks, which the application is able to register on with the appropriate security.

3.42 user: An entity, not part of UMTS, which uses UMTS services. Example: a person using a UMTS mobile station as a portable telephone.

3.43 user equipment: A device allowing a user access to network services. For the purpose of 3GPP specifications the interface between the UE and the network is the radio interface. A User Equipment can be subdivided into a number of domains, the domains being separated by reference points. Currently defined domains are the USIM and ME Domains. The ME Domain can further be subdivided into several components showing the connectivity between multiple functional groups. These groups can be implemented in one or more hardware devices. An example of such a connectivity is the TE-MT interface. Further, an occurrence of a User Equipment is an MS for GSM as defined TS 24.002.

3.44 virtual home environment: A concept for personal service environment portability across network boundaries and between terminals.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations:

2G	Second Generation
3G	Third Generation
3GMS	Third Generation Mobile Communication System
3GPP	Third Generation Partnership Project
ACELP	Algebraic Code Excited Linear Prediction
AID	Application IDentifier
AMR	Adaptive Multi-Rate
ANSI	American National Standards Institute
AoC	Advice of Charge
AoCC	Advice of Charge (Charging)
AoCI	Advice of Charge (Information)
API	Application Programming Interface
ARIB	Association of Radio Industries and Business
ASE	Application Service Element
ASN.1	Abstract Syntax Notation One
AT-command	ATtension Command
AuC	Authentication Centre
BAIC	Barring of All Incoming Call
BAOC	Barring of All Outgoing Call
BICC	Bearer Independent Call Control
BIC-Roam	Barring of Incoming Calls when Roaming outside the home PLMN country

BOIC	Barring of Outgoing International Call
BOIC-exHC	Barring of Outgoing International Calls except those directed to the Home PLMN Country
BS	Base Station
BSC	Base Station Control
BSS	Base Station System
BSSMAP	Base Station System Management Application Part
BTS	Base Transceiver Station
CAI	Charge Advise Information
CAMEL	Customized Applications for Mobile network Enhanced Logic
CAP	CAMEL Application Part
CB	Call Barring
CBC	Cell Broadcast Centre
CBS	Cell Broadcast Service
CC	Call Control
CCBS	Completion of Calls to Busy Subscriber
CD	Call Deflection
CDR	Call Detail Record
CF	Call Forwarding
CFB	Call Forwarding Busy
CFNRc	Call Forwarding on Terminal Not Reachable
CFNR	Call Forwarding on No Reply
CFU	Call Forwarding Unconditional
CLI	Calling Line Identity
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
CM	Configuration Management
CMIP	Common Management Information Protocol
CMISE	Common Management Information Service Element
CN	Core Network
CNAP	Calling Name Presentation
COLP	Connected Line identification Presentation
COLR	Connected Line identification Restriction
CORBA	Common Object Request Broker Architecture
CS	Circuit Switched
CS-1	Capability Set 1
CSE	CAMEL Service Environment

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CUG	Closed User Group
CW	Call Waiting
CWTS	China Wireless Telecommunications Standards Group
DCE	Data Circuit-terminating Equipment
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi-Frequency
DTX	Discontinuous Transmission
ECT	Explicit Call Transfer
EGPRS	Enhanced GPRS
EIR	Equipment Identity Register
EM	Element Manager
eMLPP	enhanced Multi-Level Precedence and Preemption service
EN	European Norm
E-OTD	Enhanced Observed Time Difference
EP	Elementary Procedure
ETSI	European Telecommunications Standards Institute
FM	Fault Management
GAD	Geographical Area Description
GBS	General Bearer Services
GDMO	Guidelines for the Definition of Managed Objects
GERAN	GSM EDGE Radio Access Network
GGSN	Gateway GPRS Support Node
GLR	Gateway Location Register
GMLC	Gateway Mobile Location Centre
GMSC	Gateway MSC
GPRS	General Packet Radio Service
gprsSSF	GPRS Service Switching Function
GPS	Global Positioning System
GSM	Global System for Mobile communications
GSM-EFR	GSM Enhanced Full Rate speech Codec
gsmSCF	GSM Service Control Function
gsmSRF	GSM Specialized Resource Function
gsmSSF	GSM Service Switching Function
GSN	GPRS Support Nodes
GT	Global Title
GTP	GPRS Tunnelling Protocol
HDLC	High-level Data Link Control

HE	Home Environment
HLR	Home Location Register
HPLMN	Home Public Land Mobile Network
HSCSD	High Speed Circuit Switched Data
IC	Integrated Circuit
ID	Identifier
IMEI	International Mobile Equipment Identity
IM-GSN	Intermediate GPRS Serving Node
IM-MSC	Intermediate Mobile-services Switching Centre
IMSI	International Mobile Station Identity
IN	Intelligent Network
INAP	Intelligent Network Application Protocol
IP	Internet Protocol
IPLMN	Interrogating PLMN
IrDA	Infrared Data Association
IrMC	Infrared Mobile Communications
IRP	Integration Reference Point
IS	Information Service
ISDN	Integrated Services Data Network
ISO	International Organization for Standardization
ISUP	ISDN User Part
Itf-N	Interface N
IWF	InterWorking Function
LAN	Local Area Network
LCS	Location Services
LMSI	Local Mobile Station Identity
LMU	Location Measurement Unit
LR	Location Request
MAP	Mobile Application Part
MC	Multicall
MCC	Mobile Country Code
ME	Mobile Equipment
MExE	Mobile station application Execution Environment
MIM	Management Information Model
MIME	Multipurpose Internet Mail Extensions
MLC	Mobile Location Centre
MM	Mobility Management

MMI	Man-Machine Interface
MMS	Multimedia Messaging Service
MNC	Mobile Network Code
MNP	Mobile Number Portability
MO	Mobile Originated
MO-LR	Mobile Originated Location Request
MPTY	MultiParty
MS	Mobile Station
MSC	Mobile Switching Centre
MSISDN	Mobile Station International ISDN number
MSP	Multiple Subscriber Profile
MSRN	Mobile Station Roaming Number
MT	Mobile Terminal
MT	Mobile Termination
NE	Network Element
NITZ	Network Identity and Time Zone
NM	Network Management
NRM	Network Resource Model
OACSU	Off-Air Call Set-Up
ODB	Operator Determined Barring
OMG	Object Management Group
OS	Operations System
OSA	Open Service Architecture
OSI	Open System Interconnection
PBX	Private Branch eXchange
PCM	Pulse Code Modulation
PDC-EFR	ARIB PDC-EFR 6.7 kbit/s speech Codec
PDN	Public Data Network
PDP	Packet Data Protocol
PDU	Protocol Data Unit
PI	Presentation Indicator
PIX	Proprietary application Identifier eXtension
PLMN	Public Land Mobile Network
PP	Point-to-Point
PS	Packet Switched
PSE	Personal Service Environment
PSTN	Public Switched Telephone Network

RANAP	Radio Access Network Application Part
RID	Registered application provider Identifier
RLC/MAC	Radio Link Control/ Medium Access Control
RLP	Radio Link Protocol
RNC	Radio Network Controller
RNS	Radio Network System
RR	Radio Resources
SAT	SIM Application Toolkit
SC	Service Centre
SCCP	Signalling Connection Control Part
SCR	Source Controlled Rate
SCS	Service Capability Servers
SDO	Standards Development Organization
SGSN	Serving GPRS Support Node
SI	Screening Indicator
SID	Silence Descriptor
SIM	GSM Subscriber Identity Module
SIWF	Shared Interworking Function
SIWFS	Shared InterWorking Function Server
SM	Session Management
SMIL	Synchronized Multimedia Integration Language
SM-RL	Short Message Relay function
SMS	Short Message Service
SMSC	Short Message Service Center
SMSCB	Short Message Service Cell Broadcast
SMTP	Simple Mail Transfer Protocol
SOR	Support of Optimal Routing
SRNC	Serving Radio Network Controller
SRNS	Serving RNS
SS	Supplementary Service
SS	Solution Set
SS7	Signalling System No. 7
SSF	Service Switching Function
T1	T1 Standardization Committee (part of ANSI)
T1P1	Technical Subcommittee for wireless/Mobile Services and Systems
TA	Terminal Adaptation
TAF	Terminal Adaptation Function

T-BCSM	Terminating Basic Call State Model
TCAP	Transaction Capabilities
TCH/F	A full rate Traffic CHannel
TDMA	Time Division Multiple Access
TDMA_EFR	TIA IS-641 Enhanced speech Codec
TDMA_US1	TIA TDMA-US1 (12.2 kBit/s Codec, similar to GSM-EFR)
TE	Terminal Equipment
TIA	Telecommunications Industry Association
TMSI	Temporary Mobile Station Identity
TOA	Time Of Arrival
TrFO	Transcoder Free Operation
TS	Technical Specification
TSG	Technical Specification Group
TTA	Telecommunication Technology Association (Korea)
TTC	Telecommunication Technology Committee (Japan)
TUP	Telephone User Part (SS7)
UDP	User Datagram Protocol
UE	User Equipment
UICC	Universal IC Card
UIM	User Identity Module
UMTS	Universal Mobile Telecommunication System
USAT	USIM Application Toolkit
USIM	Universal Subscriber Identity Module
USSD	Unstructured Supplementary Service Data
UTRA	Universal Terrestrial Radio Access
UTRA-FDD	Universal Terrestrial Radio Access- Frequency Division Duplex
UTRAN	Universal Terrestrial Radio Access Network
UTRA-TDD	Universal Terrestrial Radio Access- Time Division Duplex
UUS	User-to-User Signalling
VAD	Voice Activity Detector
VBS	Voice Broadcast Service
VGCS	Voice Group Call Service
VHE	Virtual Home Environment
VLR	Visitor Location Register
VMSC	Visited Mobile Switching Centre
VPLMN	Visited Public Land Mobile Network
WAP	Wireless Application Protocol
XML	eXtensible Markup Language



5 Introduction

The core network for this IMT-2000 family member referred to as "UMTS", is based on an evolved core network from the 2nd generation mobile system, GSM. The technical specifications have been developed in a partnership project and transposed to the involved Standards Development Organizations (SDOs). The system will support different applications ranging from narrow-band to wide-band communications capability with integrated personal and terminal mobility to meet the user and service requirements.

Release 1999 is the first release of this 3rd generation of mobile communications technology. The core network interfaces identified in this Recommendation constitute a complete mobile core network system for terrestrial usage based on GSM evolved UMTS core network with UTRAN access network

Refer to 10.2.37 "UMTS Service principles" for more information.

The description of the Technical Specifications listed in Clause 10 are for informative purposes only. Normative information is in the tables.

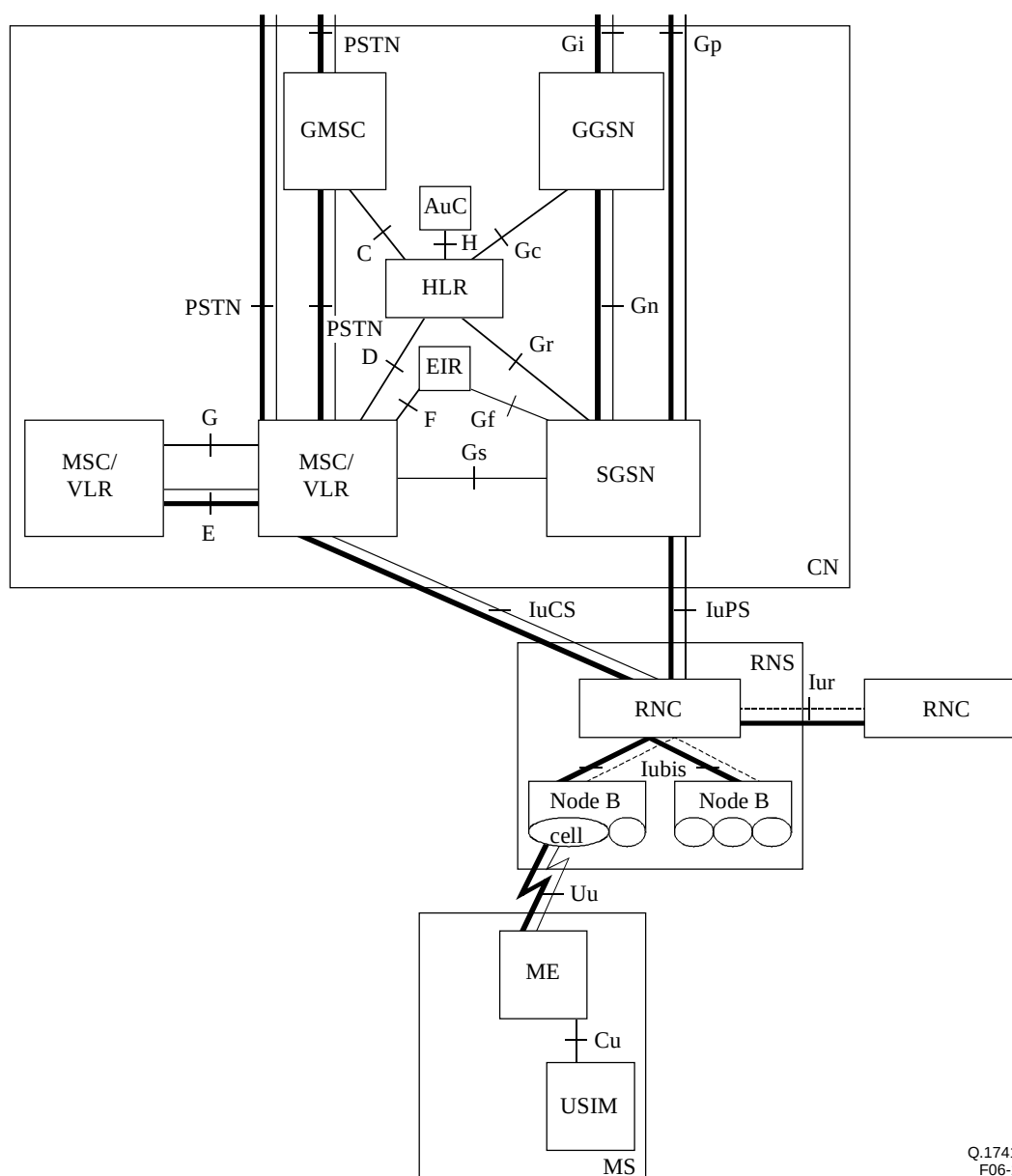
6 Basic architecture for the UMTS IMT-2000 family member

This text is based on references [2a]-[2e] section 5.1.

The basic configuration of a Public Land Mobile Network (PLMN) supporting GPRS and the interconnection to the PSTN/ISDN and PDN is presented in Figure 6-1. This configuration presents signalling interfaces, which can be found in a PLMN. Implementations may be different: some particular functions may be gathered in the same equipment and then some interfaces may become internal interfaces.

In the basic configuration presented in Figure 6-1, all the functions are considered implemented in different equipments. Therefore, all the interfaces within PLMN are external. This Recommendation will only describe the internal interfaces in the Core Network (CN) and the external interfaces to and from CN. Interfaces Iu, Iur and Iubis are defined in the UMTS 25.4xx-series of Technical Specifications, which are outside the scope of this Recommendation. Interfaces C, D, E, F and G need the support of the Mobile Application Part of the Signalling System No. 7 to exchange the data necessary to provide the mobile service. No protocols for the H-interface and for the I-interface are standardized. All the GPRS-specific interfaces (G series) are defined in the UMTS 23- and 24-series of Technical Specifications.

From this configuration, all the possible PLMN organizations can be deduced. In the case when some functions are contained in the same equipment, the relevant interfaces become internal to that equipment.



Q.1741.1
F06-1

Bold lines Interfaces supporting user traffic
Dashed lines Interfaces supporting signalling

NOTE 1 – The figure shows direct interconnections between the entities. The actual links may be provided by an underlying network (e.g. SS7 or IP); this needs further studies.

NOTE 2 – This is a simplified architecture figure. Not all nodes and interfaces are indicated.

NOTE 3 – This figure differs from the original figure in reference [2a]-[2e]. This figure only shows the third generation aspects.

Figure 6-1/Q.1741.1 – Basic configuration of a PLMN supporting CS and PS services and interfaces

This text is based on text in references [2a]-[2e] section 5.2.2.

The basic configuration of UMTS Location Services is presented in Figure 6-2.

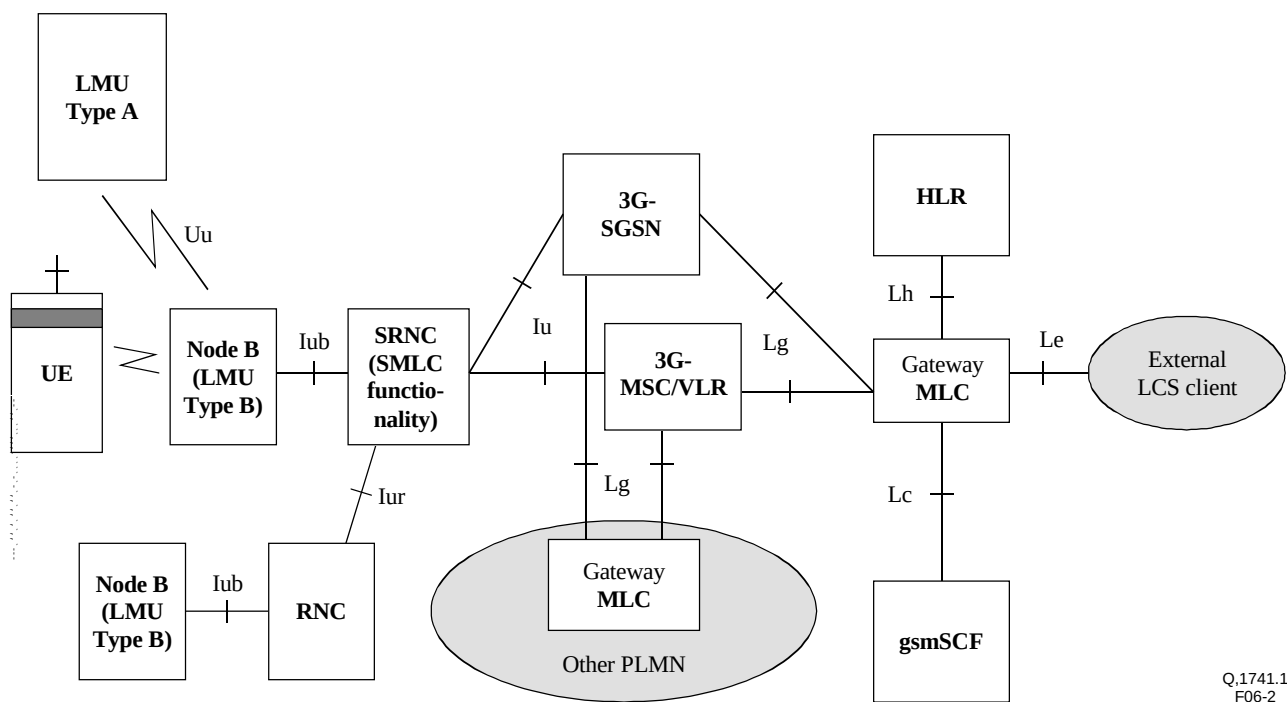


Figure 6-2/Q.1741.1 – Configuration of location services entities in an UMTS PLMN

This text is based on text in references [2a]-[2e] sections 4a.4 and 5.3.

The CAMEL feature (Customized Applications for Mobile network Enhanced Logic) provides the mechanisms to support services consistently independently of the serving network.

Figure 6-3 shows the interconnection of the CAMEL-specific entities with the rest of the network. Only the interfaces specifically involved in CAMEL provisioning are shown, i.e. all the GMSC, MSC and HLR interfaces depicted in Figure 6-3 are still supported by these entities even if not shown.

NOTE – The CAMEL-specific interfaces have no particular name. They are designated by the name of the two entities they link together, e.g. "the gsmSSF-gsmSCF interfaces".

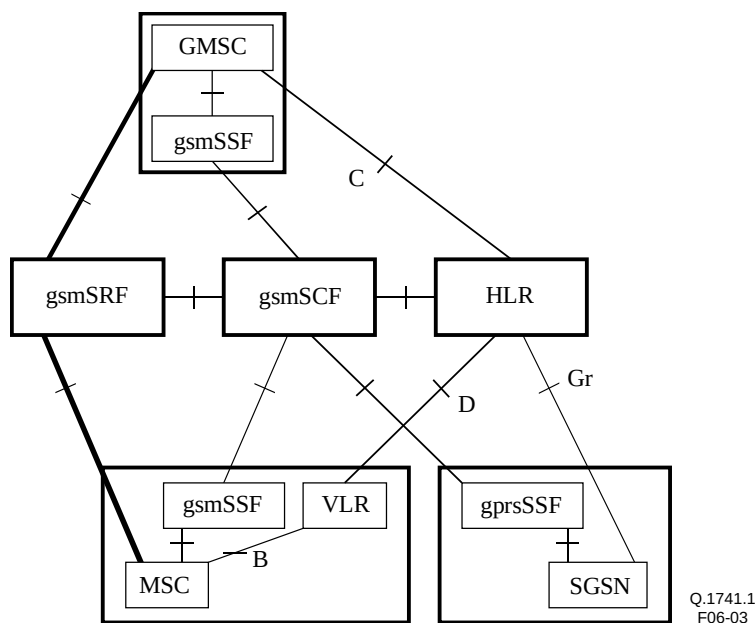


Figure 6-3/Q.1741.1 – Configuration of CAMEL entities

This text is based on text in references [2a]-[2e] section 5.3.

The bold lines are used for interfaces supporting user data only; the dashed lines are used for interfaces supporting signalling only.

This text is based on text in references [2a]-[2e] section 4.a.4.5.

The cell broadcast service (CBS) is a Teleservice, which enables an Information Provider to submit short messages for broadcasting to a specified area within the PLMN.

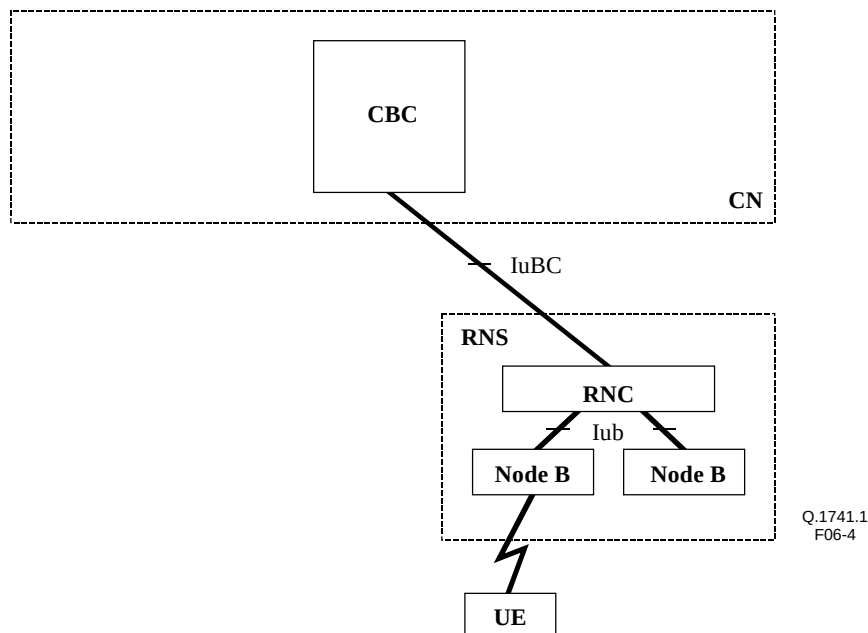


Figure 6-4/Q.1741.1 – Configuration of a PLMN supporting cell broadcast service entities

This text is based on text in references [2a]-[2e] Annex A.

Gateway Location Register (GLR) is an optional functional entity to optimize signalling traffic between PLMNs. This entity handles location management of roaming subscriber in visited network without involving HLR. The location register function in the GLR stores subscription information and routing information for both CS services and PS services. This entity can be only located in a visited PLMN.

In the basic configuration with GLR introduction, presented in Figure 6-5, all the functions related to GLR introduction is considered implemented in different equipments. Therefore, all the interfaces within PLMN are external. Interfaces GLa, GLb, GLc, GLd, GLf, GLg, GLh, and GLi need the support of the Mobile Application Part of the signalling system No. 7 to exchange the data necessary to provide the mobile service. No protocols for the GLe interface are standardized. GLj and GLk need the support of GPRS Tunnelling Protocol – Control to provide the packet domain services.

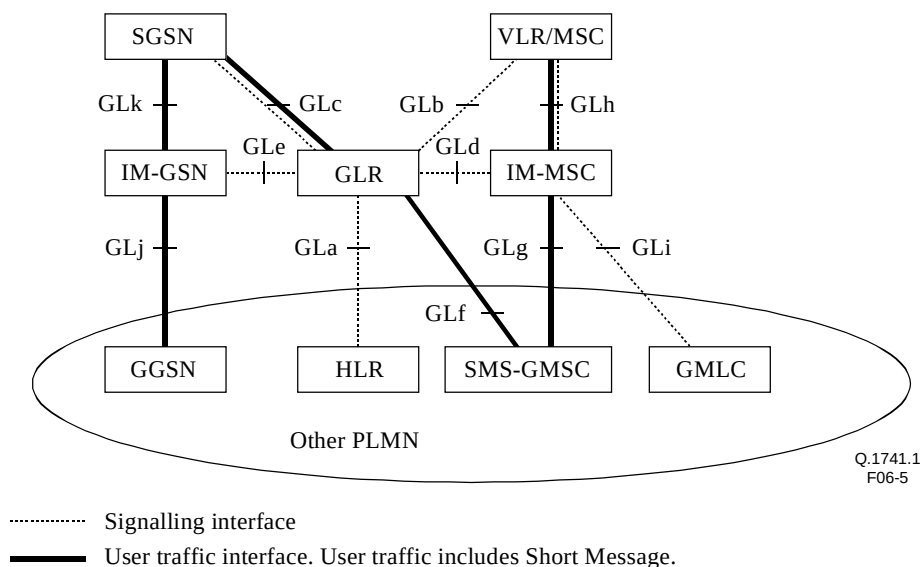


Figure 6-5/Q.1741.1 – Configuration of a PLMN and interfaces with GLR

7 Network entities

7.1 Gateway Mobile Switching Centre (GMSC)

The text in this clause is based on references [2a]-[2e] section 4.1.2.2.

The Mobile Switching Center (MSC), which performs the routing function to the actual location of the Mobile Station (MS), is called the Gateway MSC (GMSC).

If a network delivering a call to the PLMN cannot interrogate the Home Location Register (HLR), the call is routed to an MSC. This MSC will interrogate the appropriate HLR and then route the call to the MSC where the mobile station is located.

The acceptance of an interrogation to an HLR is the decision of the operator.

The choice of which MSCs can act as Gateway MSCs is for the operator to decide (i.e. all MSCs or some designated MSCs).

7.2 Mobile Switching Centre and Visitor Location Register MSC/VLR (MSC/VLR)

7.2.1 Mobile Switching Centre (MSC)

The text in this clause is based on references [2a]-[2e] section 4.1.2.1.

The Mobile-services Switching Centre (MSC) constitutes the interface between the radio system and the fixed networks. The MSC performs all necessary functions in order to handle the circuit-switched services to and from the mobile stations.

In order to obtain radio coverage of a given geographical area, a number of base stations are normally required; i.e. each MSC would thus have to interface several base stations. In addition, several MSCs may be required to cover a country.

The Mobile-services Switching Centre is an exchange that performs all the switching and signalling functions for mobile stations located in a geographical area designated as the MSC area. The main difference between a MSC and an exchange in a fixed network is that the MSC has to take into account the impact of the allocation of radio resources and the mobile nature of the subscribers and has to perform in addition, at least the following procedures:

- Procedures required for the location registration;
- Procedures required for handover.

7.2.2 Visitor Location Register (VLR)

The text in this clause is based on references [2a]-[2e] section 4.1.1.2.

A mobile station roaming in an MSC area is controlled by the Visitor Location Register in charge of this area. When a Mobile Station (MS) enters a new location area it starts a registration procedure. The MSC in charge of that area notices this registration and transfers to the Visitor Location Register the identity of the location area where the MS is situated. If this MS is not yet registered, the VLR and the HLR exchange information to allow the proper handling of calls involving the MS.

A VLR may be in charge of one or several MSC areas.

The VLR also contains the information needed to handle the calls set up or received by the MSs registered in its data base (for some supplementary services, the VLR may have to obtain additional information from the HLR). The following elements are included:

- The International Mobile Station Identity (IMSI);
- The Mobile Station International ISDN number (MSISDN);
- The Mobile Station Roaming Number (MSRN),
- The Temporary Mobile Station Identity (TMSI), if applicable;
- The Local Mobile Station Identity (LMSI), if used;
- The location area where the mobile station has been registered;
- The identity of the SGSN where the MS has been registered. Only applicable to PLMNs supporting GPRS and which have a Gs interface between MSC/VLR and SGSN;
- The last known location and the initial location of the MS.

The VLR also contains supplementary service parameters attached to the mobile subscriber and received from the HLR.

7.3 Home Location Register (HLR)

The text in this clause is based on references [2a]-[2e] section 4.1.1.1.

The Home Location Register (HLR) is a database in charge of the management of mobile subscribers. A PLMN may contain one or several HLRs: it depends on the number of mobile subscribers, on the capacity of the equipment and on the organization of the network. The following kinds of information are stored there:

- The subscription information;
- Some location information enabling the charging and routing of calls towards the MSC where the MS is registered (e.g. the MS Roaming Number, the VLR Number, the MSC Number, the Local MS Identity);

and, if GPRS is supported, also:

- Location information enabling the charging and routing of messages in the SGSN where the MS is currently registered (e.g. the SGSN Number);

and, if LCS is supported, also:

- A LCS privacy exception list, which indicates the privacy class of the MS subscriber;
- A GMLC list;
- A MO-LR list.

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Different types of identity are attached to each mobile subscription and are stored in the HLR. The following identities are stored:

- The International Mobile Station Identity (IMSI);
- One or more Mobile Station International ISDN number(s) (MSISDN);

If GPRS is supported, the following identity is also stored:

- Zero or more Packet Data Protocol (PDP) address(es);

and, if LCS is supported, the following identity is also stored:

- The LMU indicator.

There is always at least one identity, apart from the IMSI, attached to each mobile subscription and stored in the HLR.

The IMSI or the MSISDN may be used as a key to access the information in the database for a mobile subscription.

The database contains other information such as:

- Teleservices and bearer services subscription information;
- Service restrictions (e.g. roaming limitation);
- A list of all the group IDs a service subscriber is entitled to use to establish voice group or broadcast calls;
- Supplementary services; the HLR contains the parameters attached to these services;

and, if GPRS is supported, also:

- Information about if a GGSN is allowed to dynamically allocate PDP addresses for a subscriber.

7.4 Authentication Centre (AuC)

The text in this clause is based on references [2a]-[2e] section 4.1.1.3.

The Authentication Centre (AuC) is an entity that stores data for each mobile subscriber to allow the International Mobile Subscriber Identity (IMSI) to be authenticated and to allow communication over the radio path between the mobile station and the network to be ciphered. The AuC transmits the data needed for authentication and ciphering via the HLR to the VLR, MSC and SGSN which need to authenticate a mobile station.

The Authentication Centre (AuC) is associated with an HLR, and stores an identity key for each mobile subscriber registered with the associated HLR. This key is used to generate:

- Data that are used to authenticate the International Mobile Subscriber Identity (IMSI);
- A key used to cipher communication over the radio path between the mobile station and the network.

The AuC communicates only with its associated HLR over an interface denoted the H-interface (see 8.28).

7.5 Equipment Identity Register (EIR)

The text in this clause is based on references [2a]-[2e] section 4.1.1.4.

The Equipment Identity Register (EIR) is the logical entity, which is responsible for storing in the network the International Mobile Equipment Identities (IMEIs), used.

The equipment is classified, as "white listed", "grey listed", "black listed" or it may be unknown.

This functional entity contains one or several databases which store(s) the IMEIs used.

The mobile equipment may be classified as "white listed", "grey listed" and "black listed" and therefore may be stored in three separate lists.

An IMEI may also be unknown to the EIR.

An EIR shall as a minimum contain a "white list" (Equipment classified as "white listed").

7.6 Gateway GPRS Support Node (GGSN)

The text in this clause is based on references [2a]-[2e] sections 4.1.3 and 4.1.3.2.

The UMTS GPRS Support Nodes (GSN) is the Gateway GSN (GGSN) and the Serving GSN (SGSN). They constitute the interface between the radio system and the fixed networks for packet switched services. The GSN performs all necessary functions in order to handle the packet transmission to and from the mobile stations.

Gateway GPRS Support Node (GGSN): The location register function in the GGSN stores subscriber data received from the HLR and the SGSN. There are two types of subscriber data needed to handle originating and terminating packet data transfer:

- Subscription information:
 - The IMSI;
 - Zero or more PDP addresses.
- Location information:
 - The SGSN address for the SGSN where the MS is registered.

7.7 Serving GPRS Support Node (SGSN)

The text in this clause is based on references [2a]-[2e] sections 4.1.3 and 4.1.3.1.

The UMTS GPRS Support Nodes (GSN) is the Gateway GSN (GGSN) and the Serving GSN (SGSN). They constitute the interface between the radio system and the fixed networks for packet switched services. The GSN performs all necessary functions in order to handle the packet transmission to and from the mobile stations.

Serving GPRS Support Node (SGSN): The location register function in the SGSN stores two types of subscriber data needed to handle originating and terminating packet data transfer:

Subscription information:

- The IMSI;
 - One or more temporary identities;
 - Zero or more PDP addresses.
- Location information:
 - Depending on the operating mode of the MS, the cell or the routing area where the MS is registered;
 - The VLR number of the associated VLR (if the Gs interface is implemented);
 - The GGSN address of each GGSN for which an active PDP context exists.

7.8 Gateway Mobile Location Centre (GMLC)

The text in this clause is based on references [2a]-[2e] section 4a.3.2.

The Gateway Mobile Location Centre (GMLC) is the first node an external Location Application accesses in the PLMN. The GMLC performs registration authorization and requests routing information from the HLR. There may be more than one GMLC in a PLMN.

7.9 GPRS Service Switching Function (gprsSSF)

This text is based on text in references [2a]-[2e] section 4a.4.4.

A functional entity that interfaces the SGSN to the gsmSCF. The concept of the gprsSSF is derived from the IN SSF, but uses different triggering mechanisms because of the nature of the mobile network.

7.10 GSM Service Control Function (gsmSCF)

This text is based on text in references [2a]-[2e] section 4a.4.1.

A functional entity that contains the CAMEL service logic to implement Operator Specific Service. It interfaces with the gsmSSF, the gsmSRF and the HLR.

7.11 GSM Service Switching Function (gsmSSF)

This text is based on text in references [2a]-[2e] section 4a.4.2.

A functional entity that interfaces the MSC/GMSC to the gsmSCF. The concept of the gsmSSF is derived from the IN SSF, but uses different triggering mechanisms because of the nature of the mobile network.

7.12 GSM Specialised Resource Function (gsmSRF)

This text is based on text in references [2a]-[2e] section 4a.4.3.

A functional entity, which provides various specialized resources. It interfaces with the gsmSCF and with the MSC. This entity is defined in ITU-T Rec. Q.1214 [23] with variations defined in TS 23.078 (see 10.3.25).

7.13 Gateway Location Register (GLR)

The text in this clause is based on references [2a]-[2e] Annex 2.

The Gateway Location Register (GLR) handles location management of roaming subscriber in visited network without involving HLR. The location register function in the GLR stores subscription information and routing information for both CS services and PS services. This entity can be only located in a visited PLMN. The GLR is an optional functional entity to optimize signalling traffic between PLMNs.

7.14 Intermediate GPRS Serving Node (IM-GSN)

The text in this clause is based on references [2a]-[2e] Annex 2.

The Intermediate GPRS Serving Node (IM-GSN) is used as serving GSN towards home network and relay some PDU notification messages between serving GSN and Gateway GSN. This entity can be only located in a visited PLMN.

7.15 Intermediate Mobile-services Switching Centre (IM-MSC)

The text in this clause is based on references [2a]-[2e] Annex 2.

The Intermediate Mobile-services Switching Centre (IM-MSC) is used as serving MSC towards home network and relay some messages between home network and serving MSC. This entity can only be located in a visited PLMN.

8 Interfaces

8.1 C-Interface (Gateway Mobile Switching Centre (GMSC) – Home Location Register (HLR))

The text in this clause is based on the text in references [2a]-[2e] section 6.4.1.2.

The Gateway MSC must interrogate the HLR of the required subscriber to obtain routing information for a call or a short message directed to that subscriber.

Signalling on this interface uses the Mobile Application Part (MAP), which in turn uses the services of Transaction Capabilities.

For Customized Applications for Mobile network Enhanced Logic (CAMEL) purposes, this interface is used e.g. at terminating calls to exchange routing information, subscriber status, location information, subscription information, etc.

8.2 D Interface (Visitor Location Register (VLR) – Home Location Register (HLR))

The text in this clause is based on the text in references [2a]-[2e] section 6.4.1.3.

This interface is used to exchange the data related to the location of the mobile station and to the management of the subscriber. The main service provided to the mobile subscriber is the capability to set up or to receive calls within the whole service area. To support this, the location registers have to exchange data. The VLR informs the HLR of the location of a mobile station managed by the latter and provides it (either at location updating or at call set-up) with the roaming number of that station. The HLR sends to the VLR all the data needed to support the service to the mobile subscriber. The HLR then instructs the previous VLR to cancel the location registration of this subscriber. Exchanges of data may occur when the mobile subscriber requires a particular service, when he wants to change some data attached to his subscription or when some parameters of the subscription are modified by administrative means.

Signalling on this interface uses the Mobile Application Part (MAP), which in turn uses the services of Transaction Capabilities.

For Customized Applications for Mobile network Enhanced Logic (CAMEL) purposes, this interface is used to send the CAMEL related subscriber data to the visited PLMN and for provision of MSRN. The interface is also used for the other purposes, e.g. to retrieve subscriber status and location information of the mobile subscriber or to indicate suppression of announcement for a CAMEL service.

8.3 E Interface (Mobile Switching Centre (MSC) – Mobile Switching Centre (MSC))

The text in this clause is based on the text in references [2a]-[2e] section 6.4.1.4.

When a mobile station moves from one MSC area to another during a call, a handover procedure has to be performed in order to continue the communication. For that purpose the MSCs have to exchange data to initiate and then to realise the operation.

After the handover operation has been completed, the MSCs will exchange information to transfer A-interface signalling as necessary.

When a short message is to be transferred between a Mobile Station and Short Message Service Centre (SC), in either direction, this interface is used to transfer the message between the MSC serving the Mobile Station and the MSC, which acts as the interface to the SC.

Signalling on this interface uses the Mobile Application Part (MAP), which in turn uses the services of Transaction Capabilities.

8.4 F Interface (Mobile Switching Centre (MSC) – Equipment Identity Register (EIR))

The text in this clause is based on the text in references [2a]-[2e] section 6.4.1.5.

This interface is used between MSC and EIR to exchange data, in order that the EIR can verify the status of the IMEI retrieved from the Mobile Station.

Signalling on this interface uses the Mobile Application Part (MAP), which in turn uses the services of Transaction Capabilities.

8.5 G Interface (Visitor Location Register (VLR) – Visitor Location Register (VLR))

The text in this clause is based on the text in references [2a]-[2e] section 6.4.1.6.

When a mobile subscriber moves from a VLR area to another Location Registration procedure will happen. This procedure may include the retrieval of the IMSI and authentication parameters from the old VLR.

Signalling on this interface uses the Mobile Application Part (MAP), which in turn uses the services of Transaction Capabilities.

8.6 Gc Interface (Home Location Register (HLR) – Gateway GPRS Support Node (GGSN))

The text in this clause is based on the text in references [2a]-[2e] section 6.4.2.3.

This optional signalling path may be used by the GGSN to retrieve information about the location and supported services for the mobile subscriber, to be able to activate a packet data network address.

There are two alternative ways to implement this signalling path:

- If an SS7 interface is implemented in the GGSN, signalling between the GGSN and the HLR uses the Mobile Application Part (MAP), which in turn uses the services of Transaction Capabilities (TCAP);
- If there is *no* SS7 interface in the GGSN, any GSN in the same PLMN and which has an SS7 interface installed can be used as a GTP to MAP protocol converter, thus forming a signalling path between the GGSN and the HLR.

8.7 Gf Interface (Equipment Identity Register (EIR) – Serving GPRS Support Node (SGSN))

The text in this clause is based on the text in references [2a]-[2e] section 6.4.2.4.

This interface is used between SGSN and EIR to exchange data, in order that the EIR can verify the status of the IMEI retrieved from the Mobile Station.

Signalling on this interface uses the Mobile Application Part (MAP), which in turn uses the services of Transaction Capabilities (TCAP).

8.8 Gi Interface (Gateway GPRS Support Node (GGSN) – Public Network)

The text in this clause is based on the text in references [2a]-[2e] section 7.2.

This interface connects the PLMN to external public or private packet data networks.

8.9 GLa Interface (Gateway Location Register (GLR) – Home Location Register (HLR))

The text in this clause is based on the text in references [2a]-[2e] section A.5.1.

In circuit switched domain, this interface is the same as that between the VLR and the HLR. The HLR regards the GLR as the VLR via this interface. On the other hand, in packet switched domain, this interface is the same as that between the SGSN and the HLR. The HLR regards the GLR as the SGSN via this interface.

8.10 GLb Interface (Gateway Location Register (GLR) – Visitor Location Register (VLR))

The text in this clause is based on the text in references [2a]-[2e] section A.5.2.

This interface is the same as those between the VLR and the HLR. The VLR regards the GLR as the HLR via this interface.

8.11 GLc Interface (Gateway Location Register (GLR) – Serving GPRS Support Node (SGSN))

The text in this clause is based on the text in references [2a]-[2e] section A.5.3.

This interface is the same as those between the SGSN and the HLR. The SGSN regards the GLR as the HLR via this interface.

8.12 GLd Interface (Gateway Location Register (GLR) – Intermediate Mobile services Switching Centre (IM-MSC))

The text in this clause is based on the text in references [2a]-[2e] section A.5.4.

In the network with the GLR, when the IM_MSC receives a message, it interrogates the GLR for the routing information of the MSC. However, this interface is internal because GLR and IM-MSC are implemented in the same physical node and the protocol on this interface is not specified.

8.13 GLe Interface (Gateway Location Register (GLR) – Intermediate GPRS Serving Node (IM-GSN))

The text in this clause is based on the text in references [2a]-[2e] section A.5.5.

In the network with the GLR when the IM-GSN receiving a PDU notification from the GGSN, the IM-GSN relays the notification to the SGSN by interrogating via the interface the routing information to the GLR. The interrogation uses the same operation on the interface between the SGSN and the HLR.

8.14 GLf Interface (Gateway Location Register (GLR) – Short Message Service-Gateway Mobile Switching Centre (SMS-GMSC))

The text in this clause is based on the text in references [2a]-[2e] section A.5.6.

This interface is used to forward mobile-terminated short messages in the network with the GLR in case of SMS transfer over GPRS. Signalling on this interface uses the Mobile Application Part (MAP).

The SMS-GMSC regards the GLR as the SGSN via this interface.

8.15 GLg Interface (Intermediate Mobile-services Switching Centre (IM-MSC) – Short Message Service-Gateway Mobile Switching Centre (SMS-GMSC))

The text in this clause is based on the text in references [2a]-[2e] section A.5.7.

This interface is used to forward short messages in the network with the GLR in case of SMS transfer over non-GPRS. Signalling on this interface uses the Mobile Application Part (MAP)

The SMS-GMSC regards the IM_MSC as the MSC via this interface.

8.16 GLh Interface (Intermediate Mobile-services Switching Centre (IM-MSC) – Mobile Switching Centre (MSC))

The text in this clause is based on the text in references [2a]-[2e] section A.5.8.

This interface is used to forward short messages in the network with the GLR in case of SMS transfer over non-GPRS. Also this interface is used to exchange data needed by the MSC to perform subscriber authorization and allocate network resources. Signalling on this interface uses the Mobile Application Part (MAP).

8.17 GLi Interface (Intermediate Mobile-services Switching Centre (IM-MSC) – Gateway Mobile Location Centre (GMLC))

The text in this clause is based on the text in references [2a]-[2e] section A.5.9.

Also this interface is used to exchange data needed by the MSC to perform subscriber authorization and allocate network resources. Signalling on this interface uses the Mobile Application Part (MAP).

The GMLC regards the IM-MSC as the MSC via this interface.

8.18 GLj Interface (Intermediate GPRS Serving Node (IM-GSN) – Gateway GPRS Support Node (GGSN))

The text in this clause is based on the text in references [2a]-[2e] section A.5.10.

In the network with the GLR when receiving a PDP PDU from the external network the GGSN sends a notification to the IM-GSN by the routing information from the HLR. The GGSN regards the IM-GSN as the SGSN via this interface.

8.19 GLk Interface (Intermediate GPRS Serving Node (IM-GSN) – Serving GPRS Support Node (SGSN))

The text in this clause is based on the text in references [2a]-[2e] section A.5.11.

In the network with the GLR when receiving a PDP notification from the GGSN, the IM-GSN relays the notification to the SGSN by the routing information from the GLR. The SGSN regards the IM-GSN as the GGSN via this interface.

8.20 Gn Interface (Gateway GPRS Support Node (GGSN) – Serving GPRS Support Node (SGSN))

The text in this clause is based on the text in references [2a]-[2e] section 6.4.2.2.

This interface is used to support mobility between the SGSN and GGSN. The Gn interface is used when GGSN and SGSN are located inside one PLMN. The Gn interface also includes a part that allows SGSNs to communicate subscriber and user data, when changing SGSN.

Signalling on this interface uses the User Datagram Protocol, UDP/IP.

8.21 Gp Interface (Serving GPRS Support Node (SGSN) – Public Network)

The text in this clause is based on the text in references [2a]-[2e] section 6.4.2.2.

The Gp-interface is used if GGSN and SGSN are located in different PLMNs. The Gp interface also includes a part that allows SGSNs to communicate subscriber and user data, when changing SGSN.

Signalling on this interface uses the User Datagram Protocol, UDP/IP.

8.22 Gr Interface (Home Location Register (HLR) – Serving GPRS Support Node (SGSN))

The text in this clause is based on the text in references [2a]-[2e] section 6.4.2.1.

This interface is used to exchange the data related to the location of the mobile station and to the management of the subscriber. The main service provided to the mobile subscriber is the capability to transfer packet data within the whole service area. The SGSN informs the HLR of the location of a mobile station managed by the latter. The HLR sends to the SGSN all the data needed to support the service to the mobile subscriber. Exchanges of data may occur when the mobile subscriber requires a particular service, when he wants to change some data attached to his subscription or when some parameters of the subscription are modified by administrative means.

Signalling on this interface uses the Mobile Application Part (MAP), which in turn uses the services of Transaction Capabilities (TCAP).

8.23 Gs Interface (Mobile Switching Centre (MSC)/Visitor Location Register (VLR) – Serving GPRS Support Node (SGSN))

The text in this clause is based on the text in references [2a]-[2e] section 6.4.3.1.

The SGSN may send location information to the MSC/VLR via the optional Gs interface. The SGSN may receive paging requests from the MSC/VLR via the Gs interface. The MSC/VLR may indicate to an SGSN, via the Gs interface, that an UE is engaged in a service handled by the MSC.

Signalling on this interface uses connectionless SCCP (without TCAP). SCCP Global Title (GT) is used for addressing.

8.24 gsmSCF – HLR Interface

This text is based on text in references [2a]-[2e] section 6a.4.4.

This interface is used by the gsmSCF to request information from the HLR. As a network operator option the HLR may refuse to provide the information requested by the gsmSCF.

This interface is also used for USSD operations, both for gsmSCF-initiated dialogues and MS-initiated dialogues (relayed via HLR). It is a network operator option whether to support or not USSD operations on this interface.

8.25 gsmSCF – gsmSRF Interface

This text is based on text in references [2a]-[2e] section 6a.4.5

This interface is used by the gsmSCF to instruct the gsmSRF to play tones/announcements to the users.

8.26 gsmSSF – gsmSCF Interface

This text is based on text in references [2a]-[2e] section 6a.4.2.

This interface is used by the gsmSCF to control a call in a certain gsmSSF and to request the gsmSSF to establish a connection with a gsmSRF. Relationships on this interface are opened as a result of the gsmSSF sending a request for instructions to the gsmSCF.

8.27 gprsSSF – gsmSCF Interface

This text is based on text in references [2a]-[2e] section 6a.4.8

This interface is used by the gsmSCF to control a GPRS session or individual PDP Context in a certain gprsSSF. Relationships between the gprsSSF and the gsmSCF (GPRS dialogues) on this interface are opened as a result of the gprsSSF sending a request for instructions to the gsmSCF.

8.28 H Interface (Home Location Register (HLR) – Authentication Centre (AuC))

The text in this clause is based on the text in references [2a]-[2e] section 6.4.3.2.

When an HLR receives a request for authentication and ciphering data for a Mobile Subscriber and it does not hold the requested data, the HLR requests the data from the AuC. The protocol used to transfer the data over this interface is not standardized.

8.29 IuBC Interface (Core Network (CN) – Radio Network Controller (RNC))

The text in this clause is based on the text in references [2a]-[2e] section 6a.5.1.

The interface between the CBC and the RNS is specified in the 25.41x-series of 3G Technical Specifications.

The CBC-RNS interface is used to carry information concerning:

- The CBS messages itself; and
- CBS delivery parameter.

8.30 IuCS Interface (Mobile Switching Centre (MSC) – Radio Network Controller (RNC))

The text in this clause is based on the text in references [2a]-[2e] section 6.2.1.2.

The interface between the MSC and its RNS is specified in the 25.41x-series of UMTS Technical Specifications.

The RNS-MSC interface is used to carry information concerning:

- RNS Management;
- Call handling;
- Mobility management.

8.31 IuPS Interface (Serving GPRS Support Node (SGSN) – Radio Network Controller (RNC))

The text in this clause is based on the text in references [2a]-[2e] section 6.2.2.2.

The RNS-3G-SGSN interface is used to carry information concerning:

- Packet data transmission;
- Mobility management.

The IuPS interface is defined in the 25.41x-series of UMTS Technical Specifications.

8.32 Lc Interface (Gateway Mobile Location Centre (GMLC) – GSM Service Control Function (gsmSCF))

The text in this clause is based on the text in references [3a]-[3e] section 6.3.10.

The Lc interface supports CAMEL access to LCS.

8.33 Le Interface (Gateway Mobile Location Centre (GMLC) – External LCS client)

The text in this clause is base on the text in references [2a]-[2e] section 7.3.

This interface connects the PLMN to the external LCS Client.

8.34 Lg Interface (Mobile Switching Centre (MSC)/Visitor Location Register (VLR) – Mobile Location Centre (MLC))

The text in this clause is based on the text in references [2a]-[2e] section 6a.3.1.

The MSC-GMLC interface is used to exchange data needed by the MSC to perform subscriber authorization and allocate network resources. The GMLC provides the IMSI and requested Quality of Service information.

Signalling on this interface uses the Mobile Application Part (MAP), which in turn uses the services of Transaction Capabilities (TCAP).

8.35 Lh Interface (Home Location Register (HLR) – Gateway Mobile Location Centre (GMLC))

The text in this clause is based on the text in references [2a]-[2e] section 6a.3.4.

This interface is used by the GMLC to retrieve the VMSC location and IMSI for a particular mobile.

Signalling on this interface uses the Mobile Application Part (MAP), which in turn uses the services of Transaction Capabilities (TCAP).

8.36 Mobile Switching Centre (MSC) – gsmSCF Interface

This text is based on text in references [2a]-[2e] section 6a.4.6

This interface is used by the MSC to send supplementary service invocation notifications to the gsmSCF.

8.37 PSTN Interface (Mobile Switching Centre (MSC)/Visitor Location Register (VLR) – Public Switching Telephone Network (PSTN))

The text in this clause is based on the text in references [2a]-[2e] section 7.1.

The MSC is based on a normal ISDN exchange. It has, for call control, the same interface as the fixed network exchanges. The signalling interface considered in the GSM Technical Specifications is related to the signalling system No. 7 User Parts TUP and ISUP associated to the circuits used for incoming and outgoing calls.

9 Technical specifications structure

This clause provides an overview of the specifications for this IMT-2000 Family member based on GSM evolved UMTS core Network with UTRAN access network. Details for these specifications may be found in clause 10.

The following text describes the numbering scheme for the specifications and reports for the 3GPP 3rd Generation Mobile System.

Specifications for Release 1999 of the 3rd Generation mobile system are identified by the "ab.cde" numbering scheme.

Where existing GSM Specifications are enhanced or modified by the TSGs for the 3rd Generation Mobile System, the specification title and version should change (title reflecting 3rd Generation Mobile System). The GSM number (ab) has increased by 20 and a "c" digit equal to zero added (e.g., GSM 07.07 becomes 3GTS 27.007) indicating the GSM heritage of the Specification. Table 1 is a conversion table between specifications on the second generation GSM system and specifications in the third generation UMTS system.

For newly created 3GPP Specifications the "c" digit is not zero.

The following Series titles and descriptions are used for guidance only and may be further developed with experience.

The specification series are:

21-series	Requirements specifications;
22-series	Service aspects;
23-series	Technical realization;
24-series	Signalling protocols (UE – CN network);
25-series	UTRA aspects (see Note 1);
26-series	Codecs (speech, video, etc.);
27-series	Data;
28-series	Reserved for future use;
29-series	Signalling protocols;
30-series	Programme management (see Note 2);
31-series	User Identity Module (UIM);
32-series	Operation and maintenance;
33-series	Security aspects;
34-series	Test specifications (see Note 2);
35-series	Algorithm specifications.

NOTE 1 – Technical specifications in this series are not included in the scope of this Recommendation. They are described in reference [1].

NOTE 2 – Technical specifications in these series are not included in the scope of this Recommendation.

Table 1/Q.1741.1 – Conversion between 2G and 3G

GSM Number	3G Spec. Number	Title
01.01	21.101	3rd Generation mobile system Release 1999 Specifications
01.11	21.111	USIM and IC card requirements
01.33	21.133	Security threats and requirements
02.00	22.100	UMTS Phase 1
02.01	22.001	Principles of circuit telecommunication services supported by a Public Land Mobile Network (PLMN)
02.01	22.101	Service aspects; Service principles
02.02	22.002	Circuit Bearer Services (BS) supported by a Public Land Mobile Network (PLMN)
02.03	22.003	Circuit Teleservices supported by a Public Land Mobile Network (PLMN)
02.04	22.004	General on Supplementary Services
02.05	22.105	Services & service capabilities
02.11	22.011	Service accessibility
02.15	22.115	Service Aspects Charging and billing
02.16	22.016	International Mobile Equipment Identities (IMEI)
02.21	22.121	Service aspects; The Virtual Home Environment; Stage 1

Table 1/Q.1741.1 – Conversion between 2G and 3G

GSM Number	3G Spec. Number	Title
02.22	22.022	Personalization of Mobile Equipment (ME); Mobile functionality specification
02.24	22.024	Description of Charge Advice Information (CAI)
02.29	22.129	Handover Requirements between UMTS and GSM or other Radio Systems
02.30	22.030	Man-Machine Interface (MMI) of the User Equipment (UE)
02.34	22.034	High Speed Circuit Switched Data (HSCSD); Stage 1
02.35	22.135	Multicall; Stage 1
02.38	22.038	USIM/SIM Application Toolkit (USAT/SAT); Service description; Stage 1
02.40	22.140	Multimedia Messaging Service; Stage 1
02.41	22.041	Operator Determined Call Barring
02.42	22.042	Network Identity and Time Zone (NITZ); Stage 1
02.57	22.057	Mobile Execution Environment (MExE); Stage 1
02.60	22.060	General Packet Radio Service (GPRS); Stage 1
02.66	22.066	Support of Mobile Number Portability (MNP); Stage 1
02.67	22.067	Enhanced Multi-Level Precedence and Preemption service (eMLPP); Stage 1
02.71	22.071	Location Services (LCS); Stage 1
02.72	22.072	Call Deflection (CD); Stage 1
02.78	22.078	CAMEL; Stage 1
02.79	22.079	Support of optimal routing; Stage 1
02.81	22.081	Line Identification supplementary services; Stage 1
02.82	22.082	Call Forwarding (CF) supplementary services; Stage 1
02.83	22.083	Call Waiting (CW) and Call Hold (HOLD) supplementary services; Stage 1
02.84	22.084	MultiParty (MPTY) supplementary services; Stage 1
02.85	22.085	Closed User Group (CUG) supplementary services; Stage 1
02.86	22.086	Advice of Charge (AoC) supplementary services; Stage 1
02.87	22.087	User-to-user signalling (UUS); Stage 1
02.88	22.088	Call Barring (CB) supplementary services; Stage 1
02.90	22.090	Unstructured Supplementary Service Data (USSD); Stage 1
02.91	22.091	Explicit Call Transfer (ECT) supplementary service; Stage 1
02.93	22.093	Call Completion to Busy Subscriber (CCBS); Stage 1
02.94	22.094	Follow Me service description; Stage 1
02.96	22.096	Name identification supplementary services; Stage 1
02.97	22.097	Multiple Subscriber Profile (MSP); Stage 1
03.01	23.101	General UMTS Architecture
03.02	23.002	Network Architecture
03.03	23.003	Numbering, Addressing and Identification
03.07	23.007	Restoration procedures
03.07	23.107	Quality of Service (QoS) concept and architecture
03.08	23.008	Organization of subscriber data

Table 1/Q.1741.1 – Conversion between 2G and 3G

GSM Number	3G Spec. Number	Title
03.08	23.108	Mobile Radio Interface Layer 3 specification Core Network Protocols; Stage 2 (structured procedures)
03.09	23.009	Handover procedures
03.10	23.110	UMTS Access Stratum services and functions
03.11	23.011	Technical realization of supplementary services
03.12	23.012	Location management procedures
03.14	23.014	Support of Dual Tone Multi-Frequency (DTMF) signalling
03.15	23.015	Technical realization of Operator Determined Barring (ODB)
03.16	23.016	Subscriber data management; Stage 2
03.16	23.116	Super-Charger technical realization; Stage 2
03.18	23.018	Basic Call Handling; Technical realization
03.19	23.119	Gateway Location Register (GLR); Stage2
03.21	23.121	Architecture Requirements for release 99
03.22	23.122	Non-Access-Stratum functions related to Mobile Station (MS) in idle mode
03.27	23.127	Virtual Home Environment; Stage 2
03.32	23.032	Universal Geographical Area Description (GAD)
03.34	23.034	High Speed Circuit Switched Data (HSCSD); Stage 2
03.35	23.135	Multicall supplementary service; Stage 2
03.38	23.038	Alphabets and Language
03.40	23.040	Technical realization of Short Message Service (SMS)
03.40	23.140	Multimedia Messaging Service (MMS)
03.41	23.041	Technical realization of Cell Broadcast Service (CBS)
03.42	23.042	Compression algorithm for SMS
03.54	23.054	Shared Interworking Functions; Stage 2
03.57	23.057	Mobile Execution Environment (MExE); Functional description; Stage 2
03.60	23.060	General Packet Radio Service (GPRS) Service description; Stage 2
03.66	23.066	Support of GSM Mobile Number Portability (MNP); Stage 2
03.67	23.067	Enhanced Multi-Level Precedence and Preemption Service (eMLPP); Stage 2
03.71	23.171	Functional stage 2 description of location services in UMTS
03.72	23.072	Call Deflection supplementary service; Stage 2
03.78	23.078	Customized Applications for Mobile network Enhanced Logic (CAMEL) – Phase 3; Stage 2
03.79	23.079	Support of Optimal Routing (SOR) Technical realization; Stage 2
03.81	23.081	Line Identification supplementary services; Stage 2
03.82	23.082	Call Forwarding (CF) supplementary services; Stage 2
03.83	23.083	Call Waiting (CW) and Call Hold (HOLD) supplementary service; Stage 2
03.84	23.084	MultiParty (MPTY) supplementary service; Stage 2
03.85	23.085	Closed User Group (CUG) supplementary service; Stage 2
03.86	23.086	Advice of Charge (AoC) supplementary service; Stage 2

Table 1/Q.1741.1 – Conversion between 2G and 3G

GSM Number	3G Spec. Number	Title
03.87	23.087	User-to-User Signalling (UUS) supplementary service; Stage 2
03.88	23.088	Call Barring (CB) supplementary service; Stage 2
03.90	23.090	Unstructured Supplementary Service Data (USSD); Stage 2
03.91	23.091	Explicit Call Transfer (ECT) supplementary service; Stage 2
03.93	23.093	Completion of Calls to Busy Subscriber (CCBS); Stage 2
03.94	23.094	Follow Me; Stage 2
03.96	23.096	Name Identification Supplementary Service; Stage 2
03.97	23.097	Multiple Subscriber Profile (MSP); Stage 2
04.02	24.002	GSM-UMTS Public Land Mobile Network (PLMN) access reference configuration
04.07	24.007	Mobile Radio Interface Signalling Layer 3 – General Aspects
04.08	24.008	Mobile Radio Interface Layer 3 specification; Core network protocols; Stage 3
04.10	24.010	Mobile Radio Interface Layer 3 – Supplementary Services Specification – General Aspects
04.11	24.011	Point-to-Point (PP) Short Message Service (SMS) Support on Mobile Radio Interface
04.12	24.012	Short Message Service Cell Broadcast (SMSCB) Support on the Mobile Radio Interface
04.22	24.022	Radio Link Protocol (RLP) for Data and Telematic Services on the (MS-BSS) Interface and the Base Station System – Mobile-services Switching Centre (BSS-MSC) Interface
04.30	24.030	Location Services LCS Stage 3 SS (MO-LR)
04.35	24.135	Multicall supplementary service; Stage 3
04.67	24.067	Enhanced Multi-Level Precedence and Preemption service (eMLPP); Stage 3
04.72	24.072	Call Deflection supplementary service; Stage 3
04.80	24.080	Mobile radio layer 3 supplementary service specification – Formats and coding
04.81	24.081	Line Identification supplementary service; Stage 3
04.82	24.082	Call Forwarding supplementary service; Stage 3
04.83	24.083	Call Waiting (CW) and Call Hold (HOLD) supplementary service; Stage 3
04.84	24.084	MultiParty (MPTY) supplementary service; Stage 3
04.85	24.085	Closed User Group (CUG) supplementary service; Stage 3
04.86	24.086	Advice of Charge (AoC) supplementary service; Stage 3
04.87	24.087	User-to-User Signalling (UUS); Stage 3
04.88	24.088	Call Barring (CB) supplementary service; Stage 3
04.90	24.090	Unstructured Supplementary Service Data (USSD); Stage 3
04.91	24.091	Explicit Call Transfer (ECT) supplementary service; Stage 3
04.93	24.093	Completion of Calls to Busy Subscriber (CCBS); Stage 3
04.96	24.096	Name Identification supplementary service; Stage 3
06.01	26.101	AMR speech codec; Frame structure
06.02	26.102	AMR speech codec; Interface to Iu and Uu

Table 1/Q.1741.1 – Conversion between 2G and 3G

GSM Number	3G Spec. Number	Title
06.03	26.103	Codec lists
06.04	26.104	AMR speech codec; Floating point C-Code
06.10	26.110	Codec for circuit switched Multimedia Telephony Service; General description
06.11	26.111	Codec for circuit switched Multimedia Telephony Service; Modifications to ITU-T Rec. H.324
06.31	26.131	Narrow-Band (3,1 kHz) Speech & Video Telephony Terminal Acoustic Characteristics
06.32	26.132	Narrow-Band (3,1 kHz) Speech & Video Telephony Terminal Acoustic Test Specification.
06.71	26.071	AMR speech codec; General description
06.73	26.073	AMR speech codec; C-source code
06.74	26.074	AMR speech codec; Test sequences
06.90	26.090	AMR speech codec; Transcoding functions
06.91	26.091	AMR speech codec; Error concealment of lost frames
06.92	26.092	AMR speech codec; Comfort noise for AMR speech traffic channels
06.93	26.093	AMR speech codec; Source controlled rate operation
06.94	26.094	AMR speech codec; Voice Activity Detector for AMR speech traffic channels
07.01	27.001	General on Terminal Adaptation Function(s) (TAF) for Mobile Stations (MS)
07.02	27.002	Terminal Adaptation Function(s) (TAF) for services using asynchronous bearer capabilities
07.03	27.003	Terminal Adaptation Function(s) (TAF) for services using synchronous bearer capabilities
07.03	27.103	Wide Area Network Synchronization
07.05	27.005	Use of Data Terminal Equipment – Data Circuit terminating Equipment (DTE-DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)
07.07	27.007	AT command set for 3G User Equipment (UE)
07.10	27.010	Terminal Equipment to User Equipment (TE-UE) multiplexer protocol User Equipment (UE)
07.60	27.060	Packet domain; Mobile Station (MS) supporting Packet Switched services
09.02	29.002	Mobile Application Part (MAP) specification
09.07	29.007	General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)
09.08	29.108	Application of the Radio Access Network Application Part (RANAP) on the E-interface
09.10	29.010	Information Element Mapping between Mobile Station – Base Station System (MS – BSS) and Base Station System – Mobile-services Switching Centre (BSS – MCS) Signalling Procedures and the Mobile Application Part (MAP)
09.11	29.011	Signalling interworking for supplementary services
09.13	29.013	Signalling interworking between ISDN supplementary services Application Service Element (ASE) and Mobile Application Part (MAP) protocols

Table 1/Q.1741.1 – Conversion between 2G and 3G

GSM Number	3G Spec. Number	Title
09.16	29.016	Serving GPRS Support Node (SGSN) – Visitors Location Register (VLR); Gs Interface Network Service Specification
09.18	29.018	Serving GPRS Support Node (SGSN) – Visitors Location Register (VLR); Gs Interface Layer 3 Specification
09.19	29.119	GPRS Tunnelling Protocol (GTP) specification for Gateway Location Register (GLR)
09.20	29.120	Mobile Application Part (MAP) specification for Gateway Location Register (GLR); Stage 3
09.60	29.060	GPRS Tunnelling Protocol (GTP) across the Gn and Gp interface
09.61	29.061	Interworking between the Public Land Mobile Network (PLMN) supporting Packet Based services and Packet Data Networks (PDN)
09.78	29.078	Customized Applications for Mobile network Enhanced Logic (CAMEL) Phase 3; CAMEL Application Part (CAP) specification
09.98	29.198	Open Service Architecture (OSI) Application Programming Interface (API) – Part 1
11.01	31.101	UICC-terminal interface; Physical and logical characteristics
11.02	31.102	Characteristics of the USIM Application
11.10	31.110	Numbering system for telecommunication IC card applications
11.11	31.111	USIM Application Toolkit (USAT)
11.20	31.120	UICC-terminal interface; Physical, electrical and logical test specification
11.21	31.121	UICC-terminal interface; USIM application test specification
11.22	31.122	USIM conformance test specification
12.01	32.101	3G Telecom Management principles and high level requirements
12.02	32.102	3G Telecom Management Architecture
12.04	32.104	3G Performance Management
12.05	32.005	Telecommunications Management; Charging and billing; 3G call and event data for the Circuit Switched (CS) domain
12.06-1	32.106-1	Telecommunication Management; Configuration Management; Part 1: 3G configuration management; Concept and requirements
12.06-2	32.106-2	Telecommunication Management; Configuration Management; Part 2: Notification Integration Reference Point; Information Service version 1
12.06-3	32.106-3	Telecommunication Management; Configuration Management; Part 3: Notification Integration Reference Point; CORBA solution set version 1:1
12.06-4	32.106-4	Telecommunication Management; Configuration Management; Part 4: Notification Integration Reference Point: CMIP solution set version 1:1
12.06-5	32.106-5	Telecommunication Management; Configuration Management; Part 5: Basic Configuration Management IRP information model (including NRM) version 1
12.06-6	32.106-6	Telecommunication Management; Configuration Management; Part 6: Basic Configuration Management IRP CORBA solution set version 1:1
12.06-7	32.106-7	Telecommunication Management; Configuration Management; Part 7: Basic Configuration Management IRP CMIP solution set version 1:1

Table 1/Q.1741.1 – Conversion between 2G and 3G

GSM Number	3G Spec. Number	Title
12.06-8	32.106-8	Telecommunication Management; Configuration Management; Part 8: Name convention for Managed Objects
12.11-1	32.111-1	Telecommunication Management; Fault Management; Part 1: 3G fault management requirements
12.11-2	32.111-2	Telecommunication Management; Fault Management; Part 2: Alarm Integration Reference Point: Information Service
12.11-3	32.111-3	Telecommunication Management; Fault Management; Part 3: Alarm Integration Reference Point: CORBA solution set version 1:1
12.11-4	32.111-4	Telecommunication Management; Fault Management; Part 4: Alarm Integration Reference Point: CMIP solution set
12.15	32.015	Telecommunications Management; Charging and billing; 3G call and event data for the Packet Switched (PS) domain
13.02	33.102	3G security; Security architecture
13.03	33.103	Security Integration Guidelines
13.05	33.105	Cryptographic Algorithm requirements
13.06	33.106	Lawful interception requirements
13.07	33.107	Lawful interception architecture and functions
13.20	33.120	Security Objectives and Principles
15.01	35.201	Specification of the 3GPP confidentiality and integrity algorithms; Document 1: f8 and f9 specifications
15.02	35.202	Specification of the 3GPP confidentiality and integrity algorithms; Document 2: Kasumi algorithm specification
15.03	35.203	Specification of the 3GPP confidentiality and integrity algorithms; Document 3: Implementors' test data
15.04	35.204	Specification of the 3GPP confidentiality and integrity algorithms; Document 4: Design conformance test data

10 Technical specifications

The working procedures within the 3GPP allow a continuous improvement of their specifications by means of a change request procedure. The Change Requests are reviewed by each 3GPP Working Group and provided for approval to the quarterly 3GPP TSG Plenary Meetings. Therefore, the SDO standards/specifications can be updated after each 3GPP TSG Plenary meetings. In this context, it is recommended to the reader to retrieve the latest version of the SDO Standards/Specifications from the location indicated within the template.

10.1 21-series, Requirements specifications

10.1.1 TS 21.101 3rd Generation mobile system Release 1999 specifications

The document identifies the 3rd generation mobile system specifications for Release 1999. The specifications and reports of 3GPP Release 1999 have a major version number 3 (e.g. 3.x.y).

Organi- zation	Document No.	Version	Status	Issued date	Location
CWTS	CWTS-TSD-CN-21.101 (R99)	3.3.0	Published	02-02	http://www.cwts.org/cwts/itu.htm
ETSI	TS 121 101	3.3.0	Published	17-04-01	http://pda.etsi.org/pda/home.asp?wki_id=13427
T1	T1.3GPP.21.101V330-2001	3.3.0	Approved	02-11-01	http://www.atis.org/atis/docstore/search.asp?committee=S24
TTA	TTAE.3G-21.101(R99)	3.3.0	Approved	19-12-01	http://www.tta.or.kr/standardDB/stnfile/TTAE_3G-21_101_R99_.zip
TTC	TS-3GA-21.101(R99)v3.3.0	1	TTC published	29-05-01	http://www.ttc.or.jp/imt/ts/21101r99.pdf

10.1.2 TS 21.111 USIM and IC card requirements

This document defines the requirements of the Universal Subscriber Identity Module (USIM) and the IC card for 3G (UICC). These are derived from the service and security requirements defined in TS 22.100 and TS 22.101. The USIM is a 3G application on an IC card. It inter-operates with a 3G terminal and provides access to 3G services. This document is intended to serve as a basis for the detailed specification of the USIM and the UICC, and the interface to the 3G terminals.

Organi- zation	Document No.	Version	Status	Issued date	Location
ARIB	ARIB STD-T63-21.111(R99)	2.00	ARIB SA Approved	06-09-01	http://www.arib.or.jp/IMT-2000/ARIB-STD/STD-T63/R99T/21.111.html
CWTS	CWTS-TSD-CN-21.111 (R99)	3.3.0	Published	02-02	http://www.cwts.org/cwts/itu.htm
ETSI	TS 121 111	3.3.0	Published	07-11-00	http://pda.etsi.org/pda/home.asp?wki_id=11501
T1	T1.3GPP.21.111V330-2001	3.3.0	Approved	02-11-01	https://www.atis.org/atis/docstore/search.asp?committee=S24
TTA	TTAE.3G-21.111(R99F)	3.3.0	Approved	19-12-01	http://www.tta.or.kr/standardDB/stnfile/TTAE_3G-21_111_R99_.zip

10.1.3 TS 21.133 Security threats and requirements

This specification takes notice of the Security Principles and Objectives as set out in TS 33.120. It contains an evaluation of perceived threats to 3GPP and subsequently produces a list of security requirements to address these threats.

As teleservices and applications will not, in general, be standardized, it is difficult to predict their exact nature. Therefore, this specification considers all security threats and aims at listing generic security requirements that shall be applicable, irrespective of the actual services offered. The list of threats and requirements may, however, need to be updated as the 3GPP system evolves.

The threat analysis performed relies to a large extent on previous experiences with 2G systems, in particular GSM, and takes into account known problems from that area.

The security requirements listed in this specification shall be used as input for the choice of security features and the design of the 3GPP security architecture as specified in TS 33.102.

Organi- zation	Document No.	Version	Status	Issued date	Location
ARIB	ARIB STD-T63-21.133(R99)	2.00	ARIB SA Approved	06-09-01	http://www.arib.or.jp/IMT-2000/ARIB-STD/STD-T63/R99T/21.133.html
CWTS	CWTS-TSD-CN-21.133 (R99)	3.1.0	Published	02-02	http://www.cwts.org/cwts/itu.htm
ETSI	TS 121 133	3.1.0	Published	01-02-00	http://pda.etsi.org/pda/home.asp?wki_id=6973
T1	T1.3GPP.21.133V 310-2001	3.1.0	Approved	02-11-01	https://www.atis.org/atis/docstore/search.asp?committee=S24
TTA	TTAE.3G-21.133(R99)	3.1.0	Approved	13-07-00	http://www.tta.or.kr/standardDB/stnfile/TTAE_3G-21_133.zip

10.2 22-series, Service aspects

10.2.1 TS 22.001 Principles of circuit telecommunication services supported by a Public Land Mobile Network (PLMN)

The document covers the definition of the circuit telecommunication services supported by a PLMN. The purpose of the present document is to provide a method for the characterization and the description of these telecommunication services.

TS 22.101 describes overall service principles of a PLMN.

Organi- zation	Document No.	Version	Status	Issued date	Location
ARIB	ARIB STD-T63-22.001(R99)	2.00	ARIB SA Approved	06-09-01	http://www.arib.or.jp/IMT-2000/ARIB-STD/STD-T63/R99T/22.001.html
CWTS	CWTS-TSD-CN-21.001 (R99)	3.2.0	Published	02-02	http://www.cwts.org/cwts/itu.htm
ETSI	TS 122 001	3.2.0	Published	17-05-00	http://pda.etsi.org/pda/home.asp?wki_id=9985
T1	T1.3GPP.22.001V 320-2001	3.2.0	Approved	02-11-01	https://www.atis.org/atis/docstore/search.asp?committee=S24
TTA	TTAE.3G-22.001(R99)	3.2.0	Approved	19-12-01	http://www.tta.or.kr/standardDB/stnfile/TTAE_3G-22_001_R99_.zip

10.2.2 TS 22.002 Circuit bearer services supported by a PLMN

The document defines a set of Circuit Bearer Services to be provided to PLMN subscribers by a PLMN itself and in connection with other networks. This Technical Specification should also be used as a reference for defining the corresponding required mobile network capabilities.

Organi- zation	Document No.	Version	Status	Issued date	Location
ARIB	ARIB STD-T63-22.002(R99)	2.00	ARIB SA Approved	06-09-01	http://www.arib.or.jp/IMT-2000/ARIB-STD/STD-T63/R99T/22.002.html
CWTS	CWTS-TSD-CN-22.002 (99)	3.6.0	Published	02-02	http://www.cwts.org/cwts/itu.htm
ETSI	TS 122.002	3.6.0	Published	19-04-01	http://pda.etsi.org/pda/home.asp?wki_id=13537
T1	T1.3GPP.22.002V 360-2001	3.6.0	Approved	02-11-01	https://www.atis.org/atis/docstore/search.asp?committee=S24
TTA	TTAE.3G-22.002(R99)	3.6.0	Approved	19-12-01	http://www.tta.or.kr/standardDB/stnfile/TTAE_3G-22_002_R99_.zip

10.2.3 TS 22.003 Circuit teleservices supported by a Public Land Mobile Network (PLMN)

The document describes and defines a recommended set of Circuit Teleservices to be supported by a PLMN in connection with other networks as a basis for defining the network capabilities required.

Organi- zation	Document No.	Version	Status	Issued date	Location
ARIB	ARIB STD-T63-22.003(R99)	2.00	ARIB SA Approved	06-09-01	http://www.arib.or.jp/IMT-2000/ARIB-STD/STD-T63/R99T/22.003.html
CWTS	CWTS-TSD-CN-22.003(R99)	3.2.0	Published	01-02	http://www.cwts.org/cwts/itu.htm
ETSI	TS 122.003	3.2.0	Published	17-05-00	http://pda.etsi.org/pda/home.asp?wki_id=9932
T1	T1.3GPP.22.003V320-2001	3.2.0	Approved	02-11-01	https://www.atis.org/atis/docstore/search.asp?committee=S24
TTA	TTAE.3G-22.003(R99)	3.2.0	Approved	19-12-01	http://www.tta.or.kr/standardDB/stnfile/TTAE_3G-22_003_R99_.zip

10.2.4 TS 22.004 General on supplementary services

The purpose of the document is to define a recommended set of supplementary services to the Teleservices and Bearer services, which will be supported by a PLMN in connection with other networks as a basis for the definition of the network capabilities required.

Supplementary services not covered in TS 22.004 cannot be introduced unilaterally in any PLMN if they require modification of the signalling Specifications.

Technical realization of supplementary services is described in TS 23.011 and TS 24.010.

Organi- zation	Document No.	Version	Status	Issued date	Location
CWTS	CWTS-TSD-CN-22.004(R99)	3.2.1	Published	02-02	http://www.cwts.org/cwts/itu.htm
ETSI	TS 122.004	3.2.1	Published	17-04-00	http://pda.etsi.org/pda/home.asp?wki_id=10202
T1	T1.3GPP.22.004V321-2001	3.2.1	Approved	02-11-01	https://www.atis.org/atis/docstore/search.asp?committee=S24
TTA	TTAE.3G-22.004(R99)	3.2.1	Approved	13-07-00	http://www.tta.or.kr/standardDB/stnfile/TTAE_3G-22_004.zip
TTC	JP-3GA-22.004(R99)	2	TTC published	30-11-00	http://www.ttc.or.jp/imt/std/jp22004r99.pdf

10.2.5 TS 22.011 Service accessibility

The purpose of this Technical Specification is to describe the service access procedures as presented to the user.

Definitions and procedures are provided in this Technical Specification for international roaming, national roaming and regionally provided service. These are mandatory in relation to the technical realization of the Mobile Station (User Equipment).