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Decision/action requested

The

1 UMTS Forum GA,

2 3GPP SA,

3 ETSI Board "SMGor3GPP" (William Morrow)

(please delete as appropriate)

***is invited to* NOTE and to COMMENT on the draft TR 101 458.**

Enclosure:

TR 101 458 Ver. 1.0.2
Universal Mobile Telecommunications System (UMTS);
Future direction of standards work on UMTS / IMT-2000

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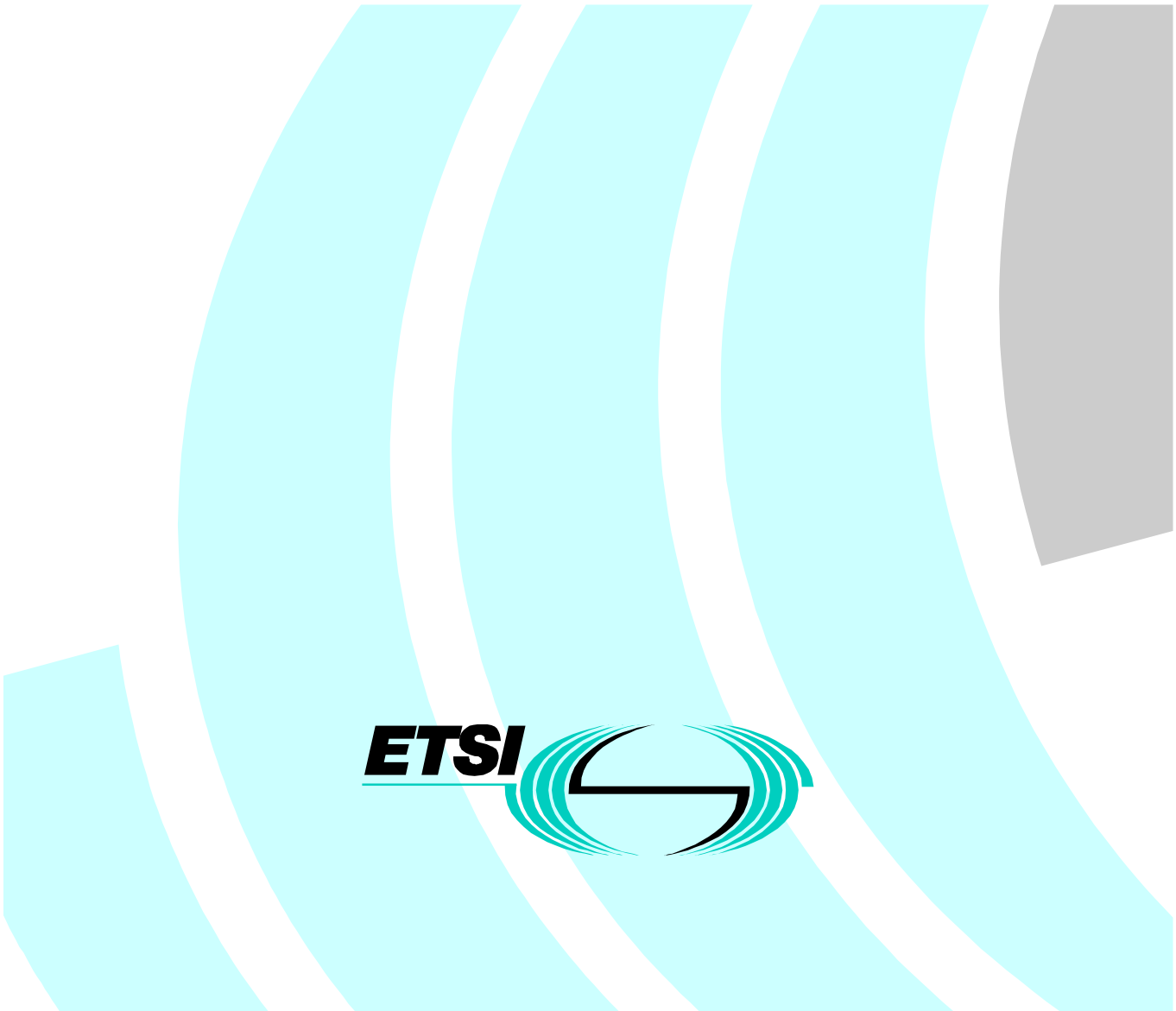
Technical Report

Universal Mobile Telecommunications Services (UMTS); Future direction of standards work on UMTS/IMT-2000



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Contents

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Foreword

This Technical Report (TR) has been produced by ETSI Project Universal Mobile Telecommunications System (UMTS).

Executive Summary

The third generation mobile system will be launched in Europe in 2002 based on the first phase of specifications such as UMTS release 99. The initial release will be followed by further phases of releases. This Technical Report documents ETSI's intentions for standardization work beyond the Phase 1 work, undertaken in Third Generation Partnership Project - 3GPP. This new work is undertaken in EP UMTS and will initially focus on "Services" and "Systems Architecture" and will include the full IP vision for UMTS and the VHE.

Regulatory issues will have a significant impact on the direction of the work and are discussed within the report.

This report will provide a record of the status of EP UMTS's work and early versions will contain questions to be addressed by ETSI. An initial list of proposals for study areas by EP UMTS is bulleted below:

- to collect current and future ETSI activities relevant to UMTS outside those G-UMTS areas to be handled in the 3GPP;

  the specification of new interfaces would require some evolution away from the present GSM/3GPP structure of standards and could be considered in EP UMTS;

- to work with other parts of ETSI to formulate recommendations on what standards (if any) should be used in UMTS private networks;

- to specify the range of UMTS Services to be provided for different “times lines” e.g. 2005 and 2010;

- to specify the framework for a packet switched or cell switched based solution which allows the needed higher data throughput;

- to sort out what needs to be done in ETSI when the ITU has published all the requirements for membership of the IMT-2000 family;

- inter-working and inter-operability between the two to support global roaming etc. is being looked at elsewhere and is not seen as a job for EP UMTS for the time being, at least.

1 Scope

This Technical Report (TR) has been written by the ETSI Project for Universal Mobile Telecommunications System (UMTS) with the purpose of documenting ETSI's intentions for standardization work beyond the Initial Phase of UMTS (Note: The initial phase of UMTS is covered by the Third Generation Partnership Project - 3GPP). This work will initially focus on "Services" and "Systems Architecture". Examples of work to be studied in this report include the full IP vision for UMTS and the VHE. The TR will be updated as work progresses and decisions are made. Early versions of this TR will contain questions to be addressed by ETSI with the intention that these will evolve into a series of recommendations in later versions.

The present document also examines “What should be the role of EP UMTS in defining the key characteristics for the later phases 0f UMTS?”. Should any of the above tasks be done elsewhere in ETSI or should they be performed/managed in EP UMTS? The present document also looks at the place of UMTS within the ITU’s IMT-2000 Family.

The present document provides a record of the direction of EP UMTS's work. It is intended that later versions will be used as an input to other standardization groups as a statement of ETSI's UMTS requirements.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] Decision 128/1999/EC - Dec.98 of the European Parliament and of the Council on the coordinated introduction of a third-generation mobile and wireless communication system (UMTS) in the Community.

[2] Directive 97/33/EC - June/97 on the frequency bands designated for the coordinated introduction of GSM, ERMES (Enhanced Radio Message System) and DECT (Digital Enhanced Cordless Telecommunications).

[3] Directive 97/13/EC - April/97 on a common framework in most Member States for general authorizations and individual licences in the field of telecommunications services supplementing the rules set out in Directive 90/388/EEC.

[4] Directive 97/66/EC - Dec/97 on rules on processing personal data and the protection of privacy in the telecommunications sector are laid down in new Directive 97/66/EC.

[5] Directive 1999/5/EC - Feb/99 on the Radio Equipment & Telecommunications Terminal Equipment (RTTE).

[6] ITU-T Recommendation Q.1701: "Framework of IMT-2000 networks".

[7] ITU-T Recommendation Q.1711: "Functional Network Architecture".

[8] ITU-T Recommendation Q.1721: "Functional Information Flows".

3 Abbreviations

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

3GPP	Third Generation Partnership Project
AAL	ATM Adaptation Layer
AAL5	ATM Adaptation Layer profile No. 5
AMR	Automatic Message Routing
ATM	Abstract Test Method
CAMEL	Customised Application of Mobile Networks Enhanced Logic
CEPT	Conférence des administrations Européennes des Postes et Telecommunications
CLI	Calling Line Identification
CN	Core Network
DECT	Digital Enhanced Cordless Telecommunications
DS	Direct Sequence
EDGE	Enhanced Data Rates for GSM Evolution
FDD	Frequency Division Duplex
FMC	Fixed - Mobile Convergence
GPRS	Generalised Packet Radio Systems
GSM	Global System for Mobile communications
G-UMTS	GSM - UMTS Migration path
HIPERLAN	High Performance Radio Local Area Network
HLR	Home Location Register
HSCSD	High Speed Circuit Switched Data Services
IETF	Internet Engineering Task Force
IMT-2000	International Mobile Telecommunications 2000
IT	Information Technology
MC	Multi-Carrier
MExE	Mobile Station Application Execution Environment
MT	Mobile Terminal
NNI	Network to Network Interface
NO	Network Operator
NRA	National Regulatory Authority
OHG	Operators Harmonization Group
PDA	Personal Digital Assistant
RAN	Radio Access Network
RTT	Radio Transmission Technology
RTTE	Radio and Telecommunications Terminal Equipment
SES	Satellite Earth Stations and Systems
SIM	Subscribers Identification Module
SP	Service Provider
TABD	Trans Atlantic Business Dialogue
TDD	Time Division Duplex
UMTS	Universal Mobile Telecommunications System
UTRA	UMTS Terrestrial Radio Access System
VHE	Virtual Home Environment
VNO	Virtual Network Operator
WTO	World Trade Organisation

4 What Are the Regulatory Issues that can Impact UMTS Standardisation Requirements?

4.1 Current Regulatory Provisions

Over the past few years a number of regulatory instruments aimed at opening up the network and service markets have come into force across EU member states. In relation to UMTS the most relevant instrument is the decision of the European Parliament and Council on the co-ordinated introduction of UMTS in the Community (128/1999/EC 14/Dec/98). This decision commits EU member states to establish a UMTS authorisation system by Jan 2000 so that UMTS services can be progressively introduced by Jan 2002. It also places great emphasis on the need for compatible UMTS systems that support cross border roaming and also identifies the basic system capabilities that are needed to support UMTS services.

The other EU regulatory instruments that have a general application to UMTS are the Interconnect directive (97/33/EC-June/97), the Licensing directive (97/13/EC-April/97), the Privacy and Personal Data directive (97/66/EC-Dec/97) and the Radio Equipment & Telecommunications Terminal Equipment (RTTE) Directive (99/5/EC-Feb/99). All these directives provide a general framework for dealing with related aspects of UMTS but in the broader context of public telecommunication networks and services.

The European Committee of Telecommunication Regulators (ECTRA) representing regulatory authorities in 43 countries of Europe, have also begun to place UMTS on their agenda. ERC are also dealing with spectrum allocation aspects of UMTS. The non-EU members of ECTRA whilst under no legal obligation to follow the EU, usually base their regulation on EU principles that typically form part of ECTRA decisions or recommendations. It is highly likely that ECTRA will play a future role in ensuring that appropriate regulatory rules concerned with delivering basic UMTS services across borders and opening up competitive access to service providers are applied consistently in the ECTRA member countries.

Although UMTS is the commonly employed term to identify third generation mobile systems in Europe, it is in fact only one member of the global universal family of standards being developed in the ITU which are known as IMT-2000. There has been a recent communication from the EU to the US stating that in EU member states licensees should be free to employ systems based on any member of IMT-2000 family of standards as long as one of the licensees employs the European UMTS version as standardised in ETSI.

Most of the regulatory attention given to UMTS so far has been concerned with the radio access aspects - that is spectrum allocation issues and the need to agree on a common air interface. The regulatory aspects dealt with in this subclause are focused more on the broader vision of UMTS in terms of its expected network and service capabilities in fast moving competitive environment.

4.2 Regulatory Direction

The thrust of the telecommunication legislation emanating from the EU as well as that introduced nationally by National Regulatory Authorities (NRAs) over the past few years has been to encourage the development of competition in networks and services both nationally and cross border. This has been reflected in requirements aimed at removing barriers to new marker entrants by defining rules which govern interconnection between networks as well as those which govern access to networks. The general trend towards deregulation throughout Europe is likely to continue in the near future as competition in the traditional fixed and mobile domains begins to strengthen and gather pace.

The European Commission has already recognised the many technological changes that are moving the media world towards convergence. They have put in train a major policy review to consider the impact so far of current telecommunication legislation and to consider what new legislation or revised existing legislation may need to be introduced in the post 2000 era. The regulatory review will be undertaken during 1999 and more specific EU proposals are likely to emerge in 2000. This review process is likely to have implications for the future regulation of services and hence to UMTS.

4.3 Future European Regulatory Needs

Any new regulatory regime likely to emerge in Europe over the next few years is clearly one that will need to respond to a much more competitive market place. That is one in which a host of different service and content providers will want to offer a far greater and diverse range of service and content than what currently exists today. It is therefore important that such a regime will create the right market framework in which all players have the necessary confidence to invest in the setting up of a wide range of service options that can be delivered to customers over UMTS platforms.

One of the issues that emerged in the European Commission's recent consultation on regulatory convergence issues was that many organisations believe that there should be a more horizontal approach to future regulation. That is there should be similar regulatory treatment for all transport network infrastructures irrespective of the services they carry. This implies that networks conveying fixed services or networks conveying mobile services or networks conveying broadcast services etc should be treated the same from a regulatory perspective. This idea of regulatory separation between networks and services is something that does not currently exist in Europe - for instance fixed and mobile networks are traditionally regulated separately.

Whilst there is still a need for the EU to consider these matters further in their 99 regulatory review, these ideas on new approaches to regulation nevertheless has key implications for the way ETSI shapes its vision of UMTS - for instance in terms of FMC and VHE. Horizontal regulation should lead to similar conditions applied to all transport networks and hence there should be less hurdles to supplying customers with the same service package irrespective of which network it is delivered - that is fixed or mobile.

This form of regulation should in principle facilitate a greater degree of convergence at network level particularly between fixed and mobile and hence capabilities like VHE becomes a more realistic prospect to incorporate under the umbrella of UMTS. It is clearly important that a post 2000 regulatory regime in Europe must enable the European industry to play a highly competitive role in the global market for UMTS and this entails the freedom for Europe (ETSI) to push ahead with new and innovative UMTS capabilities.

4.4 Implications for ETSI

The regulatory processes that are most likely to have an impact on shaping the future UMTS environment have been briefly described above. The key question for ETSI is how are these regulatory processes likely to impact the priorities and direction it sets for defining medium term UMTS solutions that will become a strong competitors in the global IMT-2000 services environment. As indicated above the current debate on future regulation in Europe is still in a transient stage but there is little doubt that the target regulatory landscape post 2000 must be fully supportive of all innovative and competitive service applications running over UMTS.

ETSI should therefore aim to focus its medium term definition of UMTS on one which can benefit from a stable and robust regulatory environment. Also one in which key aspects of UMTS are likely to bring benefits to the large majority of European industry (ETSI members) in the medium term and within the global context. Hence Convergence (in the context of Telecomms., IT and Broadcasting), new IP technologies and VHE may hold the key to differentiating UMTS as a major set of market capabilities in the medium term

In terms of the specific regulatory criterion that can impact the future direction of UMTS standards there are three areas or categories that ETSI needs to consider. Those which relate to enhancing competition in services and content through open and non discriminatory access interfaces, those which relate to providing a greater degree of user choice through number portability or carrier/service selection and those which are concerned with security, data protection, privacy and core service requirements.

The latter - perhaps the more pure regulatory requirements, encompass issues such as CLI, malicious call identity, legal interception, emergency calls, network integrity, data protection, and an understanding of what constitutes a basic or generic set of services. All of these requirements would need to be built into future ETSI standards developed for UMTS so that the cross border services based on UMTS capabilities can be readily delivered to customers without infringing the general regulatory rules that exist in Europe. Service provision outside Europe would clearly need to accord with the specific countries involved.

The second category of regulatory criterion is concerned with the need to support number portability and service choice for the customers of UMTS. In the former case the customers must be able to move their subscription to different UMTS service providers irrespective of where the service provider is located whilst still retaining their number. In the latter case customers should be able to invoke through simple means the services of other UMTS providers (that is other than the home service provider) irrespective of where the latter is located. Such services may for instance range from the basic carrier service to more advanced value added services.

See subclause 3.5. below for the third category of regulatory requirements.

4.5 Encouraging Competition through Standards

The third set of regulatory requirements is primarily concerned with encouraging competition in the provision of UMTS networks, services and content. They aim to promote development of open interfaces in following key areas:

- user to network interfaces - this can be a fixed or air interface (e.g. UTRA). Access networks are typically owned by network operators;
- network to network interfaces that is the interfaces between different technology core networks over which UMTS services are conveyed e.g. between GSM and Fixed etc. The core networks are typically owned by network operators;
- service provider to core network interfaces, that is the interface between the UMTS service provider facilities and the core network. In this case the service provider may be an independent or so called virtual provider that is he does not own core or access networks in either fixed or mobile domains but may own some level of service capabilities (e.g. billing, HLR, numbers, etc). However there is a need to ensure there is a proper balance between network and services competition;
- content provider to service provider interfaces that is the interface between the provider of content and the provider of UMTS services.

The above interfaces therefore need to be defined on the basis of the following fundamental regulatory principles:

- openness - that is should be open to all competing entities;
- non-discriminatory; similar or proportional technical conditions to all competing entities;
- unbundled capabilities; that is a sufficiently wide range of open functions available via the interface that reasonably meets the needs of competing providers.

5 Questions and Recommendations for EP UMTS

5.1 What do we mean by a "Broader approach to UMTS"?

The existing work for the Initial Phase of UMTS in the Third Generation Partnership Project (3GPP) is focusing in on the GSM - UMTS Migration path (sometimes shortened to "G-UMTS"). It is based on the development of standards for UMTS Terrestrial Radio Access System (UTRA) plus an evolved GSM Core network. It also includes work on other areas of standardization such as Terminals and Smart Cards.

UMTS standards need to be specified so as to support the modular approach to development. The use of other technologies such as those used for Fixed and Cordless access, in Private Networks access, in Satellites and in Wireless LANs etc. all need to be included in the longer term vision of UMTS and be included in the standards. The work of ETSI Project TIPHON and of the Internet Engineering Task Force (IETF) are also important building blocks for the longer term UMTS vision. An IP based network is one candidate for this UMTS long term vision, some other candidates being ATM and IP over ATM. Work in ETSI specifying the satellite component for UMTS is continuing in TC Satellite Earth Stations and Systems (SES), but at some stage there will be a need to integrate this work with the UMTS standards programme for the terrestrial component.

Work in EP UMTS also needs take account of terminal mobility (e.g. for Cellular access), personal mobility and other mobility concepts currently being developed (e.g. Service transportability). Personal Mobility is the ability of a user to access telecommunication services at any terminal on the basis of a personal telecommunication identifier, and the capability of the network to provide services according to the user's service profile. *(Definition taken from UMTS Forum Report No. 1- Annex 3).* The concept of personal mobility includes the network capability to locate the terminal associated with the user for the purposes of addressing, routing and charging of the user's calls. The design of UMTS should include the specification of both personal and terminal mobility services and features.

The new ETSI Project UMTS will collect current and future ETSI activities relevant to UMTS outside those G-UMTS areas to be handled in the 3GPP. *(ETSI Extra-ordinary GA - 29 Sept. 98).*

5.2 What are the benefits for ETSI of complementing the GSM approach to UMTS being adopted in 3GPP by the development of alternative and longer-term approaches?

The strategic importance of having a migration path from the existing second generation cellular systems which for Europe means GSM cannot be overstated. However to realise the full third generation mobile system vision for UMTS will require making use of other technologies in addition to cellular.

Hence an important part of the EP UMTS function will be to develop the European strategic view on how quickly the work on UMTS standards development should be broadened out to include the other technologies and approaches listed in the answer to question 1 above. Recommendations will then need to be made on how this process should be ***managed*** with other parts of ETSI (including recommendations to the ETSI Board) and with 3GPP etc.

Another important factor is the emergence of the requirement for “Seamless Services” across different networks. It is proposed that Seamless Services are best provided using UMTS. However for this to be achieved, there is a need for network operators from all network types to influence the specification of standards in key areas, to ensure that broad implementation is possible/likely. Examples of such key areas include the Virtual Home Environment (VHE) and the specification of common service capabilities, such as Call Divert, Personal Digital Assistants (PDAs) etc. which are independent of the network over which they are being run.

Up to now the emphasis has been on pan-European roaming and global roaming for cellular networks. However roaming across heterogeneous networks needs to be considered which will include networks such as UMTS, Bluetooth, HIPERLAN, fixed networks, GSM, DECT and other members of the IMT-2000 family. How quickly will heterogeneous roaming capabilities be developed? Will such arrangements need to be standardized? ***All the above are questions that need to be studied by EP UMTS?***

5.3 What are the market drivers for alternative approaches to UMTS?

For existing cellular operators an evolution of the current GSM network to either enhanced GSM (e.g. a GSM network containing both GPRS and EDGE capabilities) or to G-UMTS are two alternative options that could be considered. However regulators have made it increasingly clear that one of their objectives in introducing UMTS is to increase competition in the market place. The structure of the industry is also evolving taking account of both Market Convergence and Technology Convergence. The distinctions between fixed and mobile networks are becoming more blurred and there is also convergence between the Telecommunications and IT industries.

If new players are to enter the market place using UMTS, then to gain market share they will need to provide services that are not available from GSM network operators. Experience in Europe has shown that it proved harder and harder for GSM/PCN operators who were late entrants into the field (e.g. the 4th licensees in countries) to establish market share without very considerable investment backing. With almost all the GSM/PCN networks now up and running and well established, competition in the cellular sector is not likely to be increased unless new services are on offer in UMTS networks.

In addition there are pressures to change the structure of the mobile industry e.g. giving enhanced roles to both Service Providers, to Content Providers and to Multi-media Service Providers. The standards for UMTS should be developed in a way that reasonably reflects the requirements of national regulators. This has implications for the standards themselves e.g. in the need to define an interface between the Service Provider (SP) and the Network Operator (NO). ***The specification of such interfaces would require some evolution away from the present GSM/3GPP structure of standards and could be considered in EP UMTS.***

5.4 What is needed for UMTS that will not be provided in the Initial phase of UMTS being developed in 3GPP?

It is suggested that this question should be answered in three parts:

(a) Radio and Transmission aspects

The GSM technology has been well developed and refined e.g. through the use of enhanced performance codecs (such as the AMR codec) and also through the development of enhanced data facilities and services through developments such as Generalised Packet Radio Systems (GPRS), High Speed Circuit Switched Data Services (HSCSD) and more recently through Enhanced Data Rates for GSM Evolution (EDGE), but there is a limit on how much further the existing technology can be developed, particularly on the radio side. Hence for UMTS, ETSI decided to go for a composite approach in UTRA using W-CDMA in the FDD bands and TD/CDMA in the TDD bands.

Later phases of UMTS will need to be able to offer more advanced facilities such as “flexible bandwidth on demand” or “QoS negotiations” for Multi-media services. In addition, it will be much more efficient to offer Multi-media services if bandwidth can be offered asymmetrically. This is more likely using TD/CDMA in the TDD bands. W-CDMA has the advantage that most people believe it is far more likely to be used on global roaming calls. However it is also important that TD/CDMA be fully specified to enable the efficient provision of the Multi-media services offered above.

It is recognised that the availability of TDD bands for UMTS will vary in different European countries - and that it is outside the scope of work in ETSI to try and harmonize the use of the TDD bands. This is CEPT's work. The TDD bands are expected to be used in some countries for the provision of third generation mobile system private networks - such as in the office environment. There is a need to develop and agree a clear definition of what is meant by a "UMTS Private Network". Will such networks be part of the license exempt bands? If not, would they use the same standards as would be proposed for the license exempt bands, or something different? ***A job for EP UMTS to do is to work with other parts of ETSI to formulate recommendations on what standards (if any) should be used in UMTS private networks.***

(b) The provision of Seamless Services through Fixed - Mobile Convergence (FMC)

Considering that **the provision of Seamless Services** is a market driver for UMTS, the service capabilities developed for fixed networks multimedia users will be candidate services for mobile multimedia. This should be taken into account when specifying UMTS systems e.g. specific source coding or compression techniques should be considered. Common Service Provision for different networks will need to be specified by ETSI. Related to issues on seamless services, EP UMTS needs to develop and define what this concept means and to identify what this means for the other mobile standardization activities. The ETSI report on FMC produced in 1998 should be taken into account and used in future EP UMTS studies on these issues. ***The range of UMTS Services to be provided, needs to be specified for different “times lines” e.g. 2005 and 2010”.***

(c) Network and Terminal aspects

There have also been recent developments in GSM elsewhere in the standards such as specifying the use in GSM Terminals of Mobile Station Application Execution Environment (MExE) and the provision of the Subscriber Identification Module (SIM) at lower voltages together with other developments such as the SIM Took Kit. Greater intelligence has been provided in GSM networks through the development of Customised Application of Mobile Networks Enhanced Logic (CAMEL).

However, the GSM Core Network, which will also be used for the Initial Phase of UMTS, continues to be based on 64 kbit/s switching. Later phases of UMTS networks will need to use either Broadband or IP based switches if their networks are to be operated efficiently. ***A key role for EP UMTS is seen to be specifying the framework for a packet switched or cell switched based solution, which allows the needed higher data throughput.*** Later on the decision can be taken in ETSI on whether to continue with this work in house, or whether to pass it across to 3GPP for detailed specification in the later phases of UMTS.

The possibility to connect a UMTS terminal to a fixed access in order to access UMTS services should be considered. This may be useful in high capacity areas where there may be a shortage of spare radio frequencies. Another application could be obtaining access to very high bandwidth applications without using any radio resource.

5.5 What impact does the recent Trans Atlantic Business Dialogue (TABD) have on ETSI's work for UMTS? How should EP UMTS relate to the Operators Harmonization Group (OHG)?

The TABD has been primarily concerned with regulatory and business aspects of UMTS/IMT-2000. The US had complained that the EC and Member States were being anti-competitive by trying to restrict the use of IMT-2000 spectrum to UMTS systems based solely on the use of ETSI standards. The development of harmonised IPR licensing & conditions are also under active investigation.

The EC have since said that only one UMTS network/Member State must be based on ETSI standards and that systems based on other members of the IMT-2000 family can be licensed. However Member States are following their own procedures/processes for the awarding of licenses which may or may not lead to the award of any non-UMTS licenses for the use of IMT-2000 spectrum in Europe!

The TABD also worked with another group known as the Operators Harmonization Group (OHG) to help reach a consensus on how much harmonization and convergence towards a single standard was desirable for IMT-2000. In the case of W-CDMA, it was agreed that there should be a single global standard with three modes of operation which are (a) Direct Spread (DS), (b) Multi-Carrier (MC) and (c) TDD. ETSI's TD/CDMA system, harmonized with the Chinese TD-SCDMA system, are the main candidates for (c) and CDMA 2000 will be the main user of (b).

The terrestrial members of the IMT-2000 family have been defined by the ITU-R as:

a) IMT-2000 CDMA Direct Spread

b) IMT-2000 CDMA Multi-Carrier

c) IMT-2000 CDMA TDD

d) IMT-2000 TDMA Single-Carrier

e) IMT-2000 FDMA/TDMA."

The above is the final version of the modified text as approved by the TG 8/1 plenary in Helsinki and then subsequently endorsed by the ITU-R SG8 plenary in Geneva the week afterwards. In terms of relating the ITU groupings above back to things ETSI members are more familiar with:

- CDMA Direct Spread (DS) is UTRA's W-CDMA system.
- CDMA Multi-Carrier (MC) is Qualcomm's CDMA 2000 system.
- CDMA TDD is the harmonised version of UTRA's TD-CDMA and Chinese TD-SCDMA systems being developed in the 3GPP.
- TDMA Single-Carrier is the American UWC 136 system based on GSM EDGE technology.
- FDMA/TDMA is DECT - this change of title for IMT-2000 Family member e) above, was the final change agreed in the closing plenary at Helsinki.

Hence the ongoing work in ETSI, including 3GPP is covered by IMT-2000 family members a), c) and e) above and the results of ETSI standardisation in GSM EDGE have been used in developing family member d) above.

5.6 How is ETSI going to respond to 3GPP2 and other members proposed for the IMT-2000 family in the ITU?

(a) ITU Aspects

In the short term, the main activity in ETSI and 3GPP relevant to this question has been to revise the UTRA specifications to ensure that UMTS becomes a member of the IMT-2000 family based on the W-CDMA DS mode referred to in question 5 above. In addition, ETSI's DECT has been accepted as a member of the IMT-2000 Family. At some point ETSI may need to consider whether or not to publish standards of other IMT-2000 family members, but it is proposed that it is premature to actively consider this question now. The results of the TABD and the resulting EC activities referred to in the first two paragraphs in the question 5 answer above are also relevant to this question.

The ITU Standardisation Sector (ITU-T) have already defined recommendations known as ITU-T Recommendation Q.1701 [6] (Framework of IMT-2000 networks), ITU-T Recommendation Q.1711 [7] (Functional Network Architecture) and ITU-T Recommendation Q.1721 [8] (Functional Information Flows) is also in an advanced stage of preparation. The ITU are continuing with a programme of work to define functional interfaces. The objective in the ongoing ITU-T work is to define these functional interfaces in enough detail to support global interoperability.

When these recommendations are agreed and published, ETSI may need to review UMTS standards at that time to see if any extensions/changes are required to ensure IMT-2000 family membership. There is still a lot of support for the goal of achieving global roaming. Although probably only 3% of calls involve inter-country roaming, the % of revenue is higher as these are expensive calls. The GSM experience shows that this is a key feature which helps to market and sell terminals, even if not used regularly by many of the purchasers. of such terminals.

As Europe wants to achieve global roaming between UMTS and other IMT-2000 family members, then UMTS should at least fulfil the ITU requirements as defined in ITU-T Recommendation Q.1701 [6]. The requirements of the Mobile Terminal (MT) to Radio Access Network (RAN) and the Network to Network Interface (NNI) interface will also have to be met. The results of the ongoing ITU-R process of Radio Transmission Technology (RTT) selection and harmonization should be considered as well as the work undertaken during the next ITU study periods.

If global interoperability is not achieved through the IMT-2000 family concept, then one of the fundamental objectives behind all third generation mobile system standards work has been lost. *EP UMTS should have the role to sort out what needs to be done in ETSI when the ITU has published all the requirements for membership of the IMT-2000 family.*

(b) 3GPP/3GPP2 aspects

It is recognised even in the ITU that the major 2 networks forming the basis for IMT-2000/UMTS are "GSM MAP" - as it has become known - and the American ANSI 41 network. *Inter-working and inter operability between the two to support global roaming etc. is being looked at elsewhere and is not seen as a job for EP UMTS for the time being, at least.* There would be some value in merging 3GPP and 3GPP2[AZ proposal]. A related 3GPP activity on ANSI 41 inter-working may well get subsequent approval once a feasibility study has been completed.

5.7 When will alternative technologies to the transport of voice and data over ATM (AAL2/AAL5) be available for UMTS? What will these technologies be?

Current proposals for UMTS in 3GPP (e.g. from Japan) show an ATM based protocol stack using the ATM Adaptation Layer (AAL) profile No. 5 (AAL5) in conjunction with SS No. 7 across the Iu Interface. (The Iu interface is the interface between the RAN and the Core Network (CN)). Increasingly as more use is made of packet switching techniques evolving from GSM's Generalised Packet Radio System (GPRS), protocol stacks will be based on the AAL2 approach. Various views have been expressed as regards the evolution from this situation. They range from the full development of these ATM principles in UMTS Phase 1 and Phase 2 networks to the development of standards to support a fully IP based network. An intermediate view consists of an IP layer over ATM and the specification of adequate AALs for UMTS. There is also a lot of support for IP solutions based on the GSM GPRS standards.

5.8 What are the key characteristics for the later UMTS phases that will not be provided in the Initial Phase of UMTS in 3GPP?

The specification of UMTS will be comprehensive in nature and will include the following key characteristics:

- UMTS will by then be fully part of the IMT-2000 family. This will mean that global roaming and global interoperability will be achieved via the support by all IMT-2000 family members of a world-wide common ITU-T defined set of interfaces.

- There will be a range of mass produced terminals with advanced data as well as voice services/capabilities. They will include “Receive only terminals”, basic voice terminals and multi-media terminals.

- Terminals will also need to be developed that can roam across different heterogeneous networks (including UMTS/IMT-2000). Customers will want to be able to use a common set of services on these different networks and it is proposed that these capabilities will be provided using the VHE concept.

- The major use of UMTS terminals should have switched from voice applications to Multi-media applications.

- Service and Content Providers may be independent of Network Operators leading to the concept of Virtual Network Operators (VNO's). Access capabilities may be provided for a wider and diverse range of service and content providers.

- UMTS networks will be widely packet/cell based and access networks will include advanced radio/transmission capabilities such as the ability to offer flexible bandwidth on demand and asymmetric bandwidth.

- The use of “Software Radios” and Smart Antennas etc. will become more widespread. Also both terminals and networks will have much greater programmable processing power.

- The target date for achieving the above should be 2005. This implies that the standards should be in place by 2002 or at the latest 2003.

History

Document history		
V1.0.0	October 1999	Publication
V1.0.1	1 December 1999	Revised draft including changes requested by EP DECT, EP UMTS#4 Yarnfield
V1.0.2	7 December 1999	Revised draft with Rapporteur, Peter M. ADAMS (az)