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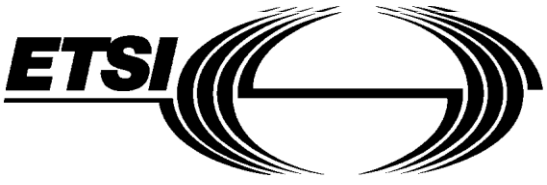
Special Mobile Group (SMG)
Universal Mobile Telecommunications System (UMTS)
Iu Principles
UMTS 23.30



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ETSI Secretariat

Postal address

F-06921 Sophia Antipolis Cedex - FRANCE

Office address

650 Route des Lucioles - Sophia Antipolis
Valbonne - FRANCE
Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16
Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

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c= fr; a=atlas; p=etsi; s=secretariat

Internet

secretariat@etsi.fr
http://www.etsi.fr

Contents

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Foreword

To be drafted by ETSI Secretariat.

Introduction

The Iu reference point of UMTS is defined to be at the boundary of the URAN and the IWU [1]. In case the IWU is null, the Iu is between URAN and CN. The purpose of this document is to analyze the basic issues related to the Iu before starting the actual standardisation of the related interface(s).

1 Scope

This report identifies the requirements on the Iu reference point and studies relevant principles to guide further standardisation of the related interface(s).

The different instances of the UMTS radio access and core networks currently identified are the following:

UMTS radio access network (URAN)	
UMTS Terrestrial Radio Access Network (UTRAN)	SMG2
Broadband Radio Access Network (BRAN)	BRAN project
UMTS satellite radio access network	SES
UMTS core network (CN)	
GSM/UMTS CN	SMG3
N/B-ISDN/UMTS CN	NA

2 References

2.1 Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

[1] UMTS 23.01: "Universal Mobile Telecommunications System (UMTS): General Architecture".

[2]

[3]

[4]

2.2 Informative references

3 Definitions, symbols and abbreviations

3.1 Definitions

Terms introduced in this document:

TBD

3.2 Symbols

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

TBD

3.3 Abbreviations

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

TBD

4 Iu requirements

The Iu shall support:

i) All service capabilities offered to UMTS users;

ii) Connection of Iu via IWU to A and Gb interfaces of GSM;

iii) Connection of various manufacturers' URANs to various manufacturers' IWU/CN;

iv) Separate evolution of URAN and IWU/CN;

v) Separate evolution of O&M facilities.

As to i), Iu shall particularly cater for a variety of services e.g. classical telephony, internet-based services (www, e-mail etc.), and multimedia services. This implies that Iu supports efficiently:

- dedicated circuits, especially for voice
- best-effort packet services (e.g. Internet/IP)
- real-time multimedia services requiring a higher degree of QoS. These real time services may be based on real-time packet data or circuit-switched data.
- UMTS signalling and backward compatibility towards GSM signalling scheme.

4 Possible solutions

Having in mind the above requirements and speaking in terms of transport capabilities, ATM is a strong candidate technology able to offer the necessary flexibility.

One possible solution to the problem of supporting a variety of services e.g. voice circuits, best effort IP services, high quality IP-based services and signalling, is to divide the bandwidth offered by an ATM trunk into four parts. Each part could share the assigned bandwidth between different information flows, but the bandwidth assigned to each part could not be stolen by the other parts neither during congestion, due to the static assignment of the bandwidth. In this scheme, the dedicated (e.g. 16 kb/s) voice circuits and real time IP services would make use of connection-oriented services based on ATM Virtual Circuits in order to insure the QoS necessary for each transaction, whereas signalling and best effort IP services would be based on a connectionless transport.

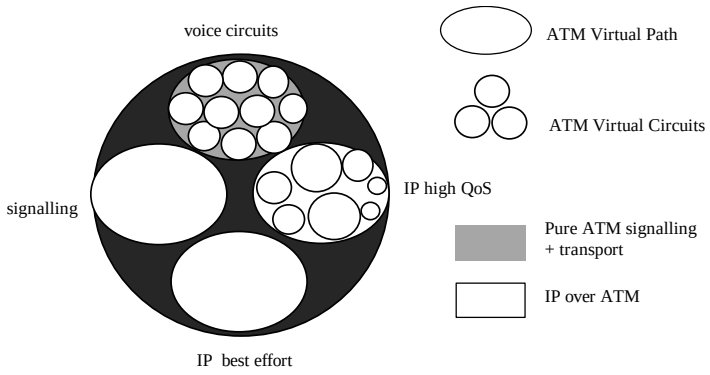


Figure 1.

Both voice circuits and IP services with high QoS would make use of ATM signalling in order to create an ATM circuit, the only difference being that the second group of circuits would allow a bandwidth assignment on demand, depending on the application to be supported.

The “classical IP over ATM approach” (where the IP datagrams are carried inside an “ATM pipe” offered by the ATM connection without any need of intermediate routing processing along the road) could be suitable for this group of transport services, but technologies like “IP switching” could be considered as well.

This approach seems to be reasonable if considering the following issues:

- in Third Generation systems, a technology to efficiently support integrated voice-data-multimedia services is needed
- ATM technology seems to have the right answers to this request of flexibility, but some doubts still exist concerning its success in telecommunications applications, while the information technology (IT) world has adopted ATM as one of the standards for LAN and WAN implementation
- IP has entered the telecommunications market, as operators and manufacturers foresee a new business in offering Internet access through mobile and fixed telecommunication networks, but technology is not ready yet to support efficiently real time services with a pure IP network

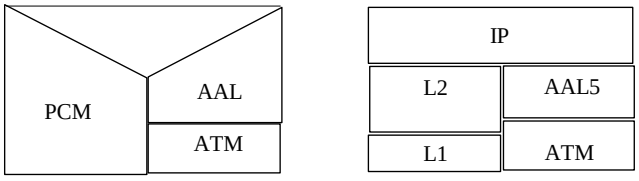
Following this approach, ATM can be introduced in the UMTS network architecture in the most proven way:

1. emulating PCM-based voice circuits as in Second Generation network (allowing backward compatibility)
2. supporting the IP protocol and re-using the experience of computer networks (it is reasonable to consider that about 40% of IP traffic world-wide is currently transported by ATM networks)

3. allowing to create a future-proof transport technology: it is uncertain if during next years the packed based IP will be able to support voice services efficiently rather than telecommunications network will continue to rely on circuit switched transport technology to provide high QoS. The proposed approach allows UMTS networks to evolve in both directions.

According to the above concepts, the role of the IWUs adapting GSM A interface and GPRS Gb/Gbu interface to the Iu interface would be first of all to provide adaptation between different transport technologies.

As an example, Figure 2 shows the case of adaptation between A and Iu interfaces and between Gbu and Iu interfaces, according to Figure 2 “Interconnection of UMTS AN and GSM NSS via IWUs using the Gbu interface” in 23.20.



IWU1: A to Iu IWU2: Gbu to Iu

Figure 2. Adaptation between different transport technologies.

5 Other specifications on the Iu

History

Document history		
August 1997		Scope agreed.
November 1997	SMG3 SA meeting in Stockholm.	Version 0.1.0 mailed to SMG3 SA delegates prior to
November 1997		Version 0.1.1 presented at SMG3 SA in Stockholm.