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Contents

Foreword

This Technical Report has been produced by the 3GPP.

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Version 3.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 Indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the specification;

1 Scope

This TR describes how to realise the SMG1 requirements for real time multimedia services in UMTS (Ref 22.60). Specifically the TR covers

1) the extent of standardization required for multimedia in UMTS;

2) the functional distribution in the UMTS network and associated applications;

3) impact of the functional distribution on user terminals (for instance, hand-held, phone with a PC, and others);

4) impact of the functional distribution on Core and Access network.

2 References

References may be made to:

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

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

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

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

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

3 Definitions and abbreviations

3.1 Definitions

(ref. 22.01 chapter 3.1)

(ref. 22.60)

[Nokia proposal ffs]

3.2 Abbreviations

ISDN	Integrated Services Digital Network
IP	Internet Protocol
ITU	International Telecommunication Union
MPEG	Moving Pictures Experts Group
QoS	Quality of Service
PSTN	Public Switched Telephone Network
WWW	World Wide Web

[ffs]

4   General

(ref 22.01 clause 5.2)

(ref 22.60)

5   Overview of Multimedia Communication Standards

[ffs]

[*Extract from Roger's report (Tdoc 98mm032)*:

There are several recommendations in the ITU H.32X series that standardize end-to-end multimedia communication protocols for different networks. In particular H.323 describes a packet-based (IP-based) standard. The 2 main circuit-switched recommendations are, H.320 for ISDN networks and H.324(/I/M) for PSTN, ISDN and mobile networks.

The standards, H.323 and H.324, are possible candidates for the UMTS multimedia communication system. Both show the following common properties:

Usage of the same video codecs (H.261 and H.263)

Usage of the same audio codecs (G.723.1)

Usage of the same control protocol (H.245) that can also signal a non-standard codec, therefore, any codec can be used.

Connection from a H.324 to an H.323 terminal requires no video and audio transcoding.

Both support the usage of MPEG-4 video.

High error resilience and error correction for H.263 video bit-streams.

Support of multipoint conferences.

Subsequent sections describe the different H.32x multimedia standards for the PSTN, ISDN and Internet]

5.1   PSTN

[*Extract from Bosch contribution (Tdoc 98mm016)*:

ITU-T Recommendation H.324 describes multimedia terminals for (circuit switched) operation over the PSTN. The implementation consists of one or two video codecs, a speech codec, data transport protocols, control protocol, multiplexing protocol and a modem. The V.34 modem sends and receives the multiplexed bitstreams of the different source codecs.

H.324/I

enables the use of the more efficient H.324 standard for the ISDN and will probably replace H.320 in the future.

H.324/M

aims at networks with bit error rates higher than that of the PSTN. It comprises a three level approach of protection of the multiplexed H.324 bitstream against bit errors. The error protection means are defined as annexes to the multiplexing protocol H.223 and operate end-to-end.

H.223/Annex A replaces the HDLC flag of a Mux-PDU by a longer flag without performing HDLC zero bit insertion.

H.223/Annex B introduces in addition to Annex A a forward error correction for the Mux-PDU header.

H.223/Annex C should be capable to operate at bit error rates of appr. 10^{-3} by adopting a hybrid ARQ Type I & II

protocol.]

[further text is required to describe H.324]

Scope of recommendation H.324

[H.324 Terminal Equipment]
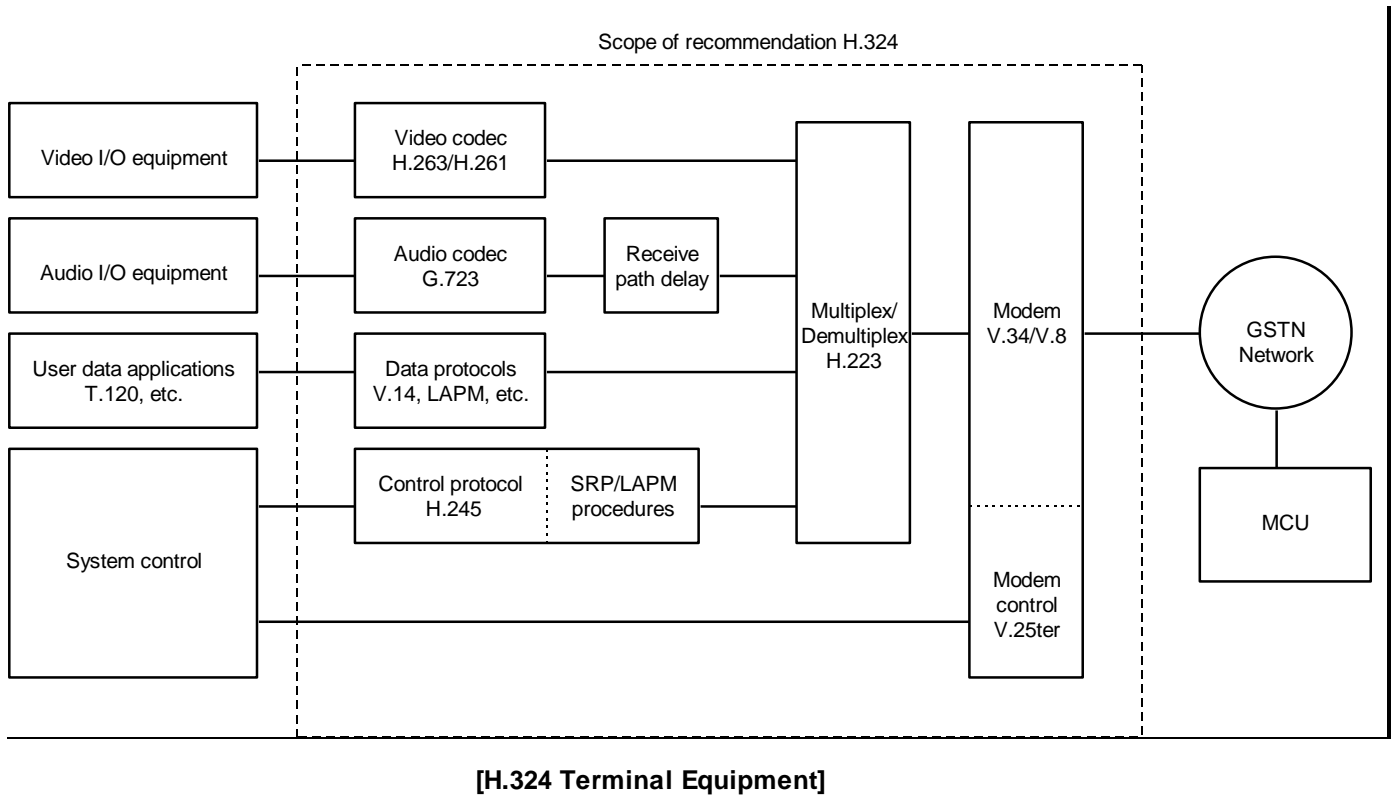
5.2   ISDN

[For the ISDN videotelephony standard H.320 the same applies as for H.324 except of the modem. It uses D-channel signalling for call setup and supports up to 6-B channels (i.e. 384 kb/s) for multimedia data transmission. Since the new H.324/I is more efficient in terms of bandwidth the future of H.320 seems to be unclear.]

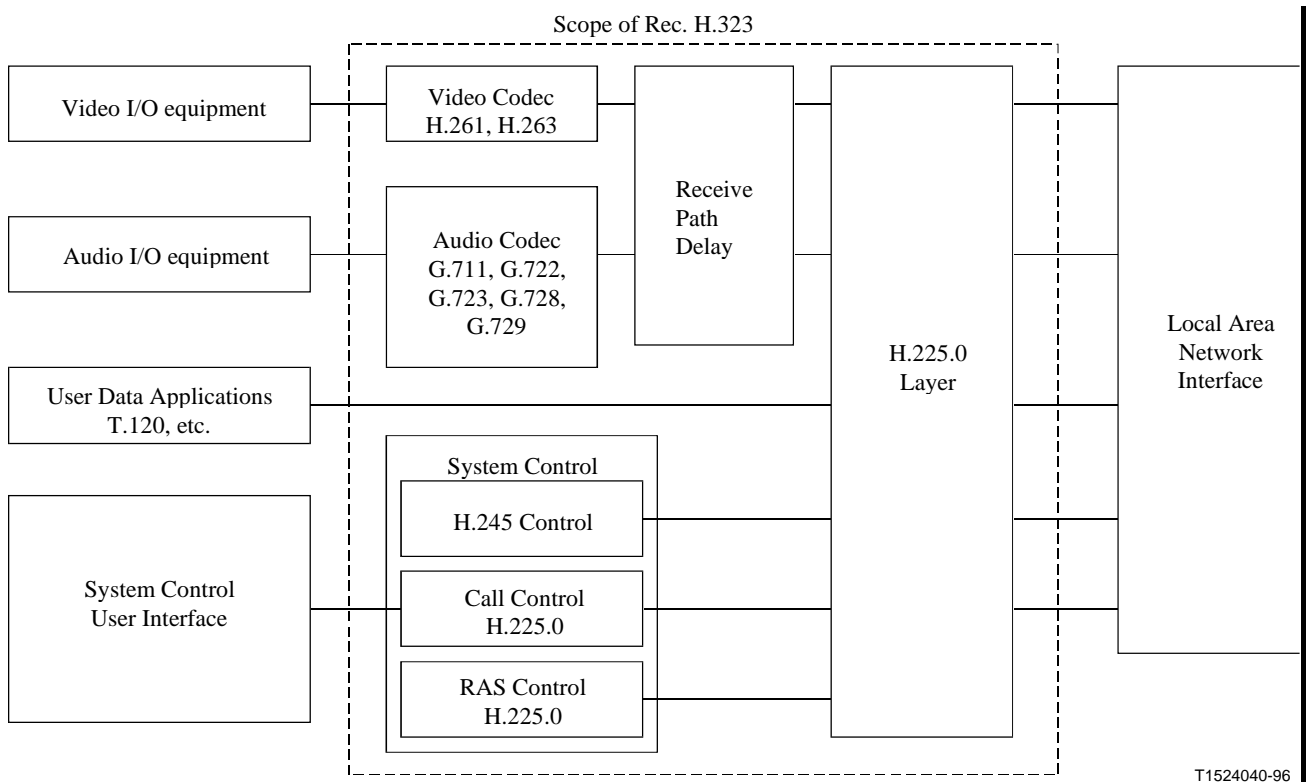[further text is required to describe H.320]
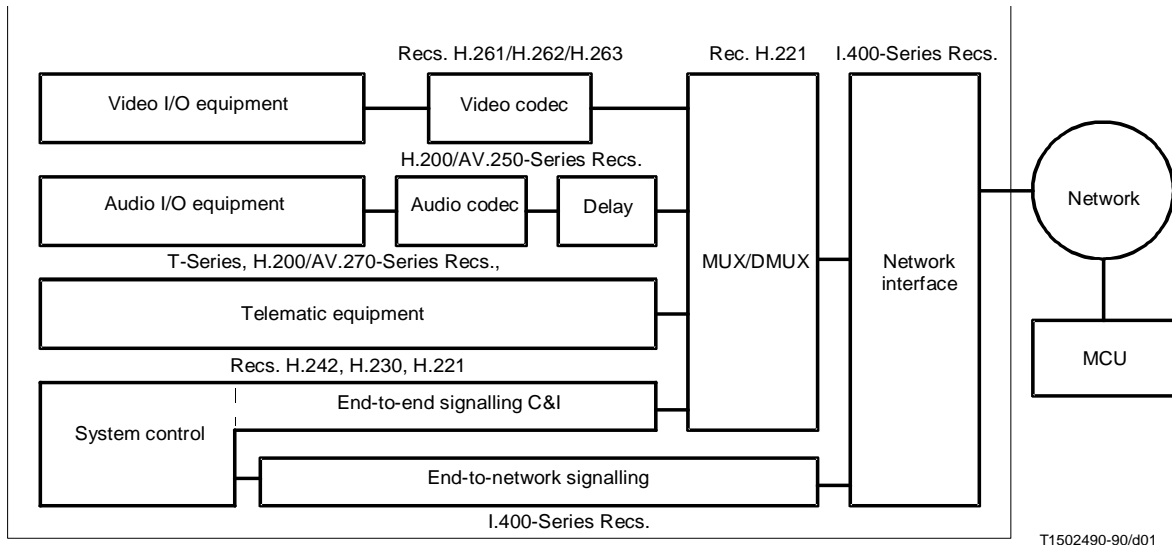
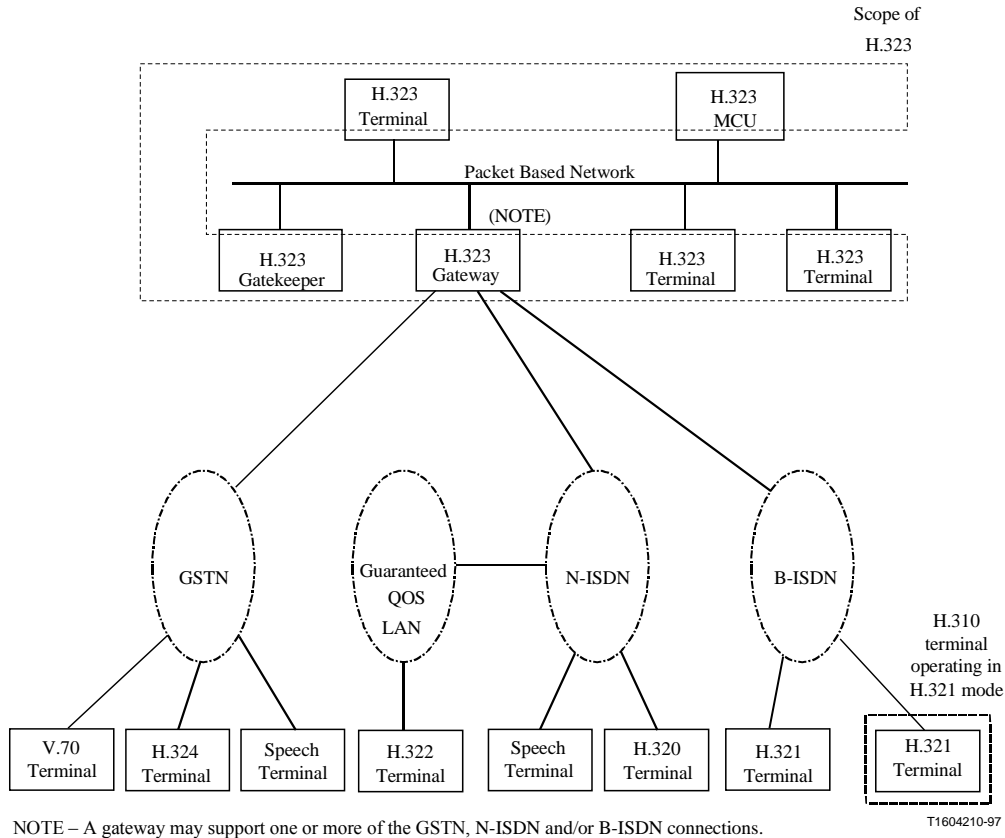MCU Multipoint Control Unit

[H.320 Terminal Equipment]

5.3   Internet

[[Extract from Bosch contribution (Tdoc 98mm016): ITU-T Recommendation H.323 is a packet switched multimedia standard and already widely used in the Internet domain. This standard requires UMTS packet access based on IP.

[H.323 Terminal Equipment]

Scope of
H.323

NOTE – A gateway may support one or more of the GSTN, N-ISDN and/or B-ISDN connections.

T1604210-97

[Interoperability of H.323 Terminals]

[Extract from Bosch contribution (Tdoc 98mm016): In addition to the above there exist further IP based applications/services which are already very popular and which envisaged to be used also in mobile terminals (figure below). The capability to access the Internet will be a must for sophisticated UMTS terminals.
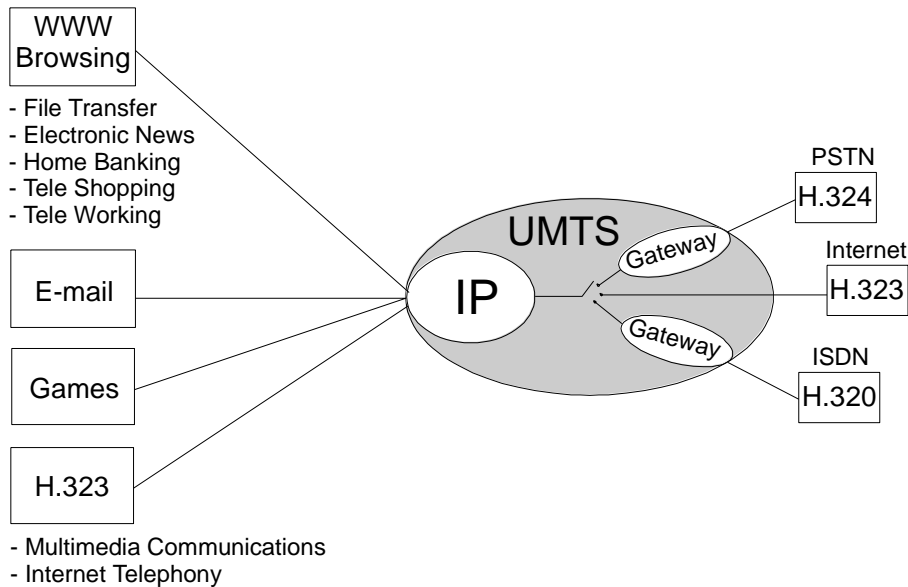
[further text is required to describe H.323]

[further text should be provided to explain the different source codecs for speech and video, the control and multiplex protocol]

6 Approaches for Multimedia in UMTS

6.1 Generic Bearers

[ffs]

6.2 Standardised Multimedia Service

6.2.1 Circuit switched real time Multimedia

[ffs]

[*Extract from Roger's report (Tdoc 98mm032)*:

H.324 variants are based on Circuit Switching. It is suitable for PSTNs, ISDN and circuit-switched bearers in mobile networks,

Designed for low bit rate and low error-susceptibility that implies that H.324/M can cope with low QoS bearers.

H.324 produces lower signalling overhead than H.323.

H.324(/M) allows separate QoS parameters inside the multplexed H.324 bitstream, e.g. retransmission or variable forward error protection capability for each media stream on top of one single UMTS bearer service.

Imposes very low impact on the UMTS core network, thus allowing an easy introduction strategy for multimedia services in UMTS networks (network operators require low network investments).

Interoperability and backward compatibility between H.324 versions for mobile networks, PSTNs, and ISDNs is possible without gateways.

To terminate in a land line or satellite network H.324 is the solution of choice, [Clarification is needed requested Ralf Fischer from Bosch]

Proponents view of H.324

H.324/M (end-to-end) error control is less efficient than error control at the network,.

H.324 and H.324/M are currently nearly not used,

Will H.324/M terminals ever be available for fixed network users ?

H.324 multipoint conferences need to utilise a separate multipoint control unit (MCU) somewhere in the fixed network

]

6.2.2 Packet switched real time Multimedia

[ffs]

[*Extract from Roger's report (Tdoc 98mm032)*:

H.323 is designed for packet-switched networks based on IP. Since IP is already supported and efficiently

transported in GPRS it can be foreseen that IP will also be supported by UMTS. Due to header compression techniques, the overhead may be reduced.

H.323 allows to use parallel bearers with different QoS parameters for the media streams leading to increased bandwidth efficiency,

H.323 is currently the most widely used multimedia communications standard,

Compatibility with existing IP based communication systems

For GPRS, the only standard acceptable is H.323

ETSI TIPHON uses the same system ensures compatibility with UMTS

Proponents view of H.323

Interworking with existing terminals in circuit switched networks will require the implementation of new gateways however no video or audio transcoding is required. . It was further commented that this applies for any multimedia standard adopted in UMTS and is no special argument here,

A Warning was raised by Siemens that for a typical 64 kbit/s communication link the overhead consumes about 20% to 40%, if no header compression is used.

A Warning was raised about IP header compression in mobile environment. If there is a problem then there will be a problem in GPRS and we do need to have companies investigate it.

Warning was raised by Nokia about rough 30% packet loss UDP/IP for a BER of 10-3. Will the remaining SDUs be sufficient for the video codec?

]

6.3   Standardised Multimedia Call Control

[ffs]

[*Extract from Motorola contribution (Tdoc 98mm0xx)*:

A multimedia call consists of multiple component data streams that must be temporally synchronised before presentation to the end-user. The multiple component data streams of a single multimedia call could either be transmitted using a single bearer or multiple bearers [Ref. 23.60].

Multimedia Call Control consists of functions required to set up multimedia calls between users at their request, maintaining these calls (potentially modifying the nature of component data streams during the call) and releasing them. It also includes means for the user to have control over the management of multimedia calls that it participates in through supplementary services.

]

7   Key Issues for Multimedia in UMTS

7.1   Bearer characteristics for supporting multimedia applications

(reference to other specifications ffs)

(ref 22.05)

7.2   Applicability of generic bearers

[ffs]

7.3　Source Coding

[ffs]

[*Do we need a default source codec ?*]

7.4　Relationship between source and channel coding

[ffs]

7.5　Signalling for multimedia

Multimedia Call Control for UMTS shall be standardised.

[The exact call control and mechanisms are ffs]

7.6　Numbering and Addressing

[ffs]

7.7　Routing aspects

[ffs]

[*can different component media streams be routed differently ?*]

8　Functional Distribution in the UMTS Network and associated Applications

8.1　Impact of functional Distribution on user terminals

[ffs]

[*e.g. hand-held, phone with PC, ...*]

8.2　Impact of functional Distribution on Core and Access Network

[ffs]

Standardisation Requirements for Multimedia in UMTS

- Multimedia Call Control for UMTS shall be standardised.

Annex A (informative):
Change history

Change history					
SMG No.	**TDoc. No.**	**CR. No.**	**Section affected**	**New version**	**Subject/Comments**