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Technical Specification

**Universal Mobile Telecommunications System (UMTS);
Codec for circuit switched multimedia telephony service;
Modifications to H.324
(3GPP TS 26.111 version 4.0.0 Release 4)**



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Foreword

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Introduction

In the present document is described additions, deletions, and changes made to ITU-T Recommendation H.324 [10] with annex C for the purpose of using that recommendation as a basis for the technical specification for circuit switched multimedia service in 3GPP networks. The present document does not address call setup procedures, which are described in 3GPP TS 26.112 [11].

1 Scope

In ITU-T Recommendation H.324 [10] with annex C describes a generic multimedia codec for use in error-prone, wireless networks. The scope of the present document are the changes, deletions, and additions to those texts necessary to fully specify a multimedia codec for use in 3GPP networks. Note that this implicitly excludes the network interface and call setup procedures. Also excluded are any general introductions to the system components.

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. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] ITU-T Recommendation H.223: "Multiplexing protocol for low bit rate multimedia communication".
- [2] ITU-T Recommendation H.223 - Annex A: "Multiplexing protocol for low bit rate multimedia mobile communication over low error-prone channels".
- [3] ITU-T Recommendation H.223 - Annex B: "Multiplexing protocol for low bit rate multimedia mobile communication over moderate error-prone channels".
- [4] ITU-T Recommendation H.223 - Annex C: "Multiplexing protocol for low bit rate multimedia mobile communication over highly error-prone channels".
- [5] ITU-T Recommendation H.223 - Annex D: "Optional multiplexing protocol for low bit rate multimedia mobile communication over highly error-prone channels".
- [6] ITU-T Recommendation H.245: "Control protocol for multimedia communication".
- [7] ITU-T Recommendation G.723.1: "Dual rate speech coder for multimedia communication transmitting at 5,3 and 6,3 kbit/s".
- [8] ITU-T Recommendation H.263: "Video coding for low bitrate communication".
- [9] ITU-T Recommendation H.261: "Video CODEC for audiovisual services at px64 kbit/s".
- [10] ITU-T Recommendation H.324: "Terminal for low bitrate multimedia communication".
- [11] 3GPP TS 26.112: "Codec for Circuit Switched Multimedia Telephony Service; General description".
- [12] 3GPP TR 26.911: "Codec for circuit switched multimedia telephony service; terminal implementor's Guide (Release 4)".
- [13] ITU-T Recommendation X.691: "Information Technology - ASN.1 Encoding Rules - Specification of Packed Encoding Rules (PER)".
- [14] ISO/IEC 14496-2: "Information technology - Coding of audio-visual objects - Part 2: Visual".
- [15] 3GPP TS 26.071: "General description".
- [16] 3GPP TS 26.090: "Transcoding functions".

[17] 3GPP TS 26.073: "Adaptive Multi-Rate (AMR); ANSI C source code".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

H.324: ITU-T H.324 [10] with annex C

3G-324M terminal: based on ITU-T H.324 [10] recommendation modified by 3GPP for purposes of 3GPP circuit switched network based video telephony

3.2 Abbreviations

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

RVLC	Reverse Variable Length Code
DP	Data Partitioning
RM	Resynchronization Marker
MCU	Multipoint Control Unit

4 General

The present document contains any deviations to ITU-T H.324 [10] required for the specification of 3G-324M Terminals.

5 Document structure

The structure of H.324 [10] is followed in the present document. Where there are no differences in a specific section, that section is skipped. Where differences are minor, only the differences are described. Where major differences exist, the section is rewritten in the present document. It is important to note that for wireless terminals, Annex C of H.324 [10] supersedes respective portions of the main body of H.324 [10]. For the present document, these modifications are treated as if they are part of the main body of H.324 [10]. Therefore, a reader must keep in mind both the main body and Annex C of H.324 [10] when reading the present document.

6 Functional requirements

6.1 Required elements

3G-324M implementations are not required to have each functional element except a wireless interface, H.223 [1] with Annex A and B multiplex, and H.245 [6] version 3 or later versions for system control protocol.

3G-324M terminals offering audio communication shall support the AMR audio codec. Support for G.723.1 [7] is not mandatory, but recommended.

3G-324M terminals offering video communication shall support the H.263 [8] video codec. Support for MPEG-4 simple profile and H.261 [9] is optional.

3G-324M terminals shall support H.223 [1] with annex A and annex B.

3G-324M terminals shall support at least 32 kbit/s minimum bit rate at the mux to wireless network interface.

6.2 Information streams

V.25ter discussion does not apply.

6.3 Modem

Does not apply.

6.4 Multiplex

3G-324M terminals shall support H.223 [1] with annex A and annex B. All other aspects shall follow H.324 [10] with annex C. H.223 [1] Annex C and D are optional.

6.5 Control channel

No differences with H.324 [10].

Should it not be possible to signal an element of the 3G-324M terminal using a published version of H.245 [6], a procedure will be defined here.

6.6 Video channels

Support for H.261 [9] is optional.

Support for MPEG-4 Visual is optional. When supported, MPEG-4 Visual codecs shall support Simple Profile @ Level 0. The FLC code 0000 1000 in Table G-1 – "FLC table for profile_and_level_indication" in ISO/IEC 14496-2 [14] is assigned to it. Additional information can be found in [14].

MPEG-4 Visual Simple Profile @ level 0 provides error concealment as part of the simple profile through Data Partitioning (DP), Reversible Variable Length Coding (RVLC), Resynchronization Marker (RM) and header extension code. MPEG-4 Visual is baseline compatible with H.263 [8].

When opening a logical channel for MPEG-4 Visual, configuration information (Visual Object Sequence Header, Visual Object Header, and Video Object Layer Header) shall be sent in the decoderConfigurationInformation parameter. The same information shall also be sent in the MPEG-4 video bitstream. If the operational mode of MPEG-4 Visual encoder needs to be changed, the existing MPEG-4 video logical channel shall be closed and H.245 [6] procedures for opening a new MPEG-4 video logical channel shall be started. The new operational mode shall be indicated in the parameters of the new logical channel.

6.6.1 MPEG-4 interface to multiplex

As H.263 [8] encoders align picture start codes with the start of an AL-SDU, the same concept applies to MPEG-4 encoders. The following are the requirements of the MPEG-4 interface to the H.223 [1] multiplex.

- a) Each 3G-324M MPEG-4 encoder shall align each visual_object_sequence_start_code with the start of an AL-SDU.
- b) Each 3G-324M MPEG-4 encoder shall align each group_of_vop_start_code (the beginning of a GOV field) with the start of an AL-SDU unless the GOV field immediately follows configuration information.
- c) Each 3G-324M MPEG-4 encoder shall align each vop_start_code with the start of an AL-SDU unless the vop_start_code immediately follows configuration information or a GOV field.

In these requirements, GOV stands for Group_of_VideoObjectPlane() and Configuration information consists of Visual Object Sequence Header, Visual Object Header, and Video Object Layer Header.

6.7 Audio channels

AMR is the mandatory speech codec. Support for G.723.1 [7] is not mandatory, but recommended. If both the receiving and transmitting terminals support AMR and G.723.1 [7], then AMR shall be used. This applies to connections without an Multipoint Control Unit (MCU).

6.8 Data channels

No differences with H.324 [10].

7 Terminal procedures

See 3GPP TS 26.112 [11].

8 Optional enhancements

No differences with H.324 [10].

9 Interoperation with other terminals

For further study.

10 Multipoint considerations

For further study.

11 Maintenance

No differences with H.324 [10].

Annex A (informative): Change Request History

TSG_MEETING	TSG_DOC	SPEC	VERS_CURR_ENT	VERS_NEW	CR	REV	SUBJECT
SP-05	SP-99359	26.111	3.0.1	3.0.2	001		Changes to editorial notes.
SP-06	SP-99434	26.111	3.0.2	3.1.0	002	2	Specification of coding parameters for MPEG-4 video codec
SP-06	SP-99514	26.111	3.0.2	3.1.0	003		Transmission of MPEG-4 configuration information in 3G-324M
SP-08	SP-00263	26.111	3.1.0	3.2.0	004		Changes to editorial notes
SP-09	SP-000396	26.111	3.2.0	3.3.0	006		MPEG-4 interface to multiplex
SP-10	SP-000653	26.111	3.3.0	3.4.0	005	1	MPEG4 visual simple profile @ level 0
SP-11				4.0.0			Version for Release 4

History

Document history		
V4.0.0	March 2001	Publication