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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 3.3.0 Release 1999)**



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Foreword

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Introduction

In the present document is described additions, deletions, and changes made to ITU-T H.324 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.

1 Scope

In ITU-T recommendation H.324 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.

- [1] ITU-T Recommendation H.223: "Multiplexing protocol for low bitrate multimedia communication".
- [2] ITU-T Recommendation H.223 - Annex A: "Multiplexing protocol for low bitrate multimedia communication over low error-prone channels".
- [3] ITU-T Recommendation H.223 - Annex B: "Multiplexing protocol for low bitrate multimedia communication over moderate error-prone channels".
- [4] ITU-T Recommendation H.223 - Annex C: "Multiplexing protocol for low bitrate multimedia communication over highly error-prone channels".
- [5] ITU-T Recommendation H.223 - Annex D: "Optional multiplexing protocol for low bitrate multimedia 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 p X 64 kbit/s".
- [10] ITU-T Recommendation H.324: "Terminal for low bitrate multimedia communication".
- [11] 3GPP Technical Specification 3GPP TS 26.111: "Modifications to H.324".
- [12] 3GPP Technical Specification 3GPP TS 26.112: "Call Set Up Requirements".
- [13] 3GPP Technical Reference 3GPP TS 26.911: "Terminal Implementor's Guide".
- [14] ITU-T Recommendation X.691: "Information Technology - ASN.1 Encoding Rules - Specification of Packed Encoding Rules (PER)".
- [15] International Standard ISO/IEC 14494-2: "Information technology - Generic coding of audio-visual object - Part 2: Visual, 1999".
- [16] 3GPP Technical Specification 3GPP TS 26.071: "Mandatory Speech Codec; General Description".
- [17] 3GPP Technical Specification 3GPP TS 26.090: "Mandatory Speech Codec; Speech Transcoding Functions".

[18] 3GPP Technical Specification 3GPP TS 26.073: "Mandatory Speech Codec; ANSI C-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 with annex C.

3G-324M terminal: Based on ITU-T H.324 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 required for the specification of 3G-324M Terminals.

5 Document structure

The structure of H.324 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 supersedes respective portions of the main body of H.324. For the present document, these modifications are treated as if they are part of the main body of H.324. Therefore, a reader must keep in mind both the main body and Annex C of H.324 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 with Annex A and B multiplex, and H.245 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 is not mandatory, but recommended.

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

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

6.5 Control channel

No differences with H.324.

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

6.6 Video channels

Support for H.261 is optional. Support for MPEG-4 is optional. MPEG-4 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 is baseline compatible with H.263.

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 encoder needs to be changed, the existing MPEG-4 video logical channel shall be closed and H.245 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 Requirements for MPEG-4 usage

The following requirements (a)-(e) apply to the usage of specific parameters within MPEG-4.

- a) Each 3G-324M MPEG-4 decoder shall be able to decode all frame-rates up to 15 frames per second, but need not support higher rates when MPEG-4 Simple Profile Level 1 is used.
- b) Each 3G-324M MPEG-4 encoder shall use a fixed f-code value of 1 when MPEG-4 Simple Profile Level 1 is used.
- c) Each 3G-324M MPEG-4 encoder shall use a fixed intra_dc_vlc_threshold of 0 when MPEG-4 Simple Profile Level 1 is used.
- d) Each 3G-324M MPEG-4 decoder shall be able to decode all horizontal luminance pixel resolutions up to 176 pels/line when MPEG-4 Simple Profile Level 1 is used. The decoder shall not be required to support higher horizontal resolutions even if the resulting number of MBs was within the 99 MB limit stipulated in MPEG-4 Simple Profile Level 1.
- e) Each 3G-324M MPEG-4 decoder shall be able to decode all vertical luminance pixel resolutions up to 144 pels/VOP when MPEG-4 Simple Profile Level 1 is used. The decoder shall not be required to support higher vertical resolutions even if the resulting number of MBs was within the 99 MB limit stipulated in MPEG-4 Simple Profile Level 1.

6.6.2 MPEG-4 interface to multiplex

As H.263 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 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 is not mandatory, but recommended. If both the receiving and transmitting terminals support AMR and G.723.1, then AMR shall be used. This applies to connections without an Multipoint Control Unit (MCU).

6.8 Data channels

No differences with H.324.

7 Terminal procedures

See 3GPP TS 26.112.

8 Optional enhancements

No differences with H.324.

9 Interoperation with other terminals

For further study.

10 Multipoint considerations

For further study.

11 Maintenance

No differences with H.324.

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

History

Document history		
V3.1.0	January 2000	Publication
V3.2.0	June 2000	Publication
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