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CR-Form-v7

CHANGE REQUEST

⌘ **26.235** **CR** **008** ⌘ **rev** **1** ⌘ Current version: **6.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Introduction of the H.264 video codec into packet-switched conversational services
Source:	⌘	Apple Computer, AT&T Wireless Services, Ericsson (editor), France Telecom, Fraunhofer, Nokia, ORANGE, PacketVideo, Panasonic, Philips, RealNetworks, Sharp, STMicroelectronics, Toshiba, Vodafone
Work item code:	⌘	CEPSCM
Date:	⌘	10/09/2004
Category:	⌘	**B**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	Improve video quality by introducing H.264 (AVC) video in Release 6.
Summary of change:	⌘	References to H.264 (AVC) and the corresponding RTP payload format added. The usage of H.264 (AVC) in packet-switched conversational services defined.
Consequences if not approved:	⌘	Release-6 will not support the new video codec H.264 (AVC).

Clauses affected:	⌘	2, 3.2, 6.2, 9.1, 9.2

Other specs affected: ⌘

Y	N	
	X	Other core specifications
	X	Test specifications
	X	O&M Specifications

⌘

Other comments:	⌘	Support for the 128 kbps video for H.263 and MPEG-4 Visual is included in CR 26.235 009

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be

downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

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] IETF RFC 3261: "SIP: Session Initiation Protocol".

[2] IETF RFC 2327: "SDP: Session Description Protocol".

[3] IETF RFC 2429: "RTP Payload Format for the 1998 Version of ITU-T Rec. H.263 Video (H.263+)".

[4] IETF RFC 1889: "RTP: A Transport Protocol for Real-Time Applications".

[5] IETF RFC 3016: "RTP Payload Format for MPEG-4 Audio/Visual Streams".

[6] ITU-T Recommendation H.263: "Video coding for low bit rate communication".

[7] 3GPP TS 26.110: "Codec for Circuit Switched Multimedia Telephony Service; General Description".

[8] 3GPP TS 26.111: "Codec for Circuit Switched Multimedia Telephony Service; Modifications to H.324".

[9] 3GPP TS 26.071: "Mandatory Speech Codec speech processing functions; AMR Speech Codec; General description".

[10] 3GPP TS 26.090: "Mandatory Speech Codec speech processing functions; AMR Speech Codec; Transcoding functions".

[11] 3GPP TS 26.073: "Adaptive Multi-Rate (AMR); ANSI C source code".

[12] 3GPP TS 26.104: "ANSI-C code for the floating-point AMR speech codec".

[13] ISO/IEC 14496-2 (1999): "Information technology - Coding of audio-visual objects - Part 2: Visual".

[14] 3GPP TS 24.228: "Signalling flows for the IP multimedia call control based on SIP and SDP".

[15] 3GPP TS 24.229: "IP Multimedia Call Control Protocol based on SIP and SDP".

[16] 3GPP TS 26.171 (Release 5): "AMR speech codec, wideband; General description".

[17] 3GPP TS 26.190 (Release 5): "Mandatory Speech Codec speech processing functions AMR Wideband speech codec; Transcoding functions".

[18] 3GPP TS 26.201 (Release 5): "AMR speech codec, wideband; Frame structure".

[19] ITU-T Recommendation H.263 (annex X): "Annex X, Profiles and levels definition".

[20] 3GPP TS 23.228: "IP multimedia subsystem; stage 2".

[21] 3GPP TS 23.107: "QoS Concept and Architecture".

[22] 3GPP TS 23.207: "End to end quality of service concept and architecture".

[23] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service description; Stage 2".

[24] IETF RFC 2793: "RTP Payload for Text Conversation".

[25] ITU-T Recommendation T.140 (1998): "Protocol for multimedia application text conversation" (with amendment 2000).

[26] 3GPP TS 26.101: "Mandatory Speech Codec speech processing functions; AMR Speech Codec; Frame Structure".

[27] IETF RFC 2119: "Key words for use in RFCs to Indicate Requirement Levels".

[28] 3GPP TS 26.093: "Mandatory Speech Codec speech processing functions; AMR Speech Codec; Source Controlled Rate operation".

[29] 3GPP TS 46.060: "Enhanced Full Rate (EFR) speech transcoding".

[30] TIA/EIA -136-Rev.A, part 410 - "TDMA Cellular/PCS ñ Radio Interface, Enhanced Full Rate Voice Codec (ACELP). Formerly IS-641. TIA published standard, 1998".

[31] ARIB, RCR STD-27H, "Personal Digital Cellular Telecommunication System RCR Standard".

[32] IETF draft-westberg-realtime-cellular-01.txt, "Realtime Traffic over Cellular Access Networks".

[33] IETF draft-larzon-udplite-03.txt, "The UDP Lite Protocol".

[34] 3GPP TS 26.092: "Mandatory Speech Codec speech processing functions; AMR Speech Codec; Comfort noise aspects".

[35] IETF RFC 3267: "RTP payload format and file storage format for the Adaptive Multi-Rate (AMR) Adaptive Multi-Rate Wideband (AMR-WB) audio codecs", March 2002.

[36] IETF RFC 2833: ìRTP Payload for DTMF Digits, Telephony Tones and Telephony Signalsî, May 2000.

[37] 3GPP TS 26.243: ìTS Software documentation for fixed-point DSR Extended Front End î.

[38] RTP Payload Formats for European Telecommunications Standards Institute (ETSI) European Standard ES 202 050, ES 202 211, and ES 202 212 Distributed Speech Recognition Encoding draft-ietf-avt-rtp-dsr-codecs-00.txt.

[39] ITU-T Recommendation H.264 (2003): "Advanced video coding for generic audiovisual services" | ISO/IEC 14496-10:2003: "Information technology ñ Coding of audio-visual objects ñ Part 10: Advanced Video Coding".

[40] ISO/IEC 14496-10/FDAM1: "AVC Fidelity Range Extensions".

[41] IETF Internet Draft: "RTP payload Format for H.264 Video", Wenger S. et al, http://www.ietf.org/internet-drafts/draft-ietf-avt-rtp-h264-11.txt, August 2004.

CR Editor's note: The above document cannot be formally referenced until it is published as an RFC.

3.2 Abbreviations

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

AMR	Adaptive MultiRate codec
AVC	Advanced Video Codec
IETF	Internet Engineering Task Force
IM Subsystem	Internet protocol Multimedia Subsystem
ITU-T	International Telecommunications Union-Telecommunications
RFC	IETF Request For Comments
RTCP	RTP Control Protocol
RTP	Real-time Transport Protocol
SDP	Session Description Protocol
SIP	Session Initiated Protocol

6.2 Video

3G PS multimedia terminals offering video communication shall support ITU-T recommendation H.263 [6] baseline. This is the mandatory video codec.

H.263 [19] version 2 Interactive and Streaming Wireless Profile (Profile 3) Level 10 should be supported. This is an optional video codec.

ISO/IEC 14496-2 [13] (MPEG-4 Visual) Simple Profile at Level 0 should be supported. This is an optional video codec.

H.264 (AVC) [39] Baseline Profile at Level 1b [40] should be supported without requirements on output timing conformance (Annex C of [39]). Each sequence parameter set of H.264 (AVC) shall contain the vui_parameters syntax structure including the num_reorder_frames syntax element set equal to 0.

The H.264 (AVC) decoder in a PSS client shall start decoding immediately when it receives data (even if the stream does not start with an IDR access unit) or alternatively no later than it receives the next IDR access unit or the next recovery point SEI message, whichever is earlier in decoding order. The decoding process for a stream not starting with an IDR access unit shall be the same as for a valid H.264 (AVC) bitstream. However, the client shall be aware that such a stream may contain references to pictures not available in the decoded picture buffer. The display behaviour of the client is out of scope of this specification.

NOTE 1: Terminals may use full-frame freeze and full-frame freeze release SEI messages of H.264 (AVC) to control the display process.

NOTE 2: An H.264 (AVC) encoder should code redundant slices only if it knows that the far-end decoder makes use of this feature (which is signaled with the redundant-pic-cap MIME/SDP parameter as specified in [41]). H.264 (AVC) encoders should also pay attention to the potential implications on end-to-end delay.

9 Multimedia stream encapsulation

9.1 MIME media types

The terminal shall declare the mandatory and any optional media streams using the codec specific MIME media types in the associated SDP syntax. The MIME media types for the mandatory and optional codecs shall be according to the corresponding types registered by IANA.

- AMR narrowband speech codec MIME media type as specified in annex B.

- AMR wideband speech codec MIME media type is specified in annex B.
- H.263 [6] video codec MIME media type is specified in annex C.
- MPEG-4 visual simple profile level 0 MIME media type as specified in RFC 3016 [5].
- H.264 (AVC) video codec MIME media type is specified in [41].
- ITU-T Recommendation T.140 [25] Text Conversation MIME media type as specified by RFC 2793 [24].
- Telephone-event MIME media type as specified by RFC 2833 [36].
- DSR MIME media type as specified in draft-ietf-avt-rtp-dsr-codecs-00.txt [38]

9.2 RTP payload

RTP payload formats specified by IETF shall be used for real time media streams.

RTP payload format for the AMR narrowband speech codec is specified in annex B.

RTP payload format for the AMR wideband speech codec is specified in annex B.

RTP payload format for the ITU-T Recommendation H.263 [6] video codec is specified in IETF RFC 2429 [3].

RTP payload format for the MPEG-4 visual simple profile level 0 is specified in IETF RFC 3016 [5].

RTP payload format for the ITU-T Recommendation H.264 (AVC) [39] video codec is specified in [41], where the interleaved packetization mode shall not be used. Receivers shall support both the single NAL unit packetization mode and the non-interleaved packetization mode of [41], and transmitters may use either one of these packetization modes.

RTP payload format for the ITU-T Recommendation T.140 [25] text conversation coding is specified in IETF RFC 2793 [24].

RTP payload format for the telephone-event is specified in IETF RFC 2833 [36].

RTP payload format for the DSR Extended Advanced Front-end is specified in draft-ietf-avt-rtp-dsr-codecs-00.txt [38].