Source: **TSG-SA WG4**

Title: CRs TS 26.140 on Introduction of Extended AMR-WB and / or Enhanced aacPlus into MMS service (Release 6)

Document for: **Discussion / Decision**

Agenda Item: **7.4.3**

At SA#24 the way forward for the selection of audio codecs was formulated in TD SP-040481. TSG SA WG4 was tasked to draft two change requests to the MMS codec and formats specification (TS 26.140), one change request for each of the codecs AMR WB+ and enhanced aacPlus to include them for use as MMS codec. SA4 has prepared also a third CR (in case SA#25 Plenary decides that both codecs are to be included in TS 26.140 for use as MMS codecs). The following CRs are therefore presented to TSG SA #25 for Discussion / Decision.

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.140	004	2	Rel-6	Introduction of Extended AMR-WB into MMS service	C	5.2.0	S4	TSG-SA WG4#32	S4-040585
26.140	005	2	Rel-6	Introduction of Enhanced aacPlus into MMS service	C	5.2.0	S4	TSG-SA WG4#32	S4-040586
26.140	006	2	Rel-6	Introduction of Extended AMR-WB and Enhanced aacPlus into MMS service	C	5.2.0	S4	TSG-SA WG4#32	S4-040587

CR-Form-v7

CHANGE REQUEST

| ⌘ | **26.140** CR **004** | ⌘**rev** | **2** | ⌘ | Current version: | **5.2.0** | ⌘ |

*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 **X** Radio Access Network ☐   Core Network ☐

Title: ⌘	Introduction of Extended AMR-WB into MMS service	
Source: ⌘	TSG-SA WG4	
Work item code:⌘	**MMS6-Codec**	***Date:*** ⌘ 14/09/2004
Category: ⌘	**C**	***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: ⌘	Codec enhancements for Rel-6 MMS service
Summary of change:⌘	Extended AMR-WB is included in audio media type as a recommended codec
Consequences if not approved: ⌘	There is no audio codec enhancement for Rel-6 MMS service

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Clauses affected: ⌘	2, 4.3

	Y	N		
Other specs ⌘	X		Other core specifications ⌘	TS 26.244
affected:		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘	

2 References

[32]   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.

[33]   3GPP TS 26.290: "Extended AMR Wideband codec; Transcoding functions"

[34]   3GPP TS 26.304: "ANSI-C code for the Floating-point; Extended AMR Wideband codec"

[35]   3GPP TS 26.273: "ANSI-C code for the Fixed-point; Extended AMR Wideband codec"

4.3 Audio

~~MPEG-4 AAC Low Complexity object type [19] should be supported. The maximum sampling rate to be supported by the decoder is 48 kHz. The channel configurations to be supported are mono (1/0) and stereo (2/0). In addition, the MPEG-4 AAC Long Term Prediction object type may be supported.~~

If audio is supported, then Extended AMR-WB [33] [34] [35] codec should be supported. There is no requirement that a terminal supporting decoding by the codec shall also support encoding by that codec.

Specifically, based on the audio codec selection test results the codec is strong for the scenarios marked with blue colour in the table below:

Content type Bit rate	Music	Speech over Music	Speech between Music	Speech
14 kbps mono	■	■	■	■
18 kbps stereo			■	■
24 kbps stereo			■	■
24 kbps mono				■
32 kbps stereo				
48 kbps stereo				

Extended AMR-WB decoder is also able to decode AMR-WB content.

In addition, MPEG-4 AAC Low Complexity and MPEG-4 AAC Long Term Prediction object types [19] may be supported. The maximum sampling rate to be supported by the decoder is 48 kHz. The channel configurations to be supported are mono (1/0) and stereo (2/0).

CR-Form-v7.1

CHANGE REQUEST

⌘	**26.140** CR **005**	⌘**rev** **2** ⌘	Current version:	**5.2.0** ⌘

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 **X** Radio Access Network ☐ Core Network ☐

Title: ⌘	Introduction of Enhanced aacPlus into MMS service	
Source: ⌘	TSG-SA WG4	
Work item code: ⌘	**MMS6-Codec**	***Date:*** ⌘ 14/09/2004

Category: ⌘	**C**	***Release:*** ⌘ Rel-6

Use <u>one</u> 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 <u>one</u> of the following releases:
 Ph2 (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)
 Rel-7 (Release 7)

Reason for change: ⌘	Codec enhancements for Rel.6 MMS service
Summary of change: ⌘	Enhanced aacPlus is introduced into the audio media type
Consequences if not approved: ⌘	No audio codec enhancement for Rel.6 MMS service

Clauses affected: ⌘	2, 3.2, 4.3

	Y	N		
Other specs Affected: ⌘	X		Other core specifications ⌘	26.244
			Test specifications	
			O&M Specifications	

Other comments: ⌘	

2 References

[32]   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.

[43]   3GPP TS 26.401: "General audio codec audio processing functions; Enhanced aacPlus general audio codec; General description".

[44]   3GPP TS 26.410: "General audio codec audio processing functions; Enhanced aacPlus general audio codec; Floating-point ANSI-C code".

[45]   3GPP TS 26.xxx: "General audio codec audio processing functions; Enhanced aacPlus general audio codec; Fixed-point ANSI-C code".

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply:

3GP	3GPP file format
AAC	Advanced Audio Coding
CC/PP	Composite Capability/Preference Profiles
Enhanced aacPlus	MPEG-4 High Efficiency AAC plus MPEG-4 Parametric Stereo
GIF	Graphics Interchange Format
H.263	ITU-T video codec
ITU-T	International Telecommunications Union - Telecommunications
JFIF	JPEG File Interchange Format
JPEG	Joint Picture Expert Group
MIDI	Musical Instrument Digital Interface
MIME	Multipurpose Internet Mail Extensions
MM	Multimedia Message
MMS	Multimedia Messaging Service
MPEG	Motion Picture Expert Group
MP4	MPEG-4 file format
PSS	Packet-switched Streaming Service
SBR	Spectral Band Replication
SP-MIDI	Scalable Polyphony MIDI
SVG	Scalable Vector Graphics
UTF-8	Unicode Transformation Format (the 8-bit form)

4.3 Audio

~~MPEG-4 AAC Low Complexity object type [19] should be supported. The maximum sampling rate to be supported by the decoder is 48 kHz. The channel configurations to be supported are mono (1/0) and stereo (2/0). In addition, the MPEG-4 AAC Long Term Prediction object type may be supported~~.

If audio is supported, then the Enhanced aacPlus [43, 44, 45] codec should be supported. There is no requirement that a terminal supporting decoding by the codec shall also support encoding by that codec.

Specifically, based on the audio codec selection test results the codec is strong for the scenarios marked with orange colour in the table below:

Content type	Music	Speech over Music	Speech between Music	Speech

Bitrate				
14 kbps mono				
18 kbps stereo				
24 kbps stereo				
24 kbps mono				
32 kbps stereo				
48 kbps stereo				

The Enhanced aacPlus decoder is also able to decode MPEG-4 AAC-LC content.

In addition, MPEG-4 AAC Low Complexity (MPEG-4 AAC-LC) and MPEG-4 AAC Long Term Prediction object types [19] may be supported. The maximum sampling rate to be supported by the decoder is 48 kHz. The channel configurations to be supported are mono (1/0) and stereo (2/0).

CR-Form-v7

CHANGE REQUEST

| ⌘ | **26.140** CR **006** | ⌘**rev** | **2** | ⌘ | Current version: | **5.2.0** | ⌘ |

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

Title:	⌘	Introduction of Extended AMR-WB and Enhanced aacPlus into MMS service
Source:	⌘	TSG-SA WG4
Work item code: ⌘	**MMS6-Codec**	***Date:*** ⌘ 14/09/2004
Category: ⌘	**C**	***Release:*** ⌘ Rel-6

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R97   (Release 1997)
R98   (Release 1998)
R99   (Release 1999)
Rel-4   (Release 4)
Rel-5   (Release 5)
Rel-6   (Release 6)

Reason for change:	⌘	Codec enhancements for Rel-6 MMS service
Summary of change: ⌘		Extended AMR-WB and Enhanced aacPlus are included in audio media type as recommended codecs
Consequences if not approved:	⌘	There are no audio codec enhancements for Rel-6 MMS services

Clauses affected:	⌘	2, 3.2, 4.3

		Y	N			
Other specs affected:	⌘	X		Other core specifications	⌘	TS 26.244
			X	Test specifications		
			X	O&M Specifications		

Other comments:	⌘	

2 References

[32]   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.

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[35]   3GPP TS 26.273: "ANSI-C code for the Fixed-point; Extended AMR Wideband codec"

[36]   3GPP TS 26.401: "General audio codec audio processing functions; Enhanced aacPlus general audio codec; General description".

[37]   3GPP TS 26.410: "General audio codec audio processing functions; Enhanced aacPlus general audio codec; Floating-point ANSI-C code".

[38]   3GPP TS 26.xxx: "General audio codec audio processing functions; Enhanced aacPlus general audio codec; Fixed-point ANSI-C code".

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GIF	Graphics Interchange Format
H.263	ITU-T video codec
ITU-T	International Telecommunications Union - Telecommunications
JFIF	JPEG File Interchange Format
JPEG	Joint Picture Expert Group
MIDI	Musical Instrument Digital Interface
MIME	Multipurpose Internet Mail Extensions
MM	Multimedia Message
MMS	Multimedia Messaging Service
MPEG	Motion Picture Expert Group
MP4	MPEG-4 file format
PSS	Packet-switched Streaming Service
SBR	Spectral Band Replication
SP-MIDI	Scalable Polyphony MIDI
SVG	Scalable Vector Graphics
UTF-8	Unicode Transformation Format (the 8-bit form)

4.3 Audio

MPEG-4 AAC Low Complexity object type [19] should be supported. The maximum sampling rate to be supported by the decoder is 48 kHz. The channel configurations to be supported are mono (1/0) and stereo (2/0). In addition, the MPEG-4 AAC Long Term Prediction object type may be supported.

If audio is supported, then one or both of the following two audio codecs should be supported:

- Enhanced aacPlus [36] [37] [38]

- Extended AMR-WB [33] [34] [35]

There is no requirement that a terminal supporting decoding by one of the codecs shall also support encoding by that codec.

Specifically, based on the audio codec selection test results Extended AMR-WB is strong for the scenarios marked with blue, Enhanced aacPlus is strong for the scenarios marked with orange, and both are strong for the scenarios marked with green colour in the table below:

Content type Bit rate	Music	Speech over Music	Speech between Music	Speech
14 kbps mono	green	green	blue	blue
18 kbps stereo	orange	orange	blue	blue
24 kbps stereo	orange	orange	blue	blue
24 kbps mono	orange	orange	orange	blue
32 kbps stereo	orange	orange	orange	orange
48 kbps stereo	orange	orange	orange	orange

Enhanced aacPlus decoder is also able to decode MPEG-4 AAC LC content.

Extended AMR-WB decoder is also able to decode AMR-WB content.

In addition, MPEG-4 AAC Low Complexity and MPEG-4 AAC Long Term Prediction object types [19] may be supported. The maximum sampling rate to be supported by the decoder is 48 kHz. The channel configurations to be supported are mono (1/0) and stereo (2/0).