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 | С | 5.2.0 | S4 | TSG-SA WG4#32 | S4-040585 |
| 26.140 | 005 | 2 | Rel-6 | Introduction of Enhanced aacPlus into MMS service | С | 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 | С | 5.2.0 | S4 | TSG-SA WG4#32 | S4-040587 |

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| æ | | <mark>26.140</mark> CR <mark>0</mark> | 04 | жrev | 2 | Ħ | Current vers | ion: <mark>5</mark> | .2.0 | ж |
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| Proposed chang | je a | ffects: UICC app | os₩ <mark></mark> | ME X |]Rac | lio Ad | ccess Networ | k 📃 (| Core Ne | etwork |
| Title: | ж | Introduction of Ext | ended AMR- | WB into I | MMS | serv | vice | | | |
| Source: | ж | TSG-SA WG4 | | | | | | | | |
| Work item code: | : H | MMS6-Codec | | | | | <i>Date:</i> ೫ | 14/09 | /2004 | |
| Category: | Ħ | C Use <u>one</u> of the follow, F (correction) A (corresponds B (addition of fe C (functional mod D (editorial mod Detailed explanations be found in 3GPP <u>TR</u> | ing categories. to a correction ature), odification of fe ification) of the above 21.900. | : n in an ear eature) categories | <i>lier re</i> can | lease | Release: % Use <u>one</u> of 2 () R96 R97 R98 R99 Rel-4 Rel-5 Rel-6 | Rel-6 (GSM F (Releas (Releas (Releas (Releas (Releas (Releas (Releas | wing rele Phase 2) e 1996) e 1997) e 1998) e 1999) e 4) e 5) e 6) | eases: |

| Reason for change: 3 | 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 \$ | There is no audio codec enhancement for Rel-6 MMS service |
| not approved: | |
| | |
| Clauses affected: | 3 2, 4.3 |
| | |
| | YN |
| Other specs | Contractions X TS 26,244 |
| affected: | X Test specifications |
| uncoleu. | X ORM Specifications |
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| Other commentes | |
| Uther comments: F | |

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 | Music | Speech over Music | Speech between | <u>Speech</u> |
|-----------------------|-------|-------------------|----------------|---------------|
| Bit rate | | | Music | |
| <u>14 kbps mono</u> | | | | |
| <u>18 kbps stereo</u> | | | | |
| 24 kbps stereo | | | | |
| <u>24 kbps mono</u> | | | | |
| <u>32 kbps stereo</u> | | | | |
| 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).

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| Title: | ₩ Intr | oductio | on of E | nhanced aac | Plus into | MMS | serv | ice | | | |
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| Summary of char | nge: ೫ | Enha | inced a | aacPlus is intr | oduced i | nto the | e aud | <mark>dio media</mark> | type | | |
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| Clauses affected: | H 2, 3.2, 4.3 |
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| Other comments: | ж |

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 aacPlu | 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 | Speech |
|--------------|-------|-------------------|----------------|---------------|
| | | | <u>Iviusic</u> | |

| Bitrate | | |
|-----------------------|--|--|
| <u>14 kbps mono</u> | | |
| 18 kbps stereo | | |
| 24 kbps stereo | | |
| 24 kbps mono | | |
| <u>32 kbps stereo</u> | | |
| 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).

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| Title: | ж | Introduction of E | xtended AMR | -WB and | Enha | anced | aacPlus into | MMS | service | |
| Source: | ж | TSG-SA WG4 | | | | | | | | |
| Work item code: | ж | MMS6-Codec | | | | | <i>Date:</i> ೫ | 14/0 | 9/2004 | |
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| 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 🛛 🕱 | There are no audio codec enhancements for Rel-6 MMS services |
| not approved: | |
| | |
| Clauses affected: # | 2, 3.2, 4.3 |
| | |
| | YN |
| Other specs 🛛 🖁 | X Other core specifications # TS 26.244 |
| affected: | X Test specifications |
| | X O&M Specifications |
| | |
| Other comments: ೫ | |

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" |
| [36] codec; Gene | 3GPP TS 26.401: "General audio codec audio processing functions; Enhanced aacPlus general audio eral description". |
| [37] codec: Eloa | 3GPP TS 26.410: "General audio codec audio processing functions; Enhanced aacPlus general audio ting-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".

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 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 | Music | Speech over Music | Speech between | <u>Speech</u> |
|-----------------------|-------|-------------------|----------------|---------------|
| Bit rate | | | Music | |
| <u>14 kbps mono</u> | | | | |
| 18 kbps stereo | | | | |
| 24 kbps stereo | | | | |
| 24 kbps mono | | | | |
| <u>32 kbps stereo</u> | | | | |
| 48 kbps stereo | | | | |

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).