Source: **TSG-SA WG4**

Title: **CRs TS 26.234 on Introduction of Enhanced aacPlus and / or Extended AMR-WB into PSS 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 PSS protocol and codecs specification (TS 26.234), one change request for each of the codecs AMR WB+ and enhanced aacPlus to include them for use as PSS codec. SA4 has prepared also a third CR (in case SA#25 Plenary decides that both codecs are to be included in TS 26.234 for use as PSS 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
26.234	072	1	Rel-6	Introduction of Enhanced aacPlus into PSS service	C	6.0.0	S4	TSG-SA WG4#32	S4-040579
26.234	073	1	Rel-6	Introduction of Extended AMR-WB into PSS service	C	6.0.0	S4	TSG-SA WG4#32	S4-040580
26.234	074	1	Rel-6	Introduction of Extended AMR-WB and Enhanced aacPlus into PSS service	C	6.0.0	S4	TSG-SA WG4#32	S4-040581

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CHANGE REQUEST

| ⌘ | **26.234** CR **072** | ⌘rev | **1** | ⌘ | Current version: | **6.0.0** | ⌘ |

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

Title:	⌘	Introduction of Enhanced aacPlus into PSS service
Source:	⌘	TSG-SA WG4

Work item code:⌘	PSSrel6-Stage3		***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:
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 PSS service
Summary of change:⌘		Enhanced aacPlus codec is introduced into the audio media type as a recommended codec
Consequences if not approved:	⌘	No audio codec enhancement for Rel.6 PSS service

Clauses affected:	⌘	2, 3.2, 5.4, 6.2.4, 7.3

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

Other comments:	⌘	

2   References

[71]   Mobile XMF Content Format Specification, MMA specification v1.0., RP-42, Los Angeles, CA, USA. 2004.

[72]   3GPP TS 26.401: "General audio codec audio processing functions; Enhanced aacPlus general audio codec; General description".

[73]   3GPP TS 26.410: "General audio codec audio processing functions; Enhanced aacPlus general audio codec; Floating-point ANSI-C code".

[74]   3GPP TS 26.xxx: "General audio codec audio processing functions; Enhanced aacPlus general audio codec; Fixed-point ANSI-C code".

 [75]   ISO/IEC 14496-3:2001/Amd.1:2003, Bandwidth Extension

3.2   Abbreviations

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

3GP	3GPP file format
AAC	Advanced Audio Coding
CC/PP	Composite Capability / Preference Profiles
DCT	Discrete Cosine Transform
DLS	Downloadable Sounds
Enhanced aacPlus	MPEG-4 High Efficiency AAC plus MPEG-4 Parametric Stereo
GIF	Graphics Interchange Format
HTML	Hyper Text Markup Language
ITU-T	International Telecommunications Union – Telecommunications
JFIF	JPEG File Interchange Format
MIDI	Musical Instrument Digital Interface
MIME	Multipurpose Internet Mail Extensions
MMS	Multimedia Messaging Service
PNG	Portable Networks Graphics
PSS	Packet-switched Streaming Service
QCIF	Quarter Common Intermediate Format
RDF	Resource Description Framework
RTCP	RTP Control Protocol
RTP	Real-time Transport Protocol
RTSP	Real-Time Streaming Protocol
SBR	Spectral Band Replication
SDP	Session Description Protocol
SMIL	Synchronised Multimedia Integration Language
SP-MIDI	Scalable Polyphony MIDI
SVG	Scalable Vector Graphics
UAProf	User Agent Profile
UCS-2	Universal Character Set (the two octet form)
UTF-8	Unicode Transformation Format (the 8-bit form)
W3C	WWW Consortium
WML	Wireless Markup Language
XHTML	eXtensible Hyper Text Markup Language
XMF	eXtensible Music Format
XML	eXtensible Markup Language

5.4　　MIME media types

For continuous media (speech, audio and video) the following MIME media types shall be used:

- AMR narrow-band speech codec (see clause 7.2) MIME media type as defined in [11];

- AMR wideband speech codec (see clause 7.2) MIME media type as defined in [11];

- Enhanced aacPlus and MPEG-4 AAC audio codecs (see clause 7.3) MIME media type as defined in RFC 3016 [13]. When used in SDP the attribute "cpresent" SHALL be set to "0" indicating that the configuration information is only carried out of band in the SDP "config" parameter. A PSS server using enhanced aacPlus with implicit signaling shall include the "SBR-enabled" parameter in the SDP "a=fmtp" line. "SBR-enabled" shall be set to "1" for streams containing SBR and shall be set to "0" for streams not containing SBR. Terminals may rely on this parameter to set the correct output sampling rate to either the indicated rate (where "SBR-enabled" is set to "0") or twice the indicated rate (where "SBR-enabled" is set to "1");

- MPEG-4 video codec (see clause 7.4) MIME media type as defined in RFC 3016 [13]. When used in SDP the configuration information shall be carried outband in the "config" SDP parameter and inband (as stated in RFC 3016). As described in RFC 3016, the configuration information sent inband and the config information in the SDP shall be the same except that first_half_vbv_occupancy and latter_half_vbv_occupancy which, if exist, may vary in the configuration information sent inband;

- H.263 [22] video codec (see clause 7.4) MIME media type as defined in clause 4.2.7 of [62].

MIME media types for JPEG, GIF, PNG, SP-MIDI, Mobile DLS, Mobile XMF, SVG, timed text and XHTML can be used both in the "Content-type" field in HTTP and in the "type" attribute in SMIL 2.0. The following MIME media types shall be used for these media:

- JPEG (see clause 7.5) MIME media type as defined in [15];

- GIF (see clause 7.6) MIME media type as defined in [15];

- PNG (see sub clause 7.6) MIME media type as defined in [38];

- SP-MIDI (see sub clause 7.3A) MIME media type as defined in clause C.2 in Annex C of the present document;

- DLS MIME media type to represent Mobile DLS (see sub clause 7.3A) as defined in clause C.4 in Annex C of the present document;

- Mobile XMF (see sub clause 7.3A) MIME media type as defined in clause C.3 in Annex C of the present document;

- SVG (see sub clause 7.7) MIME media type as defined in [42];

- XHTML (see clause 7.8) MIME media type as defined in [16];

- Timed text (see subclause 7.9) MIME media type as defined in [50].

MIME media type used for SMIL files shall be according to [31] and for SDP files according to [6].

6.2.4　　RTP payload formats

For RTP/UDP/IP transport of continuous media the following RTP payload formats shall be used:

- AMR narrow-band speech codec (see clause 7.2) RTP payload format according to [11]. A PSS client is not required to support multi-channel sessions;

- AMR wideband speech codec (see clause 7.2) RTP payload format according to [11]. A PSS client is not required to support multi-channel sessions;

- Enhanced aacPlus and MPEG-4 AAC audio codecs (see clause 7.3) RTP payload format according to RFC 3016 [13]. The MIME parameter "rate" shall either be set to the default value of 90000 or to the sampling rate signalled in the AudioSpecificConfig carried in the "config" SDP parameter;

- MPEG-4 video codec (see clause 7.4) RTP payload format according to RFC 3016 [13];

- H.263 video codec (see clause 7.4) RTP payload format according to RFC 2429 [14].

NOTE: The payload format RFC 3016 for enhanced aacPlus and MPEG-4 AAC specify that the audio streams shall be formatted by the LATM (Low-overhead MPEG-4 Audio Transport Multiplex) tool [21]. It should be noted that the references for the LATM format in the RFC 3016 [13] point to an older version of the LATM format than included in [21]. In [21] a corrigendum to the LATM tool is included. This corrigendum includes changes to the LATM format making implementations using the corrigendum incompatible with implementations not using it. To avoid future interoperability problems, implementations of PSS client and servers supporting enhanced aacPlus and/or AAC shall follow the changes to the LATM format included in [21]. It should be noted further that the enhanced aacPlus signalling mode "backwards compatible explicit signalling" (as defined in [75]) can not be used with LATM.

7.3 Audio

If audio is supported, MPEG-4 AAC Low Complexity (AAC LC) object type decoder [21] 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 (AAC LTP) object type decoder may be supported.

When a server offers an AAC LC or AAC LTP stream with the specified restrictions, it shall include the "profile-level-id" and "object" MIME parameters in the SDP "a=fmtp" line. The following values shall be used:

Object Type	profile-level-id	object
AAC LC	15	2
AAC LTP	15	4

If audio is supported, then the Enhanced aacPlus [72, 73, 74] decoder should be supported.

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 / Bitrate	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				

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

In addition, MPEG-4 AAC Low Complexity (AAC-LC) and MPEG-4 AAC Long Term Prediction (AAC-LTP) object type decoders [21] 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).

When a server offers an AAC-LC or AAC-LTP stream with the specified restrictions, it shall include the "profile-level-id" and "object" MIME parameters in the SDP "a=fmtp" line. The following values shall be used:

Object Type	profile-level-id	object
AAC-LC	15	2
AAC-LTP	15	4

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CHANGE REQUEST

| ⌘ | **26.234** CR **073** | ⌘**rev** | **1** | ⌘ | Current version: | **6.0.0** | ⌘ |

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

Title: ⌘	Introduction of Extended AMR-WB into PSS service	
Source: ⌘	TSG-SA WG4	
Work item code:⌘	PSSrel6-Stage3	***Date:*** ⌘ 14/09/2004

Category: ⌘ **C**		***Release:*** ⌘ Rel-6
	Use one of the following categories:	*Use one of the following releases:*
	F *(correction)*	*Ph2* *(GSM Phase 2)*
	A *(corresponds to a correction in an earlier release)*	*R96* *(Release 1996)*
	B *(addition of feature),*	*R97* *(Release 1997)*
	C *(functional modification of feature)*	*R98* *(Release 1998)*
	D *(editorial modification)*	*R99* *(Release 1999)*
	Detailed explanations of the above categories can	*Rel-4* *(Release 4)*
	be found in 3GPP TR 21.900.	*Rel-5* *(Release 5)*
		Rel-6 *(Release 6)*
		Rel-7 *(Release 7)*

Reason for change: ⌘	Codec enhancements for Rel-6 PSS 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 PSS

Clauses affected: ⌘	2, 5.4, 6.2.4, 7.3

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

Other comments: ⌘	

2 References

[71] Mobile XMF Content Format Specification, MMA specification v1.0., RP-42, Los Angeles, CA, USA. 2004.

[72] 3GPP TS 26.290: "Extended AMR Wideband codec; Transcoding functions"

[73] 3GPP TS 26.304: "ANSI-C code for the Floating-point; Extended AMR Wideband codec"

[74] 3GPP TS 26.273: "ANSI-C code for the Fixed-point; Extended AMR Wideband codec"

[75] Real-Time Transport Protocol (RTP) Payload Format for Extended AMR Wideband (AMR-WB+) Audio Codec, draft-ietf-avt-rtp-amrwbplus-01.txt

5.4 MIME media types

For continuous media (speech, audio and video) the following MIME media types shall be used:

- AMR narrow-band speech codec (see clause 7.2) MIME media type as defined in [11];

- AMR wideband speech codec (see clause 7.2) MIME media type as defined in [11];

- Extended AMR-WB codec (see clause 7.3) MIME media type as defined in [75];

- MPEG-4 AAC audio codec (see clause 7.3) MIME media type as defined in RFC 3016 [13]. When used in SDP the attribute "cpresent" SHALL be set to "0" indicating that the configuration information is only carried out of band in the SDP "config" parameter;

6.2.4 RTP payload formats

For RTP/UDP/IP transport of continuous media the following RTP payload formats shall be used:

- AMR narrow-band speech codec (see clause 7.2) RTP payload format according to [11]. A PSS client is not required to support multi-channel sessions;

- AMR wideband speech codec (see clause 7.2) RTP payload format according to [11]. A PSS client is not required to support multi-channel sessions;

- Extended AMR-WB codec (see clause 7.3) RTP payload format according to [75];

- MPEG-4 AAC audio codec (see clause 7.3) RTP payload format according to RFC 3016 [13];

- MPEG-4 video codec (see clause 7.4) RTP payload format according to RFC 3016 [13];

- H.263 video codec (see clause 7.4) RTP payload format according to RFC 2429 [14].

NOTE: The payload format RFC 3016 for MPEG-4 AAC specify that the audio streams shall be formatted by the LATM (Low-overhead MPEG-4 Audio Transport Multiplex) tool [21]. It should be noted that the references for the LATM format in the RFC 3016 [13] point to an older version of the LATM format than included in [21]. In [21] a corrigendum to the LATM tool is included. This corrigendum includes changes to the LATM format making implementations using the corrigendum incompatible with implementations not using it. To avoid future interoperability problems, implementations of PSS client and servers supporting AAC shall follow the changes to the LATM format included in [21].

7.3   Audio

~~If audio is supported, MPEG-4 AAC Low Complexity (AAC LC) object type decoder [21] 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 (AAC LTP) object type decoder may be supported.~~

~~When a server offers an AAC-LC or AAC-LTP stream with the specified restrictions, it shall include the "profile-level-id" and "object" MIME parameters in the SDP "a=fmtp" line. The following values shall be used:~~

~~Object Type~~	~~profile-level-id~~	~~object~~
~~AAC-LC~~	~~15~~	~~2~~
~~AAC-LTP~~	~~15~~	~~4~~

If audio is supported, then Extended AMR-WB [72] [73] [74] decoder should be supported.

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 (AAC-LC) and MPEG-4 AAC Long Term Prediction (AAC-LTP) object type decoders [21] 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).

When a server offers an AAC-LC or AAC-LTP stream with the specified restrictions, it shall include the "profile-level-id" and "object" MIME parameters in the SDP "a=fmtp" line. The following values shall be used:

Object Type	profile-level-id	object
AAC-LC	15	2
AAC-LTP	15	4

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CHANGE REQUEST

⌘   **26.234 CR 074**   ⌘ **rev 1** ⌘   Current version: **6.0.0** ⌘

*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 and Enhanced aacPlus into PSS service	
Source: ⌘	TSG-SA WG4	
Work item code: ⌘	PSSrel6-Stage3	***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:* *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 PSS service
Summary of change: ⌘	Extended AMR-WB and Enhanced aacPlus are included in audio media type as recommended codecs
Consequences if not approved: ⌘	There is no audio codec enhancement for Rel-6 PSS

Clauses affected: ⌘	2, 3.2, 5.4, 6.2.4, 7.3

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

Other comments: ⌘	

2   References

[71]   Mobile XMF Content Format Specification, MMA specification v1.0., RP-42, Los Angeles, CA, USA. 2004.

[72]   3GPP TS 26.290: "Extended AMR Wideband codec; Transcoding functions"

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[74]   3GPP TS 26.273: "ANSI-C code for the Fixed-point; Extended AMR Wideband codec"

[75]   Real-Time Transport Protocol (RTP) Payload Format for Extended AMR Wideband (AMR-WB+) Audio Codec, draft-ietf-avt-rtp-amrwbplus-01.txt

[76]   3GPP TS 26.401: "General audio codec audio processing functions; Enhanced aacPlus general audio codec; General description".

[77]   3GPP TS 26.410: "General audio codec audio processing functions; Enhanced aacPlus general audio codec; Floating-point ANSI-C code".

[78]   3GPP TS 26.xxx: "General audio codec audio processing functions; Enhanced aacPlus general audio codec; Fixed-point ANSI-C code".

[79]   ISO/IEC 14496-3:2001/Amd.1:2003, Bandwidth Extension

3.2   Abbreviations

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

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CC/PP	Composite Capability / Preference Profiles
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DLS	Downloadable Sounds
Enhanced aacPlus	MPEG-4 High Efficiency AAC plus MPEG-4 Parametric Stereo
GIF	Graphics Interchange Format
HTML	Hyper Text Markup Language
ITU-T	International Telecommunications Union – Telecommunications
JFIF	JPEG File Interchange Format
MIDI	Musical Instrument Digital Interface
MIME	Multipurpose Internet Mail Extensions
MMS	Multimedia Messaging Service
PNG	Portable Networks Graphics
PSS	Packet-switched Streaming Service
QCIF	Quarter Common Intermediate Format
RDF	Resource Description Framework
RTCP	RTP Control Protocol
RTP	Real-time Transport Protocol
RTSP	Real-Time Streaming Protocol
SBR	Spectral Band Replication
SDP	Session Description Protocol
SMIL	Synchronised Multimedia Integration Language
SP-MIDI	Scalable Polyphony MIDI
SVG	Scalable Vector Graphics
UAProf	User Agent Profile
UCS-2	Universal Character Set (the two octet form)
UTF-8	Unicode Transformation Format (the 8-bit form)
W3C	WWW Consortium
WML	Wireless Markup Language

XHTML   eXtensible Hyper Text Markup Language
XMF   eXtensible Music Format
XML   eXtensible Markup Language

5.4 MIME media types

For continuous media (speech, audio and video) the following MIME media types shall be used:

- AMR narrow-band speech codec (see clause 7.2) MIME media type as defined in [11];

- AMR wideband speech codec (see clause 7.2) MIME media type as defined in [11];

- ~~MPEG-4 AAC audio codec (see clause 7.3) MIME media type as defined in RFC 3016 [13]. When used in SDP the attribute "cpresent" SHALL be set to "0" indicating that the configuration information is only carried out of band in the SDP "config" parameter;~~

- Extended AMR-WB codec (see clause 7.3) MIME media type as defined in [75];

- Enhanced aacPlus and MPEG-4 AAC audio codecs (see clause 7.3) MIME media type as defined in RFC 3016 [13]. When used in SDP the attribute "cpresent" SHALL be set to "0" indicating that the configuration information is only carried out of band in the SDP "config" parameter. A PSS server using enhanced aacPlus with implicit signaling shall include the "SBR-enabled" parameter in the SDP "a=fmtp" line. "SBR-enabled" shall be set to "1" for streams containing SBR and shall be set to "0" for streams not containing SBR. Terminals may rely on this parameter to set the correct output sampling rate to either the indicated rate (where "SBR-enabled" is set to "0") or twice the indicated rate (where "SBR-enabled" is set to "1");

6.2.4 RTP payload formats

For RTP/UDP/IP transport of continuous media the following RTP payload formats shall be used:

- AMR narrow-band speech codec (see clause 7.2) RTP payload format according to [11]. A PSS client is not required to support multi-channel sessions;

- AMR wideband speech codec (see clause 7.2) RTP payload format according to [11]. A PSS client is not required to support multi-channel sessions;

~~MPEG-4 AAC audio codec (see clause 7.3) RTP payload format according to RFC 3016 [13];~~

- Extended AMR-WB codec (see clause 7.3) RTP payload format according to [75];

- Enhanced aacPlus and MPEG-4 AAC codec (see clause 7.3) RTP payload format according to [13];

- MPEG-4 video codec (see clause 7.4) RTP payload format according to RFC 3016 [13];

- H.263 video codec (see clause 7.4) RTP payload format according to RFC 2429 [14].

NOTE: The payload format RFC 3016 for enhanced aacPlus and MPEG-4 AAC specify that the audio streams shall be formatted by the LATM (Low-overhead MPEG-4 Audio Transport Multiplex) tool [21]. It should be noted that the references for the LATM format in the RFC 3016 [13] point to an older version of the LATM format than included in [21]. In [21] a corrigendum to the LATM tool is included. This corrigendum includes changes to the LATM format making implementations using the corrigendum incompatible with implementations not using it. To avoid future interoperability problems, implementations of PSS client and servers supporting enhanced aacPlus and/or AAC shall follow the changes to the LATM format included in [21]. It should be noted further that the enhanced aacPlus signalling mode "backwards compatible explicit signalling" (as defined in [79]) can not be used with LATM.

7.3   Audio

If audio is supported, MPEG-4 AAC Low Complexity (AAC LC) object type decoder [21] 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 (AAC LTP) object type decoder may be supported.

When a server offers an AAC-LC or AAC LTP stream with the specified restrictions, it shall include the "profile-level-id" and "object" MIME parameters in the SDP "a=fmtp" line. The following values shall be used:

Object Type	profile-level-id	object
AAC-LC	15	2
AAC-LTP	15	4

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

- Enhanced aacPlus [76] [77] [78]

- Extended AMR-WB [72] [73] [74]

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 AAC-LC content.

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

In addition, MPEG-4 AAC Low Complexity (AAC-LC) and MPEG-4 AAC Long Term Prediction (AAC-LTP) object type decoders [21] 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).

When a server offers an AAC-LC or AAC-LTP stream with the specified restrictions, it shall include the "profile-level-id" and "object" MIME parameters in the SDP "a=fmtp" line. The following values shall be used:

Object Type	profile-level-id	object
AAC-LC	15	2
AAC-LTP	15	4