

Technical Specification Group Services and System Aspects
Meeting #26, Athens, Greece
13-16 December 2004

TSGS#26(04)0843

Source: TSG-SA WG4

Title: CRs TS 26.235 and TS 26.236 on Push to Talk over Cellular (PoC) codecs (Release 6)

Document for: Approval

Agenda Item: 7.4.3

The following CRs, agreed at the TSG-SA WG4 meeting #33, are presented to TSG SA #26 for approval.

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.235	010	1	Rel-6	Inclusion of PoC support	B	6.2.0	S4	TSG-SA WG4#33	S4-040849
26.236	013	1	Rel-6	Inclusion of PoC support	B	6.0.0	S4	TSG-SA WG4#33	S4-040850

CHANGE REQUEST

⌘ **26.235 CR 010** ⌘ rev **1** ⌘ Current version: **6.2.0** ⌘

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 Radio Access Network Core Network

Title:	⌘ Inclusion of PoC support		
Source:	⌘ TSG-SA WG4		
Work item code:	⌘ PoC	Date:	⌘ 14/12/2004
Category:	⌘ B	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:	⌘ Presently there is no provision in the specification for Push-to-talk over Cellular (PoC)		
Summary of change:	⌘ PoC is referenced and an informative annex is added on how to use audio in the context of PoC.		
Consequences if not approved:	⌘ It is unclear how to implement PoC.		

Clauses affected:	⌘ 1, 2, 3.2, 6.2, Annex										
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;">X</td> <td style="text-align: center;"></td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">X</td> </tr> </table> Other core specifications Test specifications O&M Specifications	Y	N	X			X		X	⌘ 26.236	
Y	N										
X											
	X										
	X										
Other comments:	⌘										

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

FIRST CHANGE

1 Scope

The present document introduces the set of default codecs for packet switched conversational multimedia applications within 3GPP IP Multimedia Subsystem. Visual and sound communication are specifically addressed. The intended applications are assumed to require low-delay, real-time functionality.

The present document is applicable, but not limited, to [services such as PS video telephony and Push to talk over Cellular \(PoC\)](#).

The applicability of this specification to GERAN is FFS.

SECOND CHANGE

2 References

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

[43] 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.

[44] [3GPP TS 23.221: Architectural requirements](#)

THIRD CHANGE

3.2 Abbreviations

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

AMR	Adaptive MultiRate codec
AVC	Advanced Video Codec
DSR	Distributed Speech Recognition
IETF	Internet Engineering Task Force
IM Subsystem	Internet protocol Multimedia Subsystem
ITU-T	International Telecommunications Union-Telecommunications
PoC	Push to talk over Cellular
RFC	IETF Request For Comments
RTCP	RTP Control Protocol
RTP	Real-time Transport Protocol
SDP	Session Description Protocol
SES	Speech Enabled Services
SIP	Session Initiated Protocol

FOURTH CHANGE

6.1 Audio

3G PS multimedia terminals offering audio communication ([including PoC services](#)) shall support AMR narrowband speech codec [9], [10], [11] to [12].

The AMR wideband speech codec shall be supported when the 3G PS multimedia terminal supports wideband speech working at 16 kHz sampling frequency [16], [17], [39], [40].

The usage of telephone-event media format is recommended for DTMF.

[Annex E provides guidelines for using audio in the context of PoC services.](#)

FIFTH CHANGE

Annex E (informative): Push-to-Talk over cellular (PoC)

For PoC the audio codecs specified in section 6.1, namely AMR or AMR-WB are applicable~~shall be used~~. Speech codec bit rates and transport formats settings have to be selected considering the available transmission bandwidth and the allowable transport delay. In order not to introduce undue delay of more than 200 ms for RTP packetization, it is recommended to limit the number of speech codec frames per packet to 10 and not to use interleaving.

Under the assumption of RTP packetization according to [35] using octet-aligned mode, no interleaving and using 10 frames per RTP packet and depending on the IP version in IMS, the following tables show the required bandwidth for the available AMR and AMR-WB speech codec modes. Bandwidth restrictions may imply that only the lowest AMR/AMR-WB modes can be used for PoC. In order to maximize speech quality, it is recommended to use the respective highest possible bit rate.

Table 1: Required bandwidth for PoC using AMR

<u>AMR Mode</u>	<u>Required bandwidth when IPv4 is used [bits/s] [Note]</u>	<u>Required bandwidth when IPv6 is used [bits/s]</u>
<u>AMR 4.75</u>	<u>6840</u>	<u>7640</u>
<u>AMR 5.15</u>	<u>7240</u>	<u>8040</u>
<u>AMR 5.9</u>	<u>8040</u>	<u>8840</u>
<u>AMR 6.7</u>	<u>8840</u>	<u>9640</u>
<u>AMR 7.4</u>	<u>9640</u>	<u>10440</u>
<u>AMR 7.95</u>	<u>10040</u>	<u>10840</u>
<u>AMR 10.2</u>	<u>12440</u>	<u>13240</u>
<u>AMR 12.2</u>	<u>14440</u>	<u>15240</u>
<u>Note:</u>	<u>For the usage of IP version in IMS see TS 23.221 [44], subclause 5.1.</u>	

Table 2: Required bandwidth for PoC using AMR-WB

<u>AMR-WB Mode</u>	<u>Required bandwidth when IPv4 is used [bits/s] [Note]</u>	<u>Required bandwidth when IPv6 is used [bits/s]</u>
<u>AMR-WB 6.60</u>	<u>8840</u>	<u>9640</u>
<u>AMR-WB 8.85</u>	<u>11240</u>	<u>12040</u>
<u>AMR-WB 12.65</u>	<u>14840</u>	<u>15640</u>
<u>AMR-WB 14.25</u>	<u>16440</u>	<u>17240</u>
<u>AMR-WB 15.85</u>	<u>18040</u>	<u>18840</u>
<u>AMR-WB 18.25</u>	<u>20440</u>	<u>21240</u>
<u>AMR-WB 19.85</u>	<u>22040</u>	<u>22840</u>
<u>AMR-WB 23.05</u>	<u>25240</u>	<u>26040</u>
<u>AMR-WB 23.85</u>	<u>26040</u>	<u>26840</u>
<u>Note:</u> For the usage of IP version in IMS see TS 23.221 [44], subclause 5.1.		

Annex ~~E~~F (informative):
Change history

END OF CHANGES

CHANGE REQUEST

26.236 CR 013 rev **1** Current version: **6.0.0**

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Reason for change:	Presently there is no provision in the specification for Push-to-talk over Cellular (PoC)		
Summary of change:	RTP session description parameters for audio in PoC are specified. Note that it is still possible to specify Octet Aligned Operation for PoC in Rel-6 if required.		
Consequences if not approved:	The change is required to make PoC work.		

Clauses affected:	2, 4, 5.1										
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;">X</td> <td style="text-align: center;"></td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">X</td> </tr> </table> Other core specifications Test specifications O&M Specifications	Y	N	X			X		X		26.235
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X											
	X										
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FIRST CHANGE

2 References

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- [29] 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.

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

- [30] [Open Mobile Alliance: PoC User Plane Version 1, Draft Version 1.0.10 Nov 2004, OMA-UP-PoC-V1_0_10-20041103-D.](#)

SECOND CHANGE

4 General

3G PS multimedia terminals provide real-time video, audio, SES or data, in any combination, including none, over 3GPP IM Subsystem. Terminals are based on IETF defined multimedia protocols SIP, SDP, RTP and RTCP. Communication may be either 1-way or 2-way. Such terminals may be part of a portable device or integrated into an automobile or other non-fixed location device. They may also be fixed, stand-alone devices; for example, a video telephone or kiosk. Multimedia terminals may also be integrated into PCs and workstations.

In the case of SES then uplink communication is from the terminal to a server containing speech recognition.

[The transmission and reception of audio in Push-to-Talk over Cellular \(PoC\) communication is controlled by a RTCP APP conveyed Talk Burst Control Protocol defined in OMA PoC User Plane Version 1 \[30\].](#)

In addition, interoperation with other types of multimedia telephone terminals, such as 3G-324M may be possible, however in such case a media gateway functionality supporting 3G-324M - IM Subsystem interworking will be required within or outside the IM subsystem.

THIRD CHANGE

5.1 Audio

5.1.1 RTP session description parameters

The IETF AMR and AMR-WB RTP payload format [19] offers different options. Here is the list of options and how they should be used by the transmitter. The receiver shall at least support the options as they are listed ([For PoC please see below](#)):

- the bandwidth efficient operation shall be used,
- only one speech frame shall be encapsulated in each RTP packet,

- the multi-channel session shall not be used,
- interleaving shall not be used,
- internal CRC shall not be used.

For PoC services less restrictive IETF AMR and AMR-WB RTP payload format [19] options apply:

- the multi-channel session shall not be used,
- internal CRC shall not be used,
- ~~octet aligned operation shall be used,~~
- the number of speech frames encapsulated in each RTP packet should not exceed ~~1020,~~
- interleaving should not be used.
- The total packetization delay (including any interleaving delay) shall not exceed 500-~~(TBD)~~ms.

END OF CHANGES