

Technical Specification Group Services and System Aspects
Meeting #25, Palm Springs, USA
13-16 September 2004

TSGS#23(04)0654

Source: TSG-SA WG4

Title: CR TS 26.244 on Additional Release 6 update to 3GP file format (Release 6)

Document for: Approval

Agenda Item: 7.4.3

The following CR, agreed at the TSG-SA WG4 meeting #32, is presented to TSG SA #25 for approval.

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.244	003		Rel-6	Additional Release 6 update to 3GP file format	B	6.0.0	S4	TSG-SA WG4#32	S4-040507

CHANGE REQUEST

⌘ **26.244 CR 003** ⌘ rev **-** ⌘ 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 Radio Access Network Core Network

Title:	⌘ Additional Release-6 updates to the 3GP file format		
Source:	⌘ TSG SA WG4		
Work item code:	⌘ PSSrel6-Stage3	Date:	⌘ 14/09/2004
Category:	⌘ B	Release:	⌘ Rel-6
	<i>Use <u>one</u> of the following categories:</i> 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 .		<i>Use <u>one</u> of the following releases:</i> 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:	⌘ Update of Release-6 functionality		
Summary of change:	⌘ The following updates have been implemented: <ul style="list-style-type: none"> • Fragmented files allowed • Server extensions for PSS rate adaptation included. • Reference to MIME type for 3GP files included • References updated • Additional SDP attributes (reflecting updates by PSS) included. 		
Consequences if not approved:	⌘ Release-6 will not contain the new features added above and will not reflect the capabilities of PSS (TS 26.234).		

Clauses affected:	⌘ 2, 5.2.1, 5.3.3, 5.4.3, 5.5, 7.1, 7.5.2, 7.7										
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;">Y</td> <td style="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	⌘ CR 26.234 070	
Y	N										
X											
	X										
	X										
Other comments:	⌘										

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] 3GPP TS 22.233: "Transparent End-to-End Packet-switched Streaming Service; Stage 1".
- [2] 3GPP TS 26.233: "Transparent end-to-end packet switched streaming service (PSS); General description".
- [3] 3GPP TS 26.234: "Transparent end-to-end packet switched streaming service (PSS); Protocols and codecs".
- [4] 3GPP TS 26.245: "Transparent end-to-end packet switched streaming service (PSS); Timed text format".
- [5] 3GPP TS 26.246: "Transparent end-to-end packet switched streaming service (PSS); 3GPP SMIL Language Profile".
- [6] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [7] ISO/IEC 14496-12:2003 | 15444-12:2003: "Information technology – Coding of audio-visual objects – Part 12: ISO base media file format" | "Information technology – JPEG 2000 image coding system – Part 12: ISO base media file format".
- [8] 3GPP TS 26.140: "Multimedia Messaging Service (MMS); Media formats and codecs".
- [9] ITU-T Recommendation H.263 (1998): "Video coding for low bit rate communication".
- [10] ISO/IEC 14496-2:2001: "Information technology – Coding of audio-visual objects – Part 2: Visual".
- [11] 3GPP TS 26.071: "Mandatory Speech CODEC speech processing functions; AMR Speech CODEC; General description".
- [12] 3GPP TS 26.171: "AMR Wideband Speech Codec; General Description".
- [13] ISO/IEC 14496-3:2001: "Information technology – Coding of audio-visual objects – Part 3: Audio".
- [14] ISO/IEC 14496-14:2003: "Information technology – Coding of audio-visual objects – Part 14: MP4 file format".
- [15] IETF RFC 3267: "Real-Time Transport Protocol (RTP) Payload Format and File Storage Format for the Adaptive Multi-Rate (AMR) Adaptive Multi-Rate Wideband (AMR-WB) Audio Codecs", Sjöberg J. et al., June 2002.
- [16] 3GPP TS 26.101: "Mandatory Speech Codec speech processing functions; Adaptive Multi-Rate (AMR) speech codec frame structure".
- [17] 3GPP TS 26.201: "Speech Codec speech processing functions; AMR Wideband Speech Codec; Frame Structure".
- [18] ITU-T Recommendation H.263 – Annex X (2001): "Annex X: Profiles and levels definition".

- [19] IETF RFC 3711: "The Secure Real-time Transport Protocol", Baugher M. et al., ~~Feb~~[March](#) 2004.
- [20] ISO/IEC 14496-15:[2004](#): "Information technology – Coding of audio-visual objects – Part 15: Advanced Video Coding (AVC) file format".
- [\[21\] IETF RFC 3839: "MIME Type Registrations for 3rd Generation Partnership Project \(3GPP\) Multimedia files", Castagno R. and Singer D., July 2004.](#)
- [\[22\] IETF Internet Draft: "RTP Payload Format for 3GPP Timed Text", Rey J. and Matsui Y., <http://www.ietf.org/internet-drafts/draft-ietf-avt-rtp-3gpp-timed-text-04.txt>, July 2004.](#)

5.2.1 Limitations to the ISO base media file format

The following limitations to the ISO base media file format [7] shall apply to a 3GP file:

- compact sample sizes ('stz2') shall not be used.
- ~~— movie fragments shall not be used.~~

5.3.3 MIME types

The MIME types 'video/3gpp' (for visual or audio/visual content, where visual includes both video and timed text) and 'audio/3gpp' (for purely audio content) ~~are expected to be registered and~~ [shall be used as defined in \[21\]](#).

5.4.3 Basic profile

The 3GP Basic profile is branded '3gp6' and is used in MMS and PSS. Conformance to this profile will guarantee the 3GPP file format to be used internally within the MMS service, as well as PSS to interwork with MMS.

The following constraints shall apply to a 3GP file conforming to Basic profile:

- there shall be no references to external media outside the file, i.e. a file shall be self-contained;
- the maximum number of tracks shall be one for video, one for audio and one for text;
- the maximum number of sample entries shall be one per track for video and audio (but unrestricted for text).

NOTE 1: The Basic profile of 3GP in Release 6 corresponds to 3GP files of earlier releases, which did not define profiles. Files with brands '3gp4' and '3gp5' in Release 4 and 5, respectively, correspond to files with brand '3gp6' in Release 6.

NOTE 2: In order to maintain backward compatibility with Release 4 and Release 5, it is not recommended to use movie fragments in 3GP files for MMS.

5.5 File-branding guidelines

The file-type brands defined in this specification are used to label 3GP files belonging to Release 6 and conforming to one or more profiles. 3GP files may also conform to earlier Releases or even to other file formats, such as MP4, which is also derived from the ISO base media file format [7].

Table 5.1 contains a non-exhaustive list of examples with 3GP files for various purposes. All 3GP files of Release 5 or later shall contain the compatible brand 'isom' indicating that they conform to the ISO base media file format. The major brand shall be included in the compatible brands list as well. If a file contains more than one (3GPP) brand in the compatible brands list, the major brand indicates the "best use" of the file. For example, a Release-5 file with audio combined with Timed text is best played by a Release-5 player, but may also be played by a Release-4 player that does not support timed text.

NOTE 1: Since movie fragments are not allowed in Release 4 and Release 5, a fragmented 3GP file should not contain '3gp4' or '3gp5' as brand or compatible brand. A player that does not support movie fragments will only be able to play the first fragment of a fragmented file.

Table 5.1: Examples of brand usage in 3GP files

Conformance	Suffix	Brand	Compatible brands	Example content
MMS and download: Files shall contain one or more of the brands 3gp4, 3gp5 and 3gp6. It is good practice to include compatible brands of earlier releases to enable legacy players to play the files.				
Release 4	.3gp	3gp4	3gp4	H.263 and AMR
Release 5, 4	.3gp	3gp5	3gp5, 3gp4, isom	H.263 and AMR
Release 6, 5, 4	.3gp	3gp6	3gp6, 3gp5, 3gp4, isom	H.263 and AMR
Release 6, 5, 4	.3gp	3gp6	3gp6, 3gp5, 3gp4, isom	H.263, AMR and Timed text
Release 6, 5	.3gp	3gp6	3gp6, 3gp5, isom	Timed text
Release 6	.3gp	3gp6	3gp6, isom	Some Release-6 specific codec TBD
Release 6	.3gp	3gp6	3gp6, isom	fragmented H.263 and AMR
Progressive download and MMS				
Release 6, 5, 4	.3gp	3gr6	3gr6, 3gp6, 3gp5, 3gp4, isom	H.263
Release 6, 5, 4	.3gp	3gr6	3gr6, 3gp6, 3gp5, 3gp4, isom	interleaved H.263 and AMR
Release 6	.3gp	3gr6	3gr6, 3gp6, isom	fragmented and interleaved H.263 and AMR
Streaming servers: Some files may in principle also be used for MMS or download.				
Release 6	.3gp	3gs6	3gs6, isom	AMR and hint track
Release 6	.3gp	3gs6	3gs6, isom	2 tracks H.263 and 2 hint tracks
Release 6, 5, 4	.3gp	3gs6	3gs6, 3gp6, 3gp5, 3gp4, isom	H.263, AMR and hint tracks
General purpose: Files that are not yet suitable for MMS, download or PSS streaming servers.				
Release 6	.3gp	3gg6	3gg6, isom	4 tracks H.263 (and no hint tracks)
Release 6	.3gp	3gg6	3gg6, isom	2 tracks H.263, 3 tracks AMR
3GP file, also conforming to MP4				
Release 4, 5 and MP4	.3gp	3gp5	3gp5, 3gp4, mp42, isom	MPEG-4 video
MP4 file, also conforming to 3GP				
Release 5 and MP4	.mp4	mp42	mp42, 3gp5, isom	MPEG-4 video and AAC

7.1 General

This clause defines extensions to 3GP files to be used by streaming servers. The extensions enable a PSS server to relate different tracks and use them for selection and adaptation. In particular, they enable a PSS server to

- generate SDP descriptions with alternatives, as specified in subclauses 5.3.3.3 - 5.3.3.4 of [3];
- select and combine tracks with alternative encodings of media before a presentation;
- switch between tracks with alternative encodings during a streaming session;
- [determine the decoding order, playout timestamp, and size for any ADU in an RTP payload.](#)

[In addition, the streaming servers extensions enable a PSS server to](#)

- [use SRTP hint tracks for integrity protection.](#)

The streaming-server extensions are intended to be used with hint tracks, although they are not limited to be used with hint tracks. Hint tracks are defined in the ISO base media file format [7] and provide (RTP) packetization instructions for media stored in a file.

NOTE: The present document defines syntax and semantics for streaming-server extensions in 3GP files. It does not define protocols for, e.g., how a PSS server signals alternative encodings or switches between different bitrate encodings. All protocols used by a PSS server are defined in [3].

7.5.2 Stored versus generated SDP fields

The SDP information stored in a 3GP file should be as complete as possible, although some fields must be generated or modified by the server when a presentation is composed. Table 7.3 gives an overview of the SDP fields used by PSS, c.f. Table A.1 in [3], and whether they are required to be included in 3GP files or whether the server is required to generate them.

Table 7.3: Overview of stored and generated fields in SDP

Type	Description		Contained in 3GP file	Generated by PSS server
Session Description				
V	Protocol version		R	O
O	Owner/creator and session identifier		O	R
S	Session Name		R	O
I	Session information		O	O
U	URI of description		O	O
E	Email address		O	O
P	Phone number		O	O
C	Connection Information		O	R
B	Bandwidth information	AS	O	O
		RS	O	O
		RR	O	O
One or more Time Descriptions (See below)				
Z	Time zone adjustments		O	O
K	Encryption key		O	O
A	Session attributes	control	O	R
		range	R	O
		alt-group	R (see note 4)	O
		QoE-Metrics	O	O
		3GPP-Asset-Information	O	O
		3GPP-Integrity-Key	N	R (see note 6)
		3GPP-SDP-Auth	N	R (see note 6)
One or more Media Descriptions (See below)				
Time Description				
T	Time the session is active		R	O
R	Repeat times		O	O
Media Description				
M	Media name and transport address		R	O
I	Media title		O	O
C	Connection information		O	R
B	Bandwidth information	AS	R	O
		RS	O	R
		RR	O	R
K	Encryption Key		O	O
A	Attribute Lines	control	O	R
		range	R	O
		fntp	R	O
		rtpmap	R	O
		X-predecbufsize	R (see note 5)	O
		X-initpredecbufperiod	R (see note 5)	O
		X-initpostdecbufperiod	R (see note 5)	O
		X-decbyterate	R (see note 5)	O
		framesize	R	O
		alt	N	R
		alt-default-id	N	R
		3GPP-Adaptation-Support	N	O
		QoE-Metrics	O	O
		3GPP-Asset-Information	O	O
		3GPP-SRTP-Config	N	R (see note 6)
rtcp-fb	N	R		

Note 1: Fields in 3GP files are Required (R), Optional (O), or Not allowed (N).

Note 2: Servers are Required (R) to generate (possibly by copying or modifying from file), or have the Option (O) to generate/copy/modify, or are Not allowed (N) to modify fields. If a field is present in a file, it shall be copied or modified, but not omitted, by the server.

Note 3: Some types shall only be included under certain conditions, as specified by PSS [3].

Note 4: The "alt-group" attribute is required to be stored in 3GP files if it is used.

Note 5: The "X-" attributes are required to be stored in 3GP files if they are used. They may either be specified in the PSS Annex G box '3gag' (see Clause 9) or in media-level SDP fragments.

Note 6: The server is required to generate the "3GPP-Integrity-Key", "3GPP-SDP-Auth", and "3GPP-SRTP-Config" attributes if integrity protection is used.

7.7 Aggregated RTP payloads

An application data unit (ADU), normally being the smallest independently usable data unit, is specified as follows for coding formats and RTP payload formats allowed in 3GP files:

- For audio and speech, an ADU is specified as a coded frame intended for transport.
- For H.263 an ADU consists of an entire RTP payload.
- For MPEG-4 Visual an ADU consists of a complete or partial VOP in the RTP payload.
- For H.264 (AVC), an ADU is a Network Adaptation Layer Unit (NALU).
- For timed text, an ADU consists of any of the type 1-5 RTP payload units [22].

For encrypted RTP payloads, the actual ADUs are hidden within the encrypted payload. Some RTP payload formats allow aggregation of multiple ADUs into a single RTP payload. When any hint sample in an RTP hint track defines a payload including multiple ADUs, each hint sample in the hint track shall comply with the following requirements:

- The extra-flag in the RTPpacket class of the hint sample shall be set to 1. This indicates that there is extra information before the RTP constructors in the form of type-length-value sets.
- The extra information in the hint sample shall include a '3gau' structure as specified below.

```
class 3gppApplicationDataUnitInfoTLV extends Box('3gau') {
    unsigned int(16) entrycount;
    for(i=1; i<=entrycount; i++){
        unsigned int(32) numbytes;
        unsigned int(64) decorder;
        unsigned int(32) timestampoffset
    }
}
```

entrycount indicates the number of ADUs in the RTP payload.

numbytes indicates the number of bytes of the i'th ADU in the RTP payload.

decorder indicates the decoding order of ADUs within the RTP hint track. The smaller value of decorder, the earlier the ADU is in decoding order. All ADUs shall have a unique value of decorder, and the assignment shall be done using

consecutive numbers. If two or more ADUs can be decoded virtually simultaneously, i.e. their relative decoding order is undefined, they shall still be assigned consecutive numbers.

timestampoffset indicates the RTP timestamp offset of the i'th ADU relative to the timestamp of RTP header of the packet it will be transmitted in. Where the ADU's timestamp value is equal to what it would have had if it were transmitted in an RTP packet containing only the ADU.