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This draft is being discussed by the Electronic Messaging Association VPIM work group. To subscribe to the mailing list, send a message to EMA Listserv Requests [listserv@listmail.ema.org] with the line "subscribe VPIM-L" in the body of the message.
Abstract

This document describes the registration of the MIME sub-type audio/ms-gsm for toll quality audio. This audio encoding is defined by the European Telecommunications Standards Institute (ETSI) in ETS 300 961.

1. Introduction

The MIME subtype "ms-gsm" is being defined primarily for use in multimedia and voice messaging standards. The Voice Profile for Internet Messaging, version 3 [VPIM3] working draft specifies that all VPIM version 3 compliant implementations MAY generate audio/ms-gsm bodyparts and MUST receive audio/ms-gsm bodyparts.

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [REQ].

2. ETSI Definition

ETS 300 961 (GSM 06.10 version 5.1.1) [GSM] was prepared by European Telecommunications Standards Institute (ETSI) in May 1998. It is a reproduction of recommendation T/L/03/11 "13kbit/s Regular Pulse Excitation – Long Term Prediction – Linear Predictive Coder for use in the digital cellular telecommunications system."

ETS 300 961 describes the detailed mapping between input blocks of 160 speech samples in 13 bit uniform PCM format to encoded blocks of 260 bits, and from encoded blocks of 260 bits to output blocks of 160 reconstructed speech samples. The sampling rate is 8000 sample/s leading to an average bit rate for the encoded bit stream of 13 kbit/s. The coding scheme is the so-called Regular Pulse Excitation – Long Term prediction – Linear Predictive Coder, here-after referred to as RPE-LTP.

2.1 Parameter storage

ETS 300 961 provides a detailed description of the mapping of blocks of 160 speech samples in 13 bit uniform PCM format to 76 encoder parameters, and the mapping from those encoder parameters back to 160 reconstructed speech samples. The 76 encoder parameters vary in width from 2 to 7 bits, so they all fit in 260 bits.

ETS 300 961 does not define the correct way to store these 76 parameters in a computer file, however. To promote interoperability, this document describes the MS-GSM version of GSM 06.10 which is to be used to encode audio/ms-gsm data.
Audio/ms-gsm implementations MUST pack two sets of encoder output parameters into 65 bytes and MUST right justify the parameters in a byte. Since each set of encoder output parameters occupies 32.5 bytes, the two sets will be offset by a nibble (4 bits).

In this illustration, as in ETS 300 961, arrays are 1-based and the least significant bit is numbered 1. The first eight encoder parameters are named LAR1 through LAR8, and they vary from 6 to 3 bits in width. The notation LAR1[6-3] indicates the 4 high order bits of LAR1, and LAR5[2-1] indicates the 2 low-order bits of LAR5. The remaining 68 parameters are packed similarly.

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<tr>
<th>MSB</th>
<th>LSB</th>
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<tbody>
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<td>Bit 8</td>
<td>Bit 7</td>
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<td>Bit 6</td>
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<tr>
<td>LAR2[2-1]</td>
<td>LAR1[6-1]</td>
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<tr>
<td>LAR3[4-1]</td>
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<tr>
<td>LAR5[2-1]</td>
<td>LAR4[5-1]</td>
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<td>LAR3[5]</td>
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<td>LAR7[2-1]</td>
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3. MIME Definition

3.1 audio/ms-gsm

European Telecommunications Standards Institute (ETSI) ETS 300 961 [GSM] describes the algorithm recommended for conversion of blocks of 160 speech samples in 13 bit uniform PCM format to encoded blocks of 260 bits, and the mapping back from those 260 bit blocks to output blocks of 160 reconstructed speech samples.

The MIME sub-type audio/ms-gsm is defined to hold binary audio data encoded exactly as defined by ETS 300 961 (GSM 06.10) No header information shall be included as part of the audio data. The content transfer encoding is typically either binary or base64.

To enable interoperability, the audio data MUST conform to the parameter storage definition provided in the section above and in the IANA registration below.
3.2 VPIM Usage

The audio/ms-gsm sub-type is a component of the proposed VPIM version 3 specification [VPIM3]. In this context, the Content-Description headers is used to succinctly describe the contents of the audio body.

All VPIM Version 3 systems MUST be capable of receiving audio encoded in the MS-GSM version of GSM 06.10. Sending systems MAY choose to send audio data encoded in MS-GSM. All receiving systems MUST be able to process MS-GSM audio data.

Refer to the VPIM Specification for proper usage.

4. IANA Registration

To: ietf-types@iana.org
Subject: Registration of MIME media type audio/ms-gsm

MIME media type name: audio
MIME subtype name: ms-gsm
Required parameters: none
Optional parameters: none

Encoding considerations:
   Binary or Base-64 generally preferred

Security considerations:
   There are no known security risks with the sending or playing of raw audio data. Audio data is typically interpreted only by an audio codec. Unintended information introduced into the data stream will result in noise.

Interoperability considerations:
   MS-GSM is not compatible with other GSM 06.10 implementations. To be interoperable, Audio/ms-gsm implementations MUST pack two encoder parameter blocks into 65 bytes and MUST right justify the parameters in a byte.
In this illustration, as in ETS 300 961, arrays are 1-based and the least significant bit is numbered 1. The first 8 encoder parameters are named LAR1 through LAR8, and they vary from 6 to 3 bits in width. The notation LAR1[6-3] indicates the 4 high order bits of LAR1, and LAR5[2-1] indicates the 2 low-order bits of LAR5. The remaining 68 parameters are packed similarly.

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Published specification:
ETS 300 961 (May 1998), "Digital cellular telecommunications system (Phase 2+); Full rate speech; Transcoding (GSM 06.10 version 5.1.1)".

Applications which use this media type:
Voice messaging applications

Additional information:
Magic number(s): ?
File extension(s): .gsm
Macintosh File Type Code(s): ‘gsm’

Person & email address to contact for further information:
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Greg Baribault
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Intended usage: COMMON

Author/Change controller:
Laile L. Di Silvestro
Greg Baribault
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6. References

[GSM]  ETS 300 961 (May 1998), "Digital cellular telecommunications system (Phase 2+); Full rate speech; Transcoding (GSM 06.10 version 5.1.1)".


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