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Interoperability of the "audio/mpa-robust" RTP Payload Format
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Abstract

In order for the "audio/mpa-robust" RTP payload format specification to advance from Proposed Standard to Draft Standard, it is required to demonstrate interoperability for all functionality described by the specification. This document describes the interoperability shown between different implementations of this specification.

1. Introduction

The "audio/mpa-robust" RTP payload format for MP3 audio is described in [RFC 3119](#) [[3119](#)] (and updated in [[3119BIS](#)] to correct typographical errors). This payload format is an alternative to the format described in [RFC 2250](#) [[2250](#)], and performs better if there is packet loss.

This RTP payload format specification is currently at Proposed Standard. In order to advance to Draft Standard, the Internet standards process [[2026](#)] requires "at least two independent and interoperable implementations from different code bases," and that interoperability be shown for "all of the options and features of the specification." This document describes the interoperability

shown between three independent implementations:

- 1/ "LIVE.COM Streaming Media" project's "testMP3Streamer" application [[LIVEMEDIA](#)].
- 2/ RealNetworks' "RealPlayer 9" media player [[REAL](#)].
- 3/ The "MPEG4IP" project's "mp4player" media player [[MPEG4IP](#)].
(Despite its name, this player plays MP3 audio in addition to MPEG-4 formats.)

2. Features Tested for Interoperability

RTP payloads conforming to this specification can vary in the following ways:

1/ Descriptor size.

As specified by the "T" (descriptor type) flag in each ADU descriptor, the descriptor size can be either 1 byte (for ADU frame sizes < 64), or 2 bytes.

2/ Fragmentation.

If an "ADU frame" is too large to fit within a RTP packet, it is fragmented across more than one RTP packet (each beginning with an ADU descriptor. The fragmentation is indicated by the "C" (continuation) flag in each ADU descriptor.

3/ Interleaving.

The high-order 11 bits of each MPEG header ('syncword') can either remain at 0xFFE - which indicates that no ADU frame interleaving is performed - or it can consist of an "Interleaving Sequence Number" - which indicates that ADU frames are rearranged in an interleaving pattern.

As described in the next section, we demonstrated interoperability by testing each combination of these three variables.

3. Test Results

The results of the interoperability tests are shown in the table below. In each case, the LIVE.COM "testMP3Streamer" application was used as the transmitter, and one (or both) of the "RealPlayer 9" and MPEG4IP "mp4player" applications was used as the receiver.

Stream Features			Receiver	
descriptor size	fragmentation?	interleaving?	Real	mp4player
1 byte	no	no	Yes	Yes
1 byte	no	yes	Yes	Yes
1 byte	yes	no	No	Yes
1 byte	yes	yes	No	Yes

	2 bytes		no		no		Yes		Yes	
	2 bytes		no		yes		Yes		Yes	
	2 bytes		yes		no		No		Yes	
	2 bytes		yes		yes		No		Yes	
+-----+-----+-----++-----+-----+										

Note: As noted in the table, "RealPlayer 9" was unable to handle fragmented ADU frames. However, because "mp4player" was able to play fragmented frames from the LIVE.COM "testMP3Streamer" application, this is sufficient to demonstrate interoperability of this feature between two independent implementations.

4. Security Considerations

Not applicable.

5. Normative References

- [3119] Finlayson, R., "A More Loss-Tolerant RTP Payload Format for MP3 Audio," [RFC 3119](#), June 2001.
- [2026] Bradner, S., "The Internet Standards Process -- Revision 3," [RFC 2026](#), October 1996.

6. Informative References

- [3119BIS] Finlayson, R., "A More Loss-Tolerant RTP Payload Format for MP3 Audio," [draft-ietf-avt-rfc3119bis-02.txt](#), Work in progress, February 2004.
- [2250] Hoffman, D., Fernando, G., Goyal, V. and M. Civanlar, "RTP Payload Format for MPEG1/MPEG2 Video", [RFC 2250](#), January 1998.
- [LIVEMEDIA] "LIVE.COM Streaming Media," Live Networks, Inc., <<http://www.live.com/liveMedia/>>.
- [REAL] RealNetworks, Inc., <<http://www.real.com/>>.
- [MPEG4IP] The "MPEG4IP Open Streaming Video and Audio" project, <<http://mpeg4ip.sourceforge.net/>>.

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