RTP Payload Format for MPEG2-TS Preamble

draft-begen-avt-rtp-mpeg2ts-preamble-01

IETF 75 – July 2009

Ali C. Begen and Eric Friedrich
{abegen, efriedri}@cisco.com
Introduction

- MPEG2 Transport Stream (MPEG2-TS)
  - Encapsulates digital video and audio content together with metadata
  - Produces a synchronized multiplexed stream for transport

- A decoder needs “MPEG2-TS Preamble” to process and decode an incoming MPEG2-TS
  - This information resides in the transport stream but it is here and there, and not readily available

- This document defines a new RTP payload format to carry the MPEG2-TS Preamble
  - This is NOT something RFC 2250 did

- In the RAMS context, the Preamble information allows the RTP receiver to start processing/decoding the MPEG2-TS faster
Transport Stream Random Access Points (TSRAP) may include:
- **PAT**: Program Association Table
- **PMT**: Program Map Table
- **PCR**: Program Clock Reference used to initialize the decoder and STB clocks
- **SEQ**: Sequence Header (MPEG2 stream)
- **SPS**: Sequence Parameter Set (H.264 stream)
- **PPS**: Picture Parameter Set (H.264 stream)
- **ECM**: Entitlement Control Messages
RTP Header

- **M bit**: When set, it indicates the last packet carrying the Preamble information.
- **PT**: Dynamic.
- **Sequence number**: One higher for each subsequent packet.
- **Timestamp**: Set to the time corresponding to the transmission time (TBD).
- **SSRC**: It MUST be equal to the SSRC of the retransmission session when the Preamble packets are (payload-type) multiplexed with the retransmission packets. Otherwise, it is randomly assigned per RFC 3550.
RTP Payload

- Vendor-Neutral Extensions
  
  These extend the report block in a vendor-neutral manner
  
  Registry will be maintained by IANA (Specification Required)

- Private Extensions
  
  These MUST NOT collide with each other
  
  A certain range of TLV Types ([32768-65535]) is reserved for private extensions
Vendor-Neutral Extensions

- We have defined the following TLVs so far:
  - PAT TLV
  - PMT TLV
  - PCR TLV
  - PID_LIST TLV
  - SEQ TLV
  - SPS TLV
  - PPS TLV
  - SEI TLV
  - ECM TLV
  - EMM TLV
  - CAT TLV
  - PTS TLV

- Some of these TLVs may contain variable-length data
- Some of these TLVs apply to only MPEG2 video, while some apply to only AVC (H.264) video
Post-Processing of the Preamble

- RTP packet(s) carrying the Preamble cannot be fed directly to the MPEG transport demux and decoder.
- The TLVs need to be transformed into TS packets, and these need to form a demux/decoder-friendly stream.
- The stream MUST pass the TS packets to the demux in this order:
  - PAT
  - PMT
  - PCR
  - EMM
  - ECM
  - {Elementary Stream Data}
Open Issues

- Should we also define an RTCP message that can carry the TLVs defined in this draft?

  This way, the Preamble information can be sent as part of the RAMS-I message
Next Steps

- WG adoption?