RTP Payload Format for SVC Video – draft-ietf-avt-rtp-svc-15

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What has happened since last IETF

- Co-authors worked on the draft and had different editing meetings
- 2 new versions, draft is becoming stable
- We got feedback from David Singer and Peter Amon, which we incorporated
- Changes in the draft summarized on next slides

What is new - General

- Improved abstract and introduction
- New packet types via sub-types
- Signaling section completed
- Now referencing RFC3984-bis

Changes from version 13 - New Packet Types

- NI-MTAP consumed last free packet type
- Extension packet type: 31
  - For SVC and future extensions
  - 1 byte NAL header + 1 byte subtype signaling:

    5 bit sub-type and 3 bit flags
- Reserved: sub-type = 0
- NI-MTAP: sub-type = 1

  (non-interleaved multi-time aggregation packet)
- Empty NAL Unit: sub-type = 2

  (For data alignment in multi-session transport)

Changes from version 13

- Clarified usage of new NAL unit packets and usage of corresponding RTP header for Empty NAL unit and Non-Interleaved Aggregation Packet (NI-MTAP)

- Added tables on usage of packet types with respect to use of Single Session Transmission (SST) or Multi Session Transmission (MST) and packetization-mode

- Clarified PACSI usage in NI-MTAP

- Informative note for timestamp alignment with reference to informational draft: draft-schierl-avt-rtp-multi-session-transmission-00

Changes from version 13 - Signaling

- Completed signaling section
- Inline with RFC3984-bis
- Negotiation for offer/answer:
  - New sprop-operation-point-info parameter
    - Scalability SEI in plain
    - Usage of scalable-layer-id for operation point selection
  - level downgrade, only for whole stream as by RFC3984-bis (see next presentation)
  - mst-mode is used symmetrically for send and recv

Changes from version 13 - Signaling

New SDP parameters:

- sprop-operation-point-info:
  - Describes one or more operation points contained in a session: framerate, bitrate, frame-size, profile-level-idc, for association to bitstream: layer-id and TemporalID-DependencyID-QualtiyID.
  - If one operation point is described, this is the highest one in the session, if two: highest and lowest.
  - can be used as sprop-scalability-info in combination with scalable-layer-id
  - Does not allow for level-downgrading, level is given by default profile-level-id of the whole stream
  - obsoletes: sprop-layer-range, sprop-frame-size, …
  - too complicated: sprop-parameters-sets per operation point -> may use level-parameters-sets

Changes from version 13 - Signaling

- sprop-operation-point-info example

Offerer -> Answerer SDP message:

m=video 20000 RTP/AVP 97

a=rtpmap:97 H264-SVC/90000

a=fmtp:97 profile-level-id=53000c; packetization-mode=1;
sprop-operation-point-info=<1,2,0,1,4d400a,C80,B0,90,80,100>,
<2,3,1,0,53000c,1900,160,120,100,400>;scalable-layer-id=2;

Answerer -> Offerer SDP message:

m=video 40000 RTP/AVP 97

a=rtpmap:97 H264-SVC/90000

a=fmtp:97 profile-level-id=53000c; packetization-mode=1;
sprop-operation-point-info=<1,2,0,1,4d400a,C80,B0,90,80,100>,
<2,3,1,0,53000c,1900,160,120,100,400>;scalable-layer-id=1;

Changes from version 13 - Signaling (cont.)

New SDP parameters (cont.):

- sprop-no-NAL-reordering-required
  - If sessions are combined in session order, no reordering of NAL units is required
- sprop-avc-ready
  - Even though a session is announced as H264-SVC, it could be processed by a RFC3984 receiver. This is useful information for a MANE.
- sprop-mst-csdon-always-present
  - Indicates that a CSDON value is always present.
- sprop-level-parameter-sets, sprop-ssrc (RFC3984bis)
  - See next presentation

Changes from version 13 - Signaling (cont.)

Update of existing parameters:

- scalable-layer-id
- profile-level-id (RFC3984-bis)
- max-cpb (RFC3984-bis)
- sprop-parameter-sets (RFC3984-bis)
- packetization-mode (RFC3984-bis)

Changes from version 13 - Signaling (cont.)

Removed parameters:

- sprop-layer-range
- sprop-frame-size
- sprop-bit-rate
- sprop-frame-rate

Changes from version 13 - Signaling (cont.)

Signaling session dependencies for Multi Session Transmission:

- New text: In addition to I-D.ietf-mmusic-decoding-dependency, the signaled dependencies also reflect the decoding order.
  - Makes decoding order recovery process easier

Open Issues

- More SDP usage examples are needed. For declarative usage also?
- Rule on how scalable-layer-id is used in offer/answer. Additional review of scalable-layer-id operation point selection mechanism is needed, particular the rules for the different modes.
- sprop-ssrc may be unnecessary, depending on status of draft-lennox-avt-h264-source-fmtp-00.
- Section 7.4, parameter set considerations, needs to be updated.
- Section 11.4, videoconferencing description is missing

Next Steps

- Any volunteers for review?
- Timing of draft dependencies:
  - RFC3984bis ?
  - MMUSIC decoding dependency (AD Evalu.)
- Working Group Last Call with version 16: addressed open issues + integrating reviewer's feedback ?
- DVB (TS 102 005v1.4) depends on this document