RTP Payload Format for SVC Video – draft-ietf-avt-rtp-svc-03

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Status of SVC standardization

- Liaison statement sent to IETF on spec finalization
- Standard approved by ITU-T on 22-Nov-2007, approved text in JVT-X201, formal reference most likely will be

  Annex G of ITU-T recommendation H.264: 2008, Advanced video coding for generic audiovisual services (4th Edition)
- SVC includes the following new scalable profiles:
  - Scalable Baseline
  - Scalable High
  - Scalable High Intra
- Payload format (and layered signaling in MMUSIC) are now the missing links to make the technology accessible to second-tier SDOs (DVB, 3GPP, …)

-02: Changes

- Alignment with JVT final draft
- Changes to PACSI (*see also comments/open issues*):
    - TL0IDX and IDRIDX (new) are optional
    - Flags set is optional, to be used with above param.
    - Added optional CL-DON field
- Clarified packetization rules, among others to resolve "single NAL unit mode deprecation"
- Added semantics of the media type parameters inherited from RFC 3984, and added a couple of new parameters for negotiation (sprop-layer-id, sprop-parameter-layer-range) of operation points. (*see open issues*)

-02: Changes (cont.)

- Added the usages of the media type parameters, including SDP usage with offer/answer model, declarative usage, and examples.
- Updated the congestion control part according to Colin's comment.
- Checked the parameter set considerations and confirmed that the text in RFC 3984 is OK.
- Updated the security considerations part.
- Added justifications for some fields in the PACSI NAL units.

-02: Changes (cont.)

- Added following two processes to allow for layered multicast without requiring the interleaved packetization mode:
  - NAL unit order recovery process for layered multicast using CL-DON in the PACSI NAL unit, therefore extended sprop-parameters for DON to be used with H264-SVC
    (*see also comments/open issues*)
  - NAL unit order recovery process for layered multicast without using CL-DON
    (*This point has not been agreed by the authors, see: comments/open issues*)

NAL unit reordering w/ CL-DON

- By 1. CL-DON in PACSI (for packetization mode 1)
  2. extending the DON semantics already present to CL-DON semantics (for packetization mode 2)
- De-packetization process for multiple sessions same as for single session using mode 2
  - No need to perform de-packetization for each session separately beforehand
  - No need to discard received NAL units in some cases of packet loss
  - No need of dummy NAL units
  - Does not support packetization mode 0 for layered multicast

NAL unit reordering w/o CL-DON

- By • Timestamps (change according to Colin's comment)
  - RTP sequence #
  - Session dependency grouping
  - Can be used with any packetization mode
- Problem:
  - Out-of-order presentation Timestamps in video
- Idea:
  - Re-order according to matching timestamps in sessions, decoding order is given by RTP sequence #
  - Rely on knowledge, that there is always a NAL unit in a higher session, i.e. highest session gives order (insert dummy NAL units)
  - Follow the dependency grouping
  - For Temporal scalability: optimize dummy NAL units by MTAPs in higher sessions (non H264 Base Layer)

Mailing list traffic, a selective list

Comments received from Colin

- When sync. RTP sessions by RTP mechanism: If initial synchronization delay due to the RTCP timing rules is an issue, then it should be fixed in a payload format independent manner, not as part of SVC.
  Means find sync between sessions after RTCP media sync.
  Will rewrite text (§7) for non CL-DON mode. (see open issues)

Comment received from Roni

- Support for common RFC3984 modes (e.g. baseline level 1.2 is the same with H264 and H264-SVC):
  The same text as in RFC3984 is there.
  No action needed

Comments received from Jonathan Lennox:

- Confusion about extended sprop-parameters for CL-DON like sprop-deint-buf-req for H264-SVC:
  May define new parameters for CL-DON
  Needs clarification by AVT

Mailing list traffic, a selective list (cont.)

Comments received from Jonathan Lennox (cont.):

- Why is useful TL0PICIDX now optional, although differently decided by AVT before/during Prague meeting and why removing flags, although flag byte is anyway present?
  Previously these were optional in semantics
  Idea was to safe bits: because of additional IDRPICIDX and new CL-DON field
  Needs clarification by AVT
- Relax constraints on “non CL-DON” mode, especially 1-D constraint on session dependency
  Constraints should be relaxed
  If this process is supported
- “Non CL-DON” reordering spec. needs cleanup, process does not need normative text
  Authors have different positions
  If “non CL-DON” reordering is accepted by AVT, cleanup will follow

Mailing list traffic, a selective list (cont.)

Comments received from Thomas Wiegand:

- Remove CL-DON from spec, hence there is no justification for the additional mode:
  - packet.mode==0 in base layer (BL) does not work with CL-DON
  - packet.mode==2 in BL works with packet.mode==2 in higher sessions
  - remaining use-case: packet.mode==1 in BL, can be covered by “non CL-DON mode”

  Authors have different positions
  Needs clarification by AVT

Our to-do list

- Extend / add Offer/Answer examples
- Correct formatting in the draft
- Collect and report potential bugs found in RFC 3984
  - Start to draft 3984bis?

Open issue and question to WG

- How to proceed with non CL-DON mode?
- How to proceed with CL-DON mode?
- Redefining sprop- parameters for DON with H264-SVC ok, or new parameters?
- PACSI NAL unit parameters: TL0PICIDX, IDRPICIDX and flags to stay optional or move them back to mandatory (but optional in semantics)?
- Should the draft support SDP offer/answer using "sprop-scalability-information" and "sprop-layer-id"?