RTP PAYLOAD FORMAT FOR ISO/IEC 21122 (JPEG XS)

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RTP PAYLOAD FORMAT FOR JPEG XS

Short introduction

- RFC 9134 – RTP Payload Format for ISO/IEC 21122 (JPEG XS)
- Used in Broadcast and ProAV industry
  - SMPTE ST 2110-22: Professional Media Over Managed IP Networks – Constant Bit-Rate Compressed Video
  - AMWA BCP-006-01: NMOS With JPEG XS
  - VSF TR-08: Transport of JPEG XS Video in ST 2110-22
  - IPMX: Internet Protocol Media Experience (for ProAV)

TIMELINE OF JPEG XS STANDARD

JPEG XS editions and the RFC9134

Part 1 – Core coding system
Part 2 – Profiles and buffer models
Part 3 – Transport and container formats
Part 4 – Conformance testing
Part 5 – Reference software

RFC9134
Oct 2021

1st Edition – 2019	2nd Edition – 2022	Part 2 AMD1	3rd Edition – 2024	…
*Superseded**	*Published*		*Published (P1, P2, P3 in 2024, P4, P5 in 2025)*	

Functionality overview

- 4:4:4, 4:2:2 and 4:0:0
- Visually lossless
- Constant Bit Rate (CBR)

- Main 4:2:0 support
- Mathematically Lossless MLS.12 (VBR)
- Raw Bayer compression (CFA) (Star-Tetrix)
- Raw Fallback and Long Header
- Part 2 Amendment 1
  - High 4:2:0
  - Sublev4bpp

- Frame buffer
  - Compressed
  - Refresh mechanism
- Mathematically Lossless MLS.16

RTP PAYLOAD FORMAT FOR JPEG XS

Why do we need a revision of RFC 9134?

JPEG XS

- RFC 9134
  - Published around publication of JPEG XS 2nd edition
  - JPEG XS 3rd edition, published in 2024 (and 2025)
    - Adds a Temporal Differential Coding mode (with profiles) (among other changes)

- RFC9134 references and depends on internals of JPEG XS (for the slice-based packetization mode)
  - **SLH** marker, a 16-bit code used in XS codestreams to mark “slices”
  - New TDC profiles (introduced in 3rd edition) use a new 16-bit code, called **SLI**, to mark “temporal differential slices”
  - For RTP the difference between SLH and SLI is irrelevant, but RFC 9134 only mentions SLH
- TDC introduces *fbblevel* (like *profile*, *level* and *sublevel*)
  - Needs a dedicated parameter for SDP
- Feedback from implementers about ambiguity regarding interlace video signals
- One erratum exists (6752) for RFC9134

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New I-D: draft-ietf-avtcore-rtp-jpegxs-3ed

- Call for adoption was positive, https://github.com/tbr/rtp_payload_xs
- Proposal to obsolete RFC9134
- 100% backward compatible with RFC9134
  - Existing senders remain compliant (these will not use new features)
  - Existing receivers will still work (for non-TDC streams, which is indicated by the profile) and can detect if new features are used

- I-D is ready:
  - Integrates erratum of RFC9134
  - Clarifies handling of interlace video signals
  - Provisions needed TDC functionality
    - Use of SLI marker
    - Add *fbblevel* parameter
  - Many minor text improvements
  - Improves the definition of ”slices” to also support an upcoming AMD1 for 21122-1 (= slice extension markers)