

AVTCORE WG

IETF 114

Hybrid Meeting

Thursday, July 28, 2022

13:30 - 15:30 Eastern Time

Session II, Philadelphia North

Mailing list: avtcore@ietf.org

Notes: <https://notes.ietf.org/notes-ietf-114-avtcore>

MeetEcho link: <https://www.conf.meetecho.com/conference/?group=avtcore>¹

IETF² 114 Meeting Tips

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- Video can also be enabled, but it is separate from audio.
- Video is encouraged to help comprehension but not required.

Resources for IETF 114 Philadelphia

- Agenda
<https://datatracker.ietf.org/meeting/agenda>
- Meetecho and other information:
<https://www.ietf.org/how/meetings/114/preparation>
- If you need technical assistance, see the Reporting Issues page:
<http://www.ietf.org/how/meetings/issues/>

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- [BCP 9](#) (Internet Standards Process)
- [BCP 25](#) (Working Group processes)
- [BCP 25](#) (Anti-Harassment Procedures)
- [BCP 54](#) (Code of Conduct)
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- [BCP 79](#) (Patents, Participation)
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<https://www.ietf.org/how/meetings/114/faq/#covidmeasures>

About this meeting



- Agenda: <https://datatracker.ietf.org/doc/agenda-114-avtcore/>
- Notes: <https://notes.ietf.org/notes-ietf-114-avtcore>
- Jabber Room: avtcore@jabber.ietf.org
- Secretariat: mtd@jabber.ietf.org
- WG Chairs: Jonathan Lennox & Bernard Aboba
- Zulip Scribe: Jonathan Lennox
- Note takers: ?

In Memoriam: Stephen L. Casner



[IEEE Internet Award Video](#)

Agenda



1. Note Well, Note Takers, In Memorium, Agenda Bashing, Draft status (Chairs, 20 min)
2. Cryptex (S. Murillo, 10 min)
<https://datatracker.ietf.org/doc/html/draft-ietf-avtcore-cryptex>
<https://github.com/juberti/cryptex/issues>
3. RTP Payload Format for Versatile Video Coding (VVC) (S. Wenger, 10 min)
<https://datatracker.ietf.org/doc/html/draft-ietf-avtcore-rtp-vvc>
4. RTP Payload Format for SCIP (D. Hanson, 10 min)
<https://datatracker.ietf.org/doc/html/draft-ietf-avtcore-rtp-scip>
5. RFC7983bis (B. Aboba, 10 min)
<https://datatracker.ietf.org/doc/html/draft-ietf-avtcore-rfc7983bis>
6. [RTP over QUIC](#) (J. Ott, M. Engelbart, 15 min)
<https://datatracker.ietf.org/doc/html/draft-ietf-avtcore-rtp-over-quic>
7. SDP for RTP over QUIC (S. Dawkins, 10 min)
<https://datatracker.ietf.org/doc/html/draft-dawkins-sdp-rtp-quic>
8. RTP Payload for V3C (L. Ilola, 10 min)
<https://datatracker.ietf.org/doc/html/draft-ilola-avtcore-rtp-v3c>
9. RTP Control Protocol (RTCP) Messages for Green Metadata (W. Zia, 10 min)
<https://datatracker.ietf.org/doc/html/draft-he-avtcore-rtcp-green-metadata>
10. Wrapup and Next Steps (Chairs, 10 min)

Draft Status



- Published
 - RFC 9071: was draft-ietf-avtcore-multi-party-rtt-mix
 - RFC 9134: was draft-ietf-payload-rtp-jpegxs
- RFC Editor Queue
 - draft-ietf-payload-vp9 (MISSREF)
- IETF Last Call Completed: IESG Evaluation::AD Followup
 - draft-ietf-avtcore-cryptex (IETF LC completed April 5)
 - Revised I-D submitted ([draft-ietf-avtcore-cryptex-07](#))
 - draft-ietf-avtcore-rtp-vcv (IETF LC completed May 19)
- Waiting for AD Go-Ahead::Revised I-D Needed
 - draft-ietf-avtext-framemarking

Draft Status (cont'd)



- WGLC Completed, Waiting for WG Chair Go-Ahead : Proposed Standard
 - draft-ietf-avtcore-rtp-scip (WGLC completed May 8, 2022)
 - Gen-Art and Art-Art reviews posted
 - Secdir review pending
 - draft-ietf-avtcore-rfc7983bis (WGLC completed June 6, 2022)
 - WGLC announcement:
https://mailarchive.ietf.org/arch/msg/avt/k8r222c7e06_5XjYNueFXQWejQI/
 - Revised I-D submitted: draft-ietf-avtcore-rfc7983bis-05
- Adopted
 - draft-ietf-avtcore-rtp-over-quic (CfA completed July 11, 2022)
 - CfA summary:
<https://mailarchive.ietf.org/arch/msg/avt/zFliDapDs8t58T0j9bCwbEb8T4o/>
 - draft-ietf-avtcore-rtp-enc
- Call for Adoption completed:
 - [draft-jennings-dispatch-game-state-over-rtp](#) (Completed May 8, 2022)
 - CfA summary:
<https://mailarchive.ietf.org/arch/msg/avt/w80E9ihE4rrJyMzU6F9eOYgvYVE/>

CfA on “Game State over RTP”



- CfA Completed on May 8, 2022
- CfA summary:
<https://mailarchive.ietf.org/arch/msg/avt/w80E9ihE4rrJyMzU6F9eOYgvYVE/>
- Two responses:
 - In favor:
 - Suhas Nandakumar:
https://mailarchive.ietf.org/arch/msg/avt/c__oH22Gg-blmOAzVuYj3Ub_liU/
 - In favor of adopting the RTP payload format (but not the format itself):
 - Stephan Wenger:
<https://mailarchive.ietf.org/arch/msg/avt/R7il2WZ1k2xz1jljiQ-MNoPI9Xg/>
- Chair proposal
 - Proponents to provide a plan for obtaining responses outside the IETF (e.g. game developer forums)
 - WG to extend the CfA to sometime in September (due to August vacations)

Completely Encrypting RTP Header Extensions and Contributing Sources (Cryptex)

<https://datatracker.ietf.org/doc/html/draft-ietf-avtcore-cryptex>

<https://github.com/juberti/cryptex/issues>

Sergio Garcia Murillo

Current Status

- 39 comments received from IESG review, IANA and SDP Directorate review, 3 “wontfix”, 8 open, requiring further discussion

<https://github.com/juberti/cryptex/issues?q=is%3Aissue>

- New draft available addressing the non-contentious feedback

<https://datatracker.ietf.org/doc/html/draft-ietf-avtcore-cryptex-07>

Won't fix issues

- Usage of inclusive language ([#69](#))
 - Can not rename “master key” term as it is referencing RFC3711.
- Detail fingerprinting issue ([#92](#))
 - Not aware of any analysis that can be referenced .
- IANA registry for "defined by profile" ([#95](#))
 - This an issue for RFC8285, or even for RFC3550. There is no IANA registry for the "defined by profile" values, so we can't add the values specified in this doc to it.

IANA issue feedback #60

- [SOLVED] Section 4, 2nd paragraph - It says the the attribute "can be used at the session level or media level", however the IANA registration in Section 9.1 says it can only be used at the media-level. Which way is it ?

Changing “cryptex” attribute from session and media level to media only was a change introduced by mistake in the previous draft.
Reverted now.

IPR (#74,#91)

- The Shepherds write-up with respect to IPR shows two authors confirming they have filed "all required disclosures" but does not list whether this means "there are non", "there are some, compatible with IETF" or that there is "disclosed, incompatible with IETF".

[BERNARD] The authors have not filed any IPR disclosures. The status of the non-author IPR disclosures is here:

<https://mailarchive.ietf.org/arch/msg/avt/c88xDocWibCpJntwzj0rYG-3lfk/>

CRYPTEX updates RFC3711

- [SOLVED] I believe that this document should formally Update rfc3711. The mechanism described here is a replacement for what rfc6904 defined. That original mechanism was tagged as formally Updating rfc3711 -- this work should also be tagged that way.

But would like to check agreement from the WG about this. Also, two idnits warnings triggered:

- pre-RFC5378 disclaimer ([#110](#)): Should be ignored?
- [TODO] Mention rfc3711 update in abstract ([#109](#))

CRYPTEX and RFC6878

- Would it be time to deprecate RFC6904? ([#68](#))
- Prefer Cryptex over RFC6904 ([#73](#))

[QUESTION] If both are negotiated, Cryptex SHOULD be used? Or why not stronger, if both peers support Cryptex, RFC6904 SHOULD NOT (MUST NOT?) be used?

Mandatory stop #76

Alternatively, if the implementation considers the use of this specification mandatory and the "defined by profile" field does not match one of the values defined above, it SHOULD stop the processing of the RTP packet and report an error for the RTP stream.

[QUESTION] Why is this not a MUST stop? If it is mandatory, what is an example where it can continue processing an RTP packet without the mandatory requirement?

Next Steps



- Update draft with consensus of this meeting
- Publish cryptex-08
- Call for IESG review again?

RTP Payload Format for Versatile Video Coding (VVC)

<https://datatracker.ietf.org/doc/html/draft-ietf-avtcore-rtp-vvc>

Stephan Wenger

Current Status (Jul 27, 6:45 EDT)

- Lots of good AD comments against v16, pointing out (among others) an incomplete IANA registration template. Thanks.
- Authors responded to each COMMENT/DISCUSS in late June, and implemented changes into v17.
- V17 was posted on 7/2/22.
- Many ADs affirmatively signed off on our changes, and two of the three DISCUSSes cleared. Thanks.
- Only one DISCUSS open

Zahed's DISCUSS

“I would like discuss if this specification should be making stronger statement to enforce the reinterpretation the SDP Offer/Answer model for parameters sprop-max-don-diff and sprop-depack-buf-bytes.

In section 7.3.2.3, it says sprop-max-don-diff and sprop-depack-buf-bytes parameter should be interpreted differently than usual interpretation of the parameters according to [RFC 3264](#). This is a significant change and kind of easy to miss. This section does not use any normative text to enforce the change either. [...]

(Authors did address the other aspect of the DISCUSS as well as most/all of Zahed's comments in v17)

Authors' Reply, rephrased

- Authors are not experts in SDP and have little/no motivation to become such
- Spec language surrounding sprop-max-don-diff and sprop-depack-buf-bytes has been introduced in RFC 3984, is used in essentially unchanged form in at least three more video payload RFCs, is deployed, and is referenced by external specs (for example in 3GPP)
- No known (to the authors) interop issues over the past 20 years
- Therefore, authors suggest WONTFIX
- If unacceptable, please help

Q1: Does the WG see a need to tighten the language around sprop-max-don-diff and sprop-depack-buf-bytes?

Q2: If yes, who understands this stuff, and who is willing to help?

Next Steps



If Zahed clears his DISCUSS, then we authors believe that no additional WGLC on v17 is necessary, as the changes are straightforward bug fixes and editorials. Publication can proceed.

However, if the WG decides to follow Zahed's suggestion, then, as a minimum and ideally, we would have documented the behavior people expect from RFC 3984 (and successor) implementations. Unless we get it exactly right, we may well have a substantial change in behavior. If we get it wrong, we are doing more harm than good. Therefore, we authors think we should run an abbreviated WGLC on that aspect and perhaps ask for another SDP directorate review.

RTP Payload Format for for SCIP

Dan Hanson

Mike Faller

<https://datatracker.ietf.org/doc/html/draft-ietf-avtcore-rtp-scip>

SCIP Draft RFC – Status

- “Status - Awaiting Eternal Review/Resolution of Issues Raised”
- An email from MMUSIC WG indicates that their review of the SDP is complete
 - “As the draft does not define any new SDP attributes etc, there is no need for any new SDP procedures.”
- GENART - “This simple document is adequate to register the media type as is.”
- ARTART - “Not Ready”
- Draft RFC Expires Nov 26, 2022

Comments (1 of 4)

- GENART - “The references SCIP210 and SCIP214 are shown as informational. I assume that as much as anything this is because they are not widely available and strictly you could just treat them as opaque, but given they are fundamental to what you are standardising I would have expected them to be normative.”
- ARTART - “Section 4: SCIP-210 (and perhaps SCIP-214.2) seem like they are required to implement SCIP, and should therefore be normative references.”
- **Response - The AVTCORE WG determined that SCIP-210 and SCIP-214 should be informational references. Section 5 contains all the information necessary to implement support for SCIP in network devices so the SCIP standards are listed for informational purposes.**

Comments (2 of 4)

- ARTART - Abstract: SCIP-214.2 is mentioned here but nowhere else in the document except as a reference and in the media subtype registration. It seems inappropriate for the sole mention to be in the abstract; should it also appear in Section 4 along with SCIP-210?
- Response - Open to discussion. Even considering complete removal since SCIP-214.2 is essentially the predecessor to the RFC

Comments (3 of 4)

- ARTART - Sections 5.1 and 5.2: These media subtypes are already registered with IANA and should not be repeated here (some things like contact addresses may change, and RFCs are immutable).
- Response - To be discussed.
- Question: what is the process for updating contact addresses?

- ARTART - Section 7: Please add instructions to IANA that upon publication as an RFC, the registrations for [AUDIOSCIP] and [VIDEOSCIP] should be updated to cite this document as a reference..
- To be discussed.

Actions and Questions

- Some comments received that were narrative were not incorporated as they do not impact the technical information necessary to support SCIP
- Comments which may impact technical understanding that are discussed here with a resolution will be incorporated into the draft RFC
- Questions were asked about when and how to update the IANA registration of the AUDIOSCIP and VIDEOSCIP registration information. The submitters of the draft RFC will take actions based upon the group reply.
- Next Steps?

RFC 7983bis

Bernard Aboba

G. Salgueiro

C. Perkins

<https://datatracker.ietf.org/doc/html/draft-ietf-avtcore-rfc7983bis>

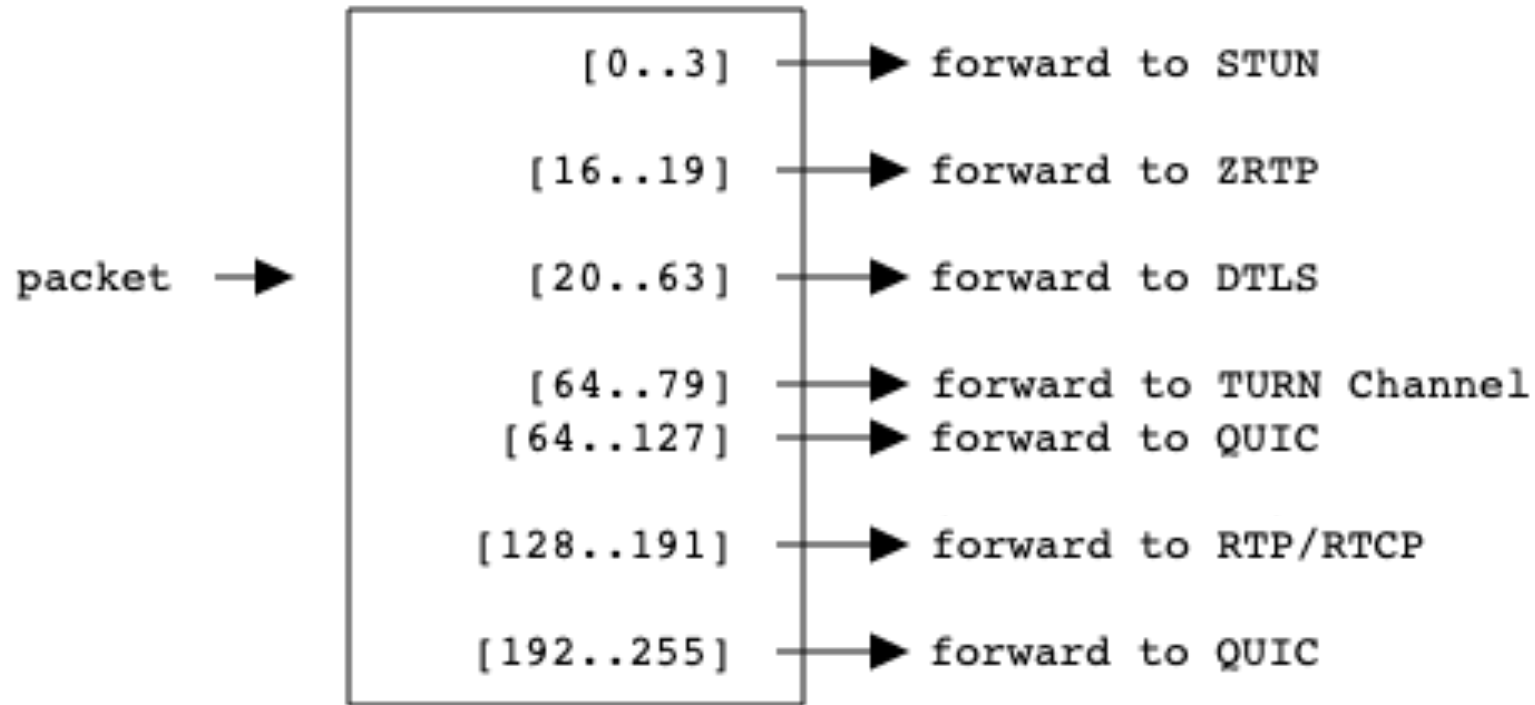
RFC 7983bis



- Update to RFC 7983 Section 7, documenting QUIC multiplexing.
 - Description of multiplexing SRTP, SRTCP, STUN, TURN, DTLS, ZRTP and QUIC
 - Guidance on handling overlap between QUIC and TURN channels.
 - Discussion of usage scenarios and multiplexing requirements
- Update to (D)TLS Content-Type Field IANA page to reference new RFC (no other change needed)

- WGLC completed June 6, 2022
 - [Announcement](#)
- Comments
 - Martin Thomson
 - Concerned about QUIC version dependencies (e.g. diagram mentioning QUIC short/long header)
 - [David Schinazi](#)
 - Add: “MUST NOT send grease_quic_bit transport parameter”
 - Question about demultiplexing of TURN channels and QUIC.
 - [Jonathan Lennox](#)
 - TURN channel packets should only ever be received from a TURN server, and a TURN client knows whether it sent TURN allocation requests, and channel-binding requests, to a server.

Updated Diagram



RFC 7983bis-05 Changes



- Section 1

While the scheme described in this document is compatible with QUIC version 2 [[I-D.ietf-quic-v2](#)], it is not compatible with QUIC bit greasing [[I-D.ietf-quic-bit-grease](#)]. As a result, endpoints that wish to use multiplexing on their socket MUST NOT send the `grease_quic_bit` transport parameter.

- Section 2

In the absence of QUIC bit greasing, the first octet of a QUIC packet (e.g. a short header packet in QUIC v1 or v2) may fall in the range 64 to 127, thereby overlapping with the allocated range for TURN channels of 64 to 79. However, in practice this overlap does not represent a problem. TURN channel packets will only be received from a TURN server to which TURN allocation and channel-binding requests have been sent. Therefore a TURN client receiving packets from the source IP address and port of a TURN server only needs to disambiguate STUN (i.e. regular TURN) packets from TURN channel packets; (S)RTP, (S)RTCP, ZRTP, DTLS or QUIC packets will not be sent from a source IP address and port that had previously responded to TURN allocation or channel-binding requests. As a result, if the source IP address and port of a packet does not match that of a responding TURN server, a packet with a first octet of 64 to 127 can be unambiguously demultiplexed as QUIC.

Next steps...



- Is the draft ready for publication?
- If not, what Issues remain?

RTP over QUIC

<https://datatracker.ietf.org/doc/html/draft-ietf-avtcore-rtp-over-quic>

Mathis Engelbart, Jörg Ott

Scope



- Aiming at minimal mapping, more complex scenarios later
- RTP over QUIC defines application usage of QUIC
- Baseline expects nothing more than standard QUIC
- Can benefit from QUIC extensions
- Describes how QUIC implementation and its API can be extended to improve efficiency
- Limited to RTP over QUIC, without enhancing QUIC or RTP
- Signaling defined separately (e.g. [draft-dawkins-sdp-rtp-quic](#))

ALPN



- Required by QUIC
- Added “rtp-mux-quic” to indicate that multiple flows may be multiplexed
- Append version suffix for draft implementations
- See also: Issue [#13](#)

API Considerations



- List of features which a QUIC implementation can provide to help implementing the previously described optimizations
- Split into two subsections:
 - Exposed information: MTU size, ACKs, Stream states, Timestamps (if available)
 - Exposed methods: Cancel Streams, Set Congestion Controller

Other updates



- Restrict RTP sessions to use QUIC streams or QUIC datagrams
 - Not both simultaneously (at this point)
- Note about implications of mapping QUIC statistics to RTCP when QUIC streams are used
- New subsection about congestion control considerations when sharing a QUIC connection with non-real-time streams
- Considerations on Connection Migration and 0-RTT
- Security Considerations

Open Issues



- Translator forwarding packets over UDP: packets received via QUIC stream may exceed MTU (and even max UDP packet size)
- [#13](#): What if datagrams are not enabled?
- [#14](#): Which stream types (PR: [#17](#): Unidirectional)
- [#15](#): Considerations about Stream concurrency
- [#16](#): Retransmission flow ID

Recent / Next Steps



- Submitted as WG draft this week
- Working further with Spencer on SDP signaling

SDP for RTP over QUIC

Spencer Dawkins

[draft-dawkins-avtcore-sdp-rtp-quic](#) - a minimal specification

<https://github.com/SpencerDawkins/sdp-rtp-quic-issues> - includes discussion

Background for this session

- [draft-dawkins-avtcore-sdp-rtp-quic](#)
 - a minimal SDP specification, tracking [draft-ietf-avtcore-rtp-over-quic](#)
 - Issues and PRs based on current text are welcome in this GitHub repo
- [Separate GitHub repo, used for broader issue tracking](#)
 - Most issues fit within [draft-ietf-avtcore-rtp-over-quic](#) scope
- At IETF 114 - provide an update based on [draft-ietf-avtcore-rtp-over-quic](#)
 - Please feel free to provide feedback on the mailing list also
- My goal is to issue a -01 before our next AVTCORE meeting
 - I plan to request adoption of [draft-dawkins-avtcore-sdp-rtp-quic](#)

What AVP profiles to register - # 5

- [draft-dawkins-avtcore-sdp-rtp-quic-issues-00](#) registered three profiles
 - "QUIC/RTP/SAVP", "QUIC/RTP/AVPF", and "QUIC/RTP/SAVPF"
- Proposal at last interim was to register one profile - "QUIC/RTP/AVPF"
 - Secure AVP profiles most useful when bridging to non-QUIC/RTP
 - We'll have that conversation when we revise [RTP Topologies](#) RFC
- And, of course, we need to prepend "UDP/" for consistency in registry
 - *Spencer missed this - my apologies*
- Then, two related questions popped up
 - What about streams versus datagrams? (next slide)
 - Will we need ICE-TCP? (new issue)

RTP over streams, datagrams, or both?

- This shows up in two related issues
 - What will RTP be using? ([#8](#))
 - Do we need to signal this in SDP ([#3](#))
- [draft-ietf-avtcare-rtp-over-quick-00](#) now includes all three choices
 - (“Both” is called “shared” - it’s new since our last interim meeting)
- My proposal is to include “stream/”, “dgram/” and “/shared”

Do We Need TCP-ICE? - [#12](#) (new)

- Using ICE to solve fundamental problem of UDP blocking/rate-limiting
 - Roman Shpout explained this in an email onlist
 - His email text is also included in the Github issue
- His key point is that we need a way to fall back to TCP
 - If we **can** use ICE TCP candidates, we do have a fallback
 - If we **can't** use ICE TCP candidates, what's the alternative?
- His proposal was to **also** register TCP/QUIC/RTP/AVPF-style profiles
 - This almost certainly needs more working group discussion

QUIC also does congestion control - #1

- To get a QUIC implementation to change its HTTP/3 behavior, we might
 - ~~Explicitly ask the QUIC implementation to do something media friendly~~
 - ~~Explicitly ask the QUIC implementation to do SGRReAM~~
 - Explicitly ask a QUIC implementation for specific feedback information
 - I proposed we explore whether this is a problem in practice
- [draft-ietf-avtcore-rtp-over-quic](#) registers "rtp-mux-quic" ALPN
 - So, the QUIC implementation at the other end will know this is RTP
- **Proposal is that SDP should carry ALPNs**
 - This allows use of multiple draft versions, experiments, etc.

How to ask for QUIC feedback - #13 (new)

- Want to allow implementations to ask QUIC for feedback
 - This is included in [draft-ietf-avtcore-rtp-over-quic](#)
- Goal: substitute transport layer feedback for RTCP feedback
 - Reduce overhead when possible
 - Mapping may require creativity (interpret lost packet as a NACK)
- What should SDP look like for this?
 - "enable-transport-layer-feedback", or something similar, or
 - name individual pieces of transport layer feedback
- Proposal is "enable-transport-layer-feedback", or something similar
 - This almost certainly needs more working group discussion

RTP Payload for V3C

<https://datatracker.ietf.org/doc/draft-ilola-avtcore-rtp-v3c/>

<https://github.com/laurilo/draft-ilola-avtcore-rtp-v3c>

Lauri Ilola

Lukasz Kondrad

Background

- The topic was first introduced in the AVTCORE virtual meeting (15/02/22)
- Visual volumetric video-based coding (V3C) aims to re-use the existing 2d video coding technologies and it is video codec agnostic.
- V3C encoder decomposes volumetric frame into multiple components
 - video components (geometry, occupancy, attribute) that can be encoded by any video codec
 - atlas (metadata) component
 - provide information how to re-project the video components back into volumetric video frame
 - is encoded using mechanisms defined in ISO/IEC 23090-5
 - high-level syntax is represented as atlas NAL units that are very similar to HEVC/VVC.

V3C RTP overview

- Video components can be streamed according to respective RTP payload specifications (e.g. H.264 - RFC6184, H.265 - RFC7798, etc.)
- Atlas component is missing RTP payload format.
- Defining V3C RTP payload format for NAL unit based atlas data
 - Encapsulation of atlas NAL units into RTP packets
 - V3C specific payload format parameters
 - Grouping mechanism (e.g. video component streams and atlas component stream can be grouped according to RFC5888)
 - Bundling of RTP streams according to RFC8843

Feedback implemented

- AVTCore feedback on draft-00 ([#1](#))
 - Align with VVC instead of HEVC RTP payload format - Done
 - Remove Multi Time Aggregation Packets - Done
 - Clean payload format parameter section - Done
- Public feedback
 - Missing acronyms ([#3](#)) - Done
 - Editorial feedback & fixing errors in examples ([#4](#)) - Done
- Feedback managed on [Github](#)

Next Steps

- Suggestions and feedback is much appreciated
 - Can be done directly on [Github](#)
 - Continue to update the draft based on feedback
- We would like to propose working group adoption

Any questions or comments?

RTC Control Protocol Messages for Green Metadata

<https://datatracker.ietf.org/doc/html/draft-he-avtcore-rtcp-green-metadata>

Yong He (Qualcomm), Waqar Zia (Qualcomm), Christian Herglotz (FAU), Edouard Francois (InterDigital)

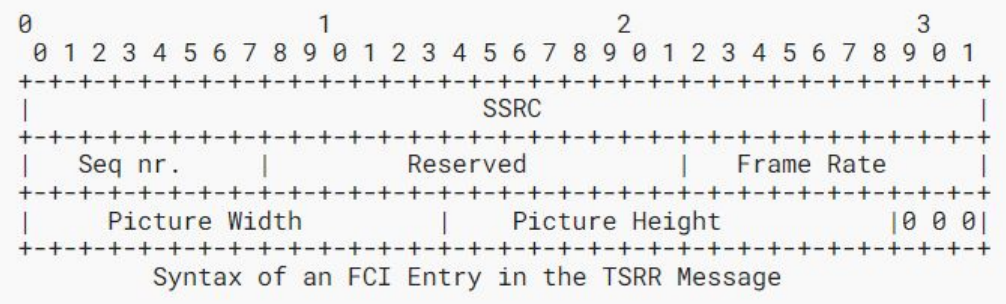
Overview

- Energy Efficient Media Consumption is specified by ISO/IEC 23001-11
- 2 types of metadata specified:
 - A. Video **encoder** generated decoding complexity (sent via SEI, not the focus here)
 - B. **Decoder feedback** □ **encoder adapts** decoder energy consumption
 - A **format is needed** for this to carry these messages □
draft-he-avtcore-rtcp-green-metadata
 - Current draft version:
<https://www.ietf.org/archive/id/draft-he-avtcore-rtcp-green-metadata-00.html>
 - Specifies a **new RTCP payload format** for
 1. **spatial and temporal resolution request** and
 2. **notification feedback** message

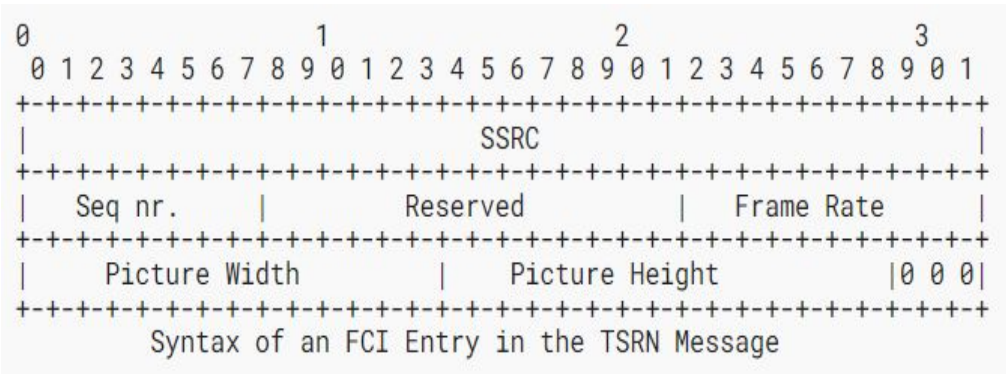
New Messages



- AVPF [[RFC4585](#)][[RFC5104](#)] defines seven **payload-specific** feedback messages and one application layer feedback message.
- This document specifies **2 new payload-specific feedback** messages
- Message may be sent
 - in a **regular full compound RTCP packet** or
 - in an **early RTCP** packet
- Decoder seeks **desirable video quality**



Temporal-Spatial Resolution Request



Temporal-Spatial Resolution
Notification (TSRN)

Timing, Security

- Mixer encoding for multiple sessions may need to consider **joint needs** of participants
- Messages **not time-critical**
 - Sent using **regular RTCP timing**
- Security:
 - Spoofed or malicious messages may **degrade video** performance (e.g. low quality video)
 - Need to apply authentication and integrity protection:
[SRTP](#) and [SAVPF](#)

Next Steps

- Gather feedback
- Reflector discussions
- Incorporate, update, review
- Seek adoption when ready

Thank you

Special thanks to:

The Secretariat, WG Participants & ADs