AVTCORE WG

Virtual Meeting

Tuesday, February 15, 2022

09:30 - 11:00 Pacific Time

Mailing list: avtcore@ietf.org
Jabber Room: avtcore@jabber.ietf.org
Virtual Bluesheets and Notes: https://notes.ietf.org/notes-ietf-interim-2022-avtcore
Meeting Link: https://meet.jit.si/EarlyLovesDenounceSolely

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This session is being recorded

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- **Please use headphones when speaking to avoid echo.**
- **Please state your full name before speaking.**

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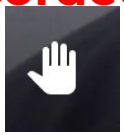
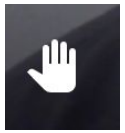
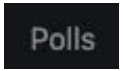
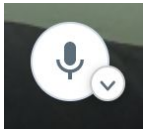
- To enter the queue, raise your hand with  , lower it with 
- To answer a hum, go to chat  and select Polls 

- When you are called on, you need to enable your audio to be heard.
- Audio is enabled by unmuting  and disabled by muting 
- Video is encouraged to help comprehension but not required.

About this meeting

- Agenda: https://datatracker.ietf.org/doc/agenda-interim-2022-avtcore-01-avtcore-01/
- CodiMD (for notes): https://notes.ietf.org/notes-ietf-interim-2022-avtcore
- Jabber Room: avtcore@jabber.ietf.org
- Secretariat: mtd@jabber.ietf.org
- WG Chairs: Jonathan Lennox & Bernard Aboba
- Jabber Scribe:
- Note takers:

Note Well

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Definitive information is in the documents listed below and other IETF BCPs. For advice, please talk to WG chairs or ADs:

- BCP 9 (Internet Standards Process)
- BCP 25 (Working Group processes)
- BCP 25 (Anti-Harassment Procedures)
- BCP 54 (Code of Conduct)
- BCP 78 (Copyright)
- BCP 79 (Patents, Participation)
- https://www.ietf.org/privacy-policy/(Privacy Policy)

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IETF 113 Plans

- IETF 113 is a hybrid meeting.
- How many people are planning to attend in person?
- Please answer the poll (in the chat).

Agenda

1. Note Well, Note Takers, Agenda Bashing, Draft status, Liaisons (Chairs, 15 min)
   https://www.ietf.org/lib/dt/documents/LIAISON/liaison-2021-10-29-iso-iec-jtc1-sc29-wg11-avtcore-liaison-statement-to-ietf-avt-on-mpeg-green-metadata-attachment-1.pdf
   Proposed response: https://mailarchive.ietf.org/arch/msg/avt/NPPqnpHDpS1uiROQAwqZY6aZwQc/
2. Cryptex (Sergio Garcia Murillo, 5 min)
   https://datatracker.ietf.org/doc/html/draft-ietf-avtcore-cryptex
   https://github.com/juberti/cryptex/issues
3. Low overhead authentication tags (H. Alvestrand, 10 min)
   https://datatracker.ietf.org/doc/html/rfc7714
   https://mailarchive.ietf.org/arch/browse/avt/?index=VOAJlmbvKpIjOn706vzizocxv34
4. RTP over QUIC (J. Ott, M. Engelbart, 15 min)
   https://datatracker.ietf.org/doc/html/draft-engelbart-rtp-over-quic
5. SDP for RTP over QUIC (Spencer Dawkins 10 min)
   https://datatracker.ietf.org/doc/html/draft-dawkins-avtcore-sdp-rtp-quic
6. RTP Payload for V3C (Lauri Ilola, 15 min)
   https://datatracker.ietf.org/doc/html/draft-ilola-avtcore-rtp-v3c
7. RTP Payload for SCIP (Daniel Hanson, 10 minutes)
   https://datatracker.ietf.org/doc/html/draft-hanson-avtcore-rtp-scip
   https://mailarchive.ietf.org/arch/msg/avt/apGhgUJnuR9U8itss2yjrCwvLxk/
8. Wrapup and Next Steps (Chairs, 10 min)

Draft status

- Published
  - RFC 8817: was draft-ietf-payload-tsvcis
  - RFC 8852: was draft-ietf-avtext-rid
  - RFC 8860: was draft-ietf-avtcore-multi-media-rtp-session
  - RFC 8861: was draft-ietf-avtcore-rtp-multi-stream-optimisation
  - RFC 8872: was draft-ietf-avtcore-multiplex-guidelines
  - RFC 8888: was draft-ietf-avtcore-cc-feedback-message
  - RFC 9071: was draft-ietf-avtcore-multi-party-rtt-mix
  - RFC 9134: was draft-ietf-payload-rtp-jpegxs

Draft Status (2)

- RFC Editor Queue
  - draft-ietf-payload-vp9 (MISSREF)
- AD Evaluation, revised I-D needed
  - draft-ietf-avtcore-cryptex
- Awaiting Chair Writeup
  - draft-ietf-avtext-framemarking
- WGLC completed, revised I-D needed
  - draft-ietf-avtcore-rtp-vvc (Second WGLC completed)
- Adopted
  - draft-hanson-avtcore-rtp-scip
  - draft-ietf-avtcore-rtp-evc
  - draft-ietf-avtcore-rfc7983bis

Recent Liaison Statements

- Liaison from ISO/IEC JTC 1/SC 29/WG 03
  - Subject: MPEG Green Metadata
  - Received: October 22, 2021
  - Link is here.
- Response proposed by Christian Herglotz is here.

Title	**Liaison statement to IETF AVT on MPEG Green Metadata**
Source	**WG 03, MPEG Systems**
Status	**Approved**
Serial Number	**21052**

SC 29/WG 03 would like to update you on the progress of the new edition (3rd) of ISO/IEC 23001-11 Energy-Efficient Media Consumption (Green Metadata). SC 29/WG 03 has issued the CD of ISO/IEC 23001-11 3rd edition in October 2021.

ISO/IEC 23001-11 specifies metadata (Green Metadata) that facilitates reduction of energy usage during media consumption. The format of metadata is specified for the following usages:

- reduced decoder power consumption;
- reduced display power consumption;
- media selection for joint decoder and display power reduction;
- quality recovery after low-power encoding.

This metadata facilitates reduced energy usage on the transmitter and the receiver side during media consumption without any degradation in the Quality of Experience (QoE). However, it is also possible to use this metadata to get larger energy savings, but at the expense of some QoE degradation.

The 3rd edition of 23001-11 adds three main aspects to the standard:

- The green metadata for Interactive signalling for remote decoder-power reduction are enhanced by adding new syntax elements. These allow a finer control for reducing decoder complexity on a high variety of platforms implementing different decoders (hardware / software) as well as processor cores. These metadata are mostly targeting point-to-point video applications and can save roughly 30% of the decoder energy and power, independent from the platform.
- The new edition adds the specification of a VVC SEI message carrying green metadata related to Complexity metrics for decoder-power reduction.
- The VVC SEI message can also carry metrics for quality recovery after low-power encoding. These metadata are mostly targeting segmented video delivery mechanism such as DASH.

SC 29/WG 03 hopes that this information is of interest to you, and you may consider using the Green Metadata to offer services for enabling use cases of video delivery with reduced energy usage, in particular concerning interactive signalling for remote decoder-power reduction. We would be interested to get feedback from your organisation on the potential usage of these metadata in your applications.

Screenshot

Liaison from ISO/IEC JTC 1/SC 29/WG03

Re: [AVTCORE] Draft Reply to Liaison Letter about Green-Mpeg Updates

Christian Herglotz <christian.herglotz@fau.de> | Mon, 13 December 2021 14:18 UTC | Show header

Dear Stephan, dear everyone,

thanks a lot for the detailed descriptions, they are very helpful. As MPEG appreciates a reply to the LS letter, we propose to send the following reply letter for the next MPEG meeting in January. As mentioned by Stephan, we adopt the recommendation to change "draft proposal" to "Internet Drafts".

The IETF AVTCORE working group replies to the Liaison letter "Liaison statement to IETF on MPEG Green Metadata", Serial number 21052, from October 2021.

IETF AVTCORE working group acknowledges and appreciates your work on updating the specifications of the GREEN-MPEG standard and thinks that the following aspects could be of interest for IETF AVTCORE working group:

- The green metadata for "interactive signalling for remote decoder power reduction" is of interest for return channel signalling via, e.g., RTCP.
- It remains to be seen whether metadata signaling from the sender to the receiver could be included in IETF specifications, in particular when the content of the metadata is codec-independent (e.g., "quality recovery after low power encoding").

The AVTCORE working group is contributions driven and further work in the group can be pursued by providing Internet Drafts to be discussed via the AVTCORE working group email reflector.

Please let us know if you have any more feedback.

Best regards,
Christian

Proposed Response

Discussion/Next Steps

- Comments
- Next steps

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

- Area Director review posted on November 19, 2021:
  - Re: [AVTCORE] Publication has been requested for draft-ietf-avtcore-cryptex-03
- Document currently in state “AD Review: Revised ID Needed”

AD Comments

Re: [AVTCORE] Publication has been requested for draft-ietf-avtcore-cryptex-03

"Murray S. Kucherawy" <superuser@gmail.com> | Fri, 19 November 2021 06:08 UTC | Show header

Hi, thanks for sending this along. First round of AD Evaluation comments, the procedural stuff:

(1) I'm confused about the IANA Considerations section, which refers to Section 5 for the registrations. Which IANA registry is this updating? I read RFC8285's IANA Considerations, since this document refers to that one, and couldn't figure it out from that either.

(2) Section 2 is obsolete. You need to use the full BCP 14 boilerplate (see RFC 8174).

(3) Section 4 defines a new SDP attribute, referencing RFC 4566 (replaced by RFC8866), which requires that attributes be registered with IANA, but this document doesn't appear to do that. RFC8866 specifies 12 fields required for such a registration, but this document provides only five.

(4) The shepherd writeup recommends further scrutiny on the SDP section, and suggests involvement of the SDP Directorate (which apparently, at the moment, is MMUSIC). Do you want to get that before we Last Call this, or do you want to do it as part of Last Call?

-MSK

Next Steps

- Resolution of open Github issues:
  - Issue 33: Section 5 IANA registration issue
  - Issue 34: Section 2 is obsolete
  - Issue 35: Missing IANA registration fields for Section 4
- Draft update
- Directorate reviews
- IETF Last Call

Low overhead authentication tags

https://datatracker.ietf.org/doc/html/rfc7714

https://mailarchive.ietf.org/arch/browse/avt/?index=VOAJlmbvKpIjOn706vzizocxv34

H. Alvestrand

The Problem

- RTP audio packets have ~70 bytes of payload
- With RTP and IP overhead, the result is ~100 bytes
- And then we add encryption
- AES_CM_128_HMAC_SHA1_80 has 10 bytes of overhead
- SHA1 is broken for many usages - we want to stop using it
- We want to use AEAD_AES_256_GCM for multiple reasons
- But the overhead is 16 bytes per packet
- 6% extra overhead has a measurable quality impact, especially
  - On slow networks
  - On low end phones

Considerations

- Implementors who are not cryptographers need exact guidance
  - Non-cryptographers designing crypto is *not good at all*
- RFC 7714 (2015) gives the detailed guidance we need
  - But does not have any lower overhead alternatives
- RTP audio consists of small packets
  - An occasional inserted “noise” packet is not a big deal
    - except if it helps key compromise
  - Key compromise *is* a big deal
- CFRG discussions don’t seem to consider this use case
  - Tag shortening issues focused around long packets (64K)

Next Steps

- Need a cryptographer-vetted solution for lower overhead audio
  - Key compromise defense is critical
  - Inability to inject “noise” packets is not critical
- Need to not depend on either SHA1 or newly specified crypto
- Need this to be documented to the level of RFC 7714
- If specified, and implementable, likely to be deployed on major services within 6 months of specification

RTP over QUIC

https://datatracker.ietf.org/doc/html/draft-engelbart-rtp-over-quic-01

https://www.in.tum.de/fileadmin/w00bws/cm/papers/epiq21-rtp-over-quic.pdf

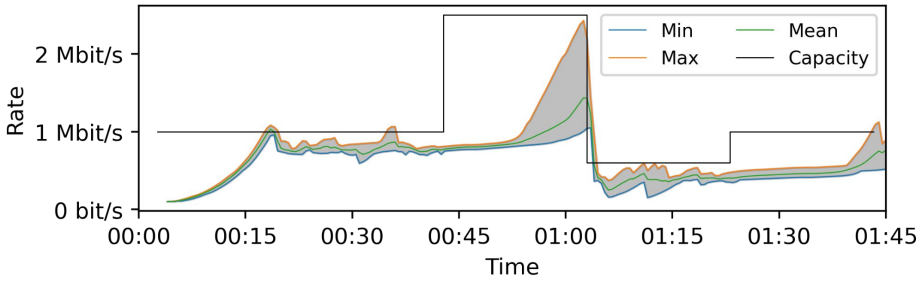
J. Ott, M. Engelbart

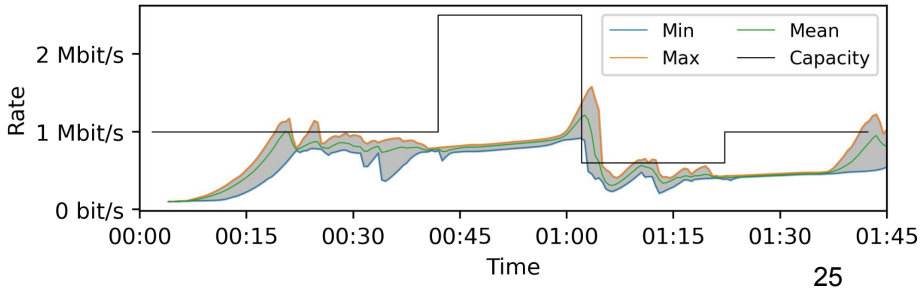
RTP over QUIC

- Draft: draft-engelbart-rtp-over-quic-01
- Encapsulation for carrying RTP/RTCP over QUIC
- Uses unreliable datagram extension
- Flow IDs to demultiplex different datagram flows
- SDP for signaling (see also: draft-dawkins-avtcore-sdp-rtp-quic-00)
- Focus on Congestion Control and interfaces between QUIC/CC/Codec
- Open Questions for Congestion Control:
  - How to do proper real-time media CC in QUIC given RTP realizes its own CC?
  - How to avoid duplicate signaling in RTCP?
- Test application integrating Gstreamer, SCReAM/GCC and quic-go

SCReAM with QUIC ACK feedback instead of RTCP

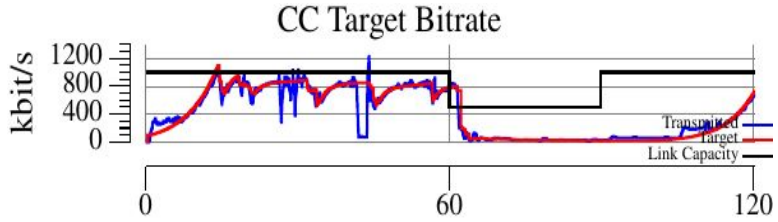
- Feedback created from QUIC connection statistics:
  - QUIC Datagram acknowledgements signal reception of RTP packets in the ACK'ed DATAGRAM frames
  - RTP packet arrival time calculated using latest_rtt
- QUIC ACK's are less granular, may be delayed
- Possible improvements:
  - Explicit timestamps in ACKs: draft-huitema-quic-ts-06 / draft-smith-quic-receive-ts-00
  - Control ACK delays: draft-ietf-quic-ack-frequency

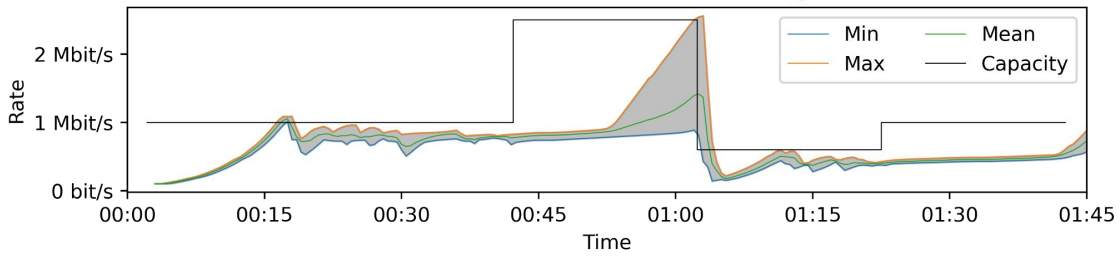


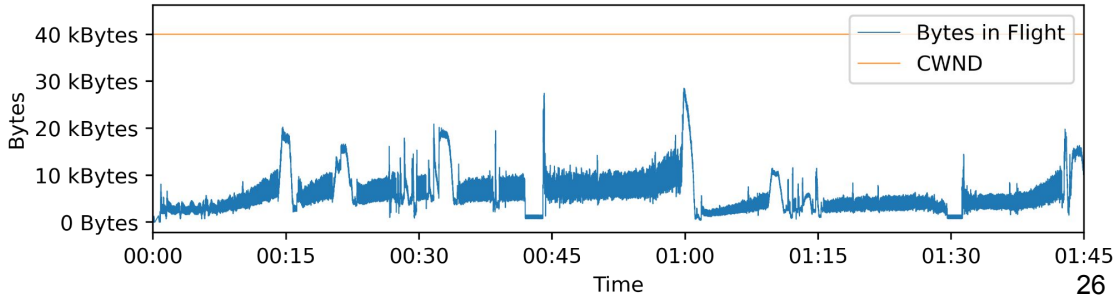


Update: SCReAM and NewReno

- IETF 112: Bug in Receiver implementation led to feedback congestion and low target bitrate
- Without congested feedback link, SCReAM target bitrate keeps up with new link capacity
- NewReno is always application limited

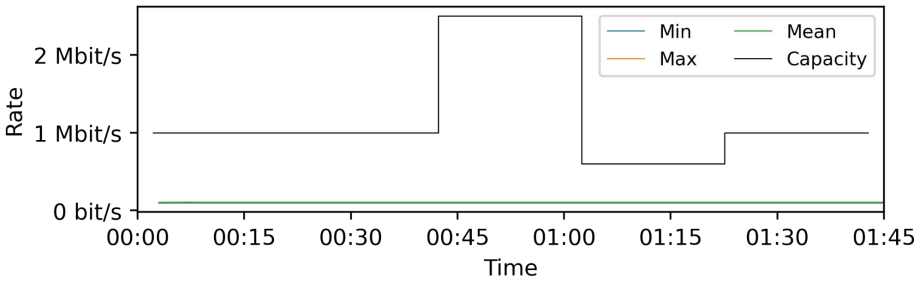




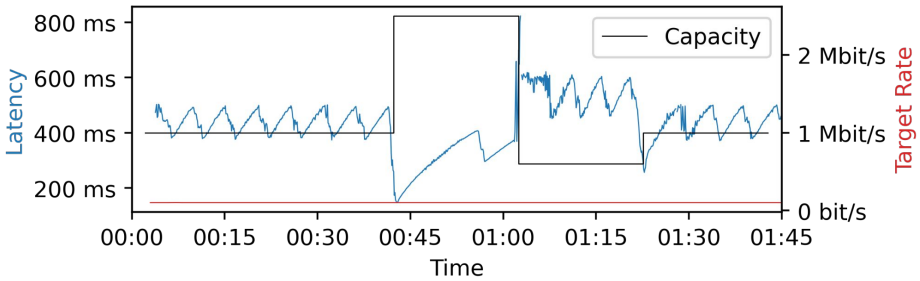


Prioritization/Scheduling

- Share QUIC connection using NewReno
  - RTP over Datagrams with additional SCReAM controller
  - Non-RTP data over QUIC stream
- High Latency variation leads to low target bitrate
- Naïve approach: prioritize datagrams over streams
  - Problem: When datagram queue empty, stream data can use congestion window
    => Next Datagram may be queued anyway



SCReAM Target Bitrate

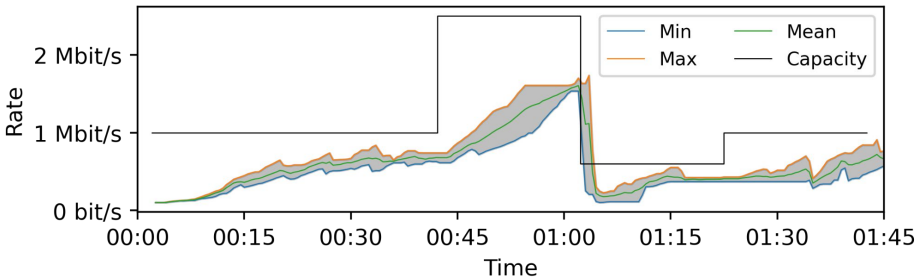


Latency and Target Bitrate

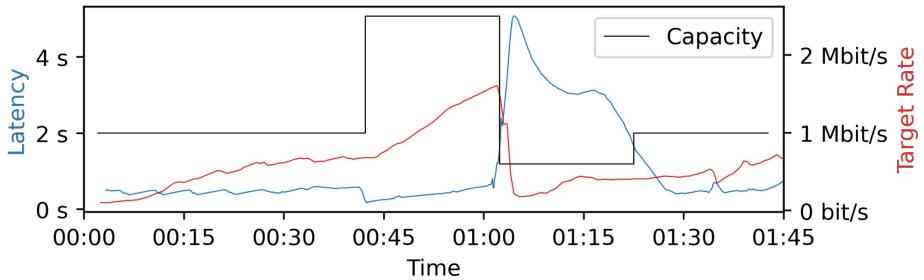
Prioritization/Scheduling

- GCC: More aggressive real-time CC to compete with QUIC stream
- Better target bitrate
- Still high latency

- In progress…



GCC Target Bitrate



Latency

Open Questions and next Steps

Update Draft:

- RTCP for congestion control?
  - Or just base RTCP?
  - Which upcoming QUIC extensions to include?
- Is the flow ID necessary, and if yes, is a flow ID enough?
- What should the draft say about congestion control schemes?
- What about prioritization?
- Others?

SDP for RTP Over QUIC

https://datatracker.ietf.org/doc/draft-dawkins-avtcore-sdp-rtp-quic/
https://github.com/SpencerDawkins/sdp-rtp-quic

Spencer Dawkins

Draft structure (stolen from RFC 4145)

- A long and twisty multi-section introduction
- Identifier and Attributes
  - Example of a QUIC/RTP/AVPF Offer
- IANA Considerations
- Security Considerations
- Acknowledgments
- References

Feedback I've gotten (GitHub Issues)

- Does double encryption matter for (say) SAVPF? #1
- Will we need a QUIC adaptation layer for RTP/RTCP #2
- Distinguishing between mappings onto streams and onto datagrams? #3
- Feedback from RTCP, QUIC, some of each, or something else?? #4
- Check QUIC impacts on BUNDLE #5
- Consider including a=tls-id in SDP #6
- Consider including a=fingerprint mechanism in a p2p SDP example #7
- Signaling media-friendly congestion control? #8

So - what happens next

- I'll continue to track AVTCORE RTP over QUIC encapsulation proposals
  - I'll continue to add new issues and propose text in GitHub
  - I'll publish updates when I have "significant text changes"
- I appreciate feedback, and I appreciate proposed text as well
  - That can happen on the AVTCORE mailing list, or in GitHub
- No need to request adoption at this time
  - AVTCORE doesn't have an adopted RTP over QUIC draft yet
- If draft is adopted, AVTCORE chairs requested MMUSIC review eventually

So, any questions or comments?

RTP Payload for V3C

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

Lauri Ilola

Lukasz Kondrad

Outline

- Background
- Motivation
- Proposal
- Conclusion

Background

Volumetric video

- Devices capable of capturing volumetric information are becoming more common in the consumer market, e.g. Kinect Azure or Apple iPhone 12 and 13.
- Volumetric video is intended to increase end-user immersion when compared to traditional 2D videos, it also comes with an increased data rate.
- Use cases:
  - Volumetric entertainment
  - Volumetric teleconferencing
  - Real-time 3D scanning in industry
- Increased capability to record volumetric video comes with new challenges
  - How to compress the volumetric video
  - How to store the compressed volumetric video
  - How to deliver the compressed volumetric video

Background

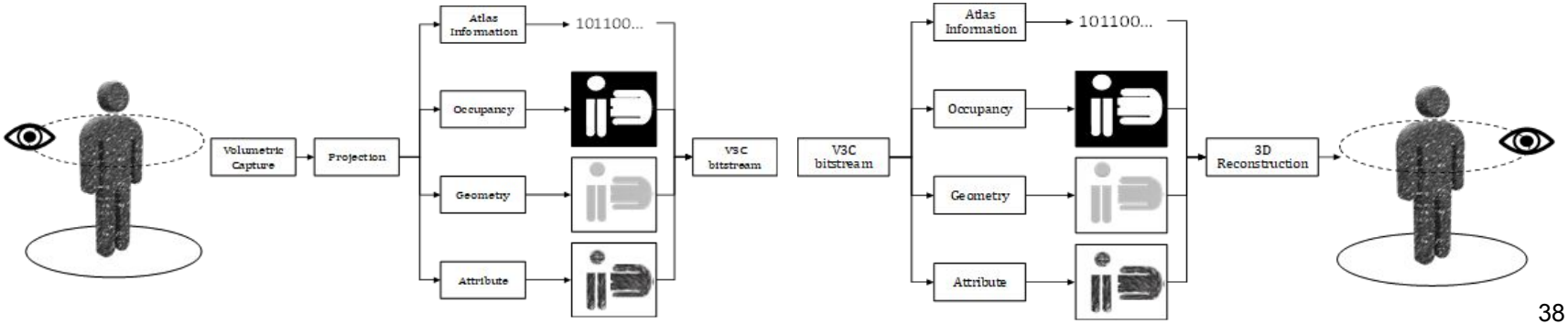
MPEG approach to volumetric video

- MPEG has defined standards related to volumetric video with intention to re-use much of the existing 2d video coding technologies
  - Compression of volumetric video re-uses 2D video codecs such as AVC, HEVC, VVC
    - 23090-5: Information technology — Coded representation of immersive media — Part 5: Visual volumetric video-based coding (V3C) and video-based point cloud compression (V-PCC)
    - 23090-12: Information technology — Coded representation of immersive media — Part 12: MPEG Immersive video
    - Both re-use the same V3C bitstream format
  - Storage of coded volumetric video using functionality of ISOBMFF
    - 23090-10: Information technology — Coded representation of immersive media — Part 10: Carriage of visual volumetric video-based coding data
  - Delivery of coded volumetric video using DASH and MMT protocols
    - 23090-10: Information technology — Coded representation of immersive media — Part 10: Carriage of visual volumetric video-based coding data

Background

ISO/IEC 23090-5 - V3C based compression

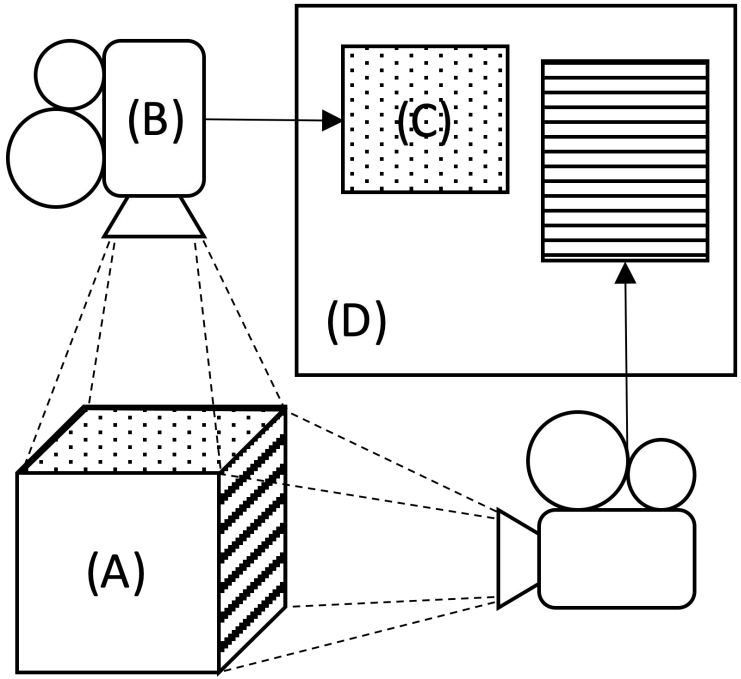
- V3C encoder decomposes volumetric frame into multiple components
  - video (geometry, occupancy, attribute).
  - metadata (atlas) - allows to re-project the video components back into volumetric frame
- Video components representing occupancy, geometry and attribute can be encoded using any existing video codec, e.g. AVC, HEVC, VVC
- Atlas component is encoded using V3C defined mechanisms (23090-5).
  - Coded atlas bitstream is represented as atlas NAL units (very similar to HEVC)



Background

ISO/IEC 23090-5 - V3C re-projection concept

- The conversion from 3D representation of a volumetric frame to 2D frame representations is achieved by projecting the 3D representation (A) of volumetric frame to a number 2D planes, called patches (C), through a virtual camera (B). The patches are then arranged into 2D collections of patches creating the 2D frame representation for an atlas (D).
- These 2D frame representations (geometry, occupancy and other attributes of the content) can be compressed using existing video codecs (e.g. AVC, HEVC, VVC).
- The information about patch layout and virtual camera projection format is compressed into an atlas bitstream using techniques defined in ISO/IEC 23090-5.



Motivation

Why do we need RTP Format

- MPEG has defined technologies and tools which are in their scope
- While DASH may have low-latency and live profiles, it is not really suited to be used in extremely low-latency use cases such as teleconferencing.
- Real-time low-latency delivery enablers are missing for V3C technology.

- We should not define a new concept but extend existing technologies and define missing pieces.
- AV RTP payload formats and deployment provide a good starting point

Motivation

What can be re-used and what is missing in RTP framework

- V3C video components
  - IETF defined RTP payload formats for video codecs can be re-used
    - H.264 (RFC6184), H.265 (RFC7798) and there is ongoing work on H.266
  - Additional V3C specific payload parameters might need to be defined
- V3C atlas component
  - RTP format for atlas component is missing.
  - Atlas bitstream high level syntax re-uses NAL unit concept from HEVC
    - Much of the work done for RTP format for HEVC can be re-used
- Association between V3C atlas component and V3C video components
  - Defining groups of RTP streams to contain V3C encoded data (RFC5888)
  - Defining way to bundle multiple RTP streams in a single transport (RFC8843)

Proposal Overview

- Define RTP payload format for atlas data
  - Single NAL unit packet
  - Single time aggregation packet
  - Multi-time aggregation packet
  - Fragmentation unit
- Define transmission modes
  - a Single RTP stream on a Single media Transport (SRST)
  - Multiple RTP streams over a Single media Transport (MRST)
  - Multiple RTP streams on Multiple media Transports (MRMT)
- Define payload format parameters and signaling in SDP
- Define grouping and bundling of V3C component streams (video & atlas)

Guiding principles

- Suggested guiding principles
  - Keep it simple
  - Maintain compatibility with existing video coding specifications
  - Mirror the behavior of RTP atlas data payload format with the video payload specifications
  - Avoid introducing new concepts by re-using what is already there

RTP Payload Format for the SCIP Codec

Daniel Hanson

and

Michael Faller

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

SCIP Background and Purpose

- The Secure Communication Interoperability Protocol (SCIP) began in 1994 in the U.S. as a combined Department of Defense and vendor working group
- The group was later expanded in 2001 to include NATO and NATO partners
- The goal of this group was to develop the next generation interoperable application layer security protocol supporting the U.S. Government and NATO interests
- The SCIP Working Group meets one or two times per year

SCIP Information Access and Awareness Issue

- SCIP standards are currently available to participating government/military communities and select OEMs of network equipment and call management servers that support SCIP
- Devices that implement the SCIP standards transparently operate over military and commercial digital carriers
- Most commercial network administrators and security personnel are not aware of SCIP
  - Can result in the SCIP media subtype “scip” being removed from the SDP.
  - The lack of awareness among the network and security community has become a larger issue as the use of SCIP grows over more commercial networks, and as network security devices become more restrictive of unknown media

Overview of SCIP RFC (1 of 2)

- Devices using the signaling in the SCIP Draft RFC are presently deployed in products used by US and NATO
  - The SCIP Draft RFC contains SDP signaling equivalent to SCIP 214.2 signaling
- The SCIP RFC enables network equipment manufacturers to provide an equipment configuration that supports SCIP as a media subtype
  - Enables network administrators and network security personnel to define and implement a compatible network policy which permits the 'scip' media subtype to traverse the network
  - End-to-end bit integrity – no compression or transcoding on the channel
  - Data streams treated as "clear-channel data" similar to RFC 4040

Overview of SCIP RFC (2 of 2)

- Two media subtypes have been registered with IANA as RTP Payload Format Media Types
  - “audio/scip”
  - “video/scip”
- The RFC is needed to provide additional information for these media subtypes
  - Media Format description
  - Payload Format (RTP Header Fields, Payload Format Parameters)
  - SDP Declaration (Mapping to SDP, Mapping Examples)

SDP Declaration to Support a SCIP Session

- SCIP devices are presently deployed on U.S. and NATO tactical networks, many national networks, and some commercial networks using the following SDP media and submedia types
- Secure Session can use “audio/scip”, “video/scip” or both
- An example mapping for both audio/scip and video/scip is:

```
m=audio 50000 RTP/AVP 96
a=rtpmap:96 scip/8000
m=video 50002 RTP/AVP 97
a=rtpmap:97 scip/90000
```

Call for Adoption – SCIP WG Participation

- AVTCORE Work Item issued a Call for Adoption on January 12
  - Solicited votes to accept or reject the draft as a AVTCORE work item and asked for comments
- SCIP WG members joined the AVTCORE Group to “vote for adoption” and with some providing comments
  - Countries supporting adopting include USA, CAN, GBR, FRA, DEU, ESP, ITA, NOR, SWE, CZE, TUR, and POL
  - No objectors

Call for Adoption - SCIP Draft RFC Comments and Updates (1 of 2)

- Section 4.1:
  - Conformance to RFC 3550 will change from “should” to “shall”
  - Added text to stipulate that the network should not repacketize SCIP packets
  - Modified wording related to the use of the marker bit
    - Marker bit shall be set to zero for discontinuous traffic
    - Marker bit for continuous traffic will be based on underlying media subtype specification (unchanged)

Call for Adoption - SCIP Draft RFC Comments and Updates (2 of 2)

- Section 5.1/5.2: Interoperability considerations: N/A
  - “N/A” was specified because there are no previous versions of the SCIP submedia type
- Section 8.1/8.2:
  - References to SCIP-214.2 and SCIP-210 to be moved from normative to informational
  - Document name will change to “draft-ietf-avtcore-rtp-scip-00”

Summary, Conclusions, and Questions

- Issues have occurred because OEMs of network equipment, network administrators and security personnel are unaware of SCIP and SDP contents necessary to establish a secure session
- The SCIP draft RFC increases IETF awareness of the SCIP WG and its efforts to achieve international interoperability
- The purpose of the SCIP RFC is to provide global access to information necessary to support SCIP
- A reference to an RFC provides information to system/network architects, network administrators, security personnel, network OEMs, risk analysts, and procurement personnel that is needed to include SCIP in the system security lifecycle
- What is the next step?

Wrapup and Next Steps

- Action items
- Next steps

Thank you

Special thanks to:

The Secretariat, WG Participants & ADs