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SDP Offer/Answer for RTP using QUIC as Transport - Design Issues  
draft-dawkins-avtcore-sdp-rtp-quic-issues-00

## Abstract

This document is intended to capture SDP aspects of RTP over QUIC design issues that have arisen, been discussed by the AVTCORE working group, and have reached a resolution that can be included in "SDP Offer/Answer for RTP using QUIC as Transport".

This document is a companion document to "SDP Offer/Answer for RTP using QUIC as Transport". That document focuses on the description and registration of SDP "proto" attribute parameters with IANA, to allow applications that rely on SDP Offer/Answer to negotiate the QUIC protocol as an encapsulation for RTP.

"SDP Offer/Answer for RTP using QUIC as Transport" is itself a companion document to "RTP over QUIC", and follows the lead of the latter specification as it evolves.

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## [1.](#) Introduction

This document is intended to capture SDP ([\[RFC8866\]](#)) aspects of RTP ([\[RFC3550\]](#)) over QUIC ([\[RFC9000\]](#)) design issues that have arisen, been discussed by one or more IETF working groups, and have reached a resolution that can be included in "SDP Offer/Answer for RTP using QUIC as Transport" [[I-D.dawkins-avtcore-sdp-rtp-quic](#)].

This document is a companion document to "SDP Offer/Answer for RTP using QUIC as Transport" ([\[I-D.dawkins-avtcore-sdp-rtp-quic\]](#)). That document focuses on the description and registration of SDP ([\[RFC8866\]](#)) "proto" attribute parameters with IANA ([\[SDP-parameters\]](#)), to allow applications that rely on SDP Offer/Answer ([\[RFC3264\]](#)) to negotiate the QUIC protocol([\[RFC9000\]](#)) as an encapsulation for RTP ([\[RFC3550\]](#)).

"SDP Offer/Answer for RTP using QUIC as Transport" ([\[I-D.dawkins-avtcore-sdp-rtp-quic\]](#)) is itself a companion document to "RTP over QUIC" ([\[I-D.engelbart-rtp-over-quic\]](#)), and follows the lead of follows the lead of the latter specification as it evolves.

### 1.1. Notes for Readers

(Note to RFC Editor - if this document ever reaches you, please remove this section)

This document is intended to stimulate discussion about how proponents of "RTP over QUIC" expect that to work, recognizing that not everyone has the same goals in mind, but it understanding what the choices are will likely be helpful in making those choices, especially when the results of a choice provide direction that will allow implementers to agree on strategies and reuse as much code as possible.

The author learned through some experience that it would be really good to collect questions and design issues about "RTP over QUIC", or even "Media Over QUIC", in one place, because trying to track what was being discussed in multiple and partially overlapping venues was a recipe for brain damage, especially when a topic would come up under the "Media Over QUIC" banner, and then seem to be useful for "RTP over QUIC", so potentially signaled in SDP.

This document is intended to keep at least one person sane. If it keeps more than one person sane, I've made the world a slightly

better place.

## 1.2. Relationship with other documents

[I-D.dawkins-avtcore-sdp-rtp-quic] will reflect answers to the questions contained in this document, but the discussion material in this document would not be appropriate for inclusion in a draft that focuses on SDP description and IANA registration. This document might be worth publishing on its own, but is primarily intended to guide discussion that will feed into [\[I-D.dawkins-avtcore-sdp-rtp-quic\]](#).

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## 1.3. Discussion and Contribution Venues for this draft.

(Note to RFC Editor - if this document ever reaches you, something has gone terribly wrong. Please notify your local IESG for guidance)

With the concurrence of the AVTCORE and MMUSIC working group co-chairs, SDP aspects of RTP over QUIC protoposals should be discussed in the AVTCORE working group, in the same venue where RTP over QUIC proposals are being discussed. When proposals for RTP over SIP have stablized in AVTCORE, this document will be sent to the MMUSIC working group for review by SDP experts, but SDP-specific comments are welcomed at any time.

Design issues relevant for [\[I-D.dawkins-avtcore-sdp-rtp-quic\]](#) may arise in a variety of venues. At this time, AVTCORE is actively considering adoption of "RTP over QUIC" ([\[I-D.engelbart-rtp-over-quic\]](#)), so this document will reflect those issues, but protocol specifications adopted by any other IETF working group relying on RTP-over-QUIC connections that are established using SDP would also be a candidate to be tracked.

Readers are invited to open issues and send pull requests with contributed text for this document in the GitHub repository at <https://github.com/SpencerDawkins/sdp-rtp-quic-issues>. The direct link to the list of issues is <https://github.com/SpencerDawkins/sdp-rtp-quic-issues/issues>.

## 2. Design Issues Resolutions Ready to be Reflected in [\[I-D.dawkins-avtcore-sdp-rtp-quic\]](#)

These issues can be found in <https://github.com/SpencerDawkins/sdp-rtp-quic-issues/issues>, by looking for the label "Solution Proposed".

## 2.1. What AVP Profiles to Register

This design issue was surprisingly difficult to resolve. The first design choice was between

- \* Registering only "insecure" AVP profiles, such as "QUIC/RTP/AVPF", because "secure AVP profiles, such as "QUIC/RTP/SAVPF", mean that the RTP payloads are encrypted using "Secure Real-time Transport Protocol (SRTP)" ([\[RFC3711\]](#)), which isn't necessary because RTP over QUIC payloads will already be encrypted by QUIC, and
- \* Also registering "secure" AVP profiles, such as "QUIC/RTP/SAVPF", for various reasons, including

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- allowing endpoints to use "double encryption", using both SRTP and QUIC to encrypt the RTP payload, in use cases where that is valuable
- giving RTP middleboxes ([\[RFC7667\]](#)) a hint, to middleboxes that they should use SRTP when they forward RTP-over-QUIC packets to non-RTP-over-QUIC endpoints.

Key points made during this discussion were

- \* We understand that it is possible to do double encryption using SRTP over QUIC, but we haven't found any use cases where that's required (yet).
- \* Double encryption increases processing overhead, and adds 10 bytes of overhead (since there are two HMACs)
- \* If use cases that require double encryption are identified in the future, the appropriate AVP profiles can be registered with IANA at that time, to address non-theoretical requirements.
- \* Using secure AVP profiles when the RTP-over-QUIC payloads are not,

in fact, encrypted by SRTP, as a hack to signal intent that middleboxes forwarding RTP-over-QUIC payloads to non-RTP-over-QUIC endpoints should use SRTP encryption is bogus, and isn't likely to be sufficient to handle all of the multi-endpoint topologies described in [[RFC7667](#)].

Note: After working group discussions at IETF 113, one more observation popped up - that if our goal is to register QUIC/RTP/AVPF, we should actually be registering UDP/QUIC/RTP/AVPF, registration of other QUIC/RTP AVP profiles that aren't running over UDP.

After investigation, I don't think this is necessary unless QUIC is also defined to run over TCP, and even then, only if (say) TCP/QUIC/RTP/AVPF is considered to be a viable protocol stack for RTP usage.

#### [2.1.1.](#) Proposal to be implemented in [draft-dawkins-avtcore-sdp-rtp-quic](#)

We will register QUIC/RTP/AVPF, and await further non-theoretical requirements to register other profiles (But see [Section 2.2](#)).

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#### [2.2.](#) QUIC Streams, QUIC Datagrams, or both?

Discussion of this issue centered on whether people were getting support for a model they plan to use, rather than preventing other people from using a model they did not plan to use.

After that became clear, and after [[I-D.engelbart-rtp-over-quic](#)] added support for both streams and datagrams, everything became clear.

#### [2.2.1.](#) Proposal to be implemented in [draft-dawkins-avtcore-sdp-rtp-quic](#)

Registered QUIC/RTP proto values will contain parallel registrations that include "stream" and "dgram".

For instance, if we intend to register QUIC/RTP/AVPF, we will actually register QUIC/stream/RTP/AVPF and QUIC/dgram/RTP/AVPF,

### 3. Design Issue Resolutions Under Discussion in IETF Working Groups

These issues can be found in <https://github.com/SpencerDawkins/sdp-rtp-quic-issues/issues>, by looking for the label "Presented to Working Group" and/or "Mailing List".

### 4. Design Issue "Parking Lot", for Design Issues That Have Not Been Discussed

These issues can be found in <https://github.com/SpencerDawkins/sdp-rtp-quic-issues/issues>, by looking for issues with no labels.

### 5. IANA Considerations

This document makes no requests of IANA.

### 6. Security Considerations

This document is intended as the basis for discussion about protocol mechanisms that will be described in other documents. As a discussion paper, this document introduces no new security considerations, and any new security considerations resulting from those discussions should be included in the documents that actually describe protocol mechanisms.

### 7. Acknowledgments

Thanks to the following folks who have contributed interesting questions and even more interesting suggested text proposals. These folk include Bernard Aboba, Colin Perkins, Justin Uberti, Martin Thomson, Richard Bradbury, Roman Shpount, Ross Finlayson, Sergio Garcia Murillo, Suhas Nandakumar, Tolga Asveren

(Your name also could appear here. You are invited to comment and contribute, as described in "Contribution and Discussion Venues for this draft" above)

## [8.](#) References

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