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Registering Values of the SDP 'proto' Field for Transporting RTP Media over TCP under Various RTP Profiles

Abstract

The Real-time Transport Protocol (RTP) specification establishes a registry of profile names for use by higher-level control protocols, such as the Session Description Protocol (SDP), to refer to the transport methods. This specification describes the following new SDP transport protocol identifiers for transporting RTP Media over TCP: 'TCP/RTP/AVPF', 'TCP/RTP/SAVP', 'TCP/RTP/SAVPF', 'TCP/DTLS/RTP/SAVP', 'TCP/DTLS/RTP/SAVPF', 'TCP/TLS/RTP/AVP', and 'TCP/TLS/RTP/AVPF'.

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1. Overview

The Real-time Transport Protocol (RTP) provides end-to-end network transport functions suitable for applications transmitting real-time data such as audio or video over multicast or unicast network services. The data transport is augmented by the RTP Control Protocol (RTCP) to allow monitoring of the data delivery in a manner scalable to large multicast networks and to provide minimal control and identification functionality.

"SDP: Session Description Protocol" [RFC4566] provides a general-purpose format for describing multimedia sessions in announcements or invitations. "TCP-Based Media Transport in the Session Description Protocol (SDP)" [RFC4145] specifies a general mechanism for describing media transport over TCP using SDP with [RFC4571] defining a method for framing RTP and RTCP packets [RFC3550] onto a connection-oriented transport (such as TCP). "Connection-Oriented Media Transport over the Transport Layer Security (TLS) Protocol in the Session Description Protocol (SDP)" [RFC4572] extends [RFC4145] for describing TCP-based media streams that are protected using TLS [RFC5246].

This specification describes additional SDP transport protocol identifiers for transporting RTP media over TCP as defined in Section 3.

2. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [RFC2119].

3. Protocol Identifiers

The "m=" line in SDP specifies, among other items, the transport protocol (identified via the "proto" field) to be used for the media in the session. See Section 5.14 (Media Descriptions) of SDP [RFC4566] for a discussion on transport protocol identifiers.

The following is the format for an "m=" line, as specified in [RFC4566]:

```
m=<media> <port> <proto> <fmt> ...
```

3.1. TCP/RTP/AVPF Transport Realization

The TCP/RTP/AVPF transport describes RTP media with RTCP-based feedback [RFC4585] over TCP.

The RTP/AVPF stream over TCP is realized using the framing method defined in [RFC4571].

3.2. TCP/RTP/SAVP Transport Realization

The TCP/RTP/SAVP transport describes Secure RTP (SRTP) media [RFC3711] over TCP.

The RTP/SAVP stream over TCP is realized using the framing method defined in [RFC4571].

3.3. TCP/RTP/SAVPF Transport Realization

The TCP/RTP/SAVPF transport describes Secure RTP media with RTCP-based feedback [RFC5124] over TCP.

The RTP/SAVPF stream over TCP is realized using the framing method defined in [RFC4571].

3.4. TCP/DTLS/RTP/SAVP Transport Realization

The TCP/DTLS/RTP/SAVP transport describes Secure RTP media [RFC3711] using Datagram Transport Layer Security SRTP (DTLS-SRTP) [RFC5764] over TCP.

RTP/SAVP using DTLS-based key establishment is realized according to the procedures defined in [RFC5764]. Also, the framing specified in [RFC4571] is used to transport DTLS-SRTP packets over TCP.

3.5. TCP/DTLS/RTP/SAVPF Transport Realization

The TCP/DTLS/RTP/SAVPF transport describes Secure RTP media with RTCP-based feedback [RFC5124] using DTLS-SRTP over TCP.

RTP/SAVPF using DTLS-based key establishment is realized according to the procedures defined in [RFC5764]. Also, the framing specified in [RFC4571] is used to transport DTLS-SRTP packets over TCP.

3.6. TCP/TLS/RTP/AVP Transport Realization

The TCP/TLS/RTP/AVP transport describes RTP Media on top of TLS over TCP.

RTP/AVP packets are framed using the procedures from [RFC4571] and are transported as application data messages over the TLS association setup using the procedures from [RFC4572].

3.7. TCP/TLS/RTP/AVPF Transport Realization

The TCP/TLS/RTP/AVPF transport describes RTP media with RTCP-based feedback [RFC5124] on top of TLS over TCP.

RTP/AVPF packets are framed using the procedures from [RFC4571] and are transported as application data messages over the TLS association setup using the procedures from [RFC4572].

4. ICE Considerations

When procedures from [RFC6544] are used to set up Interactive Connectivity Establishment (ICE) [RFC5245] candidates for a TCP transport, the framing mechanism from [RFC4571] MUST be used for framing Session Traversal Utilities for NAT (STUN) packets (for keepalives and consent checks), as defined in Section 3 of [RFC6544].

5. IANA Considerations

This specification describes the following new SDP transport protocol identifiers: 'TCP/RTP/AVPF', 'TCP/RTP/SAVP', 'TCP/RTP/SAVPF', 'TCP/DTLS/RTP/SAVP', 'TCP/DTLS/RTP/SAVPF', 'TCP/TLS/RTP/AVP', and 'TCP/TLS/RTP/AVPF', as defined in Section 3. These values have been registered by the IANA under the "proto" subregistry in the "Session Description Protocol (SDP) Parameters" registry.

Type	SDP Name	Reference
proto	TCP/RTP/AVPF	RFC 7850
proto	TCP/RTP/SAVP	RFC 7850
proto	TCP/RTP/SAVPF	RFC 7850
proto	TCP/DTLS/RTP/SAVP	RFC 7850
proto	TCP/DTLS/RTP/SAVPF	RFC 7850
proto	TCP/TLS/RTP/AVP	RFC 7850
proto	TCP/TLS/RTP/AVPF	RFC 7850

6. Security Considerations

The new "proto" identifiers registered by this document in the SDP parameters registry maintained by IANA are primarily for use by the offer/answer model of the Session Description Protocol [RFC3264] for the negotiation and establishment of RTP-based media over the TCP transport. This specification doesn't introduce any additional security considerations beyond those specified by the individual transport protocols identified in the "proto" identifiers and those detailed in Section 7 of [RFC4566].

7. References

7.1. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997, <<http://www.rfc-editor.org/info/rfc2119>>.
- [RFC4566] Handley, M., Jacobson, V., and C. Perkins, "SDP: Session Description Protocol", RFC 4566, DOI 10.17487/RFC4566, July 2006, <<http://www.rfc-editor.org/info/rfc4566>>.
- [RFC4571] Lazzaro, J., "Framing Real-time Transport Protocol (RTP) and RTP Control Protocol (RTCP) Packets over Connection-Oriented Transport", RFC 4571, DOI 10.17487/RFC4571, July 2006, <<http://www.rfc-editor.org/info/rfc4571>>.

- [RFC4572] Lennox, J., "Connection-Oriented Media Transport over the Transport Layer Security (TLS) Protocol in the Session Description Protocol (SDP)", RFC 4572, DOI 10.17487/RFC4572, July 2006, <<http://www.rfc-editor.org/info/rfc4572>>.
- [RFC5245] Rosenberg, J., "Interactive Connectivity Establishment (ICE): A Protocol for Network Address Translator (NAT) Traversal for Offer/Answer Protocols", RFC 5245, DOI 10.17487/RFC5245, April 2010, <<http://www.rfc-editor.org/info/rfc5245>>.
- [RFC5764] McGrew, D. and E. Rescorla, "Datagram Transport Layer Security (DTLS) Extension to Establish Keys for the Secure Real-time Transport Protocol (SRTP)", RFC 5764, DOI 10.17487/RFC5764, May 2010, <<http://www.rfc-editor.org/info/rfc5764>>.
- [RFC6544] Rosenberg, J., Keranen, A., Lowekamp, B., and A. Roach, "TCP Candidates with Interactive Connectivity Establishment (ICE)", RFC 6544, DOI 10.17487/RFC6544, March 2012, <<http://www.rfc-editor.org/info/rfc6544>>.

7.2. Informative References

- [RFC3264] Rosenberg, J. and H. Schulzrinne, "An Offer/Answer Model with Session Description Protocol (SDP)", RFC 3264, DOI 10.17487/RFC3264, June 2002, <<http://www.rfc-editor.org/info/rfc3264>>.
- [RFC3550] Schulzrinne, H., Casner, S., Frederick, R., and V. Jacobson, "RTP: A Transport Protocol for Real-Time Applications", STD 64, RFC 3550, DOI 10.17487/RFC3550, July 2003, <<http://www.rfc-editor.org/info/rfc3550>>.
- [RFC3711] Baugher, M., McGrew, D., Naslund, M., Carrara, E., and K. Norrman, "The Secure Real-time Transport Protocol (SRTP)", RFC 3711, DOI 10.17487/RFC3711, March 2004, <<http://www.rfc-editor.org/info/rfc3711>>.
- [RFC4145] Yon, D. and G. Camarillo, "TCP-Based Media Transport in the Session Description Protocol (SDP)", RFC 4145, DOI 10.17487/RFC4145, September 2005, <<http://www.rfc-editor.org/info/rfc4145>>.

- [RFC4585] Ott, J., Wenger, S., Sato, N., Burmeister, C., and J. Rey, "Extended RTP Profile for Real-time Transport Control Protocol (RTCP)-Based Feedback (RTP/AVPF)", RFC 4585, DOI 10.17487/RFC4585, July 2006, <<http://www.rfc-editor.org/info/rfc4585>>.
- [RFC5124] Ott, J. and E. Carrara, "Extended Secure RTP Profile for Real-time Transport Control Protocol (RTCP)-Based Feedback (RTP/SAVPF)", RFC 5124, DOI 10.17487/RFC5124, February 2008, <<http://www.rfc-editor.org/info/rfc5124>>.
- [RFC5246] Dierks, T. and E. Rescorla, "The Transport Layer Security (TLS) Protocol Version 1.2", RFC 5246, DOI 10.17487/RFC5246, August 2008, <<http://www.rfc-editor.org/info/rfc5246>>.

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