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C. Holmberg
Ericsson
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Session Description Protocol (SDP) Offer/Answer Clarifications
for RTP/RTCP Multiplexing

Abstract

This document updates RFC 5761 by clarifying the SDP offer/answer negotiation of RTP and RTP Control Protocol (RTCP) multiplexing. It makes it clear that an answerer can only include an "a=rtcp-mux" attribute in a Session Description Protocol (SDP) answer if the associated SDP offer contained the attribute.

Status of This Memo

This is an Internet Standards Track document.

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Table of Contents

1. Introduction 3

2. Conventions 3

3. Update to RFC 5761 3

 3.1. Update to Section 5.1.1 4

4. Security Considerations 6

5. IANA Considerations 6

6. Normative References 6

Acknowledgements 6

Author's Address 7

1. Introduction

RFC 5761 [RFC5761] specifies how to multiplex RTP data packets and RTP Control Protocol (RTCP) packets on a single UDP port, and how to negotiate usage of such multiplexing using the SDP offer/answer mechanism [RFC3264] with an "a=rtcp-mux" attribute. However, the text is unclear on whether an answerer is allowed to include the attribute in an answer even if the associated offer did not contain an attribute.

This document updates RFC 5761 [RFC5761] by clarifying that an answerer can only include an "a=rtcp-mux" attribute in an answer if the associated offer contained the attribute. It also clarifies that the negotiation of RTP and RTCP multiplexing is for usage in both directions.

2. Conventions

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 [RFC2119].

3. Update to RFC 5761

This section updates Section 5.1.1 of RFC 5761 by clarifying that an answerer can only include an "a=rtcp-mux" attribute in an answer if the associated offer contained the attribute, and by clarifying that the negotiation of RTP and RTCP multiplexing is for usage in both directions.

3.1. Update to Section 5.1.1

In this section, any references to Sections 4 and 8 are to those sections in [RFC5761].

OLD TEXT:

When the Session Description Protocol (SDP) [8] is used to negotiate RTP sessions following the offer/answer model [9], the "a=rtcp-mux" attribute (see Section 8) indicates the desire to multiplex RTP and RTCP onto a single port. The initial SDP offer MUST include this attribute at the media level to request multiplexing of RTP and RTCP on a single port. For example:

```
v=0
o=csp 1153134164 1153134164 IN IP6 2001:DB8::211:24ff:fea3:7a2e
s=-
c=IN IP6 2001:DB8::211:24ff:fea3:7a2e
t=1153134164 1153137764
m=audio 49170 RTP/AVP 97
a=rtpmap:97 iLBC/8000
a=rtcp-mux
```

This offer denotes a unicast voice-over-IP session using the RTP/AVP profile with iLBC coding. The answerer is requested to send both RTP and RTCP to port 49170 on IPv6 address 2001:DB8::211:24ff:fea3:7a2e.

If the answerer wishes to multiplex RTP and RTCP onto a single port, it MUST include a media-level "a=rtcp-mux" attribute in the answer. The RTP payload types used in the answer MUST conform to the rules in Section 4.

If the answer does not contain an "a=rtcp-mux" attribute, the offerer MUST NOT multiplex RTP and RTCP packets on a single port. Instead, it should send and receive RTCP on a port allocated according to the usual port-selection rules (either the port pair, or a signalled port if the "a=rtcp:" attribute [10] is also included). This will occur when talking to a peer that does not understand the "a=rtcp-mux" attribute.

When SDP is used in a declarative manner, the presence of an "a=rtcp-mux" attribute signals that the sender will multiplex RTP and RTCP on the same port. The receiver MUST be prepared to receive RTCP packets on the RTP port, and any resource reservation needs to be made including the RTCP bandwidth.

NEW TEXT:

When the Session Description Protocol (SDP) [8] is used to negotiate RTP sessions following the offer/answer model [9], the "a=rtcp-mux" attribute (see Section 8) indicates the desire to multiplex RTP and RTCP onto a single port, and the usage is always negotiated for both directions.

If the offerer wishes to multiplex RTP and RTCP onto a single port, the initial SDP offer MUST include the attribute at the media level to request multiplexing of RTP and RTCP on a single port. For example:

```
v=0
o=csp 1153134164 1153134164 IN IP6 2001:DB8::211:24ff:fea3:7a2e
s=-
c=IN IP6 2001:DB8::211:24ff:fea3:7a2e
t=1153134164 1153137764
m=audio 49170 RTP/AVP 97
a=rtpmap:97 iLBC/8000
a=rtcp-mux
```

This offer denotes a unicast voice-over-IP session using the RTP/AVP profile with Internet Low Bit Rate Codec (iLBC) coding. The answerer is requested to send both RTP and RTCP to port 49170 on IPv6 address 2001:DB8::211:24ff:fea3:7a2e.

If the offer contains the "a=rtcp-mux" attribute, and if the answerer wishes to multiplex RTP and RTCP onto a single port, it MUST include a media-level "a=rtcp-mux" attribute in the answer. The RTP payload types used in the answer MUST conform to the rules in Section 4. If the offer does not contain the "a=rtcp-mux" attribute, the answerer MUST NOT include an "a=rtcp-mux" attribute in the answer, and the answerer MUST NOT multiplex RTP and RTCP packets on a single port.

If the answer contains an "a=rtcp-mux" attribute, the offerer and answerer MUST multiplex RTP and RTCP packets on a single port.

If the answer does not contain an "a=rtcp-mux" attribute, the offerer and answerer MUST NOT multiplex RTP and RTCP packets on a single port. Instead, they should send and receive RTCP on a port allocated according to the usual port-selection rules (either the port pair, or a signalled port if the "a=rtcp:" attribute [10] is also included). This will occur when talking to a peer that does not understand the "a=rtcp-mux" attribute.

When SDP is used in a declarative manner, the presence of an "a=rtcp-mux" attribute signals that the sender will multiplex RTP and RTCP on the same port. The receiver MUST be prepared to receive RTCP packets on the RTP port, and any resource reservation needs to be made including the RTCP bandwidth.

4. Security Considerations

The security considerations for RTP and RTCP multiplexing are described in RFC 5761. This specification does not impact those security considerations.

5. IANA Considerations

IANA has added a reference to this document for the att-field (media level only) registration "rtcp-mux" in the "Session Description Protocol (SDP) Parameters" registry.

6. 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>>.
- [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>>.
- [RFC5761] Perkins, C. and M. Westerlund, "Multiplexing RTP Data and Control Packets on a Single Port", RFC 5761, DOI 10.17487/RFC5761, April 2010, <<http://www.rfc-editor.org/info/rfc5761>>.

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Author's Address

Christer Holmberg
Ericsson
Hirsalantie 11
Jorvas 02420
Finland

Email: christer.holmberg@ericsson.com