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.

This document is a product of the Internet Engineering Task Force (IETF). It represents the consensus of the IETF community. It has received public review and has been approved for publication by the Internet Engineering Steering Group (IESG). Further information on Internet Standards is available in Section 2 of RFC 7841.

Information about the current status of this document, any errata, and how to provide feedback on it may be obtained at http://www.rfc-editor.org/info/rfc8035.
Copyright Notice

Copyright (c) 2016 IETF Trust and the persons identified as the
document authors. All rights reserved.

This document is subject to BCP 78 and the IETF Trust’s Legal
Provisions Relating to IETF Documents
(http://trustee.ietf.org/license-info) in effect on the date of
publication of this document. Please review these documents
carefully, as they describe your rights and restrictions with respect
to this document. Code Components extracted from this document must
include Simplified BSD License text as described in Section 4.e of
the Trust Legal Provisions and are provided without warranty as
described in the Simplified BSD License.

This document may contain material from IETF Documents or IETF
Contributions published or made publicly available before November
10, 2008. The person(s) controlling the copyright in some of this
material may not have granted the IETF Trust the right to allow
modifications of such material outside the IETF Standards Process.
Without obtaining an adequate license from the person(s) controlling
the copyright in such materials, this document may not be modified
outside the IETF Standards Process, and derivative works of it may
not be created outside the IETF Standards Process, except to format
it for publication as an RFC or to translate it into languages other
than English.
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.
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


Acknowledgements

Thanks to Colin Perkins, Magnus Westerlund, Paul Kyzivat, and Roni Even for providing comments on the document. Thomas Belling provided useful input in the discussions that took place in 3GPP and resulted in the submission of the document. Elwyn Davies performed the Gen-ART review. Rick Casarez performed the Ops-Dir review. Alissa Cooper and Spencer Dawkins provided IESG review comments.
Author’s Address

Christer Holmberg
Ericsson
Hirsalantie 11
Jorvas 02420
Finland

Email: christer.holmberg@ericsson.com