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**RTP/RTCP Multiplexing SDP Offer/Answer Clarifications**  
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Abstract

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

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## [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](#)], using 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 references to Sections [4](#) and [8](#) are to 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 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 is requested to add a reference to this document for the add-field (media level only) registration "rtcp-mux" in Session Description Protocol (SDP) Parameters registry.

#### **6. Acknowledgements**

Thanks to Colin Perkins, Magnus Westerlund, Paul Kyzivat, 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.

#### **7. Change Log**

[RFC EDITOR NOTE: Please remove this section when publishing]

Change from -05

- o Changes based on IESG- and Gen-Art reviews:

- o - Change of document title.

- o - Editorial fix.

Change from -04

- o Change of document title.

Change from -03





- o Addition to IANA Considerations.

Change from -02

- o Editorial change based on Gen-ART review of Elwyn Davis (<https://www.ietf.org/mail-archive/web/gen-art/current/msg13713.html>).

Change from -01

- o pre-RFC5378 disclaimer added.

Change from -00

- o Editorial changes based on WGLC comments from Roni Even.

## **8. 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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