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RTP Control Protocol (RTCP) Port for
Source-Specific Multicast (SSM) Sessions

Abstract

The Session Description Protocol (SDP) has an attribute that allows RTP applications to specify an address and a port associated with the RTP Control Protocol (RTCP) traffic. In RTP-based source-specific multicast (SSM) sessions, the same attribute is used to designate the address and the RTCP port of the Feedback Target in the SDP description. However, the RTCP port associated with the SSM session itself cannot be specified by the same attribute to avoid ambiguity, and thus, is required to be derived from the "m=" line of the media description. Deriving the RTCP port from the "m=" line imposes an unnecessary restriction. This document removes this restriction by introducing a new SDP attribute.

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1. Introduction

The Session Description Protocol (SDP) [RFC4566] has an attribute that allows RTP applications [RFC3550] to specify an address and a port associated with the RTP Control Protocol (RTCP) traffic [RFC3605]. This attribute is called 'rtcp'.

Now consider a network where one or more media senders send RTP packets to a distribution source, which then multicasts these RTP packets to multicast receivers using a source-specific multicast (SSM) arrangement [RFC5760]. The distribution source also multicasts the forward RTCP traffic (i.e., RTCP sender reports and receiver reports or their summaries) to the receivers in the same SSM session.

In RTP-based SSM sessions, the 'rtcp' attribute is used to designate the address and the RTCP port of the Feedback Target in the SDP description [RFC5760]. However, the RTCP port associated with the SSM session itself cannot be specified by the same attribute since it could potentially cause ambiguity. Thus, the multicast RTCP port is required to be derived from the "m=" line of the media description

(see Section 10.2 of [RFC5760]) by following the +1 rule (see Section 11 of [RFC3550]). However, [RFC3550] lifted the requirement for the +1 rule since it imposed an unnecessary restriction on RTCP port selection.

In this specification, we introduce a new SDP attribute to remove this restriction. The new attribute allows the multicast sender to use its desired port in the RTCP session. This document updates [RFC5760].

2. The 'multicast-rtcp' Attribute

In RTP-based SSM sessions, the distribution source can use different multicast RTP and RTCP ports to send the RTP and RTCP packets, respectively. Alternatively, the distribution source can use RTP/RTCP port muxing [RFC5761], in which case the RTP and RTCP packets are sent to the same destination port in the SSM session.

For the cases when the distribution source does not want to use the one higher port for the RTCP traffic, this document defines a new SDP attribute, called 'multicast-rtcp'. By using this attribute, the distribution source uses a desired port for the SSM RTCP session. In the absence of the 'multicast-rtcp' attribute, the +1 rule applies following [RFC5760].

The following ABNF [RFC5234] syntax formally describes the 'multicast-rtcp' attribute:

```
rtcp-attribute = "a=multicast-rtcp:" port CRLF
```

Figure 1: ABNF syntax for the 'multicast-rtcp' attribute

Here, the 'port' token is defined as specified in Section 9 of [RFC4566].

The 'multicast-rtcp' attribute is defined as both a media-level and session-level attribute. Except where stated otherwise in this document, the rules of [RFC3550] apply.

3. SDP Example

In the session description shown in Figure 2, a source stream is multicast from a distribution source (with a source IP address of 198.51.100.1) to the multicast destination address of 233.252.0.2 and port 41000. The forward RTCP traffic is multicast in the same multicast group but to port 42000 as specified by the "a=multicast-rtcp:42000" line. A feedback target with an address of 192.0.2.1 and port of 43000 is specified by the 'rtcp' attribute.

```
v=0
o=ali 1122334455 1122334466 IN IP4 ssm.example.com
s='multicast-rtcp' Example
t=0 0
a=rtcp-unicast:rsi
m=video 41000 RTP/AVPF 98
i=Multicast Stream
c=IN IP4 233.252.0.2/255
a=source-filter:incl IN IP4 233.252.0.2 198.51.100.1
a=rtpmap:98 MP2T/90000
a=multicast-rtcp:42000
a=rtcp:43000 IN IP4 192.0.2.1
a=mid:1
```

Figure 2: Example SDP showing the use of the 'multicast-rtcp' attribute

4. Security Considerations

The 'multicast-rtcp' attribute is not believed to introduce any significant security risk to multimedia applications. A malevolent third party could use this attribute to redirect the RTCP traffic, but this requires intercepting and rewriting the packets carrying the SDP description; and if an interceptor can do that, many more attacks are possible, including a wholesale change of the addresses and port numbers at which the media will be sent.

In order to avoid attacks of this sort, the SDP description needs to be integrity protected and provided with source authentication. This can, for example, be achieved on an end-to-end basis using S/MIME [RFC5652] [RFC5751] when SDP is used in a signaling packet using MIME types (application/sdp). Alternatively, HTTPS [RFC2818] or the authentication method in the Session Announcement Protocol (SAP) [RFC2974] could be used as well.

5. IANA Considerations

The following contact information shall be used for all registrations in this document:

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5.1. Registration of SDP Attributes

This document registers a new attribute name in SDP.

```
SDP Attribute ("att-field"):  
Attribute name:    multicast-rtcp  
Long form:        Port in the multicast RTCP session  
Type of name:     att-field  
Type of attribute: Media or session level  
Subject to charset: No  
Purpose:          Specifies the port for the SSM RTCP session  
Reference:        [RFC6128]  
Values:           See [RFC6128]
```

6. Acknowledgments

Thanks to Colin Perkins and Magnus Westerlund for suggesting the name for the 'multicast-rtcp' attribute and providing text for portions of this specification. Some parts of this specification are based on [RFC3605] and [RFC5760]. So, also thanks to those who contributed to those specifications.

7. References

7.1. Normative References

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7.2. Informative References

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- [RFC2974] Handley, M., Perkins, C., and E. Whelan, "Session Announcement Protocol", RFC 2974, October 2000.
- [RFC5751] Ramsdell, B. and S. Turner, "Secure/Multipurpose Internet Mail Extensions (S/MIME) Version 3.2 Message Specification", RFC 5751, January 2010.

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