Network Working Group
Request for Comments: 4574
Category: Standards Track

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August 2006

The Session Description Protocol (SDP) Label Attribute

Status of This Memo

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Abstract

This document defines a new Session Description Protocol (SDP) media-level attribute: "label". The "label" attribute carries a pointer to a media stream in the context of an arbitrary network application that uses SDP. The sender of the SDP document can attach the "label" attribute to a particular media stream or streams. The application can then use the provided pointer to refer to each particular media stream in its context.

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1. Introduction

SDP is being used by a variety of distributed-over-the-network applications. These applications deal with multiple sessions being described by SDP [4] and serving multiple users or services in the context of a single application instance. Applications of this kind need a means to identify a particular media stream across multiple SDP descriptions exchanged with different users.

The XCON framework is an example of a centralized conference architecture that uses SDP according to the offer/answer mechanism defined in [3] to establish media streams with each of the conference participants. Additionally, XCON identifies the need to uniquely identify a media stream in terms of its role in a conference regardless of its media type, transport protocol, and media format. This can be accomplished by using an external document that points to the appropriate media stream and provides information (e.g., the media stream's role in the conference) about it. The SIP Event Package for Conference State [7] defines and uses a concrete format for such external documents.

This specification defines the SDP [4] "label" media-level attribute, which provides a pointer to a media stream that is described by an 'm' line in an SDP session description.

2. Terminology

In this document, the key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" are to be interpreted as described in BCP 14, RFC 2119 [1] and indicate requirement levels for compliant implementations.

3. Motivation for the New label Attribute

Even though SDP and its extensions already provide a few ways to refer to a media stream, none of them is appropriate to be used in the context of external documents that may be created before the session description itself and need to be handled by automata.

The 'i' SDP attribute, defined in RFC 2327 [4], can be used to label media streams. Nevertheless, values of the 'i' attribute are intended for human users and not for automata.

The 'mid' SDP attribute, defined in RFC 3388 [6], can be used to identify media streams as well. Nevertheless, the scope of 'mid' is too limited to be used by applications dealing with multiple SDP sessions. This is because values of the 'mid' attribute are meaningful in the context of a single SDP session, not in the context of a broader application (e.g., a multiparty application).

Another way of referring to a media stream is by using the order of the 'm' line in the SDP session document (e.g., the 5th media stream in the session description). This is the mechanism used in the offer/answer model [3].

The problem with this mechanism is that it can only be used to refer to media streams in session descriptions that exist already. There are scenarios where a static document needs to refer, using a pointer, to a media stream that will be negotiated by SDP means and created in the future. When the media stream is eventually created, the application needs to label the media stream so that the pointer in the static document points to the proper media stream in the session description.

4. The Label Attribute

This specification defines a new media-level value attribute: 'label'. Its formatting in SDP is described by the following ABNF [2]:

```
label-attribute    = "a=label:" pointer

pointer            = token

token              = 1*(token-char)

token-char         = %x21 / %x23-27 / %x2A-2B / %x2D-2E / %x30-39
                     / %x41-5A / %x5E-7E
```

The token-char and token elements are defined in [4] but included here to provide support for the implementor of this SDP feature.

The 'label' attribute contains a token that is defined by an application and is used in its context. The new attribute can be attached to 'm' lines in multiple SDP documents allowing the application to logically group the media streams across SDP sessions when necessary.

5. The Label Attribute in the Offer/Answer Model

This specification does not define a means to discover whether or not the peer endpoint understands the 'label' attribute because 'label' values are informative only at the offer/answer model level.

At the offer/answer level, it means that the fact that an offer does not contain label attributes does not imply that the answer should not have them. It also means that the fact that an offer contains label attributes does not imply that the answer should have them too.

In addition to the basic offer/answer rule above, applications that use 'label' as a pointer to media streams MUST specify its usage constraints. For example, such applications MAY mandate support for 'label'. In this case, the application will define means for negotiation of the 'label' attribute support as a part of its specification.

6. Example

The following is an example of an SDP session description that uses the 'label' attribute:

```
v=0
o=bob 280744730 28977631 IN IP4 host.example.com
s=
i=A Seminar on the session description protocol
c=IN IP4 192.0.2.2
t=0 0
m=audio 6886 RTP/AVP 0
a=label:1
m=audio 22334 RTP/AVP 0
a=label:2
```

7. Security Considerations

An attacker may attempt to add, modify, or remove 'label' attributes from a session description. This could result in an application behaving in a non-desirable way. So, it is strongly RECOMMENDED that integrity protection be applied to the SDP session descriptions. For session descriptions carried in SIP [5], S/MIME is the natural choice to provide such end-to-end integrity protection, as described in RFC 3261 [5]. Other applications MAY use a different form of integrity protection.

8. IANA Considerations

The IANA has registered the following new SDP attribute:

Contact name: Orit Levin oritl@microsoft.com.

Attribute name: "label".

Type of attribute: Media level.

Subject to charset: Not.

Purpose of attribute: The 'label' attribute associates a media stream with a label. This label allows the media stream to be referenced by external documents.

Allowed attribute values: A token.

9. Acknowledgements

Robert Sparks, Adam Roach, and Rohan Mahy provided useful comments on this document.

10. References

10.1. Normative References

[1] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[2] Crocker, D., Ed. and P. Overell, "Augmented BNF for Syntax Specifications: ABNF", RFC 4234, October 2005.

[3] Rosenberg, J. and H. Schulzrinne, "An Offer/Answer Model with Session Description Protocol (SDP)", RFC 3264, June 2002.

[4] Handley, M., Jacobson, V. and C. Perkins, "SDP: Session Description Protocol", RFC 4566, July 2006.

10.2. Informative References

[5] Rosenberg, J., Schulzrinne, H., Camarillo, G., Johnston, A., Peterson, J., Sparks, R., Handley, M., and E. Schooler, "SIP: Session Initiation Protocol", RFC 3261, June 2002.

[6] Camarillo, G., Eriksson, G., Holler, J., and H. Schulzrinne, "Grouping of Media Lines in the Session Description Protocol (SDP)", RFC 3388, December 2002.

[7] Rosenberg, J., Schulzrinne, H., and O. Levin, "A Session Initiation Protocol (SIP) Event Package for Conference State", RFC 4575, August 2006.

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Acknowledgement

Funding for the RFC Editor function is provided by the IETF Administrative Support Activity (IASA).