An Alternative Connection Model for the Message Session Relay Protocol (MSRP)
draft-ietf-simple-msrp-acm-01.txt

Status of this Memo

This Internet-Draft is submitted to IETF in full conformance with the provisions of BCP 78 and BCP 79.

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF), its areas, and its working groups. Note that other groups may also distribute working documents as Internet-Drafts.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

The list of current Internet-Drafts can be accessed at http://www.ietf.org/ietf/1id-abstracts.txt.

The list of Internet-Draft Shadow Directories can be accessed at http://www.ietf.org/shadow.html.

This Internet-Draft will expire on February 11, 2010.

Copyright Notice

Copyright (c) 2009 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 in effect on the date of publication of this document (http://trustee.ietf.org/license-info). Please review these documents carefully, as they describe your rights and restrictions with respect to this document.

Abstract

This document defines an alternative connection model for MSRP UAs.
The model differs from the standard MSRP model, as defined in RFC4975 and RFC4976 in the following ways: it uses COMEDIA for TCP connection establishment, and it allows the usage of SDP in a more conventional way for conveying endpoint address information. Because of this, the model also allows for the usage of generic mainstream mechanisms for NAT traversal, instead of using MSRP relays.

Table of Contents

1. Introduction ........................................... 3
2. Conventions ........................................... 4
3. Applicability statement ................................. 4
4. The Alternative Connection Model for MSRP .............. 4
   4.1. COMEDIA usage .................................. 4
       4.1.1. a=setup .................................. 4
       4.1.2. TLS ........................................ 6
       4.1.3. a=connection ............................... 6
       4.1.4. MSRP relay connection ...................... 6
   4.2. Transport connection addressing .................... 6
   4.3. NAT keepalive ................................... 8
   4.4. ICE usage ....................................... 8
5. Security Considerations ................................. 8
6. IANA Considerations ................................... 8
7. Acknowledgements ...................................... 8
8. References ............................................ 8
   8.1. Normative References ........................... 8
   8.2. Informative References ........................ 9
Authors’ Addresses ....................................... 9
1. Introduction

MSRP [RFC4975] is designed to use MSRP relays [RFC4976] as a means for NAT traversal and policy enforcement. However, in many SIP networks it is often desired to deploy MSRP without the use of MSRP relays, and instead use more generic NAT traversal mechanisms - such as COMEDIA [RFC4145] and ICE [I.D-ietf-mmusic-ice] - while also using SIP ALG controlled media relays for more application specific policy control.

An example is the OMA defined "Instant Message using SIMPLE" [OMA-TS-SIMPLE_IM-V1_0-20080312-D], where the UA of one endpoint of every MSRP transport connection is a media server located in the network. The media server has a global address and is handling application specific policy control as well as NAT traversal, the latter through use of COMEDIA which all IM MSRP clients are mandated to support.

Many networks where MSRP usage is emerging also contain ALGs that are deployed for reasons of performance monitoring, lawful intercept, address domain bridging, interconnect SLA policy enforcement, etc. A typical example here is the 3GPP defined Interconnect Border Control Function (IBCF) [3GPP TS23.228], which controls a media relay that handles all types of SIP session media (voice, video, MSRP, etc). Due to the fact that the MSRP connection model is not in a conventional way using the address information in the SDP c- and m-line for negotiating transport connection endpoints, and also checks consistence between addresses in the MSRP protocol and in the SDP a=path line, this forces the IBCF/media relay to act as an SDP aware MSRP B2BUA, whereas for basically all other UDP and TCP transported based media sessions it can acts as an SDP aware Relay-NAPT - which is much simpler than having to act as an MSRP B2BUA.

To adapt MSRP to a more conventional SDP usage, which is more friendly to general NAT traversal methods and to ALGs, this document defines an alternative connection model for MSRP. The model differs from the [RFC4975] defined model in that COMEDIA [RFC4145] is used in SDP offer/answer exchanges, and that the c- and m-line address and port information may be used in conventional SDP manner for determining transport endpoint, meaning that the address and port information in the MSRP URI in the a=path line is no longer used for routing.

NOTE: It is possible for a UA to only use the COMEDIA mechanism of the alternative connection model, but to use the MSRP routing mechanism defined in [RFC4975].

The alternative connection model allows conformant UAs to fall back to [RFC4975] compliant behavior when interacting with [RFC4975].
conformant UAs.

2. Conventions

The key words "MUST", "MUST NOT", "REQUIED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14, RFC 2119.

3. Applicability statement

The alternative connection model for MSRP, as defined in this document, SHOULD be used when a UA does not use an MSRP relay to proxy its MSRP communication. The UA SHALL use COMEDIA. If ALGs are used the UA SHOULD use SDP c/m line conveyed address and port information for MSRP routing, otherwise the UA MAY use the address and port information conveyed in the MSRP URI (as per RFC4975).

UAs conformant to this document are fully interoperable with RFC4975 conformant UAs, since when interacting with such UAs they will more or less fall back to RFC4975 compliant behavior. However, if a UA conformant to this document is behind NAT and receives an SDP offer from an RFC4975 conformant UA, NAT traversal can only be achieved if the UA supports ICE (and the network provides TURN servers) or if the network supports SBC assisted NAT traversal for TCP.

4. The Alternative Connection Model for MSRP

4.1. COMEDIA usage

4.1.1. a=setup

A UA SHALL support the a=setup attribute RFC4145, in order to negotiate which endpoint is to establish the transport connection for an MSRP session.

The support of a=setup is particularly useful when one MSRP endpoint is a media server which is not behind a NAT. This since the media server then make sure that transport connections for MSRP media is always set up from the UA towards the server, and ensure that possible NATs at user premises will not interfere with the connection setup.

A UA SHALL always include an explicit a=setup line in SDP offers and
answers, since it is sometimes useful for the other endpoint, or for the network, to know whether the sending endpoint supports a=setup or not.

The a=setup "active", "actpass" and "passive" values SHALL be supported, while the "holdcon" value MUST NOT be used.

NOTE: When the a=setup value is "actpass" or "passive", the IP address:port value in the SDP MUST contain the actual address:port on which the UA can receive a TCP Open request for the MSRP transport connection.

If the a=setup value is "active", the port number value MUST either be the actual port number that will be used for the TCP endpoint or the port value 9.

The a=setup "actpass" value SHALL be used in SDP offers whenever an UA can determine a valid WAN transport endpoint address:port, i.e. an address:port that the other endpoint can use as destination for a TCP Open request. This is in order to a) allow the other endpoint to answer with "a=setup:active" if it is behind NAT, and b) to be compatible with MSRP endpoints that do not support COMEDIA and thus always will always act as passive endpoints. If not the actual transport address can be provided then the a=setup "active" value MUST be used.

A valid WAN transport address:port can be determined if the UA can determine that it is not located behind a NAT, or if the UA relays its MSRP transport connections via a TURN server, or if it through STUN signaling from the local port to be used for the eventual transport connection has used STUN to retrieve NAT address:port while also having determined that the NAT is not address restricted.

If the UA is located behind a NAT, both SIP signaling and media transport will pass through it, and a UA can determine whether the media transport will be NATed by inspecting the SIP Via header in the 200 OK response to the initial REGISTER request, comparing the IP addresses in the Via sent-by and received parameters. If these are not the same then there is a NAT in the path.

If an SDP offer includes a=setup:actpass, the SDP answer MAY include a=setup:active, but SHOULD include a=setup:passive if the SDP answerer knows that it is not located behind a NAT.

Once the connection has been established, the active UA MUST immediately send a SEND request, as defined in [RFC4975].

NOTE: According to [RFC4975] the initiating UA is always active, but
When comedia is used the a=setup attribute is used to negotiate which UA becomes active.

4.1.2.  TLS

If a TLS transport connection for MSRP is negotiated, the client and server TLS roles MUST negotiate the relevant parameter as specified by COMEDIA-TLS [RFC4572], and in accordance with [RFC4975] the MSRP URI scheme SHOULD be msrps and the m-line protocol indicator SHOULD be TCP/TLS/MSRP.

4.1.3.  a=connection

The a=connection attribute is defined as a means for SDP negotiation of transport connection reuse. However, it seems that its use is limited to mid-session SDP offer/answer exchanges while [RFC4976] requires initial SDP offer/answer exchanges to result in reuse of a transport connection established via another existing SIP session at the same UA, if the SDP for the remote endpoint of that connection indicates the same host address, port and URI scheme.

A UA SHALL use a=connection lines for mid-session re-negotiation of transport connection for an MSRP session, but SHOULD not include any a=connection line in initial SDP offer/answer exchanges (if present, it SHALL be ignored by the receiving UA). Instead the connection reuse principles for initial SDP offer/answer exchanges for an MSRP session SHALL be in accordance with [RFC4975].

OPEN ISSUE: It is FFS whether there is a need for the a=connection attribute, or whether the existing MSRP connection re-use mechanism can be applied.

4.1.4.  MSRP relay connection

When MSRP relays [RFC4976] are used, the UA establishes a TCP connection towards its relay. If the UA is located behind a MSRP relay, it shall always create a connection towards the relay, no matter what value the client has provided in the a=setup attribute.

NOTE: Even if a UA establishes a TCP connection towards its relay, the UA will only send a SEND request if the UA is active.

4.2.  Transport connection addressing

If the UA supports the transport connection addressing mechanism defined in this chapter, the UA shall follow the procedures described below.
The UA SHALL follow the conventional use of address information received in the SDP c- and m-lines for determining the transport connection endpoint address:port to connect to, instead of using the address information in the MSRP URI received in the a-path line to determine the remote transport connection endpoint address:port.

With such usage, applying COMEDIA, ICE and TLS in SDP offer/answer exchanges for MSRP sessions can be done in a conventional way with very little MSRP dependencies, as detailed in this document. Furthermore, this usage also allows any ALG/SBC in the SIP signaling path to perform media anchoring in the same way they today do for any TCP connections not used for MSRP, i.e. by modifying the address:port information in the c- and m-lines, and ignoring any a-path line.

When a UA sends an SDP offer, the MSRP URI in the a-path line of the SDP offer (and eventually in the MSRP FromPath header) MAY include an AoR instead of connection address information. The AoR usage works fine even if the SDP answerer is a [RFC4975] conformant UA, since in such cases the SDP offerer will always establish the transport connection based on address information in the SDP answer. The MSRP URI matching will still work since this only requires the MSRP URIs in the a-path headers to be identical to the MSRP URIs in the MSRP protocol FromPath and ToPath headers.

When a UA sends an SDP offer, the UA SHALL include an "a=msrp-acm" attribute, which indicates that the UA supports the transport connection addressing defined in this specification.

When a UA receives an SDP offer which contains an "a=msrp-acm" attribute, the UA SHALL include the attribute in the SDP answer.

When a UA receives an SDP offer from an [RFC4975] conformant UA (the receiving UA knows this if the SDP offer does not contain an "a=setup" attribute), or the UA receives an SDP offer from a UA which only supports the COMEDIA usage mechanism of this specification (the receiving UA knows this if the SDP offer does not contain an "a=msrp-acm" attribute), the UA needs to populate the MSRP URI in the SDP answer (and eventually in the MSRP FromPath header) with an address or FQDN in accordance with [RFC4975].

In accordance with [RFC4975], for an MSRP endpoint that receives TCP open requests to be able to use a common port for all MSRP transport connections, the initiator of an MSRP transport connection SHALL always after having established a new transport connection send an MSRP message, allowing the other endpoint to establish the binding between MSRP session and transport connection.
4.3. NAT keepalive

An MSRP endpoint behind NAT MUST keep the NAT binding alive, in accordance with chapter 10 in [I.D.ietf-mmusic-ice]. The character string CRLF SHOULD be sent as NAT keepalive, but if the transport connection was established using ICE then STUN MAY alternatively be used.

4.4. ICE usage

If the UA is using ICE for MSRP transport connection establishment, it SHALL before starting to send any TCP Open requests perform the normal MSRP checks for possible reuse of an existing transport connection. If such is identified, the UA SHOULD preempt ICE processing and send a new SIP offer which indicates a=connection: existing and the SDP information for the selected connection.

5. Security Considerations

TBD

6. IANA Considerations

This document declares a new SDP attribute, "a=msrp-acm".

7. Acknowledgements

Thanks to Hadriel Kaplan and Remi Denis-Courmont for their comments and input on this document.

8. References

8.1. Normative References


[RFC4145] Yon, D. and G. Camarillo, "TCP-Based Media Transport in
8.2. Informative References

Authors’ Addresses

Christer Holmberg
Ericsson
Hirsalantie 11
Jorvas 02420
Finland

Email: christer.holmberg@ericsson.com

Staffan Blau
Ericsson AB
P.O Box 407
Sweden

Email: staffan.blau@ericsson.com