

MMUSIC
Internet-Draft
Updates: [4975](#) (if approved)
Intended status: Standards Track
Expires: January 17, 2021

J. Recio, Ed.
Unaffiliated
C. Holmberg
Ericsson
July 16, 2020

MSRP over Data Channels
draft-ietf-mmusic-msrp-usage-data-channel-22

Abstract

This document specifies how the Message Session Relay Protocol (MSRP) can be transported as a WebRTC data channel sub-protocol, using the SDP offer/answer generic data channel negotiation framework to establish such a channel. Two network configurations are supported: connecting two MSRP over data channel endpoints; and a gateway configuration, connecting an MSRP over data channel endpoint with an MSRP over TCP or TLS endpoint. This document updates [RFC4975](#).

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of [BCP 78](#) and [BCP 79](#).

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at <https://datatracker.ietf.org/drafts/current/>.

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."

This Internet-Draft will expire on January 17, 2021.

Copyright Notice

Copyright (c) 2020 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 (<https://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.

Table of Contents

| | | |
|----------------------|--|--------------------|
| 1. | Introduction | 3 |
| 2. | Conventions | 4 |
| 3. | WebRTC Data Channel Considerations | 4 |
| 3.1. | MSRP Data Channel | 4 |
| 4. | SDP Considerations | 5 |
| 4.1. | MSRP URI | 5 |
| 4.2. | msrp-scheme | 5 |
| 4.3. | Use of the dcmmap Attribute | 5 |
| 4.4. | Use of the dcsa Attribute | 6 |
| 4.5. | Use of the dcsa embedded setup Attribute | 7 |
| 4.6. | Session Closing | 7 |
| 4.7. | Support for MSRP File Transfer Function | 8 |
| 4.8. | Example SDP Negotiation | 8 |
| 5. | MSRP Considerations | 8 |
| 5.1. | Session Mapping | 9 |
| 5.2. | Session Opening | 9 |
| 5.3. | Session Closing | 9 |
| 5.4. | Data Framing | 9 |
| 5.5. | Data Sending, Receiving and Reporting | 9 |
| 5.6. | Support for MSRP File Transfer Function | 9 |
| 6. | Gateway Considerations | 10 |
| 7. | Updates to RFC4975 | 11 |
| 8. | Security Considerations | 11 |
| 9. | IANA Considerations | 11 |
| 9.1. | msrps URI scheme | 11 |
| 9.2. | Subprotocol Identifier MSRP | 11 |
| 9.3. | SDP Attributes | 11 |
| 10. | Acknowledgments | 17 |
| 11. | CHANGE LOG | 18 |
| 11.1. | Changes against ' draft-ietf-mmusic-msrp-usage-data-channel-21 ' | 18 |
| 11.2. | Changes against ' draft-ietf-mmusic-msrp-usage-data-channel-20 ' | 18 |
| 11.3. | Changes against ' draft-ietf-mmusic-msrp-usage-data-channel-19 ' | 18 |
| 11.4. | Changes against ' draft-ietf-mmusic-msrp-usage-data-channel-18 ' | 18 |
| 11.5. | Changes against ' draft-ietf-mmusic-msrp-usage-data-channel-17 ' | 18 |
| 11.6. | Changes against ' draft-ietf-mmusic-msrp-usage-data-channel-16 ' | 18 |
| 11.7. | Changes against ' draft-ietf-mmusic-msrp-usage-data- | 18 |

| | |
|--|----|
| channel-15' | 19 |
| 11.8. Changes against ' draft-ietf-mmusic-msrp-usage-data-channel-14 ' | 19 |
| 11.9. Changes against ' draft-ietf-mmusic-msrp-usage-data-channel-13 ' | 19 |
| 11.10. Changes against ' draft-ietf-mmusic-msrp-usage-data-channel-12 ' | 19 |
| 11.11. Changes against ' draft-ietf-mmusic-msrp-usage-data-channel-11 ' | 19 |
| 11.12. Changes against ' draft-ietf-mmusic-msrp-usage-data-channel-10 ' | 19 |
| 11.13. Changes against ' draft-ietf-mmusic-msrp-usage-data-channel-09 ' | 19 |
| 11.14. Changes against ' draft-ietf-mmusic-msrp-usage-data-channel-08 ' | 19 |
| 11.15. Changes against ' draft-ietf-mmusic-msrp-usage-data-channel-07 ' | 19 |
| 11.16. Changes against ' draft-ietf-mmusic-msrp-usage-data-channel-06 ' | 20 |
| 11.17. Changes against ' draft-ietf-mmusic-msrp-usage-data-channel-05 ' | 20 |
| 11.18. Changes against ' draft-ietf-mmusic-msrp-usage-data-channel-04 ' | 20 |
| 11.19. Changes against ' draft-ietf-mmusic-msrp-usage-data-channel-03 ' | 20 |
| 11.20. Changes against ' draft-ietf-mmusic-msrp-usage-data-channel-02 ' | 20 |
| 11.21. Changes against ' draft-ietf-mmusic-msrp-usage-data-channel-01 ' | 21 |
| 11.22. Changes against ' draft-ietf-mmusic-msrp-usage-data-channel-00 ' | 22 |
| 11.23. Changes against ' draft-ejzak-mmusic-msrp-usage-data-channel-01 ' | 23 |
| 11.24 . Changes against '-00' | 23 |
| 12 . Normative References | 23 |
| Authors' Addresses | 25 |

1. Introduction

The Message Session Relay Protocol (MSRP) [[RFC4975](#)] is a protocol for transmitting a series of related instant messages in the context of a session. In addition to instant messaging, MSRP can also be used for image sharing or file transfer. MSRP was initially defined in [[RFC4975](#)] to work over TCP and TLS connections, and over a WebSocket subprotocol specified by [[RFC7977](#)].

This document specifies the negotiation and transport of MSRP over a WebRTC data channel [[I-D.ietf-rtcweb-data-channel](#)]. Negotiation is

carried out as specified in [[I-D.ietf-mmusic-data-channel-sdpneg](#)] and MSRP is transported as a sub-protocol of a WebRTC data channel, without the TCP and TLS layers.

Defining MSRP as a data channel sub-protocol has many benefits:

- o provides to applications a proven protocol enabling instant messaging, file transfer, image sharing
- o integrates those features with other WebRTC voice, video and data features
- o leverages the SDP-based negotiation already defined for MSRP
- o allows the interworking with MSRP endpoints running on a TCP or TLS connection

Compared to WebSockets, which provide a message passing protocol to applications with no direct access to TCP or TLS sockets, data channels provide a low latency transport, leverage NAT-aware connectivity and security features of WebRTC, and are increasingly available not only in modern browsers but in other applications that use WebRTC for media or other purposes, such as IoT or telemetry in general, non-media data exchange, and so on.

Considering an MSRP endpoint as an MSRP application that uses a WebRTC data channel, this document describes two configurations where the other endpoint is respectively either another MSRP over data channel endpoint (e.g., a WebRTC application) or an MSRP endpoint using either TCP or TLS transport.

This document updates [[RFC4975](#)] as described in [Section 7](#).

2. Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [BCP 14](#) [[RFC2119](#)][[RFC8174](#)] when, and only when, they appear in all capitals, as shown here.

3. WebRTC Data Channel Considerations

3.1. MSRP Data Channel

In this document, an MSRP data channel is a data channel for which the instantiated sub-protocol is "msrp", and where the channel is

negotiated using the SDP-based external negotiation method defined in [\[I-D.ietf-mmusic-data-channel-sdpneg\]](#).

The following WebRTC data channel property values [\[I-D.ietf-rtcweb-data-channel\]](#) apply to an MSRP data channel:

| Property | Value |
|--------------------------|---------------------------------|
| Subprotocol Identifier | msrp |
| Transmission reliability | reliable |
| Transmission order | in-order |
| Label | See Section 4.3 |

4. SDP Considerations

This section describes the SDP considerations which are specific to an MSRP data channel

4.1. MSRP URI

This document extends the MSRP URI syntax [\[RFC4975\]](#) by defining the new transport parameter value "dc":

```
transport /= "dc"
; Add "dc" to existing transports per Section 9 of \[RFC4975\]
```

MSRP design provides for new transport bindings (see [Section 6 of \[RFC4975\]](#)). MSRP implementations are expected to allow unrecognized transports for which there is no need to establish a connection to the resource described by the URI, as it's the case of data channels ([Section 4.4](#)).

4.2. msrp-scheme

The msrp-scheme portion of the MSRP-URI that represents an MSRP data channel endpoint (used in the SDP path attribute and in the MSRP message headers) is always "msrps", which indicates that the MSRP data channel is always secured using DTLS as described in [\[I-D.ietf-rtcweb-data-channel\]](#).

4.3. Use of the dcmap Attribute

An offerer and answerer SHALL, in each offer and answer, include a dcmap attribute line ([\[I-D.ietf-mmusic-data-channel-sdpneg\]](#)) within the media description of the SCTP association for each MSRP data channel session to be negotiated.

The attribute includes the following data channel parameters:

- o "label=" labelstring
- o "subprotocol=" "msrp"

The labelstring is set by the MSRP application according to [\[I-D.ietf-mmusic-data-channel-sdpneg\]](#).

The offerer and answerer SHALL NOT include the max-retr and the max-time attribute parameters in the dcmmap attribute.

The offerer and answerer MAY include the ordered attribute parameter in the dcmmap attribute. If included, the attribute parameter value SHALL be set to "true".

Below is an example of the dcmmap attribute for an MSRP session to be negotiated with stream-id=2 and label="chat":

```
a=dcmmap:2 label="chat";subprotocol="msrp"
```

[4.4.](#) Use of the dcsa Attribute

An offerer and answerer SHALL, in each offer and answer, include a dcsa attribute line ([\[I-D.ietf-mmusic-data-channel-sdpneg\]](#)) within the media description for the SCTP association for each MSRP-specific SDP attribute to be negotiated for each MSRP data channel being negotiated.

An offerer and answerer SHALL include a dcsa attribute for each of the following MSRP-specific SDP attributes:

- o defined in [\[RFC4975\]](#): "path".
- o defined in [\[RFC6714\]](#): "msrp-cema".
- o defined in [\[RFC6135\]](#): "setup". See [Section 4.5](#)

It is considered a protocol error if one or more of the dcsa embedded attributes listed above are not included in an offer or answer.

An offerer and answerer MAY include a dcsa attribute for any of the following MSRP-specific SDP attributes, following the procedures defined for each attributes:

- o defined in [\[RFC4975\]](#): "accept-types", "accept-wrapped-types" and "max-size"

- o defined in [\[RFC4566\]](#): "sendonly", "recvonly", "inactive" and "sendrecv"
- o defined in [\[RFC5547\]](#): all the parameters related to MSRP file transfer. See [Section 4.7](#).

A subsequent offer or answer MAY update the previously negotiated MSRP subprotocol attributes while keeping the same subprotocol a=dcmap description. The semantics for newly negotiated MSRP subprotocol attributes are per [\[RFC4975\]](#).

When MSRP messages are transported on a data channel, the "path" attribute is not used for routing of the messages. The MSRP data channel is established using the SDP offer/answer procedures defined in [\[I-D.ietf-mmusic-data-channel-sdpneg\]](#), and the MSRP messages are then transported on that data channel. This is different from legacy MSRP [\[RFC4975\]](#) but similar to MSRP CEMA [\[RFC6714\]](#). However, when an endpoint receives an MSRP message over a data channel, it MUST still perform the MSRP-URI comparison procedures defined in [\[RFC4975\]](#).

[4.5](#). Use of the dcsa embedded setup Attribute

As described in [Section 4.4](#), the usage of a dcsa embedded setup attribute is mandated for MSRP sessions over data channels. It is used to negotiate which MSRP session endpoint assumes the active role as per [Section 4.2.2 of \[RFC6135\]](#) and [Section 5.4 of \[RFC4975\]](#). It has no relationship with the DTLS connection establishment roles [\[I-D.ietf-mmusic-sctp-sdp\]](#).

The dcsa embedded setup attribute is of the form "a=dcsa:x setup:<role>", with x being the data channel's SCTP stream identifier, so that such attribute is explicitly associated with an MSRP session over a specific data channel.

[4.6](#). Session Closing

An MSRP session is closed by closing the associated data channel, following the procedures in [\[I-D.ietf-mmusic-data-channel-sdpneg\]](#).

The port value for the "m=" line SHOULD NOT be changed (e.g. to zero) when closing an MSRP session (unless all data channels are being closed and the SCTP association is no longer needed), since this would close the SCTP association and impact all of the data channels. In all cases in [\[RFC4975\]](#) where the procedure calls for setting the port to zero for the MSRP "m=" line in an SDP offer for TCP transport, the SDP offerer of an MSRP session with data channel transport SHALL remove the corresponding dcmap and dcsa attributes.

[4.7.](#) Support for MSRP File Transfer Function

SDP attributes specified in [\[RFC5547\]](#) for a file transfer "m=" line are embedded as subprotocol-specific attributes using the syntax defined in [\[I-D.ietf-mmusic-data-channel-sdpneg\]](#).

[4.8.](#) Example SDP Negotiation

The following is an example of an "m=" line for data channels in an SDP offer that includes the attributes needed to establish two MSRP sessions: one for chat and one for file transfer. The example is derived from a combination of examples in [\[RFC4975\]](#) and [\[RFC5547\]](#).

```
m=application 54111 UDP/DTLS/SCTP webrtc-datachannel
c=IN IP4 198.51.100.79
a=max-message-size:100000
a=sctp-port:5000
a=setup:actpass
a=fingerprint:SHA-1 \
    4A:AD:B9:B1:3F:82:18:3B:54:02:12:DF:3E:5D:49:6B:19:E5:7C:AB
a=tls-id:4a756565cddef001be82
a=dcmap:0 label="chat";subprotocol="msrp"
a=dcsa:0 msrp-cema
a=dcsa:0 setup:active
a=dcsa:0 accept-types:message/cpim text/plain
a=dcsa:0 path:msrps://198.51.100.79:54111/si438dsaodes;dc
a=dcmap:2 label="file transfer";subprotocol="msrp"
a=dcsa:2 sendonly
a=dcsa:2 msrp-cema
a=dcsa:2 setup:active
a=dcsa:2 accept-types:message/cpim
a=dcsa:2 accept-wrapped-types:*
a=dcsa:2 path:msrps://198.51.100.79:54111/jshA7we;dc
a=dcsa:2 file-selector:name:"picture1.jpg" \
    type:image/jpeg size:1463440 hash:sha-1:\
    FF:27:0D:81:14:F1:8A:C3:35:3B:36:64:2A:62:C9:3E:D3:6B:51:B4
a=dcsa:2 file-transfer-id:rjEtHAcYVZ7xKwGYpGGwyn5gqsSaU7Ep
a=dcsa:2 file-disposition:attachment
a=dcsa:2 file-date:creation:"Mon, 12 Jan 2018 15:01:31 +0800"
a=dcsa:2 file-icon:cid:id2@bob.example.com
a=dcsa:2 file-range:1-1463440
```

[5.](#) MSRP Considerations

The procedures specified in [\[RFC4975\]](#) apply except when this document specifies otherwise. This section describes the MSRP considerations specific to an MSRP data channel.

[5.1.](#) Session Mapping

In this document, each MSRP session maps to one data channel exactly.

[5.2.](#) Session Opening

[Section 4.5](#) describes how the active MSRP session endpoint role is negotiated. The active MSRP session endpoint uses the data channel established for this MSRP session by the generic data channel opening procedure defined in [[I-D.ietf-mmusic-data-channel-sdpneg](#)].

As soon as the WebRTC data channel is opened, the MSRP session is actually opened by the active MSRP session endpoint. In order to do this the active MSRP endpoint sends an MSRP SEND message (empty or not) to the other MSRP endpoint.

[5.3.](#) Session Closing

The closure of an MSRP session SHALL be signaled via SDP following the requirements in [Section 4.6](#)

If the data channel used to transport the MSRP session fails and gets torn down, the endpoints SHALL consider the MSRP session failed. An MSRP endpoint MAY, based on local policy, try to negotiate a new MSRP data channel.

[5.4.](#) Data Framing

Each text-based MSRP message is sent on the corresponding SCTP stream using standard MSRP framing and chunking procedures, as defined in [[RFC4975](#)], with each MSRP chunk delivered in a single SCTP user message. Therefore all sent MSRP chunks including the MSRP chunk header SHALL have lengths of less than or equal to the value of the peer's "a=max-message-size" attribute, which is associated with the data channel's SCTP association.

[5.5.](#) Data Sending, Receiving and Reporting

Data sending, receiving and reporting procedures SHALL conform to [[RFC4975](#)].

[5.6.](#) Support for MSRP File Transfer Function

[[RFC5547](#)] defines an end-to-end file transfer method based on MSRP and the SDP offer/answer mechanism. This file transfer method is also usable by MSRP endpoints using data channels, with the following considerations:

- o As an MSRP session maps to one data channel, a file transfer session maps also to one data channel.
- o SDP attributes are negotiated as specified in [Section 4.7](#).
- o Once the file transfer is complete, the same data channel MAY be reused for another file transfer.

6. Gateway Considerations

This section describes the network configuration where one MSRP endpoint uses an MSRP data channel as MSRP transport, the other MSRP endpoint uses TLS/TCP connections as MSRP transport, and the two MSRP endpoints interwork via a gateway.

Specifically, a gateway can be configured to interwork an MSRP session over a data channel with a peer that does not support data channel transport in one of two ways.

In one model, the gateway performs as an MSRP Back-to-Back User Agent (B2BUA) to interwork all the procedures as necessary between the endpoints. No further specification is needed for this model.

Alternately, the gateway can provide transport level interworking between MSRP endpoints using different transport protocols. In accordance with [Section 4.4](#), path attributes SHALL NOT be used for transport level interworking.

When the gateway performs transport level interworking between MSRP endpoints, all of the procedures in [Section 5](#) and [Section 4](#) apply to each peer, with the following additions:

- o The gateway SHALL use CEMA towards the non-data channel endpoint.
- o If the non-data channel endpoint does not support CEMA, transport level interworking mode is not possible, the gateway needs to act as an MSRP B2BUA.
- o The gateway SHALL NOT modify the path attribute received from data channel or from non-data channel endpoints.
- o The gateway SHALL NOT modify the setup value received from data channel or from non-data channel endpoints.
- o The endpoint establishing an MSRP session using data channel transport SHALL NOT request inclusion of any relays, although it MAY interoperate with a peer that signals the use of relays.

7. Updates to [RFC4975](#)

This document updates [[RFC4975](#)], by allowing the usage of the "msrps" scheme when the underlying connection is protected with DTLS.

8. Security Considerations

MSRP traffic over data channels is secured, including confidentiality, integrity and source authentication, as specified by [[I-D.ietf-rtcweb-data-channel](#)]

Note that discussion in [[RFC4975](#)] on MSRP message attribution to remote identities applies to data channel transport.

9. IANA Considerations

NOTE to RFC Editor: Please replace all instances of all instances of RFCXXXX with the number of this RFC.

9.1. msrps URI scheme

This document modifies the usage of the msrps URI scheme, registered by [[RFC4975](#)], adding DTLS as a protected transport indicated by the URI scheme.

A reference to RFCXXXX is added to the URI scheme "msrps" in the Uniform Resource Identifier (URI) Schemes Registry.

9.2. Subprotocol Identifier MSRP

A reference to RFCXXXX is added to the subprotocol identifier "msrp" in the "WebSocket Subprotocol Name Registry"

9.3. SDP Attributes

This document modifies the usage of a set of SDP attributes, if any of those attributes is included in an SDP 'dsca' attribute associated with an MSRP data channel. The modified usage of the SDP 'setup' attribute is described in [Section 4.5](#). The usage of the other SDP attributes is described in [Section 4.4](#).

- o "path"
- o "msrp-cema"
- o "accept-types"
- o "accept-wrapped-types"

- o "max-size"
- o "sendonly"
- o "recvonly"
- o "inactive"
- o "sendrecv"
- o "file-selector"
- o "file-transfer-id"
- o "file-disposition"
- o "file-date"
- o "file-icon"
- o "file-range"

The usage level "dcsa(msrp)" is added to the registration of the SDP 'setup' attribute in the Session Description Protocol (SDP) Parameters "att-field" sub-registry as follows:

| | | |
|---------------------|--------------------------------------|--|
| +-----+-----+-----+ | | |
| Contact name: | IESG | |
| Contact email: | iesg@ietf.org | |
| Attribute name: | setup | |
| Usage level: | dcsa(msrp) | |
| Purpose: | Negotiate the active role of an MSRP | |
| | session over a data channel as per | |
| | Section 4.5 | |
| Reference: | RFCXXXX | |
| +-----+-----+-----+ | | |

The usage level "dcsa(msrp)" is added to the registration of the SDP 'path' attribute in the Session Description Protocol (SDP) Parameters "att-field" sub-registry as follows:

| | | | |
|--|-----------------|--|--|
| | Contact name: | IESG | |
| | Contact email: | iesg@ietf.org | |
| | Attribute name: | path | |
| | Usage level: | dcsa(msrp) | |
| | Purpose: | Indicate an endpoint, but not used for | |
| | | routing, as described in Section 4.4 | |
| | Reference: | RFCXXXX | |

The usage level "dcsa(msrp)" is added to the registration of the SDP 'msrp-cema' attribute in the Session Description Protocol (SDP) Parameters "att-field" sub-registry as follows:

| | | | |
|--|-----------------|---|--|
| | Contact name: | IESG | |
| | Contact email: | iesg@ietf.org | |
| | Attribute name: | msrp-cema | |
| | Usage level: | dcsa(msrp) | |
| | Purpose: | Indicate that the routing of MSRP | |
| | | messages transported on a data channel is | |
| | | more similar to the MSRP CEMA mechanism | |
| | | than the legacy MSRP routing mechanism. | |
| | Reference: | RFCXXXX | |

The usage level "dcsa(msrp)" is added to the registration of the SDP 'accept-types' attribute in the Session Description Protocol (SDP) Parameters "att-field" sub-registry as follows:

| | | | |
|--|-----------------|--|--|
| | Contact name: | IESG | |
| | Contact email: | iesg@ietf.org | |
| | Attribute name: | accept-types | |
| | Usage level: | dcsa(msrp) | |
| | Purpose: | Contain the list of media types that the | |
| | | endpoint is willing to receive. | |
| | Reference: | RFCXXXX | |

The usage level "dcsa(msrp)" is added to the registration of the SDP 'accept-wrapped-types' attribute in the Session Description Protocol (SDP) Parameters "att-field" sub-registry as follows:

| | | |
|-----------------|---|--|
| +-----+ | | |
| Contact name: | IESG | |
| Contact email: | iesg@ietf.org | |
| Attribute name: | accept-wrapped-types | |
| Usage level: | dcsa(msrp) | |
| Purpose: | Contain the list of media types that the | |
| | endpoint is willing to receive in an MSRP | |
| | message with multipart content. | |
| Reference: | RFCXXXX | |
| +-----+ | | |

The usage level "dcsa(msrp)" is added to the registration of the SDP 'max-size' attribute in the Session Description Protocol (SDP) Parameters "att-field" sub-registry as follows:

| | | |
|-----------------|--------------------------------------|--|
| +-----+ | | |
| Contact name: | IESG | |
| Contact email: | iesg@ietf.org | |
| Attribute name: | max-size | |
| Usage level: | dcsa(msrp) | |
| Purpose: | Indicate the largest message an MSRP | |
| | endpoint wishes to accept. | |
| Reference: | RFCXXXX | |
| +-----+ | | |

The usage level "dcsa(msrp)" is added to the registration of the SDP 'sendonly' attribute in the Session Description Protocol (SDP) Parameters "att-field" sub-registry as follows:

| | | |
|-----------------|---|--|
| +-----+ | | |
| Contact name: | IESG | |
| Contact email: | iesg@ietf.org | |
| Attribute name: | sendonly | |
| Usage level: | dcsa(msrp) | |
| Purpose: | Negotiate the direction of the media flow | |
| | on an MSRP data channel. | |
| Reference: | RFCXXXX | |
| +-----+ | | |

The usage level "dcsa(msrp)" is added to the registration of the SDP 'recvonly' attribute in the Session Description Protocol (SDP) Parameters "att-field" sub-registry as follows:

| | | |
|-----------------|---|--|
| +-----+-----+ | | |
| Contact name: | IESG | |
| Contact email: | iesg@ietf.org | |
| Attribute name: | recvonly | |
| Usage level: | dcsa(msrp) | |
| Purpose: | Negotiate the direction of the media flow | |
| | on an MSRP data channel. | |
| Reference: | RFCXXXX | |
| +-----+-----+ | | |

The usage level "dcsa(msrp)" is added to the registration of the SDP 'inactive' attribute in the Session Description Protocol (SDP) Parameters "att-field" sub-registry as follows:

| | | |
|-----------------|---|--|
| +-----+-----+ | | |
| Contact name: | IESG | |
| Contact email: | iesg@ietf.org | |
| Attribute name: | inactive | |
| Usage level: | dcsa(msrp) | |
| Purpose: | Negotiate the direction of the media flow | |
| | on an MSRP data channel. | |
| Reference: | RFCXXXX | |
| +-----+-----+ | | |

The usage level "dcsa(msrp)" is added to the registration of the SDP 'sendrecv' attribute in the Session Description Protocol (SDP) Parameters "att-field" sub-registry as follows:

| | | |
|-----------------|---|--|
| +-----+-----+ | | |
| Contact name: | IESG | |
| Contact email: | iesg@ietf.org | |
| Attribute name: | sendrecv | |
| Usage level: | dcsa(msrp) | |
| Purpose: | Negotiate the direction of the media flow | |
| | on an MSRP data channel. | |
| Reference: | RFCXXXX | |
| +-----+-----+ | | |

The usage level "dcsa(msrp)" is added to the registration of the SDP 'file-selector' attribute in the Session Description Protocol (SDP) Parameters "att-field" sub-registry as follows:

| | | | |
|--|-----------------|--|--|
| | Contact name: | IESG | |
| | Contact email: | iesg@ietf.org | |
| | Attribute name: | file-selector | |
| | Usage level: | dcsa(msrp) | |
| | Purpose: | Indicate a file in an MSRP file transfer | |
| | | negotiation. | |
| | Reference: | RFCXXXX | |

The usage level "dcsa(msrp)" is added to the registration of the SDP 'file-transfer-id' attribute in the Session Description Protocol (SDP) Parameters "att-field" sub-registry as follows:

| | | | |
|--|-----------------|--|--|
| | Contact name: | IESG | |
| | Contact email: | iesg@ietf.org | |
| | Attribute name: | file-transfer-id | |
| | Usage level: | dcsa(msrp) | |
| | Purpose: | Indicate a unique identifier of the file | |
| | | transfer operation in an MSRP file | |
| | | transfer negotiation. | |
| | Reference: | RFCXXXX | |

The usage level "dcsa(msrp)" is added to the registration of the SDP 'file-disposition' attribute in the Session Description Protocol (SDP) Parameters "att-field" sub-registry as follows:

| | | | |
|--|-----------------|---|--|
| | Contact name: | IESG | |
| | Contact email: | iesg@ietf.org | |
| | Attribute name: | file-disposition | |
| | Usage level: | dcsa(msrp) | |
| | Purpose: | Provide a suggestion to the other | |
| | | endpoint about the intended disposition | |
| | | of the file in an MSRP file transfer | |
| | | negotiation. | |
| | Reference: | RFCXXXX | |

The usage level "dcsa(msrp)" is added to the registration of the SDP 'file-date' attribute in the Session Description Protocol (SDP) Parameters "att-field" sub-registry as follows:

| | | |
|-----------------|---|--|
| +-----+-----+ | | |
| Contact name: | IESG | |
| Contact email: | iesg@ietf.org | |
| Attribute name: | file-date | |
| Usage level: | dcsa(msrp) | |
| Purpose: | Indicate a date related to the file in an | |
| | MSRP file transfer negotiation. | |
| Reference: | RFCXXXX | |
| +-----+-----+ | | |

The usage level "dcsa(msrp)" is added to the registration of the SDP 'file-icon' attribute in the Session Description Protocol (SDP) Parameters "att-field" sub-registry as follows:

| | | |
|-----------------|---|--|
| +-----+-----+ | | |
| Contact name: | IESG | |
| Contact email: | iesg@ietf.org | |
| Attribute name: | file-icon | |
| Usage level: | dcsa(msrp) | |
| Purpose: | Contain a pointer to a small preview icon | |
| | representing the contents of the file in | |
| | an MSRP file transfer negotiation. | |
| Reference: | RFCXXXX | |
| +-----+-----+ | | |

The usage level "dcsa(msrp)" is added to the registration of the SDP 'file-range' attribute in the Session Description Protocol (SDP) Parameters "att-field" sub-registry as follows:

| | | |
|-----------------|---|--|
| +-----+-----+ | | |
| Contact name: | IESG | |
| Contact email: | iesg@ietf.org | |
| Attribute name: | file-range | |
| Usage level: | dcsa(msrp) | |
| Purpose: | Contain the range of transferred octets | |
| | of the file in an MSRP file transfer | |
| | negotiation. | |
| Reference: | RFCXXXX | |
| +-----+-----+ | | |

10. Acknowledgments

The authors wish to acknowledge the borrowing of ideas from another internet draft by Peter Dunkley and Gavin Llewellyn, and to thank Flemming Andreasen, Christian Groves, Paul Kyzivat, Jonathan Lennox, Uwe Rauschenbach, Albrecht Schwarz, and Keith Drage for their invaluable comments.

Richard Ejzak, Keith Drage and Juergen Stoetzer-Bradler contributed an earlier version, before the draft was re-adopted.

Julien Maisonneuve helped with the re-adoption of the draft, and Maridi R. Makaraju (Raju) contributed valuable comments after the draft was re-adopted.

11. CHANGE LOG

NOTE to RFC Editor: Please remove this Section before the publication of RFCXXXX.

11.1. Changes against '[draft-ietf-mmusic-msrp-usage-data-channel-21](#)'

- o Changes based on Gen-Art review.

11.2. Changes against '[draft-ietf-mmusic-msrp-usage-data-channel-20](#)'

- o Changes based on AD review.

11.3. Changes against '[draft-ietf-mmusic-msrp-usage-data-channel-19](#)'

- o Minor nits.

11.4. Changes against '[draft-ietf-mmusic-msrp-usage-data-channel-18](#)'

- o Fix error in purpose of dcsa(marp) entry for 'path' attribute.

11.5. Changes against '[draft-ietf-mmusic-msrp-usage-data-channel-17](#)'

- o Shepherd's review: update to the file header, remove reference in abstract, mention update on introduction, reorder and complete IANA considerations.
- o Editorial: a MSRP -> an MSRP; MSRP -> msrp for consistency; typos.

11.6. Changes against '[draft-ietf-mmusic-msrp-usage-data-channel-16](#)'

- o WGLC review: draft updates [RFC4975](#); clarify introduction; rewrite wording on path and transport negotiation; session closing clarifications; references cleanup.
- o Editorial: consistent SHALL usage; reorder updates, security and IANA sections for consistency; typos; acknowledgements.

11.7. Changes against '[draft-ietf-mmusic-msrp-usage-data-channel-15](#)'

- o More concise and clear introduction and section descriptions.
- o Updates on author list, contributions and acknowledgements.

11.8. Changes against '[draft-ietf-mmusic-msrp-usage-data-channel-14](#)'

- o Reorganization following t140-usage-data-channel structure.

11.9. Changes against '[draft-ietf-mmusic-msrp-usage-data-channel-13](#)'

- o Clarify gateway procedures in accordance to mandatory use of CEMA.

11.10. Changes against '[draft-ietf-mmusic-msrp-usage-data-channel-12](#)'

- o Make CEMA mandatory, clarify SDP procedures.

11.11. Changes against '[draft-ietf-mmusic-msrp-usage-data-channel-11](#)'

- o Additional clarifications on cema and path attribute after mail list feedback.

11.12. Changes against '[draft-ietf-mmusic-msrp-usage-data-channel-10](#)'

- o Corrections and clarifications on cema and path attributes after mail list feedback.

11.13. Changes against '[draft-ietf-mmusic-msrp-usage-data-channel-09](#)'

- o Corrected area to ART.

11.14. Changes against '[draft-ietf-mmusic-msrp-usage-data-channel-08](#)'

- o Updated reference to 4566bis.
- o Expanded motivation paragraphs in introduction.

11.15. Changes against '[draft-ietf-mmusic-msrp-usage-data-channel-07](#)'

- o Move security considerations after IANA considerations, following [RFC7322](#) suggested order.
- o Update references to use xml.resource.org citation database.
- o Reformat of the section discussing setup parameter

- o Align examples with latest [[I-D.ietf-mmusic-data-channel-sdpneg](#)] draft.
- o Edit [section 6](#) for clarity.
- o Security requirements.
- o Clarify comment on unrecognized transports and session opening.
- o Update year, add editor.

[11.16.](#) Changes against '[draft-ietf-mmusic-msrp-usage-data-channel-06](#)'

- o Modification of Keith's address information.

[11.17.](#) Changes against '[draft-ietf-mmusic-msrp-usage-data-channel-05](#)'

- o Modification of Juergen's address information.

[11.18.](#) Changes against '[draft-ietf-mmusic-msrp-usage-data-channel-04](#)'

- o Addition of "I-D.ietf-mmusic-rfc4566bis"/> to list of normative references.
- o Addition of IANA considerations for setup attribute as per [section 8.2.4](#) of "I-D.ietf-mmusic-rfc4566bis"/>.

[11.19.](#) Changes against '[draft-ietf-mmusic-msrp-usage-data-channel-03](#)'

- o Addition of IANA registration related [Section 9.2](#).

[11.20.](#) Changes against '[draft-ietf-mmusic-msrp-usage-data-channel-02](#)'

- o Addition of "a=setup:actpass", "a=connection:new", "a=fingerprint:..." and "a=dcsa:x setup=active" SDP attributes to the SDP example in [Section 4.8](#).
- o Addition of "[RFC4145](#)" and [[I-D.ietf-mmusic-sctp-sdp](#)] to list of normative references.
- o Addition of new [Section 4.5](#) describing how the active MSRP session endpoint role is negotiated.
- o Extension of first paragraph of session-opening with new first sentence "[Section 4.5](#) describes how the active MSRP session endpoint role is negotiated."

- o First sentence of second paragraph in session-opening was "As soon as this data channel is opened, the MSRP session is actually opened by the active MSRP endpoint which sends an MSRP SEND message (empty or not) to the other MSRP endpoint." Replacement of this sentence with "As soon as this data channel is opened, the MSRP session is actually opened by the active MSRP endpoint. In order to do this the active MSRP endpoint sends an MSRP SEND message (empty or not) to the other MSRP endpoint."
- o Addition of setup attribute specific behavior descriptions of data channel to TCP or TLS interworking gateways in [Section 6](#).

11.21. Changes against '[draft-ietf-mmusic-msrp-usage-data-channel-01](#)'

- o In the abstract replacement of the first sentence "This document specifies how the Message Session Relay Protocol (MSRP) can be instantiated as a data channel sub-protocol, using the SDP offer/answer exchange-based external negotiation defined in [[I-D.ietf-mmusic-data-channel-sdpneg](#)]" with "This document specifies how the Message Session Relay Protocol (MSRP) can be instantiated as a data channel sub-protocol, using the SDP offer/answer exchange-based generic data channel negotiation framework" in order to remove the reference from the abstract text.
- o Addition of following sentence to the second paragraph in [Section 1](#): "The MSRP protocol negotiation defined in this document is based on the generic SDP offer/answer exchange based data channel negotiation as specified in [[I-D.ietf-mmusic-data-channel-sdpneg](#)]".
- o In [Section 3.1](#) replacement of sub-protocol identifier "msrp" with "MSRP" in order to make this consistent with the formal specification in [Section 4.3](#).
- o Throughout the text replacement of "shall" with "SHALL" etc where appropriate as per [[RFC2119](#)].
- o In [Section 4.3](#) replacement of sentence 'The max-retr, max-time and ordered parameters shall not be used.' with 'Ordered and reliable data channels MUST always be used, such that the "max-retr" and "max-time" parameters SHALL NOT be used. If the "ordered" parameter is used, then its value MUST be equal to "true".'
- o In [Section 4.3](#) removal of "(on default SCTP port 5000)" from the sentence preceding the example "a=dcmap" attribute line.
- o In [Section 4.4](#) first paragraph was "The SDP offer shall also include a dcsa attribute line (defined in

[[I-D.ietf-mmusic-data-channel-sdpneg](#)]) within the media description for the SCTP association for each MSRP-specific SDP attribute to be negotiated for each MSRP data channel being negotiated.". Replacement of this paragraph with "The SDP offer SHALL also include within the media description for the SCTP association a dcsa attribute line (defined in [[I-D.ietf-mmusic-data-channel-sdpneg](#)]) for each MSRP-specific SDP attribute to be negotiated for each MSRP data channel being negotiated.".

- o Appended following sentence at the end of the first paragraph of [Section 5.4](#): "Therefore all sent MSRP chunks MUST have lengths of less than or equal to the value of the peer's "a=max-message-size" attribute, which is associated with the data channel's SCTP association.".
- o Addition of the previously missing colon to the "a=sctp-port" attribute line in [Section 4.8](#).
- o In [Section 5.3](#) replacement of the first paragraph "Closing of an MSRP session is done using the generic data channel closing procedure defined in [[I-D.ietf-mmusic-data-channel-sdpneg](#)]." with 'The closure of an MSRP session MUST be signaled via an SDP offer/answer exchange which removes the "a=dcmap:" and "a=dcsa:" attribute lines associated with the MSRP session from the associated DTLS/SCTP based media description. This results in the associated data channel being closed as well as per [[I-D.ietf-mmusic-data-channel-sdpneg](#)], where the actual data channel closure procedure is typically initiated by the SDP answerer right after having accepted the SDP offer.'

[11.22](#). Changes against '[draft-ietf-mmusic-msrp-usage-data-channel-00](#)'

- o Additional reference to [[I-D.ietf-mmusic-data-channel-sdpneg](#)] in list of normative references.
- o Replacement of previous document title "MSRP over SCTP/DTLS data channels" with "MSRP over Data Channels" in order to align with the terminology used in [[I-D.ietf-mmusic-data-channel-sdpneg](#)].
- o In "terminology", "WebRTC data channel" was defined as "A bidirectional channel consisting of paired SCTP outbound and inbound streams." Replacement of this definition with "Data channel: A WebRTC data channel as specified in [[I-D.ietf-rtcweb-data-channel](#)]", and consistent usage of either "data channel" or "MSRP data channel" in the remainder of the document."

- o In the introduction replacement of references to [[I-D.ietf-rtcweb-data-protocol](#)] with a reference to [[I-D.ietf-rtcweb-data-channel](#)].
- o Consistent usage of '"m=" line' in whole document as per [[RFC4566](#)].
- o In the gateway configuration section ([Section 6](#)) replacement of the first sentence "This section describes the network configuration where one endpoint runs MSRP over a WebRTC SCTP/DTLS connection, the other MSRP endpoint runs MSRP over one or more TLS/TCP connections, and the two endpoints interwork via an MSRP gateway" with "This section describes the network configuration where one MSRP endpoint uses data channels as MSRP transport, the other MSRP endpoint uses TLS/TCP connections as MSRP transport, and the two MSRP endpoints interwork via an MSRP gateway".

[11.23.](#) Changes against '[draft-ejzak-mmusic-msrp-usage-data-channel-01](#)'

- o Removed empty spaces after ";" in the examples' "a=dcmap" attribute lines.
- o In all examples, the "m=" line proto value "DTLS/SCTP" was replaced with "UDP/DTLS/SCTP" and the "a=fmtp" attribute lines were replaced with "a=max-message-size" attribute lines, as per [draft-ietf-mmusic-sctp-sdp-12](#).

[11.24.](#) Changes against '-00'

- o Transport parameter change for MSRP to allow MSRP RFC transports.
- o Clarification on SDP offer/answer and removing duplicated procedures and refer them to [draft-ejzak-mmusic-data-channel-sdpneg-02](#).

[12.](#) 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, <<https://www.rfc-editor.org/info/rfc2119>>.
- [I-D.ietf-rtcweb-data-protocol] Jesup, R., Loreto, S., and M. Tuexen, "WebRTC Data Channel Establishment Protocol", [draft-ietf-rtcweb-data-protocol-09](#) (work in progress), January 2015.

[I-D.ietf-rtcweb-data-channel]

Jesup, R., Loreto, S., and M. Tuexen, "WebRTC Data Channels", [draft-ietf-rtcweb-data-channel-13](#) (work in progress), January 2015.

[I-D.ietf-mmusic-data-channel-sdpneg]

Drage, K., Makaraju, M., Ejzak, R., Marcon, J., and R. Even, "SDP-based Data Channel Negotiation", [draft-ietf-mmusic-data-channel-sdpneg-28](#) (work in progress), May 2019.

[I-D.ietf-mmusic-sctp-sdp]

Holmberg, C., Shpount, R., Loreto, S., and G. Camarillo, "Session Description Protocol (SDP) Offer/Answer Procedures For Stream Control Transmission Protocol (SCTP) over Datagram Transport Layer Security (DTLS) Transport.", [draft-ietf-mmusic-sctp-sdp-26](#) (work in progress), April 2017.

[RFC4566] Handley, M., Jacobson, V., and C. Perkins, "SDP: Session Description Protocol", [RFC 4566](#), DOI 10.17487/RFC4566, July 2006, <<https://www.rfc-editor.org/info/rfc4566>>.

[RFC4975] Campbell, B., Ed., Mahy, R., Ed., and C. Jennings, Ed., "The Message Session Relay Protocol (MSRP)", [RFC 4975](#), DOI 10.17487/RFC4975, September 2007, <<https://www.rfc-editor.org/info/rfc4975>>.

[RFC5547] Garcia-Martin, M., Isomaki, M., Camarillo, G., Loreto, S., and P. Kyzivat, "A Session Description Protocol (SDP) Offer/Answer Mechanism to Enable File Transfer", [RFC 5547](#), DOI 10.17487/RFC5547, May 2009, <<https://www.rfc-editor.org/info/rfc5547>>.

[RFC6135] Holmberg, C. and S. Blau, "An Alternative Connection Model for the Message Session Relay Protocol (MSRP)", [RFC 6135](#), DOI 10.17487/RFC6135, February 2011, <<https://www.rfc-editor.org/info/rfc6135>>.

[RFC6714] Holmberg, C., Blau, S., and E. Burger, "Connection Establishment for Media Anchoring (CEMA) for the Message Session Relay Protocol (MSRP)", [RFC 6714](#), DOI 10.17487/RFC6714, August 2012, <<https://www.rfc-editor.org/info/rfc6714>>.

- [RFC7977] Dunkley, P., Llewellyn, G., Pascual, V., Salgueiro, G., and R. Ravindranath, "The WebSocket Protocol as a Transport for the Message Session Relay Protocol (MSRP)", [RFC 7977](#), DOI 10.17487/RFC7977, September 2016, <<https://www.rfc-editor.org/info/rfc7977>>.
- [RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in [RFC 2119](#) Key Words", [BCP 14](#), [RFC 8174](#), DOI 10.17487/RFC8174, May 2017, <<https://www.rfc-editor.org/info/rfc8174>>.

Authors' Addresses

Jose M. Recio (editor)
Unaffiliated

Email: jose@ch3m4.com

Christer Holmberg
Ericsson
Hirsalantie 11
Jorvas 02420
Finland

Email: christer.holmberg@ericsson.com

