**3GPP TSG-CT WG1 Meeting #125-eC1-205455**

**Electronic meeting, 20-28 August 2020 (was -*4899, -5293* )**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **24.582** | **CR** | **0016** | **rev** | **2** | **Current version:** | **14.3.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  | Addressing a potential race/ambiguity condition when MSRP is used |
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| ***Source to WG:*** | AT&T |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | MCImp-MCDATA-CT |  | ***Date:*** | 9 August 2020 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-14 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)Rel-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
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| ***Reason for change:*** | During C1#124-e (June 2020) the issue of a potential race/ambiguity condition when using MSRP was raised, but at the time, no definite conclusion was reached in terms of a solution.Essentially, the terminating participating function (TPF) sends an MSRP 200 OK towards the originating side immediately upon receiving an MSRP SEND media package, although the (in)correctness of the packet is only determined by the MCData client, later on, upon receiving that media packet from the TPF. At that time, if the media packet is deemed incorrect, the MCData client sends the error response towards the originator, but it is unclear if this mechansim works, as the originator’s MSRP context may no longer exist after receiving the 200 OK.This CR proposes a solution.  |
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| ***Summary of change:*** | This CR explicitly adds support for the sending of MSRP REPORT requests for both successful and failed delivery of each MSRP SEND request (including chunks), thus enabling proper error processing and reliable delivery (for unicast), per RFC 4975. Changes are:- explicit inclusion of Success-Report and Failure-Report headers set to ‘yes’ in all the MSRP SEND requests- explicit handling of MSRP REPORT requests in addition to the MSRP responses- removal of text explicitly mandating the sending of MSRP responses by mid-nodes (originating participating, terminating participating and controlling functions), as this will be handled at the protocol level, per RFC 4975.- align with RFC 4975 to determine missing data based on byte-ranges rather than on chunks- correction of references and editorials |
|  |  |
| ***Consequences if not approved:*** | Potential for malfunction may lead to transfer failure.  |
|  |  |
| ***Clauses affected:*** | 6.1.1.2.1, 6.1.1.2.4, 6.1.1.2.5.1, 6.1.2.5.3, 6.2.1.5.3, 6.2.2.4.3, 6.2.2.5.3, 6.3.1.3, 6.3.2.3, 7.1.2.1, 7.1.3.1, 7.2.1, 7.2.4.3, 7.2.5.3, 7.3.2.1, 7.3.2.2, 7.3.3 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

**\* \* \* \* \* FIRST CHANGE \* \* \* \* \***

##### 6.1.1.2.1 Handling MSRP connection

Upon receiving an indication to establish MSRP connection for standalone SDS using media plane as the originating client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];

2. shall act according to IETF RFC 6135 [12], as:

a. an "active" endpoint, if a=setup attribute in the received SDP answer is set to "passive"; and

b. a "passive" endpoint, if a=setup attribute in the received SDP answer is set to "active";

3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP answer received in the SIP 200 (OK) response according to IETF RFC 4975 [11]; and

4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12].

On receiving MSRP 200 (OK) response to the first MSRP SEND request, the MCData client:

1. shall generate an SDS SIGNALLING PAYLOAD as specified in subclause 6.1.1.2.2;

2. shall generate an SDS DATA PAYLOAD as specified in subclause 6.1.1.2.3;

3. shall include the SDS SIGNALLING PAYLOAD and SDS DATA PAYLOAD in an MSRP SEND request as specified in subclause 6.1.1.2.4; and

4. shall send the MSRP SEND request on the established MSRP connection.

If MSRP chunking is not used, then on receipt of an MSRP 200 (OK) response, the MCData client shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

If MSRP chunking is used, the MCData client:

1. shall send further MSRP SEND requests as necessary including re-sending chunks corresponding to bytes not deemed as delivered to the destination, based on received MSRP responses and/or MSRP REPORT requests;

2. shall wait until received MSRP 200 (OK) responses or MSRP REPORT requests confirm the reception of all MSRP SEND requests or all bytes sent or until an implementation dependent wait timer expires; and

3. shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

On receiving a non-200 MSRP response to the MSRP SEND request or an MSRP REPORT indicating an error, the MCData client shall handle the error as specified in IETF RFC 4975 [11]. To terminate the MSRP session, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks;

2. shall indicate to the MCData user that the SDS message could not be sent; and

3. shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

On receiving an indication to terminate the session from the signalling plane, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks and may indicate to MCData user that the SDS message could not be sent.

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

##### 6.1.1.2.4 Generate MSRP SEND for SDS message

The MCData client shall take the procedures in subclause 6.4.1 into consideration when generating MSRP SEND messages.

The MCData client shall generate MSRP SEND for SDS message requests according to IETF RFC 4975 [11].

NOTE: Requiring success reporting in the procedures below increases the traffic load. Implementations considering other mechanisms of ensuring the proper level of reliability to be sufficient, can choose not to include the Success-Report header field in MSRP SEND requests.

When generating an MSRP SEND for SDS message request containing an SDS SIGNALLING PAYLOAD message and an SDS DATA PAYLOAD message, the MCData client

1. shall set the To-Path header field according to the MSRP URI(s) received in the answer SDP;

2. should include a Success-Report header field set to "yes";

3. shall incluede a Failure-Report header field set to "yes";

4. shall set the first Content-Type header fieldto "application/vnd.3gpp.mcdata-signalling";

5. shall set the first body of the MSRP SEND request to the generated SDS SIGNALLING PAYLOAD message;

6. shall set the second Content-Type header field to "application/vnd.3gpp.mcdata-payload"; and

7. shall set the second body of the MSRP SEND request to the generated SDS DATA PAYLOAD message.

When generating an MSRP SEND for SDS message request containing only an SDS DATA PAYLOAD message, the MCData client:

1. shall set To-Path header field according to the MSRP URI(s) received in the answer SDP;

2. should include a Success-Report header field set to "yes";

3. shall include a Failure-Report header set to "yes";

4. shall set the Content-Type header field to "application/vnd.3gpp.mcdata-payload"; and

5. shall set the body of the MSRP SEND request to the generated SDS DATA PAYLOAD message.

When generating an MSRP SEND for SDS message request containing only an SDS SIGNALLING PAYLOAD, the MCData client.

1. shall set the To-Path header field according to the MSRP URI(s) received in the answer SDP;

2. should include a Success-Report header set to "yes";

3. shall include a Failure-Report header set to "yes";

4. shall set the Content-Type header field to "application/vnd.3gpp.mcdata-signalling"; and

5. shall set the body of the MSRP SEND request to the generated SDS SIGNALLING PAYLOAD message.

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

##### 6.1.2.5.1 Sending SDS Notification

To send an SDS disposition notification, the MCData client:

1. shall generate an SDS NOTIFICATION as specified in subclause 6.1.2.5.2;

2. shall include the SDS NOTIFICATION in an MSRP SEND request as specified in subclause 6.1.2.5.3;

 and

3. shall send the MSRP SEND request on the established MSRP connection.

If MSRP chunking is used, the MCData client:

1. shall send further MSRP SEND requests as necessary, including re-sending chunks corresponding to bytes not deemed as delivered to the destination, based on received MSRP responses and/or MSRP REPORT requests.

On receiving a non-200 MSRP response to the MSRP SEND request or an MSRP REPORT indicating an error, the MCData client shall handle the error as specified in IETF RFC 4975 [11]. To terminate the MSRP session, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks; and

2. shall indicate to MCData user that the SDS message or the SDS disposition notification could not be sent.

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

##### 6.1.2.5.3 Generate MSRP SEND for SDS disposition notification

The MCData client shall generate MSRP SEND requests for SDS disposition notification according to IETF RFC 4975 [11].

When generating an MSRP SEND request for SDS disposition notification containing an SDS NOTIFICATION message, the MCData client

1. shall set To-Path header according to the MSRP URI(s) received in the SDP;

2. should include a Success-Report header field set to "yes";

NOTE: Requiring success reporting in the procedures below increases the traffic load. Implementations considering other mechanisms of ensuring the proper level of reliability to be sufficient, can choose not to include the Success-Report header in some MSRP SEND requests.

3. shall include a Failure-Report header field set to "yes";

4. shall set the content type as Content-Type = "application/vnd.3gpp.mcdata-signalling"; and

5. shall set the body of the MSRP SEND request to the generated SDS NOTIFICATION message.

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

##### 6.2.1.5.3 Handling of received MSRP messages

Upon receiving an MSRP SEND request from the controlling MCData function, the terminating participating MCData function:

1. shall forward the received MSRP SEND request to the terminating MCData client according to the rules and procedures of IETF RFC 4975 [11].

Upon receiving an MSRP response or an MSRP REPORT request from the terminating MCData client, the terminating participating MCData function shall forward the MSRP response or MSRP REPORT request according to the rules and procedures of IETF RFC 4975 [11].

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

##### 6.2.2.4.3 Handling of received MSRP messages

Upon receiving an MSRP SEND request from the originating MCData client, the originating participating MCData function:

1. if an MSRP connection is not established with the controlling MCData function then, shall establish the MSRP connection as specified in subclause 6.2.2.4.2. Otherwise, shall use the existing MSRP connection; and

2. shall forward the received MSRP SEND request to the controlling MCData function according to the rules and procedures of IETF RFC 4975 [11].

The originating participating MCData function shall forward any MSRP response or MSRP REPORT request received from the controlling MCData function to the originating MCData client, according to the rules and procedures of IETF RFC 4975 [11].

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

##### 6.2.2.5.3 Handling of received MSRP messages

Upon receiving an MSRP SEND request from the controlling MCData function, the terminating participating MCData function:

1. shall forward the received MSRP SEND request to the terminating MCData client according to the rules and procedures of IETF RFC 4975 [11].

Upon receiving an MSRP response or an MSRP REPORT request from the terminating MCData client, the terminating participating MCData function shall forward the MSRP response or MSRP REPORT request towards the originating MCData client (for one-to-one communications) or towards the controlling MCData function (for group communications), according to the rules and procedures of IETF RFC 4975 [11].

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

#### 6.3.1.3 Handling of received MSRP messages

Upon receiving an MSRP SEND request from the originating participating MCData function, the controlling MCData function:

1. if in a standalone one-to-one SDS using media plane, shall verify that the SDS message size is less than or equal to <max-data-size-sds-bytes> element in the MCData service configuration document as specified in 3GPP TS 24.484 [7];

2. if in a standalone group SDS using media plane, shall verify that:

a. the SDS message size is less than or equal to <mcdata-max-data-in-single-request> element of the MCData group document (see the MCData group document in 3GPP TS 24.481 [4]); and

b. the SDS message size is less than or equal to <mcdata-on-network-max-data-size-for-SDS> element of the MCData group document (see the MCData group document in 3GPP TS 24.481 [4]);

3. if the verifications in either 1 or 2 a or 2 b above fail, shall send the MSRP response with the error code 403 to the MCData client which sent the SDS message and shall not continue with the rest of the procedure;

4. shall follow the rules and procedures defined in IETF RFC 4975 [11] and in IETF RFC 6714 [13], including, if necessary, generating and sending an MSRP 200 (OK) response or an MSRP REPORT request for the received MSRP SEND request to the originating participating MCData function; and

5. shall forward the received MSRP SEND request (or copies thereof) to each terminating MCData client with which a successful MSRP connection was established, according to the rules and procedures of IETF RFC 4975 [11]. Following clarifications apply to the generated MSRP SEND request:

a. shall modify the To-Path header according to the MSRP URI received in the answer SDP from the MCData client in accordance with rules and procedures of IETF RFC 4975 [11]; and

b. shall modify the From-Path header to the controlling MCData function's own MSRP URI, according to the rules and procedures of IETF RFC 4975 [11].

For one-to-one communications, the controlling MCData function shall forward, upon reception from the terminating participating MCData function or terminating MCData client, any received error MSRP response or any MSRP REPORT request, to the originating participating MCData function, according to the rules and procedures of IETF RFC 4975 [11].

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

#### 6.3.2.3 Handling of received MSRP messages

Upon receiving a MSRP SEND request from the originating participating MCData function, the controlling MCData function:

1. shall follow the rules and procedures defined in IETF RFC 4975 [11] and in IETF RFC 6714 [13], including, if necessary, generating and sending an MSRP 200 (OK) response or an MSRP REPORT request for the received MSRP SEND request to the originating participating MCData function; and

2. shall forward the received MSRP SEND request (or copies thereof) to each terminating MCData client with which a successful MSRP connection was established, according to the rules and procedures of IETF RFC 4975 [11]. Following clarifications apply to the generated MSRP SEND request:

a. shall modify the To-Path header according to the MSRP URI received in the answer SDP from the MCData client in accordance with rules and procedures of IETF RFC 4975 [11]; and

b. shall modify the From-Path header to the controlling MCData function's own MSRP URI, according to the rules and procedures of IETF RFC 4975 [11].

For one-to-one communications, the controlling MCData function shall forward, upon reception from the terminating participating MCData function or the terminating MCData client, any received error MSRP response or any MSRP REPORT request, to the originating participating MCData function, according to the rules and procedures of IETF RFC 4975 [11].

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

#### 7.1.2.1 Handling MSRP connection

Upon receiving an indication to establish MSRP connection for file distribution as the originating client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];

2. shall act according to IETF RFC 6135 [12], as:

a. an "active" endpoint, if a=setup attribute in the received SDP answer is set to "passive"; and

b. a "passive" endpoint, if a=setup attribute in the received SDP answer is set to "active";

3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP answer received in the SIP 200 (OK) response according to IETF RFC 4975 [11]; and

4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint, according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12].

On receiving MSRP 200 (OK) response to the first MSRP SEND request, the MCData client can send the file. To send the file, the MCData client:

1. shall generate MSRP SEND request(s) for file distribution request according to IETF RFC 4975 [11]. When generating an MSRP SEND, the MCData client:

a. shall set To-Path header according to the MSRP URI(s) received in the answer SDP;

b. should include a Success-Report header field set to "yes";

NOTE 1: Requiring success reporting in the procedures below increases the traffic load. Implementations considering other mechanisms of ensuring the proper level of reliability to be sufficient, can choose not to include the Success-Report header in some MSRP SEND requests.

c. shall include a Failure-Report header field set to "yes";;

d. shall set the Content-Type header field to "application/vnd.3gpp.mcdata-file"; and

e. shall include in the body of the MSRP SEND request the MSRP payload. The MSRP payload is set to the file or part of the file.

2. shall send the MSRP SEND request(s) on the established MSRP connection.

If MSRP chunking is used, the MCData client:

1. shall send further MSRP SEND requests containing the file, with the Success-Report and Failure-Report header fields present and set to "yes", as necessary, including re-sending chunks corresponding to bytes not deemed as delivered to the destination, based on received MSRP responses and/or MSRP REPORT requests;

NOTE 2: Implementations that want to reduce the amount of traffic caused by responses confirming successful delivery and consider other mechanisms of ensuring the proper level of reliability to be sufficient, can choose not to include the Success-Report header in some MSRP SEND requests.

2. shall wait until received MSRP 200 (OK) responses and/or MSRP REPORT requests confirm the reception of all MSRP SEND requests and/or all the bytes sent or until an implementation dependent wait timer expires; and

3. shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

On receiving a non-200 MSRP response to the MSRP SEND request or an MSRP REPORT indicating an error, the MCData client shall handle the error as specified in IETF RFC 4975 [11]. To terminate the MSRP session, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks;

2. shall indicate to MCData user that the file could not be distributed; and

3. shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

On receiving an indication to terminate the session from the signalling plane, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks and may indicate to the MCData user that the file could not be sent.

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

#### 7.1.3.1 Handling MSRP connection

Upon receiving an indication to establish MSRP connection for file distribution as the terminating client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];

2. shall act either as an active endpoint or as a passive endpoint to open the transport connection, according to IETF RFC 6135 [12];

3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP offer received in the SIP INVITE request according to IETF RFC 4975 [11]; and

4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12].

Once the MSRP session is established, on receipt of an MSRP request in the MSRP session, the MCData client:

1. shall follow the rules and procedures defined in IETF RFC 4975 [11] and in IETF RFC 6714 [13];

2. if an MSRP SEND request indicates the use of chunking, shall wait until all further MSRP SEND requests for the remaining chunks of the MSRP message have been received and shall reassemble the entire set of MSRP requests into the file before delivering the content to the application; and

3. shall handle the received content as described in subclause 7.1.3.2.

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

#### 7.2.4.3 Handling of received MSRP messages

Upon receiving an MSRP SEND request from the originating MCData client, the originating participating MCData function:

1. if an MSRP connection is not established with the controlling MCData function then, shall establish the MSRP connection as specified in subclause 7.2.4.2. Otherwise, shall use the existing MSRP connection; and

2. shall forward the received MSRP SEND request to the controlling MCData function according to the rules and procedures of IETF RFC 4975 [11].

The originating participating MCData function shall forward upon reception any MSRP response or MSRP REPORT request received from the controlling MCData function, according to the rules and procedures of IETF RFC 4975 [11].

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

#### 7.2.5.3 Handling of received MSRP messages

Upon receiving an MSRP SEND request from the controlling MCData function, the terminating participating MCData function:

1. shall forward the received MSRP SEND request to the terminating MCData client according to the rules and procedures of IETF RFC 4975 [11].

Upon receiving an MSRP response or an MSRP REPORT request from the terminating MCData client, the terminating participating MCData function shall forward the MSRP response or MSRP REPORT request towards the originating MCData client, according to the rules and procedures of IETF RFC 4975 [11].

**\* \* \* \* \* NEXT CHANGE \* \* \* \* \***

#### 7.3.2.1 MSRP session establishment with originating MCData client

To establish the MSRP connection with the originating MCData client, the controlling MCData function:

1. shall act as an MSRP client and establish TLS connection with the originating participating MCData function, if it exists, otherwise with the originating MCData client, according to the rules and procedures described in IETF RFC 4975 [11];

2. shall act as an MSRP client to send MSRP SEND requests according to the rules and procedures described in IETF RFC 6135 [12];

3. shall act as a "passive" endpoint according to the rules and procedures described in IETF RFC 6135 [12];

4. shall establish the MSRP connection with originating MCData client, according to the rules and procedures described in IETF RFC 6135 [12]; and

5. acting as a "passive" endpoint, shall wait for MSRP SEND request on established MSRP connection, to bind the MSRP connection to the MSRP session according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12].

#### 7.3.2.2 MSRP session establishment with terminating MCData client

To establish the MSRP connection with the terminating MCData client, the controlling MCData function:

1. shall act as an MSRP client and establish TLS connection with the terminating participating MCData function, if it exists, otherwise with the terminating MCData client, according to the rules and procedures described in IETF RFC 4975 [11];

2. shall act as an MSRP client to send MSRP SEND requests according to the rules and procedures described in IETF RFC 6135 [12];

3. shall act according to IETF RFC 6135 [12], as:

a. an "active" endpoint, if a=setup attribute in the received SDP answer is set to "passive"; and

b. a "passive" endpoint, if a=setup attribute in the received SDP answer is set to "active";

4. shall establish the MSRP connection with each terminating MCData client identified in the 3GPP TS 24.282 [8], according to the rules and procedures described in IETF RFC 6135 [12]; and

5. if acting as an "active" endpoint, shall send an empty MSRP SEND request, with the Success-Report and Failure-Report header fields present and set to "yes", on each established MSRP connection, to bind the MSRP connection to the MSRP session according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12].

### 7.3.3 Handling of received MSRP messages

Upon receiving a MSRP SEND request from the originating participating MCData function, the controlling MCData function:

1. shall follow the rules and procedures defined in IETF RFC 4975 [11] and in IETF RFC 6714 [13], including, if necessary, generating and sending an MSRP 200 (OK) response or an MSRP REPORT request for the received MSRP SEND request to the originating participating MCData function; and

2. shall forward the received MSRP SEND requests (or copies thereof) to each terminating MCData client with which a successful MSRP connection was established, according to the rules and procedures of IETF RFC 4975 [11]. Following clarifications apply to the generated MSRP SEND request:

a. shall modify the To-Path header according to the MSRP URI received in the answer SDP from the MCData client in accordance with rules and procedures of IETF RFC 4975 [11]; and

b. shall modify the From-Path header to the controlling MCData function's own MSRP URI, according to the rules and procedures of IETF RFC 4975 [11].

**\* \* \* \* \* END CHANGES \* \* \* \* \***