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**Gateway control protocol: Packages for  
interworking between MSRP and H.248**

Recommendation ITU-T H.248.69



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## **Recommendation ITU-T H.248.69**

### **Gateway control protocol: Packages for interworking between MSRP and H.248**

#### **Summary**

Recommendation ITU-T H.248.69 defines packages and procedures to enable the message session relay protocol (MSRP) to be sent and received on a H.248 controlled media gateway (MG). It further allows communication between an MGC and MG regarding the messaging policy, messaging statistics and message protocol connection state.

#### **Source**

Recommendation ITU-T H.248.69 was approved on 16 March 2009 by ITU-T Study Group 16 (2009-2012) under Recommendation ITU-T A.8 procedures.

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## Recommendation ITU-T H.248.69

### Gateway control protocol: Packages for interworking between MSRP and H.248

#### 1 Scope

This Recommendation defines packages and procedures to enable the message session relay protocol (MSRP) to be sent and received on a H.248 controlled media gateway (MG). It further allows communication between an MGC and MG regarding the messaging policy, messaging statistics and message protocol connection state.

It is assumed that the MG contains the MSRP switch functionality.

NOTE – The use of MSRP over TLS is for further study.

#### 2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

- [ITU-T H.248.1] Recommendation ITU-T H.248.1 (2005), *Gateway control protocol: Version 3*.
- [ITU-T H.248.7] Recommendation ITU-T H.248.7 (2004), *Gateway control protocol: Generic announcement package*.
- [ITU-T H.248.9] Recommendation ITU-T H.248.9 (2005), *Gateway control protocol: Advanced media server packages*.
- [ITU-T H.248.19] Recommendation ITU-T H.248.19 (2004), *Gateway control protocol: Decomposed multipoint control unit, audio, video and data conferencing packages*.
- [ITU-T H.248.43] Recommendation ITU-T H.248.43 (2008), *Gateway control protocol: Packages for gate management and gate control*.
- [ITU-T H.248.47] Recommendation ITU-T H.248.47 (2008), *Gateway control protocol: Statistic conditional reporting package*.
- [IETF RFC 2822] IETF RFC 2822 (2001), *Internet Message Format*.
- [IETF RFC 3339] IETF RFC 3339 (2002), *Date and Time on the Internet: Timestamps*.
- [IETF RFC 3860] IETF RFC 3860 (2004), *Common Profile for Instant Messaging (CPIM)*.
- [IETF RFC 3862] IETF RFC 3862 (2004), *Common Presence and Instant Messaging (CPIM): Message format*.
- [IETF RFC 3986] IETF RFC 3986 (2005), *Uniform Resource Identifier (URI): Generic Syntax*.
- [IETF RFC 4021] IETF RFC 4021 (2005), *Registration of Mail and MIME Header Fields*.
- [IETF RFC 4975] IETF RFC 4975 (2007), *The Message Session Relay Protocol (MSRP)*.
- [IETF RFC 4976] IETF RFC 4976 (2007), *Relay Extensions for the Message Session Relay Protocol (MSRP)*.
- [IETF RFC 5228] IETF RFC 5228 (2008), *Sieve: An Email Filtering Language*.

## **3 Definitions**

### **3.1 Terms defined elsewhere**

This Recommendation uses the following term defined elsewhere:

**3.1.1 sieve** [IETF RFC 5228]: An Email Filtering Language.

### **3.2 Terms defined in this Recommendation**

This Recommendation defines the following terms:

**3.2.1 message identity:** Used between the MGC and MG in order to uniquely identify a particular message for H.248 procedural purposes. It may be the MSRP message identity but may be any valid identifier.

**3.2.2 messaging stream:** A H.248 stream that contains SDP indicating that the connection media type format is related to messaging.

**3.2.3 MSRP switch:** A media level entity that receives MSRP messages and delivers them to the other conference participants. An MSRP switch has a similar role to a conference mixer with the exception that an MSRP switch does not actually "mix" together different input media streams; it merely relays the messages between participants.

## **4 Abbreviations and acronyms**

This Recommendation uses the following abbreviations and acronyms:

MG	Media Gateway
MGC	Media Gateway Controller
MSRP	Message Session Relay Protocol
SDP	Session Description Protocol

## **5 Conventions**

None.

## **6 Messaging streams**

### **6.1 Session establishment**

The MGC is responsible for determining the filtering criteria, based on subscriber information and any local policy. The filtering is enforced in two ways. Firstly, through the modification of the session requests received from users before the session description/configuration is provided to an MG. Secondly, filtering may occur within the messaging session with different actions being applied to messages received by a user's termination.

### **6.2 Connection establishment**

In order for a MG to send and receive messages, a H.248 stream is created on a Termination in addition to any other streams, i.e., audio/video streams. The MCG shall assign a new StreamID for the stream. The characteristics of sent messaging may be set in the Local Descriptor and the characteristics of received messaging may be set in the Remote Descriptor.

The addressing information for the messaging stream may be set via a session description protocol (SDP) connection "c=" line.

The MGC shall indicate that the stream is for messaging through the use of a SDP media "m=" line. See clause 8.1 of [IETF RFC 4975] for details on how to set the components of this line.

The MGC may indicate or request the allowed media types and formats through the use of the SDP "accept-types" attribute (see clause 8.6 of [IETF RFC 4975]). Messages received with message media types and formats not included in attribute are discarded by the MG.

The MGC may indicate or request the maximum message size through the SDP "max-size" attribute (see clause 8.6 of [IETF RFC 4975]).

The MGC may also set message level filters in order to request the MG to perform certain actions based on different message characteristics.

Session level filtering (i.e., that is described in SDP) related to message media types, media formats and maximum message size is applied to messages entering the termination from an MG external direction.

Message level filtering is typically applied to messages received on a termination from other terminations in the associated context.

Additional characteristics of the messaging session may be set via the "Message Session Information" (*msi*) package (see clause 12).

In addition to providing information regarding the allowed messages, the MGC may set quotas for the sending and reception of messages on a termination/stream. See clause 8.6.1 for more details.

Once the message characteristics have been negotiated with the end user (see [IETF RFC 4975] for an example on how this is achieved) and the SDP related to the message stream has been set, then the MG shall wait for a MSRP connection request from the peer. If the MGC sends the "Establish MSRP Connection" (*msrpstat/conn*) signal, then the MG shall be responsible for initiating the MSRP connection. Once the connection is established, the MG shall then be responsible for MSRP signalling according to [IETF RFC 4975].

NOTE – Clause 4 of [IETF RFC 4975] indicates that MSRP nodes may support multiple sessions over a single MSRP connection. In this case, multiple H.248 Streams are used for each session; however, the connection information will remain the same (see clause 8.1 of [IETF RFC 4975]).

The MG shall then relay the MSRP messages between terminations containing the same StreamID. If a message is relayed to a termination that has message level filtering applied to it, the filter shall be applied before sending the message to the user represented by the termination. See clause 13 for more information.

When sending MSRP "SEND Requests", the MG should follow the chunk size recommendations in clause 7.1.1 of [IETF RFC 4975]; however the chunk size may be altered via provisioning.

Clause 8.9 of [IETF RFC 4975] describes the relationship between the SDP Direction Attribute and MSRP. [ITU-T H.248.1] contains the StreamMode property in the Local Control descriptor. The StreamMode property shall take precedence over the SDP Direction Attribute. The effect of the StreamMode property values shall be the same as described in clause 8.9 of [IETF RFC 4975].

Clause 5.4 of [IETF RFC 4975] describes the MSRP Connection model. In order for the MGC to be aware of the status of the connection, it should set the "MSRP Connection Failure" event (see clause 9.2.1). If the MGC wishes to re-establish the MSRP connection (and associated Sessions), then the MGC should resend the *msrpstate/conn* signal.

As per clause 8.4 of [IETF RFC 4975], the MGC may send SDP exchanges to refresh the network state. The MGC is responsible for determining when this occurs. However, if it needs the updated SDP "path" attribute information, it may perform a wildcard CHOOSE on this attribute to determine the current value.

### **6.3 Recording messages**

It is assumed that the MGC is responsible for receiving application level requests related to the storage of messaging. The MGC is responsible for maintaining the list of URIs that are related to a particular user/subscriber and is also responsible for determining who may access this data.

From a H.248 perspective, once a connection is established, the MGC may request via the "Store Message Package" that messages sent and/or received on a Termination/Stream be stored in a particular URI for later play out. See clause 15 for more details.

Messages may also be recorded as a result of a filtering action. This is achieved through the use of the Message Filtering Package (see clause 13). The MGC shall set the filter rules indicating which messages are applicable and the action "fileinto" to indicate that the applicable messages are stored. The MGC may also request notification of the storage of a message with the storage location and message identity, so that the MGC may later manage the stored messages.

Further information regarding stored messages can be retrieved via the Stored Message Information Package (see clause 14).

### **6.4 Playing messages**

Once a connection is established, the MGC may request via the "Play Message Package" that a message stored on the MG (or provided by the MGC) be played to that particular user (termination/stream). See clause 10 for more details.

### **6.5 Deleting messages**

A MGC may request the MG to delete previously stored messages. See clause 11 for more details.

### **6.6 Connection removal**

When the MGC requires the removal of a MSRP connection, it should remove the associated StreamID from the applicable termination. As per clause 5.4 of [IETF RFC 4975], the MGC should ensure that call level sessions related to MSRP connection are terminated before removing the connection.

## **7 Message conferencing**

[ITU-T H.248.1] allows conferencing as part of its core functionality. [ITU-T H.248.19] describes audio and video conferencing configurations. MSRP conferencing follows the same principles, except that the messages are not mixed but relayed between terminations where the messaging stream is set. The use of a separate messaging stream allows the MG to support different types of media per termination.

Identity management and privacy information is typically negotiated via session-based signalling. Thus the MGC is responsible for relaying this MSRP received information between participants.

The MGC/MG may itself act as a conference participant, and thus it has the capability to generate messages to the other participants in the conference connection.

## **8 MSRP Statistics Package**

Package Name: MSRP Statistics Package

Package ID: msrpstat (0x00ea)

Description: This package allows the MGC to set certain messaging statistics on the MG per termination or messaging stream. It also allows the MGC to determine the cumulative messaging statistics for a particular messaging stream/termination and also message specific information.

Version: 1

Extends: None.

## 8.1 Properties

None.

## 8.2 Events

### 8.2.1 Messaging Quota

Event Name: Messaging Quota

Event ID: mquota (0x0001)

Description: This event allows the MGC to send quotas for message sending and reception on a MG. It allows the MG to report when the quota has been reached. The MGC may set multiple instances of this event if different sending and reception quotas are subject to different time constraints.

#### 8.2.1.1 EventsDescriptor parameters

##### 8.2.1.1.1 Number of Messages Sent Quota

Parameter Name: Number of Messages Sent Quota

Parameter ID: msq (0x0001)

Description: This parameter defines the maximum number of messages that may be sent from the Termination for the messaging stream.

Type: Integer

Optional: Yes

Possible values: 0 – 65535 (0 indicates no limit)

Default: 0

##### 8.2.1.1.2 Number of Messages Received Quota

Parameter Name: Number of Messages Received Quota

Parameter ID: mrq (0x0002)

Description: This parameter defines the maximum number of messages that may be received on the termination for the messaging stream.

Type: Integer

Optional: Yes

Possible values: 0 – 65535 (0 indicates no limit)

Default: 0

##### 8.2.1.1.3 Messages Sent Volume Quota

Parameter Name: Messages Sent Volume Quota

Parameter ID: msv (0x0003)

Description: This parameter defines the maximum cumulative total size (in octets) of messages that may be sent by the termination for the messaging stream.

Type: Integer

Optional: Yes

Possible values: 0 and upwards. "0" indicates no quota.

Default: 0

#### **8.2.1.1.4 Messages Received Volume Quota**

Parameter Name: Messages Received Volume Quota

Parameter ID: mrv (0x0004)

Description: This parameter defines the maximum cumulative total size (in octets) of messages that may be received on the termination for the messaging stream.

Type: Integer

Optional: Yes

Possible values: 0 and upwards. "0" indicates no quota.

Default: 0

#### **8.2.1.1.5 Time Quota**

Parameter Name: Time Quota

Parameter ID: tm (0x0005)

Description: This parameter defines for how long the quotas associated with the event are active. On expiry of the time, the event is reported.

Type: Integer

Optional: Yes

Possible values: 0 and upwards (in seconds). "0" indicates no quota.

Default: 0

#### **8.2.1.1.6 Statistics Reported**

Parameter Name: Statistics Reported

Parameter ID: statrep (0x0006)

Description: This parameter defines which statistics are reported with the observed event.

Type: Sub-list of Enumeration

Optional: Yes

Possible values:

none (0x0000)	No Statistics Reported
nms (0x0001)	Number of Messages Sent
nmr (0x0002)	Number of Messages Received
vms (0x0003)	Volume of Messages Sent
vmr (0x0004)	Volume of Messages Received

Default: (nms, nmr, vms, vmr) "All Statistics"

## 8.2.1.2 ObservedEventsDescriptor parameters

### 8.2.1.2.1 Quota Reached

Parameter Name: Quota Reached

Parameter ID: qreach (0x0001)

Description: This parameter indicates which quota has triggered the reporting of the event.

Type: Enumeration

Optional: No

Possible values:	msq	(0x0001)	Number of Messages Sent Quota
	mrq	(0x0002)	Number of Messages Received Quota
	msv	(0x0003)	Messages Sent Volume Quota
	mrv	(0x0004)	Messages Received Volume Quota
	tm	(0x0005)	Time Quota

Default: None.

### 8.2.1.2.2 Number of Messages Sent

Parameter Name: Number of Messages Sent

Parameter ID: nms (0x0002)

Description: This parameter indicates the number of messages successfully sent by a messaging stream.

Type: Integer

Optional: Yes

Possible values: 0 and up

Default: None.

### 8.2.1.2.3 Number of Messages Received

Parameter Name: Number of Messages Received

Parameter ID: nmr (0x0003)

Description: This parameter indicates the number of messages successfully received by a messaging stream.

Type: Integer

Optional: Yes

Possible values: 0 and up

Default: None.

### 8.2.1.2.4 Volume of Messages Sent

Parameter Name: Volume of Messages Sent

Parameter ID: vms (0x0004)

Description: This parameter indicates the current cumulative total size (in octets) of all messages successfully sent by the messaging stream.

Type: Integer

Optional: Yes  
Possible values: 0 and up  
Default: None.

#### **8.2.1.2.5 Volume of Messages Received**

Parameter Name: Volume of Messages Received  
Parameter ID: vmr (0x0005)  
Description: This parameter indicates the current cumulative total size (in octets) of all messages successfully received by the messaging stream.  
Type: Integer  
Optional: Yes  
Possible values: 0 and up  
Default: None.

#### **8.2.2 Individual Message Information Event**

Event Name: Individual Message Information  
Event ID: imi (0x0002)  
Description: This event allows the MGC to request detailed information regarding the messages that a particular user sends.  
NOTE – This event may result in a large number of notifications where a large number of messages are sent; however, for some services/charging detailed information is required.

##### **8.2.2.1 EventsDescriptor parameters**

###### **8.2.2.1.1 Information Requested**

Parameter Name: Information Requested  
Parameter ID: infreq (0x0001)  
Description: This parameter allows the MGC to request the information that is reported when a message is received.  
Type: Sub-list of Enumeration  
Optional: Yes  
Possible values: "fr" (0x0001) From  
"to" (0x0002) To  
"cc" (0x0003) Carbon (or Courtesy) Copy  
"dt" (0x0004) Date and Time  
"sb" (0x0004) Subject  
"sz" (0x0005) Size  
Default: None. If no value is provided, all the information is reported.

## 8.2.2.2 ObservedEventsDescriptor parameters

### 8.2.2.2.1 Message Identity

Parameter Name: Message Identity  
Parameter ID: mi (0x0001)  
Description: This parameter indicates the MSRP message identity of the received message.  
Type: String  
Optional: No  
Possible values: The string is of type "ident" defined by the following ABNF:  
`ident = ALPHANUM 3*31ident-char`  
`ident-char = ALPHANUM / "." / "-" / "+" / "%" / "="`  
See clause 9 of [IETF RFC 4975].  
Default: None.

### 8.2.2.2.2 "From" Information

Parameter Name: "From" Information  
Parameter ID: fr (0x0002)  
Description: This parameter indicates the sender or originator of a message.  
Type: String  
Optional: Yes  
Possible values: String of type "From-header". Syntax according to the following ABNF:  
`From = [ Formal-name ] "<" URI ">"`  
See clause 4.1 of [IETF RFC 3862] for more information.  
Default: None.

### 8.2.2.2.3 "To" Information

Parameter Name: "To" Information  
Parameter ID: to (0x0003)  
Description: This parameter specifies an intended recipient of a message.  
Type: Sub-list of String  
Optional: Yes  
Possible values: Each instance of String of type "To-header". Syntax according to the following ABNF:  
`To-header = [ Formal-name ] "<" URI ">"`  
See clause 4.2 of [IETF RFC 3862] for more information.  
Default: None.

### 8.2.2.2.4 "CC" Information

Parameter Name: "CC" Information  
Parameter ID: cc (0x0004)  
Description: This parameter specifies a non-primary recipient for a message.

Type: Sub-list of String  
Optional: Yes  
Possible values: Each instance of String of type "Cc-header". Syntax according to the following ABNF:  
`Cc-header = [ Formal-name ] "<" URI ">"`  
See clause 4.3 of [IETF RFC 3862] for more information.  
Default: None.

#### **8.2.2.2.5 "DateTime" Information**

Parameter Name: "DateTime" Information  
Parameter ID: dt (0x0005)  
Description: This parameter specifies the date and time a message was sent.  
Type: String  
Optional: Yes  
Possible values: String of type "DateTime-header". Syntax according to the following ABNF:  
`DateTime-header = date-time`  
The syntax of 'date-time' is defined in [IETF RFC 3339].  
See clause 4.4 of [IETF RFC 3862] for more information.  
Default: None.

#### **8.2.2.2.6 "Subject" Information**

Parameter Name: "Subject" Information  
Parameter ID: sb (0x0006)  
Description: This parameter contains a description of the topic of the message.  
Type: Sub-list of String  
Optional: Yes  
Possible values: Each instance of String of type "Subject-header". Syntax according to the following ABNF:  
`Subject-header = [ ";" Lang-param ] SP *HEADERCHAR`  
See clause 4.5 of [IETF RFC 3862] for more information.  
Default: None.

#### **8.2.2.2.7 "Size" Information**

Parameter Name: "Size" Information  
Parameter ID: sz (0x0007)  
Description: This parameter contains the total size of the message in bytes.  
Type: String  
Optional: Yes

Possible values: Each instance of String of type "total". Syntax according to the following ABNF:

```
total = 1*DIGIT
```

For more information, see the "byte-range" header in [IETF RFC 4975].

Default: None.

### 8.3 Signals

None.

### 8.4 Statistics

#### 8.4.1 Number of Messages Sent

Statistic Name: Number of Messages Sent

Statistic ID: nms (0x0001)

Description: This Statistics counts the number of messages successfully sent by a messaging stream.

Type: Integer

Possible values: 0 and up.

Level: Stream or Termination.

#### 8.4.2 Number of Messages Received

Statistic Name: Number of Messages Received

Statistic ID: nmr (0x0002)

Description: This Statistics counts the number of messages successfully received by a messaging stream.

Type: Integer

Possible values: 0 and up.

Level: Stream or Termination.

#### 8.4.3 Volume of Messages Sent

Statistic Name: Volume of Messages Sent

Statistic ID: vms (0x0003)

Description: This Statistics contains the current cumulative total size (in octets) of all messages successfully sent by the messaging stream.

Type: Integer

Possible values: 0 and up.

Level: Stream or Termination.

#### 8.4.4 Volume of Messages Received

Statistic Name: Volume of Messages Received

Statistic ID: vmr (0x0004)

Description: This Statistics contains the current cumulative total size (in octets) of all messages successfully received by the messaging stream.

Type: Integer  
Possible values: 0 and up.  
Level: Stream or Termination.

## 8.5 Error codes

None.

## 8.6 Procedures

### 8.6.1 Quotas

Where the MGC requires that quotas are set for messaging sending and reception, it shall set the "Messaging Quota" (*msrstat/mquota*) event with the applicable quotas. The MGC must set at least one of the quotas. The MGC may set multiple events where different metrics apply to different quotas.

If the event is set at a termination level, then the quota applies to all messaging streams and represents a cumulative value for all the messaging streams. Events may also be set at a stream level which allows different message streams to have different quotas.

If the "Time Quota" (*tm*) parameter is set with another quota(s), then time-based reporting will apply to those quotas. The MG shall Notify the event when the time period has elapsed even if the other quotas have been reached. The time-triggered report shall only contain the quota reached reason "Time Quota".

If the "Number of Messages Sent Quota" (*msq*), "Number of Messages Received Quota" (*mrq*), "Messages Sent Volume Quota" (*msv*) or "Messages Received Volume Quota" (*mrsv*) quotas have been reached, then a Notify will be triggered containing the quota reached reason related to the quota that has been reached.

NOTE – In this package, volume (size) relates to the MSRP application layer, not to the underlying protocol layers (i.e., TCP/IP). An MG sending or receiving a complete message may cause it to exceed a volume quota. It is a matter of MG policy whether this full message is accepted or only partially accepted.

Once a quota has been reached, the MG shall not send any messages or relay any received messages related to the user (Termination/Stream). However, the MG may still perform message related signalling, i.e., generating MSRP error replies, etc.

### 8.6.2 Cumulative statistics

In order for the MG to record statistics related to Messaging Stream, it should set the "Number of Messages Sent" (*nms*), "Number of Messages Received" (*nmr*), "Volume of Messages Sent" (*vms*) or "Volume of Messages Received" (*vmr*) Statistics. If these are set at a termination level, then the statistics represent a cumulative total for all messaging streams on a termination. Where multiple messaging Streams are used on a termination, the Statistics may be set on each Stream in order to record individual statistics.

NOTE – The ability to set Statistics on a stream level was introduced in [ITU-T H.248.1] version 3.

Any further action by the MGC is service dependent. An indication may be sent to the user indicating that their quota has been reached (i.e., via [ITU-T H.248.9]) or the messaging stream may be removed.

Where an MGC requires notification of the above Statistics without applying quotas, then it shall use the events and procedures defined in [ITU-T H.248.47]. These allow the MGC to set value or time-based metrics for reporting. When these metrics are reporting, the MG shall not stop the sending or reception of messages.

### 8.6.3 Individual message statistics

Where the MGC wishes to receive real-time information regarding messages sent by a certain user (received at the MG), it should set the "Individual Message Information" (*msrpstat/imi*) Event indicating in the "Information Requested" (*infreq*) parameter what information it requires. The *msrpstat/imi* shall be set on the Termination/Stream representing the message sender. If this parameter is omitted, all information defined in the Package will be returned.

Once the event is set, the MG shall generate a notification with the requested information for each message received (from external to the MG) by the termination/stream. If the received message does not contain the requested information, it shall be omitted from the notification to the MGC.

## 9 MSRP Connection Status Package

Package Name: MSRP Connection Status Package

Package ID: msrpcs (0x00eb)

Description: This package allows the MGC to determine the status of the MSRP connection related to a particular messaging stream.

Version: 1

Extends: None.

### 9.1 Properties

None.

### 9.2 Events

#### 9.2.1 MSRP Connection Failure

Event Name: MSRP Connection Failure

Event ID: fail (0x0001)

Description: This event indicates that the MG considers that the MSRP connection has failed.

##### 9.2.1.1 EventsDescriptor parameters

None.

##### 9.2.1.2 ObservedEventsDescriptor parameters

None.

### 9.3 Signals

#### 9.3.1 Establish MSRP Connection

Signal Name: Connect

Signal ID: conn (0x0001)

Description: This signal indicates that the MG is responsible for initiating an MSRP connection to its peer (indicated by the SDP in the associated stream).

Signal Type: Brief

Duration: Not Applicable.

### 9.3.1.1 Additional parameters

None.

## 9.4 Statistics

None.

## 9.5 Error codes

None.

## 9.6 Procedures

Clause 8.5 of [IETF RFC 4975] indicates that "the party that sent the original offer is responsible for connecting to its peer." As this relates to call/session level signalling, the MGC has the knowledge of this and, in order for the MG to establish the MSRP connection, the MG must be provided with this information. When the MGC requires the establishment of a MSRP connection, it shall propagate the necessary SDP information (see clause 6) in the Local and Remote Descriptors. It shall then issue the "Establish MSRP Connection" (*msrpcs/conn*) Signal.

When the MGC wishes to determine when and if the MSRP connection has failed, it shall set the "MSRP Connection Failure" (*msrpcs/fail*) event on the stream, associated with the messaging stream. When the MG detects a failure of the messaging stream it shall Notify the MGC via the "MSRP Connection Failure" (*fail*) event. The MG shall include the StreamID in the response in order to uniquely identify the messaging stream.

## 10 Play Message Package

Package Name: Play Message

Package ID: mess (0x00ec)

Description: This package allows the MGC to request the MG to send a particular message on a termination/stream.

Version: 1

Extends: None.

### 10.1 Properties

None.

### 10.2 Events

#### 10.2.1 Message Sending Response Status

Event Name: Message Sending Response Status

Event ID: msrs (0x0001)

Description: This event allows the MG to report the response status when the MGC has requested that a message is sent via the "Send Message" Signal. It is only reported if the MGC had indicated that success and failures should be reported to it.

##### 10.2.1.1 EventsDescriptor parameters

None.

## 10.2.1.2 ObservedEventsDescriptor parameters

### 10.2.1.2.1 Message Identity

Parameter Name: Message Identity  
Parameter ID: mi (0x0001)  
Description: This parameter allows the MGC to correlate the received message status with its original message sending request.  
Type: String  
Optional: No  
Possible values: The string is of type "ident" defined by the following ABNF:  

```
ident = ALPHANUM 3*31ident-char  
ident-char = ALPHANUM / "." / "-" / "+" / "%" / "="
```

  
See clause 9 of [IETF RFC 4975].  
NOTE – Whilst the MSRP message identity encoding is used, a message identity other than the MSRP message identity may be used.  
Default: None.

### 10.2.1.2.2 Status Code

Parameter Name: Status Code  
Parameter ID: sc (0x0002)  
Description: This parameter indicates the status code associated with the response to sending a message via the "Send Message" signal.  
Type: String  
Optional: No  
Possible values: The string is of type "Status" defined by the following ABNF:  

```
Status = namespace SP status-code [SP comment]  
namespace = 3 (DIGIT) ;  
status-code = 3DIGIT ;
```

  
See clause 9 of [IETF RFC 4975] for further ABNF definitions.  
See clause 10 of [IETF RFC 4975] for a list of possible codes.  
Default: None.

## 10.3 Signals

### 10.3.1 Send Message

Signal Name: Send Message  
Signal ID: sm (0x0001)  
Description: This signal allows the MGC to request the MG to send a message from a particular termination/stream.  
Signal Type: Brief  
Duration: Not Applicable

### 10.3.1.1 Additional parameters

#### 10.3.1.1.1 Message Identity

Parameter Name: Message Identity

Parameter ID: mi (0x0001)

Description: This parameter allows the MGC to correlate the sent message with any requested failure or success reports.

Type: String

Optional: No

Possible values: The string is of type "ident" defined by the following ABNF:

```
ident = ALPHANUM 3*31ident-char
```

```
ident-char = ALPHANUM / "." / "-" / "+" / "%" / "="
```

See clause 9 of [IETF RFC 4975].

NOTE – Whilst the MSRP message identity encoding is used, a message identity other than the MSRP message identity may be used.

This parameter may also be wildcarded CHOOSE in order for the MG to supply the Message Identity when the MGC is unaware of the Identity. The MGC may also wildcard ALL if it requests all messages associated with a URI are to be sent.

Default: None.

#### 10.3.1.1.2 Message Contents by reference

Parameter Name: Message Contents by reference

Parameter ID: mcr (0x0002)

Description: This parameter allows the MGC to provide the MG with an URI which points to the message data that shall be sent.

Type: String

Optional: No

Possible values: As per [IETF RFC 3986].

Default: None.

#### 10.3.1.1.3 Failure Report

Parameter Name: Failure Report

Parameter ID: fr (0x0003)

Description: This parameter allows the MGC to indicate the failure reporting mode that the MG shall use when sending the message. In order for the MGC to receive the error response from the MG, it shall set the "Message Sending Response Status" (*mess/msrs*) Event.

Type: Enumeration

Optional: Yes

Possible values: "yes" (0x0001) Request Failure Report  
"no" (0x0002) No Failure Report Request  
"partial" (0x0003) Request partial failure reporting  
Default: yes

#### 10.3.1.1.4 Success Report

Parameter Name: Success Report  
Parameter ID: sr (0x0004)  
Description: This parameter allows the MGC to indicate the success reporting mode that the MG shall use when sending the message. In order for the MGC to receive the status response from the MG, it shall set the "Message Sending Response Status" (*mess/msrs*) Event.  
Type: Enumeration  
Optional: Yes  
Possible values: "yes" (0x0001) Request Success Status Report  
"no" (0x0002) No Status Report Request  
Default: no

### 10.4 Statistics

None.

### 10.5 Error codes

None.

### 10.6 Procedures

In a particular service scenario, the MGC may request the MG to send messages to particular end users. This is similar to the ability to send audio, video and multimedia announcements to users as defined in [ITU-T H.248.9] and [ITU-T H.248.7]. The packages in these Recommendations allow a MGC to use a Signal to point data to be sent to the user in the format described in the Local and Remote Descriptors.

Likewise, this package defines the "Send Message" (*mess/sm*) signal that allows the MGC to request the MG to send a message to a user. Where there are multiple streams on a termination, the MGC should identify the StreamID of the messaging stream where the signal is to be sent. Furthermore, the MGC shall ensure that the messaging stream has been defined (clause 6.2) before requesting that the signal has been sent. If the MGC tries to send the *mess/sm* signal before the messaging stream is established, the MG shall respond with error code 514 "Media Gateway cannot send the specified Announcement".

The MGC must set the "Message Contents by reference" (*mcr*) to identify the contents of the message to be sent.

The MGC must either request or provide a value for the "Message Identity" in order to correlate the signal with a particular message.

The MGC may request Status or Error Reporting through the use of the "Status Report" (*sr*) and "Failure Report" (*fr*) parameters, respectively. If received, the MG shall use these values in any messaging signalling it sends related to the *mess/sm* signal.

On receipt of the *mess/sm* signal, the MG shall send the message using the protocol as described by the Local and Remote descriptors in the applicable messaging stream. The MG is responsible for providing and maintaining any protocol specific data, e.g., transaction-ids and message length information.

If the MGC requires notification of a success or failure report associated with the sent message, then it shall set the "Message Sending Response Status" (*mess/msrs*) event on the applicable stream or termination. The MG shall trigger this event based on the success and failure reporting requested by a particular signal/message identity. If triggered, the MG shall send a Notify command to the MGC containing the message identity and status.

## **11 Delete Stored Message Package**

Package Name: Delete Stored Message Package  
Package ID: delmess (0x00ed)  
Description: This package allows the MGC to request the MG to delete previously stored messages. The signal is applied to the root termination.  
Version: 1  
Extends: None.

### **11.1 Properties**

None.

### **11.2 Events**

None.

### **11.3 Signals**

#### **11.3.1 Delete Message**

Signal Name: Delete Message  
Signal ID: dm (0x0001)  
Description: This signal allows the MGC to request the MG to delete one or more messages associated with a particular URI.  
Signal Type: Brief  
Duration: Not Applicable

##### **11.3.1.1 Additional parameters**

###### **11.3.1.1.1 Storage Location**

Parameter Name: Storage Location  
Parameter ID: sl (0x0001)  
Description: This parameter allows the MGC to provide to (or request from) the MG a URI where the messages are to be stored.  
Type: String  
Optional: No  
Possible values: As per [IETF RFC 3986].  
Default: None.

### 11.3.1.1.2 Message Identity

Parameter Name:	Message Identity
Parameter ID:	mi (0x0002)
Description:	This parameter allows the MGC to request that a MG deletes particular messages associated with the URI.
Type:	Sub-list of String
Optional:	Yes
Possible values:	Each string instance of the sub-list is of type "ident" defined by the following ABNF: <pre>ident = ALPHANUM 3*31ident-char ident-char = ALPHANUM / "." / "-" / "+" / "%" / "="</pre> See clause 9 of [IETF RFC 4975]. NOTE – Whilst the MSRP message identity encoding is used, a message identity other than the MSRP message identity may be used. If no value is provided, all messages associated with the URI are deleted.
Default:	None.

## 11.4 Statistics

None.

## 11.5 Error codes

None.

## 11.6 Procedures

The MGC may request the MG to delete a message associated with a particular URI or the entire URI through the use of the "Delete Message" (*delmess/dm*) signal on the root termination. The usage of the signal on the root termination allows the deletion of messages outside of a MSRP session. The MGC must provide the URI of the messages to be deleted.

## 12 Messaging Session Information Package

Package Name:	Message Session Information Package
Package ID:	msi (0x00ee)
Description:	This package allows the MGC to indicate additional attributes to describe the messaging session to those defined in [IETF RFC 4975]. The MG shall ensure that messages sent/received also comply with these attributes.
Version:	1
Extends:	None.

### 12.1 Properties

#### 12.1.1 Subject

Property Name:	Message Subject
Property ID:	sb (0x0001)
Description:	This property contains a description of the topic of the message.

Type: Sub-list of String  
Possible values: Each instance of String of type "Subject-header". Syntax according to the following ABNF:  
`Subject-header = [ ";" Lang-param ] SP *HEADERCHAR`  
See clause 4.5 of [IETF RFC 3862] for more information.

Default: None.  
Defined in: LocalControl  
Characteristics: Read/Write

### **12.1.2 Message Class**

Property Name: Message Class  
Property ID: class (0x0002)  
Description: This property indicates the messages class, e.g., Advertisement/private  
Type: Sub-list of String  
Possible values: Any string. A profile may define possible values.  
Default: None.  
Defined in: LocalControl  
Characteristics: Read/Write

### **12.1.3 Message Priority**

Property Name: Message Priority  
Property ID: pri (0x0003)  
Description: This property indicates the messages priority.  
Type: String  
Possible values: "normal", "non-urgent", "urgent"  
See clause 2.1.54 of [IETF RFC 4021].  
Default: None.  
Defined in: LocalControl  
Characteristics: Read/Write

### **12.2 Events**

None.

### **12.3 Signals**

None.

### **12.4 Statistics**

None.

### **12.5 Error codes**

None.

## 12.6 Procedures

This package allows a MGC to provide further information to the MG on the characteristics of a particular messaging stream. If the MGC sets the properties in this package on a particular messaging stream, then the MG shall ensure that MSRP messages sent and received by the termination/stream comply with these characteristics. If MSRP messages/signalling does not comply with the properties, then the messaging server shall generate an appropriate error code.

## 13 Messaging Filtering Package

Package Name: Message Filtering Package

Package ID: mf (0x00ef)

Description: This package allows the MGC to indicate to the MG message filtering rules and the behaviour to apply to the messages based on matching the filtering rule. The filter rules and behaviour are based on "Sieve" as defined by [IETF RFC 5228], which allows complex filtering rules for e-mail to be specified. As e-mail and messaging have similar headers, this language is applied in ITU-T H.248.

Version: 1

Extends: None.

### 13.1 Properties

#### 13.1.1 Incoming Message Filters

Property Name: Incoming Message Filters

Property ID: imf (0x0001)

Description: This property contains a Sieve script that is applied to incoming messages from a user's perspective, i.e messages received by a termination from other terminations in the context.

Type: String

Possible values: As per the Sieve Grammar (clause 8.2 of [IETF RFC 5228]). See clause 13.6 for more information.

Default: All messages are implicitly kept.

Defined in: LocalControl

Characteristics: Read/Write

#### 13.1.2 Incoming Message Filters by Reference

Property Name: Incoming Message Filters by Reference

Property ID: imfr (0x0002)

Description: This property allows the MGC to indicate which Sieve script should be used for incoming message filtering by referring to a URI pointing to a Sieve script file (e.g., a file with .siv or .sieve file extension).

Type: String

Possible values: The string is of type "SIEVE-URI".  
See: <http://www.iana.org/assignments/uri-schemes.html>

Default: All messages are implicitly kept.

Defined in: LocalControl

Characteristics: Read/Write

### 13.1.3 Outgoing Message Filters

Property Name: Outgoing Message Filters

Property ID: omf (0x0003)

Description: This property contains a Sieve script that is applied to outgoing messages from a user's perspective, i.e., messages received by a termination from the user.

Type: String

Possible values: As per the Sieve Grammar (clause 8.2 of [IETF RFC 5228]). See clause 13.6 for more information.

Default: All messages are implicitly kept.

Defined in: LocalControl

Characteristics: Read/Write

### 13.1.4 Outgoing Message Filters by Reference

Property Name: Outgoing Message Filters by Reference

Property ID: omfr (0x0004)

Description: This property allows the MGC to indicate which Sieve script should be used for outgoing message filtering by referring to a URI pointing to a Sieve script file (e.g., a file with .siv or .sieve file extension).

Type: String

Possible values: The string is of type "SIEVE-URI". See: <http://www.iana.org/assignments/uri-schemes.html>

Default: All messages are implicitly kept.

Defined in: LocalControl

Characteristics: Read/Write

## 13.2 Events

### 13.2.1 Filed Message

Event Name: Filed Message

Event ID: fm (0x0001)

Description: This event enables the MGC to be notified when the MG has filed a message as a result of filtering. This allows the MGC to determine if the user needs to be notified of this event.

#### 13.2.1.1 EventsDescriptor parameters

None.

#### 13.2.1.2 ObservedEventsDescriptor parameters

##### 13.2.1.2.1 Storage Location

Parameter Name: Storage Location

Parameter ID: sl (0x0001)

Description: This parameter allows the MG to indicate to the MGC where the messages are stored.  
Type: String  
Optional: No  
Possible values: As per [IETF RFC 3986].  
Default: None.

#### **13.2.1.2.2 Message Identity**

Parameter Name: Message Identity  
Parameter ID: mi (0x0002)  
Description: This parameter allows the MGC to request that a MG stores particular messages associated with the URI.  
Type: Sub-list of String  
Optional: No  
Possible values: Each string instance of the sub-list is of type "ident" defined by the following ABNF:  

```
ident = ALPHANUM 3*31ident-char  
ident-char = ALPHANUM / "." / "-" / "+" / "%" / "="
```

See clause 9 of [IETF RFC 4975].  
NOTE – Whilst the MSRP message identity encoding is used, a message identity other than the MSRP message identity may be used.  
If no value is provided, all messages are stored.

Default: None.

### **13.2.2 Filtering Runtime Error Event**

Event Name: Filtering Runtime Error  
Event ID: fre (0x0002)  
Description: This event allows the MG to send a notification to the MGC indicating that an error has occurred during the execution of a filtering script against a particular message.

#### **13.2.2.1 EventsDescriptor parameters**

None.

#### **13.2.2.2 ObservedEventsDescriptor parameters**

##### **13.2.2.2.1 Message Identity**

Parameter Name: Message Identity  
Parameter ID: mi (0x0001)  
Description: This parameter indicates the MSRP message identity of the message the filtering script that generated an error was applied to.  
Type: String  
Optional: Yes

Possible values: The string is of type "ident" defined by the following ABNF:

```
ident = ALPHANUM 3*31ident-char
```

```
ident-char = ALPHANUM / "." / "-" / "+" / "%" / "="
```

See clause 9 of [IETF RFC 4975].

NOTE – Whilst the MSRP message identity encoding is used, a message identity other than the MSRP message identity may be used.

Default: None.

#### 13.2.2.2.2 Error Cause

Parameter Name: Error Cause

Parameter ID: cause (0x0002)

Description: This parameter provides information on the cause of the error.

Type: Integer

Optional: No

Possible values:

- 0 Unknown Cause
- 1 Invalid Combination of Actions
- 2 Unable to file message (disk full)
- 3 Unable to file message (invalid mailbox)
- 4 Unable to redirect message
- 5 Loop detected in script

Default: 0

### 13.3 Signals

None.

### 13.4 Statistics

None.

### 13.5 Error codes

#### 13.5.1 Sieve Script Syntax Error

Error Code #: 700

Name: Sieve Script Syntax Error

Definition: The MG has detected a syntax error in the provided Sieve script. Therefore, the provided script is ignored.

Error Text in the  
Error Descriptor: None.

Comment: None.

#### 13.5.2 Unsupported Sieve Require Error

Error Code #: 701

Name: Unsupported Sieve Require Error

Definition: The MG does not support a particular "require" in the requested Sieve script. The provided script is ignored.

Error Text in the  
Error Descriptor: A copy of the line containing the unsupported "require" may be included.

Comment: None.

### 13.5.3 Sieve Actions Exceeded Error

Error Code #: 702

Name: Sieve Actions Exceeded Error

Definition: The MG does not support the number of Sieve actions required in the requested Sieve script. The provided script is ignored.

Error Text in the  
Error Descriptor: An integer value of the maximum number of Sieve actions.

Comment: None.

## 13.6 Procedures

### 13.6.1 Filtering script compatibility with Sieve

The encoding, processing and actions of H.248 filtering scripts follows Sieve [IETF RFC 5228], with the following exceptions:

- 1) The use of double quote (") character is not permitted within a H.248 Property String. However, double quotes are used in the Sieve language and may be contained in Sieve strings. Therefore, where quoted string is used within a Sieve script, it shall be represented using %x22.

For example, the Sieve test 'header :contains ["To"]' would be encoded in a H.248 property as "header :contains [%x22To%x22]".

NOTE – When a double quote is used within a Sieve String, a backslash "\" precedes the %x22 encoding.

- 2) Sieve (clause 2.4.2.2 of [IETF RFC 5228]) allows the specification of header fields according to clause 3.6 of [IETF RFC 2822]. The use of this package allows the specification of header fields according to the MSRP [IETF RFC 4975] and CPIM [IETF RFC 3860].
- 3) A subset of header fields may be specified in an applicable H.248 profile.
- 4) A single Sieve script shall apply to either the incoming or outgoing messages. Separate scripts are used for the incoming or outgoing message direction. See clause 2.4.2.3 of [IETF RFC 5228] for related information.
- 5) Sieve scripts allow different types of action commands (clause 2.9 of [IETF RFC 5228]). Implementation shall support the "Keep" action; however, the support of the "Discard", "Redirect" and "Fileinto" actions is optional.
- 6) The "Fileinto" action is used to store a message. The <mailbox: string> format (see clause 4.1 of [IETF RFC 5228]) shall comply with the URI format.
- 7) The "Keep" action results in the message being sent to the user, it does not imply local storage on the MG.

### 13.6.2 Encoding of Sieve scripts

Sieve scripts are encoded using the "Quoted String Form".

### 13.6.3 H.248 usage of filtering scripts

Based on a user profile or MGC policy, the MGC may set a message level filtering script at an individual termination/stream level. The result of such a script may cause the following actions:

- A message is delivered to the user represented by the termination (i.e., action Keep).
- A message is discarded (i.e., action Discard).
- A message is redirected to another address (i.e., action Redirect).
- A message is stored (i.e., action Fileinto).

NOTE – Due to the complexity of the interaction between messaging scripts at an individual termination and root termination level, the use of message filters at the MG wide level (i.e., on the root termination) is for further study.

For filtering incoming messages, the MGC shall use either the "Incoming Message Filters" (*mf/imf*) property or the "Incoming Message Filters by Reference" (*mf/imfr*) property containing a filtering script. If the MGC sets both these properties, the MG shall respond with error 473 "Conflicting Property Values". The filtering script shall comply with clause 13.6.1.

For filtering outgoing messages, the MGC shall use either the "Outgoing Message Filters" (*mf/omf*) property or the "Outgoing Message Filters by Reference" (*mf/omfr*) property containing a filtering script. If the MGC sets both these properties, the MG shall respond with error 473 "Conflicting Property Values". The filtering script shall comply with clause 13.6.1.

On reception of the script, the MG should parse the script to determine if there are any errors. If an error is detected, one of the errors in clause 13.5 shall be returned.

Once the filtering script is accepted it shall be applied to each message received on the applicable termination/stream.

If the MGC requires information regarding the storage (filing) of messages, it shall set the "Filed Message" (*mf/fm*) event. This allows the MGC to determine the message identity of the stored message along with the storage location. The MGC may then use this information to provide further services to a user.

The MGC should also set the "Filter Runtime Error" (*mf/fre*) event on the applicable stream in order to determine if there are any errors when running the filter against an incoming message.

### 13.6.4 H.248 filtering script example

The script below shows an example filter that checks the sender of the message and provides different actions based on the sender. The example shows a filter that saves messages from *friend@friendlydomain.com* to a MSRP URI and forwards all work-related messages to the user.

```
mf/fre{"require [%x22fileinto%x22];
      if header is %x22Sender%x22 %x22friend@friendlydomain.com%x22
      {
        fileinto %x22msrp://mydomain.com:8493/session123;tcp%x22
      }
      elseif address :DOMAIN :is [%x22From%x22, %x22To%x22]
      %x22mycompany.com%x22
      {
        keep;
      }
}
```

## 14 Stored Message Information Package

Package Name: Stored Message Information Package  
Package ID: sminf (0x00f0)  
Description: This package allows the MGC to request information regarding stored messages.  
Version: 1  
Extends: None.

### 14.1 Properties

None.

### 14.2 Events

None.

### 14.3 Signals

#### 14.3.1 Message Information

Signal Name: Message Information  
Signal ID: mi (0x0001)  
Description: This signal allows the MGC to request information on a previously stored message on the MG.  
Signal Type: Brief  
Duration: Not Applicable

##### 14.3.1.1 Additional parameters

###### 14.3.1.1.1 Storage Location

Parameter Name Storage Location  
Parameter ID: sl (0x0001)  
Description: This parameter allows the MGC to provide to the MG the URI of the stored message.  
Type: String  
Optional: No  
Possible values: As per [IETF RFC 3986].  
Default: None.

###### 14.3.1.1.2 Message Identity

Parameter Name: Message Identity  
Parameter ID: mi (0x0002)  
Description: This parameter allows the MGC to request information regarding a sub-set of messages when multiple messages are stored in a URI.  
Type: Sub-list of String  
Optional: No

Possible values: Each string instance of the sub-list is of type "ident" defined by the following ABNF:  
`ident = ALPHANUM 3*31ident-char`  
`ident-char = ALPHANUM / "." / "-" / "+" / "%" / "="`  
NOTE – Whilst the MSRP message identity encoding is used, a message identity other than the MSRP message identity may be used.  
See clause 9 of [IETF RFC 4975].

Default: None.

#### 14.3.1.1.3 "From" Information

Parameter Name: "From" Information

Parameter ID: fr (0x0003)

Description: This parameter indicates the sender or originator of a message.

Type: String

Optional: Yes

Possible values: String of type "From-header". Syntax according to the following ABNF:

```
From = [ Formal-name ] "<" URI ">"
```

See clause 4.1 of [IETF RFC 3862] for more information.

Default: None.

#### 14.3.1.1.4 "To" Information

Parameter Name: "To" Information

Parameter ID: to (0x0004)

Description: This parameter specifies an intended recipient of a message.

Type: Sub-list of String

Optional: Yes

Possible values: Each instance of String of type "To-header". Syntax according to the following ABNF:

```
To-header = [ Formal-name ] "<" URI ">"
```

See clause 4.2 of [IETF RFC 3862] for more information.

Default: None.

#### 14.3.1.1.5 "CC" Information

Parameter Name: "CC" Information

Parameter ID: cc (0x0005)

Description: This parameter specifies a non-primary recipient for a message.

Type: Sub-list of String

Optional: Yes

Possible values: Each instance of String of type "Cc-header". Syntax according to the following ABNF:  
`Cc-header = [ Formal-name ] "<" URI ">"`  
See clause 4.3 of [IETF RFC 3862] for more information.

Default: None.

#### 14.3.1.1.6 "DateTime" Information

Parameter Name: "DateTime" Information

Parameter ID: dt (0x0006)

Description: This parameter specifies the date and time a message was sent.

Type: String

Optional: Yes

Possible values: String of type "DateTime-header". Syntax according to the following ABNF:  
`DateTime-header = date-time`  
The syntax of 'date-time' is defined in [IETF RFC 3339].  
See clause 4.4 of [IETF RFC 3862] for more information.

Default: None.

#### 14.3.1.1.7 "Subject" Information

Parameter Name: "Subject" Information

Parameter ID: sb (0x0007)

Description: This parameter contains a description of the topic of the message.

Type: Sub-list of String

Optional: Yes

Possible values: Each instance of String of type "Subject-header". Syntax according to the following ABNF:  
`Subject-header = [ ";" Lang-param ] SP *HEADERCHAR`  
See clause 4.5 of [IETF RFC 3862] for more information.

Default: None.

#### 14.3.1.1.8 "Size" Information

Parameter Name: "Size" Information

Parameter ID: sz (0x0008)

Description: This parameter contains the total size of the message in bytes.

Type: String

Optional: Yes

Possible values: Each instance of String of type "total". Syntax according to the following ABNF:  
`total = 1*DIGIT`  
For more information, see the "byte-range" header in [IETF RFC 4975].

Default: None.

#### 14.4 Statistics

None.

#### 14.5 Error codes

None.

#### 14.6 Procedures

A MGC may require further information regarding the messages stored by a MG. The MGC may learn of the location and the identity of the stored messages through the Filed Message (*mf/fm*) event.

However, the MGC may determine further information regarding a storage location via the "Message Information" (*sminf/mi*) signal.

Multiple messages may be stored in a particular URI. In order for the MGC to determine the identity of messages stored in a particular URI, it may wildcard "CHOOSE" the Message Identity (*mi*) parameter. The MGC shall not use the "from", "to", "cc", "datetime", "subject" and "size" parameters in a signal containing a wildcarded "CHOOSE" Message Identity. The MG shall then return a list of all the message identities in the URI.

By providing the storage location and message identity in the *sminf/mi* signal and wildcarding CHOOSE the "from", "to", "cc", "datetime", "subject" and "size" parameters as appropriate, the MG will return detailed information regarding the referred-to message.

### 15 Record Message Package

Package Name: Record Message Package

Package ID: recmess (0x00f1)

Description: This package allows the MGC to request the MG to store messages sent and/or received at a particular termination/stream.

Version: 1

Extends: None.

#### 15.1 Properties

None.

#### 15.2 Events

##### 15.2.1 Record Operation Failure

Event Name: Record Operation Failure

Event ID: messfail (0x0001)

Description: This event allows the MG to send a notification to the MGC indicating that a failure has occurred when recording a message.

##### 15.2.1.1 EventsDescriptor parameters

None.

##### 15.2.1.2 ObservedEventsDescriptor parameters

###### 15.2.1.2.1 Return Code

Parameter Name: Return Code

Parameter ID: rc (0x0001)  
Description: This parameter allows the MG to indicate to the MGC why the record operation failed.  
Type: Integer  
Optional: No  
Possible values: 623 Out of Storage  
Default: None.

### **15.3 Signals**

#### **15.3.1 Record Message**

Signal Name: Record Message  
Signal ID: rm (0x0001)  
Description: This signal allows the MGC to request the MG to store the message sent and/or received at a particular termination/stream.  
Signal Type: On/Off  
Duration: Not Applicable

##### **15.3.1.1 Additional parameters**

###### **15.3.1.1.1 Storage Location**

Parameter Name: Storage Location  
Parameter ID: sl (0x0001)  
Description: This parameter allows the MGC to provide to (or request from) the MG a URI where the messages are to be stored.  
Type: String  
Optional: No  
Possible values: As per [IETF RFC 3986].  
Default: None.

###### **15.3.1.1.2 Append**

Parameter Name: Append  
Parameter ID: app (0x0002)  
Description: This parameter allows the MGC to indicate to (or request from) the MG whether the messages will be appended to data already existing at a URI or whether the messages will overwrite the data at a URI.  
Type: Enumeration  
Optional: Yes  
Possible values: "ovr" (0x0001) Overwrite  
"app" (0x0002) Append  
Default: ovr

### 15.3.1.1.3 Direction

Parameter Name: Direction

Parameter ID: dir (0x0003)

Description: This parameter indicates which messages should be stored by the MG. "External" indicates those messages received on the termination/stream external to the MG. "Internal" indicates those messages received on the termination/stream from other terminations in the context. "Both" indicates messages from both directions.

Type: Enumeration

Optional: Yes

Possible values:	"EXT" (0x0001)	External
	"INT" (0x0002)	Internal
	"BOTH" (0x0003)	Both

Default: EXT

### 15.3.1.1.4 Maximum Record Size

Parameter Name: Maximum Record Size

Parameter ID: mrs (0x0004)

Description: This parameter indicates the maximum storage size associated with the recording request.

Type: Integer

Optional: Yes

Possible values: 0 – upwards (in octets). Zero (0) indicates no maximum size.

Default: 0

## 15.4 Statistics

None.

## 15.5 Error codes

None.

## 15.6 Procedures

The MGC shall ensure that a messaging stream is established on the MG before requesting message storage. If the MGC requires that the MG store the messages on a particular messaging stream, it shall send the "Record Message" (*recmess/rm*) signal to the MG. It shall either provide to or request from the MG the URI of the stored messages. The MGC is responsible for maintaining the list of stored URI per user/subscriber and also the permissions of who may access the stored messages. The MGC may also request that the MG store the messages sent by a user or received by the user through the use of the "Direction" (*dir*) parameter. The MGC may also set the "Maximum Record Size" (*mrs*) parameter. This parameter indicates the size of the storage for recording messages. Messages are recorded until the maximum recording size is reached. If this size limit results in a partial message being stored, then this partial message is discarded and further recording is stopped.

NOTE 1 – If the message recording is done in conjunction with message sending, the complete message is still sent.

The MGC may set time-based recording by either applying the record message signal as an on/off or timeout signal. If the MGC requires notification of recording failure, it should set the "Record Operation Failure" event.

NOTE 2 – There should be at most one outstanding record operation per messaging stream. In order to correlate the "Record Operation Failure" (*messfail*) event with the correct messaging stream, the MG shall return the StreamID with the ObservedEvent.

The MG shall record the messages received by the termination/stream whilst the signal is set to "on". Messages are recorded prior to any message filtering taking place and once stored will be subject to any applicable message filtering (see the Message Filtering Package in clause 13). When the signal is removed, the MG shall stop recording. If the MGC wishes to subsequently record messages again and wishes to use the same URI, it may indicate whether the messages are appended to the data in the URI or whether the messages overwrite the data in the URI through the use of the "Append" (*app*) parameter. If maximum record size is specified in conjunction with the *app* parameter, then the storage size includes any messages already stored at the storage location. If the *messfail* event had been set, and the MG detects that a storage location size associated with a message recording has been exceeded, then it shall notify the MGC.





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