Multiple recipient MESSAGE requests in the Session Initiation Protocol (SIP)
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Abstract

This document specifies how to request a MESSAGE exploder to send a copy of a MESSAGE to a set of destinations. The client sends a SIP MESSAGE request with a URI list to the MESSAGE exploder, which sends a similar MESSAGE request to each of URIs included in the list.
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1. Introduction


"REQ-GROUP-3: It MUST be possible for a user to send to an ad-hoc group, where the identities of the recipients are carried in the message itself."

To meet this requirement, we allow SIP MESSAGE requests carry an URI list as specified in [4]. The Request-URI of the MESSAGE request contains a "list" URI parameter that points to a body part that carries the URI list. On reception of such a request, the MESSAGE exploder sends a similar MESSAGE request that includes a copy of the body (except the list itself) to each URI in the list.

The UAC needs to be configured with the SIP URI of the MESSAGE exploder. Provisioning of the MESSAGE exploder URI to the UAC is outside the scope of this document.

2. Terminology

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

'MESSAGE exploder': SIP application server that receives a MESSAGE request with a URI list and sends a similar MESSAGE request to each URI in the list. MESSAGE exploders behave effectively as B2BUAs (Back-To-Back-User-Agents).

'Incoming MESSAGE request': A SIP MESSAGE request that a UAC creates and addresses to a SIP MESSAGE exploder. Besides the regular instant message payload, an incoming MESSAGE request contains a URI list.

'Outgoing MESSAGE request': A SIP MESSAGE request that a MESSAGE exploder and addresses to a UAS. It contains the regular instant message payload.

3. Procedures at the UAC

A client that wants to create a multiple recipient MESSAGE request SHOULD add a "list" parameter (specified in [4]) to the MESSAGE exploder's URI and MUST place the resulting URI in the Request-URI of the MESSAGE request. The "list" parameter MUST contain a pointer to a
URI list that contains the recipients of the MESSAGE. The following is an example of a Request-URI with a "list" parameter.

```
sip:message-exploder.example.com;list=cid:cn35t8jf@uac.example.com
```

Multiple recipient MESSAGE requests will typically contain a multiparty body that contains the body carrying the list and the actual instant message payload. In some cases, the MESSAGE request will contain bodies other than the text and the list bodies, for instance, when the request is protected with S/MIME.

Typically the MESSAGE exploder will copy all the significant header fields in the exploded MESSAGE request. However, there might be cases where the SIP UA wants the MESSAGE exploder to add a particular header field with a particular value, when the header field wasn't present in the MESSAGE request sent by the UAC. In this case the UAC MAY use the "?" mechanism described in Section 19.1.1 of RFC 3261 [2] to encode extra information in any URI in the list. However, the UAC MUST NOT use the special "body" hname (see Section 19.1.1 of RFC 3261 [2]) to encode a body, since the body is present in the MESSAGE request itself.

The following is an example of a URI that uses the "?" mechanisms:

```
sip:message-exploder.example.com;list=cid:cn35t8jf@uac.example.com?
Accept-Contact=*/%3bmobility%3d%22mobile%22
```

The previous URI requests the exploder to add the following header field to a MESSAGE request:

```
Accept-Contact: *;mobility="mobile"
```

As described in [4], the default format for URI lists in SIP is the XCAP resource list format [5]. User Agents compliant to this specification MUST support the XCAP resource list format [5] and MAY support other formats.

UAs generating multiple recipient MESSAGES SHOULD use flat lists (i.e., no hierarchical lists), SHOULD NOT use any entry's attributes but "uri", and SHOULD NOT include any elements inside entries but "display-name" elements.

4. Procedures at the MESSAGE Exploder

On receiving a MESSAGE request that contains a "list" parameter in the Request-URI as described in [4], a MESSAGE exploder SHOULD answer to the UAC with a 202 Accepted response. Note that the status code in the response to the MESSAGE does not provide any information about
whether or not the MESSAGEs generated by the exploder were successfully delivered to the URIs in the list. That is, a 202 Accepted means that the MESSAGE exploder has received the MESSAGE and that it will try to send a similar MESSAGE to the URIs in the list. Designing a mechanism to inform a client about the delivery status of an instant message is outside the scope of this document.

On receiving a MESSAGE request that contains a "list" parameter in the Request-URI as described [4], a MESSAGE exploder SHOULD create as many new MESSAGEs as URIs the list contains. The body of these new MESSAGEs SHOULD contain the same bodies as the incoming MESSAGE carried, except the body carrying the list, which MUST NOT be present in the outgoing MESSAGE request. This behaviour allows the MESSAGE exploder to transfer all the relevant bodies included in the request, e.g., text message, images, etc.

The rest of the MESSAGE request corresponding to a given URI in the list MUST be created following the rules in Section 19.1.5 "Forming Requests from a URI" of RFC 3261 [2]. In particular, Section 19.1.5 of RFC 3261 [2] states:

"An implementation SHOULD treat the presence of any headers or body parts in the URI as a desire to include them in the message, and choose to honor the request on a per-component basis."

SIP allows to append a "method" parameter to a URI. Therefore, it is legitimate that an the "uri" attribute of the "entry" element in the XCAP resource list contains a "method" parameter. MESSAGE exploders MUST generate only MESSAGE requests, regardless of the "method" parameter that the URIs in the list indicate. Effectively, MESSAGE exploders MUST ignore the "method" parameter in each of the URIs present in the URI list.

It is RECOMMENDED that the MESSAGE exploder copies the value From header field of the incoming MESSAGE into the outgoing MESSAGE requests (note that this need not apply to the "tag" parameter). The MESSAGE exploder SHOULD also copy to the outgoing MESSAGE request any P-Asserted-Identity header fields that can be present in the incoming MESSAGE request.

OPEN ISSUE: What should the exploder do with a possible P-Asserted-Identity? Copying the contents of the incoming MESSAGE request or generate a new "unasserted" value to the outgoing MESSAGE request?

On each given outgoing MESSAGE request, the MESSAGE exploder SHOULD generate a new To header field value which, according to the procedures of RFC 3261 Section 8.1.1.1, should be equal to the
Request-URI of the outgoing MESSAGE request.

On each given outgoing MESSAGE request, the MESSAGE exploder SHOULD initialize the values of the Call-ID, CSeq and Max-Forwards header fields. The MESSAGE exploder should also include its own value in the Via header field.

A MESSAGE exploder receiving a URI list with more information than what we have just described SHOULD discard all the extra information.

As described in [4], the default format for URI lists in SIP is the XCAP resource list format [5]. MESSAGE exploders compliant to this specification MUST support the XCAP resource list format [5] and MAY support other formats.

5. Examples

The following is an example of an incoming MESSAGE request which carries a URI list in its body.

MESSAGE sip:exploder.example.com;list=cn35t8jf@uac.example.com
  SIP/2.0
  Via: SIP/2.0/TCP uac.example.com
    ;branch=z9hG4bKhjhs8ass83
  Max-Forwards: 70
  To: MESSAGE Exploder <sip:exploder.example.com>
  From: Carol <sip:carol@example.com>;tag=32331
  Call-ID: d432fa84b4c76e66710
  CSeq: 1 MESSAGE
  Content-Type: multipart/mixed;boundary="boundary1"
  Content-Length: xxx

  --boundary1
  Content-Type: text/plain
  Content-Length: 13

   Hello World!

  --boundary1
  Content-Type: application/resource-lists+xml
  Content-Length: 315
  Content-ID: <cn35t8jf@uac.example.com>

<?xml version="1.0" encoding="UTF-8">
<resource-lists xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <list>
    <entry uri="sip:bill@example.com" />
    <entry uri="sip:joe@example.com" />
  </list>
</resource-lists>
<entry uri="sip:ted@example.com" />
   <entry uri="sip:bob@example.com" />
</list>
</resource-lists>

Figure 4: Multiple recipient incoming MESSAGE request

The following is an example of one of the outgoing MESSAGE requests that the MESSAGE exploder creates.

MESSAGE sip:bill@example.com SIP/2.0
Via: SIP/2.0/TCP exploder.example.com
     ;branch=z9hG4bKhjhs8as34sc
Max-Forwards: 70
To: <sip:bill@example.com>
From: Carol <sip:carol@uac.example.com>;tag=210342
Call-ID: 39s02ds120d9sj2l
CSeq: 1 MESSAGE
Content-Type: text/plain
Content-Length: 13

Hello World!

Figure 5: Outgoing MESSAGE request

6. Security Considerations

If MESSAGE exploders are not implemented properly, they could become a SPAM amplification tool. The SPAMMER would have the exploder, which will generally have a higher access bandwidth and more processing power, send a SPAM message to a large set of destinations. This section provides guidelines to prevent SPAM amplifications in particular, and DoS attacks in general. In addition, we describe how to provide content confidentiality and integrity.

MESSAGE exploders MUST authenticate and authorize any user agent sending a multiple recipient MESSAGE. Additionally, MESSAGE exploders MAY have policies that limit the number of URIs in the list, as a very long list could be used in a DoS attack to place a large burden on the exploder to send a large number of MESSAGEs or to perform an amplification attack.

In case an exploder is used to send unsolicited instant messages (i.e., SPAM), it should be possible to track down the sender of such messages. To do that, MESSAGE exploders MAY provide information about the identity of the original sender of the MESSAGE in their outgoing
MESSAGE requests. Exploders can use Authenticated Identity Bodies (AIB) [7] or P-Asserted-Identity header fields [8] to provide this information. Furthermore, it is RECOMMENDED that MESSAGE exploders keep a log of all the transactions they handle (for a reasonable period of time), so that SPAMMERS can be tracked down.

It is RECOMMENDED that user agents using MESSAGE exploders integrity protect the contents of their instant messages and the list of recipients using S/MIME. If the contents of the instant message or the list of recipients needs to be kept private, the user agent SHOULD also use S/MIME to prevent a third party from viewing this information.

7. Acknowledgements

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Normative References


Informational References


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