

SIPPING Working Group
Internet-Draft
Expires: January 5, 2005

G. Camarillo
Ericsson
A. Niemi
H. Khartabil
M. Isomaki
M. Garcia-Martin
Nokia
July 7, 2004

**Referring to Multiple Resources in the Session Initiation Protocol
(SIP)
draft-ietf-sipping-multiple-refer-00.txt**

Status of this Memo

By submitting this Internet-Draft, I certify that any applicable patent or other IPR claims of which I am aware have been disclosed, and any of which I become aware will be disclosed, in accordance with [RFC 3668](#).

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

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

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

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

This Internet-Draft will expire on January 5, 2005.

Copyright Notice

Copyright (C) The Internet Society (2004). All Rights Reserved.

Abstract

This document defines extensions to the SIP REFER method so that this method can be used to refer servers to multiple resources. These extensions include the use of pointers to URI-lists in the Refer-To header field and the multiple-refer SIP option-tag.

Table of Contents

1.	Introduction	3
2.	Terminology	3
3.	Overview of operation	3
4.	The multiple-refer SIP Option-Tag	4
5.	Suppressing REFER's Implicit Subscription	4
6.	Behavior of SIP User Agents	5
6.1	Behavior of SIP REFER-Issuers	5
6.2	Behavior of REFER-Recipients	5
7.	Example	5
8.	Security Considerations	6
9.	IANA Considerations	7
10.	References	7
10.1	Normative References	7
10.2	Informational References	8
	Authors' Addresses	8
	Intellectual Property and Copyright Statements	10

1. Introduction

The SIP REFER method [5] allows a user agent to request a server to send a request to a third party. Still, a number of applications need to request a server to initiate transactions towards a set of destinations. In one example, the moderator of a conference may want the conference server to send BYE requests to a group of participants. In another example, the same moderator may want the conference server to INVITE a set of new participants.

We define an extension to REFER so that REFER can be used to refer servers to multiple destinations. In addition, we use the REFER extension defined in [7] which suppresses REFER's implicit subscription.

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.

We define the following three new terms:

REFER-Issuer: the user agent issuing the REFER request.

REFER-Recipient: the user agent receiving the REFER request.

REFER-Target: the user agent designated in the Refer-To URI.

3. Overview of operation

This document defines an extension to the SIP REFER method [5] that allows a SIP UAC to include a list of REFER-Targets in a REFER request and send it to a server. The server will create a new request for each entry in the list of REFER-Target URIs.

We represent the multiple REFER-Targets of a REFER using the URI-list format specified in [8]. A UAC (User Agent Client) that wants to refer a server to a set of destinations creates a SIP REFER request. The Refer-To header contains a pointer to a URI-list, which is included in a body part, and two option-tags in the Required header field: "multiple-refer" and "norefersub". The former indicates the requirement to support the functionality described in this specification and the latter removes the implicit subscription associated to REFER requests by default.

When the server receives such request it creates a new request per destination and sends them.

This document does not provide any mechanism for UACs to find out about the results of a REFER with multiple REFER-Targets. Furthermore, we do not provide support for the implicit subscription mechanism that is part of the SIP REFER method. The way UACs are kept informed about the results of a REFER is service specific. For example, a UAC sending a REFER to INVITE a set of participants to a conference may discover which participants were successfully brought in into the conference by using the conference package [\[10\]](#)

4. The multiple-refer SIP Option-Tag

We define a new SIP option-tag for the Require and Supported header fields: "multiple-refer".

A user agent including the "multiple-refer" option-tag in a Supported header indicates compliance with this specification.

A user agent generating a REFER with a pointer to a URI-list in its Refer-To header field MUST include the "multiple-refer" option-tag in the Require header field of the REFER.

5. Suppressing REFER's Implicit Subscription

REFER requests with a single REFER-Target establish a subscription implicitly. The REFER-Issuer is informed about the result of the transaction towards the REFER-Target through this implicit subscription.

In the case of a REFER-Issuer that generates a REFER with multiple REFER-targets, the REFER-Issuer is typically already subscribed to other event package that can provide the information about the result of the transactions towards the REFER-Targets. For example, a moderator instructing a conference server to send a BYE request to a set of participants is usually subscribed to the conference state event package for the conference. Notifications to this event package will keep the moderator and the rest of the subscribers informed of the current list of conference participant.

Consequently, we have decided to remove the implicit subscription from a multiple REFER request. So, a SIP REFER-Issuer generating a REFER request with multiple REFER-Targets MUST include the 'norefersub' option-tag in a Require header field to indicate that no notifications about the requests should be sent to the REFER-Issue. The 'norefersub' SIP option-tag is defined in [\[7\]](#) and suppresses the REFER's implicit subscription.

6. Behavior of SIP User Agents

Implementations of this specification MUST support the transfer mechanism for URI-lists defined in [8].

6.1 Behavior of SIP REFER-Issuers

As indicated in [Section 4](#) and [Section 5](#) a SIP REFER-Issuer that creates a REFER request with multiple REFER-Targets includes a "multiple-refer" and a "norefersub" option-tags in the Require header field.

The Refer-To header field of a REFER request with multiple REFER-Targets MUST contain a pointer (i.e., a Content-ID URL [2]) that points to the body part (whose disposition type is "uri-list") that carries the URI-list.

As described in [8], the default format for URI-lists in SIP is the XCAP resource list format [6]. Still, specific services need to describe which information clients should include in their URI lists, as described in [8].

SIP REFER-Issuers generating REFERs with multiple REFER-Targets 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.

6.2 Behavior of REFER-Recipients

A REFER-Recipient receiving a URI-list with more information than what we have described in [Section 6.1](#) SHOULD discard all the extra information.

The REFER-Recipient follows the rules in [Section 2.4.2 of RFC 3515](#) [5] to determine the status code of the response to the REFER.

7. Example

The following is an example of a REFER request with multiple REFER-Targets. The REFER's Refer-To header field carries a pointer to the message body, which carries a list with the URIs of the REFER-Targets. The REFER's Require header field carries both the "multiple-refer" and the "norefersub" option-tags.


```
REFER sip:conf-123@example.com
SIP/2.0 Via: SIP/2.0/TCP client.chicago.example.com
           ;branch=z9hG4bKhjhs8ass83
Max-Forwards: 70
To: Conference 123 <sip:conf-123@example.com>
From: Carol <sip:carol@chicago.example.com>;tag=32331
Call-ID: d432fa84b4c76e66710
CSeq: 2 REFER
Contact: <sip:carol@client.chicago.example.com>
Refer-To: <cid:cn35t8jf02@example.com>
Require: multiple-refer, norefersub
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE, REFER, SUBSCRIBE, NOTIFY
Allow-Events: dialog
Accept: application/sdp, message/sipfrag
Content-Type: application/resource-lists+xml
Content-Disposition: uri-list
Content-Length: 307
Content-ID: <cn35t8jf02@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?method=BYE" />
    <entry uri="sip:joe@example.org?method=BYE" />
    <entry uri="sip:ted@example.net?method=BYE" />
  </list>
</resource-lists>
```

Figure 1: REFER request with multiple REFER-Targets

8. Security Considerations

The Security Considerations Section of the Requirements and Framework for SIP URI-List Services [9] discusses issues related to SIP URI-list services. Given that a server accepting REFERs with multiple REFER-targets acts as an URI-list service, implementations of this type of server MUST follow the security-related rules in [9]. These rules include mandatory authentication and authorization of clients, and opt-in lists.

Additionally, servers SHOULD only accept REFER requests within the context of an application the server understands (e.g., a conferencing application). This implies that servers MUST NOT accept REFERs for methods they do not understand. The idea behind these two rules is that servers are not used as dumb servers whose only function is to fan-out random messages they do not understand.

9. IANA Considerations

This document defines a SIP option-tag (multiple-refer) in [Section 4](#). This option-tag should be registered in the SIP parameter registry (<http://www.iana.org/assignments/sip-parameters>).

SIP user agents that place the multiple-refer option-tag in a Supported header field understand REFER requests with multiple REFER-Targets.

10. References

10.1 Normative References

- [1] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [2] Levinson, E., "Content-ID and Message-ID Uniform Resource Locators", [RFC 2392](#), August 1998.
- [3] Rosenberg, J., Schulzrinne, H., Camarillo, G., Johnston, A., Peterson, J., Sparks, R., Handley, M. and E. Schooler, "SIP: Session Initiation Protocol", [RFC 3261](#), June 2002.
- [4] Sparks, R., "Internet Media Type message/sipfrag", [RFC 3420](#), November 2002.
- [5] Sparks, R., "The Session Initiation Protocol (SIP) Refer Method", [RFC 3515](#), April 2003.
- [6] Rosenberg, J., "An Extensible Markup Language (XML) Configuration Access Protocol (XCAP) Usage for Presence Lists", [draft-ietf-simple-xcap-list-usage-02](#) (work in progress), February 2004.
- [7] Olson, S., "Extended-REFER framework and other REFER extensions", [draft-olson-sipping-refer-extensions-01](#) (work in progress), February 2004.
- [8] Camarillo, G., "Providing a Session Initiation Protocol (SIP) Application Server with a List of URIs", [draft-camarillo-sipping-uri-list-01](#) (work in progress), February 2004.
- [9] Camarillo, G., "Requirements for Session Initiation Protocol (SIP) Exploder Invocation", [draft-camarillo-sipping-exploders-02](#) (work in progress), February 2004.

10.2 Informational References

- [10] Rosenberg, J. and H. Schulzrinne, "A Session Initiation Protocol (SIP) Event Package for Conference State", [draft-ietf-sipping-conference-package-03](#) (work in progress), February 2004.
- [11] Camarillo, G., "A Transaction Event Package for the Session Initiation Protocol (SIP)", [draft-camarillo-sipping-transac-package-00](#) (work in progress), February 2004.

Authors' Addresses

Gonzalo Camarillo
Ericsson
Hirsalantie 11
Jorvas 02420
Finland

EMail: Gonzalo.Camarillo@ericsson.com

Aki Niemi
Nokia
P.O. Box 321
NOKIA GROUP, FIN 00045
Finland

EMail: Aki.Niemi@nokia.com

Hisham Khartabil
Nokia
P.O. Box 321
NOKIA GROUP, FIN 00045
Finland

EMail: Hisham.Khartabil@nokia.com

Markus Isomaki
Nokia
Itamerenkatu 11-13
Helsinki 00180
Finland

E-Mail: Markus.Isomaki@nokia.com

Miguel A. Garcia-Martin
Nokia
P.O.Box 407
NOKIA GROUP, FIN 00045
Finland

E-Mail: miguel.an.garcia@nokia.com

Intellectual Property Statement

The IETF takes no position regarding the validity or scope of any Intellectual Property Rights or other rights that might be claimed to pertain to the implementation or use of the technology described in this document or the extent to which any license under such rights might or might not be available; nor does it represent that it has made any independent effort to identify any such rights. Information on the IETF's procedures with respect to rights in IETF Documents can be found in [BCP 78](#) and [BCP 79](#).

Copies of IPR disclosures made to the IETF Secretariat and any assurances of licenses to be made available, or the result of an attempt made to obtain a general license or permission for the use of such proprietary rights by implementers or users of this specification can be obtained from the IETF on-line IPR repository at <http://www.ietf.org/ipr>.

The IETF invites any interested party to bring to its attention any copyrights, patents or patent applications, or other proprietary rights that may cover technology that may be required to implement this standard. Please address the information to the IETF at ietf-ipr@ietf.org.

Disclaimer of Validity

This document and the information contained herein are provided on an "AS IS" basis and THE CONTRIBUTOR, THE ORGANIZATION HE/SHE REPRESENTS OR IS SPONSORED BY (IF ANY), THE INTERNET SOCIETY AND THE INTERNET ENGINEERING TASK FORCE DISCLAIM ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Copyright Statement

Copyright (C) The Internet Society (2004). This document is subject to the rights, licenses and restrictions contained in [BCP 78](#), and except as set forth therein, the authors retain all their rights.

Acknowledgment

Funding for the RFC Editor function is currently provided by the Internet Society.

