A Mechanism for Content Indirection in SIP Messages
draft-olson-sip-content-indirect-mech-01

Status of this Memo

   This document is an Internet-Draft and is in full conformance with
   all provisions of Section 10 of RFC2026.

   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 February 5, 2003.

Copyright Notice

Abstract

   This Internet-Draft proposes an extension to the URL MIME External-
   Body Access-Type as defined in RFC2017 [7] to satisfy the content
   indirection requirements defined in draft-ietf-sipping-content-
   indirect-01 [1]. These extensions are aimed at allowing any MIME
   part in a SIP message to be referred to indirectly via a URL [4].

1. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [2].

2. **Introduction**

   Previous attempts at solving the content indirection problem made use
   of the text/uri-list [8] MIME type. While attractive for its
   simplicity (a list of URIs delimted by end-of-line markers), it fails
   to satisfy a number of the requirements for a more general purpose
   content indirection mechanism. Most notably lacking is the ability
   to specify various attributes on a per-URL basis. These attributes
   might include version information, the MIME type of the referenced
   content, etc.

   In searching for a replacement for the text/uri-list MIME type,
   RFC2017 defines a strong candidate. RFC2017 defines an extension to
   the message/external-body MIME type originally defined in RFC2046
   [6]. The extension that RFC2017 makes is to allow a generic URI to
   specify the location of the content rather than protocol specific
   parameters for FTP, etc. as originally defined in RFC2046. While
   providing most of the functionality needed for a SIP content
   indirection mechanism, RFC2017 by itself is not a complete solution.
   This document will specify the usage of RFC2017 necessary to fulfill
   the requirments outlined for content indirection.

   The requirements of [1] can be classified as applying either to the
   URL which indirectly references the desired content or to the content
   itself. Where possible, existing MIME parameters and entity headers
   will be used to satisfy those requirements. MIME (Content-Type)
   parameters will be the preferred manner of describing the URL while
   entity headers will be the preferred manner of describing the
   (indirect) content. See RFC 2045 [5] for a description of most of
   these entity headers and MIME parameters.

3. Application of RFC2017 to the Content Indirection Problem

   The following text describes the application of RFC2017 to the
   requirements for content indirection.

3.1 Specifying the location of the content via a URL

   The URL for the indirect content is specified in a "URL" parameter of
   the message/external-body MIME type. An access-type parameter
   indicates that the external content is referenced by a URL.

   For example:

        Content-Type: message/external-body;
                      access-type="URL";
                 URL="http://www.volcano.com/the-indirect-content"

3.2 Specifying versioning information for the URL

   In order to determine whether or not the content indirectly
   referenced by the URL has changed, a Content-ID entity header is
   used. The syntax of this header follows that of the Call-ID in SIP.
   Changes in the underlying content referred to by a URL MUST result in
   a change in the Content-ID associated with that URL. Multiple SIP
   messages carrying URLs that refer to the same content SHOULD reuse
   the same Content-ID to allow the receiver to cache this content and
   avoid unnecessary lookups. The Content-ID is intended to be globally
   unique and SHOULD be temporally unique across SIP dialogs.

   For example:

        Content-ID: 4232423424@www.volcano.com

3.3 Specifying the lifetime of the URL

   The URL supplied by in Content-Type header is not required to be
   accessible or valid for an indefinite period of time. Rather, the
   supplier of the URL MUST specify the time period for which this URL
   is valid and accessible. This is done through an "EXPIRATION"
   parameter of the Content-Type. The format of this expiration
   parameter is a RFC1123 date-time value. This is further restricted
   in this application to use only GMT time, consistent with the Date:
   header in SIP. This is a mandatory parameter.

For example:

```
    Content-Type: message/external-body;
                  expiration="Mon, 24 June 2002 09:00:00 GMT"
```

3.4 Specifying support for content indirection

A UAC/UAS may indicate support for content indirection through an
Accept header containing the message/external-body MIME type. In the
absence of any other Accept headers, this indicates support for
content indirection of the application/sdp MIME type. If other
Accept values are present, this indicates support for content
indirection of those MIME types as well. User-Agents supporting
content indirection MUST support content indirection of the
application/sdp MIME type.

For example:

```
    Accept: message/external-body, image/*, application/sdp
```

3.5 Mandatory support for HTTP URLs

Applications which use this content indirection mechanism MUST
support at least the HTTP URI scheme. Additional URI schemes MAY be
used, but a UAC/UAS MUST support receiving a HTTP URI for indirect
content if it advertises support for content indirection.

The intention is to establish a baseline of support to further
strengthen interoperability. Implementors may design for the most
common case (HTTP) without having to worry about negotiation of
support for this particular URI scheme.

3.6 Rejecting content indirection

If a UAS receives a SIP request which contains a content indirection
payload, and the UAS cannot or does not wish to support such a
content type, it MUST reject the request with a 415 Unsupported Media
Type response as defined in section 21.4.13 of SIP [3]. In
particular, the UAC should note the absence of the message/external-
body MIME type in the Accept header of this response to indicate that
the UAS does not support content indirection.

3.7 Specifying the type of the indirect content

   To support existing SIP mechanisms for the negotiation of content
   types, a Content-Type entity header SHOULD be present in the entity
   (payload) itself. If the protocol (scheme) of the URL supports its
   own content negotiation mechanisms (e.g. HTTP), this header may be
   omitted. The sender MUST however be prepared for the receiving party
   to reject content indirection if the receiver is unable to negotiate
   an appropriate MIME type using the underlying protocol for the URL
   scheme.

   For example:

        Content-Type: message/external-body; access-type="URL";
                    expiration="Mon, 24 June 2002 09:00:00 GMT";
                  URL="http://www.volcano.com/the-indirect-content"
        <CRLF>
        Content-Type: application/sdp
        <CRLF>

3.8 Specifying the purpose of the indirect content

   A Content-Disposition entity header SHOULD be present for all
   indirect content. In the absence of an an explicit Content-
   Disposition header, a content disposition of "session" should be
   assumed.

   For example:

        Content-Type: message/external-body; access-type="URL";
                  expiration="Mon, 24 June 2002 09:00:00 GMT";
                  URL="http://www.volcano.com/the-indirect-content"
        Content-Disposition: render
        <CRLF>
        Content-Type: image/jpeg
        <CRLF>

3.9 Specifying multiple URLs for content indirection

   If there is a need to send multiple URLs for the purpose of content
   indirection, an appropriate multipart MIME type [6] should be used.
   Each URL should be contained in a single entity. Indirect content
   may be mixed with directly supplied content. This is particularly
   useful with the multipart/alternative MIME type.

For example:

        MIME-Version: 1.0
        Content-Type: multipart/mixed; boundary=boundary42

        --boundary42
        Content-Type: text/plain; charset=us-ascii

        The company announcement for June, 2002 follows:
        --boundary42
        Content-Type: message/external-body;
                      access-type="URL";
                      expiration="Mon, 24 June 2002 09:00:00 GMT";
                  URL="http://www.volcano.com/announcements/07242002"
        Content-Disposition: render

        Content-Type: text/html

        --boundary42--

3.10 Supplying additional comments about the indirect content

   Optional, freeform text may be supplied to comment on the indirect
   content. This should be supplied in a Content-Description entity
   header.

   For example:

        Content-Type: message/external-body;
                      access-type="URL";
                      expiration="Mon, 24 June 2002 09:00:00 GMT";
                  URL="http://www.volcano.com/the-indirect-content"
        Content-Description: Multicast gaming session

3.11 Relationship to Call-Info, Error-Info, and Alert-Info Headers

   SIP [3] defines three headers which are used to supply additional
   information with regard to a session, a particular error response, or
   alerting. All three of these headers allow the UAC or UAS to
   indicate additional information through a URL. They may be
   considered a form of content indirection. The content indirection
   mechanism defined in this document is not intended as a replacement

for these headers. Rather, the headers defined in SIP MUST be used
in preference to this mechanism where applicable because of the well
defined semantics of those headers.

[4](#). Examples

[4.1](#) Single Content Indirection

        INVITE sip:boromir@volcano.com SIP/2.0
        From: <sip:gandalf@nwt.com>;tag=347242
        To: <sip:boromir@volcano.com>
        Call-ID: 3573853342923422@nwt.com
        CSeq: 2131 INVITE
        Accept: message/external-body
        Content-Type: message/external-body;
                    ACCESS-TYPE=URL;
                    URL="http://www.nwt.com/party/06/2002/announcement";
                    EXPIRATION="Sat, 20 Jun 2002 12:00:00 GMT"
        Content-Disposition: session
        Content-ID: <4e5562cd1214427d@nwt.com>
        Content-Length: 32

        Content-Type: application/sdp

[4.2](#) Multipart MIME with Content Indirection

```
MESSAGE sip:boromir@volcano.com SIP/2.0
From: <sip:gandalf@nwt.com>;tag=34589882
To: <sip:boromir@volcano.com>
Call-ID: 9242892442211117@nwt.com
CSeq: 388 MESSAGE
Accept: message/external-body, text/html, text/plain, image/*, text/x-
emoticon
MIME-Version: 1.0
Content-Type: multipart/mixed; boundary=zz993453

--zz993453
Content-Type: message/external-body;
            access-type="URL";
            expiration="Mon, 24 June 2002 09:00:00 GMT";
        URL="http://www.nwt.com/company_picnic/image1.png"
Content-ID: <9535035333@nwt.com>
Content-Disposition: render
Content-Description: "Kevin getting dunked in the wading pool"

Content-Type: image/png

--zz993453
Content-Type: message/external-body;
            access-type="URL";
            expiration="Mon, 24 June 2002 09:00:00 GMT";
        URL="http://www.nwt.com/company_picnic/image2.png"
Content-ID: <1134299224244@nwt.com>
Content-Disposition: render
Content-Description: "Peter on his tricycle"

Content-Type: image/png

--zz993453--
```

5. **Security Considerations**

   For confidentiality, integrity, and authentication, this content
   indirection mechanism relies on the security mechanisms outlined in
   RFC3261. In particular, the usage of S/MIME as defined in section 23
   of RFC3261 provides the necessary mechanism to ensure integrity
   protection of the indirect content URL and associated parameters.

   Securing the transfer of the indirect content is the responsibility
   of the underlying protocol used for this transfer. It is RECOMMENDED
   that applications implementing this content indirection method
   support the HTTPS URI scheme for secure transfer of content.

References

   [1]   Olson, S., "Requirements for Content Indirection in SIP
         Messages", Internet Draft draft-ietf-sipping-content-indirect-
         01, June 2002.

   [2]   Bradner, S., "Key words for use in RFCs to Indicate Requirement
         Levels", RFC 2119, March 1997.

   [3]   Rosenberg, J., Schulzrinne, Camarillo, Johnston, Peterson,
         Sparks, Handley and Schooler, "SIP: Session Initiation
         Protocol", RFC 3261, June 2002.

   [4]   Berners-Lee, Fielding and Masinter, "Uniform Resource
         Identifiers (URI): Generic Syntax", RFC 2396, August 1996.

   [5]   Freed and Borenstein, "Multipurpose Internet Mail Extensions
         (MIME) Part One: Format of Internet Message Bodies", RFC 2045,
         November 1996.

   [6]   Freed and Borenstein, "Multipurpose Internet Mail Extensions
         (MIME) Part Two: Media Types", RFC 2046, November 1996.

   [7]   Freed, "Definition of the URL MIME External-Body Access-Type",
         RFC 2017, October 1996.

   [8]   Daniel, R., "A Trivial Convention for using HTTP in URN
         Resolution", RFC 2169, June 1997.

Author's Address

   Sean Olson
   Microsoft
   One Microsoft Way
   Redmond, WA 98052
   US

   Phone: +1-425-707-2846
   EMail: seanol@microsoft.com
   URI: http://www.microsoft.com/rtc

Full Copyright Statement

Acknowledgement