

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

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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 delimited 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 requirements 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 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.
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- [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.

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