                          The SIP INFO Method

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Abstract

   This document proposes an extension to the Session Initiation
   Protocol (SIP). This extension adds the INFO method to the SIP
   protocol. The intent of the INFO method is to allow for the carrying
   of session related control information that is generated during a
   session. One example of such session control information is ISUP and
   ISDN signaling messages used to control telephony call services.

   This and other example uses of the INFO method may be standardized in
   the future.

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1. Introduction

   The SIP protocol described in [1] defines session control messages
   used during the setup and tear down stages of a SIP controlled
   session.

   In addition, the SIP re-INVITE can be used during a session to change
   the characteristics of the session. This is generally to change the
   properties of media flows related to the session or to update the SIP
   session timer.

   However, there is no general-purpose mechanism to carry session
   control information along the SIP signaling path during the session.

   The purpose of the INFO message is to carry application level
   information along the SIP signaling path.

   The INFO method is not used to change the state of SIP calls, or the
   parameters of the sessions SIP initiates. It merely sends optional
   application layer information, generally related to the session.

   It is necessary that the mid-session signaling information traverse
   the post session setup SIP signaling path. This is the path taken by
   SIP re-INVITEs, BYEs and other SIP requests that are tied to an
   individual session. This allows SIP proxy servers to receive, and
   potentially act on, the mid-session signaling information.

   This document proposes an extension to SIP by defining the new INFO
   method. The INFO method would be used for the carrying of mid-call
   signaling information along the session signaling path.

   1.1 Example Uses

      The following are a few of the potential uses of the INFO message:

      - Carrying mid-call PSTN signaling messages between PSTN
        gateways.

      - Carrying DTMF digits generated during a SIP session.

      - Carrying wireless signal strength information in support of
        wireless mobility applications.

      - Carrying account balance information.

- Carrying images or other non streaming information between the
  participants of a session.

These are just potential uses; this document does not specify such
uses nor does it necessarily recommend them.

It can also be envisioned that there will be other telephony and
non-telephony uses of the INFO method.

2. INFO Method

The INFO method is used for communicating mid-session signaling
information along the signaling path for the call.

The INFO method is not used to change the state of SIP calls, nor
does it change the state of sessions initiated by SIP. Rather, it
provides additional optional information which can further enhance
the application using SIP.

The signaling path for the INFO method is the signaling path
established as a result of the call setup. This can be either direct
signaling between the calling and called user agents or a signaling
path involving SIP proxy servers that were involved in the call setup
and added themselves to the Record-Route header on the initial INVITE
message.

The mid-session information can be communicated in either an INFO
message header or as part of a message body. The definition of the
message body and/or message headers used to carry the mid-session
information is outside the scope of this document.

There are no specific semantics associated with INFO. The semantics
are derived from the body or new headers defined for usage in INFO.

2.1 Header Field Support for INFO Method

Tables 1 and 2 add a column to tables 4 and 5 in the [1]. Refer
to Section 6 of [1] for a description of the content of the
tables. Note that the rules defined in the enc. and e-e columns
in tables 4 and 5 in [1] also apply to use of the headers in the
INFO request and responses to the INFO request.

2.2 Responses to the INFO Request Method

If a server receives an INFO request it MUST send a final
response.

A 200 OK response MUST be sent by a UAS for an INFO request with
no message body if the INFO request was successfully received for
an existing call. Beyond that, no additional operations are
required.

Header	Where	INFO
Accept	R	o
Accept-Encoding	R	o
Accept-Language	R	o
Allow	200	-
Allow	405	o
Authorization	R	o
Call-ID	gc	m
Contact	R	o
Contact	1xx	-
Contact	2xx	-
Contact	3xx	-
Contact	485	-
Content-Encoding	e	o
Content-Length	e	o
Content-Type	e	*
CSeq	gc	m
Date	g	o
Encryption	g	o
Expires	g	o
From	gc	m
Hide	R	o
Max-Forwards	R	o
Organization	g	o

Table 1 Summary of header fields, A-O

Handling of INFO messages that contain message bodies is outside
the scope of this document. The documents defining the message
bodies will also need to define the SIP protocol rules associated
with those message bodies.

A 481 Call Leg/Transaction Does Not Exist message MUST be sent by
a UAS if the INFO request does not match any existing call leg.

If a server receives an INFO request with a body it understands,
but it has no knowledge of INFO associated processing rules for
the body, the body MAY be rendered and displayed to the user. The
INFO is responded to with a 200 OK.

If the INFO request contains a body that the server does not
understand then, in the absence of INFO associated processing
rules for the body, the server MUST respond with a 415 Unsupported
Media Type message.

Header	Where	INFO
Priority	R	o
Proxy-Authenticate	407	o
Proxy-Authorization	R	o
Proxy-Require	R	o
Require	R	o
Retry-After	R	-
Retry-After	404,480,486	o
Retry-After	503	o
Retry-After	600,603	o
Response-Key	R	o
Record-Route	R	o
Record-Route	2xx	o
Route	R	o
Server	r	o
Subject	R	o
Timestamp	g	o
To	gc(1)	m
Unsupported	420	o
User-Agent	g	o
Via	gc(2)	m
Warning	r	o
WWW-Authenticate	401	o

Table 2 Summary of header fields, P-Z

Bodies which imply a change in the SIP call state or the sessions
initiated by SIP MUST NOT be sent in an INFO message.

Other request failure (4xx), Server Failure (5xx) and Global
Failure (6xx) responses MAY be sent for the INFO Request.

2.3 Message Body Inclusion

The INFO request MAY contain a message body.

2.4 Behavior of SIP User Agents

Unless stated otherwise, the protocol rules for the INFO request
governing the usage of tags, Route and Record-Route,
retransmission and reliability, CSeq incrementing and message
formatting follow those in [1] as defined for the BYE request.

An INFO request MAY be cancelled. A UAS receiving a CANCEL for an
INFO request SHOULD respond to the INFO with a "487 Request
Cancelled" response if a final response has not been sent to the
INFO and then behave as if the request were never received.

However, the INFO message MUST NOT change the state of the SIP
call, or the sessions initiated by SIP.

2.5 Behavior of SIP Proxy and Redirect Servers

2.5.1 Proxy Server

Unless stated otherwise, the protocol rules for the INFO
request at a proxy are identical to those for a BYE request as
specified in [1].

2.5.2 Forking Proxy Server

Unless stated otherwise, the protocol rules for the INFO
request at a proxy are identical to those for a BYE request as
specified in [1].

2.5.3 Redirection Server

Unless stated otherwise, the protocol rules for the INFO
request at a proxy are identical to those for a BYE request as
specified in [1].

3. INFO Message Bodies

The purpose of the INFO message is to carry mid-session information
between SIP user agents. This information will generally be carried
in message bodies, although it can be carried in headers in the INFO
message.

The definition of the message bodies or any new headers created for
the INFO method is outside the scope of this document. It is
expected that separate documents will be created to address
definition of these entities.

In addition, the INFO method does not define additional mechanisms
for ensuring in-order delivery. While the CSeq header will be
incremented upon the transmission of new INFO messages, this should
not be used to determine the sequence of INFO information. This is
due to the fact that there could be gaps in the INFO message CSeq
count caused by a user agent sending re-INVITES or other SIP
messages.

4. Guidelines for extensions making use of INFO

   The following are considerations that should be taken into account
   when defining SIP extensions that make use of the INFO method.

   - Consideration should be taken on the size of message bodies to be
     carried by INFO messages. The message bodies should be kept small
     due to the potential for the message to be carried over UDP and the
     potential for fragmentation of larger messages.

   - There is potential that INFO messages could be forked by a SIP
     Proxy Server. The implications of this forking of the information
     in the INFO message need to be taken into account.

   - The use of multi-part message bodies may be helpful when defining
     the message bodies to be carried by the INFO message.

   - The extensions that use the INFO message MUST NOT rely on the
     INFO message to do anything that effects the SIP call state or the
     state of related sessions.

   - The INFO extension defined in this document does not depend on
     the use of the Require or Proxy-Require headers. Extensions using
     the INFO message may need the use of these mechanisms. However,
     the use of Require and Proxy-Require should be avoided, if
     possible, in order to improve interoperability between SIP
     entities.

5. Security Considerations

   If the contents of the message body are private then end-to-end
   encryption of the message body can be used to prevent unauthorized
   access to the content.

   There are no other security issues specific to the INFO method.
   The security requirements specified in the SIP specification apply
   to the INFO method.

6. References

[1] Handley, M., Schulzrinne, H., Schooler, E. and J. Rosenberg,
    "SIP: Session Initiation Protocol", RFC 2543, March 1999.

7. Acknowledgements

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9. Full Copyright Statement

Acknowledgement