

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-0

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

The author would like to thank Matthew Cannon for his contributions to this document. In addition, the author would like to thank the members of the MMUSIC and SIP working groups, especially Jonathan Rosenberg, for comments and suggestions on how to improve the document.

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Acknowledgement

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

