Technical specification: Reliable RTT (real-time text)

Abstract

This document describes a private Session Initiation Protocol (SIP) [IETF RFC 3261] header (P-header), used to achieve real-time sending of text using SIP Message requests, along with its applicability. The formatting of the real-time text (RTT) messages follows ITU-T Recommendation T.140.

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1. Introduction and scope

This Technical Specification defines a way to provide reliable, real-time, character-by-character conversation functionality using SIP MESSAGE [IETF RFC 3428] requests. The purpose is to present the text typed by the sender as soon as possible on the device of the receiving party (unless otherwise preferred by the sender - e.g. an individual preference for word completion through predictive text input). The method is typically implemented in the user agent client (UAC) by sending a MESSAGE request as soon as possible, after the detection of user input. The difference from the standard behaviour is that the UAC doesn't wait for the user to hit the return key before sending, instead every typed character can be sent individually or as a group of characters. The P-Header defined in this document is used to facilitate a simple negotiation procedure, where the UAC and user agent server (UAS) indicates support for this method of sending text by including the header.

2. Overall applicability

The SIP extension specified in this document makes no assumptions regarding the surrounding environment it operates in, except a SIP compliant UAC and UAS. A UAS not implementing the mechanism described in this document can safely ignore the P-Header described.

3. Conventions

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 [IETF RFC 2119].

4. Overview

This document describes a way to address the requirement to let characters appear in real-time as they are typed, not as a block of text after it is written (as they do in a typical IM or SMS application) using only the SIP protocol. A private extension header is used to mimic this behaviour using plain SIP Message requests. The obvious advantage of this method is its simplicity. Since this method uses the SIP signalling path instead of the speech path, to transfer text, it also achieves a higher degree of reliability.

5. Sending SIP Messages

The UAC MUST send SIP MESSAGE Requests in an established SIP dialogue to ensure that the sent messages gets delivered to the correct UAS.

6. Protection against Loss of Data

The UAC MUST never send more than 4 SIP MESSAGE requests per second and there MUST be at least 250ms between each SIP MESSAGE Requests sent. The UAS can send SIP MESSAGE Request using UDP or TCP. To avoid congestion the UAC MUST wait for a SIP MESSAGE Response before sending the next SIP MESSAGE Request and the UAC SHOULD send SIP MESSAGE Request using TCP.

7. SIP Private Header

7.1. The P-Safe-Text header

The purpose of the P-Safe-Text header field is to provide an indication from a SIP UAC that it supports this way of sending text real-time. If used the header MUST be present in the SIP INVITE request.

It is also used for a SIP UAS to confirm the support for sending text this way. If used, this header field MUST occur in a final 200 OK Response.

To detect missing characters this header SHALL contain a sequence number and be present in every SIP MESSAGE Request sent.

7.1.1. P-Safe-Text Header Syntax

The syntax of the P-Safe-Text header is described as an augmented [IETF *RFC 4234]* Backus-Naur Form (BNF):

P-Safe-Text = "P-Safe-Text"

8. Content Type

A SIP UAC utilizing the Reliable RTT (real-time text) way of sending a SIP Message Request MUST specify the Content Type Header to use media type 'text' and media sub type 'plain'. If no character encoding is specified contents MUST be UTF-8 encoded. A SIP UAS receiving a SIP Message Request with this content type SHALL treat the text as entered character-by-character and SHALL NOT add a trailing CR-LF to the text.

9. Content

The UAC SHOULD add all buffered written characters since the last SIP MESSAGE Request was sent. Take into consideration the MTU for the current network and IP protocol used.

10. Interoperability

Any ICT systems (including networks, devices, services and protocols) interoperating with Reliable RTT SHALL comply with the functional and interoperability requirements presented in the present document (published on the Internet and freely available).

11. Miscellaneous

The UAC SHOULD use SIP via TCP when sending text to ensure the best transport reliability.

Reliable RTT is fully compatible with [IETF RFC 3428], “SIP chat”. The UAC can therefore in the same SIP dialogue use messages with Reliable RTT header mixed with messages without Reliable RTT header. This enables Reliable RTT interoperability with any SIP chat based system, also supporting use from mobile devices.

12. IANA Considerations

This Technical Specification includes no request to IANA.

13. References

All [RFC(number)] references have been issued by the Internet Engineering Task Force (IETF). All IETF RFCs are freely available at www.ietf.org.

13.1. Normative references

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[RFC3261] 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.

[RFC4234] Crocker, D., Ed. and P. Overell, "Augmented BNF for Syntax Specifications: ABNF", RFC 4234, October 2005.

[RFC3428] Campbell, B., Rosenberg, J., Schulzrinne, H.,Huitema, C., and D. Gurle, "Session Initiation Protocol (SIP) Extension for Instant Messaging", RFC 3428, December 2002.

[ITU.T140.1998] "Protocol for Multimedia Application Text Conversation", ITU-T Recommendation T.140, February 1998.

13.2. Informative references

[RFC3410] Case, J., Mundy, R., Partain, D., and B. Stewart, "Introduction and Applicability Statements for Internet-Standard Management Framework", RFC 3410, December 2002.

[RFC2629] Rose, M., "Writing I-Ds and RFCs using XML", RFC 2629, June 1999.

Appendix A (informative): SIP examples

A.1 Example of SIP Invite Request containing a P-Safe-Text header

INVITE sip:bob@biloxi.com SIP/2.0
Via: SIP/2.0/UDP pc33.atlanta.com;branch=z9hG4bK776
Max-Forwards: 70
To: Bob <sip:bob@biloxi.com>
From: Alice <;sip:alice@atlanta.com>;tag=4234876723
Call-ID: a84b4c76e66710@pc33.atlanta.com
CSeq: 1 INVITE
Contact: <sip:alice@pc33.atlanta.com>
P-Safe-Text: 0
Content-Type: application/sdp
Content-Length: 134

A.2 Example of SIP 200 OK Response to an Invite Request, containing a P-Safe-Text header

SIP/2.0 200 OK
Via: SIP/2.0/UDP pc33.atlanta.com;branch=z9hG4bK776 ;received=192.0.2.1
To: Bob <sip:bob@biloxi.com>;tag=a6werc85cf
From: Alice <sip:alice@atlanta.com>;tag=4234876723
Call-ID: a84b4c76e66710@pc33.atlanta.com
CSeq: 1 INVITE
Contact: <sip:bob@192.0.2.4>
P-Safe-Text: 0
Content-Type: application/sdp
Content-Length: 123

A.3 Example of SIP Message Request with Content-Type-Header set to 'text/plain'

MESSAGE sip:bob@biloxi.com SIP/2.0
Via: SIP/2.0/UDP pc33.atlanta.com;branch=z9hG4bK776
Max-Forwards: 70
To: Bob <sip:bob@biloxi.com>;tag=a6werc85cf
From: Alice <sip:alice@atlanta.com>;tag=4234876723
Call-ID: a84b4c76e66710@pc33.atlanta.com
CSeq: 3 MESSAGE
Contact: <sip:alice@pc33.atlanta.com>
P-Safe-Text: 1
Content-Type: application/sdp
Content-Length: 134