        Advanced Instant Messaging Requirements for the Session Initiation
                              Protocol (SIP)
                draft-ietf-simple-messaging-requirements-00

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Abstract

   Session Initiation Protocol (SIP) supports the basic instant
   messaging service in both page and session mode. This document
   defines a set of requirements for instant messaging capabilities that
   are beyond the scope of the baseline specifications.

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1. Introduction

The Session Initiation Protocol (SIP) defines several specifications
that support Instant Messaging (IM). The SIP MESSAGE method [3]
allows for "page-mode" messaging, offering a service in some aspects
similar to Short Message Service (SMS) in wireless networks. A more
advanced capability, called session mode messaging, uses the SIP
INVITE method to establish a session where messages are transported
using Message Session Relay Protocol (MSRP) [9]. This makes it
possible to combine messaging with other media such as audio and
video. Also, many regular SIP capabilities to be directly applied to
instant messaging, such as conferencing [10].

However, there are many additional features that exist in current,
proprietary IM systems. Some of these features do not require
protocol extensions in order to be deployed (IM message archival, for
example). However, others do.

This document provides requirements for a number of advanced IM
features which require additional standardization activity in
addition to the basic SIP MESSAGE and MSRP work. For some of the
requirements presented here the relevant standardization work has
actlly been already concluded. In those cases the related
specifications are called out and referenced.

2. Terminology

In this document, the key words "MUST", "MUST NOT", "REQUIRED",
"SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT
RECOMMENDED", "MAY", and "OPTIONAL" are to be interpreted as
described in BCP 14, RFC 2119 [1] and indicate requirement levels for
compliant implementations.

3. Instant Messaging Disposition Notifications

In most cases, an IM is delivered immediately to the recipient.
Indeed, this is the principal motivation behind the "Instant" in
"Instant Messaging". However, in many systems, an instant message
can be sent even when the recipient is not available. Indeed, even
if they are available when the message is sent, the user may log off
before the message can be delivered. In addition to basic delivery
reporting, the sender may be interested when the recipient has
actually "read" the message or the message has been at least
displayed to the user in some way.

Typically, this is dealt with through a combination of two features.

The first is message archival and retrieval. These features allow
the intended recipient to retrieve their messages at a later time.
To support this, the receiving domain stores the content of the IM,
allowing the user to fetch it later. In this regard, it is very
similar to existing email systems. Existing protocols, such as IMAP4
[8], can be used for the retrieval functions of IM.

The second feature is message disposition notification. This feature
allows the sender to be notified when the message has been delivered
to the recipient and when the recipient has "read" the message. This
feature exists in SMS, email [11] and several commercia IM systems.
A similar function is needed for SIP-based instant messaging.

Certainly, much of the email specifications for message delivery
confirmation can be reused for IM. However, much of it is email-
specific, and IM introduces some new requirements. The following
requirements apply to IM disposition notifications:

   REQ-DISNOT-1: It MUST be possible for the sender of an IM to
   request a delivery notification and/or a read notification.

   REQ-DISNOT-2: It MUST be possible for the recipient of the message
   to immediately indicate to the sender that the recipient supports
   delivery and/or read notifications.

   REQ-DISNOT-3: It MUST be possible that the disposition
   notifications can be sent and received at any point in the future
   after the actual IM has been sent, without introducing any limits
   on such a time window.

   REQ-DISNOT-4: The delivery notification MUST be capable of
   indicating that the message was delivered to the intended target.

   REQ-DISNOT-5: The delivery notification MUST be capable of
   indicating whether the message was delivered successfully, or
   whether, when it was delivered, the recipient geneeated an error.
   It MUST be possible for the sender to learn the specific error
   condition.

   REQ-DISNOT-6: The disposition notification MUST indicate the time
   when the message was delivered or read.

   REQ-DISNOT-7: The disposition notification MUST contain enough
   information to allow the sender of the original IM to correlate
   the notification with the correct message, provided that the
   sender has stored the contents of the sent message. In addition
   the notification MUST be able to carry information that might be
   helpful to a sender who no longer has the original message

available, such as the original To, From, Content-Type and
Content-Length headers.

REQ-DISNOT-8: It MUST be possible for the message sender (the
recipient of the notification) to authenticate the sender of the
notification. There is no explicit requirement for confidentialy
of the notification.

REQ-DISNOT-9: As it is anticipated that this mechanism will be
used frequently from wireless devices, it SHOULD keep overhead to
a minimum, and in particular, SHOULD NOT provide extraneous
information not relevant to the above requirements.

REQ-DISNOT-10: When an IM is sent to an intermediary that will
relay it to a group of recipients, it MUST be possible for the
sender to ask that disposition notifications are generated by each
final recipient separately.

REQ-DISNOT-11: When an IM is sent to an intermediary that will
relay it to a group of recipients, it MUST be possible for the
sender to ask that the intermediary will generate summary reports
based on reports it receives from each final recipient. [OPEN
ISSUE: Is this needed?]

REQ-DELNOT-12: Any error condition reported by the notification
MAY contain a textual description of the error meant for human
consumption [OPEN ISSUE: How about internationalization?]

REQ-DELNOT-13: If an IM is being relayed through a gateway, for
example, to SMS, the delivery report SHOULD be able to indicate
such a condition [OPEN ISSUE: Is this needed?]]

[4](#). Is-Composing

Many commercial instant messaging and presence systems provide a
feature generally referred to as "is-typing". This feature is used
during instant messaging chat sessions. Whenever one user is in the
process of typing a message to another user, the recipient-to-be can
see that a message is in progress. This avoids a common problem
where both participants are typing replies at the same time, so that
the resulting stream of converation is not well synchronized.

Generalizing this concept, the idea is really to allow one
participant to inform another participant that they are composing a
message of some type. By conveying a type, a broader set of features
can be enabled. For example, if one user indicates that they are

composing a message of type audio/basic, the other user will know
that a voice IM is coming.

The specification of how is-composing indicators are generated and
represented is available as RFC 3994 [13]. It has been designed
based on the requirements listed in this Section.

REQ-COMP-1: The is-composing feature MUST work with instant
messaging sessions [9].

REQ-COMP-2: Either side in the session should be able to indicate
that they can receive the indicators. The indicators MUST NOT be
sent from A to B if B does not explicitly indicate that they can
receive them.

REQ-COMP-3: It MUST be possible for indicators to be sent in only
one direction, i.e., A sends them to B, but B does not send them
to A.

REQ-COMP-4: It MUST be possible for usage of the indicators to be
added or removed to any IM session after the session has begun.

REQ-COMP-5: The indicator MUST be able to inform the recipient
that the sender has begun composing a message.

REQ-COMP-6: The indicator MUST be able to inform the recipient
that the sender has stopped composing a message.

REQ-COMP-7: The indicator MUST be able to convey the MIME type of
the message that is being composed.

REQ-COMP-8: The indicator must be synchrnonized with the message
stream itself. That is, if a recipient gets an indicator that a
user has stopped composing a message, and they also get a message,
the recipient must be able to know which came first.

REQ-COMP-9: It must be possible to provide end-to-end message
integrity and authentication over the indicators.

REQ-COMP-10: It must be possible to associate the is-composing
indicator with a particular instant messaging session.

REQ-COMP-11: It should be possible to interwork is-composing
indicators between CPIM compliant systems, possibly with some loss
of functionality, but with integrity and authentication in tact.

   REQ-COMP-12: It should be possible for is-composing indicators to
   work, possibly with loss of functionality, in page mode.

   REQ-COMP-13: The is-composing indicator should not result in an
   increase on the load of proxies.

   REQ-COMP-14: It must be possible to receive delivery confirmation
   reports for is-composing indicators [OPEN ISSUE: This is related
   to the question on whether disposition notifications will be
   supported for session-mode messaging.]

   REQ-COMP-15: The overhead of the indicators should be minimal.

5. Content Capabilities

   Although traditionally used with text, an IM can contain any kind of
   content. There is an increasing trend to send multimedia content,
   including audio, video, and even applications, over IM. However,
   recipients may not wish to receive content that they do not
   understand, or is over a particular size limit.

   Handling these "content capabilities" is done differently for page
   mode and session mode. In session mode, the initial offer/answer
   exchange [4] can be used to convey content capabilities. Indeed, the
   messaging sessions mechanism allows for negotiation of supported
   content types. However, some additional aspects of negotiation are
   required:

      REQ-CONTENT-1: A UA MUST be able to indicate the maximum message
      size it is willing to receive.

      This requirement has been met in MSRP via the a=max-size
      attribute.

   In page mode messaging, a 413 response can be sent if a MESSAGE
   request is too large. However, there is no way to indicate what the
   largest allowed size is:

      REQ-CONTENT-2: A 413 response MUST be capable of indicating the
      maximum allowed message size. [OPEN ISSUE: Is this needed?]

   Note that, there is no requirement to support transcoding of content
   at an intermediary in order to reduce the size of a sent message to
   match that of a recipient.

6. Page-Mode Groups

   The baseline SIP MESSAGE specification does not have explicit support
   for sending page mode messages to groups or multiple recipients.
   This capability is addressed by the Multi-recipient MESSAGE request
   [12] specification to meet the following requirements.

      REQ-GROUP-1: It MUST be possible to address a page-mode IM to a
      group.

      REQ-GROUP-2: Each recipient of a group page IM MUST be capable of
      determining the set of other recipients that got the request.

      REQ-GROUP-3: It MUST be possible for a user to send to an ad-hoc
      group, where the identities of the recipients are carried in the
      message itself.

      REQ-GROUP-4: It MUST be possible for the recipient of a group IM
      to send a message to all other participants that received the same
      group IM (i.e., Reply-To-All).

7. IANA Considerations

   There are no IANA Considerations associated with this specification.

8. Security Considerations

   Security requirements are discussed above where relevant.

9. Acknowledgments

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10. References

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