Network Working Group   E. Burger
Request for Comments: 3458   SnowShore Networks
Category: Standards Track   E. Candell
                                                              Comverse
                                                              C. Eliot
                                                  Microsoft Corporation
                                                              G. Klyne
                                                          Nine by Nine
                                                          January 2003

Message Context for Internet Mail

Status of this Memo

Copyright Notice

Abstract

   This memo describes a new RFC 2822 message header, "Message-Context".
   This header provides information about the context and presentation
   characteristics of a message.

   A receiving user agent (UA) may use this information as a hint to
   optimally present the message.

Table of Contents

1. Introduction

   This document describes a mechanism to allow senders of an Internet
   mail message to convey the message's contextual information. Taking
   account of this information, the receiving user agent (UA) can make
   decisions that improve message presentation for the user in the
   context the sender and receiver expects.

   In this document, the "message context" conveys information about the
   way the user expects to interact with the message. For example, a
   message may be e-mail, voice mail, fax mail, etc. A smart UA may
   have specialized behavior based on the context of the message.

   This document specifies a RFC 2822 header called "Message-Context".

The mechanism is in some ways similar to the use of the Content-
Disposition MIME entity described in [6]. Content-Disposition gives
clues to the receiving User Agent (UA) for how to display a given
body part. Message-Context can give clues to the receiving UA for
the presentation of the message. This allows the receiving UA to
present the message to the recipient, in a meaningful and helpful
way.

Typical uses for this mechanism include:

o Selecting a special viewer for a given message.

o Selecting an icon indicating the kind of message in a displayed
   list of messages.

o Arranging messages in an inbox display.

o Filtering messages the UA presents when the user has limited
   access.

2. Conventions used in this document

   This document refers generically to the sender of a message in the
   masculine (he/him/his) and the recipient of the message in the
   feminine (she/her/hers). This convention is purely for convenience
   and makes no assumption about the gender of a message sender or
   recipient.

   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 BCP 14, RFC 2119 [2].

   FORMATTING NOTE: Notes, such at this one, provide additional
   nonessential information that the reader may skip without missing
   anything essential. The primary purpose of these non-essential notes
   is to convey information about the rationale of this document, or to
   place this document in the proper historical or evolutionary context.
   Readers whose sole purpose is to construct a conformant
   implementation may skip such information. However, it may be of use
   to those who wish to understand why we made certain design choices.

3. Motivation

   Multimedia messaging systems receive messages that a UA may present
   in variety of ways. For example, traditional e-mail uses simple text
   messages that the recipient displays and edits. One UA may
   automatically print Fax images. Another UA may play voice messages
   through a telephone handset. Likewise, a receiving desktop computer

may process or present documents transferred over e-mail using a
local application. Emerging and future developments may deliver
other forms of information that have their own characteristics for
user presentation, such as video messages and pager messages.

An often-requested characteristic for multimedia messaging systems is
to collect received messages in a "universal inbox", and to offer
them to the user as a combined list.

In the context of "unified messaging", different message contexts may
have different implied semantics. For example, some users may
perceive voicemail to have an implicit assumption of urgency. Thus
they may wish to gather them together and process them before other
messages. This results in the end-user receiving agent needing to be
able to identify voicemail and distinguish it from other messages.

The uses of this kind of presentation characteristic for each message
are multi-fold:

o Display an indication to the user (e.g., by a suitably evocative
   icon along with other summary fields),

o Auto-forward a given message type into another messaging
   environment (e.g., a page to a mobile short message service),

o Prioritize and group messages in an inbox display list,

o Suggest appropriate default handling for presentation,

o Suggest appropriate default handling for reply, forward, etc.

A problem faced by multimedia messaging systems is that it is not
always easy to decide the context of a received message. For
example, consider the following scenarios.

o A message that contains audio and image data: Is this a fax
   message that happens to have some voice commentary? Is it a voice
   message that is accompanied by some supplementary diagrams? Is it
   a fully multimedia message, in which all parts are expected to
   carry equal significance?

o A message containing text and audio data: Is this e-mail with an
   MP3 music attachment? Is it a voice message that happens to have
   been generated with an initial text header for the benefit of
   non-voice-enabled e-mail receivers?

The message context does relate to the message media content.
However, it is not the same thing. As shown above, the media type
used in a message is not sufficient to indicate the message context.
One cannot determine a priori which media types to use in alternative
(gateway) messages. Also, what if the user cares about
distinguishing traditional e-mail text from SMS messages? They are
both the same media type, text, but they have different user
contexts.

4. Functional Requirements

   The goals stated above lead to the following functional requirements.

   For receivers:

   o Identify a message as belonging to a message class.

   o Incorrect or invalid message classification must not result in
      failure to transfer or inability to present a message.

   For senders:

   o Specify message classes by the originating user's choice of
      authoring tool or simple user interaction.

   For both:

   o Specify a well-defined set of message classes to make
      interoperability between mail user agents (UAs) possible.

   o Message classification information has to be interpretable in
      reasonable fashion by many different user agent systems.

   o The mechanism should be extensible to allow for the introduction
      of new kinds of messages.

   NOTE: We specifically do not specify user agent behavior when the
   user agent forwards a message. Clearly, the user agent, being
   message-context-aware, should provide a meaningful message-context.
   It is obvious what to do for the easy cases. Messages that the user
   simply forwards will most likely keep the context unchanged.
   However, it is beyond the scope of this document to specify the user
   agent behavior for any other scenario.

5. Determining the Message Context

   One method of indicating the interpretation context of a message is
   to examine the media types in the message. However, this requires
   the UA to scan the entire message before it can make this
   determination. This approach is particularly burdensome for the
   multi-media mail situation, as voice and especially video mail
   objects are quite large.

   We considered indicating the message context by registering a
   multipart/* MIME subtype (Content-Type). For example, the VPIM Work
   Group has registered multipart/voice-message to indicate that a
   message is primarily voice mail [7]. However, multipart/voice-
   message is identical in syntax to multipart/mixed. The only
   difference is that VPIM mail transfer agents and user agents
   recognize that they can perform special handling of the message based
   on it being a voice mail message. Moreover, Content-Type refers to a
   given MIME body part, not to the message as a whole.

   We wish to avoid scanning the entire message. In addition, we wish
   to avoid having to create multiple aliases for multipart/mixed every
   time someone identifies a new primary content type. Multiple aliases
   for multipart/mixed are not desirable as they remove the possibility
   for specifying a message as multipart/alternate, multipart/parallel,
   or multipart/encrypted, for example.

   Since the message context is an attribute of the entire message, it
   is logical to define a new top-level (RFC 2822 [3]) message
   attribute. To this end, this document introduces the message
   attribute "Message-Context".

   Message-Context only serves to identify the message context. It does
   not provide any indication of content that the UA must be capable of
   delivering. It does not imply any message disposition or delivery
   notification. There is a related effort to define Critical Content
   of Internet Mail [8] that one might use to perform these tasks.

   Message-Context is only an indicator. We do not intend for it to
   convey information that is critical for presentation of the message.
   One can conceive of goofy situations, such as a message marked
   "voice-message" but without an audio body part. In this case, the
   fact that the contents of a message don't match its context does not
   mean the receiving system should generate an error report or fail to
   deliver or process the message.

6. Message-Context Reference Field

   The Message-Context reference field is a top-level header inserted by
   the sending UA to indicate the context of the message.

   A receiving user agent MUST NOT depend on the indicated message-
   context value in a way that prevents proper presentation of the
   message. If the value is incorrect or does not match the message
   content, the receiving user agent MUST still be capable of displaying
   the message content at least as meaningfully as it would if no
   Message-Context value were present.

   One can envision situations where a well-formed message ends up not
   including a media type one would expect from the message-context.
   For example, consider a voice messaging system that records a voice
   message and also performs speech-to-text processing on the message.
   The message then passes through a content gateway, such as a
   firewall, that removes non-critical body parts over a certain length.
   The receiving user agent will receive a message in the voice-message
   context that has only a text part and no audio. Even though the
   message does not have audio, it is still in the voice message
   context.

   Said differently, the receiving UA can use the message-context to
   determine whether, when, and possibly where to display a message.
   However, the message-context should not affect the actual rendering
   or presentation. For example, if the message is in the voice-message
   context, then don't try to send it to a fax terminal. Conversely,
   consider the case of a message in the voice-message context that gets
   delivered to a multimedia voice terminal with a printer. However,
   this message only has fax content. In this situation, the "voice-
   message" context should not stop the terminal from properly rendering
   the message.

6.1. Message-Context Syntax

   The syntax of the Message-Context field, described using the ABNF [4]
   is as follows. Note that the Message-Context header field name and
   message-context-class values are not case sensitive.

      "Message-Context" ":" message-context-class CRLF

6.2. message-context-class Syntax

   The message-context-class indicates the context of the message. This
   is an IANA registered value. Current values for message-context-
   class are as follows.

```
     message-context-class = (   "voice-message"
                              / "fax-message"
                              / "pager-message"
                              / "multimedia-message"
                              / "text-message"
                              / "none"
                             )
```

   Note: The values for Message-Context MUST be IANA registered values
   following the directions in the IANA Considerations section below.

6.2.1. voice-message

   The voice-message class states the message is a voice mail message.

6.2.2. fax-message

   The fax-message class states the message is a facsimile mail message.

6.2.3. pager-message

   The pager-message class states the message is a page, such as a text
   or numeric pager message or a traditional short text message service
   (SMS) message.

6.2.4. multimedia-message

   The multimedia-message class states the message is an aggregate
   multimedia message, such as a message specified by [9]. This helps
   identify a message in a multimedia context. For example, a MIME
   multipart/related [10] data part and resource part looks the same as
   a multimedia MHTML multipart/related. However, the semantics are
   quite different.

6.2.5. text-message

   The text-message class states the message is a traditional internet
   mail message. Such a message consists of text, possibly richly
   formatted, with or without attachments.

6.2.6. none

   The none class states there is no context information for this
   message.

   If a message has no Message-Context reference field, a receiving user
   agent MUST treat it the same as it would if the message has a "none"
   value.

7. Security Considerations

   The intention for this header is to be an indicator of message
   context only. One can imagine someone creating an "Application"
   Message-Context. A poorly designed user agent could blindly execute
   a mailed program based on the Message-Context. Don't do that!

   One can envision a denial of service attack by bombing a receiver
   with a message that has a Message-Context that doesn't fit the
   profile of the actual body parts. This is why the receiver considers
   the Message-Context to be a hint only.

8. IANA Considerations

   Section 8.3 is a registration for a new top-level RFC 2822 [3]
   message header, "Message-Context".

   This document creates an extensible set of context types. To promote
   interoperability and coherent interpretations of different types, a
   central repository has been established for well-known context types.

   The IANA has created a repository for context types called "Internet
   Message Context Types". Following the policies outlined in [5], this
   repository is "Specification Required" by RFC. Section 8.1 describes
   the initial values for this registry.

   To create a new message context type, you MUST publish an RFC to
   document the type. In the RFC, include a copy of the registration
   template found in Section 8.2 of this document. Put the template in
   your IANA Considerations section, filling-in the appropriate fields.
   You MUST describe any interoperability and security issues in your
   document.

8.1. Message Content Type Registrations

   Internet Message Content Types
   ==============================

   Value   Description   Reference
   -----   -----------   ---------
   voice-message   Indicates a message whose primary   This RFC
                    content is a voice mail message. The
                    primary content is audio data. The
                    context is usually a message recorded
                    from a voice telephone call.

      fax-message   Indicates a message whose primary   This RFC
                          content is a fax mail message. The
                          primary content is image data. The
                          context is usually a message recorded
                          from a facsimile telephone call.

      pager-message   Indicates a message whose primary   This RFC
                          content is a page. The primary
                          content is text data. The context is
                          an urgent message usually of a
                          limited length.

      multimedia-message Indicates a message whose primary   This RFC
                          content is a multimedia message. The
                          primary content is multimedia, most
                          likely MHTML. The context is often
                          spam or newsletters.

      text-message   Indicates a classic, text-based,   This RFC
                          Internet message.

      None   Indicates an unknown message context. This RFC

8.2. Registration Template

   In the following template, a pipe symbol, "|", precedes instructions
   or other helpful material. Be sure to replace "<classname>" with the
   class name you are defining.

   Message-Context class name:
   <classname>

   Summary of the message class:
       | Include a short (no longer than 4 lines) description or summary
       | Examples:
       | "Palmtop devices have a 320x160 pixel display, so we can..."
       | "Color fax is so different than black & white that..."
   Person & email address to contact for further information:
       | Name & e-mail

8.3. Message-Context Registration

    To: iana@iana.org
    Subject: Registration of New RFC 2822 Header

    RFC 2822 Header Name:
    Message-Context

    Allowable values for this parameter:
    Please create a new registry for Primary Context Class
    registrations. See section 8.1 of this document for the initial
    values.

    RFC 2822 Section 3.6 Repeat Value:
    Field   Min Number   Max Number   Notes
    Message-Context   0   1

    Person & email address to contact for further information:
    Eric Burger
    e.burger@ieee.org

9. APPENDIX: Some messaging scenarios

   This section is not a normative part of this document. We include it
   here as a historical perspective on the issue of multimedia message
   types.

   These scenarios are neither comprehensive nor fixed. For example,
   e-mails being typically text-based do not mean that they cannot
   convey a voice-message. This very mutability serves to underline the
   desirability of providing some explicit message context hint.

9.1. Internet e-mail

   Internet e-mail carries textual information. Sometimes it conveys
   computer application data of arbitrary size.

   Typically, one uses e-mail for non-urgent messages, which the
   recipient will retrieve and process at a time convenient to her.

   The normal device for receiving and processing e-mail messages is
   some kind of personal computer. Modern personal computers usually
   come with a reasonably large display and an alphanumeric keyboard.
   Audio, video, and printing capabilities are not necessarily
   available.

   One can use E-mail for communication between two parties (one-to-
   one), a small number of known parties (one-to-few) or, via an e-mail
   distribution list, between larger numbers of unknown parties (one-
   to-many).

   One of the endearing characteristics of e-mail is the way that it
   allows the recipient to forward all or part of the message to another
   party, with or without additional comments. It is quite common for
   an e-mail to contain snippets of content from several previous
   messages. Similar features apply when replying to e-mail.

9.2. Pager service

   One uses a pager message to convey notifications and alerts. For the
   most part, these notifications are textual information of limited
   size. The typical limit is 160 characters. People use pages for
   relatively urgent messages, which the sender wishes the receiver to
   see and possibly respond to within a short time period. Pager
   messages are often used as a way of alerting users to something
   needing their attention. For example, a system can use a page to
   notify a subscriber there is a voicemail message requiring her
   attention.

   Example devices for sending and receiving a pager message are a
   mobile telephone with a small character display or a text pager.
   Personal computers and personal digital assistants (PDAs) can also
   participate in pager messaging.

   Currently, the most common use of pager messages are between just two
   parties (one-to-one).

   One delivery method for pager messages is the short text messaging
   service (SMS). SMS is a facility that has evolved for use with
   mobile telephones, and has an associated per-message transmission
   charge. Note that the focus here is on the notification aspect of
   SMS. From the beginning, SMS was envisioned to be more than a simple
   pager service. Operators can use SMS to provision the phone, for
   example. From the subscriber point of view, SMS has evolved
   considerably from its origins as a pure pager replacement service.
   For example, with mobile originate service, people can have two-way
   text chat sessions using SMS and a mobile phone. In addition, there
   are SMS-enabled handsets that can display pictures. However, for the
   purposes of this document, there is still a need to capture the
   essence of a "highly urgent, short-text, notification or alert"
   service.

   Users often send pager messages in isolation, rather than as part of
   a longer exchange. One use for them is as a prompt or invitation to
   communicate by some more convenient and content-rich method, such as
   a telephone call.

9.3. Facsimile

   People use facsimile to convey image information of moderate size,
   typically a small number of pages. Sometimes people use facsimile
   for larger documents.

   Facsimile is a facility that usually uses circuit-switched telephone
   circuits, with connection-time charges. Message transfer takes place
   in real-time. Thus, people often use facsimile for urgent
   communication.

   The normal device for sending and receiving a facsimile is a self-
   contained scanning and printing device connected to a telephone line
   or a desktop computer.

   Most facsimiles are between just two parties (one-to-one). However,
   a significant portion of facsimile service is broadcast between
   multiple parties (one-to-many).

Most facsimile exchanges are in isolation, rather than as part of a
longer exchange. Facsimile data is typically not suitable for
further processing by computer.

9.4. Voice mail

People use voice mail to convey audio information, almost exclusively
human speech.

Voice mail is a facility that usually uses circuit-switched telephone
circuits, with modest connection-time charges, often used for
moderately urgent messages. A common use for them is as a prompt or
invitation to communicate by some more convenient method, such as a
telephone call. In most, but not all cases, the sender of a voice
message does not want to send a message at all. Rather, they wished
to engage in a real-time conversation.

The normal device for sending and receiving a voice mail is a
telephone handset.

Voice messages are usually sent between just two parties (one-to-
one).

Voice mail data is not generally suitable for further processing by
computer.

9.5. Multimedia message

We define a multimedia message as a message containing more than one
basic media type (text, image, audio, video, model, application).

The following are some characteristics of a multimedia message.

In some cases, a multimedia message is just e-mail with an attachment
that a multimedia display application presents. For example, I can
send you an MP3 of something I recorded in my garage today.

In other cases, a multimedia message represents a convergence between
two or more of the scenarios described above. For example, a voice
message with an accompanying diagram or a talking head video message
is a multimedia message.

The characteristics will vary somewhat with the intent of the sender.
This in turn may affect the user agent or application used to render
the message.

10. References

10.1 Normative References

   [1] Bradner, S., "The Internet Standards Process -- Revision 3", BCP
        9, RFC 2026, October 1996.

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

   [3] Resnick, P., "Internet Message Format", RFC 2822, April 2001.

   [4] Crocker, D. and P. Overell, Eds., "Augmented BNF for Syntax
        Specifications: ABNF", RFC 2234, November 1997.

   [5] Alvestrand, H. and T. Narten, "Guidelines for Writing an IANA
        Considerations Section in RFCs", BCP 26, RFC 2434, October 1998.

10.2 Informative References

   [6] Troost, R., Dorner, S. and K. Moore, "Communicating Presentation
        Information in Internet Messages: The Content-Disposition Header
        Field", RFC 2183, August 1997.

   [7] Vaudreuil, G. and G. Parsons, "VPIM Voice Message MIME Sub-type
        Registration", RFC 2423, September 1998.

   [8] Burger, E., "Critical Content of Internet Mail", RFC 3459,
        January 2003.

   [9] Palme, J., Hopmann, A. and N. Shelness, "MIME Encapsulation of
        Aggregate Documents, such as HTML (MHTML)", RFC 2557, March
        1999.

   [10] Levinson, E., "The MIME Multipart/Related Content-type", RFC
        2387, August 1998.

11. Acknowledgments

   Antti Vaha-Sipila pointed out advances in SMS, while Stuart McRae
   helped distil the essence of the pager service vis a vis SMS.

   We offer an extra special thanks to Greg Vaudreuil for pulling RFC
   2557 out of his hat.

12. Authors' Addresses

   Eric Burger
   SnowShore Networks, Inc.
   285 Billerica Rd.
   Chelmsford, MA 01824-4120
   USA

   Phone: +1 978 367 8403
   EMail: e.burger@ieee.org

   Emily Candell
   Comverse Network Systems
   200 Quannapowitt Pkwy.
   Wakefield, MA 01880
   USA

   Phone: +1 781 213 2324
   EMail: emily.candell@comverse.com

   Graham Klyne
   Nine by Nine
   United Kingdom

   EMail: GK-IETF@ninebynine.org

   Charles Eliot
   Microsoft Corporation
   One Microsoft Way
   Redmond WA 98052
   USA

   Phone: +1 425 706 9760
   EMail: charle@Microsoft.com

13. Full Copyright Statement

Acknowledgement