An Extensible Message Format for Message Tracking Responses

Status of this Memo

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Abstract

   Message Tracking is expected to be used to determine the status of
   undelivered e-mail upon request. Tracking is used in conjunction
   with Delivery Status Notifications (DSN) and Message Disposition
   Notifications (MDN); generally, a message tracking request will be
   issued only when a DSN or MDN has not been received within a
   reasonable timeout period.

   This memo defines a MIME content-type for message tracking status in
   the same spirit as RFC 3464, "An Extensible Message Format for
   Delivery Status Notifications". It is to be issued upon a request as
   described in "Message Tracking Query Protocol". This memo defines
   only the format of the status information. An extension to SMTP to
   label messages for further tracking and request tracking status is
   defined in a separate memo.

1. Introduction

   Message Tracking is expected to be used to determine the status of
   undelivered e-mail upon request. Tracking is used in conjunction
   with Delivery Status Notifications (DSN) [RFC-DSN-SMTP] and Message
   Disposition Notifications (MDN) [RFC-MDN]; generally, a message
   tracking request will be issued only when a DSN or MDN has not been
   received within a reasonable timeout period.

   This memo defines a MIME [RFC-MIME] content-type for message tracking
   status in the same spirit as RFC 3464, "An Extensible Message Format
   for Delivery Status Notifications" [RFC-DSN-STAT]. It is to be
   issued upon a request as described in "Message Tracking Query
   Protocol" [RFC-MTRK-MTQP]. This memo defines only the format of the
   status information. An extension to SMTP [RFC-ESMTP] to label
   messages for further tracking and request tracking status is defined
   in a separate memo [RFC-MTRK-SMTPEXT].

2. Other Documents and Conformance

   The model used for Message Tracking is described in [RFC-MTRK-MODEL].

   Message tracking is intended for use as a "last resort" mechanism.
   Normally, Delivery Status Notifications (DSNs) [RFC-DSN-SMTP] and
   Message Disposition Notifications (MDNs) [RFC-MDN] would provide the
   primary delivery status. Only if no response is received from either
   of these mechanisms would Message Tracking be used.

   This document is based on [RFC-DSN-STAT]. Sections 1.3
   (Terminology), 2.1.1 (General conventions for DSN fields), 2.1.2
   ("*-type" subfields), and 2.1.3 (Lexical tokens imported from RFC
   822) of [RFC-DSN-STAT] are included into this document by reference.
   Other sections are further incorporated as described herein.

   Syntax notation in this document conforms to [RFC-ABNF].

   The following lexical tokens, defined in [RFC-MSGFMT], are used in
   the ABNF grammar for MTSNs: atom, CHAR, comment, CR, CRLF, DIGIT, LF,
   linear-white-space, SPACE, text. The date-time lexical token is
   defined in [RFC-HOSTREQ].

   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 RFC 2119 [RFC-
   KEYWORDS].

3. Format of a Message Tracking Status Notification

   A Message Tracking Status Notification (MTSN) is intended to be
   returned as the body of a Message Tracking request [RFC-MTRK-MTQP].
   The actual body MUST be a multipart/related [RFC-RELATED] with type
   parameter of "message/tracking-status"; each subpart MUST be of type
   "message/tracking-status" as described herein. The multipart/related
   body can include multiple message/tracking-status parts if an MTQP
   server chains requests to the next server; see [RFC-MTRK-MODEL] and
   [RFC-MTRK-MTQP] for more information about chaining.

3.1. The message/tracking-status content-type

   The message/tracking-status content-type is defined as follows:

   MIME type name: message
   MIME subtype name: tracking-status
   Optional parameters: none
   Encoding considerations: "7bit" encoding is sufficient and
                             MUST be used to maintain readability
                             when viewed by non-MIME mail readers.
   Security considerations: discussed in section 4 of this memo.

   The body of a message/tracking-status is modeled after [RFC-DSN-
   STAT]. That body consists of one or more "fields" formatted to
   according to the ABNF of RFC 2822 header "fields" (see [RFC-MSGFMT]).
   The per-message fields appear first, followed by a blank line.
   Following the per-message fields are one or more groups of per-
   recipient fields. Each group of per-recipient fields is preceded by
   a blank line. Note that there will be a blank line between the final
   per-recipient field and the MIME boundary, since one CRLF is
   necessary to terminate the field, and a second is necessary to
   introduce the MIME boundary. Formally, the syntax of the
   message/tracking-status content is as follows:

   tracking-status-content =
           per-message-fields 1*(CRLF per-recipient-fields)

   The per-message fields are described in section 3.2. The per-
   recipient fields are described in section 3.3.

3.1.1. General conventions for MTSN fields

   Section 2.1.1 (General conventions for DSN fields) of [RFC-DSN-STAT]
   is included herein by reference. Notably, the definition of xtext is
   identical to that of that document.

3.1.2. *-type subfields

   Section 2.1.2 (*-type subfields) of [RFC-DSN-STAT] is included herein
   by reference. Notably, the definitions of address-type, diagnostic-
   type, and MTA-name type are identical to that of RFC 3464.

3.2. Per-Message MTSN Fields

   Some fields of an MTSN apply to all of the addresses in a single
   envelope. These fields may appear at most once in any MTSN. These
   fields are used to correlate the MTSN with the original message
   transaction and to provide additional information which may be useful
   to gateways.

      per-message-fields =
              original-envelope-id-field CRLF
              reporting-mta-field CRLF
              arrival-date-field CRLF
              *(extension-field CRLF)

3.2.1. The Original-Envelope-Id field

   The Original-Envelope-Id field is defined as in section 2.2.1 of
   [RFC-DSN-STAT]. This field is REQUIRED.

3.2.2. The Reporting-MTA field

   The Reporting-MTA field is defined as in section 2.2.2 of [RFC-DSN-
   STAT]. This field is REQUIRED.

3.2.3. The Arrival-Date field

   The Arrival-Date field is defined as in section 2.2.5 of [RFC-DSN-
   STAT]. This field is REQUIRED.

3.3. Per-Recipient MTSN fields

   An MTSN contains information about attempts to deliver a message to
   one or more recipients. The delivery information for any particular
   recipient is contained in a group of contiguous per-recipient fields.
   Each group of per-recipient fields is preceded by a blank line.

   The syntax for the group of per-recipient fields is as follows:

```
      per-recipient-fields =
                  original-recipient-field CRLF
                  final-recipient-field CRLF
                  action-field CRLF
                  status-field CRLF
                  [ remote-mta-field CRLF ]
                  [ last-attempt-date-field CRLF ]
                  [ will-retry-until-field CRLF ]
                  *( extension-field CRLF )
```

3.3.1. Original-Recipient field

   The Original-Recipient field is defined as in section 2.3.1 of [RFC-
   DSN-STAT]. This field is REQUIRED.

3.3.2. Final-Recipient field

   The required Final-Recipient field is defined as in section 2.3.2 of
   [RFC-DSN-STAT]. This field is REQUIRED.

3.3.3. Action field

   The required Action field indicates the action performed by the
   Reporting-MTA as a result of its attempt to deliver the message to
   this recipient address. This field MUST be present for each
   recipient named in the MTSN. The syntax is as defined in RFC 3464.
   This field is REQUIRED.

   Valid actions are:

   failed   The message could not be delivered. If DSNs have been
               enabled, a "failed" DSN should already have been
               returned.

   delayed   The message is currently waiting in the MTA queue for
               future delivery. Essentially, this action means "the
               message is located, and it is here."

   delivered   The message has been successfully delivered to the final
               recipient. This includes "delivery" to a mailing list
               exploder. It does not indicate that the message has
               been read. No further information is available; in
               particular, the tracking agent SHOULD NOT attempt
               further "downstream" tracking requests.

   expanded   The message has been successfully delivered to the
                 recipient address as specified by the sender, and
                 forwarded by the Reporting-MTA beyond that destination
                 to multiple additional recipient addresses. However,
                 these additional addresses are not trackable, and the
                 tracking agent SHOULD NOT attempt further "downstream"
                 tracking requests.

   relayed   The message has been delivered into an environment that
                 does not support message tracking. No further
                 information is available; in particular, the tracking
                 agent SHOULD NOT attempt further "downstream" tracking
                 requests.

   transferred   The message has been transferred to another MTRK-
                 compliant MTA. The tracking agent SHOULD attempt
                 further "downstream" tracking requests unless that
                 information is already given in a chaining response.

   opaque   The message may or may not have been seen by this
                 system. No further information is available or
                 forthcoming.

   There may be some confusion between when to use "expanded" versus
   "delivered". Whenever possible, "expanded" should be used when the
   MTA knows that the message will be sent to multiple addresses.
   However, in some cases the delivery occurs to a program which,
   unknown to the MTA, causes mailing list expansion; in the extreme
   case, the delivery may be to a real mailbox that has the side effect
   of list expansion. If the MTA cannot ensure that this delivery will
   cause list expansion, it should set the action to "delivered".

3.3.4. Status field

   The Status field is defined as in RFC 3464. A new code is added to
   RFC 3463 [RFC-EMSSC], "Enhanced Mail System Status Codes",

      X.1.9   Message relayed to non-compliant mailer"

         The mailbox address specified was valid, but the message has
         been relayed to a system that does not speak this protocol; no
         further information can be provided.

   A 2.1.9 Status field MUST be used exclusively with a "relayed" Action
   field. This field is REQUIRED.

3.3.5. Remote-MTA field

   The Remote-MTA field is defined as in section Reference 2.3.5 of
   [RFC-DSN-STAT]. This field MUST NOT be included if no delivery
   attempts have been made or if the Action field has value "opaque".
   If delivery to some agent other than an MTA (for example, a Local
   Delivery Agent) then this field MAY be included, giving the name of
   the host on which that agent was contacted.

3.3.6. Last-Attempt-Date field

   The Last-Attempt-Date field is defined as in section Reference 2.3.7
   of [RFC-DSN-STAT]. This field is REQUIRED if any delivery attempt
   has been made and the Action field does not have value "opaque", in
   which case it will specify when it last attempted to deliver this
   message to another MTA or other Delivery Agent. This field MUST NOT
   be included if no delivery attempts have been made.

3.3.7. Will-Retry-Until field

   The Will-Retry-Until field is defined as in section Reference 2.3.9
   of [RFC-DSN-STAT]. If the message is not in the local queue or the
   Action field has the value "opaque" the Will-Retry-Until field MUST
   NOT be included; otherwise, this field SHOULD be included.

3.4. Extension fields

   Future extension fields may be defined as defined in section 2.4 of
   [RFC-DSN-STAT].

3.5. Interaction Between MTAs and LDAs

   A message that has been delivered to a Local Delivery Agent (LDA)
   that understands message tracking (in particular, an LDA speaking
   LMTP [RFC-LMTP] that supports the MTRK extension) SHOULD pass the
   tracking request to the LDA. In this case, the Action field for the
   MTA->LDA exchange will look the same as a transfer to a compliant
   MTA; that is, a "transferred" tracking status will be issued.

4. Security Considerations

4.1. Forgery

   Malicious servers may attempt to subvert message tracking and return
   false information. This could result in misdirection or
   misinterpretation of results.

4.2. Confidentiality

   Another dimension of security is confidentiality. There may be cases
   in which a message recipient is autoforwarding messages but does not
   wish to divulge the address to which the messages are autoforwarded.
   The desire for such confidentiality will probably be heightened as
   "wireless mailboxes", such as pagers, become more widely used as
   autoforward addresses.

   MTA authors are encouraged to provide a mechanism which enables the
   end user to preserve the confidentiality of a forwarding address.
   Depending on the degree of confidentiality required, and the nature
   of the environment to which a message were being forwarded, this
   might be accomplished by one or more of:

   (a) respond with a "relayed" tracking status when a message is
        forwarded to a confidential forwarding address, and disabling
        further message tracking requests.

   (b) declaring the message to be delivered, issuing a "delivered"
        tracking status, re-sending the message to the confidential
        forwarding address, and disabling further message tracking
        requests.

   The tracking algorithms MUST NOT allow tracking through list
   expansions. When a message is delivered to a list, a tracking
   request MUST respond with an "expanded" tracking status and MUST NOT
   display the contents of the list.

5. IANA Considerations

   IANA has registered the SMTP extension defined in section 3.

6. Acknowledgements

   Several individuals have commented on and enhanced this document,
   including Tony Hansen, Philip Hazel, Alexey Melnikov, Lyndon
   Nerenberg, Chris Newman, Gregory Neil Shapiro, and Dan Wing.

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7.1. Normative References

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