Partial Non-Delivery Notification

Status of this Memo

1.   Abstract

   This document describes the interaction between systems sending
   multi-part Internet mail [2] to systems that cannot render parts of
   the sent message. In particular, this document describes an
   extension to the Delivery Status Notification mechanism described in
   [3].

   An example of partial message delivery failure is the case when a
   user sends an audio file and a video file to an Internet Voice Mail
   [4] system. The Internet Voice Mail system can render the audio
   part but not the video part. In this case, a partial delivery
   occurs.

   This document reflects work undertaken in support of the Internet
   Voice Mail and Voice Profile for Internet Mail [5] initiatives. The
   VPIM Work Group home page is <http://www.ema.org/vpim>.

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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 RFC-2119 [6].

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.   Introduction

This document describes partial non-delivery notifications (PNDN).
Partial non-delivery notifications are an extension of the Delivery
Status Notification (DSN) described in RFC 1894 [3].

The need for a partial non-delivery notification comes about because
of the internetworking of Internet mail systems with legacy
messaging systems that do not fulfil all of the semantics of
Internet mail. Such legacy systems have a limited ability to render
all parts of a given message. This document will use the case of an
Internet mail system sending electronic messages a legacy voice
messaging system for illustrative purposes.

Electronic mail has historically been text-centric. Extensions such
as MIME enable the desktop to send and receive multi-part,
multimedia messages. Popular multimedia data types include binary
word processing documents, binary business presentation graphics,
voice, and video.

Voice mail has historically been audio-centric. Many voice
messaging systems can only render voice. Extensions such as fax
enable the voice mail system to send and receive fax images as well
as create multi-part voice and fax messages. A few voice mail
systems can render text using text-to-speech or text-to-fax
technology. Although theoretically possible, none can today render
video.

An important aspect of the interchange between voice messaging
services and desktop e-mail client applications is that the
rendering capability of the voice messaging platform is often much
less than the rendering capability of a desktop e-mail client. In
the e-mail case, the sender has the expectation that the recipient

receives all components of a multimedia message. This is so even if
the recipient cannot render all body parts. For the most part, the

recipient can either find the appropriate rendering tool or tell the sender that she cannot read the particular attachment.

This is an important issue. By definition, a MIME-enabled user agent, conforming to [7] will present or make available all of the body parts to the recipient. However, a voice mail system may not be capable of storing non-voice objects. Moreover, the voice mail system may not be capable of notifying the recipient that there were undeliverable message parts.

The inability of the receiving system to render a body part is usually a permanent failure. Retransmission of the message will not improve the likelihood of a future successful delivery. Contrast this to the case with normal data delivery. Traditional message failures, such as a garbled message or disabled link will benefit from retransmission.

Note that the PNDN does not attempt to address User Agent failures, such as a corruption of a body part. PNDN only addresses the capability of a system to handle the data type by observing the part's metadata. Other mechanisms, such as Message Disposition Notification [8], can address the situation when the recipient system discovers an error in the payload of a body part.

This document addresses the need to allow Internet e-mail client applications to send arbitrary multi-part multimedia messages to voice messaging systems, retaining the semantics of delivery notification, while taking into account the limitations of the voice messaging system's rendering capabilities. The method described by this document is applicable to any interface between a full-featured user agent and a recipient mail transfer agent that has less rendering and media type storage capabilities than the sender has.

Ideally, the voice mail system would notify the recipient of the undeliverable body parts. Such behavior would satisfy the essential requirements of [8]. In fact, if the voice mail system can notify the recipient there were undeliverable body parts, then there would be no need for this document. However, many voice mail systems are not capable of making this notification.

NOTE: Another method of handling partial delivery is to determine what parts of the message the sender considers critical. If the voice mail system could not deliver the critical parts, then the voice mail system would reject the entire message. If the voice mail system could deliver the critical parts, but there were other undeliverable parts, it would silently delete the parts from the delivered message. However, currently there is no method to identify critical parts. In light of the limitations of voice mail

systems, we decided to deliver as much of the message as possible,
notifying the sender of any parts that the voice mail system fails
to deliver.

NOTE: The concept of a critical part indicator is still a useful
construction. The sender may wish to specify a body part as so
important that if the system cannot deliver the specified body part,
then the system will not deliver any parts of the message. However,
this is beyond the scope of this document. We should revisit this
issue once there is an acceptable mechanism for identifying critical
parts.

4. Operation

The sending system sees the Internet Voice Mail system as a peer e-
mail client. The only special consideration on the part of the
sending system is that it may encode the MIME message following the
format specified by VPIM [5] or the Internet Voice Mail Profile [4].
Properly encoding and profiling the message will enhance the
receiving system's ability to process and successfully deliver the
message. Such considerations include the formatting and encoding of
the sender's audio name clip, return address information, out-dial
destinations, and other elements. Refer to [5] for more
information.

The recipient system, on receipt of e-mail destined for a voice mail
user, makes a best-efforts attempt to deliver what parts it can to
the user.

If the recipient system is capable of delivering the entire message,
it follows the notification protocols specified in [4].

If the recipient system cannot deliver any part of the message, it
will return the non-delivery notification specified in [4].

If the recipient system is capable of delivering only part of the
message, it will return a partial non-delivery notification (PNDN)
as described below.

Delivery failure can occur for all recipients of a message because
the recipient system cannot handle a given body part. However,
body-part delivery failure can also occur for a subset of recipients
of a message. This happens if the recipient system is capable of
handling the media type of the body part, but the recipient user
does not subscribe to a service that can present the media type.
For example, consider an Internet Voice Mail platform that can
handle fax. Now consider a service provider that has a class of
service that is voice only. If the message recipient user has a
voice only class of service, she will not be able to render fax,
which is an image.

NOTE: We chose Delivery Status Notification (DSN) [3] over Message
   Disposition Notification (MDN) [8] as a model for PNDN. There was

   some discussion on this point because an Internet Voice Mail system
   acts as both a UA and a MTA. The Message Disposition Notification
   deals with things such as return receipt. The generation of the
   return receipt can occur long after the receiving system has
   received the message. On the other hand, the receiving system can
   know on receipt whether it has the capabilities to deliver all parts
   of the message. In this case, the recipient acts more like an MTA
   than a UA. In addition, we decided it was more important for the
   sender to know the system would never deliver some parts of the
   message. It would not be desirable to wait for the recipient to
   attempt to read the message and only at that point generate a
   notification that the system could not deliver parts of the message.

   NOTE: This is why the language uses "is capable of delivering"
   rather than "delivers" in the description above.

[5](). Contents of the PNDN

   The PNDN informs a human or machine sender that the recipient system
   could not deliver one or more parts of a message they have sent.

   The PNDN is a special case of Delivery Status Notification. In the
   sections that follow, refer to [3] for a full description of the
   fields.

   The receiving system transmits a PNDN as a MIME message with a top-
   level content-type of multipart/report, as defined in [3].

   The mail system can use the multipart/report content-type for any of
   several kinds of reports. For a PNDN, the report-type parameter
   uses the DSN multipart/report content-type of "delivery-status".

   As described in [9], the first part of a multipart/report content-
   type is a human readable explanation of the report. For a PNDN, the
   second component of the multipart/report is of content-type
   message/delivery-status. The third component of the
   multipart/report consists of the original message or some portion
   thereof.

[5.1](). The message/delivery-status content-type

   The message/delivery-status content-type definition is as follows:

     MIME type name: message

```
MIME subtype name:         delivery-status
Optional parameters:       none.
Encoding considerations:   "7bit" encoding is sufficient and
```

                                   conforming systems MUST use it to
                                   maintain readability when viewed
                                   by non-MIME mail readers.
        Security considerations: discussed in section 7 of this memo.

   The message/delivery-status report type for use in the
   multipart/report is "delivery-status".

   The body of a message/delivery-status consists of one or more
   "fields" formatted according to the ABNF [10] specified below and in
   [3]. The per-message fields appear first, followed by a blank line.
   Following the per-message fields are one or more groups of per-
   recipient/per-body part fields. A blank line precedes each group of
   per-recipient fields.

   The syntax of the message/delivery-status content is in section 7.

   Section 5.2 describes the per-message-fields. Section 5.3 describes
   the per-part-fields.

   NOTE: Readers should focus on Section 5.3 as it describes the
   essential extensions to DSN.

5.2. Per-Message PNDN Fields

5.2.1. Fields from RFC 1894

   Except as noted below, the PNDN contains all fields as appropriate
   from DSN [3]. In particular, Reporting-MTA MUST be present.

   NOTE: The sender's MTA could generate a DSN. In this case, the
   Reporting-MTA is optional. However, only receiving systems will
   generate Partial Non-Delivery Notifications. Thus, the sender needs
   to know who reported the failure.

5.2.2. Original-Message-ID

   The recipient system MUST generate an Original-Message-ID field if a
   Message-ID field was present in the original message.

   NOTE: This is a change from RFC 1894. Few User Agents insert an
   Envelope-ID. The sender needs to know what message failed. Sending
   back the original message in a multimedia environment has security
   implications. In particular, requiring the receiving system to send

back large multimedia files would make them vulnerable to denial of
service attacks. Moreover, MIME-encoded body parts are in base64.
Since we cannot rely on the user recognizing the original text of

their message, we must rely on alternative identifying
characteristics.

5.3. Per-Part PNDN Fields

A PNDN contains information about attempts to deliver a message's
parts to one or more recipients. A group of contiguous per-message,
per-recipient body-part content partial non-delivery notification
fields contains delivery information for that recipient. A blank
line precedes each group of per-recipient fields.

PNDN expands upon DSN by introducing body part indicators to DSN's
per-recipient block. This extension allows multiple body part
indicators per per-recipient block. A conforming implementation
MUST choose to separate each body-part failure into its own per-
recipient block.

For example, take a message sent to two users, A and B. In
addition, let's say that Part 1 fails for the same reason for both
users, and Part 2 fails only for user B for the same reason Part 1
failed. Here is the way of rendering the per-recipient block.

            Recipient A Failure
            Part 1 Failure

            Recipient B Failure
            Part 1 Failure
            Part 2 Failure

NOTE: This RFC could have allowed splitting the report by body-
parts. However, this would break other NDN implementations,
especially MIXER.

5.3.1. Fields from RFC 1894

Except as noted below, the PNDN contains all fields as appropriate
from DSN [3]. The Original-Recipient, Final-Recipient, Last-
Attempt-Date, and Final-Log-ID fields follow their meaning and
requirements set forth in DSN. The Will-Retry-Until field is not
relevant, as the PNDN is not a delayed delivery notification.

5.3.2. Action Field

The action field reflects the disposition of the message. Since the

receiving system can deliver at least part of the message, the
action value SHOULD be "delivered". If the recipient system did not

   deliver any parts of the message, then it would perform the normal
   undeliverable message processing described by DSN [3].

   NOTE: Considering partial delivery a failure or a success is a
   matter of many debates. There is work ongoing in the IETF to
   develop an indicator for identifying critical body parts. With a
   critical body part indicator, the recipient system can return to the
   sender a success or failure indication based on whether or not the
   system succeeded in delivering the critical parts.

   Without critical part indicators, one may chose to err on the side
   of failing the entire message. However, from a practical point of
   view, the sender probably will have some idea of the capabilities of
   the recipient. Moreover, experience shows that users do not take
   well to being bombarded with failure notices they believe should be
   warnings.

   Therefore, until such a time as we have a critical body part
   indicator, the best practice is to return a delivered notice to the
   sender, with the appropriate warning and explanation message for the
   body part(s) not delivered.

5.3.3. Final Recipient Field

   The Final-Recipient field indicates the recipient for which this set
   of per-part fields applies. The definition of the final recipient
   field is as described by DSN [3]. However, for security reasons,
   the PNDN relaxes the imperative for including this field. That is,
   the per-part data MAY include the final recipient field

   NOTE: The change in imperative from [3], from MUST to MAY, comes
   from the Internet Voice Mail environment. One can envision Internet
   Voice Mail implementations where the service provider wishes to keep
   the actual host name of the voice mail system hidden yet in the
   Internet name space. Reporting the final recipient field may
   include the actual host name of a voice mail node. Making that
   information public through a PNDN may enable attacks on that node.

5.3.4. Original Content ID Field

   The Original-Content-ID field MUST be present in the PNDN if a
   Content-ID field is present in the original message. This field
   aids the sender in understanding exactly which body part the
   receiving system is not capable of delivering.

5.3.5. Original Content Description Field

The Original-Content-Description field MUST be present in the PNDN
if a Content-Description field is present in the original message.

This field aids the sender in understanding exactly which body part
the receiving system is not capable of delivering. This field will
be much more useful than the Original-Content-ID field to a human
sender. However, few User Agents insert the Content-Description
field in a message.

5.3.6. Original Content Disposition Field

The Original-Content-Disposition field MAY be present in the PNDN if
a Content-Disposition field is present in the original message.

If the original message does not have a Content-Type field, the
Original-Content-Disposition field MUST be present in the PNDN if a
Content-Disposition field is present in the original message.

The Original-Content-Disposition field aids the sender in
understanding exactly which body part the receiving system is not
capable of delivering. This field will be more useful than the
Original-Content-ID field to a human sender. It will let the human
know the file name of the part the receiving system is not capable
of handling.

5.3.7. Original Content Type Field

The Original-Content-Type field MUST be present in the PNDN if a
Content-Type field is present in the original message. This field
aids the sender in understanding exactly which body part the
receiving system is not capable of delivering. This field will be
much more useful than the Original-Content-ID field to a human
sender. It will let the human know the MIME types that the
receiving system is not capable of handling. In addition, the
sender will get a clue as to what body part the receiving system is
not capable of handling from the filename sub-field, if present.

5.3.8. Status Field

Message Transfer Agents (MTAs) are free to generate standard status
codes from [11]. This section describes status codes that have
special meaning for PNDN.

All of these status codes are of type "permanent failures of media",
type 5.

Receiving systems that generate Partial Non-Delivery Notifications
MUST insert descriptive text in the comment field of the status code
so a human sender can understand why his message failed.

Sending systems that automatically process returned status codes
MUST use the numeric status code and MUST NOT use the comment.

5.3.8.1. **Media not Supported**

   If the recipient system is not capable of delivering a part of a
   message because it does not support a given media type, it MUST
   return the Media not Supported status code. For example, if an
   Internet Voice Mail system receives an AutoCAD document and it can
   only render voice, the Internet Voice Mail system will return a
   Media not Supported status code.

   The Media not Supported status code is 5.6.1 [11].

5.3.8.2. **Conversion With Loss Performed**

   If the recipient system can deliver the part, but only with a lossy
   conversion, the receiving system SHOULD NOT return Conversion With
   Loss Performed.

   NOTE: We considered the optional return code of Conversion With
   Loss Performed, Status 5.6.4. However, we realized two things.
   First, few Internet Voice Mail systems would necessarily have the
   capability of generating this warning. Second, there is dubious
   value to the sender of receiving this warning. If the receiver has
   trouble understanding the rendering of the body part, she can always
   send a message to the sender. On the other hand, we could foresee
   confusion on the part of the sender if he constantly received
   warning messages every time he sends a message to the particular
   recipient.

6.   **Appendix - Examples**

   NOTE: These examples are for illustrative purposes only and are not
   a normative part of the PNDN definition. If an example conflicts
   with the normative description of sections 3 through 5, the example
   is wrong.

   The examples in this appendix use the following MIME-Encoded message
   for the original sent message.

   The message has three parts. The first part is a text message. The
   second part is a voice message. The third part is a fax message.
   Here is the sample message.

```
Message-ID: 005901bf3532$2c0c3e20$29010981@mtc.telecnnct.com
From: "Eric Burger" <ericb@mtc.telecnnct.com>
```

To: "Eric Burger" <eric.burger@centigram.com>
Subject: Three-part Message
Date: Mon, 22 Nov 1999 12:02:30 -0500
MIME-Version: 1.0
Content-Type: multipart/mixed;
     boundary="----=_NextPart_000_0007_01BF34E1.74123720"
X-Priority: 3
X-Mailer: The One And Only Test Platform V8.1222.974B

This is a multi-part message in MIME format.

------=_NextPart_000_0007_01BF34E1.74123720
Content-Type: text/plain;
     charset="iso-8859-1"
Content-Transfer-Encoding: 7bit
Content-ID: TextPart0AFF8B

Here is a three-part message. The first part is text (this one).
The second part is voice. The third part is fax.

------=_NextPart_000_0007_01BF34E1.74123720
Content-Type: audio/wav;
     name="Voice Message.wav"
Content-Transfer-Encoding: base64
Content-Disposition: attachment;
     filename="Voice Message.wav"

UklGRjgRAABXQVZFZm10IBQAAAAxAAEAQB8AAFkGAABBAAAAAgBAAWZhY3QEAAAAwFMA
EQAASfYQFoWCEkuSTST3JGyiTbIfDybr9hltilsnh+uBo/OEpE1iTFGWuFEcFJFuVAxk
...
0TIT1twS7JVeyYHHFDaWIEN1mcYMlvLNgGoakdxbL2ErxZprJS+htNhu4ozNYKmwCGvT
wErbIgazEvRAGn5hMxhcqGS59UE1cHEjR08A

------=_NextPart_000_0007_01BF34E1.74123720
Content-Type: image/tiff;
     name="My House.tif"
Content-Transfer-Encoding: base64
Content-Disposition: attachment;
     filename="My House.tif"
Content-Description: Picture of My House

SUkqABhSAAAAAU2agAFNmoABTZqAAU2agAFNmoABTZqAAU2agAFNmoABTZqAAU2agAFN
AU2agAFNmoABTZqAAU2agAFNmoABTZqAAU2agAGRqDuH4JefU8/YSwd8/xdn7CKC4PMW
...
UAAAGgEFAAEAAAAIUgAAGwEFAAEAAAAQUgAAJAEEAAEAAAAEAAAAKAEDAAEAAAACAAAA
AAAAAAEARgEDAAEAAAAAAAAARwEDAAEAAAAAAAAAAAAAA==

```
------=_NextPart_000_0007_01BF34E1.74123720--
```

[6.1](). PNDN With One Failed Body Part

   This example shows a PNDN for a system that does not handle text,
   but does handle voice and fax.

   Date: Thu, 22 Nov 1999 09:05:15 -0800
   From: Mail Delivery Subsystem <MAILER-DAEMON@CENTIGRAM.COM>
   Message-Id: <199407072116.RAA14128@TELECNNCT>
   Subject: WARNING: Could Not Delivery Body Part
   To: <ericb@mtc.telecnnct.com>
   MIME-Version: 1.0
   Content-Type: multipart/report; report-type=delivery-status;
        boundary="RAA14128.773615765/CENTIGRAM.COM"

   --RAA14128.773615765/CENTIGRAM.COM

   The original message was received at Mon, 22 Nov 1999 09:05:05 -0800
   from root@localhost

      ----- The following addresses had delivery problems -----
   <eric.burger@centigram.com> (warning)

      ----- Transcript of session follows -----
   Could Not Deliver Text Part to < eric.burger@centigram.com >

   Body part will be deleted from queue

   --RAA14128.773615765/CENTIGRAM.COM
   content-type: message/delivery-status

   Original-Message-ID:
        005901bf3532$2c0c3e20$29010981@mtc.telecnnct.com
   Reporting-MTA: dns; telecnnct.com

   Action: delivered
   Status: 5.6.1   (Media not Supported)
   Original-Recipient: [rfc822]();eric.burger@centigram.com
   Original-Content-ID: TextPart0AFF8B

   --RAA14128.773615765/CENTIGRAM.COM
   content-type: message/rfc822

   Here is a three-part message. The first part is text (this one).
   The second part is voice. The third part is fax.

```
    --RAA14128.773615765/CENTIGRAM.COM--
```

[6.2](). PNDN With Two Failed Body Parts

   This example shows a PNDN for a system that does not handle text or
   fax.

   Date: Thu, 22 Nov 1999 09:05:15 -0800
   From: Mail Delivery Subsystem <MAILER-DAEMON@CENTIGRAM.COM>
   Message-Id: <199407072116.RAA14128@TELECNNCT>
   Subject: WARNING: Could Not Delivery Body Part
   To: <ericb@mtc.telecnnct.com>
   MIME-Version: 1.0
   Content-Type: multipart/report; report-type=delivery-status;
        boundary="RAA14128.773615765/CENTIGRAM.COM"

   --RAA14128.773615765/CENTIGRAM.COM

   The original message was received at Mon, 22 Nov 1999 09:05:05 -0800
   from root@localhost

      ----- The following addresses had delivery problems -----
   <eric.burger@centigram.com> (warning)

      ----- Transcript of session follows -----
   Could Not Deliver Text Part to < eric.burger@centigram.com >
   Could Not Deliver Fax Part to < eric.burger@centigram.com >

   Body parts will be deleted from queue

   --RAA14128.773615765/CENTIGRAM.COM
   content-type: message/delivery-status

   Original-Message-ID:
        005901bf3532$2c0c3e20$29010981@mtc.telecnnct.com
   Reporting-MTA: dns; telecnnct.com

   Original-Recipient: [rfc822]();eric.burger@centigram.com
   Status: 5.6.1   (Media not Supported)
   Action: delivered
   Original-Content-Description: Picture of My House
   Original-Content-Type: image/tiff; name="My House.tif"
   Original-Content-Disposition: attachment; filename="My House.tif"
   Status: 5.6.1   (Media not Supported)
   Action: delivered
   Original-Content-ID: TextPart0AFF8B

   --RAA14128.773615765/CENTIGRAM.COM

content-type: message/rfc822

   Here is a three-part message. The first part is text (this one).
   The second part is voice. The third part is fax.

   --RAA14128.773615765/CENTIGRAM.COM--

6.3. PNDN With One Body Part Failure and Two
     Recipients

   This example shows a PNDN for a system that does not handle text,
   but does handle voice and fax. Assume the original message was sent
   to <ericb@mtc.telecnnct.com> and <8005551212@vm.sp.net>.

   Date: Thu, 22 Nov 1999 09:05:15 -0800
   From: Mail Delivery Subsystem <MAILER-DAEMON@CENTIGRAM.COM>
   Message-Id: <199407072116.RAA14128@TELECNNCT>
   Subject: WARNING: Could Not Delivery Body Part
   To: <ericb@mtc.telecnnct.com>
   MIME-Version: 1.0
   Content-Type: multipart/report; report-type=delivery-status;
        boundary="RAA14128.773615765/CENTIGRAM.COM"

   --RAA14128.773615765/CENTIGRAM.COM

   The original message was received at Mon, 22 Nov 1999 09:05:05 -0800
   from root@localhost

      ----- The following addresses had delivery problems -----
   <eric.burger@centigram.com> (warning)
   <8005551212@vm.sp.net> (warning)

      ----- Transcript of session follows -----
   Could Not Deliver Text Part to < eric.burger@centigram.com >
   Could Not Deliver Text Part to < 8005551212@vm.sp.net >

   Body part will be deleted from queue

   --RAA14128.773615765/CENTIGRAM.COM
   content-type: message/delivery-status

   Original-Message-ID:
        005901bf3532$2c0c3e20$29010981@mtc.telecnnct.com
   Reporting-MTA: dns; telecnnct.com

   Action: delivered
   Status: 5.6.1   (Media not Supported)

```
Original-Recipient: rfc822;eric.burger@centigram.com
Final-Recipient: rfc822;eburger@vmail27.sp.net
Original-Content-ID: TextPart0AFF8B
```

```
Action: delivered
Status: 5.6.1     (Media not Supported)
Original-Recipient: rfc822;8005551212@vm.sp.net
Final-Recipient: rfc822;eburger@vmail27.sp.net
Original-Content-ID: TextPart0AFF8B


--RAA14128.773615765/CENTIGRAM.COM
content-type: message/rfc822

Here is a three-part message.  The first part is text (this one).
The second part is voice.  The third part is fax.

--RAA14128.773615765/CENTIGRAM.COM--
```

6.4. PNDN With One Body Part Failure for One Recipient
   and Another Body Part Failure for Two Recipients

This example shows a PNDN for a system that does not handle text,
but does handle voice and fax. However, the recipient at
ericb@mtc.telecnnct.com does not subscribe to a fax service. Assume
the original message was sent to <ericb@mtc.telecnnct.com> and
<8005551212@vm.sp.net>.


```
Date: Thu, 22 Nov 1999 09:05:15 -0800
From: Mail Delivery Subsystem <MAILER-DAEMON@CENTIGRAM.COM>
Message-Id: <199407072116.RAA14128@TELECNNCT>
Subject: WARNING: Could Not Delivery Body Part
To: <ericb@mtc.telecnnct.com>
MIME-Version: 1.0
Content-Type: multipart/report; report-type=delivery-status;
     boundary="RAA14128.773615765/CENTIGRAM.COM"

--RAA14128.773615765/CENTIGRAM.COM

The original message was received at Mon, 22 Nov 1999 09:05:05 -0800
from root@localhost

   ----- The following addresses had delivery problems -----
<eric.burger@centigram.com>  (warning)
<8005551212@vm.sp.net>  (warning)

   ----- Transcript of session follows -----
Could Not Deliver Text Part to < eric.burger@centigram.com >
```

```
Could Not Deliver Text Part to < 8005551212@vm.sp.net >
Could Not Deliver Fax Part to < eric.burger@centigram.com >
```

   Body part will be deleted from queue

   --RAA14128.773615765/CENTIGRAM.COM
   content-type: message/delivery-status

   Original-Message-ID:
        005901bf3532$2c0c3e20$29010981@mtc.telecnnct.com
   Reporting-MTA: dns; telecnnct.com

   Action: delivered
   Status: 5.6.1   (Media not Supported)
   Original-Recipient: rfc822;eric.burger@centigram.com
   Final-Recipient: rfc822;eburger@vmail27.sp.net
   Original-Content-ID: TextPart0AFF8B
   Action: delivered
   Status: 5.6.1   (Media not Supported)
   Original-Content-Description: Picture of My House
   Original-Content-Type: image/tiff; name="My House.tif"
   Original-Content-Disposition: attachment; filename="My House.tif"

   Action: delivered
   Status: 5.6.1   (Media not Supported)
   Original-Recipient: rfc822;8005551212@vm.sp.net
   Original-Content-ID: TextPart0AFF8B

   --RAA14128.773615765/CENTIGRAM.COM
   content-type: message/rfc822

   Here is a three-part message. The first part is text (this one).
   The second part is voice. The third part is fax.

   --RAA14128.773615765/CENTIGRAM.COM--

7.   **Formal Syntax**

   The following syntax specification uses the augmented Backus-Naur
   Form (BNF) as described in RFC-2234 [10].

   delivery-status-content =
        per-message-fields 1*(CRLF per-part-fields)

7.1. **Syntax of Per-Message Fields**

   per-message-fields =

```
[ original-message-id-field CRLF ]
[ original-envelope-id-field CRLF ]
reporting-mta-field CRLF
```

```
        [ dsn-gateway-field CRLF ]
        [ received-from-mta-field CRLF ]
        [ arrival-date-field CRLF ]
        *( extension-field CRLF )


original-message-id-field =
        "Original-Message-ID" ":" message-id

message-id = *text


Original-envelope-id-field, reporting-mta-field, dsn-gateway-field,
received-from-mta-field, arrival-date-field, and extension-field are
all as defined in DSN [3].
```

[7.2](). Syntax of Per-Part Fields

```
per-part-fields =
    1*( [ original-content-description-field CRLF ]
        [ original-content-id-field CRLF ]
        [ original-content-disposition-field CRLF ]
        [ original-content-type-field CRLF ] )
    1*( [ original-recipient-field CRLF ]
        final-recipient-field CRLF )
    action-field CRLF
    status-field CRLF
    [ remote-mta-field CRLF ]
    [ diagnostic-code-field CRLF ]
    [ last-attempt-date-field CRLF ]
    *( extension-field CRLF )


action-field =
     "Action: delivered"

original-content-id-field =
        "Original-Content-ID" ":" content-id

content-id = *text

original-content-description-field =
        "Original-Content-Description" ":" content-description

content-description = *text

original-content-disposition-field =
        "Original-Content-Disposition" ":" content-disposition
```

```
content-disposition = *text
```

```
original-content-type-field =
        "Original-Content-Type" ":" content-type

content-type = *text

status-field =
      "Status" ":" status-code "(" comment ")"

status-code =
      DIGIT "." 1*3DIGIT "." 1*3DIGIT

comment = *text
```

Original-recipient-field, final-recipient-field, remote-mta-field,
diagnostic-code-field, last-attempt-date-field, and extension-field
are as defined in DSN [3].

Status-code is defined in [11].

8.   Security Considerations

   The following security considerations apply when using PNDNs.

8.1. Forgery

   One can forge a PNDN as easily as ordinary Internet electronic mail.
   User agents and automatic mail handling facilities (such as
   automatic voice mail forwarding agents) that wish to make use of
   PNDNs should take appropriate precautions to minimize the potential
   damage from denial-of-service attacks.

   Security threats related to forged PNDNs include the sending of:

   (a) A falsified delivery notification when the message is
       not delivered to the indicated recipient,
   (b) A falsified Final-Recipient address, or
   (c) A falsified Remote-MTA identification.

8.2. Confidentiality

   Another dimension of security is confidentiality. For example, a
   message recipient can be autoforwarding messages. However, she does
   not wish to divulge her autoforward address. The desire for such
   confidentiality will probably be heightened as "wireless mailboxes",

such as pagers, become more widely used as autoforward addresses.

Confidentiality also applies to the service provider. For example,
in an Internet Voice Mail scenario, one can envision implementations
of protocols such as VPIM [5] where reporting the actual Internet
host name can open the system to attack.

MTA authors are encouraged to provide a mechanism that 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) omitting the "Final-Recipient" field, as it has
    little use to the sender,

(b) omitting "Remote-*" or extension fields of a PNDN
    whenever they would otherwise contain confidential
    information (such as a confidential forwarding address),

(c) for messages forwarded to a confidential address,
    setting the envelope return address (e.g. SMTP MAIL FROM
    address) to the NULL reverse-path ("<>") (so that no
    PNDNs would be sent from a downstream MTA to the
    original sender), or

(d) when forwarding mail to a confidential address, having
    the forwarding MTA rewrite the envelope return address
    for the forwarded message and attempt delivery of that
    message as if the forwarding MTA were the originator.
    On its receipt of final delivery status, the forwarding
    MTA would issue a PNDN to the original sender.

In general, the Reporting MTA site can omit any optional PNDN field
that it determines inclusion of the field would impose too great a
compromise of site confidentiality. The need for such
confidentiality must be balanced against the utility of the omitted
information in trouble reports.

Implementers are cautioned that many existing MTAs will send non-
delivery notifications to a return address in the message header
(rather than to the one in the envelope), in violation of SMTP and
other protocols. If a message is forwarded through such an MTA, no
reasonable action on the part of the forwarding MTA will prevent the
downstream MTA from compromising the forwarding address. Likewise,
if the recipient's MTA automatically responds to messages based on a
request in the message header (such as the nonstandard, but widely
used, Return-Receipt-To extension header), it will also compromise
the forwarding address.

9.   References

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