

Network Working Group

Greg Vaudreuil

Internet Draft

Lucent Technologies

Expires in six months

Glenn Parsons

Obsoletes: [RFC 2421](#)

Nortel Networks

October 28, 1999

Voice Profile for Internet Mail - version 2

<[draft-ema-vpim-vpimv2r2-02.txt](#)>

Status of this Memo

This document is an Internet-Draft and is in full conformance with all provisions of [Section 10 of RFC2026](#).

This document is an Internet Draft. Internet Drafts are working documents of the Internet Engineering Task Force (IETF), its Areas, and its Working Groups. Note that other groups may also distribute working documents as Internet Drafts.

Internet Drafts are valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet Drafts as reference material or to cite them other than as a "work in progress".

The list of current Internet-Drafts can be accessed at <http://www.ietf.org/ietf/1id-abstracts.txt>

The list of Internet-Draft Shadow Directories can be accessed at <http://www.ietf.org/shadow.html>.

To learn the current status of any Internet-Draft, please check the "1id-abstracts.txt" listing contained in the Internet-Drafts Shadow Directories on ftp.is.co.za (Africa), nic.nordu.net (Europe), munnari.oz.au (Pacific Rim), ds.internic.net (US East Coast), or ftp.isi.edu (US West Coast).

Copyright Notice

Copyright (C) The Internet Society (1999). All Rights Reserved.

Internet Draft

VPIM v2

October 28, 1999

Overview

This document profiles Internet mail for voice messaging. It obsoletes [RFC 2421](#) which describes version 2 of the profile with less precision. A list of changes from that document are noted in

[Appendix F](#). As well, [Appendix A](#) summarizes the protocol profiles of this version of VPIM.

Please send comments on this document to the IETF VPIM mailing list:
<vpim@lists.neystadt.org>

Working Group Summary

This document is a deliverable of the draft charter of the IETF VPIM BOF. This document is intended as a revision of VPIM v2 [[RFC 2421](#)] for the purposes of elevating its maturity status. No protocol changes should be made from [RFC 2421](#) but this document is hoped to be a more precise profile.

Table of Contents

1.	ABSTRACT.....	4
2.	SCOPE.....	5
2.1	Voice Messaging System Limitations	5
2.2	Design Goals	6
3.	PROTOCOL RESTRICTIONS.....	7
4.	VOICE MESSAGE INTERCHANGE FORMAT.....	8
4.1	Message Addressing Formats	8
4.2	Message Header Fields	11
4.3	MIME Audio Content Descriptions	19
4.4	Voice Message Content Types	20
4.5	Other MIME Content Types	25
4.6	Return and Notification Messages	27
4.7	Forwarded Messages	29
4.8	Reply Messages	29
4.9	Notification Messages	30
5.	MESSAGE TRANSPORT PROTOCOL.....	31
5.1	ESMTP Commands	31
5.2	ESMTP Keywords	33
5.3	ESMTP Parameters - MAIL FROM	34
5.4	ESMTP Parameters - RCPT TO	35
5.5	ESMTP - SMTP Downgrading	35
6.	DIRECTORY ADDRESS RESOLUTION.....	36
7.	MANAGEMENT PROTOCOLS.....	36
7.1	Network Management	36
8.	CONFORMANCE REQUIREMENTS.....	37
9.	SECURITY CONSIDERATIONS.....	38
9.1	General Directive	38
9.2	Threats and Problems	38
9.3	Security Techniques	39
10.	REFERENCES.....	39
11.	ACKNOWLEDGMENTS.....	42
12.	COPYRIGHT NOTICE.....	42
13.	AUTHORS' ADDRESSES.....	43
14.	APPENDIX A - VPIM REQUIREMENTS SUMMARY.....	44
15.	APPENDIX B - EXAMPLE VOICE MESSAGES.....	52
16.	APPENDIX C - EXAMPLE ERROR VOICE PROCESSING ERROR CODES.....	57
17.	APPENDIX D - EXAMPLE VOICE PROCESSING DISPOSITION TYPES.....	58
18.	APPENDIX E - IANA REGISTRATIONS.....	59
18.1	vCard EMAIL Type Definition for VPIM	59
18.2	Voice Content-Disposition Parameter Definition	59
19.	APPENDIX F - CHANGE HISTORY: RFC 2421 (VPIM V2) TO THIS DOCUMENT.....	61

Vaudreuil, Parsons

Expires 4/28/00

[Page 3]

1. Abstract

Voice messaging evolved as telephone answering service into a full send, receive, and forward messaging paradigm with unique message features, semantics and usage patterns. Voice messaging was introduced on special purpose computers that interface to a telephone switch and provide call answering and voice messaging services. Traditionally, messages sent from one voice messaging system to another were transported using analog networking protocols based on DTMF signaling and analog voice playback. As the demand for networking increases, there was a need for a standard high-quality digital protocol to connect these machines. VPIM has successfully demonstrated its usefulness as this new standard. VPIM is widely implemented and is seeing deployment in early adopter customer networks. This document clarifies ambiguities found in the earlier specification and is consistent with implementation practice. The profile is referred to as VPIM (Voice Profile for Internet Mail) in this document.

This second revision of the version 2 of obsoletes [RFC 2421](#) which less precisely describes version 2 of the profile.

Vaudreuil, Parsons

Expires 4/28/00

[Page 4]

2. Scope

MIME is the Internet multipurpose, multimedia messaging standard. This document explicitly recognizes its capabilities and provides a mechanism for the exchange of various messaging technologies, primarily voice and facsimile.

This document specifies a restricted profile of the Internet multimedia messaging protocols for use between voice processing server platforms. These platforms have historically been special-purpose computers and often do not have the same facilities normally associated with a traditional Internet Email-capable computer. As a result, VPIM also specifies additional functionality as it is needed. This profile is intended to specify the minimum common set of features to allow interworking between compliant systems.

2.1 Voice Messaging System Limitations

The following are typical limitations of voice messaging platform which were considered in creating this baseline profile.

- 1) Text messages are not normally received and often cannot be easily displayed or viewed. They can often be processed only via text-to-speech or text-to-fax features not currently present in many of these machines.
- 2) Voice mail machines usually act as an integrated Message Transfer Agent, Message Store and User Agent. There is typically no relaying of messages, and [RFC 822](#) header fields may have limited use in the context of the limited messaging features currently deployed.
- 3) Voice mail message stores are generally not capable of preserving the full semantics of an Internet message. As such, use of a voice mail machine for gatewaying is not supported. In particular, storage of recipient lists, "Received" lines, and "Message-ID" may be limited.
- 4) Internet-style distribution/exploder mailing lists are not typically supported. Voice mail machines often implement only local alias lists, with error-to-sender and reply-to-sender behavior. Reply-all capabilities using a CC list are not generally available.
- 5) Error reports must be machine-parsable so that helpful responses can be voiced to users whose only access mechanism is a telephone.
- 6) The voice mail systems generally limit address entry to 16 or fewer numeric characters, and normally do not support alphanumeric

mailbox names. Alpha characters are not generally used for mailbox identification as they cannot be easily entered from a telephone terminal.

It should be noted that newer systems are based natively on SMTP/MIME and do not suffer these limitations. In particular, some systems may support media other than voice and fax.

2.2 Design Goals

It is a goal of this profile to make as few restrictions and additions to the existing Internet mail protocols as possible while satisfying the requirements for interoperability with current generation voice messaging systems. This goal is motivated by the desire to increase the accessibility to digital messaging by enabling the use of proven existing networking software for rapid development.

This specification is intended for use on a TCP/IP network; however, it is possible to use the SMTP protocol suite over other transport protocols. The necessary protocol parameters for such use is outside the scope of this document.

This profile is intended to be robust enough to be used in an environment, such as the global Internet with installed-base gateways which do not understand MIME. Full functionality, such as reliable error messages and binary transport, will require careful selection of gateways (e.g., via MX records) to be used as VPIM forwarding agents. Nothing in this document precludes use of general purpose MIME email packages to read and compose VPIM messages. While no special configuration is required to receive VPIM compliant messages, some may be required to originate compliant structures.

It is expected that a VPIM messaging system will be managed by a system administrator who can perform TCP/IP network configuration. When using facsimile or multiple voice encodings, it is suggested that the system administrator maintain a list of the capabilities of the networked mail machines to reduce the sending of undeliverable messages due to lack of feature support. Configuration, implementation and management of these directory listing capabilities are local matters.

Vaudreuil, Parsons

Expires 4/28/00

[Page 6]

3. Protocol Restrictions

This protocol does not limit the number of recipients per message. Where possible, server implementations should not restrict the number of recipients in a single message. It is recognized that no implementation supports unlimited recipients, and that the number of supported recipients may be quite low.

This protocol does not limit the maximum message length. Implementers should understand that some machines will be unable to accept excessively long messages. A mechanism is defined in the [RFC 1425](#) SMTP service extensions to declare the maximum message size supported.

The message size indicated in the ESMTP SIZE parameter is in bytes, not minutes or seconds. The number of bytes varies by voice encoding format and includes the MIME wrapper overhead. If the length must be known before sending, an approximate translation into minutes or seconds can be performed if the voice encoding is known.

The following sections describe the restrictions and additions to Internet mail protocols that are required to be compliant with this VPIM v2 profile. Though various SMTP, ESMTP and MIME features are described here, the implementer is referred to the relevant RFCs for complete details. The table in [Appendix A](#) summarizes the protocol details of this profile.

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 [\[REQ\]](#).

Vaudreuil, Parsons

Expires 4/28/00

[Page 7]

4. Voice Message Interchange Format

The voice message interchange format is a profile of the Internet Mail Protocol Suite. Any Internet Mail message containing the format defined in this section is referred to as a VPIM Message in this document. As a result, this document assumes an understanding of the Internet Mail specifications. Specifically, VPIM references components from the message format standard for Internet messages [[RFC822](#)], the Multipurpose Internet Message Extensions [MIME], the X.400 gateway specification [[X.400](#)], delivery status and message disposition notifications [[REPORT](#)][DSN][[DRPT](#)][STATUS][[MDN](#)], and the electronic business card [[MIMEDIR](#)][VCARD].

MIME, introduced in [[MIME1](#)], is a general-purpose message body format that is extensible to carry a wide range of body parts. It provides for encoding binary data so that it can be transported over the 7-bit text-oriented SMTP protocol. This transport encoding (denoted by the Content-Transfer-Encoding header field) is in addition to the audio encoding required to generate a binary object.

MIME defines two transport encoding mechanisms to transform binary data into a 7 bit representation, one designed for text-like data ("Quoted-Printable"), and one for arbitrary binary data ("Base64"). While Base64 is dramatically more efficient for audio data, either will work. Where binary transport is available, no transport encoding is needed, and the data can be labeled as "Binary".

An implementation in compliance with this profile SHOULD send audio and/or facsimile data in binary form when binary message transport is available (see [section 5](#)). When binary transport is not available, implementations MUST encode the audio and/or facsimile data as Base64. The detection and decoding of "Quoted-Printable", "7bit", and "8bit" MUST be supported in order to meet MIME requirements and to preserve interoperability with the fullest range of possible devices. However, if a content is received in a transfer encoding that cannot be rendered to the user, an appropriate negative delivery status notification MUST be sent.

4.1 Message Addressing Formats

[RFC 822](#) addresses are based on the domain name system. This naming system has two components: the local part, used for username or mailbox identification; and the host part, used for global machine identification.

Vaudreuil, Parsons

Expires 4/28/00

[Page 8]

4.1.1 VPIM Addresses

The local part of the address shall be a US-ASCII string uniquely identifying a mailbox on a destination system. For voice messaging, the local part is a printable string containing the mailbox ID of the originator or recipient. While alpha characters and long mailbox identifiers are permitted, most voice mail networks rely on numeric mailbox identifiers to retain compatibility with the limited 10 digit telephone keypad. As a result, some voice messaging systems may only be able to handle a numeric local part. The reception of alphanumeric local parts on these systems may result in the address being mapped to some locally unique (but confusing to the recipient) number or, in the worst case the address could be deleted making the message un-replyable. Additionally, it may be difficult to create messages on these systems with an alphanumeric local part without complex key sequences or some form of directory lookup (see 6).

The use of the domain naming system should be transparent to the user. It is the responsibility of the voice mail machine to lookup the fully-qualified domain name (FQDN) based on the address entered by the user (see 6).

In the absence of a global directory, specification of the local part is expected to conform to international or private telephone numbering plans. It is likely that private numbering plans will prevail and these are left for local definition. However, it is RECOMMENDED that public telephone numbers be noted according to the international numbering plan described in [E.164]. The indication that the local part is a public telephone number is given by a preceding '+' (the '+' would not be entered from a telephone keypad, it is added by the system as a flag). Since the primary information in the numeric scheme is contained by the digits, other character separators (e.g. '-') may be ignored (i.e. to allow parsing of the numeric local mailbox) or may be used to recognize distinct portions of the telephone number (e.g. country code). The specification of the local part of a VPIM address can be split into the four groups described below:

- 1) mailbox number
 - for use as a private numbering plan (any number of digits)
 - e.g. 2722@lucent.com
- 2) mailbox number+extension
 - for use as a private numbering plan with extensions
 - any number of digits, use of '+' as separator
 - e.g. 2722+111@Lucent.com
- 3) +international number

- for international telephone numbers conforming to E.164
maximum of 15 digits
- e.g. +16137637582@vm.nortel.ca

4) +international number+extension

- for international telephone numbers conforming to E.164 maximum of 15 digits, with an extension (e.g. behind a PBX) that has a maximum of 15 digits.
- e.g. +17035245550+230@ema.org

Note that this address format is designed to be compatible with current usage within the voice messaging industry. It is not compatible with the addressing formats of RFC s 2303-2304. It is expected that as telephony services become more widespread on the Internet, these addressing formats will converge.

4.1.2 Special Addresses

Special addresses are provided for compatibility with the conventions of Internet mail. These addresses do not use numeric local addresses, both to conform to current Internet practice and to avoid conflict with existing numeric addressing plans. Two special addresses are RESERVED for use as follows:

postmaster@domain

By convention, a special mailbox named "postmaster" MUST exist on all systems. This address is used for diagnostics and should be checked regularly by the system manager. This mailbox is particularly likely to receive text messages, which is not normal on a voice processing platform. The specific handling of these messages is an individual implementation choice.

non-mail-user@domain

If a reply to a message is not possible, such as a telephone answering message, then the special address "non-mail-user" SHOULD be used as the originator's address. Any text name such as "Telephone Answering", or the telephone number if it is available, is permitted. This special address is used as a token to indicate an unreachable originator. For compatibility with the installed base of mail user agents, implementations that generate this special address MUST send a negative delivery status notification (DSN) for reply messages sent to the undeliverable address. The status code for such NDN's is 5.1.1 "Mailbox does not exist".

Example:

From: Telephone Answering <non-mail-user@mycompany.com>

4.1.3 Distribution Lists

There are many ways to handle distribution list (DL) expansions and none are 'standard'. Simple alias is a behavior closest to what most voice mail systems do today and what is to be used with VPIM messages. That is:

Vaudreuil, Parsons

Expires 4/28/00

[Page 10]

Reply to the originator - (Address in the [RFC822](#) Reply-to or From field)

Errors to the submitter - (Address in the MAIL FROM: field of the ESMTP exchange and the Return-Path: [RFC 822](#) field)

Some proprietary voice messaging protocols include only the recipient of the particular copy in the envelope and include no "header fields" except date and per-message features. Most voice messaging systems do not provide for "Header Information" in their messaging queues and only include delivery information. As a result, recipient information MAY be in either the To or CC header fields. If all recipients cannot be presented then the recipient header fields SHOULD be omitted to indicate that an accurate list of recipients (e.g. for use with a reply-all capability) is not known.

[4.2](#) Message Header Fields

Internet messages contain a header information block. This header block contains information required to identify the sender, the list of recipients, the message send time, and other information intended for user presentation. Except for specialized gateway and mailing list cases, header fields do not indicate delivery options for the transport of messages.

Distribution list processors are noted for modifying or adding to the header fields of messages that pass through them. VPIM systems MUST be able to accept and ignore header fields that are not defined here.

The following header lines are permitted for use with VPIM voice messages:

[4.2.1](#) From

SEND RULES

The originator's fully-qualified domain address (a mailbox address followed by the fully-qualified domain name) MUST be present. Systems compliant with this profile SHOULD provide the text personal name of the voice message originator in a quoted phrase, if the name is available. Text names of corporate or positional mailboxes MAY be provided as a simple string. From [[RFC822](#)]

Example:

From: "Joe S. User" <12145551212@mycompany.com>

From: Technical Support <611@serviceprovider.com>

From: Non-mail-user@myserver.mycompany.com

Vaudreuil, Parsons

Expires 4/28/00

[Page 11]

Voice mail machines may not be able to support separate attributes for the "From:" and "Reply-To:" header fields, the SMTP MAIL FROM and the vCard email attribute, VPIM-conforming systems SHOULD set these values to the same address. Use of addresses different than those present in the "From:" header field address may result in unanticipated behavior.

RECEPTION RULES

The user listed in this field should be presented in the voice message envelope of the voice messaging system as the originator of the message. The "From:" address SHOULD be used for replies (see 4.8). However, if the "From:" address contains <non-mail-user@domain>, the user SHOULD NOT be offered the option to reply, nor should notifications be sent to this address.

4.2.2 To

The "To:" field contains the recipient's fully-qualified domain address. Example:

To: +12145551213@mycompany.com

SEND RULES

There MAY be one or more "To:" fields in any message. Systems SHOULD provide a list of recipients only if all recipients are available.

Systems such as gateways from protocols which do not indicate the complete list of recipients SHOULD provide a "To:" line. Because these systems cannot accurately enumerate all recipients in the "To:" headers, no recipients should be enumerated.

RECEPTION RULES

Systems compliant to this profile MAY discard the addresses in the "To:" fields if they are unable to store the information. This would, of course, make a reply-to-all capability impossible. If present, the addresses in the "To:" field MAY be used for a reply message to all recipients.

4.2.3 Cc

The "Cc:" field contains additional recipients' fully-qualified domain addresses. Many voice mail systems maintain only sufficient envelope information for message delivery and are not capable of storing or providing a complete list of additional recipients.

SEND RULES

Vaudreuil, Parsons

Expires 4/28/00

[Page 12]

Conforming implementations MAY send "Cc:" lists if all recipients are known at the time of origination. The list of disclosed recipients MUST not include undisclosed recipients (ie., those sent via a blind copy). If not, systems SHOULD omit the "Cc:" fields to indicate that the full list of recipients is unknown or otherwise unavailable.

Example:

Cc: +12145551213@mycompany.com

RECEPTION RULES

Systems compliant to this profile MAY add all the addresses in the "Cc:" field to the "To:" field, others MAY discard the addresses in the "Cc:" fields. If a list of "Cc:" addresses is present, these addresses MAY be used for a reply message to all recipients.

[4.2.4](#) Date

The "Date:" field MUST be present and contains the date, time, and time zone in which the message was sent by the originator.

SEND RULES

The time zone MUST be present and SHOULD be represented in a four-digit time zone offset, such as -0500 for North American Eastern Standard Time. This MAY be supplemented by a time zone name in parentheses, e.g., "-0900 (PDT)". Compliant implementations SHOULD be able to convert [[RFC822](#)] date and time stamps into local time.

If the VPIM sender is relaying a message from a system which does not provide a time stamp, the time of arrival at the gateway system SHOULD be used as the date.

Example:

Date: Wed, 28 Jul 96 10:08:49 -0800 (PST)

RECEPTION RULES

The sending system MUST report the time the message was sent. From [[RFC822](#)]

[4.2.5](#) Sender

SEND RULES

The "Sender:" field contains the actual address of the originator if the message is sent by an agent on behalf of the author indicated in

the "From:" field. This header field MAY be sent by VPIM-conforming systems.

RECEPTION RULES

If the address in the "Sender:" field cannot be preserved in the recipient's message queues or in the next-hop protocol from a gateway, the field MAY be silently discarded.

[4.2.6](#) Return-Path

The "Return-path:" field is added by the final delivering SMTP server. If present, it contains the address from the MAIL FROM parameter of the ESMTP exchange (see 5.1.2). Any error messages resulting from the delivery failure MUST be sent to this address. Note that if the "Return-path:" is null ("<>"), e.g. no path, loop prevention or confidential, delivery status and message disposition notifications MUST NOT be sent.

SEND RULES

The originator system MUST not add this header.

RECEPTION RULES

If the receiving system is incapable of storing the return path to be used for subsequent delivery errors, the receiving system must otherwise ensure that further delivery errors don't happen. Systems that do not support the return path MUST ensure that at the time the message is acknowledged, the message is delivered to the recipient's ultimate mailbox. Non-Delivery notifications should not be sent after that final delivery.

[4.2.7](#) Message-id

The "Message-Id:" field contains a unique per-message identifier.

SEND RULES

A unique message-id MUST be generated for each message sent from a VPIM-compliant implementation.

Example:

Message-Id: <12345678@mycompany.com>

RECEPTION RULES

The message id is not required to be stored on the receiving system. This identifier MAY be used for tracking, auditing, and returning

receipt notification reports. From [[RFC822](#)]

Vaudreuil, Parsons

Expires 4/28/00

[Page 14]

4.2.8 Reply-To

If present, the "Reply-to:" header provides a preferred address to which reply messages should be sent (see 4.8). Typically, voice mail systems can only support one originator of a message so it is likely that this field will be ignored by the receiving system. From [\[RFC822\]](#)

SEND RULES

A compliant system SHOULD NOT send a Reply-To header.

RECEPTION RULES

If a "reply-to:" field is present, a reply-to sender message MAY be sent to the address specified (that is, in lieu of the address in the "From:" field). If only one address of the originator is supported in the message store or in the next-hop protocol from a multi-protocol gateway, the address in the "From:" field MUST be used and the "Reply-To:" field MAY be silently discarded.

4.2.9 Received

The "Received:" field contains trace information added to the beginning of a [RFC 822](#) message by MTAs. This is the only field permitted to be added by an MTA. Information in this header is useful for debugging when using an US-ASCII message reader or a header-parsing tool. From [\[RFC822\]](#)

SEND RULES

A VPIM-compliant system MUST add a "Received:" field. When acting as a gateway, information about the system translated from SHOULD be included.

RECEPTION RULES

A VPIM-compliant system SHOULD NOT remove any "Received:" fields when relaying messages to other MTAs or gateways. These header fields MAY be ignored or deleted when the message is received at the final destination.

4.2.10 MIME Version

The "MIME-Version:" field indicates that the message conforms to [MIME]. Systems compliant with this specification SHOULD include a comment with the words "(Voice 2.0)". [\[VPIM1\]](#) defines an earlier version of this profile and uses the token (Voice 1.0). Example:

MIME-Version: 1.0 (Voice 2.0)

Vaudreuil, Parsons

Expires 4/28/00

[Page 15]

This identifier is intended for information only and SHOULD NOT be used to semantically identify the message as being a VPIM message. Instead, the presence of the content defined in [[V-MSG](#)] SHOULD be used if identification is necessary.

[4.2.11](#) Content-Type

The content-type header declares the type of content enclosed in the message. The typical top level content in a VPIM Message SHOULD be multipart/voice-message. The allowable contents are detailed starting in [section 4.4](#) of this document. From [[MIME2](#)]

[4.2.12](#) Content-Transfer-Encoding

Because Internet mail was initially specified to carry only 7-bit US-ASCII text, it may be necessary to encode voice and fax data into a representation suitable for that environment. The content-transfer-encoding header describes this transformation if it is needed. Compliant implementations MUST recognize and decode the standard encodings, "Binary", "7bit", "8bit", "Base64" and "Quoted-Printable". From [[MIME1](#)].

[4.2.13](#) Sensitivity

The "Sensitivity:" field, if present, indicates the requested privacy level. The case-insensitive values "Personal", "Private", and "Normal" are specified. If no privacy is requested, this field is omitted.

SEND RULES

A VPIM-compliant implementations MAY include this header to indicate the sensitivity of a message. If the message is of "Normal" sensitivity, this field SHOULD be omitted. From: [[X.400](#)]

RECEPTION RULES

If a "Sensitivity:" field with a value of "Personal" or "Private" is present in the message, a compliant system MUST prohibit the recipient from forwarding this message to any other user. A compliant system, however, SHOULD allow the responder to reply to a sensitive message, but SHOULD NOT include the original message content. The sensitivity of the reply message MAY be set by the responder.

Vaudreuil, Parsons

Expires 4/28/00

[Page 16]

If the receiving system does not support privacy and the sensitivity is one of "Personal" or "Private", a negative delivery status notification MUST be sent to the originator with the appropriate status code (X.Y.Z) indicating that privacy could not be assured. The message contents SHOULD be returned to the sender to allow for a voice context with the notification. A non-delivery notification to a private message SHOULD NOT be tagged private since it will be sent to the originator. From: [[X.400](#)]

A message with no privacy explicitly noted (ie., no header) or with _ Normal_ sensitivity has no special treatment.

[4.2.14](#) Importance

Indicates the requested importance to be given by the receiving system. The case-insensitive values "low", "normal" and "high" are specified. If no special importance is requested, this header may be omitted and the value of the absent header assumed to be "normal". From: [[X.400](#)]

SEND RULES

Compliant implementations MAY include this header to indicate the importance of a message

RECEPTION RULES

If the receiving system does not support importance, the attribute may be silently dropped. If the attribute is supported, it can be used for various user interface purposes including the ordering messages within a mailbox or triggering notification devices such as pagers.

[4.2.15](#) Subject

The subject field is often provided by email systems but is not widely supported on Voice Mail platforms. From [[RFC822](#)]

SEND RULES

For compatibility with text based mailbox interfaces, a text subject field SHOULD be generated by a compliant implementation. It is recommended that voice-messaging systems that do not support any text user interfaces (e.g. access only by a telephone) insert a generic subject header of "VPIM Message" or _ Voice Message_ for the benefit of GUI enabled recipients.

RECEPTION RULES

It is anticipated that many voice-only systems will be incapable of storing the subject line. The subject MAY be discarded if present by a receiving system.

4.2.16 Disposition-Notification-To

This header MAY be present to indicate that the sender is requesting a receipt notification from the receiving user agent. This message disposition notification (MDN) is typically sent by the user agent after the user has listened to the message and consented to an MDN being sent

Example:

Disposition-notification-to: +12145551213@mycompany.com

SEND RULES

VPIM-compliant implementations MAY include this header to request a disposition indication such as a listen confirmation.

RECEPTION RULES

The presence of a "Disposition-notification-to:" header in a message is merely a request for an MDN described in 4.6.3. The recipients' system is always free to silently ignore such a request so this header does not burden any system that does not support it. From [\[MDN\]](#).

4.2.17 Disposition-Notification-Options

This header MAY be present to define future extensions parameters for an MDN requested by the presence of the header in the previous section.

SEND RULES

No "Disposition-notification-options:" are defined that are useful for voice messaging. Sending systems SHOULD NOT request disposition notification options by sending a disposition-notification-options header.

RECEPTION RULES

Currently no parameters are defined by this document or by [\[MDN\]](#). However for forward compatibility with future extensions, this header MUST be processed if present, if MDNs are supported. If it contains an extension parameter that is required for proper MDN generation (noted with "=required"), then an MDN MUST NOT be sent if the parameter is not understood. See [\[MDN\]](#) for complete details.

Example:

Disposition-notification-options:
whizzbang=required,foo

Vaudreuil, Parsons

Expires 4/28/00

[Page 18]

4.3 MIME Audio Content Descriptions

4.3.1 Content-Description:

This field MAY be present to facilitate the text identification of these body parts in simple email readers. Any values may be used, though it may be useful to use values similar to those for Content-Disposition.

Example:

Content-Description: Big Telco Voice Message

4.3.2 Content-Disposition:

This field MUST be present to allow the parsable identification of body parts within a VPIM voice message. This is especially useful if, as is typical, more than one Audio/* body occurs within a single level (e.g. multipart/voice-message). Since a VPIM voice message is intended to be automatically played upon display of the message, in the order in which the audio contents occur, the audio contents must always be of type inline. However, it is still useful to include a filename value, so this should be present if this information is available. From [[DISP](#)]

In order to distinguish between the various types of audio contents in a VPIM voice message a new disposition parameter "voice" is defined with the parameter values below to be used as appropriate (see 18.2):

Voice-Message - the primary voice message,
Voice-Message-Notification - a spoken delivery notification
or spoken disposition notification,
Originator-Spoken-Name - the spoken name of the originator,
Recipient-Spoken-Name - the spoken name of the recipient(s) if
available to the originator
Spoken-Subject- the spoken subject of the message, typically
spoken by the originator

Note that there SHOULD only be one instance of each of these types of audio contents per message level. Additional instances of a given type (i.e., parameter value) may occur within an attached forwarded voice message.

Implementations that do not understand the "voice" parameter (or the Content-Disposition header) can safely ignore it, and will present the audio bodyparts in order (but will not be able to distinguish between them).

Vaudreuil, Parsons

Expires 4/28/00

[Page 19]

4.3.3 Content-Duration:

This field MAY be present to allow the specification of the length of the audio bodypart in seconds. The use of this field on reception is a local implementation issue. From [[DUR](#)]

Example:

Content-Duration: 33

4.3.4 Content-Language:

This field MAY be present to allow the specification of the spoken language of the audio bodypart. The encoding is defined in [[LANG](#)]. The use of this field on reception is a local implementation issue.

Example for UK English:

Content-Language: en-UK

4.4 Voice Message Content Types

The content types described in this section are identified for use within the multipart/voice-message content. This content is referred to as a 'VPIM voice message' in this document and is the fundamental part of a 'VPIM message'.

Only the contents profiled subsequently (and occasionally those in 4.5) can be sent within a VPIM voice message construct (i.e., the multipart/voice-message content type) to form a simple or a more complex structure (several examples are given in [Appendix B](#)). The presence of other contents (see 4.5) within a VPIM voice message is not permitted. If present, it MAY be tolerated, but most voice message systems have no means to tolerate other contents. In this case, the unsupported content MAY be deleted and the remaining message delivered, however most systems SHOULD reject the entire message with a negative delivery status notification. In case of partial delivery, the recipient must be notified of the deletion. When multiple contents are present within the multipart/voice-message, they SHOULD be presented to the user in the order that they appear in the message.

4.4.1 Multipart/Voice-Message

This MIME multipart structure provides a mechanism for packaging a voice message into one container that is tagged as VPIM v2 compliant.

SEND RULES

The Multipart/Voice-Message content-type MUST only contain the profiled media and content types specified in this section (i.e. audio/*, image/*, message/rfc822 and text/directory). The most

common will be: spoken name, spoken subject, the message itself, attached fax and directory info. Forwarded messages are created by simply using the message/rfc822 construct.

Conformant implementations MUST send the multipart/voice-message in a VPIM message. In most cases, this Multipart/Voice-Message content will be the top level (i.e. in the Content-Type header).

RECEPTION RULES

Conformant implementations MUST recognize the Multipart/Voice-Message content (whether it is a top level content or below a multipart/mixed) and be able to separate the contents (e.g. spoken name or spoken subject).

The semantic of multipart/Voice-Message (defined in [\[V-MSG\]](#)) is identical to multipart/mixed and may be interpreted as that by systems that do not recognize this content-type.

[4.4.2](#) Message/RFC822

SEND RULES

MIME requires support of the Message/RFC822 message encapsulation body part. This body part SHOULD be used within a multipart/voice-message to forward complete messages (see 4.7) or to reply with original content (see 4.8). From [\[MIME2\]](#)

RECEPTION RULES

The receiving system SHOULD treat this attachment as a forwarded message. The receiving system may flatten the forwarding structure (ie., remove this construct to leave multiple voice contents or even concatenate the voice contents to fit in a recipient's mailbox) if necessary. If flattening and vCards are supported, the recipient system MUST discard other vCards of forwarded parts such that only the outermost vCard is retained.

[4.4.3](#) Text/Directory

This content allows for the inclusion of a Versit vCard [\[VCARD\]](#) electronic business card within a VPIM message. The format is suitable as an interchange format between applications or systems, and is defined independent of the method used to transport it.

SEND RULES

Each vCard MUST be contained within a Text/Directory content type [\[MIMEDIR\]](#) within a VPIM message. [\[MIMEDIR\]](#) requires that the

character set MUST be defined as a parameter value (typically us-ascii for VPIM) and that the profile SHOULD be defined (the value MUST be vCard within VPIM messages).

Each VPIM message SHOULD be created with a Text/Directory (vCard profile) content type that MUST contain the preferred email address, telephone number, and text name of the message originator as well as the vCard version. The vCard SHOULD contain the spoken name and role of the originator, as well as the revision date. Any other vCard attribute MAY also be present. The intent is that the vCard be used as the source of information to contact the originator (e.g., reply, call).

The vCard profile [[VCARD](#)] MUST specify at least the following attributes:

- TEL - Public switched telephone number in international (E.164) format (various types, typically VOICE)
- EMAIL - email address (various types, typically INTERNET; the type VPIM is optionally used to denote an address that supports VPIM messages. This address MAY be used for reply-to-sender functionality when the [RFC822](#) FROM: header field is not accessible to the voice mail helper application.
- Version - Indicates the version of the vCard profile. Version 3.0 [[VCARD](#)] MUST be used.

The following attributes SHOULD be specified:

- N - Family Name, Given Name, Additional Names, Honorific Prefixes, and Suffixes. Because it is expected that recipients using a telephone user interface will use the information in the vCard to identify the originator, and the GUI will see the information presented in the FROM line, all present components in the text name of the FROM header field MUST match the values provided by the Vcard.
- SOUND - spoken name sound data (various types, typically 32KADPCM)
- REV - Revision of vCard in ISO 8601 date format

The vCard MAY use other attributes as defined in [[VCARD](#)] or extensions attributes not yet defined (e.g. recipient media capabilities).

If present, the spoken name attribute MUST be denoted by a content ID pointing to an audio/* content elsewhere in the VPIM message.

Vaudreuil, Parsons

Expires 4/28/00

[Page 22]

Each multipart/voice-message content MUST only contain one vCard -- more than one is an error condition. A VPIM message may contain forwarded messages. VCards that are part of the forwarded messages are permitted. However, these vCards MUST be associated with the originator(s) of the forwarded message(s) and the originator of the forwarding message. As a result, all forwarded vCards will be contained in message/rfc822 contents -- only the vCard of forwarding originator will be at the top-level.

RECEPTION RULES

The vCard MAY be used by the receiving system. It provides a useful mechanism to transport information about the originator that can be used by the receiving VPIM system or other local applications. It may also be used to create a reply VPIM message (see 4.8).

Example:

```
Content-Type: text/directory; charset=us-ascii; profile=vCard
Content-Transfer-Encoding: 7bit
```

```
BEGIN:VCARD
N:Parsons;Glenn
ORG:Northern Telecom
TEL;TYPE=VOICE;MSG;WORK:+1-613-763-7582
EMAIL;TYPE=INTERNET;glenn.parsons@nortel.ca
EMAIL;TYPE=INTERNET;VPIM:6137637582@vm.nortel.ca
SOUND;TYPE=32KADPCM;ENCODING=URI: CID:<part1@VM2-4321>
REV:19960831T103310Z
Version: 3.0
END:VCARD
```

4.4.4 Audio/32KADPCM

SEND RULES

An implementation compliant to this profile MUST send Audio/32KADPCM by default for voice [[ADPCM](#)]. This encoding is a moderately compressed encoding with a data rate of 32 kbits/second using moderate processing resources. Typically this body contains several minutes of message content, however if used for spoken name or subject the content should be considerably shorter (i.e. about 10 and 20 seconds respectively).

Note that if an Originator Spoken Name audio body and a vCard are both present in a VPIM message, the vCard SOUND attribute MUST point to this audio body (see 4.4.3).

RECEPTION RULES

Vaudreuil, Parsons

Expires 4/28/00

[Page 23]

Receivers MUST be able to accept and decode Audio/32KADPCM. If an implementation can only handle one voice body, then multiple voice bodies (if present) SHOULD be concatenated, and SHOULD NOT be discarded. It is RECOMMENDED that this be done in the same order as they were sent.

4.4.5 Image/Tiff

A common image encoding for facsimile, known as TIFF-F, is a derivative of the Tag Image File Format (TIFF) and is described in several documents. For the purposes of VPIM, the F Profile of TIFF for Facsimile (TIFF-F) is defined in [[TIFF-F](#)] and the image/tiff MIME content type is defined in [[TIFFREG](#)]. While there are several formats of TIFF, only TIFF-F is profiled for use within a VPIM voice message. Further, since the TIFF-F file format is used in a store-and-forward mode with VPIM, the image MUST be encoded so that there is only one image strip per facsimile page.

SEND RULES

All VPIM implementations that support facsimile MUST generate TIFF-F compatible facsimile contents in the image/tiff; application=faxbw sub-type encoding by default. An implementation SHOULD send this fax content in multipart/voice-message but may send it outside to be more compatible with fax only ([RFC 2305](#)) implementations.

While any valid MIME body header MAY be used (e.g., Content-Disposition to indicate the filename), none are specified to have special semantics for VPIM and MAY be ignored. Note that the content type parameter application=faxbw MUST be included in outbound messages.

Inbound messages in the multipart/voice-message with or without the application parameter MUST be rendered to the user. If the rendering software encounters an error in the file format, some form of negative delivery status notification SHOULD be sent to the originator).

RECEPTION RULES

Not all VPIM systems support fax. Those that do MUST support it without the multipart/voice-message and MAY outside of the multipart/voice-message. A receiving system MAY accept the voice content of a VPIM message and discard the fax content. The recipient MUST be notified of the dropped content. Though discouraged, a recipient system MAY reject (with appropriate NDN) the entire message if it cannot handle fax attachments within the multipart/voice-message.

Vaudreuil, Parsons

Expires 4/28/00

[Page 24]

4.4.6 Proprietary Voice or Fax Formats

Use of any other encoding except the required codecs reduces interoperability in the absence of explicit knowledge about the capabilities of the recipient. A compliant implementation MAY use any other encoding provided a unique identifier is registered with the IANA prior to use (see [[MIME4](#)]). The voice encodings should be registered as sub-types of Audio. The fax encodings should be registered as sub-types of Image.

SEND RULES

Proprietary voice encoding formats or other standard formats MAY be sent under this profile only if the sender has a reasonable expectation that the recipient will accept the encoding. In practice, this requires explicit per-destination configuration information maintained either in a directory, personal address book, or gateway configuration tables.

RECEPTION RULES

Systems MAY accept other audio/* or image/* content types if they can decode them. Systems which receive audio/* or image/* content types which they are unable to decode MUST return the message to the originator with an NDN indicating media not supported.

4.5 Other MIME Content Types

An implementation compliant with this profile MAY send additional contents in a VPIM message, but only outside the multipart/voice-message. If an implementation receives a VPIM message that contains content types not specified in 4.4 or 4.5, their handling is a local implementation issue (e.g., the unknown contents MAY be discarded if they cannot be presented to the recipient). Conversely, if an implementation receives a non-VPIM message (i.e., without a multipart/voice-message content type) with any of the contents defined in 4.4, it SHOULD deliver those contents, but the full message handling is a local issue (e.g. the unknown contents or the entire message MAY be discarded). Implementations MUST issue negative delivery status notifications to the originator when any form of non-delivery to the recipient occurs.

Only the contents specified in 4.4 are required to be supported within a multipart/voice message by a receiving system. Other contents MUST NOT be sent within the multipart/voice-message. The multipart contents defined below MAY be sent within a multipart/voice message as the recipient system will likely reject the message. Several examples are given in [Appendix B](#).

Vaudreuil, Parsons

Expires 4/28/00

[Page 25]

4.5.1 Multipart/Mixed

Multipart/mixed provides the facilities for enclosing several body parts in a single message.

SEND RULES

When used in a VPIM message, multipart/mixed is the top level content type and multipart/voice-message is typically the first second level content type. Other attachments follow as additional second level content types. Multipart/mixed may also be used within a multipart/voice-message but caution is advised. Note that the semantics of using complex hierarchy within a voice message is undefined and the use of such a structure is discouraged.

Multipart/mixed contents MAY be sent as the top level of a VPIM message. Typically, this would only be used when attaching non-voice or fax content to a VPIM message. These other contents SHOULD be placed after the multipart/voice-message.

RECEPTION RULES

Compliant systems MUST accept multipart/mixed content types at the top level and SHOULD within a multipart/voice-messages. Systems may collapse the contents of the multipart/mixed structure into the multipart/voice message itself. If necessary, systems SHOULD discard the other contents to deliver the voice content but they MAY reject the entire message if this is not possible. From [[MIME2](#)]

4.5.2 Text/Plain

MIME requires support of the basic Text/Plain content type. This content type has limited applicability within the voice messaging environment. However, because VPIM is a MIME profile, MIME requirements should be met.

SEND RULES

Compliant VPIM implementations SHOULD NOT send the Text/Plain content-type. It should be understood that the textual information is not considered a primary media within multipart/voice-message and may be discarded (or rejected) by a receiving system.

RECEPTION RULES

Vaudreuil, Parsons

Expires 4/28/00

[Page 26]

Within a multipart/voice message, the text/plain content type MAY be dropped from the message. The recipient SHOULD NOT reject the entire message (if an implementation does reject the entire message a suitable DSN MUST be used). However, if no rendering of the text is possible and no indication of its presence can be given to the recipient, the entire message SHOULD be returned to the sender with a negative delivery status notification and a media-unsupported status code.

Outside a Multipart/Voice-message, compliant implementations MUST accept Text/Plain messages, however, specific handling is left as an implementation decision. From [[MIME2](#)]

There are several mechanisms that can be used to support text (once accepted) on voice messaging systems including text-to-speech and text-to-fax conversions.

[4.6](#) Return and Notification Messages

VPIM delivery status notification messages (4.6.2) MUST be sent to the originator of the message when any form of non-delivery of the subject message or its components occurs. These error messages MUST be sent to the address in the Mail From (5.1.2) if available (same as the return path (4.2.6) if present), otherwise, the From (4.2.1) address may be used.

VPIM Receipt Notification messages (4.6.3) SHOULD be sent to the sender specified in the Disposition-Notification-To header field (4.2.16). The MDN SHOULD be sent after the message has been presented to the recipient or if the message has somehow been disposed of without being presented to the recipient (e.g. if it were deleted before playing it).

VPIM Notification messages may be positive or negative, and can indicate delivery at the server or receipt by the client. However, the notification MUST be contained in a multipart/report container (4.6.1) and SHOULD contain a spoken error message.

[4.6.1](#) Multipart/Report

The Multipart/Report is used for enclosing human-readable and machine parsable notification (e.g. Message/delivery-status) body parts and any returned message content. The multipart/report content-type is used to deliver both delivery status reports indicating transport success or failure and message disposition notifications to indicate post-delivery events such as receipt notification.

SEND RULES

Compliant implementations MUST use the Multipart/Report construct.
From [[REPORT](#)]

Multipart/Report messages from VPIM implementations MAY include the human-readable description of the error as a spoken audio/* content (this speech MAY be made available to the notification recipient). As well, VPIM implementations MAY generate Multipart/Report messages that encode the human-readable description of the error as text. Note that per [\[DSN\]](#) the human-readable part MUST always be present.

RECEPTION RULES

Compliant implementations MUST recognize and decode the Multipart/Report content type and its components in order to present the report to the user.

As well, implementers MUST be able to handle the human readable description of the error as text or audio.

[4.6.2](#) Message/Delivery-status

This MIME body part is used for sending machine-parsable delivery status notifications.

SEND RULES

Compliant implementations MUST use the Message/delivery-status construct when returning messages or sending warnings.

RECEPTION RULES

Compliant implementations MUST recognize and decode the Message/delivery-status content type and present the reason for failure to the sender of the message. From [\[DSN\]](#)

[4.6.3](#) Message/Disposition-notification

This MIME body part is used for sending machine-parsable read-receipt message disposition notifications.

SEND RULES

Conforming implementations SHOULD use the Message/Disposition-notification construct when sending post-delivery message status notifications. These MDNs, however, MUST only be sent in response to the presence of the Disposition-notification-to header described in 4.2.16.

RECEPTION RULES

Conforming implementations should recognize and decode the Message/Disposition-notification content type and present the

notification to the user. From [[MDN](#)]

Vaudreuil, Parsons

Expires 4/28/00

[Page 28]

4.7 Forwarded Messages

VPIM version 2 explicitly supports the forwarding of voice and fax content with voice or fax annotation. However, only the two constructs described below are acceptable in a VPIM message. Since only the first (i.e. message/rfc822) can be recognized as a forwarded message (or even multiple forwarded messages), it is RECOMMENDED that this construct be used whenever possible.

Forwarded VPIM messages SHOULD be sent as a multipart/voice-message with the entire original message enclosed in a message/rfc822 content type and the annotation as a separate Audio/* or image/* body part. If the [RFC822](#) header fields are not available for the forwarded content, simulated header fields with available information SHOULD be constructed to indicate the original sending timestamp, and the original sender as indicated in the "From" line. However, note that at least one of "From", "Subject", or "Date" MUST be present. As well, the message/rfc822 content MUST include at least the "MIME-Version", and "Content-Type" header fields. From [[MIME2](#)]

In the event that forwarding information is lost through concatenation of the original message and the forwarding annotation, such as must be done in a gateway between VPIM and the AMIS voice messaging protocol, the entire audio content MAY be sent as a single Audio/* segment without including any forwarding semantics.

4.8 Reply Messages

Replies to VPIM messages (and Internet mail messages) are addressed to the address noted in the reply-to header (see 4.2.8) if it is present, else the From address (see 4.2.1) is used. The vCard EMAIL attribute, if present, SHOULD be the same as the reply-to address and may be the same as the From address. It is expected that within legacy email implementations, the voice message viewer application may need to create a reply message without the benefit of the [RFC822](#) headers. In such a case, the vCard MAY be used to generate a reply to the sender.

RECEPTION RULES

Support of multiple originator header fields is often not possible on voice messaging systems, so it may be necessary to choose only one when gatewaying a VPIM message to another voice message system. However, implementers should note that this may make it impossible to send error messages and replies to their proper destinations.

In some cases, a reply message is not possible, such as with a message created by telephone answering (i.e. classic voice mail). In this case, the From field MUST contain the special address non-mail-

user@domain (see 4.1.2). A null ESMTTP MAIL FROM address SHOULD also be used in this case (see 5.1.2). A receiving VPIM system SHOULD NOT offer the user the option to reply to this kind of message.

4.9 Notification Messages

VPIM delivery status notification messages (4.6.2) **MUST** be sent to the originator of the message when any form of non-delivery of the subject message or its components occurs. These error messages must be sent to the Mail From (5.1.2) if available (same as the return path (4.2.6) if present), otherwise, the From (4.2.1) address may be used.

VPIM Receipt Notification messages (4.6.3) should be sent to the sender specified in the Disposition-Notification-To header field (4.2.16), only after the message has been presented to the recipient or if the message has somehow been disposed of without being presented to the recipient (e.g. if it were deleted before playing it).

VPIM Notification messages may be positive or negative, and can indicate delivery at the server or receipt by the client. However, the notification **MUST** be contained in a multipart/report container (4.6.1) and **SHOULD** contain a spoken error message.

If a VPIM system receives a message with contents that are not understood (see 4.4 & 4.5), its handling is a local matter. A delivery status notification **SHOULD** be generated if the message could not be delivered because of unknown contents (e.g., on traditional voice processing systems). In some cases, the message may be delivered (with a positive DSN sent) to a mailbox before the determination of rendering can be made.

Vaudreuil, Parsons

Expires 4/28/00

[Page 30]

5. Message Transport Protocol

Messages are transported between voice mail machines using the Internet Extended Simple Mail Transfer Protocol (ESMTP). All information required for proper delivery of the message is included in the ESMTP dialog. This information, including the sender and recipient addresses, is commonly referred to as the message "envelope". This information is equivalent to the message control block in many analog voice messaging protocols.

ESMTP is a general-purpose messaging protocol, designed both to send mail and to allow terminal console messaging. Simple Mail Transport Protocol (SMTP) was originally created for the exchange of US-ASCII 7-bit text messages. Binary and 8-bit text messages have traditionally been transported by encoding the messages into a 7-bit text-like form. [[ESMTP](#)] formalized an extension mechanism for SMTP, and subsequent RFCs have defined 8-bit text networking, command streaming, binary networking, and extensions to permit the declaration of message size for the efficient transmission of large messages such as multi-minute voice mail.

The following sections list ESMTP commands, keywords, and parameters that are required and those that are optional for conformance to this profile.

5.1 ESMTP Commands

5.1.1 HELO

Base SMTP greeting and identification of sender.

SEND RULES

This command SHOULD not be sent by compliant systems unless the more-capable EHLO command is not accepted. It is included for compatibility with general SMTP implementations.

RECEPTION RULES

Compliant servers MUST implement the HELO command for backward compatibility. From [[SMTP](#)]

5.1.2 MAIL FROM

Originating mailbox. This address contains the mailbox to which errors should be sent.

SEND RULES

Vaudreuil, Parsons

Expires 4/28/00

[Page 31]

VPIM implementations SHOULD use the same address in the MAIL FROM command as is used in the From header field. This address is not necessarily the same as the message Sender listed in the message header fields if the message was received from a gateway or sent to an Internet-style mailing list. From [[SMTP](#), [ESMTP](#)]

RECEPTION RULES

The MAIL FROM address SHOULD be stored in the local message store for the purposes of generating a delivery status notification to the originator. The address indicated in the MAIL FROM command SHOULD be passed as a local system parameter or placed in a Return-Path: line inserted at the beginning of a VPIM message. From [[HOSTREQ](#)]

Since delivery status notifications MUST be sent to the MAIL FROM address, the use of the null address ("<>") is often used to prevent looping of messages. This null address MAY be used to note that a particular message has no return path (e.g. a telephone answer message). From [[SMTP](#)]

[5.1.3](#) RCPT TO

Recipient's mailbox. The parameter to this command contains only the address to which the message should be delivered for this transaction. It is the set of addresses in one or more RCPT TO commands that are used for mail routing. From [[SMTP](#), [ESMTP](#)]

Note: In the event that multiple transport connections to multiple destination machines are required for the same message, the set of addresses in a given transport connection may not match the list of recipients in the message header fields.

[5.1.4](#) DATA

Initiates the transfer of message data. Support for this command is required. Compliant implementations MUST implement the SMTP DATA command for backwards compatibility. From [[SMTP](#)]

[5.1.5](#) TURN

Requests a change-of-roles, that is, the client that opened the connection offers to assume the role of server for any mail the remote machine may wish to send. Because SMTP is not an authenticated protocol, the TURN command presents an opportunity to improperly fetch mail queued for another destination. Compliant implementations SHOULD NOT implement the TURN command. From [[SMTP](#)]

[5.1.6](#) QUIT

Requests that the connection be closed. If accepted, the remote machine will reset and close the connection. Compliant implementations MUST implement the QUIT command. From [[SMTP](#)]

[5.1.7](#) RSET

Resets the connection to its initial state. Compliant implementations MUST implement the RSET command. From [[SMTP](#)]

[5.1.8](#) VRFY

Requests verification that this node can reach the listed recipient. While this functionality is also included in the RCPT TO command, VRFY allows the query without beginning a mail transfer transaction. This command is useful for debugging and tracing problems. Compliant implementations MAY implement the VRFY command. From [[SMTP](#)]

(Note that the implementation of VRFY may simplify the guessing of a recipient's mailbox or automated sweeps for valid mailbox addresses, resulting in a possible reduction in privacy. Various implementation techniques may be used to reduce the threat, such as limiting the number of queries per session.) From [[SMTP](#)]

[5.1.9](#) EHLO

The enhanced mail greeting that enables a server to announce support for extended messaging options. The extended messaging modes are discussed in subsequent sections of this document. Compliant implementations MUST implement the ESMTP command and return the capabilities indicated later [section 5](#). From [[ESMTP](#)]

[5.1.10](#) BDAT

The BDAT command provides a higher efficiency alternative to the earlier DATA command, especially for voice. The BDAT command provides for native binary transport of messages. Compliant implementations SHOULD support binary transport using the BDAT command. [[BINARY](#)]

[5.2](#) ESMTP Keywords

The following ESMTP keywords indicate extended features useful for voice messaging.

[5.2.1](#) PIPELINING

The "PIPELINING" keyword indicates ability of the receiving server to accept new commands before issuing a response to the previous command. Pipelining commands dramatically improves performance by reducing the number of round-trip packet exchanges and makes it possible to validate all recipient addresses in one operation. Compliant implementations SHOULD support the command pipelining indicated by this keyword. From [[PIPE](#)]

Vaudreuil, Parsons

Expires 4/28/00

[Page 33]

5.2.2 SIZE

The "SIZE" keyword provides a mechanism by which the SMTP server can indicate the maximum size message supported. Compliant servers MUST provide size extension to indicate the maximum size message that can be accepted. Clients SHOULD NOT send messages larger than the size indicated by the server. Clients SHOULD advertise SIZE= when sending messages to servers that indicate support for the SIZE extension.

From [[SIZE](#)]

5.2.3 CHUNKING

The "CHUNKING" keyword indicates that the receiver will support the high-performance binary transport mode. Note that CHUNKING can be used with any message format and does not imply support for binary encoded messages. Compliant implementations MAY support binary transport indicated by this capability. From [[BINARY](#)]

5.2.4 BINARYMIME

The "BINARYMIME" keyword indicates that the SMTP server can accept binary encoded MIME messages. Compliant implementations MAY support binary transport indicated by this capability. Note that support for this feature requires support of CHUNKING. From [[BINARY](#)]

5.2.5 DSN

The "DSN" keyword indicates that the SMTP server will accept explicit delivery status notification requests. Compliant implementations MUST support the delivery notification extensions in [[DRPT](#)].

5.2.6 ENHANCEDSTATUSCODES

The "ENHANCEDSTATUSCODES" keyword indicates that an SMTP server augments its responses with the enhanced mail system status codes [[CODES](#)]. These codes can then be used to provide more informative explanations of error conditions, especially in the context of the delivery status notification format defined in [[DSN](#)]. Compliant implementations SHOULD support this capability. From [[STATUS](#)]

5.3 ESMTP Parameters - MAIL FROM

5.3.1 BINARYMIME

The current message is a binary encoded MIME messages. Compliant implementations SHOULD support binary transport indicated by this parameter. From [[BINARY](#)]

Vaudreuil, Parsons

Expires 4/28/00

[Page 34]

5.3.2 RET

The RET parameter indicates whether the content of the message should be returned. Compliant systems SHOULD honor a request for returned content. From [\[DRPT\]](#)

5.3.3 ENVID

The ENVID keyword of the SMTP MAIL command is used to specify an "envelope identifier" to be transmitted along with the message and included in any DSNs issued for any of the recipients named in this SMTP transaction. The purpose of the envelope identifier is to allow the sender of a message to identify the transaction for which the DSN was issued. Compliant implementations MAY use this parameter. From [\[DRPT\]](#)

5.4 ESMTP Parameters - RCPT TO

5.4.1 NOTIFY

The NOTIFY parameter indicates the conditions under which a delivery report should be sent. Compliant implementations MUST honor this request. From [\[DRPT\]](#)

5.4.2 ORCPT

The ORCPT keyword of the RCPT command is used to specify an "original" recipient address that corresponds to the actual recipient to which the message is to be delivered. If the ORCPT esmtp-keyword is used, it MUST have an associated esmtp-value, which consists of the original recipient address. Compliant implementations MAY use this parameter. From [\[DRPT\]](#)

5.5 ESMTP - SMTP Downgrading

The ESMTP extensions suggested or required for conformance to VPIM fall into two categories. The first category includes features which increase the efficiency of the transport system such as SIZE, BINARYMIME, and PIPELINING. In the event of a downgrade to a less functional transport system, these features can be dropped with no functional change to the sender or recipient.

Vaudreuil, Parsons

Expires 4/28/00

[Page 35]

The second category of features is transport extensions in support of new functions. DSN and EnhancedStatusCodes provide essential improvements in the handling of delivery status notifications to bring email to the level of reliability expected of Voice Mail. To ensure a consistent level of service across an intranet or the global Internet, it is essential that VPIM compliant ESMTP support the ESMTP DSN extension at all hops between a VPIM originating system and the recipient system. In the situation where a 'downgrade' is unavoidable a relay hop may be forced (by the next hop) to forward a VPIM message without the ESMTP request for positive delivery status notification. It is RECOMMENDED that the downgrading system should continue to attempt to deliver the message, but MUST send an appropriate delivery notification to the originator, e.g. the message left an ESMTP host and was sent (unreliably) via SMTP.

6. Directory Address Resolution

It is the responsibility of a VPIM system to provide the fully-qualified domain name (FQDN) of the recipient based on the address entered by the user (if the entered address is not already a FQDN). This would typically be an issue on systems that offered only a telephone user interface. The mapping of the dialed target number to a routable FQDN address allowing delivery to the destination system can be accomplished through implementation-specific means.

To facilitate a local dial-by-name cache, an implementation may wish to populate local directories with the first and last names, as well as the address information extracted from received messages. It is mandated that only address information from vCard attachments to VPIM messages be used to populate such a directory when the vCard is available. Addresses or names parsed from the header fields of VPIM messages SHOULD NOT be used to populate directories as it only provides partial data. Alternatively, bilateral agreements could be made to allow the bulk transfer of vCards between systems.

7. Management Protocols

The Internet protocols provide a mechanism for the management of messaging systems, from the management of the physical network through the management of the message queues. SNMP should be supported on a compliant message machine.

7.1 Network Management

The digital interface to the VM and the TCP/IP protocols MAY be managed. MIB II MAY be implemented to provide basic statistics and reporting of TCP and IP protocol performance. [MIB II]

Vaudreuil, Parsons

Expires 4/28/00

[Page 36]

8. Conformance Requirements

VPIM is a messaging application which must be supported in several environments and be supported on differing devices. These environments include traditional voice processing systems, desktop voice messaging systems, store and forward relays, and protocol translation gateways.

In order to accommodate all environments, this document defines two areas of conformance: transport and content.

Transport conformant systems will pass VPIM messages in a store and forward manner with assured delivery notifications and without the loss of information. It is expected that most store and forward Internet mail based messaging systems will be VPIM transport compliant.

Content conformant systems will generate and interpret VPIM messages. Conformance in the generation of VPIM messages indicates that the restrictions of this profile are honored. Only contents specified in this profile or extensions agreed to by bilateral agreement may be sent. Conformance in the interpretation of VPIM messages indicates that all VPIM content types and constructs can be received; that all mandatory VPIM content types can be decoded and presented to the recipient in an appropriate manner; and that any unrenderable contents result in the appropriate notification.

A summary of the compliance requirements is contained in [Appendix A](#).

VPIM end systems are expected to be both transport and content conformant. They should generate conforming content, reliably send it to the next hop system, receive a message, decode the message and present it to the user. Voice messaging systems and protocol conversion gateways are considered end systems.

Relay systems are expected to be transport compliant in order to receive and send conforming messages. However, they must also create VPIM conforming delivery status notifications in the event of delivery problems.

Desktop Email clients that support VPIM and are expected to be content conformant. Desktop email clients use various protocols and API's for exchanging messages with the local message store and message transport system. While these clients may benefit from VPIM transport capabilities, specific client-server requirements are out-of-scope for this document.

Vaudreuil, Parsons

Expires 4/28/00

[Page 37]

9. Security Considerations

9.1 General Directive

This document is a profile of existing Internet mail protocols. To maintain interoperability with Internet mail, any security to be provided should be part of the Internet security infrastructure, rather than a new mechanism or some other mechanism outside of the Internet infrastructure.

9.2 Threats and Problems

Both Internet mail and voice messaging have their own set of threats and countermeasures. As such, this specification does not create any security issues not already existing in the profiled Internet mail and voice mail protocols themselves. This section attends only to the set of additional threats that ensue from integrating the two services.

9.2.1 Spoofed sender

The actual sender of the voice message might not be the same as that specified in the Sender or From header fields of the message content header fields or the MAIL FROM address from the SMTP envelope. In a tightly constrained environment, sufficient physical and software controls may be able to ensure prevention of this problem. In addition, the recognition of the sender's voice may provide confidence of the sender's identity irrespective of that specified in Sender or From. It should be recognized that SMTP implementations do not provide inherent authentication of the senders of messages, nor are sites under obligation to provide such authentication.

9.2.2 Unsolicited voice mail

Assigning an Internet mail address to a voice mailbox opens the possibility of receiving unsolicited messages (either text or voice mail). Traditionally voice mail systems operated in closed environments and were not susceptible to unknown senders. Voice mail users have a higher expectation of mailbox privacy and may consider such messages as a security breach. Many Internet mail systems are choosing to block all messages from unknown sources in an attempt to curb this problem.

9.2.3 Message disclosure

Users of voice messaging systems have an expectation of a level of message privacy that is higher than the level provided by Internet mail without security enhancements. This expectation of privacy by users SHOULD be preserved as much as possible.

Vaudreuil, Parsons

Expires 4/28/00

[Page 38]

9.3 Security Techniques

Sufficient physical and software control may be acceptable in constrained environments. Further, the profile specified in this document does not in any way preclude the use of any Internet object or channel security protocol to encrypt, authenticate, or non-repudiate the messages.

10. References

- [8BIT] Klensin, J., Freed, N., Rose, M., Stefferud, E., D. Crocker, "SMTP Service Extension for 8bit-MIMEtransport" [RFC 1426](#), United Nations University, Innosoft International, Inc., Dover Beach Consulting, Inc., Network Management Associates, Inc., The Branch Office, February 1993.
- [ADPCM] G. Vaudreuil and G. Parsons, "Toll Quality Voice - 32 kbit/s ADPCM: MIME Sub-type Registration", [RFC 2422](#), September 1998.
- [AMIS-A] Audio Messaging Interchange Specifications (AMIS) - Analog Protocol Version 1, Issue 2, February 1992.
- [AMIS-D] Audio Messaging Interchange Specifications (AMIS) - Digital Protocol Version 1, Issue 3 August 1993.
- [BINARY] Vaudreuil, G., "SMTP Service Extensions for Transmission of Large and Binary MIME Messages", [RFC 1830](#), October 1995.
- [CODES] Vaudreuil, G. "Enhanced Mail System Status Codes", [RFC 1893](#), 01/15/1996.
- [MIMEDIR] F. Dawson, T. Howes, & M. Smith, "A MIME Content-Type for Directory Information", [RFC 2425](#) September 1998
- [DISP] R. Troost and S. Dorner, Communicating Presentation Information in Internet Messages: The Content-Disposition Header, [RFC 2183](#), August 1997
- [DNS1] Mockapetris, P., "Domain names - implementation and specification", [RFC1035](#), Nov 1987.
- [DNS2] Mockapetris, P., "Domain names - concepts and facilities", [RFC 1034](#), Nov 1987.
- [DRPT] Moore, K. "SMTP Service Extensions for Delivery Status Notifications", [RFC 1891](#), 01/15/1996
- [DSN] Moore, K., Vaudreuil, G., "An Extensible Message Format for Delivery Status Notifications", [RFC 1894](#), 01/15/1996.

[DUR] G. Parsons and G. Vaudreuil, "Content Duration MIME Header Definition", [RFC 2424](#), September 1998.

Vaudreuil, Parsons

Expires 4/28/00

[Page 39]

- [E164] CCITT Recommendation E.164 (1991), Telephone Network and ISDN Operation, Numbering, Routing and Mobile Service - Numbering Plan for the ISDN Era.
- [ESMTP] Klensin, J., Freed, N., Rose, M., Stefferud, E., and D. Crocker, "SMTP Service Extensions" [RFC 1869](#), United Nations University, Innosoft International, Inc., Dover Beach Consulting, Inc., Network Management Associates, Inc., The Branch Office, November 1995.
- [G726] CCITT Recommendation G.726 (1990), General Aspects of Digital Transmission Systems, Terminal Equipment - 40, 32, 24,16 kbit/s Adaptive Differential Pulse Code Modulation (ADPCM).
- [HOSTREQ] Braden, R., "Requirements for Internet Hosts -- Application and Support", STD 3, [RFC 1123](#), October 1989.
- [LANG] Alvestrand, H., "Tags for the Identification of Languages", [RFC 1766](#), Mar 1995
- [MDN] Fajman, Roger, "An Extensible Message Format for Message Disposition Notifications" [RFC 2298](#), March 1998
- [MIB II] M. Rose, "Management Information Base for Network Management of TCP/IP-based internets: MIB-II", [RFC 1158](#), May 1990.
- [MIME1] N. Freed and N. Borenstein, "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies", [RFC 2045](#), Innosoft, First Virtual, Nov 1996.
- [MIME2] N. Freed and N. Borenstein, "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types ", [RFC 2046](#), Innosoft, First Virtual, Nov 1996.
- [MIME3] K. Moore, "Multipurpose Internet Mail Extensions (MIME) Part Three: Message Header Extensions for Non-ASCII Text ", [RFC 2047](#), University of Tennessee, Nov 1996.
- [MIME4] N. Freed, J. Klensin and J. Postel, "Multipurpose Internet Mail Extensions (MIME) Part Four: Registration Procedures", [RFC 2048](#), Innosoft, MCI, ISI, Nov 1996.
- [MIME5] N. Freed and N. Borenstein, "Multipurpose Internet Mail Extensions (MIME) Part Five: Conformance Criteria and Examples ", [RFC 2049](#), Innosoft, First Virtual, Nov 1996.
- [PIPE] Freed, N., Cargille, A., "SMTP Service Extension for Command Pipelining" [RFC 1854](#), October 1995.
- [REPORT] Vaudreuil, G., "The Multipart/Report Content Type for the

Reporting of Mail System Administrative Messages", [RFC 1892](#),
01/15/1996.

Vaudreuil, Parsons

Expires 4/28/00

[Page 40]

- [REQ] S. Bradner, "Key words for use in RFCs to Indicate Requirement Levels", [RFC 2119](#), March 1997.
- [RFC822] Crocker, D., "Standard for the Format of ARPA Internet Text Messages", STD 11, [RFC 822](#), UDEL, August 1982.
- [SIZE] Klensin, J, Freed, N., Moore, K, "SMTP Service Extensions for Message Size Declaration" [RFC 1870](#), United Nations University, Innosoft International, Inc., November 1995.
- [SMTP] Postel, J., "Simple Mail Transfer Protocol", STD 10, [RFC 821](#), USC/Information Sciences Institute, August 1982.
- [STATUS] Freed, N. "SMTP Service Extension for Returning Enhanced Error Codes", [RFC 2034](#), 10/30/1996.
- [TIFF-F] G. Parsons and J. Rafferty, "Tag Image File Format: Application F", [RFC 2306](#) , March 1998.
- [TIFFREG] G. Parsons, J. Rafferty & S. Zilles, "Tag Image File Format: image/tiff - MIME sub-type registraion", [RFC 2302](#), March 1998.
- [V-MSG] G. Vaudreuil and G. Parsons, "VPIM Voice Message: MIME Sub-type Registration", [RFC 2022](#), September 1998.
- [VCARD] Dawson, Frank, Howes, Tim, "vCard MIME Directory Profile" [RFC 2426](#), September 1998.
- [VPIM1] Vaudreuil, Greg, "Voice Profile for Internet Mail", [RFC 1911](#), Feb 1996.
- [VPIM2] Vaudreuil, Greg, Parsons, Glen, "Voice Profile for Internet Mail, Version 2", [RFC 2421](#), September 1998.
- [X.400] Hardcastle-Kille, S., "Mapping between X.400(1988) / ISO 10021 and [RFC 822](#)", [RFC 1327](#), May 1992.

Vaudreuil, Parsons

Expires 4/28/00

[Page 41]

11. Acknowledgments

The authors would like to offer a special thanks to the Electronic Messaging Association (EMA), especially the members of the Voice Messaging Committee and the VPIM Work Group, for their support of the VPIM specification and the efforts they have made to ensure its success.

The EMA hosts the VPIM web page at <http://www.ema.org/vpim>.

12. Copyright Notice

"Copyright (C) The Internet Society (1999). All Rights Reserved.

This document and translations of it may be copied and furnished to others, and derivative works that comment on or otherwise explain it or assist in its implementation may be prepared, copied, published and distributed, in whole or in part, without restriction of any kind, provided that the above copyright notice and this paragraph are included on all such copies and derivative works. However, this document itself may not be modified in any way, such as by removing the copyright notice or references to the Internet Society or other Internet organizations, except as needed for the purpose of developing Internet standards in which case the procedures for copyrights defined in the Internet Standards process must be followed, or as required to translate it into languages other than English.

The limited permissions granted above are perpetual and will not be revoked by the Internet Society or its successors or assigns.

This document and the information contained herein is provided on an "AS IS" basis and THE INTERNET SOCIETY AND THE INTERNET ENGINEERING TASK FORCE DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE."

Vaudreuil, Parsons

Expires 4/28/00

[Page 42]

13. Authors' Addresses

Glenn W. Parsons
Nortel Networks
P.O. Box 3511, Station C
Ottawa, ON K1Y 4H7
Canada
Phone: +1-613-763-7582
Fax: +1-613-763-4461
Glenn.Parsons@NortelNetworks.com

Gregory M. Vaudreuil
Lucent Technologies
7291 Williamson Rd
Dallas, TX 75214
United States
Phone/Fax: +1-972-733-2722
GregV@Lucent.Com

14. Appendix A - VPIM Requirements Summary

The following table summarizes the profile of VPIM version 2 detailed in this document. Since in many cases it is not possible to simplify the qualifications for supporting each feature this appendix is informative. The reader is recommended to read the complete explanation of each feature in the referenced section. The text in the previous sections shall be deemed authoritative if any item in this table is ambiguous.

The conformance table is separated into various columns:

Feature - name of protocol feature (note that the indenting indicates a hierarchy of conformance, i.e. the conformance of a lower feature is only relevant if there is conformance to the higher feature)

Section - reference section in main text of this document

Area - conformance area to which each feature applies:

C - content

T - transport

Status - whether the feature is mandatory, optional, or prohibited. The key words used in this table are to be interpreted as described in [\[REQ\]](#), though the following list gives a quick overview of the different degrees of feature conformance:

Must - mandatory

Should - required in the absence of a compelling need to omit.

May - optional

Should not - prohibited in the absence of a compelling need.

Must not - prohibited

Footnote - special comment about conformance for a particular feature

Vaudreuil, Parsons

Expires 4/28/00

[Page 44]

VPIM version 2 Conformance

		S
		H F
		O M o
		S U U o
		H L S t
		A M O D T n
		R U U M o
		E S L A N N t
		A T D Y O O t
FEATURE	SECTION	T T e
-----	-----	- - - - -
Message Addressing Formats:		
Use DNS host names	4.1	C x
Use only numbers in mailbox IDs	4.1.1	C x
Use alpha-numeric mailbox IDs	4.1.1	C x
Support of postmaster@domain	4.1.2	C x
Support of non-mail-user@domain	4.1.2	C x
Support of distribution lists	4.1.3	C x
Message Header Fields:		
Encoding outbound messages		
From	4.2.1	C x
Addition of text name	4.2.1	C x
To	4.2.2	C x 1
cc	4.2.3	C x 1
Date	4.2.4	C x
Sender	4.2.5	C x
Return-Path	4.2.6	C x
Message-id	4.2.7	C x
Reply-To	4.2.8	C x
Received	4.2.9	C x
MIME Version: 1.0 (Voice 2.0)	4.2.10	C x
Content-Type	4.2.11	C x
Content-Transfer-Encoding	4.2.12	C x
Sensitivity	4.2.13	C x
Importance	4.2.14	C x
Subject	4.2.15	C x
Disposition-notification-to	4.2.16	C x
Disposition-notification-options	4.2.17	C x
Other Headers	4.2	C x

Vaudreuil, Parsons

Expires 4/28/00

[Page 45]

						S	
						H	F
						O M	o
				S		U U	o
				H		L S	t
				A M O		D T n	
				R U U M			o
				E S L A N N		t	
				A T D Y O O		t	
FEATURE	SECTION					T T	e
-----	-----						
Detection & Decoding inbound messages							
From	4.2.1	C x					
Present text personal name	4.2.1	C		x			
To	4.2.2	C x					
cc	4.2.3	C		x			
Date	4.2.4	C x					
Conversion of Date to local time	4.2.4	C	x				
Sender	4.2.5	C		x			
Return-Path	4.2.6	C	x				
Message ID	4.2.7	C x					
Reply-To	4.2.8	C		x			
Received	4.2.9	C		x			
MIME Version: 1.0 (Voice 2.0)	4.2.10	C	x				
Content Type	4.2.11	C x					
Content-Transfer-Encoding	4.2.12	C x					
Sensitivity	4.2.13	C x					2
Importance	4.2.14	C		x			
Subject	4.2.15	C		x			
Disposition-notification-to	4.2.16	C		x			
Disposition-notification-options	4.2.17	C			x		
Other Headers	4.2	C x					3
Message Content Encoding:							
Encoding outbound audio/fax contents							
7BIT	4 C				x		
8BIT	4 C				x		
Quoted Printable	4 C				x		
Base64	4 C x				4		
Binary	4 C	x			5		
Detection & decoding inbound messages							
7BIT	4 C x						
8BIT	4 C x						
Quoted Printable	4 C x						
Base64	4 C x						
Binary	4 C x				5		

Vaudreuil, Parsons

Expires 4/28/00

[Page 46]

						S	
						H	F
						O M	o
				S		U U	o
				H		L S	t
				A M O		D T	n
				R U U M			o
				E S L A N N		t	
				A T D Y O O		t	
FEATURE	SECTION					T T	e
-----	-----						
Message Content Types:							
Inclusion in outbound messages							
Multipart/Voice-Message	4.4.1	C x					
Message/RFC822	4.4.2	C		x			
Text/Directory	4.4.3	C	x				
include TEL, EMAIL, VERSION	4.4.3	C x					
include SOUND, N, REV	4.4.3	C	x				
only one voice type per level	4.4.3	C x					
Audio/32KADPCM	4.4.4	C x					
Content-Description	4.3.1	C		x			
Content-Disposition	4.3.2	C x					
Content-Duration	4.3.3	C		x			
Content-Language	4.3.4	C		x			
Image/tiff; application=faxbw	4.4.5	C		x			
Audio/* or Image/* (other encodings)	4.4.6	C		x			
Other contents	4.5	C				x	
Multipart/Mixed	4.5.1	C		x			
Text/plain	4.5.2	C			x		
Multipart/Report	4.6.1	C x					
human-readable part is voice	4.6.1	C	x				
human-readable part is text	4.6.1	C		x			
Message/delivery-status	4.6.2	C x					
Message/disposition-notification	4.6.3	C	x				
Other contents	4.5	C		x			6
Detection & decoding in inbound messages							
Multipart/Voice-Message	4.4.1	C x					
Message/RFC822	4.4.2	C x					
Text/Directory	4.4.3	C	x				
recognize TEL, EMAIL, VERSION	4.4.3	C x					
recognize SOUND, N, REV	4.4.3	C	x				
Audio/32KADPCM	4.4.4	C x					
Content-Description	4.3.1	C		x			
Content-Disposition	4.3.2	C	x				
Content-Duration	4.3.3	C		x			
Content-Langauge	4.3.4	C		x			
Image/tiff; application=faxbw	4.4.5	C	x				

send NDN if unable to render	4.4.5 C	x			7
Audio/* or Image/* (other encodings)	4.4.6 C		x		
Other contents	4.5	C			x
Multipart/Mixed	4.5.1	C x			

Text/plain	4.5.2	C x
send NDN if unable to render	4.5.2	C x

						S	
						H	F
						O M	o
				S		U U	o
				H		L S	t
				A M O		D T	n
				R U U M			o
				E S L A N N		t	
				A T D Y O O		t	
FEATURE	SECTION					T T	e
-----	-----						
Multipart/Report	4.6.1	C x					
human-readable part is voice	4.6.1	C	x				
human-readable part is text	4.6.1	C x					
Message/delivery-status	4.6.2	C x					
Message/disposition-notification	4.6.3	C	x				
Other contents	4.5	C		x			6
send NDN if unable to render	4.5	C	x				
Forwarded Messages							
use Message/RFC822 construct	4.7	C	x				
simulate headers if none available	4.7	C	x				
Reply Messages							
send to Reply-to, else From address	4.8	C x					
send to non-mail-user	4.8	C			x		
Notifications							
use multipart/report format	4.9	C x					
always send error on non-delivery	4.9	C	x				
Message Transport Protocol:							
ESMTP Commands							
HELO	5.1.1	T x					
MAIL FROM	5.1.2	T x					
support null address	5.1.2	T x					
RCPT TO	5.1.3	T x					
DATA	5.1.4	T x					
TURN	5.1.5	T				x	
QUIT	5.1.6	T x					
RSET	5.1.7	T x					
VERFY	5.1.8	T		x			
EHLO	5.1.9	T x					
BDAT	5.1.10	T		x			5

Vaudreuil, Parsons

Expires 4/28/00

[Page 49]

						S	
						H	F
						O M	o
				S		U U	o
				H		L S	t
				A M O		D T n	
				R U U M			o
				E S L A N N		t	
				A T D Y O O		t	
FEATURE	SECTION					T T	e
-----	-----						
ESMTP Keywords & Parameters							
PIPELINING	5.2.1	T	x				
SIZE	5.2.2	T x					
CHUNKING	5.2.3	T		x			
BINARYMIME	5.2.4, 5.3.1	T		x			
DSN	5.2.5	T x					
ENHANCEDSTATUSCODES	5.2.6	T	x				
RET	5.3.2	T	x				
ENVID	5.3.3	T		x			
NOTIFY	5.4.1	T x					
ORCPT	5.4.2	T		x			
ESMTP-SMTP Downgrading							
send delivery report upon downgrade	5.5	T x					
Directory Address Resolution							
provide facility to resolve addresses	6	C	x				
use vCards to populate local directory	6	C	x				8
use headers to populate local directory	6	C			x		
Management Protocols:							
Network management	7.1	T		x			
-----	-----						

Footnotes:

1. SHOULD leave blank if all recipients are not known or resolvable.
2. If a sensitive message is received by a system that does not support sensitivity, then it MUST be returned to the originator with an appropriate error notification. Also, a received sensitive message MUST NOT be forwarded to anyone.
3. If the additional header fields are not understood they MAY be ignored
4. When binary transport is not available
5. When binary transport is available

6. Other un-profiled contents must only be sent by bilateral agreement.

Vaudreuil, Parsons

Expires 4/28/00

[Page 50]

7. If the content cannot be presented or acknowledged in some form, the entire message MUST be returned with a negative delivery status notification.
8. When the vCard is present in a message

15. [Appendix B](#) - Example Voice Messages

The following message is a full-featured message addressed to two recipients. The message includes the sender's spoken name and a short speech segment. The message is marked as important and private.

```
To: +19725551212@vm1.mycompany.com
To: +16135551234@VM1.mycompany.com
From: "Parsons, Glenn" <12145551234@VM2.mycompany.com>
Date: Mon, 26 Aug 93 10:20:20 -0700 (CDT)
MIME-Version: 1.0 (Voice 2.0)
Content-type: Multipart/Voice-Message; Version=2.0;
  Boundary="MessageBoundary"
Content-Transfer-Encoding: 7bit
Message-ID: 123456789@VM2.mycompany.com
Sensitivity: Private
Importance: High
```

```
--MessageBoundary
Content-type: Audio/32KADPCM
Content-Transfer-Encoding: Base64
Content-Disposition: inline; voice=Originator-Spoken-Name
Content-Language: en-US
Content-ID: part1@VM2-4321
```

```
glsldfslsertiflktfpgkTportrpkTpfgTpoiTpdadasssdasddasdasd
(This is a sample of the base-64 Spoken Name data)
fgdhgddlkgpokpeowrit09==
```

```
--MessageBoundary
Content-type: Audio/32KADPCM
Content-Transfer-Encoding: Base64
Content-Description: Brand X Voice Message
Content-Disposition: inline; voice=Voice-Message; filename=msg1.726
Content-Duration: 25
```

```
iIiIiIjMzN3czdze3s7d7fwfHhcvESJVe/4yEhLz8/F0QjVFRERCESL/zqrq
(This is a sample of the base64 message data) zb8tFdLTQt1PXj
u7wj0yRhws+krdns7Rju0t4tLF7cE0K0Mx0T0nRW/Pn30c8uHi9==
```

```
--MessageBoundary
Content-type: text/directory; charset=us-ascii; profile=vCard
Content-Transfer-Encoding: 7bit
```

```
BEGIN:VCARD
N:Parsons;Glenn;;Mr.;
EMAIL;TYPE=INTERNET:+12145551234@VM2.mycompany.com
TEL:+1-217-555-1234
SOUND;TYPE=32KADPCM;ENCODING=URI: CID:<part1@VM2-4321>
```

REV:19951031T222710Z
VERSION: 3.0
END:VCARD

Vaudreuil, Parsons

Expires 4/28/00

[Page 52]

--MessageBoundary_

The following message is a forwarded single segment voice. Both the forwarded message and the forwarding message contain VCARDS with spoken names.

To: +12145551212@vm1.mycompany.com
From: "Vaudreuil, Greg" <+19725552345@VM2.mycompany.com>
Date: Mon, 26 Aug 93 10:20:20 -0700 (CDT)
MIME-Version: 1.0 (Voice 2.0)
Content-type: Multipart/Voice-Message; Version=2.0;
Boundary="MessageBoundary"
Content-Transfer-Encoding: 7bit
Message-ID: ABCD-123456789@VM2.mycompany.com

--MessageBoundary

Content-type: Audio/32KADPCM
Content-Transfer-Encoding: Base64
Content-Disposition: inline; voice=Originator-Spoken-Name
Content-Language: en-US
Content-ID: part3@VM2-4321

glsldfslsertiflkTfpkgTportrpKtpfgTpoiTpdadasssdasddasdasd
(This is a sample of the base-64 Spoken Name data)
fgdhgd dlkgpokpeowrit09==

--MessageBoundary

Content-type: Audio/32KADPCM
Content-Description: Forwarded Message Annotation
Content-Disposition: inline; voice=Voice-Message
Content-Transfer-Encoding: Base64

glsldfslsertiflkTfpkgTportrpKtpfgTpoiTpdadasssdasddasdasd
(This is the voiced introductory remarks encoded in base64)
jrgoij3o45itj09fiuvdkjgWlakgQ93ijkpokfpgokQ90gQ5tkjpokfgW
dlkgpokpeowrit09==

--MessageBoundary

Content-type: Message/RFC822
Content-Transfer-Encoding: 7bit

To: +19725552345@VM2.mycompany.com
From: "Parsons, Glenn, W." <+16135551234@VM1.mycompany.com>
Date: Mon, 26 Aug 93 8:23:10 -0500 (EST)
Content-type: Multipart/Voice-Message; Version=2.0;
Boundary="MessageBoundary2"
Content-Transfer-Encoding: 7bit
MIME-Version: 1.0 (Voice 2.0)

Vaudreuil, Parsons

Expires 4/28/00

[Page 53]

--MessageBoundary2

Content-type: Audio/32KADPCM

Content-Transfer-Encoding: Base64

Content-Disposition: inline; voice=Originator-Spoken-Name

Content-Language: en-US

Content-ID: part6@VM2-4321

glsldfslsertiflkTfpkgTportrpkTpfgTpoiTpdadasssdasddasdasd
(This is a sample of the base-64 Spoken Name data) fgdhgd
dlkgpokpeowrit09==

--MessageBoundary2

Content-type: Audio/32KADPCM

Content-Disposition: inline; voice=Voice-Message

Content-Transfer-Encoding: Base64

glsldfslsertiflkTfpkgTportrpkTpfgTpoiTpdadasssdasddasdasd
(This is the original message audio data) fgwersdfmniwrjj
jrgoij3o45itj09fiuvdkjgWlakgQ93ijkpokfpgokQ90gQ5tkjpokfgW
dlkgpokpeowrit09==

--MessageBoundary2

Content-type: text/directory; charset=us-ascii

Content-Transfer-Encoding: 7bit

BEGIN:VCARD

N:Parsons;Glenn;W;Mr.;

EMAIL;TYPE=INTERNET:+16135551234@VM2.mycompany.com

TEL:+1-613-555-1234

SOUND;TYPE=32KADPCM;ENCODING=URI: CID:<part6@VM2-4321>

REV:19951031T222710Z

END:VCARD

--MessageBoundary2--

--MessageBoundary

Content-type: text/directory; charset=us-ascii

Content-Transfer-Encoding: 7bit

BEGIN:VCARD

N:Vaudreuil;Greg;;Mr.;

SOUND;TYPE=32KADPCM;ENCODING=URI: CID:<part3@VM2-4321>

EMAIL;TYPE=INTERNET,VPIM:+19725552345@VM2.mycompany.com

TEL:+1-972-555-2345

REV:19951031T222710Z

VERSION: 3.0

END:VCARD

--MessageBoundary--

Vaudreuil, Parsons

Expires 4/28/00

[Page 54]

The following example is for a message returned to the sender by a VPIM gateway at VM1.company.com for a mailbox which does not exist.

Date: Thu, 7 Jul 1994 17:16:05 -0400
From: Mail Delivery Subsystem <MAILER-DAEMON@vm.company.com>
Message-Id: <199407072116.RAA14128@vm1.company.com>
Subject: Returned voice message
To: 2175552345@VM2.mycompany.com
MIME-Version: 1.0 (Voice 2.0)
Content-Type: multipart/report; report-type=delivery-status;
 boundary="RAA14128.773615765/VM1.COMPANY.COM"

--RAA14128.773615765/VM1.COMPANY.COM
Content-type: Audio/32KADPCM
Content-Description: Spoken Delivery Status Notification
Content-Disposition: inline; voice= Voice-Message-Notification
Content-Transfer-Encoding: Base64

glsldfslsertiflkTfpkgTportrpKtpfgTpoiTpdadadffsssdasdasd
(This is a voiced description of the error in base64)
jrgoij3o45itj09fiuvdkjgWlakgQ93ijkpokfpgokQ90gdffkjokfgW
dlkgpokpeowrit09==

--RAA14128.773615765/VM1.COMPANY.COM
Content-type: message/delivery-status

Reporting-MTA: dns; vm1.company.com

Original-Recipient: [rfc822](#); 2145551234@VM1.mycompany.com
Final-Recipient: [rfc822](#); 2145551234@VM1.mycompany.com
Action: failed
Status: 5.1.1 (User does not exist)
Diagnostic-Code: smtp; 550 Mailbox not found
Last-Attempt-Date: Thu, 7 Jul 1994 17:15:49 -0400

--RAA14128.773615765/VM1.COMPANY.COM
content-type: message/rfc822

[original VPIM message goes here]

--RAA14128.773615765/VM1.COMPANY.COM--

Vaudreuil, Parsons

Expires 4/28/00

[Page 55]

The following example is for a receipt notification sent to the original sender for a message which has been played. This delivered VPIM message was received by a corporate gateway and relayed to a unified mailbox.

Date: Thu, 7 Jul 1994 17:16:05 -0400
From: "Greg Vaudreuil" <22722@vm.company.com>
Message-Id: <199407072116.RAA14128@exchange.company.com>
Subject: Voice message played
To: 2175552345@VM2.mycompany.com
MIME-Version: 1.0 (Voice 2.0)
Content-Type: multipart/report;
 Report-type=disposition-notification;
 Boundary="RAA14128.773615765/EXCHANGE.COMPANY.COM"

--RAA14128.773615765/EXCHANGE.COMPANY.COM
Content-type: Audio/32KADPCM
Content-Description: Spoken Disposition Notification
Content-Disposition: inline; voice= Voice-Message-Notification
Content-Transfer-Encoding: Base64

glsldslsertiflkTfpkgTpportrpKtpfgTpoiTpdadadffssddasdasd
(Voiced description of the disposition action in base64)
jrgoij3o45itj09fiuudkjgWlakgQ93ijkpokfpgokQ90gdffkjokfgW
dlkgpokpeowrit09==

--RAA14128.773615765/EXCHANGE.COMPANY.COM
Content-type: message/disposition-notification

Reporting-UA: gregs-laptop.dallas.company.com (Unified FooMail 3.0)

Original-Recipient: [rfc822](#);22722@vm.company.com
Final-Recipient: [rfc822](#);Greg.Vaudreuil@foomail.company.com
Original-Message-ID: <199509192301.12345@vm2.mycompany.com >
Disposition: manual-action/MDN-sent-automatically; displayed

--RAA14128.773615765/EXCHANGE.COMPANY.COM
Content-type: message/rfc822

[original VPIM message goes here]

--RAA14128.773615765/EXCHANGE.COMPANY.COM--

Vaudreuil, Parsons

Expires 4/28/00

[Page 56]

16. [Appendix C](#) - Example Error Voice Processing Error Codes

The following common voice processing errors and their corresponding status codes are given as examples. Text after the error codes are intended only for reference to describe the error code.

Implementations should provide implementation specific informative comments after the error code rather than the text below.

Error condition	RFC 1893 Error codes
-----	-----
Analog delivery failed because remote system is busy	4.4.0 Persistent connection error - other
Analog delivery failed because remote system is ring-no-answer	4.4.1 Persistent protocol error - no answer from host
Remote system did not answer AMIS-Analog handshake ("D" in response to "C" at connect time)	5.5.5 Permanent protocol error - wrong version
Mailbox does not exist	5.1.1 Permanent mailbox error - does not exist
Mailbox full or over quota	4.2.2 Persistent mailbox error - full
Disk full	4.3.1 Persistent system error - full
Command out of sequence	5.5.1 Permanent protocol error - invalid command
Frame Error	5.5.2 Permanent protocol error - syntax error
Mailbox does not support FAX	5.6.1 Permanent media error - not supported
Mailbox does not support TEXT	5.6.1 Permanent media error - not supported
Sender is not authorized	5.7.1 Permanent security error - sender not authorized
Message marked private, but system is not private capable	5.3.3 Permanent system error - not feature capable

Vaudreuil, Parsons

Expires 4/28/00

[Page 57]

17. [Appendix D](#) - Example Voice Processing Disposition Types

The following common voice processing disposition conditions and their corresponding MDN Disposition (which contains the disposition mode, type and modifier, if applicable) are given as examples. Implementers should refer to [[MDN](#)] for a full description of the format of message disposition notifications.

Notification event modifier	MDN Disposition mode, type & modifier
-----	-----
-	
Message played by recipient, receipt automatically returned	manual-action/MDN-sent-automatically; displayed
Message deleted from mailbox by user without listening	manual-action/MDN-sent-automatically; deleted
Message cleared when mailbox deleted by admin	manual-action/MDN-sent-automatically; deleted/mailbox-terminated
Message automatically deleted when older than administrator set threshold	automatic-action/ MDN-sent-automatically; deleted/ expired
Message processed, however audio encoding unknown - unable to play to user	manual-action/MDN-sent-automatically; processed/error Error: unknown audio encoding

Vaudreuil, Parsons

Expires 4/28/00

[Page 58]

18. Appendix E - IANA Registrations

18.1 vCard EMAIL Type Definition for VPIM

To: ietf-mime-directory@imc.org

Subject: Registration of new parameter for text/directory MIME type
EMAIL

Type name: EMAIL

Type purpose: To specify the electronic mail address for
communication with the object the vCard represents (defined in
[[VCARD](#)]).

Type encoding: 8bit

Type value: A single text value.

Type special notes: The type may include the type parameter "TYPE" to
specify the format or preference of the electronic mail address. The
TYPE parameter values previously defined include: "internet" to
indicate an Internet addressing type, "x400" to indicate a X.400
addressing type and "pref" to indicate a preferred-use email address
when more than one is specified. The value of "vpim" is defined to
indicate that the address specified supports VPIM messages. Other
IANA registered address type may also be specified. The default email
type is "internet". A non-standard value may also be specified.

Type example:

EMAIL;TYPE=internet,vpim:jqpublic@xyz.dom1.com

18.2 Voice Content-Disposition Parameter Definition

To: IANA@IANA.ORG

Subject: Registration of new Content-Disposition parameter

Content-Disposition parameter name: voice

Allowable values for this parameter:

Vaudreuil, Parsons

Expires 4/28/00

[Page 59]

Voice-Message - the primary voice message,
Voice-Message-Notification - a spoken delivery notification
or spoken disposition notification,
Originator-Spoken-Name - the spoken name of the originator,
Recipient-Spoken-Name - the spoken name of the recipient if
available to the originator and present if there is ONLY one
recipient,
Spoken-Subject- the spoken subject of the message, typically
spoken by the originator

Description:

In order to distinguish between the various types of audio contents in a VPIM voice message a new disposition parameter "voice" is defined with the preceding values to be used as appropriate. Note that there SHOULD only be one instance of each of these types of audio contents per message level. Additional instances of a given type (i.e., parameter value) may occur within an attached forwarded voice message.

Vaudreuil, Parsons

Expires 4/28/00

[Page 60]

19. [Appendix F](#) - Change History: [RFC 2421](#) (VPIM V2) to this Document

The updated profile in this document is based on the implementation and operational deployment experience of several vendors. The changes are categorized as general, content, transport and compliance. They are summarized below:

1. General

- Various editorial updates to improve readability.
- Separated send rules from reception rules.

Clarified the behavior upon reception of unrecognized content types (eg. originator and recipient should be notified) expected with the interworking between voice and unified messaging systems.

- added `_ Normal_` sensitivity for consistency
- should not use MDN Content-Disp options
- reorganized the content type descriptions

2. Content

- Changed handling of received lines by a gateway to SHOULD NOT delete in a gateway. In gateways to systems such as AMIS, it is not possible to preserve this information. It is intended that such systems be able to claim conformance.
- Removed "ROLE" as a recommended vCard field
- Proposed change of the encoding of spoken name in vCards from "by-reference" to "inline" will aid "helper application" based implementations create replies when access to [RFC822](#) headers is not possible.

3. Transport

- None

4. Compliance

- Aligned the table of [Appendix A](#) to the requirements in the text.

Outstanding Issues

Should functionality be dropped to progress to Draft Standard since

some features are only Proposed Standard

Vaudreuil, Parsons

Expires 4/28/00

[Page 61]

Internet Draft

VPIM v2

October 28, 1999

- v-Card
- DSN
- MDN

