                     Voice Profile for Internet Mail

Status of this Memo

1. Abstract

   A class of special-purpose computers has evolved to provide voice
   messaging services. These machines generally interface to a
   telephone switch and provide call answering and voice messaging
   services. Traditionally, messages sent to a non-local machine are
   transported using analog networking protocols based on DTMF signaling
   and analog voice playback. As the demand for networking increases,
   there is a need for a standard high-quality digital protocol to
   connect these machines. The following document is a profile of the
   Internet standard MIME and ESMTP protocols for use as a digital voice
   networking protocol.

   This profile is based on an earlier effort in the Audio Message
   Interchange Specification (AMIS) group to define a voice messaging
   protocol based on X.400 technology. This protocol is intended to
   satisfy the user requirements statement from that earlier work with
   the industry standard ESMTP/MIME mail protocol infrastructures
   already used within corporate internets. This profile will be called
   the voice profile in this document.

2. Scope and Design Goals

   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
   including voice and facsimile.

   This document specifies a profile of the TCP/IP multimedia messaging
   protocols for use by special-purpose voice processing platforms.
   These platforms have historically been special-purpose computers and
   often do not have facilities normally associated with a traditional
   Internet Email-capable computer. This profile is intended to specify
   the minimum common set of features and functionally for conformant

systems.

The voice profile does not place limits on the use of additional
media types or protocol options. However, systems which are
conformant to this profile should not send messages with features
beyond this profile unless explicit per-destination configuration of
these enhanced features is provided. Such configuration information
could be stored in a directory, though the implementation of this is
a local matter.

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
   displayed or viewed. They can often be processed only via
   advanced text-to-speech or text-to-fax features not currently
   present in these machines.

   2) Voice mail machines usually act as an integrated Message
   Transfer Agent and a User Agent. The voice mail machine is
   responsible for final delivery, and there is no relaying of
   messages. RFC 822 header fields may have limited use in the
   context of the simple messaging features currently deployed.

   3) VM message stores are generally not capable of preserving the
   full semantics of an Internet message. As such, use of a voice
   mail machine for general message forwarding and gatewaying is not
   supported. Storage of "Received" lines and "Message-ID" may be
   limited.

   4) Nothing in this document precludes use of a general purpose
   email gateway from providing these services. However, significant
   performance degradation may result if the email gateway does not
   support the ESMTP options recommended by this document.

   5) Internet-style mailing lists are not generally supported.
   Distribution lists are implemented as local alias lists.

   6) There is generally no human operator. Error reports must be
   machine-parsable so that helpful responses can be given to users
   whose only access mechanism is a telephone.

   7) The system user names are often limited to 16 or fewer numeric
   characters. Alpha characters are not generally used for mailbox
   identification as they cannot be easily entered from a telephone
   terminal.

It is a goal of this effort to make as few restrictions and additions
to the existing Internet mail protocols as possible while satisfying
the user requirements for interoperability with current 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. It is expected that a 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 expected that the system administrator will 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 this directory
listing capabilities is a local matter.

This specification is a profile of the relevant TCP/IP Internet
protocols. These technologies, as well as the specifications for the
Internet mail protocols, are defined in the Request for Comment (RFC)
document series. That series documents the standards as well as the
lore of the TCP/IP protocol suite. This document should be read with
the following RFC documents: RFC 821, Simple Mail Transfer Protocol;
RFC 822, Standard for the format of ARPA Internet Messages; RFC 1521
and RFC 1522, Multipurpose Internet Mail Extensions; RFC 1651, RFC
1652, and RFC 1653, SMTP Service Extensions (ESMTP); and RFC 1034 and
RFC 1035, Domain Name System. Where additional functionality is
needed, it will be defined in this document or in an appendix.

3. Protocol Restrictions

This protocol does not limit the number of recipients per message.
Where possible, 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. However, ESMTP currently does
not provide a mechanism for indicating the number of supported
recipients.

This protocol does not limit the maximum message length.
Implementors should understand that some machines will be unable to
accept excessively long messages. A mechanism is defined in the RFC
1425 ESMTP extensions to declare the maximum message size supported.

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

4. Voice Message Interexchange Format

The voice message interchange format is a profile of the Internet
Email Protocol Suite. It requires components from the message format
standard for Internet messages [RFC822], the Multipurpose Internet
Message Extensions [MIME], the X.400 gateway specification [X.400],
and the delivery report specifications [DRPT][STATUS].

4.1 Message Addressing Formats

The RFC 822 uses 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.

The local part of the address shall be an 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. Administration of this space is expected to
conform to national or corporate private telephone numbering plans.
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.

For example, a compliant message may contain the address
2145551212@mycompany.com. It should be noted that while the example
mailbox address is based on the North American Numbering Plan, any
other corporate numbering plan can be used. 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. The mapping of dialed address to final destination system is
generally accomplished through implementation-specific means.

Special addresses are provided for compatibility with the conventions
of the Internet mail system and to facilitate testing. These
addresses do not use numeric local addresses, both to conform to

current Internet practice and to avoid conflict with existing numeric
addressing plans. Some special addresses are 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 a individual
implementation choice.

Loopback@domain

A special mailbox name named "loopback" SHOULD be designated for
loopback testing. If supported, all messages sent to this mailbox
MUST be returned back to the address listed in the From: address as a
new message. The originating address of the returned address MUST be
"postmaster" to prevent mail loops.

These two addresses are RESERVED so they do not conflict with any
internal addressing plan.

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, headers do not indicate delivery options for the
transport of messages.

The following header lines are permitted for use with voice messages.

From

The originator's fully-qualified domain address (a mailbox address
followed by the fully-qualified domain name). The user listed in
this field should be presented in the voice message envelope as the
originator of the message.

Systems conformant to this profile SHOULD provide the text personal
name of the sender in a quoted phrase if available. To facilitate
storage of the text name in a local dial-by-name cache directory, the
first and last name MUST be separable. Text names in voice messages
MUST be represented in the form "last, first, mi." [822].

   Example:

      From: "User, Joe S." <2145551212@mycompany.com>

   To

   The TO header contains the recipient's fully-qualified domain
   address. There may be one or more To: fields in any message.

   Systems conformant to this profile SHOULD provide the text personal
   name of the recipient, if known, in a quoted phrase. The name MUST
   be in the form "last, first, mi." [822].

      Example:

      To: "User, Sam S." <2145551213@mycompany.com>

   Cc

   The CC header contains additional recipients' fully-qualified domain
   addresses. Many voice mail systems are not capable of storing or
   reporting the full list of recipients to the receiver.

   Systems conformant to this profile SHOULD provide the text personal
   name of the recipient, if known, in a quoted phrase. The name MUST
   be in the form "last, first, mi." [822].

      Example:

      To: "User, Sam S." <2145551213@mycompany.com>

   Systems conformant to this profile may discard the CC list of
   incoming messages as necessary. Systems conformant to this profile
   should provide a complete list of recipients when possible.

   Date

   The Date header contains the date, time, and time zone in which the
   message was sent by the originator. Conforming implementations
   SHOULD be able to convert RFC 822 date and time stamps into local
   time.

      Example:

      Date: Wed, 28 Jul 93 10:08:49 PST

   The sending system MUST report the time the message was sent [822].

Sender

The Sender header 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. Support for this field cannot be assumed when
talking to a voice system and SHOULD NOT be generated by a conforming
implementation.

While it may not be possible to save this information in some voice
mail machines, discarding this information or the ESMTP MAIL FROM
address will make it difficult to send an error message to the proper
destination [822].

Message-id

The Message-id header contains a unique per-message identifier. A
unique message-id MUST be generated for each message sent from a
conforming implementation.

The message-id is not required to be stored on the receiving system.
This identifier MAY be used for tracking, auditing, and returning
read-receipt reports [822].

   Example:

   Message-id: <12345678@mycompany.com>

Received

The Received header contains trace information added to the beginning
of a RFC 822 message by message transport agents (MTA). This is the
only header permitted to be added by an MTA. Information in this
header is useful for debugging when using an ASCII message reader or
a header parsing tool.

A conforming system MUST add Received headers when acting as a
gateway and must not remove them. These headers MAY be ignored or
deleted when the message is received at the final destination [822].

MIME Version

The MIME-Version header indicates that the message is conformant to
the MIME message format specification. Systems conformant to the
voice messaging profile MUST include a comment with the words "(Voice
1.0)" [MIME].

   Example:

      MIME-Version: 1.0 (Voice 1.0)

   Content-Type

   The content-type header declares the type of content enclosed in the
   message. One of the allowable contents is multipart, a mechanism for
   bundling several message components into a single message.   The
   allowable contents are specified in the next section of this document
   [MIME].

   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. Conformant implementations MUST recognize and decode the
   standard encodings, "Binary", "7bit, "8bit", "Base-64" and "Quoted-
   Printable". The allowable content-transfer-encodings are specified
   in the next section of this document [MIME].

   Sensitivity

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

   If a sensitivity header is present in the message, a conformant
   system MUST prohibit the recipient from forwarding this message to
   any other user. If the receiving system does not support privacy and
   the sensitivity is one of "Personal" or "Private", the message MUST
   be returned to the sender with an appropriate error code indicating
   that privacy could not be assured and that the message was not
   delivered [X400].

   Importance

   Indicates the requested priority 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 assumed to be "normal".

   Conformant implementations MAY use this header to indicate the
   importance of a message and may order messages in a recipient's
   mailbox [X400].

Subject

The subject field is often provided by email systems but is not
widely supported on Voice Mail platforms. This field MAY be generated
by a conforming implementation and may be discarded if present by a
receiving system [822].

4.3 Message Content Types

MIME is a general-purpose message body format that is extensible to
carry a wide range of body parts. The basic protocol is described in
[MIME]. MIME also provides for encoding binary data so that it can
be transported over the 7-bit text-oriented SMTP protocol. This
transport encoding is independent of the audio encoding designed 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 ("Base-64").
While Base-64 is dramatically more efficient for audio data, both
will work. Where binary transport is available, no transport
encoding is needed, and the data can be labeled as "Binary".

An implementation in conformance with this profile SHOULD send audio
data in binary form when binary message transport is available. When
binary transport is not available, implementations MUST encode the
message as Base-64. 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.

The following content types are identified for use with this profile.
Note that each of these contents can be sent individually in a
message or wrapped in a multipart message to send multi-segment
messages.

Message/RFC822

MIME requires support of the Message/RFC822 message encapsulation
body part. This body part is used in the Internet to forward
complete messages within a multipart/mixed message. Processing of
this body part entails trivial processing to decapsulate/encapsulate
the message. Systems conformant to this profile SHOULD NOT send this
body part but MUST accept if in conformance with basic MIME.
Specific handling depends on the platform, and interpretation of this
content-type is left as an implementation decision [MIME].

Text/Plain

MIME requires support of the basic Text/Plain content type. This
content type has no applicability within the voice messaging
environment. Conformant implementations MUST NOT send the Text/Plain
content-type. Conformant implementations MUST accept Text/Plain
messages, however, specific handling is left as an implementation
decision. One option is to return the message to the sender with a
media-unsupported error code [MIME].

Multipart/Mixed

MIME provides the facilities for enclosing several body parts in a
single message. Multipart/Mixed MAY be used for sending multi-segment
voice messages, that is, to preserve across the network the
distinction between an annotation and a forwarded message.
Conformant systems MUST accept multipart/mixed body parts. Systems
MAY to collapse such a multi-segment message into a single segment if
multi-segment messages are not supported on the receiving machine
[MIME].

Message/Notification

This MIME body part is used for sending machine-parsable delivery
status notifications. Conformant implementations must use the
Message/Notification construct when returning messages or sending
warnings. Conformant implementations must recognize and decode the
Message/Notification content type and present the reason for failure
to the user [NOTIFY].

Multipart/Report

The Multipart/Report is used for enclosing a Message/Notification
body part and any returned message content. This body type is a
companion to Message/Notification. Conformant implementations must
use the Multipart/Report construct when returning messages or sending
warnings. Conformant implementations must recognize and decode the
Multipart/Report content type [REPORT].

Audio/32KADPCM

CCITT Recommendation G.721 [G721] describes the algorithm recommended
for conversion of a 64 KB/s A-law or u-law PCM channel to and from a
32 KB/s channel. The conversion is applied to the PCM stream using
an Adaptive Differential Pulse Code Modulation (ADPCM) transcoding
technique. This algorithm will be registered with the IANA for MIME
use under the name Audio/32KADPCM.

An implementation conformant to this profile MUST use Audio/32KADPCM
by default.

Proprietary Voice Formats

Proprietary voice encoding formats or other standard formats may be
supported under this profile provided a unique identifier is
registered with the IANA prior to use. These encodings should be
registered as sub-types of Audio.

Use of any other encoding except Audio/32KADPCM reduces
interoperability in the absence of explicit manual system
configuration. A conformant implementation MAY use any other
encoding with explicit per-destination configuration.

Multipart/Voice-Message

This new MIME multipart structure provides a mechanism for packaging
the senders spoken name, a spoken subject and, the message. The
multipart provides for the packaging of three segments, the first is
the spoken name, the second is a spoken subject, and the third is the
message itself. Forwarded messages can be created by simply nesting
multipart content-types (this is also possible with Multipart/Mixed
if spoken name or spoken subject is not present). This type is
defined in an appendix to this document.

Conforming implementations MUST send the Multipart/Voice-Message if a
spoken name or spoken subject is available. Conforming
implementations SHOULD recognize the Multipart/Voice-Message and
separate the spoken name or spoken subject.

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 networking 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] was recently published and formalized an
extension mechanism for SMTP, and subsequent RFCs have defined 8-bit

text networking, binary networking, and extensions to permit the
declaration of message size for the efficient transmission of large
messages such as multi-minute voice mail.

A command streaming extension for high performance message
transmission has been defined [PIPE]. This extension reduces the
number of round-trip packet exchanges and makes it possible to
validate all recipient addresses in one operation. This extension is
optional but recommended.

The following sections list ESMTP commands, keywords, and parameters
that are required and those that are optional.

5.1 ESMTP Commands

HELO

Base SMTP greeting and identification of sender. This command is not
to be sent by conforming systems unless the more-capable EHLO command
is not accepted. It is included for compatibility with general SMTP
implementations. Conforming implementations MUST implement the HELO
command for backward compatibility but SHOULD NOT send it unless EHLO
is not supported [SMTP].

MAIL FROM (REQUIRED)

Originating mailbox. This address contains the mailbox to which
errors should be sent. This address may not be 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.
Conforming implementations MUST implement the extended MAIL FROM
command [SMTP, ESMTP].

RCPT TO

Recipient's mailbox. This field contains only the addresses to which
the message should be delivered for this transaction. In the event
that multiple transport connections to multiple destination machines
are required for the same message, this list may not match the list
of recipients in the message header. Conforming implementations MUST
implement the extended RCPT TO command [SMTP, ESMTP].

DATA

Initiates the transfer of message data. Support for this command is
required in the event the binary mode command BDAT is not supported
by the remote system. Conforming implementations MUST implement the
SMTP DATA command for backwards compatibility [SMTP].

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. Conforming
implementations SHOULD NOT implement the TURN command [SMTP].

QUIT

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

RSET

Resets the connection to its initial state. Conforming
implementations MUST implement the RSET command [SMTP].

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.
Conforming implementations MAY implement the VRFY command [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 [SMTP].)

EHLO

The enhanced mail greeting that enables a server to announce support
for extended messaging options. The extended messaging modes are
discussed in a later section of this document. Conformant
implementations MUST implement the ESMTP command and return the
capabilities indicated later in this memo [ESMTP].

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. Because voice messages are large binary
objects otherwise subject to BASE-64 encoding, BDAT will result in a

substantial improvement in transmission efficiency over DATA.
Conformant implementations SHOULD support binary transport using the
BDAT command [BINARY].

5.2 ESMTP Capabilities

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

PIPELINING

The "PIPELINING" keyword indicates ability of the receiving SMTP to
accept pipelined commands. Pipelining commands dramatically improves
the protocol performance over wide area networks. Conformant
implementations SHOULD support the command pipelining indicated by
this parameter [PIPE].

SIZE

The "SIZE" keyword provides a mechanism by which the receiving SMTP
can indicate the maximum size message supported. Conformant
implementations MUST provide the size capability and SHOULD honor any
size limitations when sending [SIZE].

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. Conformant implementations SHOULD support binary
transport indicated by this capability [BINARY].

BINARYMIME

The "BINARYMIME" keyword indicates that the receiver SMTP can accept
binary encoded MIME messages. Conformant implementations should
support binary transport indicated by this capability [BINARY].

NOTIFY

The "NOTIFY" keyword indicates that the receiver SMTP will accept
explicit delivery status notification requests. Conformant
implementations MUST support the delivery notification extensions in
[DSN].

5.3 ESMTP Parameters - MAIL FROM

   BINARYMIME

   The current message is a binary encoded MIME messages. Conformant
   implementations SHOULD support binary transport indicated by this
   parameter [BINARY].

5.4 ESMTP Parameters - RCPT TO

   NOTIFY

   The NOTIFY parameter indicates the conditions under which a delivery
   report SHOULD be sent. Conformant implementations must honor this
   request [DSN].

   RET

   The RET parameter indicates whether the content of the message should
   be returned. Conformant systems SHOULD honor a request for returned
   content [DSN].

6. 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.

6.1 Network Management

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

6.2 Directory and Message Management

   Conformant systems SHOULD provide for the management of message
   traffic and queue monitoring based on the Message and Directory MIB
   [MADMAN].

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8. Security Consideration

   This document is a profile of existing Internet mail protocols. As
   such, it does not create any security issues not already existing in
   the profiled Internet mail protocols themselves.

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11. Appendix - MIME/ESMTP Voice Profile Requirements Summary

FEATURE	SECTION	MUST	SHOULD	MAY	SHOULD NOT	MUST NOT	Footnote
Message Addressing Formats:							
Use DNS host names	4.1	x					
Use only numbers in mailbox IDs	4.1		x				
Use alpha-numeric mailbox IDs	4.1			x			
Support of postmaster@domain	4.1		x				
Support of loopback@domain	4.1		x				
Message Header Fields:							
Encoding outbound messages							
From	4.2	x					
Addition of text personal name	4.2		x				
To	4.2	x					
Addition of text personal name	4.2		x				
CC	4.2			x			
Date	4.2	x					
Sender	4.2				x		
Message-id	4.2		x				
Received	4.2	x					
MIME Version: 1.0 (Voice 1.0)	4.2	x					
Content-Type	4.2	x					
Content-Transfer-Encoding	4.2	x					
Sensitivity	4.2			x			
Importance	4.2			x			
Subject	4.2			x			
Detection & Decoding inbound messages							
From	4.2	x					
Utilize text personal name	4.2		x				
To	4.2	x					
Utilize text personal name	4.2			x			
CC	4.2			x			
Utilize text personal name	4.2			x			
Date	4.2	x					
Conversion of Date to local time	4.2		x				
Sender	4.2					x	

```
     Message ID                          |4.2      |x| | | | |
     Received                            |4.2      | |x| | | |
     MIME Version: 1.0 (Voice 1.0)       |4.2      |x| | | | |
     Content Type                        |4.2      |x| | | | |
     Content-Transfer-Encoding           |4.2      |x| | | | |
     Sensitivity                         |4.2      |x| | | |1
     Importance                          |4.2      | | |x| | |
     Subject                             |4.2      | | |x| | |
                                         |         | | | | | |
  Binary Content Encoding:               |         | | | | | |
    Encoding outbound messages           |         | | | | | |
      7BITMIME                           |4.3      | | | |x| |
      8BITMIME                           |4.3      | | | |x| |
      Quoted Printable                   |4.3      | | | |x| |
      Base-64                            |4.3      |x| | | |2
      Binary                             |4.3      |x| | | |3
     Detection & decoding inbound messages|        | | | | |
      7BITMIME                           |4.3      |x| | | | |
      8BITMIME                           |4.3      |x| | | | |
      Quoted Printable                   |4.3      |x| | | | |
      Base-64                            |4.3      |x| | | | |
      Binary                             |4.3      |x| | | | |
                                         |         | | | | | |
  Message Content Types:                 |         | | | | | |
    Inclusion in outbound messages       |         | | | | | |
      Message/RFC822                     |4.3      | | | |x| |
      Text/plain                         |4.3      | | | | |x|
      Multipart/Mixed                    |4.3      | | |x| | |
      Message/Notification               |4.3      |x| | | | |
      Multipart/Report                   |4.3      |x| | | | |
      Audio/32KADPCM                     |4.3      |x| | | | |
      Audio/* (proprietary encodings)    |4.3      | | |x| | |
      Multipart/Voice-Message            |4.3      |X| | | | |
     Detection & decoding in inbound messages|     | | | | |
      Message/RFC822                     |4.3      |x| | | | |
      Text/plain                         |4.3      |x| | | | |
      Multipart/Mixed                    |4.3      |x| | | | |
      Message/Notification               |4.3      |x| | | | |
      Multipart/Report                   |4.3      |x| | | | |
      Audio/32KADPCM                     |4.3      |x| | | | |
      Audio/* (proprietary encodings)    |4.3      | | |x| | |
      Multipart/Voice-Message            |4.3      |X| | | | |
                                         |         | | | | | |
  Message Transport Protocol:            |         | | | | | |
    ESMTP Commands                       |         | | | | | |
      HELO                               |5.1      |x| | | | |
      MAIL FROM                          |5.1      |x| | | | |
      RCPT TO                            |5.1      |x| | | | |
```

```
         DATA                                 |5.1       |x| | | | |
         TURN                                 |5.1       | | | | |x|
         QUIT                                 |5.1       |x| | | | |
         RSET                                 |5.1       |x| | | | |
         VRFY                                 |5.1       | | |x| | |
         EHLO                                 |5.1       |x| | | | |
         BDAT                                 |5.1       | |x| | |3|
       ESMTP Keywords                         |          | | | | | |
         PIPELINING                           |5.2       | |x| | | |
         SIZE                                 |5.2       |x| | | | |
         CHUNKING                             |5.2       | |x| | | |
         BINARYMIME                           |5.2       | |x| | | |
         NOTIFY                               |5.2       |x| | | | |
                                              |          | | | | | |
     Management Protocols:                    |          | | | | | |
       Network management                     |6.1       | |x| | | |
       Monitoring queues                      |6.2       | |x| | | |
     -----------------------------------------|----------|-|-|-|-|-|-
```

1. 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.
2. When binary transport is not available
3. When binary transport is available

12. Appendix - Example Voice Message

   The following message is a full-featured, all-options-enabled 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: 2145551212@vm1.mycompany.com
   To: "Parsons, Glenn, W." 2145551234@VM1.mycompany.com
   From: "Vaudreuil, Greg" 2175552345@VM2.mycompany.com
   Date: Mon, 26 Aug 93 10:20:20 CST
   MIME-Version: 1.0  (Voice 1.0)
   Content-type: Multipart/Voice-Message; Boundary = "MessageBoundary"
   Content-Transfer-Encoding: 7bit
   Message-ID: VM2.mycompany.com-123456789
   Sensitivity: Private
   Importance: High

   --MessageBoundary
   Content-type: Audio/32KADPCM
   Content-Transfer-Encoding: Base-64
```

     glslfdslsertiflkTfpgkTportrpkTpfgTpoiTpdadasssdasddasdasd
     (This is a sample of the base-64 Spoken Name data) fgdhgd
     jrgoij3o45itj09fiuvdkjgWlakgQ93ijkpokfpgokQ90gQ5tkjpokfgW
     dlkgpokpeowrit09==

     --MessageBoundary
     Content-type: Audio/32KADPCM
     Content-Transfer-Encoding: Base-64

     glslfdslsertiflkTfpgkTportrpkTpfgTpoiTpdadasssdasddasdasd
     (This is a sample of the base-64 Spoken Subject data) fgdhgd
     jrgoij3o45itj09fiuvdkjgWlakgQ93ijkpokfpgokQ90gQ5tkjpokfgW
     dlkgpokpeowrit09==

     --MessageBoundary
     Content-type: Audio/32KADPCM
     Content-Transfer-Encoding: Base-64

     glslfdslsertiflkTfpgkTportrpkTpfgTpoiTpdadasssdasddasdasd
     (This is a sample of the base-64 message data) fgdhgdfwgd
     jrgoij3o45itj09fiuvdkjgWlakgQ93ijkpokfpgokQ90gQ5tkjpokfgW
     dlkgpokpeowrit09==

     --MessageBoundary--

13. Appendix - Audio/32KADPCM Content Type

     Mime type name: Audio
     Mime Sub-Type name: 32KADPCM
     Required Parameters: None
     Optional Parameters: None
     Encoding Considerations: Any encoding necessary for transport may be
     used.

   CCITT Recommendation G.721 [G721] describes the algorithm recommended
   for conversion of a 64 KB/s A-law or u-law PCM channel to and from a
   32 KB/s channel. The conversion is applied to the PCM stream using
   an Adaptive Differential Pulse Code Modulation (ADPCM) transcoding
   technique.

   No header information shall be included before the audio data. When
   this subtype is present, a sample rate of 8000 Hz and a single
   channel is assumed.

14.   Appendix - Multipart/Voice-Message

      Mime type name: Multipart
      Mime Sub-Type name: Voice-Message
      Required Parameters: Boundary
      Optional Parameters: None
      Encoding Considerations: Binary of 7 bit are sufficient. Base-64
      and Quoted-Printable are prohibited on multipart content-types.

   The syntax of a Multipart/Voice-Message is identical to the
   Multipart/Mixed content type. The Voice-Message content-type
   contains three body parts. The first is an audio segment containing
   the spoken name of the originator, the second is an audio segment
   containing a spoken subject, and the third is the voice message
   itself. Forwarded voice messages can be created by simply nesting
   multipart content types.

   The spoken name segment shall contain the name of the message sender
   in the voice of the sender. The length of the spoken name segment
   must not exceed 12 seconds. If no spoken name is available, the
   segment must still be present but may be empty.

   The spoken subject segment shall contain the subject of the message
   sender in the voice of the sender. The length of the spoken subject
   segment must not exceed 20 seconds. If no spoken subject segment is
   available, the segment must still be present but may be empty.

   The voice message body part may contain any arbitrary content
   including a multipart/mixed collections of body parts, though will
   typically be an audio segment.

   The default handling of the Multipart/Voice-Message shall be to voice
   the spoken-name segment and then the spoken-subject prior to
   displaying or voicing the remainder of the message.