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VISUAL VOICEMAIL INTERFACE SPECIFICATION

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1 INTRODUCTION

1.1 DOCUMENT PURPOSE

The aim of this document is to provide a Technical Recommendation for an open and standardised Visual Voice Mail (VVM) interface protocol which VVM clients may use to interact with a voicemail server. The key functions of this interface will be support of:

- Message Retrieval

- Message Upload

- VVM Management

- Greeting Management

- Provisioning

The document will not define how a VVM client looks nor will it define the general behaviour of a client user interface or the manner in which a user shall interact with the user interface. The definition of the protocol may however imply certain client and/or user behaviours. The document intention is to ensure that standard functionality of voice mail servers may be accessed through a range of VVM clients via the defined interface. This approach leaves scope for operators and vendors to differentiate their products.

1.2 BUSINESS RATIONALE

The growth of VVM services and possible new business models is handicapped by the lack of a standardised client side interface to the voice mail server.

Native support on terminals for such an interface will significantly improve the overall user experience, which in turn will encourage wider use of voice mail services.

If vendors are able to support a single VVM interface their time to market and associated costs shall be reduced.

A common interface definition shall allow client developers to focus on producing better clients rather than modifying clients to work with multiple interfaces.

Having only one interface to support will improve the ability of an operator to provide the VVM service on a variety of terminals, roll out the service more quickly and contain operational expenditure.

There already are a number of VVM implementations in the market, however service deployment is at a nascent stage and so there is still the opportunity to prevent market fragmentation. It is imperative that vendors and operators achieve quick agreement on the core VVM interface.

1.3 INTENDED AUDIENCE

The audience for this document includes:

- Network operators' defining specific requirements for VVM clients to be delivered on mobile devices delivered against the operators mobile requirements documents.

- OMTP Terminal vendors, i.e. equipment and technology vendors who will deliver VVM clients on their devices.

- Third party providers of VVM clients and servers.

- Other projects inside OMTP that will take these requirements as input.

1.4 COMPLIANCE REQUIREMENTS

Conformance to this document does not offer a partial compliance option at the individual requirements level as is the case with most OMTP requirements documents. Conformance may only be stated if the vendor is 100% compliant to all aspects of the recommendation.

This document is a Technical Recommendation for an open and standardised VVM interface protocol which VVM clients may use to interact with a voicemail server. Compliance statement is towards the interface protocol and does not state compliance to functionalities implemented.

2 VVM INTERFACES OVERVIEW

The VVM service enables third parties to develop terminal client applications for subscribers to manage their mailbox messages. Subscribers can use the VVM client on their terminals to listen to messages, delete messages, and compose messages.

The following actions can be performed from the VVM client:

- **Message Retrieval**: As described in chapter 1
- **Message Deposit**: As described in chapter 2
- **TUI Password Changes**: As described in chapter 3
- **TUI Language Settings Changes**: As described in chapter 4
- **NUT Session Disabling**: As described in chapter 5
- **Greeting and VS Management**: As described in chapter 6

Examples of VVM message commands and responses are provided in chapter 9.

SMS messages sent between the VVM service and client, used to notify the client about events in the subscriber mailbox, query the subscriber's provisioning status, and activate and deactivate the service are described in chapter 8. Subscriber provisioning statuses are described in chapter 7.

The VVM service complies with RFC standards described in chapter 10.

1. MESSAGE RETRIEVAL INTERFACE DESCRIPTION

The VVM client communicates with the VVM server via a standard IMAP4 protocol for message retrieval. In addition to the IMAP4 RFC, some extensions have been added to enable the client to perform certain mailbox configuration actions, such as changing the Telephony User Interface (TUI) password and language.

The number of concurrent IMAP4 sessions for a single client has a configurable limit. The client must log out at the end of a session.

Commands used during the IMAP4 message retrieval sessions are described in chapter 1.1.

The headers included in the messages retrieved via the VVM service are described in chapter 1.5.

Message types and attachment formats supported by the VVM message retrieval sessions are described in chapter 1.2 and 1.3.

Some TUI features are limited by the VVM service, as described in chapter 1.4.

1.1. MESSAGE RETRIEVAL: IMAP4 COMMAND REFERENCE

The VVM service supports the IMAP4 commands listed in Table 1, with some restrictions as described in this chapter. Other IMAP4 extensions are not supported, unless specifically stated.

Command Name	RFC Reference
APPEND	RFC3501
AUTHENTICATE	RFC3501 for the DIGEST-MD5 algorithm (RFC 2831) only
CAPABILITY	RFC3501
CHECK	RFC3501
CLOSE	RFC3501
EXAMINE	RFC3501
EXPUNGE	RFC3501
FETCH	RFC3501
GETMETADATA	RFC5464
GETQUOTAROOT	RFC2087
GETQUOTA	RFC2087
LIST	RFC3501
LOGIN	RFC3501
LOGOUT	RFC3501
NOOP	RFC3501
SEARCH	RFC3501
SELECT	RFC3501
SETMETADATA	RFC5464
STARTTLS	RFC3501
STATUS	RFC3501
STORE	RFC3501
UID	RFC3501

Table 1 *Supported IMAP4 Commands*

When a server receives a command not listed in Table 1 which it does not support, it will respond with the following error message:

```
NO command not allowed
```

1.1.1. APPEND

The VVM service supports the APPEND command, as described in RFC3501.

The APPEND command is not supported on the Inbox folder. The APPEND command can be used only to append a new greeting to the Greetings folder.

If the APPEND command is performed on the Inbox folder, the system returns the following error message:

```
NO command not allowed
```

The APPENDUID response code described in RFC4315 is supported. However, commands described in RFC4315 are not supported.

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1.1.2. AUTHENTICATE

The VVM service supports the AUTHENTICATE command described in RFC3501 for the DIGEST-MD5 algorithm (RFC2831) only.

The AUTHENTICATE command includes the following credentials:

Username: Defines the subscriber's IMAP4 user name as received in the STATUS SMS

Password: Defines the VVM service password, and is either the subscriber's IMAP4 password or the TUI password, depending on the system setup.

The IMAP4 password is sent in the STATUS SMS message. If a TUI password is used, it must be set by the user.

The table below describes error messages that can be returned for the AUTHENTICATE command.

Error	Description
NO unknown user	The subscriber can not be located in the system.
NO unknown client	The Client Type or Protocol Version is unknown.
NO invalid password	The password received from the client does not match the password defined in the subscriber's profile.
NO mailbox not initialized	The subscriber's mailbox has not yet been initialised via the TUI (the VVM server can, by configuration, reject login attempts if the subscriber has not changed the default password/greeting via the TUI).
NO service is not provisioned	The subscriber has not been provisioned for the VVM service.
NO service is not activated	The subscriber is provisioned for the VVM service but the VVM service is currently not active (the VVM server can, by configuration, reject login attempts in such cases also)
NO user is blocked	The Voice Mail Blocked flag in the subscriber's profile is set to YES.

Table 2 AUTHENTICATE Command Error Messages

1.1.3. CAPABILITY

The VVM service supports the CAPABILITY command, as described in RFC3501.

Note: The untagged response returned by the server indicates which authentication mechanisms are supported. Currently AUTH=DIGEST-MD5 and STARTTLS LOGINDISABLED are returned.

The QUOTA IMAP4 extension (RFC2087) and the IMAP METADATA extension (RFC5464) are also supported, as indicated in the CAPABILITY response.

1.1.4. FETCH

The VVM service supports the FETCH command, as described in RFC3501.

Note: The Fetch item RFC822.SIZE, in addition to ALL, FAST, and FULL Fetch macros, return an inaccurate size value.

Upon receiving the Fetch Body content, the attachment is transcoded to the format supported by the client. The size returned with the Fetch item RFC822.SIZE command is the size of the original attachment format, as stored in the server and not necessarily the size of the content sent to the client after the server performed any transcoding.

A Partial Body Fetch, such as **BODY[<section>]<<partial>>** is not currently supported. If a partial fetch command is performed, the system returns the following error message:

> NO command not allowed

If the user has no credit, the system may return the following error message:

> NO reservation failed

1.1.5. GETMETADATA

The GETMETADATA command, as defined in RFC5464, is used for the client to query the VVM server about some information. The "depth" and "maxsize" command options are not supported.

All parameter names are defined in a namespace, with the following prefix: "/private/VVM/"

Table 3 Parameters supported by GETMETADATA, lists the parameters to be managed by the GETMETADATA command. It is envisaged that any new parameters included in this protocol will be managed via the METADATA extension rather than via SMS.

Variable	Values	Comment
GreetingTypesAllowed	Comma Separated List of zero or more of: ▪ personal ▪ voiceSignature ▪ busyGreeting ▪ noAnswerGreeting ▪ extendedAbsenceGreeting	This parameter defines the list of the greeting announcements supported by the VVM server.

Table 3 Parameters supported by GETMETADATA

Example of usage for the allowed greeting:

```
C: a GETMETADATA "" /private/VVM/GreetingTypesAllowed
S: * METADATA "" (/private/VVM/GreetingTypesAllowed
personal,voiceSignature,busyGreeting)
S: a OK GETMETADATA complete
```

The possible error responses are:

```
S: a BAD GETMETADATA invalid parameter

S: a NO GETMETADATA application error
```

If the GETMETADATA command is used with parameters not defined in RFC5464 or not supported by the server, the error response will be:

```
S: a BAD GETMETADATA invalid command

S: a BAD GETMETADATA command not allowed
```

1.1.6. GETQUOTAROOT and GETQUOTA Commands

The VVM service supports the GETQUOTAROOT and GETQUOTA commands, as described in RFC2087. All other commands in the quota extension are not supported.

Both the GETQUOTAROOT and GETQUOTA responses include the total quota and the quota per media types for all mailbox folders. The following is the GETQUOTA response syntax:

> QUOTA "" (STORAGE [occupied] [total] MESSAGE [occupied] [total] MESSAGE-soft [occupied] [total] empty-call-capture [occupied] [total] empty-call-capture-soft [occupied] [total] number [occupied] [total] number-soft [occupied] [total] fax [occupied] [total] fax-soft [occupied] [total] voice [occupied] [total] voice-soft [occupied] [total] video [occupied] [total] video-soft [occupied] [total] x-voice-greeting [occupied] [total] x-voice-greeting-soft [occupied] [total])

Where:

- The media type returned in the GETQUOTAROOT or GETQUOTA responses depends on the media types supported in the system, including the following:
    - Voice
    - Fax
    - Video
    - Greeting
    - Empty Call Capture
    - NUMBER message

    Additional media types might be returned in the response. Such media types shall be ignored by the client.

- The soft quota represents the quota on which the subscriber is being notified.
- The returned units depend on system initial setup. The default setup is as follows:
    - Voice messages = Length in seconds
    - Video messages = Length in seconds
    - Fax messages = Number of pages

- o Greetings messages = Length in seconds

- o STORAGE = Size in KB

- o Empty Call Capture and NUMBER messages = number of messages

The VVM service can be configured to return total storage only or a specific media type, such as voice only, fax only, video only, or greeting only. In this case the response syntax is as follows:

```
* QUOTA "" (STORAGE [occupied][total])
```

1.1.7. *LOGIN*

The VVM service supports the LOGIN command, as described in RFC3501.

For the error messages that can be returned for the LOGIN command, refer to Table 2 AUTHENTICATE Command Error Messages.

1.1.8. SEARCH

The VVM service supports the SEARCH command, as described in RFC3501.

Note: The BODY, LARGER, SMALLER, and TEXT search criteria must not be used. SEARCH commands performed with one of these attributes can respond with incorrect results, due to the differences between the media format stored in the server and the format returned to the client upon the Body Fetch command.

1.1.9. SETMETADATA

The SETMETADATA command, as defined in the RFC5464, is used for the client to set annotations, and it is only available in authenticated or selected states.

All parameter names for this command are defined in a namespace, with the following prefix: "/private/VVM/". It is envisaged that any new parameters included in the protocol will be managed via the METADATA extension rather than via SMS.

Table 4 Parameters supported by SETMETADATA, lists the parameters which are supported for the VVM service:

Variable	Values	Comment
Accept	A list of the media formats supported by the VVM client. Legal values: List of one or more voice media types listed in Table 5 separated by a comma (,).	This parameter defines the media formats supported by the client. A SETMETADATA command shall be issued by the client at the beginning of an IMAP session, right after a successful authentication with the VVM server.

Table 4 Parameters supported by SETMETADATA

Example of usage for the allowed greeting:

```
C: a SETMETADATA "" (/private/VVM/Accept
"audio/amr,audio/wav; codec=g711a")
S: a OK SETMETADATA complete
```

Possible error responses are:

```
S: a BAD invalid parameter (wrong parameters)

S: a NO application error (server error)

S: a BAD SETMETADATA unrecognized IMAP4 command
(for backward compatibility in case of new client
working against old server)
```

1.1.10. *STARTTLS*

The VVM service supports the STARTTLS command, as described in RFC3501.

1.1.11. STATUS

The VVM service supports the STATUS command, as described in RFC3501.

The client application must not perform the STATUS command on the Greetings folder. The VVM server synchronises the greetings in the Greetings folder with the greeting in the TUI storage upon a SELECT Greetings command. If the STATUS command is performed on the greeting folder, the system returns the following error message:

> NO command not allowed

1.1.12. Supported IMAP4 Flags

The following standard IMAP4 flags are supported by the VVM service:

- **\Seen**: Indicates that the message was played
- **\Deleted**: Indicates that the message was deleted
- **\Recent**

Note: Other standard or non-standard IMAP4 flags, must not be set by the client, except for the $CNS-Greeting-On flag (see chapter 7)

If non-supported flags are set by the client, the system returns the following error message:

> NO command not allowed

1.2. MESSAGE RETRIEVAL: SUPPORTED MESSAGE TYPES

The following message types can be retrieved via the VVM service:

- **Voice**
- **Video**
- **Fax**
- **ECC (Empty Call Capture):** An empty voice message.
- **NM (Number Message):** An empty voice message including the number to which the reply is sent.
- **MDN (Message Disposition Notification):** A system message advising the subscriber whether the message has been displayed, deleted, dispatched, or denied
- **DSN (Delivery Status Notification):** A system message notifying the subscriber of the message delivery status (Delivered, Failed, or Delayed).
- **Infotainment:** A voice message deposited directly to the subscriber mailbox by an external application.

1.3. MESSAGE RETRIEVAL: SUPPORTED ATTACHMENT FORMATS

Upon a Fetch Body command, the VVM server transcodes the message attachment to a format supported by the client. A message may have multiple attachments or components. Depending on how the TUI formats forwarded messages, a component may also encapsulate multiple components.

All attachments are encoded in base64.

The table below lists the file formats supported by the protocol.

Attachment Type	File Formats	MIME Types
Voice and Greeting attachments	AMR 12200	`audio/amr`
	WAV g711a WAV g711u	`audio/wav; codec="g711a"` `audio/wav; codec="g711u"`
	QCELP 13300 EVRC, 13000	`audio/qcelp` `audio/evrc`
Video attachments	3gpp h263_amr	`video/3gpp; codec="h263_amr"`
Fax attachments	PDF	`application/pdf`
Scripted Text	Text	`plain/text`

Table 5 Supported Attachment Formats

VVM TUI Features Limitations

The VVM service has the following limitations relating to specific TUI features:

- **Re-save**: When a message is re-saved via the TUI, the original message is deleted and the internal date of the new message reflects the last date in which the message was re-saved. The original message deposit date can be obtained from the message **Date** header.

- **ECC from the same CLI Aggregation**: When ECC messages from the same CLI are aggregated, the internal date of the resulted message reflects the last missed call date. The date in which the ECC was first issued can be obtained from message **Date** header.

Note: When these TUI features are used, the UID of the message on which the action was executed changes.

1.4. MESSAGE RETRIEVAL HEADER REFERENCE

The following types of headers are returned to the VVM client during message retrieval sessions:

- **Standard Root Level Message Retrieval Header Reference:** Describes the standard message headers returned in the root level of the message

- **VVM Specific Root Level Message Retrieval Header Reference:** Describes the VVM specific message headers returned in the root level of the message

- **Attachment Message Retrieval Header Reference:** Describes the message header returned at the attachment level of the message

For examples of MIME messages, see VVM Message Command Examples.

1.4.1. Root Level Message Retrieval Header Reference

The following headers are returned to the VVM client during message retrieval sessions at the root level:

From

Description: Defines the message originator.
This header is mandatory.

Note: In case of a restricted CLI, the VVM client should not rely on the From field, because the default value can change depending on the voicemail deployment.

Legal Values: The phone number of the message originator, including the domain, in the following format:
<phone-number>@<domain name>

Default Value:In case of a restricted CLI,
Unknown@<domain name>
The client recognizes that the CLI is restricted if the left side of the email address is not a numeric phone number.

To

Description: Defines the phone line numbers associated with the message. Multiple addresses are separated by commas. This header is mandatory.

Legal Values: <main-phone>@<domain name>

Default Value:N/A

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Date

Description: Defines the date that the message was sent. This header is mandatory.

Note: It is the client's responsibility to display dates in the client's time-zone. The message received date can be fetched from the internal date message attribute. The Internal date may not reflect the actual received time of the message when the Re-save or ECC aggregation features are used via the TUI (see VVM TUI Features Limitations).

Legal Values: As defined in RFC2822

Default Value: N/A

Example:
Sun, 2 Sep 2007 07:36:05 +0000 (UTC)

Subject

Description: Determines the message subject. This header is optional.

Note: The VVM client should not rely on the Subject header to detect the message type. The message type should be detected according to the Message-Context header.

Legal Values: Alphanumeric string (maximum length 90 characters)

Default Value: N/A

Message-Context

Description: Determines the message context.
This header is mandatory.

For MDN and DSN message types, this header specifies the original message type

This header is mandatory.

Legal Values: Voice-message
Video-message
Fax-message
X-empty-call-capture-message
X-number-message
X-voice-infotainment-message

Default Value:N/A

Content-Duration

Description: Defines the length of the message, and is returned only for voice and video messages.
This header is mandatory for voice and video messages.

Legal Values: Length of voice or video content, in seconds.

Default Value:N/A

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Content-Type

Description: The message content type. This header is used to recognize MDN and DSN messages. This header is mandatory.

Note: The VVM client can use this header value to distinguish between MDN or DSN messages and other messages.

Legal Values: For voice messages: Multipart/voice-message or Multipart/mixed

For fax messages: Multipart/fax-message or Multipart/mixed

For video messages: Multipart/video-message or Multipart/mixed

For ECC and number messages: Text/Plain

For DSN messages: Multipart/report: report-type=delivery-status

For MDN messages: Multipart/report; report-type=receipt-disposition-notification (or report-type=disposition-notification)

For Infotainment messages: multipart/mixed

Default Value:N/A

MIME-Version

Description: Determines the MIME version.
This header is mandatory.

Legal Values: 1.0 (Voice Version 2.0)

Default Value:1.0 (Voice Version 2.0)

Importance

Description: Determines the message priority.
This header is optional.

Legal Values: Normal

High

Default Value: Normal

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Sensitivity

Description: Determines the message sensitivity.
This header is optional.

Legal Values: Private
Confidential
Personal

Default Value:N/A

X-Content-Pages

Description: Defines the number of fax pages in a fax message, and is relevant only for fax messages.
This header is mandatory for fax messages.

Legal Values: Integer

Default Value:N/A

1.4.2. Attachment Message Retrieval Header Reference

The following header is returned to the VVM client during message retrieval sessions per attachment:

Content-Type

Description: Determines the attachment content type.
The **name** and **application** parameters can optionally be added to this header.

This header is mandatory.

Legal Values: For Voice Messages:
audio/wav; codec=g711a
audio/wav; codec=g711u
audio/amr
audio/qcelp
For Fax Messages:
application/pdf
For Video Messages:
video/3gpp; codec="h263_amr"
For Scripted Voice Messages:
text/plain

For nested messages:
Message/rfc822

Default Value:N/A

X-Transcription

Description: The content ID of the transcripted attachment.

Legal Values: Source-ID= <id>, id value MUST equal to the value of Content-ID header of the transcripted body part

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2. MESSAGE DEPOSIT INTERFACE DESCRIPTION

The VVM service supports voice message deposit via the SMTP protocol as described in RFC2821. SMTP authentication, as described inRFC 2554, uses the AUTH mechanism command.

The client may optionally use STARTTLS for session encryption.

In the SMTP AUTH (Digest MD5) command, the client is authenticated with a predefined username and password, supplied as part of the STATUS SMS.

For an example of an SMTP authentication command, see SMTP MD5 Authentication Example.

Note: Only voice messages can be deposited via the VVM service.

Only the Digest-MD5 algorithm is supported in the AUTH mechanism command.

Delivery Status Notification (DSN) messages are deposited in the sender's mailbox if one of the message recipients was not located. See Voice DSN Message Example for an example of DSN.

For details about the headers included in deposited messages, see:

- Standard Message Deposit Header Reference (chapter 2.1): Describes message deposit headers that require specific values
- VVM Specific Message Deposit Header Reference (chapter 2.2): Describes additional headers that can be added to the deposited message
- Message Deposit Attachment Header Reference (chapter 2.3): Describes attachment headers that require specific values

When forwarding or replying, the original should be attached as a message [RFC822] mime component. Putting the original as a message [RFC822] component in the reply/forward preserves all the header information of the original message. The TUI might need this information. The VVM server might have to reformat the message to the format that the TUI expects.

2.1. STANDARD MESSAGE DEPOSIT HEADER REFERENCE

The following RFC2822 message deposit headers require specific values:

From

Description: The Phone number and domain of the message sender.

This header is mandatory.

Legal Values: <phone-number>@<domain name>

Default Value:N/A

Example: 1234@Example.com

To

Description: Defines the message addressee. Multiple addresses are separated by commas.
This header is mandatory.

Note: RCPT TO envelope headers are used to resolve the destination. The VVM client must set the RCPT TO envelope header in addition to the message TO field.

Legal Values: <main-phone>@<domain name>

Default Value:N/A

Date

Description: Defines the date that the message was sent.
This header is mandatory.

Legal Values: Date and time as defined by RFC2822

Default Value:N/A

Example:
Sun, 2 Sep 2007 07:36:05 +0000 (UTC)

Subject

Description: Defines the message subject.
This header is optional.

Note: The subject header is not available via TUI sessions, and can be displayed through web UI access.

The subject set by the client may be overridden by the VVM system with default values.

Legal Values: Alphanumeric string (maximum length 90 characters)

Default Value:N/A

Message-Context

Description: Defines the standard header for message presentation, based on RFC 3458.
This header is mandatory.

Legal Values: Voice-message

Default Value:N/A

Content-Duration

Description: Defines the length of the message in seconds.
This header is mandatory.

Legal Values: Integer

Default Value:N/A

Content-Type

Description: Determines the message content-type .
This header is mandatory.

Legal Values: Multipart/mixed;

Default Value:N/A

MIME-Version

Description: Defines the MIME version.
This header is mandatory.

Legal Values: 1.0

Default Value:N/A

Importance

Description: Defines the message importance.
This header is optional.

Legal Values: High

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Normal (including Low importance)

Default Value:Normal

Sensitivity

Description: Determines the message sensitivity.

This is an optional header.

Legal Values: Private

Confidential

Personal

Default Value:N/A

Expires

Description: Determines the message expiration date, after which the message is automatically purged by the server periodic process.

This is an optional header.

Legal Values: Date in the following format:

DAY, D MMM YYYY HH:MM:SS (+-)TTTT

Default Value:N/A

Example:
Sun, 10 Mar 2005 18:16:02 +0200

2.2. VVM SPECIFIC MESSAGE DEPOSIT HEADER REFERENCE

The following additional header fields can be added to the deposited message:

X-CNS-Messaging-Action

Description: Determines the message's messaging action.

This header is relevant only for messages created using a messaging service and is applicable only to some VVM systems.

Legal Values: reply = Indicates that the message is a reply to a subscriber's message

forward = Indicates that the message was forwarded to the subscriber by another subscriber

Default Value: N/A

2.3. MESSAGE DEPOSIT ATTACHMENT HEADER REFERENCE

The following headers must be set by the VVM client in the attachment level:

Content-Type

Description: Determines the attachment content-type.

This header is mandatory.

Legal Values: message/rfc822

Multipart/mixed

See Table 5 Supported Attachment Formats for list of content-types**.**

Default Value: N/A

Content-Transfer-Encoding

Description: Determines the content transfer encoding.

This header is mandatory.

Legal Values: base64

Default Value: N/A

Content-Disposition

Description: Determines the attachment, along with the filename.

The voicemail system ignores the path for the file.

This header is mandatory.

Legal Values: attachment; filename="<file name>"

Default Value: N/A

Example:

attachment; filename="test.wav"

Content-Duration

Description: Defines the length of the voice attachment in seconds.

This header is mandatory.

Legal Values: Integer

Default Value: N/A

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3. TUI PASSWORD CHANGES INTERFACE DESCRIPTION

The VVM service enables the client to change the subscriber's TUI password via a custom IMAP4 command. The change password command can be invoked only in the authenticated state, meaning that the user must be in the authenticated IMAP4 session.

The password must be made up of digits only.

The password minimum and maximum length will be sent to the client in the STATUS SMS message (see STATUS SMS Description (System Originated)).

For details about the command syntax used to change TUI passwords, see:

- Change Password Request Syntax (chapter 3.1)
- Change Password Response Syntax (chapter 3.2)

3.1. CHANGE PASSWORD REQUEST SYNTAX

The change password request syntax is as follows:

CNS1 XCHANGE_TUI_PWD PWD=<Value> OLD_PWD=<Value>

The change password request syntax uses the following parameters:

PWD

Description: Defines the new TUI password.
This parameter is mandatory.

Legal Values: Integer

Default Value:N/A

OLD_PWD

Description: The current TUI password that is being replaced.
This parameter is mandatory.

Legal Values: Integer

Default Value:N/A

In case of invalid command syntax, the following error is returned:

No unknown command

3.2. CHANGE PASSWORD RESPONSE SYNTAX

Upon successfully changing the password, the following response is returned:

```
CNS1 OK password changed successfully
```

The following errors can also be returned in the change password response:

```
CNS1 NO password too short
```

```
CNS1 NO password too long
```
```
CNS1 NO password too weak
```

```
CNS1 NO old password mismatch
```

```
CNS1 NO password contains invalid characters
```

```
CNS1 NO system error
```

4. CHANGE TUI LANGUAGE INTERFACE DESCRIPTION

The VVM service enables the client to change the subscriber's voicemail language via a custom IMAP4 command. The change language command can be invoked only in the authenticated state, meaning that the user must be in the authenticated IMAP4 session.

The system supported languages is sent to the client in the STATUS SMS message (see STATUS SMS Description (System Originated))

For details about the command syntax used to change TUI languages, see:

- Change Language Request Syntax (chapter 4.1)
- Change Language Response Syntax (chapter 4.2)

4.1. CHANGE LANGUAGE REQUEST SYNTAX

The change language request syntax is as follows:

CNS2 XCHANGE_VM_LANG LANG=<Language number>

The change language request syntax includes the following parameter:

Lang

Description:	Determines the new language, and is one of the system supported languages as returned in the STATUS SMS (see STATUS SMS Description (System Originated)). This parameter is mandatory.
Legal Values:	String maximum 5 digits in the following format: <lang code>.<variant>
	The "lang code" is an ISO 639-2 value, 3 characters max
	The "variant" is one (values 0 to 9) digit indicating a speech characteristic or accent extension (for example a Man or Woman voice). The variant is optional. The definition of the variant value will be configured in the VVM client and server sides according to the operator policies and requirements.

Examples of valid values:
Lang=eng
Lang=eng.1

Default Value:N/A

In case of invalid command syntax, the
following error message is returned:

No unknown command

4.2. CHANGE LANGUAGE RESPONSE SYNTAX

Upon a successful language change, the following response is returned:

```
CNS2 OK language changed successfully
```

The following possible errors can also be returned in the change language response:

```
CNS2 NO invalid language
CNS2 NO system problem
```

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5. CLOSE NUT INTERFACE DESCRIPTION

If available, the New User Tutorial (NUT) is implemented in the client. It is usually played the first time the user uses the VVM application if the subscriber status is "new subscriber" (see STATUS SMS Description (System Originated)). The VVM service enables the client to disable the New User Tutorial (NUT) flag in the server via a custom IMAP4 command to change the provisioning status of the customer in order for the server to avoid re-playing the TUI NUT. The CLOSE NUT command can be invoked only in the authenticated state, meaning that the user must be in the authenticated IMAP4 session.

For details about the command syntax used to change TUI languages, see:

- CLOSE NUT Request Syntax (chapter 5.1)
- CLOSE NUT Response Syntax (chapter 5.2)

5.1. CLOSE NUT REQUEST SYNTAX

The CLOSE NUT request syntax is as follows:

CNS3 XCLOSE_NUT

In case of invalid command syntax, the following error is returned:

> No unknown command

5.2. CLOSE NUT RESPONSE SYNTAX

Upon successful NUT CLOSE, the following response is returned:

> CNS3 OK NUT closed

Note: A successful CLOSE NUT command changes the VVM subscriber provisioning status and triggers a STATUS SMS message (see STATUS SMS Description (System Originated)).

The following error can also be returned as part of the CLOSE NUT response:

> CNS3 NO system error

6. GUIDELINES FOR GREETINGS AND VOICE SIGNATURE MANAGEMENT

The VVM service enables the client to manage personalised greetings and voice signatures. Not all Voice mail users want to leave a fully personalised greeting. The Voice Signature (VS) option allows users to leave a very short recording typically a couple of seconds long. The Voice Mail System would use this message, the voice signature, to replace the phone number in the default system voice mail greeting that a user hears when the call is diverted to the voice mail system. Thus, for example, instead of hearing the response "You have reached the mailbox of 12345678910, please leave a message after the beep", one would hear "You have reached the mailbox of Michel Arnaud, please leave a message after the beep".

Greetings (personalised and VS) are stored in the server in the subscriber's Greetings Folder, in the format of a multipart-mixed message with an audio attachment. Personalised greetings and VS are distinguished by a specific header, as described in chapter 5.3.

Several personalised greetings or VS can be flagged as "ON". This flag indicates to the server that these messages are to be used by the voicemail system in the TUI session, according to the voicemail logic.

If several greetings of the same type are simultaneously flagged as ($CNS-Greeting-On) the voicemail system will play the one with the smallest message-sequence. If no personalised greeting or VS are flagged as ($CNS-Greeting-On) then the default system voicemail greeting will be played by the voicemail system.

Greeting headers that require specific values and are set by the VVM client are described in chapter 5.3.

See the following for details about how to upload or delete greetings or VSs from the Greetings Folder on the VVM server:

- Uploading a Greeting or VS chapter 5.1
- Deleting a Greeting or VS chapter 5.2

Note:

Greeting management error responses are formatted according to the IMAP4 standard.

In order to perform actions on the Greetings folder, the client application must issue the SELECT GREETINGS command.

The client application must not perform STATUS command on the Greetings Folder.

6.1. UPLOADING A GREETING OR VS

This procedure describes how to upload a personalised greeting or VS to the Greetings Folder.

How:

1. Use the IMAP4 APPEND command to append the message to the Greetings Folder.

2. In order to activate a greeting, set the **$CNS-Greeting-On** flag.

Note:

The VVM client can append several personalised greetings and several VS to the Greetings folder, up to the quota limit.

The flag can be set as part of the APPEND command or with a dedicated store command.

The client must limit the recorded greeting or VS length according to the maximum greeting or VS length received in the STATUS SMS message (see STATUS SMS Description (System Originated)).

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6.2. DELETING A GREETING OR VS

This procedure describes how to delete a greeting or VS from the Greetings Folder.

How:

1. Flag the greeting or VS as deleted.

2. Send the Expunge command.

Note:

Deleted greetings or VS flagged as **($CNS-Greeting-On)** are not played by the VVM system, and the default greeting is played instead.

6.3. GREETING HEADER REFERENCE

The following greeting and VS headers require specific values, and must be set by the client.

X-CNS-Greeting-Type

Description: Determines the greeting type.
This header is mandatory..

Legal Values: **normal-greeting** For Personalised greeting

voice-signature For VS (Name greeting)

busy-greeting For a personalised greeting when busy. If not recorded, normal greeting is used. If recorded, the normal greeting is used for the "no-answer" case, and the busy-greeting used for the "busy" case.

extended-absence-greeting: If this greeting is flagged "on", it takes precedence over "normal" and "no-answer" greetings.

Default Value:N/A

From

Description: The phone number@Domain of the message sender.

This header value is ignored by the server.

Legal Values: N/A

Default Value:N/A

Subject

Description: Defines the message subject.

This header value is ignored by the server.

Legal Values: N/A

Default Value:N/A

Content-Type

Description: Determines the message content type.

This header is mandatory and appears in the message header and in the MIME part header.

The greeting must include a single voice attachment at the root level only.

Legal Values: Message header content-type: multipart/mixed; [boundary=<boundary -string>]

MIME part content-type (must be encoded in base64):

The valid values are the audio MIME types in Table 5 Supported Attachment Formats

Default Value:N/A

To

Description: Defines the message addressee.

This header value is ignored by the server.

Legal Values: N/A

Default Value:N/A

MIME-Version

Description: Defines the MIME version.

This header is mandatory.

Legal Values: 1.0

Default Value:N/A

Content-Transfer-Encoding

Description: Defines the content transfer encoding.

This header is mandatory.

Legal Values: base64

Default Value:N/A

7. PROVISIONING STATUS

A subscriber's provisioning status determines the subscriber's level of access to VVM services.
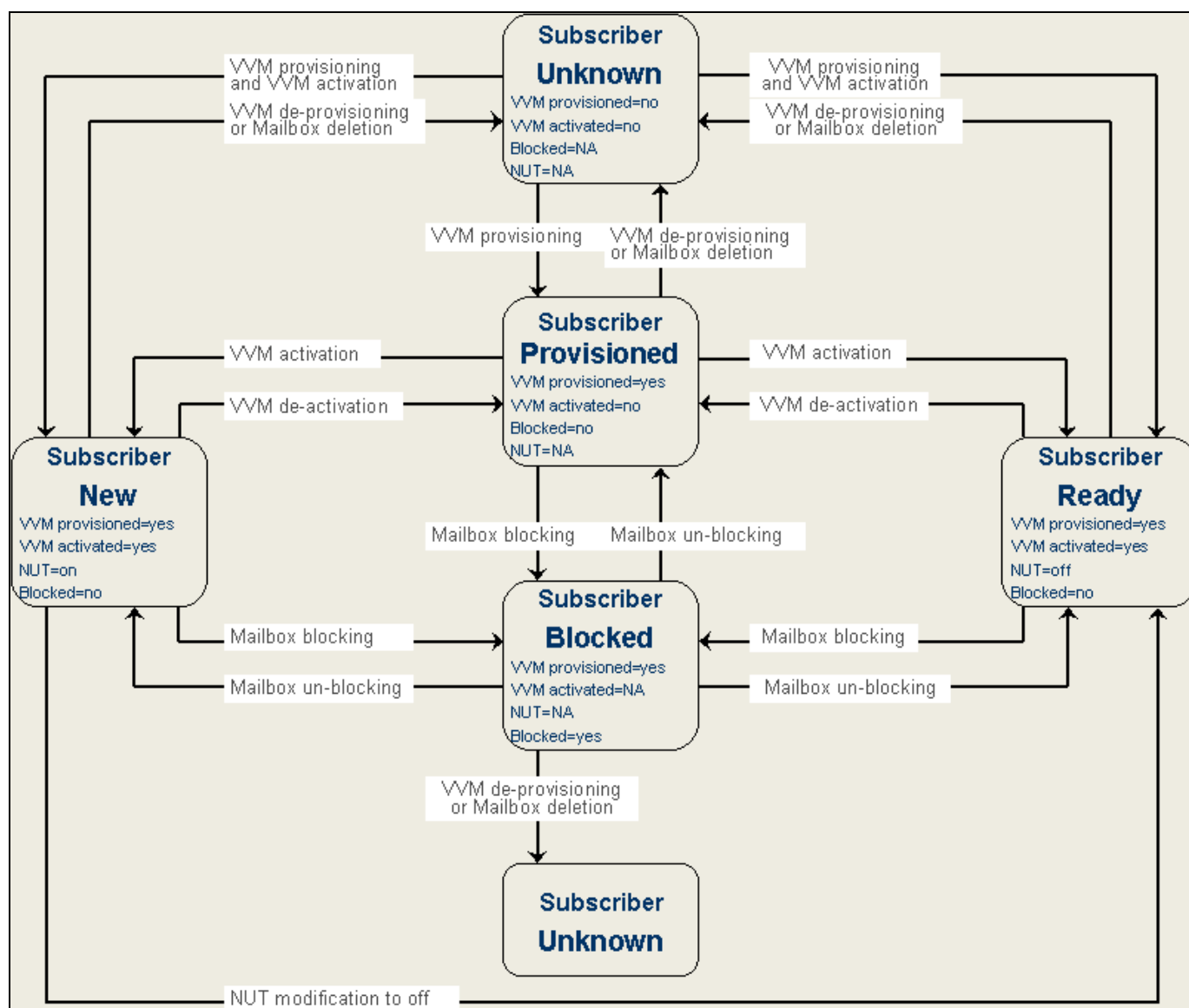

Figure 1: VVM Provisioning Status Transitions

The table below describes the possible VVM provisioning statuses.

VVM Provisioning Status	Description	VVM Service Impact
Subscriber Unknown	The subscriber is not provisioned to the VVM service or does not have a mailbox in the voicemail system	**VVM service is not active:** • SYNC SMS will not be sent from the server. • The server may send legacy notifications for voicemail deposit. • STATUS SMS may be sent from the server. • The client must not initiate IMAP4 sessions. • The server will block IMAP4 session initiation attempts.
Subscriber Provisioned	The subscriber is provisioned to the VVM service, while the VVM service is not activated yet.	**VVM service is temporarily not active:** • SYNC SMS will not be sent from the server. • The server may send legacy notifications for voicemail deposit. • STATUS SMS may be sent from the server. • The VVM server will block IMAP4 session initiation attempts. • The VVM client may send activate SMS to change provisioning status to **New** or **Ready**.
Subscriber New	The subscriber is provisioned to the VVM service, and the VVM service is active, while the subscriber has not gone through NUT (New User Tutorial) session.	**VVM service is active:** • SYNC SMS may be sent from the server. • The server may send legacy notifications for voicemail deposit. • STATUS SMS may be sent from the server. • The VVM server allows IMAP4 session initiation attempts. • The VVM client may issue CLOSE_NUT command (to change provisioning status to **READY**). • The VVM client may send de-activate SMS to change the provisioning status to **Provisioned**.
Subscriber Ready	The subscriber is provisioned to the VVM service, and the VVM service is active, while the subscriber has already gone through NUT session.	**VVM service is active:** • SYNC SMS may be sent from the server. • The server may send legacy notifications for voicemail deposit. • STATUS SMS may be sent from the server. • The VVM server allows IMAP4 session initiation attempts. • The VVM client may send de-activate SMS to change the provisioning status to **Provisioned**
Subscriber Blocked	The subscriber mailbox is Blocked	**VVM service is temporarily not active:** • SYNC SMS may be sent from the server. • The server may send legacy notifications for voicemail deposit. • STATUS SMS may be sent from the server. • The VVM server will block IMAP4 session initiation attempts.

Table 4: VVM Provisioning States

8. VVM SMS INTERFACE DESCRIPTION

The VVM service includes the following types of SMS messages:

- System Originated SMS Messages: SMS messages sent to the VVM client to notify the client about a specific event in the subscriber's mailbox or profile

- Mobile (Client) Originated SMS Messages: SMS messages that enable the client to query the system about the subscriber's status, as well as to turn the service notifications on or off

The SMS format is based on the device type, which is stored in the subscriber's profile either during the service activation process (see Activate SMS (Client Originated)) or by the operator's customer support.

The VVM service sends the VVM notifications to the client's VVM application port. The notifications have specific characteristics, as described in System Originated SMS Message Characteristics.

Note: Depending on the device type, it is possible to configure the VVM service to send legacy notifications in addition to the VVM notifications, in order to support a scenario in which the VVM subscriber SIM is switched to a non-VVM enabled phone that cannot process VVM notifications.

If regular notifications are sent in addition to VVM notifications, it is the client's responsibility to filter out the regular notifications according to the SMS source address or SMS Protocol Identifier.

8.1. SYSTEM ORIGINATED SMS MESSAGES

The VVM service sends the following SMS messages to the client:

- **SYNC SMS**: Notifies the client that the status of a message or greeting in the mailbox may have been changed.

For details see SYNC SMS Description (System Originated).

- **STATUS SMS**: Notifies the client that the VVM subscriber's provisioning status was changed.

For details see STATUS SMS Description (System Originated).

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The maximum length for system originated SMS messages is 160 characters for 7bit encoding and 140 characters for 8bit encoding. It is recommended not to exceed the maximum SMS message length.

If the SMS message exceeds the maximum message length, both the operator's SMSC and the client must support SMS concatenation.

For more details about system originated SMS messages, see System Originated SMS Message Characteristics.

8.1.1. SYNC SMS Description (System Originated)

SYNC SMS messages are sent from the system to the client, to notify the client that the status of a message or greeting in the mailbox may have changed. A SYNC SMS message will be sent when:

- A new message has been deposited to the subscriber's mailbox

Additionally a SYNC SMS may be sent when one or more of the following events occur:

- Message purge due to retention time
- TUI session logout
- Greeting changed via the TUI, including a personalised greeting or VS recorded or deleted

In the SYNC SMS message, both the Client prefix and Prefix fields are followed by a colon (:), and all other fields are followed by semicolons (;). Each field is represented by the field name, an equal sign (=), and a legal value. Spaces are not allowed between parameters, although the parameter values may include spaces.

For details about SYNC SMS notification messages see SYNC SMS Field Reference and SYNC SMS Notification Examples.

8.1.2. SYNC SMS Field Reference

The following fields are used in SYNC SMS text that is sent to the VVM client:

Client prefix

Description: Mandatory field; definition dependant on the client. Also see Client prefix in Activate SMS section 8.2.2.

Legal Values: Configurable string, unlimited length, always followed by a colon (:)

Default Value://VVM

Prefix

Description: Determines the SMS type.
This field is always followed by a colon (:)

This field is mandatory.

Legal Values: String, maximum four characters
SYNC

Default Value:SYNC

ev

Description: Determines the event that triggered the SYNC SMS.
This field is mandatory.

Legal Values: String, maximum three characters
NM = New message deposit
MBU = Mailbox update, including TUI session end or message purge
GU = Greetings/VS update

Default Value:N/A

id

Description: Defines the message UID.
This field is returned for new message events only, and the value can be used by the client for the IMAP4 FETCH command, used to retrieve the message.

This field is mandatory..

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Legal Values: New message UID, maximum 21 digits

Default Value:N/A

c

Description: Defines the number of new messages in the inbox.

This field is mandatory.,

The client may use this field to show the number of new messages.

Legal Values: Integer, maximum five digits

Default Value:N/A

t

Description: Determines the message type. This field is returned for new message events only.

This field is mandatory.

The client may use this field to show the type of message.

Legal Values: Maximum length one character

v = Voice

o = Video

f = Fax

i = Infotainment

e = ECC

Default Value:N/A

s

Description: Defines the message sender (message originator MSISDN).
This field is returned for new message events only.

This field is not returned if the CLI is restricted.

This field is mandatory.

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The client may use this field to show the message sender before initiating IMAP communication.

Legal Values: Numeric string (phone number in E164 format), maximum length 29 digits (30 including the null terminator)

Default Value:N/A

dt

Description: Defines the deposit date and time, in the system's time zone.
This field is returned for new message events only.

This field is mandatory. The client may use this field to show the deposit time before initiating IMAP communication.

Legal Values: Date and time in DD/MM/YYYY HH:MM TZ format

Maximum length 22 characters

Default Value:N/A

Example:
02/08/2008 12:53 +0200

l

Description: Determines the message length.
This field is returned for new message events only.

This field is mandatory, depending on system configuration, and is used in the default setup. The client may use this field to show the length of message before initiating IMAP communication.

Legal Values: Numeric string, maximum five digits, as follows:

Voice, Video, and Infotainment messages: Length in seconds

Fax messages: Number of pages

Number and ECC messages: 0

Default Value:0

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8.1.3. SYNC SMS Notification Examples

The following is an example of system originated SYNC SMS notifications:

```
//VVM:SYNC:ev=NM;id=3446456;c=1;t=v;s=01234567898;dt=02/08/2008
12:53 +0200;l=30
```

Fields used in the SYNC SMS messages are described in SYNC SMS Field Reference.

8.1.4. STATUS SMS Description (System Originated)

STATUS SMS messages are sent from the system to the client to notify the client about provisioning status changes. The VVM client is also able to query the VVM service for the current status.

For details about possible provisioning statuses, see chapter 7.

In the STATUS SMS message, the mandatory Client prefix field is following by a colon (:), as well as the mandatory Prefix field. All other fields are followed by semicolons (;). Each field is represented by the field name, an equal sign (=), and a legal value. Spaces are not allowed.

For details about STATUS SMS notification messages see STATUS SMS Field Reference and STATUS SMS Field Examples.

8.1.5.   STATUS SMS Field Reference

The following fields are used in the STATUS SMS text that is sent to the VVM client:

Client prefix

Description: Mandatory field definition dependant on the client. Also see Client prefix in Activate SMS section 8.2.2.

Legal Values: Configurable string, unlimited length, always followed by a colon (:)

Default Value://VVM

Prefix

Description: Determines the SMS type.
This field is always followed by a colon (**:**)

This field is mandatory.

Legal Values: String, maximum six characters
STATUS

Default Value:STATUS

st

Description: Determines the subscriber's provisioning status.
For details about provisioning status transitions, see chapter 7.

This field is mandatory.

Note: Depending on system configuration, the st value may appear between quotation marks.

For example:

st="N"

Legal Values: Maximum length one character
N = Subscriber New
R = Subscriber Ready
P = Subscriber Provisioned

U = Subscriber Unknown

B = Subscriber Blocked

Default Value:N/A

rc

Description: Determines the return code. When the VVM provisioning status is unknown one of the following codes is returned:

Mailbox unknown: The user is unknown by the voicemail system, he does not have any voicemail box provisioned, even with a non-VVM service.

VVM not provisioned: The user has a voicemail box provisioned on the voicemail system, but he does not belong to a class of service allowing him to use the VVM service.

VVM not activated: The user has been provisioned with a VVM service on the system but the VVM service activation has failed.

VVM client unknown: The Client Type or Protocol Version is unknown.

VVM mailbox not initialised: The subscriber's mailbox has not yet been initialized via the TUI, so the VVM service cannot be activated.

This field is mandatory.

Legal Values: Maximum length one character

0 = Success

1 = System error

2 = Subscriber error

3 = Mailbox unknown

4 = VVM not activated

5 = VVM not provisioned

6 = VVM client unknown

7 = VVM mailbox not initialised

Default Value:N/A

rs

Description: Provide a URL.
This URL may be used by the client to reach a server, in order for the user to subscribe to the VVM service.

This field may be returned when the return code (rc) is "VVM not provisioned".

Legal Values: String, maximum 100 characters

Default Value: N/A

srv

Description: Determines the IMAP4/SMTP server IP address or Fully Qualified Domain Name.
This field is mandatory, but is not returned for U and B events (see st).

Legal Values: Prefix followed by VVM server IP address or Fully Qualified Domain Name, maximum length 30 characters.

1:<IP address>

2:<FQDN>

Default Value: N/A

tui

Description: Determines the TUI access number.
This field is mandatory.
The client may use this field to show the visual voicemail TUI number.

Legal Values: A telephone number, up to 16 digits.

Default Value: N/A

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dn

Description: Determines the destination number used for addressing the VVM service. The destination number to be used for a client originating SMS. This number is also configured in the device but may be different in value. The VVM client must always use the latest number received from the server.

This field is mandatory.

This field is not returned for U and B provisioning status (i.e. st=U or st=B).

Legal Values: destination number, maximum length 30 characters.

Default Value:N/A

ipt

Description: Determines the IMAP4 listening port.
This field is mandatory, but is not returned for U and B events (see st).

Legal Values: IMAP4 port, maximum length 10 digits.

Default Value:N/A

spt

Description: Determines the SMTP listening port.
This field is mandatory.

The client may use this field for SMTP deposits.

This field is not returned for U and B provisioning status (i.e. st=U or st=B).

Legal Values: SMTP port, maximum length 10 digits.

Default Value:N/A

u

Description: Determines the IMAP4 user name that is used upon LOGIN, including domain.

This field is mandatory, but is not returned for U and B events (see st).

Legal Values: IMAP4 username, maximum length 50 characters.

Default Value: N/A

pw

Description: Determines the IMAP4 password that is used upon login.

This field is mandatory, but is not returned for U and B events (see st).

Legal Values: IMAP4 password, maximum length 30 characters.

Default Value: N/A

lang

Description: Determines the list of languages supported by the VVM system.
This field is used together with the change language command (see chapter 4).

This field is mandatory, but is not returned for U and B provisioning status (i.e. st=U or st=B).

Legal Values: String, maximum length 36 characters.

Multiple values are separated by a pipe (|).

A language value will be in the following format:
<lang code>.<variant>

The "lang code" is an ISO 639-2 value, 3 characters max

The "variant" is one digit indicating a speech characteristic or accent extension (for example a Man or Woman voice). The variant is optional. The definition of the variant value will be configured in the VVM client and server sides according to the operator policies and requirements.

Example of valid value:
lang=eng.1|eng.2|fre|ita|ger.1|ger.2

Default Value:N/A

g_len

Description: Defines the maximum greeting length allowed, in seconds.

This field is not returned for U and B provisioning status (i.e. st=U or st=B).

This field is mandatory. The client may use the field for the Record Greeting feature (see Guidelines for Greetings and VS Management).

Legal Values: Integer, maximum three digits.

Default Value:N/A

vs_len

Description: Defines the maximum VS length allowed, in seconds.

This field is not returned for U and B provisioning status (i.e. st=U or st=B).

This field is mandatory. The client may use the field for the Record VS feature (see Guidelines for Greetings and VS Management).

Legal Values: Integer, maximum three digits.

Default Value:N/A

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pw_len

Description: Defines the minimum and maximum TUI
password length allowed.
This field is used together with the change Password
command (see chapter 3.1).

This field is not returned for U and B
provisioning status (i.e. st=U or st=B).
This field is mandatory. The client may use
the field for the TUI Password feature (see
TUI Password Changes Interface
Description).

Legal Values: String, maximum five characters, in the
following format:

<min length>-<max length>

Default Value:N/A

smtp_u

Description: Defines the username used upon SMTP
authentication.
This field is mandatory. The client may use it for SMTP
deposits.

This field is not returned for U and B
provisioning status (i.e. st=U or st=B).

Legal Values: String, unlimited length.

Default Value:N/A

smtp_pw

Description: Defines the SMTP password used upon
SMTP authentication.
This field is mandatory. The client may use it for SMTP
deposits.

This field is not returned for U and B
provisioning status (i.e. st=U or st=B).

Legal Values: String, unlimited length.

Default Value:N/A

pm

Description: Defines if the pin code must be reset by the user at the VVM service activation.

This field is mandatory.
This field is sent only for new provisioning status.
This parameter, if set to Yes, does not prevent the client to activate the VVM service, but is an indication which may be used by the client as a condition to close the NUT.

Legal Values: String, Maximum 1 character:

Y
N

Default Value: N

gm

Description: Defines if a personal greeting or a voice signature must be reset by the user at the VVM service activation.

This field is mandatory.
This field is sent only for new provisioning status.
This parameter, if set to Yes, does not prevent the client to activate the VVM service, but is an indication which may be used by the client as a condition to close the NUT.

Legal Values: String, Maximum 1 character

G = normal greeting

V = voice signature

B = Both the normal greeting and the voice signature

N = Neither

Default Value: N

8.1.6. STATUS SMS Field Examples

The following are examples of STATUS SMS notifications:

```
//VVM:STATUS:st=N;rc=0;srv=1:10.115.67.251;tui=123;dn=999;ipt=143;
spt=25; u=78236487@wirelesscarrier.com;pw=32u4yguetrr34;
lang=eng|fre;g_len=25;vs_len=15;pw_len=4-6;
smtp_u=super_user@wirelesscarrier.com;
smtp_pw=48769463wer;pm=Y;gm=N;
```

```
//VVM:STATUS:st=B;rc=0
```

The fields used in STATUS SMS notifications are described in STATUS SMS Field Reference.

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8.1.7. *System Originated SMS Message Characteristics*

The outgoing SMS can be configured on the server according to the client type.

For example, the default SMS configuration of a binary message sent by the server is according to TS23.040. An example of such a message is:

- **ESM class** = 64 (for using UDH)
- **Data coding** = 4 (8-bit encoding)
- **Protocol ID** = 64 (Type 0 message indicating the mobile to acknowledge the message silently)
- **Application Port Addressing scheme in UDH** = 5 (16bit address
- **Destination Application Port Address =** client's listening port on the mobile set by client as defined in Chapter 8.2.2
- **Replace flag** = 1 (replace) for the following service types:
    - o For SYNC SMS messages due to Inbox change
    - o For STATUS and deactivate response SMS messages
    - o For SYNC SMS messages due to Greeting change

These SMS parameters can be customised on the server.

8.2. MOBILE (CLIENT) ORIGINATED SMS MESSAGES

The client can send SMS messages to the server to do the following:

- Query the subscriber's provisioning status, using a STATUS SMS message (see STATUS SMS (Client Originated))
- Activate the service (see Activate SMS (Client Originated)
- Deactivate the service (see Deactivate SMS (Client Originated)

The VVM client sends the SMS messages to a destination number that is configured into the VVM client (see also the field dn in section 8.1.5). Upon receiving the VVM client SMS message, the SMSC finds the relevant VVM system and transfers the received SMS as an AT message. The VVM service then sends a response to the VVM client that sent the original message.

Note: The client must not depend on reliable delivery, and may retry a command that has not returned a response.

8.2.1. STATUS SMS (Client Originated)

The VVM client can send a STATUS SMS message to query the system about the subscriber's provisioning status and service settings.

The following is an example of a client originated STATUS SMS message:

```
STATUS
```

Upon receiving a STATUS query from the client, a STATUS SMS response is returned, as described in STATUS SMS Description (System Originated).

Note: The STATUS SMS message is case-sensitive.

8.2.2. Activate SMS (Client Originated)

The client can send an Activate SMS in the following situations:

- To activate the service (change the VVM provisioning status from Subscriber Provisioned to Subscriber New or Subscriber Ready). Once the service is activated, VVM notifications are sent to the client.
- To inform the server about a new client type, that is specified in the SMS and is saved in the subscriber profile.
- Every time the user puts a new SIMCARD in the mobile to inform the server about the client capabilities.

The following is the Activate SMS message syntax:

```
Activate:pv=<value>;ct=<value>; pt=<value>;<Clientprefix>
```

An Activate SMS message updates the subscriber's VVM provisioning status and some Client information and results in a STATUS SMS, as described in STATUS SMS Description (System Originated).

If the Activate SMS message is not successful, the following failure response is sent:

```
//VVM:STATUS:st=U;rc=<error code>
```

ct

Description: Determines the client type.

This field is mandatory.

Legal Values: String, (up to 30 characters)

Default Value: N/A

Client prefix

Description: This field may be used by the VVM client to change the default client prefix value "//VVM" which is included in the SYNC and STATUS SMS (see sections 8.1.2 and 8.1.5).. If not used by the client in the Activate SMS, the client prefix value sent in SYNC and STATUS SMS will remain as default. As an example, some VVM clients may need the client prefix to include a specific keyword and port number for client wakeup (instead of UDH).

Legal Values: Configurable string (up to 30 characters), always followed by a colon (:)

Default Value: N/A

pt

Description: Application port 16 bit address (as described in 3GPP TS 23.040). This is the destination port number where the client is listening on the mobile. The server may use this value for the destination application port address in the system-originated SMS message (see example in Section 8.1.7).

In case the value is set to 0, the server may not send a binary message but either a legacy message or a different network specific message

It is a mandatory parameter, the value of which is dependant on the client.

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Legal Values: Configurable string, maximum length = 30 characters

1 – 16999: Application port addressing for GSM-networks

0: Non-GSM networks and legacy notifications

Default Value:N/A

pv

Description: Determines the protocol version. For example version 1.2 of the protocol takes the value 12.

This field is mandatory

Legal Values: 10-99

Default Value: 12

8.2.3.   Deactivate SMS (Client Originated)

The client can send a Deactivate SMS message to deactivate the service. No VVM SYNC notifications are sent to the client after service deactivation.

The following is the Deactivate SMS message syntax:

> Deactivate:pv=<value>;ct=<string>

A Deactivate SMS message updates the subscriber's VVM provisioning status and results in a STATUS SMS, as described in STATUS SMS Description (System Originated).

If the Deactivate SMS message is not successful, the following failure response is sent:

> //VVM:STATUS:st=U;rc=<error code>

ct

Description: Determines the client type.

This field is mandatory.

Legal Values: String, up to 30 characters

Default Value:N/A

---

pv

> **Description:** Determines the protocol version. For example version 1.2 takes the value 12.
>
> This field is mandatory.

Legal Values: 10-99

Default Value: 12

9. VVM MESSAGE COMMAND EXAMPLES

The following are VVM command and response examples:

- IMAP4 MD5 Authentication Example
- SMTP MD5 Authentication Example
- Voice Message Example
- Video Message Example
- Fax Message Example
- ECC Message Example
- Number Message Example
- Voice DSN Message Example
- Voice Message Disposition Notification Message Example
- Deposit Voice Message Example
- Greeting Message Example
- Deposit Voice Message Example

9.1. IMAP4 MD5 AUTHENTICATION EXAMPLE

The following example illustrates the use of the required IMAP4 authentication command:

Client: a0001 authenticate digest-md5
cmVhbG09ImVzdTFiLm1zdW5nLnRlc3QiLG5vbmNlPSIyNzlzN
TU4Q0YwQzVGGO
Ul3NjRFRDJCMkU0RDcwNzY
MjExN0ExlixhbGdvcml0aG09Im1kNS1zZXNzlixxb3A9ImF1dG
gi
Client:
dXNlcm5hbWU9InZsYWRAdmxhZC5jb20iLHJlYWxtPSJlc3Ux
Yi5tc3VuZy50ZXN
0lixub25jZT0iMjcyMzU1OE
1RjlCNzY0RUQyQjJFNEQ3MDc2MkVDMjlxMTdBMSlsY25vbm
NlPSJNVGs1T1R
Fek1UTTVMakV3TkRnMk1UXdPVFk9IixuY
wMDAwMSxxb3A9YXV0aCxkaWdlc3QtdXJpPSJpbWFwL2Vzd
TFiLm1zdW5nLnR
lc3QiLHJlc3BvbnNlPWU0Y2NhZDJkYTZiNW
1ODZlZTEzOWY0OTY3ZmU0
Server: +
cnNwYXV0aD1kYjQ0Y2U0ZjdjYzVkZTNlYzkyZmViZWRjOGNlZD
YyMQ==
Client:
Server: a0001 OK login successful

For more information about IMAP4, see RFC 2195.

9.2. SMTP MD5 AUTHENTICATION EXAMPLE

The following example illustrates the use of the required SMTP authentication command:

Client: ehlo mta.example.com
Server: 250-esu1c.example.com
250-DSN
250-8BITMIME
250-PIPELINING
250-HELP
250-AUTH DIGEST-MD5
250-DELIVERBY 300
250-MEDIASIZE text:0Kb voice:0sec fax:0pages number:0bytes
empty-call-capture:0bytes voice-infotainment:0sec
250-SIZE OK
Client: auth digest-md5
Server: 334
cmVhbG09ImVzdTFjLmljb212ZXJzZS5jb20iLG5vbmNlPSJBNz
Q3NTJEOEIwNzE2MzlDN0QzQzBCCNkNDMjE1Mz
QzMzgwNjQzMTZGIixhbGdvcml0aG09Im1kNS1zZXNzIixxb3A9I
mF1dGgi
Client:
dXNlcm5hbWU9InVzZXIxQGguaCIscmVhbG09ImVzdTFjLmljb
212ZXJzZS5
jb20iLG5vbmNlPSJBNzQ3NTJEOEIwNzE2MzlDN0Qz
QzBCCNkNDMjE1MzQzMzgwNjQzMTZGIixjbm9uY2U9Ik1UazVP
VEV6TVRNNU
xqRXdORGcyTVRRNd09UWT0iLG5jPTAwMDAwMDAxLHFv
cD1hdXRoLGRpZ2VzdC11cmk9Im1tYXAvZXN1MWMuaWNvbX
ZlcnNlLmNvbSls
cmVzcG9uc2U9MDQ5ZmRlODI4OTFjMmJhZTE2OTg1
Y2FlYjRmOWRjNTY=
Server: 334 ...
Server: 235 digest-md5 authentication successful

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9.3.   *VOICE MESSAGE EXAMPLE*

The following example illustrates the use of voice message commands:

```
Return-Path: <>
Received: from msuic1 (10.106.145.31) by MIPS.SITE1 (MIPS
Email Server)
id 45879DD300000196 for 11210@vi.com; Tue, 19 Dec 2006
12:12:09 +0200
subject: voice mail
MIME-Version: 1.0 (Voice Version 2.0)
Message-Id: <31.24.2326006@msu31_24>
Content-Type: Multipart/ voice-message; boundary="------------
Boundary-00=_90NIQYRXFQQMYJ0CCJD0"
From: 771004@vi.com
To: 771000@vi.com
Content-Duration: 17
Message-Context: voice-message
Date: Tue, 19 Dec 2006 10:12:09 +0000 (UTC)
--------------Boundary-00=_90NIQYRXFQQMYJ0CCJD0
Content-Type: Text/Plain
Content-Transfer-Encoding: 7bit
click on attachment
--------------Boundary-00=_90NIQYRXFQQMYJ0CCJD0
Content-Type: audio/amr
Content-Transfer-Encoding: base64
Content-Disposition: attachment; filename="vm.amr"
Content-Duration: 17
[message attachment]
--------------Boundary-00=_90NIQYRXFQQMYJ0CCJD0--
```

9.4. VIDEO MESSAGE EXAMPLE

The following example illustrates the use of video message commands:

```
Return-Path: <>
Received: from msuic196 (10.119.37.197) by MIPS.SITE1
(MIPS Email Server)
id 4545A1DF00039933 for 151515@rlcom.com; Wed, 20 Dec
2006 12:13:48 +0200
Subject: video message
MIME-Version: 1.0 (Voice Version 2.0)
Message-Id: <197.195.3706011@msu197_195>
Content-Type: Multipart/Mixed; boundary="------------
Boundary-00=_7XAKIOLYA1UMYJ0CCJD0"
From: 8390@rlcom.com
To: 151515@rlcom.com
Content-Duration: 11
Message-Context: video-message
Date: Wed, 20 Dec 2006 07:46:19 +0000 (UTC)
---------------Boundary-00=_7XAKIOLYA1UMYJ0CCJD0
Content-Type: Text/Plain
Content-Transfer-Encoding: 7bit
Double-click on the attached video file
-------------- Boundary-00=_7XAKIOLYA1UMYJ0CCJD0
Content-Type: video/3gpp; codec="h263_amr"
Content-Transfer-Encoding: base64
Content-Disposition: attachment; filename="fffff2df.3gp"
Content-Duration: 11
[message attachment]
-------------- Boundary-00=_7XAKIOLYA1UMYJ0CCJD0
```

OMTP PUBLISHED

9.5. FAX MESSAGE EXAMPLE

The following example illustrates the use of fax message commands:

```
Return-Path: <>
Received: from msuic1 (10.106.145.31) by MIPS.SITE1 (MIPS
Email Server)
id 458E1FCB0000183B for 111222333@vi.com; Mon, 25 Dec
2006 17:02:06 +0200
subject: fax mail
MIME-Version: 1.0 (Voice Version 2.0)
Message-Id: <31.24.2326073@msu31_24>
Content-Type: Multipart/fax-message; boundary="------------
Boundary-00=_IF4U6KM71OVNTT4D7TH0"
From: 797979@vi.com
To: 111222333@vi.com
X-Content-Pages: 3
Message-Context: fax-message
Date: Mon, 25 Dec 2006 15:02:06 +0000 (UTC)
--------------Boundary-00=_IF4U6KM71OVNTT4D7TH0
Content-Type: Text/Plain
Content-Transfer-Encoding: 7bit
click on attachment
--------------Boundary-00=_IF4U6KM71OVNTT4D7TH0
Content-Type: Application/pdf
Content-Transfer-Encoding: base64
Content-Disposition: attachment; filename="fax123.pdf"
X-Content-Pages: 3
 [message attachment]
--------------Boundary-00=_IF4U6KM71OVNTT4D7TH0--
```

9.6. ECC MESSAGE EXAMPLE

The following example illustrates the use of ECC message commands:

Return-Path: <>
Received: from msuic196 (10.119.37.197) by MIPS.SITE1
(MIPS Email Server)
id 4545A1DF00039C1E for 151515@rlcom.com; Wed, 20 Dec
2006 16:07:41 +0200
subject: empty message
MIME-Version: 1.0 (Voice Version 2.0)
Message-Id: <197.195.3706023@msu197_195>
Content-Type: Text/Plain; boundary="------------ Boundary-
00=_ZQLK6RB00M3NTT4D7TH0"
From: 4504@rlcom.com
To: 151515@rlcom.com
Message-Context: x-empty-call-capture-message
Date: Wed, 20 Dec 2006 11:40:11 +0000 (UTC)
4504

9.7. NUMBER MESSAGE EXAMPLE

The following example illustrates the use of Number message commands:

```
Return-Path: <9699999@system.com>
Received: from aplus2 (172.17.5.44) by mips.system.com
(MIPS Email Server)
id 43EB428D00001AFD for 1111111@system.com; Fri, 10 Feb
2006 13:57:21 +0200
subject: number message
MIME-Version: 1.0 (Voice Version 2.0)
Message-Id: <9.6.4252201@msu9_6>
Content-Type: Text/Plain; boundary="------------ Boundary-
00=_R5EK7W5NTEPOO49D7TH0"
From: message@system.com
To: 1111111@system.com
Message-Context: x-number-message
Date: Fri, 10 Feb 2006 09:58:39 +0200 (IST)
523
```

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9.8. VOICE DSN MESSAGE EXAMPLE

The following example illustrates the use of Delivery Status Notification (DSN):

```
Return-Path: <>
Received: from msuic1 (10.106.145.31) by MIPS.SITE1 (MIPS
Email Server)
id 458A530000000D39 for 11410@vi.com; Fri, 22 Dec 2006
05:02:28 +0200
Message-ID: <458A530000000D39@MIPS.SITE1> (added by
postmaster@MIPS.SITE1)
subject: voice mail
Content-Type: Multipart/report; report-type=delivery-status;
boundary="-------------Boundary-
00=_44NNCQ75B3NNTT4D7TH0"
From: 11310@vi.com
To: 11410@vi.com
Date: Fri, 22 Dec 2006 01:02:28 -0200
This multi-part MIME message contains a Delivery Status
Notification. If you can see this text, your mail client may not
be able to understand MIME formatted messages or DSNs
(see RFC 2045 through 2049 for general MIME information
and RFC 3461, RFC 3463 DSN specific information).
--------------Boundary-00=_44NNCQ75B3NNTT4D7TH0
Content-Type: Text/Plain
--------------Boundary-00=_44NNCQ75B3NNTT4D7TH0
Content-Type: Message/Delivery-Status
Reporting-MTA: smtp; msung.example.com
Final-Recipient: 11310@vi.com
Action: Failed
Status: 5.4.3 (routing server failure)
--------------Boundary-00=_44NNCQ75B3NNTT4D7TH0
Content-Type: Message/rfc822
subject: voice mail
MIME-Version: 1.0 (Voice Version 2.0)
Message-Id: <31.24.2326058@msu31_24>
Content-Type: Multipart/voice-message; boundary="------------
Boundary-00=_44NNHG35B3NNTT4D7TH0"
From: 11410@vi.com
To: 11310@vi.com
```

Content-Duration: 78
Message-Context: voice-message
Date: Tue, 19 Dec 2006 15:02:26 +0000 (UTC)
--------------Boundary-00=_44NNHG35B3NNTT4D7TH0
Content-Type: Text/Plain
Content-Transfer-Encoding: 7bit
--------------Boundary-00=_44NNHG35B3NNTT4D7TH0
Content-Type: audio/vnd.cns.inf1
Content-Transfer-Encoding: base64
Content-Disposition: attachment; filename="3ec6c(null).sbc"
Content-Duration: 78
[message attachment]
--------------Boundary-00=_44NNHG35B3NNTT4D7TH0--

9.9. VOICE MESSAGE DISPOSITION NOTIFICATION MESSAGE EXAMPLE

The following example illustrates the use of Message Disposition Notification (MDN) messages:

> **Return-Path: <>**
> **Received: from aplus2 (172.17.5.44) by mips.system.com (MIPS Email Server)**
> **id 43EF8A6E00000668 for 1111111@system.com; Mon, 13 Feb 2006 14:54:28 +0200**
> **Message-ID: <43EF8A6E00000668@mips.system.com> (added by postmaster@mips.system.com)**
> **subject: voice mail**
> **Content-Type: Multipart/report; report-type=receipt-disposition-notification; boundary="-------------Boundary-00=_XGBMBU3XFQQMYJ0CCJD0"**
> **From: 3333333@system.com**
> **To: 1111111@system.com**
> **Date: Wed, 8 Feb 2006 10:55:45 -2200**
> **This multi-part MIME message contains a Message Disposition Notification. If you can see this text, your mail client may not be able to understand MIME formatted messages or MDNs (see RFC 2045 through 2049 for general MIME information and RFC 3798 for MDN specific information).**
> **--------------Boundary-00=_XGBMBU3XFQQMYJ0CCJD0**
> **Content-Type: Text/Plain**
> **--------------Boundary-00=_XGBMBU3XFQQMYJ0CCJD0**
> **Content-Type: Message/disposition-notification**
> **Final-Recipient: 3333333@system.com**
> **Disposition: manual-action/MDN-sent-automatically; displayed**
> **--------------Boundary-00=_XGBMBU3XFQQMYJ0CCJD0**
> **Content-Type: Message/rfc822**
> **subject: voice mail**
> **MIME-Version: 1.0 (Voice Version 2.0)**
> **Message-Id: <9.6.4278007@msu9_6>**
> **Content-Type: Multipart/voice-message; boundary="------------Boundary-00=_XGBMGJZXFQQMYJ0CCJD0"**
> **From: 1111111@system.com**
> **To: 3333333@system.com**

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Content-Duration: 2
Message-Context: voice-message
Date: Mon, 13 Feb 2006 10:44:36 +0200 (IST)
---------------Boundary-00=_XGBMGJZXFQQMYJ0CCJD0
Content-Type: Text/Plain
Content-Transfer-Encoding: 7bit
---------------Boundary-00=_XGBMGJZXFQQMYJ0CCJD0
Content-Type: audio/vnd.cns.inf1
Content-Transfer-Encoding: base64
Content-Disposition: attachment; filename="48f36.sbc"
Content-Duration: 2
[message attachment]
---------------Boundary-00=_XGBMBU3XFQQMYJ0CCJD0--

OMTP PUBLISHED

9.10. DEPOSIT VOICE MESSAGE EXAMPLE

The following example illustrates the use of a Deposit Voice Message command. In this example, the client deposits an 18-second message.

```
Message-ID:
<10545552.1131961091850.JavaMail.icassagn@I20050329>
Date: Wed, 21 Dec 2005 16:34:50 +0100 (CET)
From: 5000250@example.com
MIME-Version: 1.0
Content-Type: multipart/mixed; boundary="----
=_Part_6_16713087.1135179290661"
Importance: Normal
Message-Context: voice-message
Content-Duration: 18
Expires: Sat, 31 Dec 2005 00:00:00 +0100 (CET)
------=_Part_6_16713087.1135179290661
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 8bit
Open the attached file
------=_Part_6_16713087.1135179290661
Content-Type: Audio/wav; codec=g711a
Content-Transfer-Encoding: base64
Content-Disposition: attachment;
filename="wav_00000002.wav"
Content-Duration: 18
[message attachment]
------=_Part_6_16713087.1135179290661--
```

9.11. GREETING MESSAGE EXAMPLE

The following example illustrates the use of a greeting message:

```
X-CNS-Greeting-Type: normal-greeting
Message-ID: <1232456789.example4u@MGU_5>
Date: Thu, 27 Mar 2008 17:37:02 +0200
From: 3333333@system.com
To: 1111111@system.com
Subject: append personalised greeting
Mime-Version: 1.0
Content-Type: multipart/mixed;
boundary="----=_Part_10_6838114.1062660453543"
Content-Duration: 8
------=_Part_10_6838114.1062660453543
Content-Type: Audio/AMR;
name="greeting.amr"
Content-Transfer-Encoding: base64
Content-Disposition: attachment; size=3724;
filename="greeting.amr"
[message attachment]
------=_Part_10_6838114.1062660453543--
```

9.12. VS MESSAGE EXAMPLE

The following example illustrates the use of a VS message:

```
X-CNS-Greeting-Type: voice-signature
Message-ID: <1232456789.example4u@MGU_5>
Date: Thu, 27 Mar 2008 17:37:02 +0200
From: 3333333@system.com
To: 1111111@system.com
Subject: append VOICE SIGNATURE
Mime-Version: 1.0
Content-Type: multipart/mixed;
boundary="----=_Part_10_6838114.1062660453543"
Content-Duration: 8
------=_Part_10_6838114.1062660453543
Content-Type: audio/qcelp; name=vs.qcp
Content-Transfer-Encoding: base64
Content-Disposition: attachment; filename=vs.qcp
[message attachment]
------=_Part_10_6838114.1062660453543--
```

10. REFERENCE

The VVM service complies with the following RFC standards:

- RFC Compliance Related to Internet Mail
- RFC Compliance Related to IMAP4
- RFC Compliance Related to SMTP

and also refers to **3GPP TS23.040** Technical realization of Short Message Service (SMS)

10.1. RFC COMPLIANCE RELATED TO INTERNET MAIL

The VVM service complies with the following RFCs related to Internet Mail:

- **RFC 2045**: Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies (renders obsolete RFCs 1521, 1522, 1590)
- **RFC 2046**: Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types
- **RFC 2195:** IMAP/POP AUTHorize Extension for Simple Challenge/Response
- **RFC 2821**: Simple Mail Transfer Protocol (renders obsolete RFCs 821, 974, 1869)
- **RFC 2822**: Internet Message Format
- **RFC 2831**: Using Digest Authentication as a SASL Mechanism
- **RFC 3458:** Message Context for Internet Mail
- **RFC 3461:** Simple Mail Transfer Protocol (SMTP) Service Extension for Delivery Status Notifications (DSNs)
- **RFC 3798**: An Extensible Message Format of MIME content-type for Message Disposition Notifications

10.2. RFC COMPLIANCE RELATED TO IMAP4

The VVM service complies with the following RFCs related to IMAP4:

- **RFC 3501**: Internet Message Access Protocol: Version 4, rev. 1
- **RFC 2087**: IMAP4 QUOTA extension
- **RFC 4315:** Internet Message Access Protocol (IMAP) - UIDPLUS extension
- **RFC 5464:** The IMAP METADATA Extension

10.3. RFC COMPLIANCE RELATED TO SMTP

The VVM service complies with the following RFCs related to SMTP:

- **RFC 2554**: SMTP Service Extension for Authentication
- **RFC 3463**: Enhanced Mail System Status Codes for Delivery Reports.

3 ABBREVIATIONS

ABBREVIATION	DESCRIPTION
CLI	Calling Line Identification
DSN	Delivery Status Notification
ECC	Empty Call Capture
IMAP	Internet Message Access Protocol
MDN	Message Disposition Notification
MD5	Message-Digest algorithm 5
MIME	Multi-purpose Internet Mail Extension
MSISDN	Mobile Subscriber Integrated Services Digital Network Number
NUT	New User Tutorial
RFC	Request For Change
SMPP	Short Message Peer to Peer
SMS	Short Message Service
SMSC	Short Message Service Centre
SMTP	Simple Mail Transfer Protocol
SSL	Secure Sockets Layer
TLS	Transport Layer Security
TUI	Telephony User Interface
VS	Voice Signature
VVM	Visual Voice Mail