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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.

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

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.
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.

<table>
<thead>
<tr>
<th>Error</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO unknown user</td>
<td>The subscriber can not be located in the system.</td>
</tr>
<tr>
<td>NO unknown client</td>
<td>The Client Type or Protocol Version is unknown.</td>
</tr>
<tr>
<td>NO invalid password</td>
<td>The password received from the client does not match the password defined in the subscriber's profile.</td>
</tr>
<tr>
<td>NO mailbox not initialized</td>
<td>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).</td>
</tr>
<tr>
<td>NO service is not provisioned</td>
<td>The subscriber has not been provisioned for the VVM service.</td>
</tr>
<tr>
<td>NO service is not activated</td>
<td>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)</td>
</tr>
<tr>
<td>NO user is blocked</td>
<td>The Voice Mail Blocked flag in the subscriber's profile is set to YES.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>GreetingTypesAllowed</td>
<td>Comma Separated List of zero or more of:</td>
<td>This parameter defines the list of the greeting announcements supported by the VVM server.</td>
</tr>
<tr>
<td></td>
<td>- personal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- voiceSignature</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- busyGreeting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- noAnswerGreeting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- extendedAbsenceGreeting</td>
<td></td>
</tr>
</tbody>
</table>

**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:

```
```

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
Greetings messages = Length in seconds
STORAGE = Size in KB
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:
<table>
<thead>
<tr>
<th>Variable</th>
<th>Values</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accept</td>
<td>A list of the media formats supported by the VVM client.</td>
<td>This parameter defines the media formats supported by the client.</td>
</tr>
<tr>
<td></td>
<td>Legal values:</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>List of one or more voice media types listed in Table 5 separated by a comma (,).</td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Attachment Type</th>
<th>File Formats</th>
<th>MIME Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voice and Greeting</td>
<td>AMR 12200</td>
<td>audio/amr</td>
</tr>
<tr>
<td>attachments</td>
<td>WAV g711a</td>
<td>audio/wav; codec=&quot;g711a&quot;</td>
</tr>
<tr>
<td></td>
<td>WAV g711u</td>
<td>audio/wav; codec=&quot;g711u&quot;</td>
</tr>
<tr>
<td></td>
<td>QCELP 13300</td>
<td>audio/qcelp</td>
</tr>
<tr>
<td></td>
<td>EVRC, 13000</td>
<td>audio/evrc</td>
</tr>
<tr>
<td>Video attachments</td>
<td>3gpp h263_amr</td>
<td>video/3gpp; codec=&quot;h263_amr&quot;</td>
</tr>
<tr>
<td>Fax attachments</td>
<td>PDF</td>
<td>application/pdf</td>
</tr>
<tr>
<td>Scripted Text</td>
<td>Text</td>
<td>plain/text</td>
</tr>
</tbody>
</table>

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
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
**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
**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 transcribed attachment.

**Legal Values:** Source-ID= <id>, id value MUST equal to the value of Content-ID header of the transcribed body part
2. **Message Deposit Interface Description**

The VVM service supports voice message deposit via the SMTP protocol as described in RFC2821. SMTP authentication, as described in RFC 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
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
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=&lt;Language number&gt;**

The change language request syntax includes the following parameter:

<table>
<thead>
<tr>
<th><strong>Lang</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong> 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.</td>
</tr>
</tbody>
</table>
| **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
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.

Greetings 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)).
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 \(\text{($)CNS-Greeting-On}\) 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.

<table>
<thead>
<tr>
<th>Header</th>
<th>Description</th>
<th>Legal Values</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>X-CNS-Greeting-Type</td>
<td>Determines the greeting type. This header is mandatory.</td>
<td>normal-greeting</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>voice-signature</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>busy-greeting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>extended-absence-greeting</td>
<td>If this greeting is flagged “on”, it takes precedence over “normal” and “no-answer” greetings.</td>
</tr>
</tbody>
</table>

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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.

<table>
<thead>
<tr>
<th>Subscriber Provisioning Status</th>
<th>Description</th>
<th>VVM Service Impact</th>
</tr>
</thead>
</table>
| 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).
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.
Legal Values: New message UID, maximum 21 digits
Default Value: N/A

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

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

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.
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
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
**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
**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
**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
**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

**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.
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:
  - For SYNC SMS messages due to Inbox change
  - For STATUS and deactivate response SMS messages
  - 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>
```
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.
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

ov

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>

c

Description: Determines the client type.
This field is mandatory.
Legal Values: String, up to 30 characters
Default Value:N/A
**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
cmVhbG09ImVzdTFiLm1zdW5nLnRlc3QiLGM5vbmNlPSIyNzIzNTQxQ0YwQ2YwQ1M1QzAhQ0E4Qzc5QTBZQjc4NjQ2Q2MxNTk5QjJhMjg1MTY4QzA5QjliOTg2QzA=
   g
Client:
dXNlc3hbWU9InZsYWRAdmxhZC5jb20iLHJlYWxtPSJljic3Ux
Yi5tc3VuZy50ZXN
   i
Client:
dXNlc3hbWU9InZsYWRAdmxhZC5jb20iLHJlYWxtPSJljic3Ux
Yi5tc3VuZy50ZXN
   i
Server: +
cnNwYXV0aD1kYjQ0Y2U0ZjdjYzVkZTNlYzkyZmViOGNlZDJyMQ==
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
cmVhbG09ImVzdTFjLmljb212ZXJzZS5jb20iLGL5vbmlNIPJBNz
Q3NTJEOElwNzE2MzlDN0QzQzBCkNDMjE1Mz
QzMzgwNjQzMTZGiixhbGdvcml0aG09Im1kNS1zZXNzlixxb3A9I
mF1dGgi
Client: dXNlc3NhWdZWJXl0WGByaCIscmVhbG09ImVzdTFjLmljb212ZXJzZS5
jb20iLGL5vbmlNIPJBNzQ3NTJEOElwNzE2MzlDN0Qz
QzBCkNDMjE1MzQzMzgwNjQzMTZGiixjb20iLGRpZ2VuY2U9Iiw0
LGM9Iiw0YzI0Iixib3A9Im1kNS1zZXNzlixxb3A9I
mF1dGgi
Server: 334 ...
Server: 235 digest-md5 authentication successful
```
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
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)
```

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
```
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
```
Content-Duration: 2
Message-Context: voice-message
Date: Mon, 13 Feb 2006 10:44:36 +0200 (IST)
----------Boundary-00=_XGBMGJZXFFQMYJ0CCJD0
Content-Type: Text/Plain
Content-Transfer-Encoding: 7bit
----------Boundary-00=_XGBMGJZXFFQMYJ0CCJD0
Content-Type: audio/vnd.cns.inf1
Content-Transfer-Encoding: base64
Content-Disposition: attachment; filename="48f36.sbc"
Content-Duration: 2
[message attachment]
----------Boundary-00=_XGBMBU3XFQMYJ0CCJD0--
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@l20050329>
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 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

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