This file documents the Emacs MIME interface functionality.


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Emacs MIME

This manual documents the libraries used to compose and display MIME messages.

This manual is directed at users who want to modify the behavior of the MIME encoding/decoding process or want a more detailed picture of how the Emacs MIME library works, and people who want to write functions and commands that manipulate MIME elements.

MIME is short for *Multipurpose Internet Mail Extensions*. This standard is documented in a number of RFCs; mainly RFC2045 (Format of Internet Message Bodies), RFC2046 (Media Types), RFC2047 (Message Header Extensions for Non-ASCII Text), RFC2048 (Registration Procedures), RFC2049 (Conformance Criteria and Examples). It is highly recommended that anyone who intends writing MIME-compliant software read at least RFC2045 and RFC2047.
1 Decoding and Viewing

This chapter deals with decoding and viewing MIME messages on a higher level.

The main idea is to first analyze a MIME article, and then allow other programs to do things based on the list of handles that are returned as a result of this analysis.

1.1 Dissection

The \texttt{mm-dissect-buffer} is the function responsible for dissecting a MIME article. If given a multipart message, it will recursively descend the message, following the structure, and return a tree of MIME handles that describes the structure of the message.

1.2 Non-MIME

Gnus also understands some non-MIME attachments, such as postscript, uuencode, binhex, yenc, shar, forward, gnatsweb, pgp, diff. Each of these features can be disabled by add an item into \texttt{mm-uu-configure-list}. For example,

\begin{verbatim}
(require 'mm-uu)
(add-to-list 'mm-uu-configure-list '(pgp-signed . disabled))
\end{verbatim}

\begin{itemize}
\item \texttt{postscript} - PostScript file.
\item \texttt{uu} - Uuencoded file.
\item \texttt{binhex} - Binhex encoded file.
\item \texttt{yenc} - Yenc encoded file.
\item \texttt{shar} - Shar archive file.
\item \texttt{forward} - Non-MIME forwarded message.
\item \texttt{gnatsweb} - Gnatsweb attachment.
\item \texttt{pgp-signed} - PGP signed clear text.
\item \texttt{pgp-encrypted} - PGP encrypted clear text.
\item \texttt{pgp-key} - PGP public keys.
\item \texttt{emacs-sources} - Emacs source code. This item works only in the groups matching \texttt{mm-uu-emacs-sources-regexp}.
\item \texttt{diff} - Patches. This is intended for groups where diffs of committed files are automatically sent to. It only works in groups matching \texttt{mm-uu-diff-groups-regexp}.
\item \texttt{verbatim-marks} - Slrn-style verbatim marks.
\item \texttt{LaTeX} - \LaTeX{} documents. It only works in groups matching \texttt{mm-uu-tex-groups-regexp}.
\end{itemize}
Some inlined non-MIME attachments are displayed using the face \texttt{mm uu extract}. By default, no MIME button for these parts is displayed. You can force displaying a button using \texttt{K b (gnus-summary-display-buttonized)} or add \texttt{text/x-verbatim} to \texttt{gnus-buttonized-mime-types}, See Section “MIME Commands” in \textit{Gnus Manual}.

1.3 Handles

A MIME handle is a list that fully describes a MIME component.

The following macros can be used to access elements in a handle:

\begin{itemize}
\item \texttt{mm-handle-buffer}\texttt{}\texttt{\textbackslash \texttt{R}eturn the buffer that holds the contents of the undecoded MIME part.}
\item \texttt{mm-handle-type}\texttt{}\texttt{\textbackslash \texttt{R}eturn the parsed Content-Type of the part.}
\item \texttt{mm-handle-encoding}\texttt{}\texttt{\textbackslash \texttt{R}eturn the Content-Transfer-Encoding of the part.}
\item \texttt{mm-handle-undisplayer}\texttt{}\texttt{\textbackslash \texttt{R}eturn the object that can be used to remove the displayed part (if it has been displayed).}
\item \texttt{mm-handle-set-undisplayer}\texttt{}\texttt{\textbackslash \texttt{S}et the undisplayer object.}
\item \texttt{mm-handle-disposition}\texttt{}\texttt{\textbackslash \texttt{R}eturn the parsed Content-Disposition of the part.}
\item \texttt{mm-get-content-id}\texttt{}\texttt{\textbackslash \texttt{R}eturns the handle(s) referred to by Content-ID.}
\end{itemize}

1.4 Display

Functions for displaying, removing and saving.

\begin{itemize}
\item \texttt{mm-display-part}\texttt{}\texttt{\textbackslash \texttt{D}isplay the part.}
\item \texttt{mm-remove-part}\texttt{}\texttt{\textbackslash \texttt{R}emove the part (if it has been displayed).}
\item \texttt{mm-inlinable-p}\texttt{}\texttt{\textbackslash \texttt{S}ay whether a MIME type can be displayed inline.}
\item \texttt{mm-automatic-display-p}\texttt{}\texttt{\textbackslash \texttt{S}ay whether a MIME type should be displayed automatically.}
\item \texttt{mm-destroy-part}\texttt{}\texttt{\textbackslash \texttt{F}ree all resources occupied by a part.}
\item \texttt{mm-save-part}\texttt{}\texttt{\textbackslash \texttt{O}ffer to save the part in a file.}
\item \texttt{mm-pipe-part}\texttt{}\texttt{\textbackslash \texttt{O}ffer to pipe the part to some process.}
\end{itemize}
mm-interactively-view-part
Prompt for a mailcap method to use to view the part.

1.5 Display Customization

mm-inline-media-tests
This is an alist where the key is a MIME type, the second element is a function
to display the part inline (i.e., inside Emacs), and the third element is a form
to be eval to say whether the part can be displayed inline.
This variable specifies whether a part can be displayed inline, and, if so, how
to do it. It does not say whether parts are actually displayed inline.

mm-inlined-types
This, on the other hand, says what types are to be displayed inline, if they
satisfy the conditions set by the variable above. It’s a list of MIME media
types.

mm-automatic-display
This is a list of types that are to be displayed “automatically”, but only if
the above variable allows it. That is, only inlinable parts can be displayed
automatically.

mm-automatic-external-display
This is a list of types that will be displayed automatically in an external viewer.

mm-keep-viewer-alive-types
This is a list of media types for which the external viewer will not be killed
when selecting a different article.

mm-attachment-override-types
Some MIME agents create parts that have a content-disposition of ‘attachment’.
This variable allows overriding that disposition and displaying the part inline.
(Note that the disposition is only overridden if we are able to, and want to,
display the part inline.)

mm-discouraged-alternatives
List of MIME types that are discouraged when viewing ‘multipart/alternative’. Viewing agents are supposed to view the last possible part of a message,
as that is supposed to be the richest. However, users may prefer other
types instead, and this list says what types are most unwanted. If, for
instance, ‘text/html’ parts are very unwanted, and ‘text/richtext’ parts
are somewhat unwanted, you could say something like:

(setq mm-discouraged-alternatives
  ’("text/html" "text/richtext")
  mm-automatic-display
  (remove "text/html" mm-automatic-display))

Adding "image/.*" might also be useful. Spammers use images as the preferred
part of ‘multipart/alternative’ messages, so you might not notice there are
other parts. See also gnus-buttonized-mime-types, Section “MIME Com-
mands” in Gnus Manual. After adding "multipart/alternative" to gnus-
**buttonized-mime-types** you can choose manually which alternative you’d like to view. For example, you can set those variables like:

```
(setq gnus-buttonized-mime-types
  '("multipart/alternative" "multipart/signed")
mm-discouraged-alternatives
  '("text/html" "image/.*"))
```

In this case, Gnus will display radio buttons for such a kind of spam message as follows:

1. (**) multipart/alternative  ( ) image/gif

2. (**) text/plain  ( ) text/html

**mm-inline-large-images**

When displaying inline images that are larger than the window, Emacs does not enable scrolling, which means that you cannot see the whole image. To prevent this, the library tries to determine the image size before displaying it inline, and if it doesn’t fit the window, the library will display it externally (e.g., with ‘ImageMagick’ or ‘xv’). Setting this variable to t disables this check and makes the library display all inline images as inline, regardless of their size. If you set this variable to resize, the image will be displayed resized to fit in the window, if Emacs has the ability to resize images.

**mm-inline-large-images-proportion**

The proportion used when resizing large images.

**mm-inline-override-types**

**mm-inlined-types** may include regular expressions, for example to specify that all ‘text/.*’ parts be displayed inline. If a user prefers to have a type that matches such a regular expression be treated as an attachment, that can be accomplished by setting this variable to a list containing that type. For example assuming **mm-inlined-types** includes ‘text/.*’, then including ‘text/html’ in this variable will cause ‘text/html’ parts to be treated as attachments.

**mm-text-html-renderer**

This selects the function used to render HTML. The predefined renderers are selected by the symbols gnus-article-html, w3m¹, links, lynx, w3m-standalone or html2text. If nil use an external viewer. You can also specify a function, which will be called with a MIME handle as the argument.

**mm-inline-text-html-with-images**

Some HTML mails might have the trick of spammers using ‘<img>’ tags. It is likely to be intended to verify whether you have read the mail. You can prevent your personal information from leaking by setting this option to nil (which is the default). For emacs-w3m, you may use the command t on the image anchor to show an image even if it is nil.²

---

¹ See [http://emacs-w3m.namazu.org/](http://emacs-w3m.namazu.org/) for more information about emacs-w3m

² The command T will load all images. If you have set the option w3m-key-binding to info, use i or I instead.
mm-w3m-safe-url-regexp
A regular expression that matches safe URL names, i.e., URLs that are unlikely to leak personal information when rendering HTML email (the default value is "\'cid:'"). If nil consider all URLs safe. In Gnus, this will be overridden according to the value of the variable gnus-safe-html-newsgroups, See Section “Various Various” in Gnus Manual.

mm-inline-text-html-with-w3m-keymap
You can use emacs-w3m command keys in the inlined text/html part by setting this option to non-nil. The default value is t.

mm-external-terminal-program
The program used to start an external terminal.

mm-enable-external
Indicate whether external MIME handlers should be used.
If t, all defined external MIME handlers are used. If nil, files are saved to disk (mailcap-save-binary-file). If it is the symbol ask, you are prompted before the external MIME handler is invoked.

When you launch an attachment through mailcap (see Section 4.12 [mailcap], page 27) an attempt is made to use a safe viewer with the safest options—this isn’t the case if you save it to disk and launch it in a different way (command line or double-clicking). Anyhow, if you want to be sure not to launch any external programs, set this variable to nil or ask.

1.6 Files and Directories

mm-default-directory
The default directory for saving attachments. If nil use default-directory.

mm-tmp-directory
Directory for storing temporary files.

mm-file-name-rewrite-functions
A list of functions used for rewriting file names of MIME parts. Each function is applied successively to the file name. Ready-made functions include

mm-file-name-delete-control
Delete all control characters.

mm-file-name-delete-gotchas
Delete characters that could have unintended consequences when used with flawed shell scripts, i.e., ‘|’, ‘>’ and ‘<’; and ‘-’, ‘.’ as the first character.

mm-file-name-delete-whitespace
Remove all whitespace.

mm-file-name-trim-whitespace
Remove leading and trailing whitespace.

mm-file-name-collapse-whitespace
Collapse multiple whitespace characters.
mm-file-name-replace-whitespace

Replace whitespace with underscores. Set the variable mm-file-name-replace-whitespace to any other string if you do not like underscores.

The standard Emacs functions capitalize, downcase, upcase and upcase-initials might also prove useful.

mm-path-name-rewrite-functions

List of functions used for rewriting the full file names of MIME parts. This is used when viewing parts externally, and is meant for transforming the absolute name so that non-compliant programs can find the file where it’s saved.

1.7 New Viewers

Here’s an example viewer for displaying text/enriched inline:

(defun mm-display-enriched-inline (handle)
  (let (text)
    (with-temp-buffer
      (mm-insert-part handle)
      (save-window-excursion
        (enriched-decode (point-min) (point-max))
        (setq text (buffer-string)))
      (mm-insert-inline handle text)))

We see that the function takes a MIME handle as its parameter. It then goes to a temporary buffer, inserts the text of the part, does some work on the text, stores the result, goes back to the buffer it was called from and inserts the result.

The two important helper functions here are mm-insert-part and mm-insert-inline. The first function inserts the text of the handle in the current buffer. It handles charset and/or content transfer decoding. The second function just inserts whatever text you tell it to insert, but it also sets things up so that the text can be “undisplayed” in a convenient manner.
2 Composing

Creating a MIME message is boring and non-trivial. Therefore, a library called mml has been defined that parses a language called MML (MIME Meta Language) and generates MIME messages.

The main interface function is mml-generate-mime. It will examine the contents of the current (narrowed-to) buffer and return a string containing the MIME message.

2.1 Simple MML Example

Here’s a simple ‘multipart/alternative’:

```
<#multipart type=alternative>
  This is a plain text part.
  <#part type=text/enriched>
    <center>This is a centered enriched part</center>
  </#part>
</#multipart>
```

After running this through mml-generate-mime, we get this:

```
Content-Type: multipart/alternative; boundary="=-=-="

--=-=-=

This is a plain text part.

--=-=-=

Content-Type: text/enriched

<center>This is a centered enriched part</center>

--=-=-=-=-
```

2.2 MML Definition

The MML language is very simple. It looks a bit like an SGML application, but it’s not.

The main concept of MML is the part. Each part can be of a different type or use a different charset. The way to delineate a part is with a ‘<#part ...>’ tag. Multipart parts can be introduced with the ‘<#multipart ...>’ tag. Parts are ended by the ‘<#/part>’ or ‘<#/multipart>’ tags. Parts started with the ‘<#part ...>’ tags are also closed by the next open tag.

There’s also the ‘<#external ...>’ tag. These introduce ‘external/message-body’ parts.

Each tag can contain zero or more parameters on the form ‘parameter=value’. The values may be enclosed in quotation marks, but that’s not necessary unless the value contains white space. So ‘filename=/home/user/#hello$"yes’ is perfectly valid.
The following parameters have meaning in MML; parameters that have no meaning are ignored. The MML parameter names are the same as the MIME parameter names; the things in the parentheses say which header it will be used in.

‘type’ The MIME type of the part (Content-Type).

‘filename’ Use the contents of the file in the body of the part (Content-Disposition).

‘recipient-filename’ Use this as the file name in the generated MIME message for the recipient. That is, even if the file is called ‘foo.txt’ locally, use this name instead in the Content-Disposition in the sent message.

‘charset’ The contents of the body of the part are to be encoded in the character set specified (Content-Type). See Section 2.5 [Charset Translation], page 14.

‘name’ Might be used to suggest a file name if the part is to be saved to a file (Content-Type).

‘disposition’ Valid values are ‘inline’ and ‘attachment’ (Content-Disposition).

‘encoding’ Valid values are ‘7bit’, ‘8bit’, ‘quoted-printable’ and ‘base64’ (Content-Transfer-Encoding). See Section 2.5 [Charset Translation], page 14.

‘description’ A description of the part (Content-Description).

‘creation-date’ RFC822 date when the part was created (Content-Disposition).

‘modification-date’ RFC822 date when the part was modified (Content-Disposition).

‘read-date’ RFC822 date when the part was read (Content-Disposition).

‘recipients’ Who to encrypt/sign the part to. This field is used to override any auto-detection based on the To/CC headers.

‘sender’ Identity used to sign the part. This field is used to override the default key used.

‘size’ The size (in octets) of the part (Content-Disposition).

‘sign’ What technology to sign this MML part with (smime, pgp or pgpmime)

‘encrypt’ What technology to encrypt this MML part with (smime, pgp or pgpmime)

Parameters for ‘text/plain’:

‘format’ Formatting parameter for the text, valid values include ‘fixed’ (the default) and ‘flowed’. Normally you do not specify this manually, since it requires the textual body to be formatted in a special way described in RFC 2646. See Section 2.7 [Flowed text], page 15.
Parameters for `application/octet-stream`:

`type`   Type of the part; informal—meant for human readers (Content-Type).

Parameters for `message/external-body`:

`access-type`  A word indicating the supported access mechanism by which the file may be obtained. Values include `ftp`, `anon-ftp`, `tftp`, `localfile`, and `mailserver`. (Content-Type.)

`expiration`   The RFC822 date after which the file may no longer be fetched. (Content-Type.)

`size`          The size (in octets) of the file. (Content-Type.)

`permission`  Valid values are `read` and `read-write` (Content-Type).

Parameters for `sign=smime`:

`keyfile`  File containing key and certificate for signer.

Parameters for `encrypt=smime`:

`certfile`  File containing certificate for recipient.

### 2.3 Advanced MML Example

Here’s a complex multipart message. It’s a `multipart/mixed` that contains many parts, one of which is a `multipart/alternative`.

```xml
<#multipart type=mixed>
  <#part type=image/jpeg filename="/rms.jpg" disposition=inline>
  <#multipart type=alternative>
  This is a plain text part.
  <#part type=text/enriched name=enriched.txt>
  <center>This is a centered enriched part</center>
  </#multipart>
  This is a new plain text part.
  <#part disposition=attachment>
  This plain text part is an attachment.
  </#multipart>
  </#multipart>
This is a new plain text part.
  <#part disposition=attachment>
  This plain text part is an attachment.
  </#multipart>
</#multipart>
```

And this is the resulting MIME message:

```
Content-Type: multipart/mixed; boundary="--=-=-=

--=-=-=
```
2.4 Encoding Customization

**mm-body-charset-encoding-alist**

Mapping from MIME charset to encoding to use. This variable is usually used except, e.g., when other requirements force a specific encoding (digitally signed messages require 7bit encodings). The default is

```lisp
((iso-2022-jp . 7bit)
 (iso-2022-jp-2 . 7bit)
 (utf-16 . base64)
 (utf-16be . base64)
 (utf-16le . base64))
```

As an example, if you do not want to have ISO-8859-1 characters quoted-printable encoded, you may add `(iso-8859-1 . 8bit)` to this variable. You can override this setting on a per-message basis by using the `encoding` MML tag (see Section 2.2 [MML Definition], page 9).

**mm-coding-system-priorities**

Prioritize coding systems to use for outgoing messages. The default is `nil`, which means to use the defaults in Emacs, but is `(iso-8859-1 iso-2022-jp utf-8)` when running Emacs in the Japanese language environment. It is a list of coding system symbols (aliases of coding systems are also allowed, use `M-x describe-coding-system` to make sure you are specifying correct coding system names). For example, if you have configured Emacs to prefer UTF-8, but wish that outgoing messages should be sent in ISO-8859-1 if possible, you can set this variable to `(iso-8859-1)`. You can override this setting on a per-message basis by using the `charset` MML tag (see Section 2.2 [MML Definition], page 9).

As different hierarchies prefer different charsets, you may want to set `mm-coding-system-priorities` according to the hierarchy in Gnus. Here’s an example:

```lisp
(add-to-list 'gnus-newsgroup-variables 'mm-coding-system-priorities)
(setq gnus-parameters
  (nconc
   ;; Some charsets are just examples!
   ;"^"cn\\." ;; Chinese
   (mm-coding-system-priorities
    '(iso-8859-1 cn-big5 chinese-iso-7bit utf-8))
   "^"cz\\.\"\"pl\".\" ;; Central and Eastern European
   (mm-coding-system-priorities '(iso-8859-2 utf-8))))```
mm-content-transfer-encoding-defaults

Mapping from MIME types to encoding to use. This variable is usually used except, e.g., when other requirements force a safer encoding (digitally signed messages require 7bit encoding). Besides the normal MIME encodings, qp-or-base64 may be used to indicate that for each case the most efficient of quoted-printable and base64 should be used.

qp-or-base64 has another effect. It will fold long lines so that MIME parts may not be broken by MTA. So do quoted-printable and base64.

Note that it affects body encoding only when a part is a raw forwarded message (which will be made by gnus-summary-mail-forward with the arg 2 for example) or is neither the 'text/*' type nor the 'message/*' type. Even though in those cases, you can override this setting on a per-message basis by using the encoding MML tag (see Section 2.2 [MML Definition], page 9).

mm-use-ultra-safe-encoding

When this is non-nil, it means that textual parts are encoded as quoted-printable if they contain lines longer than 76 characters or starting with "From " in the body. Non-7bit encodings (8bit, binary) are generally disallowed. This reduce the probability that a non-8bit clean MTA or MDA changes the message. This should never be set directly, but bound by other functions when necessary (e.g., when encoding messages that are to be digitally signed).

2.5 Charset Translation

During translation from MML to MIME, for each MIME part which has been composed inside Emacs, an appropriate charset has to be chosen.

If you are running a non-MULE Emacs, this process is simple: If the part contains any non-ASCII (8-bit) characters, the MIME charset given by mail-parse-charset (a symbol) is used. (Never set this variable directly, though. If you want to change the default charset, please consult the documentation of the package which you use to process MIME messages. See Section “Various Message Variables” in Message Manual, for example.) If there are only ASCII characters, the MIME charset US-ASCII is used, of course.

Things are slightly more complicated when running Emacs with MULE support. In this case, a list of the MULE charsets used in the part is obtained, and the MULE charsets are translated to MIME charsets by consulting the table provided by Emacs itself or the variable mm-mime-mule-charset-alist for XEmacs. If this results in a single MIME charset, this
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is used to encode the part. But if the resulting list of MIME charsets contains more than one element, two things can happen: If it is possible to encode the part via UTF-8, this charset is used. (For this, Emacs must support the utf-8 coding system, and the part must consist entirely of characters which have Unicode counterparts.) If UTF-8 is not available for some reason, the part is split into several ones, so that each one can be encoded with a single MIME charset. The part can only be split at line boundaries, though—if more than one MIME charset is required to encode a single line, it is not possible to encode the part.

When running Emacs with MULE support, the preferences for which coding system to use is inherited from Emacs itself. This means that if Emacs is set up to prefer UTF-8, it will be used when encoding messages. You can modify this by altering the mm-coding-system-priorities variable though (see Section 2.4 [Encoding Customization], page 13).

The charset to be used can be overridden by setting the charset MML tag (see Section 2.2 [MML Definition], page 9) when composing the message.

The encoding of characters (quoted-printable, 8bit, etc.) is orthogonal to the discussion here, and is controlled by the variables mm-body-charset-encoding-alist and mm-content-transfer-encoding-defaults (see Section 2.4 [Encoding Customization], page 13).

2.6 Conversion

A (multipart) MIME message can be converted to MML with the mime-to-mml function. It works on the message in the current buffer, and substitutes MML markup for MIME boundaries. Non-textual parts do not have their contents in the buffer, but instead have the contents in separate buffers that are referred to from the MML tags.

An MML message can be converted back to MIME by the mml-to-mime function.

These functions are in certain senses “lossy”—you will not get back an identical message if you run mime-to-mml and then mml-to-mime. Not only will trivial things like the order of the headers differ, but the contents of the headers may also be different. For instance, the original message may use base64 encoding on text, while mml-to-mime may decide to use quoted-printable encoding, and so on.

In essence, however, these two functions should be the inverse of each other. The resulting contents of the message should remain equivalent, if not identical.

2.7 Flowed text

The Emacs MIME library will respect the use-hard-newlines variable (see Section “Hard and Soft Newlines” in Emacs Manual) when encoding a message, and the “format=flowed” Content-Type parameter when decoding a message.

On encoding text, regardless of use-hard-newlines, lines terminated by soft newline characters are filled together and wrapped after the column decided by fill-flowed-encode-column. Quotation marks (matching ‘->* ??’) are respected. The variable controls how the text will look in a client that does not support flowed text, the default is to wrap after 66 characters. If hard newline characters are not present in the buffer, no flow encoding occurs.

You can customize the value of the mml-enable-flowed variable to enable or disable the flowed encoding usage when newline characters are present in the buffer.
On decoding flowed text, lines with soft newline characters are filled together and wrapped after the column decided by \texttt{fill-flowed-display-column}. The default is to wrap after \texttt{fill-column}.

\texttt{mm-fill-flowed}

If non-\texttt{nil} a format=flowed article will be displayed flowed.
3 Interface Functions

The mail-parse library is an abstraction over the actual low-level libraries that are described in the next chapter.

Standards change, and so programs have to change to fit in the new mold. For instance, RFC2045 describes a syntax for the Content-Type header that only allows ASCII characters in the parameter list. RFC2231 expands on RFC2045 syntax to provide a scheme for continuation headers and non-ASCII characters.

The traditional way to deal with this is just to update the library functions to parse the new syntax. However, this is sometimes the wrong thing to do. In some instances it may be vital to be able to understand both the old syntax as well as the new syntax, and if there is only one library, one must choose between the old version of the library and the new version of the library.

The Emacs MIME library takes a different tack. It defines a series of low-level libraries (‘rfc2047.el’, ‘rfc2231.el’ and so on) that parses strictly according to the corresponding standard. However, normal programs would not use the functions provided by these libraries directly, but instead use the functions provided by the mail-parse library. The functions in this library are just aliases to the corresponding functions in the latest low-level libraries. Using this scheme, programs get a consistent interface they can use, and library developers are free to create write code that handles new standards.

The following functions are defined by this library:

mail-header-parse-content-type

Parse a Content-Type header and return a list on the following format:

("type/subtype"
 (attribute1 . value1)
 (attribute2 . value2)
 ...)

Here’s an example:

(mail-header-parse-content-type
 "image/gif; name="b980912.gif")
⇒ ("image/gif" (name . "b980912.gif"))

mail-header-parse-content-disposition

Parse a Content-Disposition header and return a list on the same format as the function above.

mail-content-type-get

Takes two parameters—a list on the format above, and an attribute. Returns the value of the attribute.

(mail-content-type-get
 ,("image/gif" (name . "b980912.gif")) 'name)
⇒ "b980912.gif"

mail-header-encode-parameter

Takes a parameter string and returns an encoded version of the string. This is used for parameters in headers like Content-Type and Content-Disposition.
mail-header-remove-comments
Return a comment-free version of a header.
(mail-header-remove-comments
 "Gnus/5.070027 (Pterodactyl Gnus v0.27) (Finnish Landrace)"
⇒ "Gnus/5.070027 ")

mail-header-remove-whitespace
Remove linear white space from a header. Space inside quoted strings and
comments is preserved.
(mail-header-remove-whitespace
 "image/gif; name="Name with spaces\"")
⇒ "image/gif; name="Name with spaces"

mail-header-get-comment
Return the last comment in a header.
(mail-header-get-comment
 "Gnus/5.070027 (Pterodactyl Gnus v0.27) (Finnish Landrace)"
⇒ "Finnish Landrace"

mail-header-parse-address
Parse an address and return a list containing the mailbox and the plaintext
name.
(mail-header-parse-address
 "Hrvoje Niksic <hniksic@srce.hr>"
⇒ ("hniksic@srce.hr" . "Hrvoje Niksic")

mail-header-parse-addresses
Parse a string with list of addresses and return a list of elements like the one
described above.
(mail-header-parse-addresses
 "Hrvoje Niksic <hniksic@srce.hr>, Steinar Bang <sb@metis.no>")
⇒ (["hniksic@srce.hr" . "Hrvoje Niksic")
("sb@metis.no" . "Steinar Bang")

mail-header-parse-date
Parse a date string and return an Emacs time structure.

mail-narrow-to-head
Narrow the buffer to the header section of the buffer. Point is placed at the
beginning of the narrowed buffer.

mail-header-narrow-to-field
Narrow the buffer to the header under point. Understands continuation headers.

mail-header-fold-field
Fold the header under point.

mail-header-unfold-field
Unfold the header under point.

mail-header-field-value
Return the value of the field under point.
Chapter 3: Interface Functions

mail-encode-encoded-word-region
 Encode the non-ASCII words in the region. For instance, ‘Naïve’ is encoded as ‘=?iso-8859-1?q?Na=EFve=?’.

mail-encode-encoded-word-buffer
 Encode the non-ASCII words in the current buffer. This function is meant to be called narrowed to the headers of a message.

mail-encode-encoded-word-string
 Encode the words that need encoding in a string, and return the result.

| (mail-encode-encoded-word-string |
| "This is naïve, baby") |
| ⇒ "This is =?iso-8859-1?q?na=EFve,?= baby" |

mail-decode-encoded-word-region
 Decode the encoded words in the region.

mail-decode-encoded-word-string
 Decode the encoded words in the string and return the result.

| (mail-decode-encoded-word-string |
| "This is =?iso-8859-1?q?na=EFve,?= baby") |
| ⇒ "This is naïve, baby" |

Currently, mail-parse is an abstraction over ietf-drums, rfc2047, rfc2045 and rfc2231. These are documented in the subsequent sections.
4 Basic Functions

This chapter describes the basic, ground-level functions for parsing and handling. Covered here is parsing From lines, removing comments from header lines, decoding encoded words, parsing date headers and so on. High-level functionality is dealt with in the first chapter (see Chapter 1 [Decoding and Viewing], page 3).

4.1 rfc2045

RFC2045 is the "main" MIME document, and as such, one would imagine that there would be a lot to implement. But there isn’t, since most of the implementation details are delegated to the subsequent RFCs.

So ‘rfc2045.el’ has only a single function:

rfc2045-encode-string
  Takes a parameter and a value and returns a ‘PARAM=VALUE’ string, value will be quoted if there are non-safe characters in it.

4.2 rfc2231

RFC2231 defines a syntax for the Content-Type and Content-Disposition headers. Its snappy name is MIME Parameter Value and Encoded Word Extensions: Character Sets, Languages, and Continuations.

In short, these headers look something like this:

Content-Type: application/x-stuff;
title*0*=us-ascii’en’This%20is%20even%20more%20;
title*1*+%2A%2A%2Afun%2A%2A%2A%20;
title*2="isn’t it!"

They usually aren’t this bad, though.

The following functions are defined by this library:

rfc2231-parse-string
  Parse a Content-Type header and return a list describing its elements.

  (rfc2231-parse-string
   "application/x-stuff;
    title*0*=us-ascii’en’This%20is%20even%20more%20;
    title*1*+%2A%2A%2Afun%2A%2A%2A%20;
    title*2="isn’t it!"
  )
  ⇒ ("application/x-stuff"
       (title . "This is even more ***fun*** isn’t it!"))

rfc2231-get-value
  Takes one of the lists on the format above and returns the value of the specified attribute.

rfc2231-encode-string
  Encode a parameter in headers likes Content-Type and Content-Disposition.
4.3 ietf-drums

drums is an IETF working group that is working on the replacement for RFC822.

The functions provided by this library include:

ietf-drums-remove-comments
Remove the comments from the argument and return the results.

ietf-drums-remove-whitespace
Remove linear white space from the string and return the results. Spaces inside quoted strings and comments are left untouched.

ietf-drums-get-comment
Return the last most comment from the string.

ietf-drums-parse-address
Parse an address string and return a list that contains the mailbox and the plain text name.

ietf-drums-parse-addresses
Parse a string that contains any number of comma-separated addresses and return a list that contains mailbox/plain text pairs.

ietf-drums-parse-date
Parse a date string and return an Emacs time structure.

ietf-drums-narrow-to-header
Narrow the buffer to the header section of the current buffer.

4.4 rfc2047

RFC2047 (Message Header Extensions for Non-ASCII Text) specifies how non-ASCII text in headers are to be encoded. This is actually rather complicated, so a number of variables are necessary to tweak what this library does.

The following variables are tweakable:

rfc2047-header-encoding-alist
This is an alist of header / encoding-type pairs. Its main purpose is to prevent encoding of certain headers.

The keys can either be header regexps, or t.

The values can be nil, in which case the header(s) in question won’t be encoded, mime, which means that they will be encoded, or address-mime, which means the header(s) will be encoded carefully assuming they contain addresses.

rfc2047-charset-encoding-alist
RFC2047 specifies two forms of encoding—Q (a Quoted-Printable-like encoding) and B (base64). This alist specifies which charset should use which encoding.

rfc2047-encode-function-alist
This is an alist of encoding / function pairs. The encodings are Q, B and nil.

rfc2047-encoded-word-regexp
When decoding words, this library looks for matches to this regexp.
rfc2047-encoded-word-regexp-loose
This is a version from which the regexp for the Q encoding pattern of rfc2047-encoded-word-regexp is made loose.

rfc2047-encode-encoded-words
The boolean variable specifies whether encoded words (e.g., ‘=?us-ascii?q?hello?=’) should be encoded again. rfc2047-encoded-word-regexp is used to look for such words.

rfc2047-allow-irregular-q-encoded-words
The boolean variable specifies whether irregular Q encoded words (e.g., ‘=?us-ascii?q?hello??=’) should be decoded. If it is non-nil, rfc2047-encoded-word-regexp-loose is used instead of rfc2047-encoded-word-regexp to look for encoded words.

Those were the variables, and these are this functions:

rfc2047-narrow-to-field
Narrow the buffer to the header on the current line.

rfc2047-encode-message-header
Should be called narrowed to the header of a message. Encodes according to rfc2047-header-encoding-alist.

rfc2047-encode-region
Encodes all encodable words in the region specified.

rfc2047-encode-string
Encode a string and return the results.

rfc2047-decode-region
Decode the encoded words in the region.

rfc2047-decode-string
Decode a string and return the results.

rfc2047-encode-parameter
Encode a parameter in the RFC2047-like style. This is a substitution for the rfc2231-encode-string function, that is the standard but many mailers don’t support it. See Section 4.2 [rfc2231], page 21.

4.5 time-date
While not really a part of the MIME library, it is convenient to document this library here. It deals with parsing Date headers and manipulating time. (Not by using tesseracts, though, I’m sorry to say.)

These functions convert between five formats: A date string, an Emacs time structure, a decoded time list, a second number, and a day number.

Here’s a bunch of time/date/second/day examples:

(parse-time-string "Sat Sep 12 12:21:54 1998 +0200")
⇒ (54 21 12 12 9 1998 6 nil 7200)
And finally, we have **safe-date-to-time**, which does the same as **date-to-time**, but returns a zero time if the date is syntactically malformed.

The five data representations used are the following:

**date** An RFC822 (or similar) date string. For instance: "Sat Sep 12 12:21:54 1998 +0200".

**time** An internal Emacs time. For instance: \( (13818 \ 19266 \ 0 \ 0) \).
seconds    A floating point representation of the internal Emacs time. For instance: 905595714.0.

days      An integer number representing the number of days since 00000101. For instance: 729644.

decoded time
    A list of decoded time. For instance: (54 21 12 9 1998 6 t 7200).

All the examples above represent the same moment.

These are the functions available:

date-to-time
    Take a date and return a time.

float-time
    Take a time and return seconds. (This is a built-in function.)

seconds-to-time
    Take seconds and return a time.

time-to-days
    Take a time and return days.

days-to-time
    Take days and return a time.

date-to-day
    Take a date and return days.

time-to-number-of-days
    Take a time and return the number of days that represents.

safe-date-to-time
    Take a date and return a time. If the date is not syntactically valid, return a “zero” time.

time-less-p
    Take two times and say whether the first time is less (i.e., earlier) than the second time.

time-since
    Take a time and return a time saying how long it was since that time.

subtract-time
    Take two times and subtract the second from the first. I.e., return the time between the two times.

days-between
    Take two days and return the number of days between those two days.

date-leap-year-p
    Take a year number and say whether it’s a leap year.

time-to-day-in-year
    Take a time and return the day number within the year that the time is in.
4.6 qp

This library deals with decoding and encoding Quoted-Printable text.

Very briefly explained, qp encoding means translating all 8-bit characters (and lots of control characters) into things that look like ‘=EF’; that is, an equal sign followed by the byte encoded as a hex string.

The following functions are defined by the library:

- **quoted-printable-decode-region**
  QP-decode all the encoded text in the specified region.

- **quoted-printable-decode-string**
  Decode the QP-encoded text in a string and return the results.

- **quoted-printable-encode-region**
  QP-encode all the encodable characters in the specified region. The third optional parameter *fold* specifies whether to fold long lines. (Long here means 72.)

- **quoted-printable-encode-string**
  QP-encode all the encodable characters in a string and return the results.

4.7 base64

Base64 is an encoding that encodes three bytes into four characters, thereby increasing the size by about 33%. The alphabet used for encoding is very resistant to mangling during transit.

The following functions are defined by this library:

- **base64-encode-region**
  base64 encode the selected region. Return the length of the encoded text. Optional third argument *no-line-break* means do not break long lines into shorter lines.

- **base64-encode-string**
  base64 encode a string and return the result.

- **base64-decode-region**
  base64 decode the selected region. Return the length of the decoded text. If the region can’t be decoded, return *nil* and don’t modify the buffer.

- **base64-decode-string**
  base64 decode a string and return the result. If the string can’t be decoded, *nil* is returned.

4.8 binhex

binhex is an encoding that originated in Macintosh environments. The following function is supplied to deal with these:

- **binhex-decode-region**
  Decode the encoded text in the region. If given a third parameter, only decode the binhex header and return the filename.
4.9 uudecode

Uuencode is probably still the most popular encoding of binaries used on Usenet, although base64 rules the mail world.

The following function is supplied by this package:

uudecode-decode-region

Decode the text in the region.

4.10 yenc

Yenc is used for encoding binaries on Usenet. The following function is supplied by this package:

yenc-decode-region

Decode the encoded text in the region.

4.11 rfc1843

RFC1843 deals with mixing Chinese and ASCII characters in messages. In essence, RFC1843 switches between ASCII and Chinese by doing this:

This sentence is in ASCII.
The next sentence is in GB. "{:<Ky2;S{#NpJ16HK!#}" Bye.

Simple enough, and widely used in China.

The following functions are available to handle this encoding:

rfc1843-decode-region

Decode HZ-encoded text in the region.

rfc1843-decode-string

Decode a HZ-encoded string and return the result.

4.12 mailcap

The ‘~/.mailcap’ file is parsed by most MIME-aware message handlers and describes how elements are supposed to be displayed. Here’s an example file:

image/*; gimp -g %s
audio/wav; wavplayer %s
application/msword; catdoc %s ; copiousoutput ; nametemplate=%s.doc

This says that all image files should be displayed with gimp, that WAV audio files should be played by wavplayer, and that MS-WORD files should be inlined by catdoc.

The mailcap library parses this file, and provides functions for matching types.

mailcap-mime-data

This variable is an alist of alists containing backup viewing rules.

Interface functions:

mailcap-parse-mailcaps

Parse the ‘~/.mailcap’ file.

mailcap-mime-info

Takes a MIME type as its argument and returns the matching viewer.
5 Standards

The Emacs MIME library implements handling of various elements according to a (somewhat) large number of RFCs, drafts and standards documents. This chapter lists the relevant ones. They can all be fetched from http://quimby.gnus.org/notes/.

RFC822   Standard for the Format of ARPA Internet Text Messages.
STD11    Standard for Interchange of USENET Messages
RFC1036  Format of Internet Message Bodies
RFC2045  Media Types
RFC2046  Message Header Extensions for Non-ASCII Text
RFC2047  Registration Procedures
RFC2049  Conformance Criteria and Examples
RFC2231  MIME Parameter Value and Encoded Word Extensions: Character Sets, Languages, and Continuations
RFC1843  HZ—A Data Format for Exchanging Files of Arbitrarily Mixed Chinese and ASCII characters

draft-ietf-drums-msg-fmt-05.txt
Draft for the successor of RFC822

RFC2112  The MIME Multipart/Related Content-type
RFC1892  The Multipart/Report Content Type for the Reporting of Mail System Administrative Messages
RFC2183  Communicating Presentation Information in Internet Messages: The Content-Disposition Header Field
RFC2646  Documentation of the text/plain format parameter for flowed text.
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