

# Mime

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## Introduction

Multipurpose Internet Mail Extensions (MIME) is an Internet standard that extends the format of email to support:

- Text in charsets other than ASCII
- Non-text attachments: audio, video, images, application programs etc.
- Message bodies with multiple parts
- Header information in non-ASCII character sets

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## Mime headers

- MIME-Version
  - Typically
    - MIME-Version: 1.0
- Content-Type
  - This header indicates the media type of the message content, consisting of a *type* and *subtype*, for example:
    - Content-Type: type/subtype
      - text/plain, text/html, image/jpeg, audio/mp3, video/mp4, application/msword, ...
      - multipart/alternative (mirar a sota)
- Content-Disposition
  - A MIME part can have:
    - an *inline* content-disposition, which means that it should be automatically displayed when the message is displayed, OR
    - an *attachment* content-disposition, in which case it is not displayed automatically and requires some form of action from the user to open it. (download a document)
    - + descriptions
  - Example:
  - Content-Disposition: attachment; filename=genome.jpeg; modification-date="Wed, 12 Feb 1997 16:29:51 -0500";
- Content-Transfer-Encoding
  - The content-transfer-encoding MIME header has 2-sided significance. It indicates whether or not a binary-to-text encoding scheme has been used on top of the original encoding as specified within the Content-Type header.
    - If such a binary-to-text encoding method has been used, it states which one.
    - If not, it provides a descriptive label for the format of content, with respect to the presence of 8-bit or binary content.

(continua...)

- Suitable for use with normal SMTP:
  - 7bit
    - up to 998 octets per line of the code range 1..127 with CR and LF (codes 13 and 10 respectively) only allowed to appear as part of a CRLF line ending. This is the default value.
  - quoted-printable
    - used to encode arbitrary octet sequences into a form that satisfies the rules of 7bit. Designed to be efficient and mostly human readable when used for text data consisting primarily of US-ASCII characters but also containing a small proportion of bytes with values outside that range.
  - base64
    - used to encode arbitrary octet sequences into a form that satisfies the rules of 7bit. Designed to be efficient for non-text 8 bit and binary data. Sometimes used for text data that frequently uses non-US-ASCII characters.
- Suitable for use with SMTP servers that support the 8BITMIME SMTP extension (RFC 6152)
  - 8bit
    - up to 998 octets per line with CR and LF (codes 13 and 10 respectively) only allowed to appear as part of a CRLF line ending.
- Suitable for use with SMTP servers that support the BINARYMIME SMTP extension (RFC 3030):
  - binary
    - any sequence of octets.

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## Multipart messages

- MIME example:

```
MIME-Version: 1.0
Content-Type: multipart/mixed; boundary=frontier

This is a message with multiple parts in MIME format.
--frontier
Content-Type: text/plain

This is the body of the message.
--frontier
Content-Type: application/octet-stream
Content-Transfer-Encoding: base64

PGh0bWw+CiAgPGhlYWQ+CiAgPC9oZWFKPgogIDxib2R5PgogICAgPHA+VGhpcyBpcyB0aGUg
Ym9keSBvZiB0aGUgbWVzc2FnZS48L3A+CiAgPC9ib2R5Pgo8L2h0bWw+Cg==
--frontier--
```

The MIME multipart message contains a boundary in the "Content-Type: " header;  
This boundary, which must not occur in any of the parts, is placed between the parts, and at the beginning and end of the body of the message.

- Multipart subtypes
  - Content-type: multipart/mixed, multipart/digest, multipart/alternative, ...
  - Mixed
    - Multipart/mixed is used for sending files with different "Content-Type" headers inline (or as attachments).
  - Digest
    - Multipart/digest is a simple way to send multiple text messages.
  - Alternative
    - The multipart/alternative subtype indicates that each part is an "alternative" version of the same (or similar) content, each in a different format denoted by its "Content-Type" header.
  - Related
    - A multipart/related is used to indicate that each message part is a component of an aggregate whole.
  - Report
    - *Multipart/report* is a message type that contains data formatted for a mail server to read.
    - It is split between a text/plain (or some other content/type easily readable) and a message/delivery-status, which contains the data formatted for the mail server to read.
  - Signed
    - A multipart/signed message is used to attach a digital signature to a message.
    - It has exactly two body parts, a body part and a signature part.
  - Encrypted
    - A multipart/encrypted message has two parts.
    - The first part has control information that is needed to decrypt the application/octet-stream second part.
  - Form-Data
    - As its name implies, multipart/form-data is used to express values submitted through a form. (HTTP)
  - Mixed-Replace
    - The content type multipart/x-mixed-replace was developed as part of a technology to emulate server push and streaming over HTTP.
    - All parts of a mixed-replace message have the same semantic meaning. However, each part invalidates - "replaces" - the previous parts as soon as it is received completely.
    - Clients should process the individual parts as soon as they arrive and should not wait for the whole message to finish.
  - Byteranges
    - The multipart/byterange is used to represent noncontiguous byte ranges of a single message. (HTTP)