MIME = Multi-Purpose Internet Mail Extension

FEATURES OF MIME

- extension of SMTP
- runs at Application Layer
- contains 8-bit encoded data, non-text information encoded as text (encoding: base64)
- files in .mim or .mme formats
- MIME files can contain file attachments and richer character sets other than ASCII
- supports audio, video, images (several attachments at once)
- also used in HTTP for web transmissions to distinguish between types of web documents. During communication, web server first sends MIME **Content-Type** to browser.
- no limitation of length of message
- different layouts, fonts, colors, size can be used in message
- uses header format – stores information about type of format that mail body is using so email-client can understand it in the correct format
- used in Communication protocols
- web servers add MIME header at starting point of circulation of web data. Web clients use header to finalize the suitable viewer application for their service

MIME HEADERS

- **MIME-Version:** shows the version of MIME. Example MIME-Version: 1.0.
- **Content-Type:** specifies data's type and sub-type. Default: Content-Type:text/plain (contains simple text), Content-Type:image/GIF (GIF images), Content-Type:audio/mp3 (mp3 files), Content-Type:video/mp4 (video files). (Helps browser to open file with appropriate extension/plugin.)
- **Content-transfer-encoding:** type of encoding used. Examples: 7-bit, 8-bit, binary etc
- **Content-id:** used to identify MIME entities uniquely in multiple context.
- **Content-Disposition:** specifies presentation style and filename. Example: Content-disposition:attachment is sent to browser by server so it knows how to display the content. Types of disposition: **in-line** Content-disposition are automatically displayed when message is shown. **Attachment** Content-Disposition will not be displayed automatically, user has to do some action to see it. Example In-line: Clothing Stores' pictures in mail. Example Attachment: Password Protected bank statement.

MULTIPART-MESSAGES AND SUB-TYPES

- **Multipart/mixed:** deployed for sending several elements like plain text with attachment.
- **Multipart/alternative:** shows contents in a form which are understood by client. Generally displays message in text or HTML format. Message remains the same, only format differs.
- **Multipart/signed:** deployed to impose a digital signature with message in email
- **Multipart/related:** specifies related message information of whole message. Used when web page contains many videos and images, the whole web page is sent as one message and later the videos and images are retrieved.
- **Multipart/mixed-replace:** deployed for streaming online video/movies.

EXAMPLE

Gmail uses S/MIME: Secure MIME. Available only for paid G Suite users.

SECURITY ISSUES

- Adversaries can overload Content headers with information that isn't discarded but goes in memory to run programs. The virus program is run this way.

DIFFERENCE B/W SMTP & MIME

SMTP	MIME
Email Application Program	Email Application Program
Sends textual data	Sends texts as well as images/videos/.exe's/docs in a single message
Checks delivery status	Checks delivery status
Can't send .exe's	Encoded messages
Can't send 8-bit code	Can send 8-bit codes
May reject messages over a certain size	Multiple message bodies
Only plain text	Supports various content types + multipart msgs

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