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**IMAP4 Extension: Message Preview Generation**  
**draft-ietf-extra-imap-fetch-preview-09**

Abstract

This document specifies an Internet Message Access Protocol (IMAP) protocol extension allowing a client to request a server-generated abbreviated text representation of message data useful as a contextual preview of the entire message.

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## [1.](#) Introduction

Many modern mail clients display small extracts of the body text as an aid to allow a user to quickly decide whether they are interested in viewing the full message contents. Mail clients implementing the Internet Message Access Protocol [[RFC3501](#)] would benefit from a standardized, consistent way to generate these brief textual previews of messages.

Generation of a preview on the server has several benefits. First, it allows consistent representation of previews across all clients. This standardized display can reduce user confusion when using multiple clients, as abbreviated message representations in clients will show identical message contents.

Second, server-side preview generation is more efficient. A client-based algorithm needs to issue, at a minimum, a FETCH BODYSTRUCTURE command in order to determine which MIME [[RFC2045](#)] body part(s) should be represented in the preview. Subsequently, at least one FETCH BODY command may be needed to retrieve body data used in preview generation. These FETCH commands cannot be pipelined since the BODYSTRUCTURE query must be parsed on the client before the list of parts to be retrieved via the BODY command(s) can be determined.



Additionally, it may be difficult to predict the amount of body data that must be retrieved to adequately represent the part via a preview, therefore requiring inefficient fetching of excessive data in order to account for this uncertainty. For example, a preview algorithm to display data contained in a text/html [\[RFC2854\]](#) part will likely strip the markup tags to obtain textual content. However, without fetching the entire content of the part, there is no way to guarantee that sufficient non-tag content will exist unless either 1) the entire part is retrieved or 2) an additional partial FETCH is executed when the client determines that it does not possess sufficient data from a previous partial FETCH to display an adequate representation of the preview.

Finally, server generation allows caching in a centralized location. Using server-generated previews allows global generation once per message, and then cached for the retention period of the source message. Retrieval of message data may be expensive within a server, for example, so a server can be configured to reduce its storage retrieval load by pre-generating preview data.

A server indicates support for this extension via the "PREVIEW" capability name.

## **2. Conventions Used In This Document**

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [BCP 14](#) [\[RFC2119\]](#) [\[RFC8174\]](#) when, and only when, they appear in all capitals, as shown here.

"User" is used to refer to a human user, whereas "client" refers to the software being run by the user.

In examples, "C:" and "S:" indicate lines sent by the client and server respectively. If a single "C:" or "S:" label applies to multiple lines, then the line breaks between those lines are for editorial clarity only and are not part of the actual protocol exchange.

As with all IMAP extension documents, the case used in writing IMAP protocol elements herein is chosen for editorial clarity, and implementations must pay attention to the numbered rules at the beginning of [\[RFC3501\] Section 9](#).



### **3. FETCH Data Item**

#### **3.1. Command**

To retrieve a preview for a message, the "PREVIEW" FETCH attribute is used when issuing a FETCH command.

#### **3.2. Response**

The server returns a variable-length string that is the generated preview for that message.

Example: Retrieving preview information in a SELECTed mailbox

```
C: A1 FETCH 1 (PREVIEW)
S: * 1 FETCH (PREVIEW "Preview text!")
S: A1 OK FETCH complete.
```

A server SHOULD strive to generate the same string for a given message for each request. However, since previews are understood to be an approximation of the message data and not a canonical view of its contents, a client MUST NOT assume that a message preview is immutable for a given message. This relaxed requirement permits a server to offer previews as an option without requiring potentially burdensome storage and/or processing requirements to guarantee immutability for a use case that does not require this strictness. For example, the underlying IMAP server may change due to a system software upgrade; an account's state information may be retained in the migration but the new server may generate different PREVIEW text than the old server.

It is possible that the server has determined that no meaningful preview text can be generated for a particular message, and that decision won't change later. Examples of this involve encrypted messages, content types the server does not support previews of, and other situations where the server is not able to extract information for a preview. In such cases, the server MUST return a zero-length string. Clients SHOULD NOT send another FETCH for a preview for such messages. (As discussed previously, preview data is not immutable so there is chance that at some point in the future the server would be able to generate meaningful text. However, this scenario is expected to be rare so a client should not continually send out requests to try to capture this infrequent occurrence.)

If the LAZY modifier is used, the server MAY return NIL for the preview response, indicating that preview generation could not be completed without causing undue delay. A server MUST NOT return NIL to a FETCH PREVIEW request made without the LAZY modifier.



### **3.3. Preview Text Format**

The generated preview text MUST be treated as text/plain [[RFC2046](#)] media type data by the client.

The generated string MUST NOT be content transfer encoded and MUST be encoded in UTF-8 [[RFC3629](#)]. The server SHOULD remove any formatting markup and do whatever processing might be useful in rendering the preview as plain text.

For purposes of this section, a "preview character" is defined as a single UCS character encoded in UTF-8. Note: a single preview character may compromise multiple octets, so any buffers implemented to conform to the string limitations identified in this document should be sized to prevent possible overflow errors.

The server SHOULD limit the length of the preview text to 200 preview characters. This length should provide sufficient data to generally support both various languages (and their different average word lengths) and diverse client display size requirements.

The server MUST NOT output preview text longer than 256 preview characters.

If the preview is not generated based on the body content of the message, and the LANGUAGE [[RFC5255](#)] extension is supported by the server, the preview text SHOULD be generated according to the language rules that apply to human-readable text. For example, a message that consists of a single image MIME part has no human-readable text from which to generate preview information. Instead, the server may wish to output a description that the message contains an image and describe some attributes of the image, such as image format, size, and filename. This descriptive text is not a product of the message body itself but is rather auto-generated data by the server, and should thus use the rules defined for human-generated text described in the LANGUAGE extension (if supported on the server).

## **4. LAZY Priority Modifier**

### **4.1. LAZY**

The LAZY modifier directs the server to return the preview representation only if that data can be returned without undue delay to the client.





If this modifier is used, and the server is unable to return preview data without undue delay, the server **MUST** return NIL as the preview response.

The LAZY modifier **MUST** be implemented by any server that supports the PREVIEW extension.

#### **4.2. Client Implementation Advice**

Upon opening a mailbox, a client generally performs a FETCH of message details in order to create a listing to present to the user (e.g. ENVELOPE data). Using this extension, a client may want to additionally display preview information as part of this listing. Quickly providing the base mailbox listing, with basic message details, is the primary goal of this command as this is required to allow the user to begin interacting with the mailbox. Preview data is likely to be of secondary importance; it provides useful context, but it is not necessary to perform message actions. A client can load unavailable previews in the background and display them asynchronously to the user as the preview data is provided by the server.

In this scenario, the client would add the PREVIEW data item, with the LAZY modifier, to the list of FETCH items needed to generate the mailbox listing. This allows the server to advantageously return preview data without blocking the primary goal of quickly returning the basic message details used to generate the mailbox listing.

Once this initial FETCH is complete, the client can then issue FETCH requests, without the LAZY modifier, to load the preview data for the messages in which preview data was not returned. It is **RECOMMENDED** that these FETCH requests be issued in small batches, e.g. 50 messages per FETCH command, since preview generation may be expensive and a single large request may exceed server resource limits.

See Example 2 for an implementation of this strategy.

A client **SHOULD NOT** continually issue LAZY PREVIEW FETCH commands in a selected mailbox as the server is under no requirement to return preview information for this command, which could lead to an unnecessary waste of system and network resources.

#### **5. Examples**



Example 1: Requesting PREVIEW without LAZY modifier.

```
C: A1 CAPABILITY
S: * CAPABILITY IMAP4rev1 PREVIEW
S: A1 OK Capability command completed.
[...a mailbox is SELECTed...]
C: A2 FETCH 1 (RFC822.SIZE PREVIEW)
S: * 1 FETCH (RFC822.SIZE 5647 PREVIEW {200}
S: Lorem ipsum dolor sit amet, consectetur adipiscing elit.
S: Curabitur aliquam turpis et ante dictum, et pulvinar dui congue.
S: Maecenas hendrerit, lorem non imperdiet pellentesque, nulla
S: ligula nullam
S: )
S: A2 OK FETCH complete.
```

Example 2: Requesting PREVIEW with LAZY modifier, to obtain previews during initial mailbox listing if readily available; otherwise, load previews in background.

```
C: D1 FETCH 1:4 (ENVELOPE PREVIEW (LAZY))
S: * 1 FETCH (ENVELOPE ("Wed, 25 Oct 2017 15:03:11 +0000" [...])
PREVIEW "Preview text for message 1.")
S: * 2 FETCH (PREVIEW "" ENVELOPE
("Thu, 26 Oct 2017 12:17:23 +0000" [...]))
S: * 3 FETCH (ENVELOPE ("Fri, 27 Oct 2017 22:19:21 +0000" [...])
PREVIEW NIL)
S: * 4 FETCH (ENVELOPE ("Sat, 28 Oct 2017 07:11:18 +0000" [...])
PREVIEW NIL)
S: D1 OK FETCH completed.
[...Client has preview for message 1 and knows that message 2 has
a preview that is empty; only need to request preview of
messages 3 & 4 (e.g. in background)...]
C: D2 FETCH 3:4 (PREVIEW)
S: * 3 FETCH (PREVIEW {30}
S: Message data from message 3.
S: )
S: * 4 FETCH (PREVIEW "Message 4 preview")
S: D2 OK Fetch completed.
```



Example 3: Retrieve preview information for search results within a single mailbox. Use SEARCHRES [RFC5182] extension to save a round-trip.

```
C: E1 CAPABILITY
S: * CAPABILITY IMAP4rev1 PREVIEW SEARCHRES
S: E1 OK Capability command completed.
[...a mailbox is SELECTed...]
C: E2 SEARCH RETURN (SAVE) FROM "FOO"
C: E3 FETCH $ (UID PREVIEW (LAZY))
S: E2 OK SEARCH completed.
S: * 5 FETCH (UID 13 PREVIEW "Preview!")
S: * 9 FETCH (UID 23 PREVIEW NIL)
S: E3 OK FETCH completed.
[...Retrieve message 9 preview in background...]
C: E4 UID FETCH 23 (PREVIEW)
S: * 9 FETCH (UID 23 PREVIEW "Another preview!")
S: E4 OK FETCH completed.
```

## 6. Formal Syntax

The following syntax specification uses the augmented Backus-Naur Form (BNF) as described in ABNF [RFC5234]. It includes definitions from IMAP [RFC3501].

```
capability          =/ "PREVIEW"

fetch-att            =/ "PREVIEW" [SP "(" preview-mod *(SP
                                preview-mod) ")"]

msg-att-dynamic      =/ "PREVIEW" SP nstring

preview-mod          = "LAZY"
```

## 7. IANA Considerations

IMAP4 [RFC3501] capabilities are registered by publishing a standards track or IESG-approved experimental RFC. The registry is currently located at:

<http://www.iana.org/assignments/imap-capabilities>

This document requests that IANA adds the "PREVIEW" capability to the IMAP4 [RFC3501] capabilities registry.



## **8. Security Considerations**

Implementation of this extension might enable denial-of-service attacks against server resources, due to excessive memory or CPU usage during preview generation or increased storage usage if preview results are stored on the server after generation. Servers MAY limit the resources that preview generation uses. In order to mitigate such attacks, servers SHOULD log the client authentication identity on FETCH PREVIEW operations in order to facilitate tracking of abusive clients.

Just as the messages they summarize, preview data may contain sensitive information. If generated preview data is stored on the server, e.g. for caching purposes, these previews MUST be protected with equivalent authorization and confidentiality controls as the source message.

## **9. References**

### **9.1. Normative References**

- [RFC2046] Freed, N. and N. Borenstein, "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types", [RFC 2046](#), DOI 10.17487/RFC2046, November 1996, <<https://www.rfc-editor.org/info/rfc2046>>.
- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), DOI 10.17487/RFC2119, March 1997, <<https://www.rfc-editor.org/info/rfc2119>>.
- [RFC3501] Crispin, M., "INTERNET MESSAGE ACCESS PROTOCOL - VERSION 4rev1", [RFC 3501](#), DOI 10.17487/RFC3501, March 2003, <<https://www.rfc-editor.org/info/rfc3501>>.
- [RFC3629] Yergeau, F., "UTF-8, a transformation format of ISO 10646", STD 63, [RFC 3629](#), DOI 10.17487/RFC3629, November 2003, <<https://www.rfc-editor.org/info/rfc3629>>.
- [RFC5234] Crocker, D., Ed. and P. Overell, "Augmented BNF for Syntax Specifications: ABNF", STD 68, [RFC 5234](#), DOI 10.17487/RFC5234, January 2008, <<https://www.rfc-editor.org/info/rfc5234>>.
- [RFC5255] Newman, C., Gulbrandsen, A., and A. Melnikov, "Internet Message Access Protocol Internationalization", [RFC 5255](#), DOI 10.17487/RFC5255, June 2008, <<https://www.rfc-editor.org/info/rfc5255>>.





- [RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in [RFC 2119](#) Key Words", [BCP 14](#), [RFC 8174](#), DOI 10.17487/RFC8174, May 2017, <<https://www.rfc-editor.org/info/rfc8174>>.

## 9.2. Informative References

- [RFC2045] Freed, N. and N. Borenstein, "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies", [RFC 2045](#), DOI 10.17487/RFC2045, November 1996, <<https://www.rfc-editor.org/info/rfc2045>>.
- [RFC2854] Connolly, D. and L. Masinter, "The 'text/html' Media Type", [RFC 2854](#), DOI 10.17487/RFC2854, June 2000, <<https://www.rfc-editor.org/info/rfc2854>>.
- [RFC5182] Melnikov, A., "IMAP Extension for Referencing the Last SEARCH Result", [RFC 5182](#), DOI 10.17487/RFC5182, March 2008, <<https://www.rfc-editor.org/info/rfc5182>>.

## [Appendix A](#). Change History (To be removed by RFC Editor before publication)

Changes from [draft-slusarz-imap-fetch-snippet-00](#):

- o Added standardized language to [Section 2](#) regarding IMAP ABNF conventions
- o Changed draft name to [draft-ietf-extra-imap-fetch-snippet-##](#)

Changes from [draft-ietf-extra-imap-fetch-snippet-00](#):

- o Changed nomenclature from "snippet" to "preview"
- o Changed draft name to [draft-ietf-extra-imap-fetch-preview-##](#)
- o Update to [RFC 8174](#) boilerplate
- o Updated length requirements for PREVIEW=FUZZY
- o Added preview-atom ABNF to limit use of "=" character
- o UTF-8 is a normative reference
- o Clarify that characters for purpose of length limitations are defined as UCS characters as encoded by UTF-8
- o Fix some incorrect literal lengths in examples



Changes from [draft-ietf-extra-imap-fetch-preview-00](#):

- o Updated postal address
- o Added example to FETCH response section
- o Added example on how LANGUAGE extension may influence preview generation
- o Added recommendation that only one LAZY FETCH be executed for a message per mailbox
- o Added request to create algorithm and modifier registries
- o Added requirement that algorithm and modifier names conform to [RFC 6648](#)
- o Added DoS attack info to security considerations
- o Distinguish between NIL response and zero-length string
- o Don't use deprecated "X-" convention in example
- o Spelling and nits

Changes from [draft-ietf-extra-imap-fetch-preview-01](#):

- o Fix capability ABNF
- o Removed CAPABILITY string for examples where it did not add valuable context
- o Altered preview data in examples to cover a variety of potential server return scenarios
- o Added "SHOULD be registered" language to algorithm names and priority modifiers

Changes from [draft-ietf-extra-imap-fetch-preview-02](#):

- o Move Acknowledgments to un-numbered appendix
- o Improved abstract text
- o Consistently use "priority modifiers" instead of "modifiers"
- o Update example to conform with [RFC 3501](#) UID FETCH requirements



Changes from [draft-ietf-extra-imap-fetch-preview-03](#):

- o Remove preview modifier registry request
- o Improve instructions for registration of algorithms
- o Add storage information to security considerations
- o Clarify parsing of algorithm list in FETCH command
- o Clarify difference between NIL response and zero-length string
- o Add normative reference for text/plain
- o Add warning regarding buffers and multiple octet preview characters
- o Clarify how to handle preview data return when using an explicit algorithm list
- o Various editorial fixes

Changes from [draft-ietf-extra-imap-fetch-preview-04](#):

- o Make clear that preview caching is tied to retention period of the source message

Changes from [draft-ietf-extra-imap-fetch-preview-05](#):

- o Clarify "zero-length string" preview data vs. NIL preview data
- o MIME data -> media type
- o Capability registration should not include the algorithm name
- o Give example of how PREVIEW data might change over time

Changes from [draft-ietf-extra-imap-fetch-preview-06](#):

- o Change algorithm names to media types
- o FUZZY algorithm changed to text/imap-fetch-preview
- o Remove server broadcast of PREVIEW algorithm extensions from capability
- o Default, fallback algorithm in absence of client selection now MUST be text/imap-fetch-preview



- o LAZY modifier should work on default algorithm if no specific algorithm is provided as an argument

Changes from [draft-ietf-extra-imap-fetch-preview-07](#):

- o Remove algorithm selection; PREVIEW always returns text in format defined in [Section 3.3](#)

Changes from [draft-ietf-extra-imap-fetch-preview-08](#):

- o FETCH PREVIEW without LAZY modifier MUST NOT return NIL
- o Improve client implementation advice for LAZY modifier

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