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**Internet Message Access Protocol (IMAP) - MOVE Extension**  
**draft-ietf-imapmove-command-03**

Abstract

This document defines an IMAP extension consisting of two new commands, MOVE and UID MOVE, that are used to move messages from one mailbox to another.

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## **1. Introduction**

This document defines an IMAP [[RFC3501](#)] extension to facilitate moving messages from one mailbox to another. This is accomplished by defining a new MOVE command and extending the UID command to allow UID MOVE.

A move function is not provided in the base IMAP specification, so clients have instead had to use a combination of the UID STORE, UID COPY and EXPUNGE commands to perform this very common operation. This has meant needing to cope with partial failures and side effects that can occur when multiple commands are involved.

The MOVE extension is present in any IMAP4 implementation which returns "MOVE" as one of the supported capabilities to the CAPABILITY command.

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

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [[RFC2119](#)].

Formal syntax is specified using ABNF [[RFC5234](#)].

Example lines prefaced by "C:" are sent by the client and ones prefaced by "S:" by the server.

## **3. MOVE and UID MOVE**

### **3.1. MOVE Command**

Arguments: sequence set  
            mailbox name

Responses: no specific responses for this command

Result: OK - move completed

NO - move error: can't move those messages or to that name

BAD - command unknown or arguments invalid

### **3.2. UID MOVE Command**

This extends the first form of the UID command (see [\[RFC3501\]](#), [Section 6.4.8](#)) to add the MOVE command, defined above, as a valid argument.

### **3.3. Semantics of MOVE and UID MOVE**

The MOVE command takes two arguments: a message set (sequence numbers for MOVE, UIDs for UID MOVE) and a named mailbox. Each message included in the set is moved, rather than copied, from the selected (source) mailbox to the named (target) mailbox.

This means that a new message is created in the target mailbox, with a new UID, the original message is removed from the source mailbox, and it appears to the client as a single action. This has the same effect for each message as this sequence:

1. [UID] COPY
2. [UID] STORE +FLAGS.SILENT \DELETED
3. UID EXPUNGE

Because a MOVE applies to a set of messages, it might fail partway through the set. Regardless of whether the command is successful in moving the entire set, each individual message SHOULD either be moved or unaffected. The server MUST leave each message in a state where it is in at least one of the source or target mailboxes (no message can be lost or orphaned). The server SHOULD NOT leave any message in both mailboxes (it would be bad for a partial failure to result in a bunch of duplicate messages). This is true even if the server returns a tagged NO response to the command.

Because of the similarity of MOVE to COPY, extensions that affect COPY affect MOVE in the same way. Response codes such TRYCREATE (see [\[RFC3501\]](#) [Section 6.4.7](#)), as well as those defined by extensions, are sent as appropriate. See [Section 4](#) for more information about how MOVE interacts with other IMAP extensions.

An example:

```
C: a UID MOVE 42:69 forble
S: * OK [COPYUID 432432 42:69 1202:1229]
S: * 22 EXPUNGE
S: (more expunges)
S: a OK Done
```



Note that the server may send unrelated EXPUNGE messages as well, if any happen to have been expunged at the same time; this is normal IMAP operation.

Implementers will need to read [\[RFC4315\]](#) to understand what UID EXPUNGE does, though full implementation of [\[RFC4315\]](#) is not necessary.

Note that moving a message to the currently selected mailbox (that is, where the source and target mailboxes are the same) is allowed when copying the message to the currently selected mailbox.

The server may send EXPUNGE (or VANISHED) messages before the tagged response, so the client cannot safely send more commands with message sequence number arguments while the server is processing MOVE. The UID MOVE command does not have this limitation.

Both MOVE and UID MOVE can be pipelined. However, pipelined MOVE and UID MOVE commands MUST NOT specify overlapping sets of messages.

#### **4. Interaction with other extensions**

This section describes how MOVE interacts with some other IMAP extensions.

##### **4.1. [RFC 2087](#), QUOTA**

The QUOTA extension (defined by [\[RFC2087\]](#)) may interact with MOVE, on some servers, in the sense that a MOVE command may succeed where COPY would cause a quota overrun.

##### **4.2. [RFC 4314](#), ACL**

The ACL rights [\[RFC4314\]](#) required for the UID MOVE are the union of the ACL rights required for UID STORE, UID COPY and UID EXPUNGE.

##### **4.3. [RFC 4315](#), UIDPLUS**

Servers supporting UIDPLUS [\[RFC4315\]](#) MUST send COPYUID in response to a UID MOVE command.

Servers implementing UIDPLUS are also advised to send the COPYUID response code in an untagged OK before sending EXPUNGE for moved messages. (Sending COPYUID in the tagged OK, as described in the UIDPLUS specification, means that clients first receive an EXPUNGE for a message and afterwards COPYUID for the same message. It can be unnecessarily difficult to process that sequence usefully.)



#### **4.4. [RFC 5162](#), QRESYNC**

The QRESYNC extension [[RFC5162](#)] states that the server SHOULD send VANISHED rather than the EXPUNGE in response to the UID EXPUNGE command. The same requirement applies to MOVE, and a QRESYNC-enabled client needs to handle both VANISHED and EXPUNGE responses to a UID MOVE command.

#### **4.5. IMAP Events in Sieve**

MOVE applies to IMAP events in Sieve [[RFC6785](#)] in the same way as COPY does. Therefore, MOVE can cause a Sieve script to be invoked with the `imap.cause` set to "COPY". Because MOVE does not cause flags to be changed, a MOVE command will not result in a script invocation with the `imap.cause` set to "FLAG".

### **5. Formal Syntax**

The following syntax specification uses the Augmented Backus-Naur Form (ABNF) notation as specified in [[RFC5234](#)]. [[RFC3501](#)] defines the non-terminals "capability", "command-select", "sequence-set" and "mailbox".

Except as noted otherwise, all alphabetic characters are case-insensitive. The use of upper or lower case characters to define token strings is for editorial clarity only. Implementations MUST accept these strings in a case-insensitive fashion.

```
capability      =/ "MOVE"

command-select =/ move
move            = "MOVE" SP sequence-set SP mailbox
uid            = "UID" SP (copy / fetch / search / store / move)
```

### **6. Security Considerations**

MOVE does not introduce any new capabilities to IMAP, and this limits the security impact. However, the transactional semantics of MOVE may interact with specific implementations in ways that could have unexpected consequences. For example, moving messages between mailboxes under the quota root may require temporary suspension of quota checking.

An additional area of concern is interaction with antispam, antivirus, and other security scanning and auditing mechanisms. Different mailboxes may have different security policies which could





interact with MOVE in complex ways. Scanning with updated rules may also be required when messages are moved even when the underlying policy has not changed.

MIME does relieve a problem with the base specification, since client authors currently have to devise and implement complicated algorithms to handle partial failures of the STORE/COPY/EXPUNGE trio. Incomplete or improper implementation of these algorithms can lead to mail loss.

## **7. IANA Considerations**

The IANA is requested to add MOVE to the "IMAP 4 Capabilities" registry, <http://www.iana.org/assignments/imap4-capabilities>.

## **8. Acknowledgments**

An extension like this has been proposed many times, by many people. This document is based on several of those, most recently that by Witold Krecicki. Witold, Adrien W. de Croy, Bron Gondwana, Dan Karp, Christian Ketterer, Murray Kucherawy, Jan Kundrat, Barry Leiba, Alexey Melnikov, Kathleen Moriarty, Michael Slusarz, and others provided valuable comments.

## **9. References**

### **9.1. Normative References**

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC3501] Crispin, M., "INTERNET MESSAGE ACCESS PROTOCOL - VERSION 4rev1", [RFC 3501](#), March 2003.
- [RFC4314] Melnikov, A., "IMAP4 Access Control List (ACL) Extension", [RFC 4314](#), December 2005.
- [RFC4315] Crispin, M., "Internet Message Access Protocol (IMAP) - UIDPLUS extension", [RFC 4315](#), December 2005.
- [RFC5234] Crocker, D. and P. Overell, "Augmented BNF for Syntax Specifications: ABNF", STD 68, [RFC 5234](#), January 2008.

## **9.2. Informative References**

- [RFC2087] Myers, J., "IMAP4 QUOTA extension", [RFC 2087](#), January 1997.
- [RFC5162] Melnikov, A., Cridland, D., and C. Wilson, "IMAP4 Extensions for Quick Mailbox Resynchronization", [RFC 5162](#), March 2008.
- [RFC6785] Leiba, B., "Support for Internet Message Access Protocol (IMAP) Events in Sieve", [RFC 6785](#), November 2012.

## **Appendix A. Change History**

RFC Editor: Please delete this section from the final RFC.

### **A.1. Changes since -00**

1. Fixed two bad nouns. Mailboxes aren't messages.
2. Adrien's server can easily do UID MOVE but not so easily MSN-based moves.

### **A.2. Changes since -01**

1. Changed to Informative, on Barry's suggestion. Or did I ask him? Whatever.
2. Removed the 'reasons to avoid', it was doubleplusungood.

### **A.3. Changes since [draft-gulbrandsen-imap-move-02](#)**

1. Various wording changes from Barry's review.
2. Open issue: Delete the \deleted rule?
3. Back to PS, informative didn't fly in the IESG
4. Turned into a WG document in order to get write access to the IMAP4 capabilities registry
5. Mention VANISHED in 5162
6. Added bad boilerplate to please idnits. This document contains no code.

#### **A.4. Changes since -00**

1. Added MSN-based move. The consensus seems mildly in favour. I think. We'll see once this is posted.
2. Advise sending COPYUID earlier, to help clients. Requiring out of order processing is unnecessarily nasty.
3. Note that moving to the source inbox has to work. I think it does have to work, but this is a draft, it says so on every page.

#### **A.5. Changes since -01**

1. (Issue tracker #1) Changed command-select ABNF to conform with the conventions used in [RFC 3501](#).
2. (Issue tracker #2) Banned overlapped pipelined MOVE and UID MOVE.
3. (Issue tracker #3) Added section about interaction with IMAP Sieve.
4. (Issue tracker #4) Revised security considerations.
5. (Issue tracker #5) Removed text that characterized MOVE as the same as COPY/STORE/EXPUNGE.
6. (Issue tracker #6) [RFC 4314](#) is now a normative reference.
7. (Issue tracker #7) Major rewrite of the command description text as a result of AD review.
8. (Issue tracker #8) Revised abstract.
9. (Issue tracker #9) Added text saying partial failures are allowed.
10. (Issue tracker #10) Some additional tweaks to the security considerations section were made.
11. The abstract and introduction were out of whack as a result of other changes, so some revisions were made to bring them back into sync.

#### **A.6. Changes since -02**

1. Corrected various typos, clarified several paragraphs discussing MOVE semantics.
2. Added the usual text about the extension only being available when it is reported by the CAPABILITIES command.
3. Revised the text about QRESYNC to make clear what the requirements are.
4. Removed a suggestion about MUA/user behavior from the discussion of the QUOTA extension.
5. Updated the main and running title to conform to other IMAP RFCs.

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