

Sieve Email Filtering: Delivering to Special-Use Mailboxes

Abstract

The SPECIAL-USE capability of the IMAP protocol (RFC 6154) allows clients to identify special-use mailboxes, e.g., where draft or sent messages should be put. This simplifies client configuration. In contrast, the Sieve mail filtering language (RFC 5228) currently has no such capability. This memo defines a Sieve extension that fills this gap: it adds a test for checking whether a special-use attribute is assigned for a particular mailbox or any mailbox, and it adds the ability to file messages into a mailbox identified solely by a special-use attribute.

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Table of Contents

- 1. Introduction 2
- 2. Conventions Used in This Document 3
- 3. Test "specialuse_exists" 3
 - 3.1. Equivalent IMAP Operations 4
- 4. ":specialuse" Argument to "fileinto" Command 5
 - 4.1. Mailboxes Created Implicitly by the "fileinto" Command 6
 - 4.2. Equivalent IMAP Operations 7
- 5. Sieve Capability Strings 8
- 6. Examples 8
- 7. Security Considerations 9
- 8. IANA Considerations 10
- 9. References 10
 - 9.1. Normative References 10
 - 9.2. Informative References 11
- Acknowledgements 11
- Author's Address 12

1. Introduction

Commonly, several mailboxes in an IMAP message store [IMAP] have a special use. For example, there can be a special-use mailbox for storing the user's draft messages, for keeping copies of sent messages, and for collecting spam messages that were classified as such at delivery. The SPECIAL-USE capability [SPECIAL-USE] of the IMAP protocol defines mailbox attributes that identify these special mailboxes explicitly to the client. This way, client configuration is simplified significantly. Using the CREATE-SPECIAL-USE capability [SPECIAL-USE], IMAP clients can also configure these attributes dynamically based on user preference.

Unlike the IMAP protocol, the Sieve mail filtering language [SIEVE] currently cannot freely access these special-use mailbox attributes. Particularly, the Sieve interpreter has no means to identify a mailbox with a particular special-use attribute. This would be very useful, for example, to find the user's "Spam" mailbox at delivery.

In Sieve, limited access to the special-use attributes is provided using the "mailboxmetadata" extension [SIEVE-MAILBOX], which allows testing for the presence of a special-use attribute in the "/private/specialuse" IMAP METADATA [IMAP-METADATA] entry of a mailbox. Still, not all implementers will be willing to add the complexity of the IMAP METADATA capability just to provide access to special-use attributes to the Sieve interpreter.

If the mailbox argument is specified, the "specialuse_exists" test yields "true" if all of the following statements are true:

- a. The indicated mailbox exists.
- b. That mailbox allows the user in whose context the Sieve script runs to "deliver" messages into it.
- c. That mailbox has all of the special-use attributes listed in the special-use-attrs argument assigned to it.

Refer to the specification of the "mailboxexists" test in Section 3.1 of RFC 5490 [SIEVE-MAILBOX] for a definition of when "delivery" of messages into a mailbox is deemed possible.

3.1. Equivalent IMAP Operations

To clarify, the following IMAP protocol examples show a sequence of [IMAP] commands that a client could send to perform an assessment without Sieve that is equivalent to the "specialuse_exists" test.

First, the client queries which namespaces are available using the NAMESPACE command [NAMESPACE]:

```
C: A01 NAMESPACE
S: * NAMESPACE (("INBOX/" "/" )("Archive/" "/" )) NIL (("Public/" "/" ))
S: A01 OK NAMESPACE command completed
```

Subsequently, when no particular mailbox is of interest (i.e., the "specialuse_exists" test has no mailbox argument), the client lists all mailboxes with special-use attributes in the two returned personal namespaces (this extended LIST command requires the LIST-EXTENDED IMAP capability [LIST-EXTENDED]):

```
C: A02 LIST (SPECIAL-USE) "" ("INBOX/*" "Archive/*")
   RETURN (SPECIAL-USE)
S: * LIST (\Drafts) "/" INBOX/Drafts
S: * LIST (\Trash) "/" INBOX/Trash
S: * LIST (\Sent) "/" INBOX/Sent
S: * LIST (\Archive) "/" Archive/Default
S: A02 OK LIST command completed
```

Finally, using the MYRIGHTS command [IMAP-ACL], the client determines the access rights it has for the mailbox or mailboxes that have all the requested attributes assigned. This way, it can determine whether messages can be saved to any of those. In this example, an "\Archive" special-use mailbox is sought:

```
C: A03 MYRIGHTS Archive/Default
S: * MYRIGHTS Archive/Default lrwsip
S: A03 OK Myrights completed
```

The MYRIGHTS response indicates that the user has "insert" rights [IMAP-ACL] for the "Archive/Default" mailbox, meaning that the client can deliver (APPEND) messages to that mailbox and that the Sieve "specialuse_exists" test would yield "true" in this case.

4. ":specialuse" Argument to "fileinto" Command

```
Usage: fileinto [:specialuse <special-use-attr: string>]
        <mailbox: string>
```

Normally, the "fileinto" command delivers the message in the mailbox specified using its positional mailbox argument, which is the name of the mailbox. However, if the optional ":specialuse" argument is also specified, the "fileinto" command first checks whether a mailbox exists in the user's personal namespace [NAMESPACE] with the specified special-use attribute assigned to it. If that is the case, that special-use mailbox is used for delivery instead. If there is no such mailbox or if the specified special-use attribute is unknown to the implementation in general, the "fileinto" action proceeds as it would without the ":specialuse" argument.

Summarizing, if the ":specialuse" argument is specified, the "fileinto" command deals with two mailboxes that may or may not exist and may, in fact, be equal:

- o A special-use mailbox in the user's personal namespace, which has at least the special-use attribute specified with the ":specialuse" argument assigned to it. The name for this mailbox is not relevant here; it is only identified by the assigned special-use attribute.
- o The default mailbox named by the positional string argument of the "fileinto" command, which is used when the special-use mailbox is not found.

The special-use attribute specified with the ":specialuse" argument conforms to the "use-attr" syntax described in Section 6 of RFC 6154 [SPECIAL-USE]. Implementations SHOULD handle an invalid special-use attribute in the same way as an invalid mailbox name is handled. The string parameter of the ":specialuse" argument is not a constant string, which means that variable substitutions are allowed when the "variables" extension [VARIABLES] is active. In that case, the syntax of the special-use attribute is only verified at runtime.

If neither the special-use mailbox nor the default mailbox exists, the "fileinto" action MUST proceed exactly as it does in case the ":specialuse" argument is absent and the mailbox named by its positional argument does not exist. The various options for handling this situation are described in Section 4.1 of RFC 5228 [SIEVE].

More than one mailbox in the user's personal namespace can have a particular special-use attribute assigned. If one of those mailboxes is, in fact, the default mailbox named by the positional string argument of the "fileinto" command, that mailbox MUST be used for delivery. If the default mailbox is not one of the options, the mailbox that is chosen for delivery is implementation defined. However, while the set of mailboxes to which the involved special-use attribute are assigned remains unchanged, implementations SHOULD ensure that the mailbox choice is made consistently, so that the same mailbox is used every time. Conversely, the chosen mailbox MAY change once the assignments of the special-use attribute that are relevant for the mailbox choice are changed (usually by user interaction).

If delivery to the special-use mailbox fails for reasons not relating to its existence, the Sieve interpreter MUST NOT subsequently attempt delivery in the indicated default mailbox as a fallback. Instead, it MUST proceed exactly as it does in case the ":specialuse" argument is absent and delivery to the mailbox named by its positional argument fails. This prevents the situation where messages are unexpectedly spread over two mailboxes in case transient or intermittent delivery failures occur.

4.1. Mailboxes Created Implicitly by the "fileinto" Command

Before attempting to deliver the message into the specified mailbox, the "fileinto" command may implicitly create the mailbox if it does not exist (see Section 4.1 of RFC 5228 [SIEVE]). This optional behavior can be requested explicitly using the "mailbox" extension [SIEVE-MAILBOX], which adds the optional ":create" argument to the "fileinto" command. If the ":create" argument is specified with "fileinto", it instructs the Sieve interpreter to unconditionally create the specified mailbox if needed. Note that the ":create" argument has no effect when the implicit creation of mailboxes for delivery is the default behavior.

When the ":specialuse" argument is present, this behavior does not change; the Sieve interpreter will implicitly create the specified default mailbox if needed. This need arises when both the special-use mailbox and the default mailbox are not found.

If the server implementation supports the CREATE-SPECIAL-USE capability [SPECIAL-USE] for IMAP (i.e., it allows assigning special-use attributes to new mailboxes), it SHOULD assign the special-use attribute specified with the ":specialuse" argument to the newly created mailbox.

4.2. Equivalent IMAP Operations

To clarify, the following IMAP protocol examples show a sequence of [IMAP] commands that a client could send to perform an action without Sieve that is equivalent to the "fileinto" action with the ":specialuse" argument. The following Sieve script is assumed:

```
require "fileinto";
require "special-use";

fileinto :specialuse "\\Archive" "INBOX/Archive";
```

First, the client proceeds as in Section 3.1 to find out whether the indicated special-use attribute is assigned to any mailbox in the user's personal namespace. If a matching special-use mailbox is found, the message is delivered there using the IMAP APPEND command. If no matching special-use mailbox is found, the client attempts to deliver the message to the indicated default mailbox:

```
C: A04 APPEND INBOX/Archive {309}
S: A04 NO [TRYCREATE] Mailbox does not exist: INBOX/Archive
```

In this example, the default mailbox does not exist either. In that case, the client MAY create the default mailbox and assign the indicated special-use attribute to it:

```
C: A05 CREATE INBOX/Archive (USE (\Archive))
S: A05 OK Create completed
```

Finally, the client completes the delivery:

```
C: A06 APPEND INBOX/Archive {309}
S: + OK
C: Date: Wed, 18 Jul 2018 22:00:09 +0200
C: From: mooch@owatagu.siam.example
C: To: Fred Foobar <foobar@Blurdybloop.example>
C: Subject: afternoon meeting
C: Message-Id: <Q234234-01012222@owatagu.siam.example>
C: MIME-Version: 1.0
C: Content-Type: text/plain; charset=UTF-8
C:
C: Hi Fred, do you think we can meet again at 3:30 tomorrow?
C:
S: A06 OK [APPENDUID 1533375901 2312] Append completed.
```

5. Sieve Capability Strings

A Sieve implementation that defines the "specialuse_exists" test and the ":specialuse" argument for the "fileinto" command will advertise the capability string "special-use".

6. Examples

The following example saves the message in the mailbox where messages deemed to be junk mail are held. This mailbox is identified using the "\Junk" special-use attribute. If no mailbox has this attribute assigned, the message is filed into the mailbox named "Spam". If the mailbox named "Spam" does not exist either, the result of this Sieve script is implementation dependent, e.g., it may trigger an error or the mailbox may be created implicitly.

```
require "fileinto";
require "special-use";

fileinto :specialuse "\\Junk" "Spam";
```

The following very similar example explicitly handles the case in which neither a "\Junk" special-use mailbox nor the "Spam" mailbox exists. In that case, a mailbox called "Spam" is created, and the message is stored there. Additionally, the "\Junk" special-use attribute may be assigned to it.

```
require "fileinto";
require "special-use";
require "mailbox";

fileinto :specialuse "\\Junk" :create "Spam";
```


The following example is used in a Sieve script that is triggered from an IMAP event rather than at message delivery [IMAPSIEVE]. This Sieve script redirects messages to an automated recipient that processes junk mail if those messages are copied or moved into a mailbox that has the "\Junk" special-use attribute assigned.

```
require "imapsieve";
require "special-use";
require "environment";
require "variables";

if environment :contains "imap.mailbox" "*" {
    set "mailbox" "${1}";
}

if allof(
    environment "imap.cause" "COPY",
    specialuse_exists "${mailbox}" "\\Junk") {
    redirect "spam-report@example.org";
}
```

7. Security Considerations

Security considerations are discussed in [SIEVE], [VARIABLES], and [SPECIAL-USE]. It is believed that this extension does not introduce any additional security concerns.

Note that this specification explicitly restricts the special-use mailbox to the user's personal namespace. First, this avoids the need to search the entire mail storage for mailboxes that have a particular special-use attribute assigned. This could put undue load on the system, while shared special-use mailboxes are deemed of limited use with the currently defined special-use attributes. Secondly, it prevents security concerns with shared mailboxes that have special-use attributes assigned that apply to all users. Searching the entire mail storage for special-use mailboxes could lead to messages unexpectedly or even maliciously being filed to shared mailboxes.

This restriction could be lifted for particular future special-use attributes, but such new attributes should have a clear application for shared mailboxes, and the security concerns should be considered carefully.

8. IANA Considerations

IANA has registered the Sieve extension specified in this document in the "Sieve Extensions" registry at <https://www.iana.org/assignments/sieve-extensions>:

Capability name: special-use
Description: adds a test for checking whether an IMAP special-use attribute is assigned for a particular mailbox or any mailbox; also adds the ability to file messages into a mailbox identified solely by a special-use attribute.
RFC number: RFC 8579
Contact address: Sieve discussion list <sieve@ietf.org>

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9.1. Normative References

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Acknowledgements

Thanks to Stan Kalisch, Barry Leiba, Alexey Melnikov, Ken Murchison, and Ned Freed for reviews and suggestions.

Thanks to the authors of RFC 5490 [SIEVE-MAILBOX], from which some descriptive text in this document is borrowed.

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