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The Internet Message Action Protocol (IMAP4) Child Mailbox Extension

Status of this Memo

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Abstract

The Internet Message Action Protocol (IMAP4) CHILDREN extension provides a mechanism for a client to efficiently determine if a particular mailbox has children, without issuing a LIST "" * or a LIST "" % for each mailbox.

1. Conventions used in this document

In examples, "C:" and "S:" indicate lines sent by the client and server respectively. If such lines are wrapped without a new "C:" or "S:" label, then the wrapping is for editorial clarity and is not part of the command.

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 [RFC-2119].

2. Introduction and Overview

Many IMAP4 [RFC-2060] clients present to the user a hierarchical view of the mailboxes that a user has access to. Rather than initially presenting to the user the entire mailbox hierarchy, it is often preferable to show to the user a collapsed outline list of the mailbox hierarchy (particularly if there is a large number of mailboxes). The user can then expand the collapsed outline hierarchy as needed. It is common to include within the collapsed hierarchy a

visual clue (such as a "+") to indicate that there are child mailboxes under a particular mailbox. When the visual clue is clicked the hierarchy list is expanded to show the child mailboxes.

Several IMAP vendors implemented this proposal, and it is proposed to document this behavior and functionality as an Informational RFC.

There is interest in addressing the general extensibility of the IMAP LIST command through an IMAP LIST Extension draft. Similar functionality to the \HasChildren and \HasNoChildren flags could be incorporated into this new LIST Extension. It is proposed that the more general LIST Extension draft proceed on the standards track with this proposal being relegated to informational status only.

If the functionality of the \HasChildren and \HasNoChildren flags were incorporated into a more general LIST extension, this would have the advantage that a client could then have the opportunity to request whether or not the server should return this information. This would be an advantage over the current draft for servers where this information is expensive to compute, since the server would only need to compute the information when it knew that the client requesting the information was able to consume it.

3. Requirements

IMAP4 servers that support this extension MUST list the keyword CHILDREN in their CAPABILITY response.

The CHILDREN extension defines two new attributes that MAY be returned within a LIST response.

\HasChildren - The presence of this attribute indicates that the mailbox has child mailboxes.

Servers SHOULD NOT return \HasChildren if child mailboxes exist, but none will be displayed to the current user in a LIST response (as should be the case where child mailboxes exist, but a client does not have permissions to access them.) In this case, \HasNoChildren SHOULD be used.

In many cases, however, a server may not be able to efficiently compute whether a user has access to all child mailboxes, or multiple users may be accessing the same account and simultaneously changing the mailbox hierarchy. As such a client MUST be prepared to accept the \HasChildren attribute as a hint. That is, a mailbox MAY be flagged with the \HasChildren attribute, but no child mailboxes will appear in a subsequent LIST response.

Example 3.1:
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/*** Consider a server that has the following mailbox hierarchy:

INBOX
ITEM_1
   ITEM_1A
ITEM_2
   TOP_SECRET

Where INBOX, ITEM_1 and ITEM_2 are top level mailboxes. ITEM_1A is a child mailbox of ITEM_1 and TOP_SECRET is a child mailbox of ITEM_2 that the currently logged on user does NOT have access to.

Note that in this case, the server is not able to efficiently compute access rights to child mailboxes and responds with a \HasChildren attribute for mailbox ITEM_2, even though ITEM_2/TOP_SECRET does not appear in the list response. ***/

C: A001 LIST "" *
S: * LIST (\HasNoChildren) "/" INBOX
S: * LIST (\HasChildren) "/" ITEM_1
S: * LIST (\HasNoChildren) "/" ITEM_1/ITEM_1A
S: * LIST (\HasChildren) "/" ITEM_2
S: A001 OK LIST Completed

\HasNoChildren - The presence of this attribute indicates that the mailbox has NO child mailboxes that are accessible to the currently authenticated user. If a mailbox has the \Noinferiors attribute, the \HasNoChildren attribute is redundant and SHOULD be omitted in the LIST response.

In some instances a server that supports the CHILDREN extension MAY NOT be able to determine whether a mailbox has children. For example it may have difficulty determining whether there are child mailboxes when LISTing mailboxes while operating in a particular namespace.

In these cases, a server MAY exclude both the \HasChildren and \HasNoChildren attributes in the LIST response. As such, a client can not make any assumptions about whether a mailbox has children based upon the absence of a single attribute.

It is an error for the server to return both a \HasChildren and a \HasNoChildren attribute in a LIST response.

It is an error for the server to return both a \HasChildren and a \NoInferiors attribute in a LIST response.

Note: the \HasNoChildren attribute should not be confused with the IMAP4 [RFC-2060] defined attribute \Noinferiors which indicates that no child mailboxes exist now and none can be created in the future.

The \HasChildren and \HasNoChildren attributes might not be returned in response to a LSUB response. Many servers maintain a simple mailbox subscription list that is not updated when the underlying mailbox structure is changed. A client MUST NOT assume that hierarchy information will be maintained in the subscription list.

RLIST is a command defined in [RFC-2193] that includes in a LIST response mailboxes that are accessible only via referral. That is, a client must explicitly issue an RLIST command to see a list of these mailboxes. Thus in the case where a mailbox has child mailboxes that are available only via referral, the mailboxes would appear as \HasNoChildren in response to the LIST command, and \HasChildren in response to the RLIST command.

5. Formal Syntax

The following syntax specification uses the augmented Backus-Naur Form (BNF) as described in [ABNF].

Two new mailbox attributes are defined as flag_extensions to the IMAP4 mailbox_list response:

HasChildren = "\HasChildren"

HasNoChildren = "\HasNoChildren"

6. Security Considerations

This extension provides a client a more efficient means of determining whether a particular mailbox has children. If a mailbox has children, but the currently authenticated user does not have access to any of them, the server SHOULD respond with a \HasNoChildren attribute. In many cases, however, a server may not be able to efficiently compute whether a user has access to all child mailboxes. If such a server responds with a \HasChildren attribute, when in fact the currently authenticated user does not have access to any child mailboxes, potentially more information is conveyed about the mailbox than intended. A server designed with such levels of security in mind SHOULD NOT attach the \HasChildren attribute to a mailbox unless the server is certain that the user has access to at least one of the child mailboxes.

7. References

[RFC-2060] Crispin, M., "Internet Message Access Protocol - Version 4rev1", RFC 2060, December 1996.

[RFC-2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[RFC-2234] Crocker, D. and P. Overell, Editors, "Augmented BNF for Syntax Specifications: ABNF", RFC 2234, November 1997.

[RFC-2193] Gahrns, M., "IMAP4 Mailbox Referrals", RFC 2193, September 1997.

8. Acknowledgments

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10. Full Copyright Statement

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