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# IMAP4 Namespace

## Status of this Memo



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## 1. Abstract

IMAP4 [RFC-2060] does not define a default server namespace. As a result, two common namespace models have evolved:

The "Personal Mailbox" model, in which the default namespace that is presented consists of only the user's personal mailboxes. To access shared mailboxes, the user must use an escape mechanism to reach another namespace.

The "Complete Hierarchy" model, in which the default namespace that is presented includes the user's personal mailboxes along with any other mailboxes they have access to.

These two models, create difficulties for certain client operations. This document defines a NAMESPACE command that allows a client to discover the prefixes of namespaces used by a server for personal mailboxes, other users' mailboxes, and shared mailboxes. This allows a client to avoid much of the manual user configuration that is now necessary when mixing and matching IMAP4 clients and servers.

## 2. 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.

Personal Namespace: A namespace that the server considers within the personal scope of the authenticated user on a particular connection. Typically, only the authenticated user has access to mailboxes in their Personal Namespace. It is the part of the namespace that belongs to the user that is allocated for mailboxes. If an INBOX exists for a user, it MUST appear within the user's personal namespace. In the typical case, there SHOULD be only one Personal Namespace on a server.

Other Users' Namespace: A namespace that consists of mailboxes from the Personal Namespaces of other users. To access mailboxes in the Other Users' Namespace, the currently authenticated user MUST be explicitly granted access rights. For example, it is common for a manager to grant to their secretary access rights to their mailbox. In the typical case, there SHOULD be only one Other Users' Namespace on a server.

Shared Namespace: A namespace that consists of mailboxes that are intended to be shared amongst users and do not exist within a user's Personal Namespace.

The namespaces a server uses MAY differ on a per-user basis.

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].

## 3. Introduction and Overview

Clients often attempt to create mailboxes for such purposes as maintaining a record of sent messages (e.g. "Sent Mail") or temporarily saving messages being composed (e.g. "Drafts"). For these clients to inter-operate correctly with the variety of IMAP4 servers available, the user must enter the prefix of the Personal Namespace used by the server. Using the NAMESPACE command, a client is able to automatically discover this prefix without manual user configuration.

In addition, users are often required to manually enter the prefixes of various namespaces in order to view the mailboxes located there. For example, they might be required to enter the prefix of #shared to view the shared mailboxes namespace. The NAMESPACE command allows a client to automatically discover the namespaces that are available on a server. This allows a client to present the available namespaces to the user in what ever manner it deems appropriate. For example, a

client could choose to initially display only personal mailboxes, or it may choose to display the complete list of mailboxes available, and initially position the user at the root of their Personal Namespace.

A server MAY choose to make available to the NAMESPACE command only a subset of the complete set of namespaces the server supports. To provide the ability to access these namespaces, a client SHOULD allow the user the ability to manually enter a namespace prefix.

## 4. Requirements

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

The NAMESPACE command is valid in the Authenticated and Selected state.

## 5. NAMESPACE Command

Arguments: none

Response: an untagged NAMESPACE response that contains the prefix and hierarchy delimiter to the server's Personal Namespace(s), Other Users' Namespace(s), and Shared Namespace(s) that the server wishes to expose. The response will contain a NIL for any namespace class that is not available. Namespace_Response_Extensions MAY be included in the response. Namespace_Response_Extensions which are not on the IETF standards track, MUST be prefixed with an "X-".

Result: OK - Command completed
NO - Error: Can't complete command
BAD - argument invalid

Example 5.1:
===========

< A server that supports a single personal namespace. No leading prefix is used on personal mailboxes and "/" is the hierarchy delimiter.>

```
C: A001 NAMESPACE
S: * NAMESPACE (("" "/")) NIL NIL
S: A001 OK NAMESPACE command completed
```

Example 5.2:
==========

< A user logged on anonymously to a server. No personal mailboxes are associated with the anonymous user and the user does not have access to the Other Users' Namespace. No prefix is required to access shared mailboxes and the hierarchy delimiter is "." >

```
C: A001 NAMESPACE
S: * NAMESPACE NIL NIL (("" "."))
S: A001 OK NAMESPACE command completed
```

Example 5.3:
==========

< A server that contains a Personal Namespace and a single Shared Namespace. >

```
C: A001 NAMESPACE
S: * NAMESPACE (("" "/")) NIL (("Public Folders/" "/"))
S: A001 OK NAMESPACE command completed
```

Example 5.4:
==========

< A server that contains a Personal Namespace, Other Users' Namespace and multiple Shared Namespaces. Note that the hierarchy delimiter used within each namespace can be different. >

```
C: A001 NAMESPACE
S: * NAMESPACE (("" "/")) (("~" "/")) (("#shared/" "/")
   ("#public/" "/")("#ftp/" "/")("#news." "."))
S: A001 OK NAMESPACE command completed
```

The prefix string allows a client to do things such as automatically creating personal mailboxes or LISTing all available mailboxes within a namespace.

Example 5.5:
==========

< A server that supports only the Personal Namespace, with a leading prefix of INBOX to personal mailboxes and a hierarchy delimiter of ".">

```
C: A001 NAMESPACE
S: * NAMESPACE (("INBOX." ".")) NIL  NIL
S: A001 OK NAMESPACE command completed
```

```
   < Automatically create a mailbox to store sent items.>

   C: A002 CREATE "INBOX.Sent Mail"
   S: A002 OK CREATE command completed
```

Although typically a server will support only a single Personal Namespace, and a single Other User's Namespace, circumstances exist where there MAY be multiples of these, and a client MUST be prepared for them. If a client is configured such that it is required to create a certain mailbox, there can be circumstances where it is unclear which Personal Namespaces it should create the mailbox in. In these situations a client SHOULD let the user select which namespaces to create the mailbox in.

Example 5.6:
==========

```
   < In this example, a server supports 2 Personal Namespaces.  In
   addition to the regular Personal Namespace, the user has an
   additional personal namespace to allow access to mailboxes in an
   MH format mailstore. >

   < The client is configured to save a copy of all mail sent by the
   user into a mailbox called 'Sent Mail'.  Furthermore, after a
   message is deleted from a mailbox, the client is configured to
   move that message to a mailbox called 'Deleted Items'.>

   < Note that this example demonstrates how some extension flags can
   be passed to further describe the #mh namespace. >

   C: A001 NAMESPACE
   S: * NAMESPACE (("" "/")("#mh/" "/" "X-PARAM" ("FLAG1" "FLAG2")))
      NIL NIL
   S: A001 OK NAMESPACE command completed

   < It is desired to keep only one copy of sent mail. It is unclear
   which Personal Namespace the client should use to create the 'Sent
   Mail' mailbox.  The user is prompted to select a namespace and
   only one 'Sent Mail' mailbox is created. >

   C: A002 CREATE "Sent Mail"
   S: A002 OK CREATE command completed

   < The client is designed so that it keeps two 'Deleted Items'
   mailboxes, one for each namespace. >

   C: A003 CREATE "Delete Items"
   S: A003 OK CREATE command completed
```

```
   C: A004 CREATE "#mh/Deleted Items"
   S: A004 OK CREATE command completed
```

The next level of hierarchy following the Other Users' Namespace prefix SHOULD consist of <username>, where <username> is a user name as per the IMAP4 LOGIN or AUTHENTICATE command.

A client can construct a LIST command by appending a "%" to the Other Users' Namespace prefix to discover the Personal Namespaces of other users that are available to the currently authenticated user.

In response to such a LIST command, a server SHOULD NOT return user names that have not granted access to their personal mailboxes to the user in question.

A server MAY return a LIST response containing only the names of users that have explicitly granted access to the user in question.

Alternatively, a server MAY return NO to such a LIST command, requiring that a user name be included with the Other Users' Namespace prefix before listing any other user's mailboxes.

Example 5.7:
==========

```
   < A server that supports providing a list of other user's
   mailboxes that are accessible to the currently logged on user. >

   C: A001 NAMESPACE
   S: * NAMESPACE (("" "/")) (("Other Users/" "/")) NIL
   S: A001 OK NAMESPACE command completed

   C: A002 LIST "" "Other Users/%"
   S: * LIST () "/" "Other Users/Mike"
   S: * LIST () "/" "Other Users/Karen"
   S: * LIST () "/" "Other Users/Matthew"
   S: * LIST () "/" "Other Users/Tesa"
   S: A002 OK LIST command completed
```

Example 5.8:
==========

```
   < A server that does not support providing a list of other user's
   mailboxes that are accessible to the currently logged on user.
   The mailboxes are listable if the client includes the name of the
   other user with the Other Users' Namespace prefix. >
```

```
C: A001 NAMESPACE
S: * NAMESPACE (("" "/")) (("#Users/" "/")) NIL
S: A001 OK NAMESPACE command completed

< In this example, the currently logged on user has access to the
Personal Namespace of user Mike, but the server chose to suppress
this information in the LIST response.  However, by appending the
user name Mike (received through user input) to the Other Users'
Namespace prefix, the client is able to get a listing of the
personal mailboxes of user Mike. >

C: A002 LIST "" "#Users/%"
S: A002 NO The requested item could not be found.

C: A003 LIST "" "#Users/Mike/%"
S: * LIST () "/" "#Users/Mike/INBOX"
S: * LIST () "/" "#Users/Mike/Foo"
S: A003 OK LIST command completed.

A prefix string might not contain a hierarchy delimiter, because
in some cases it is not needed as part of the prefix.

Example 5.9:
===========

< A server that allows access to the Other Users' Namespace by
prefixing the others' mailboxes with a '~' followed by <username>,
where <username> is a user name as per the IMAP4 LOGIN or
AUTHENTICATE command.>

C: A001 NAMESPACE
S: * NAMESPACE (("" "/")) (("~" "/")) NIL
S: A001 OK NAMESPACE command completed

< List the mailboxes for user mark >

C: A002 LIST "" "~mark/%"
S: * LIST () "/" "~mark/INBOX"
S: * LIST () "/" "~mark/foo"
S: A002 OK LIST command completed
```

Historical convention has been to start all namespaces with the "#" character. Namespaces that include the "#" character are not IMAP URL [IMAP-URL] friendly requiring the "#" character to be represented as %23 when within URLs. As such, server implementers MAY instead consider using namespace prefixes that do not contain the "#" character.

## 6. Formal Syntax

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

```
atom = <atom>
   ; <atom> as defined in [RFC-2060]

Namespace = nil / "(" 1*( "(" string SP  (<"> QUOTED_CHAR <"> /
   nil) *(Namespace_Response_Extension) ")" ) ")"

Namespace_Command = "NAMESPACE"

Namespace_Response_Extension = SP string SP "(" string *(SP string)
   ")"

Namespace_Response = "*" SP "NAMESPACE" SP Namespace SP Namespace SP
   Namespace

   ; The first Namespace is the Personal Namespace(s)
   ; The second Namespace is the Other Users' Namespace(s)
   ; The third Namespace is the Shared Namespace(s)

   nil = <nil>
      ; <nil> as defined in [RFC-2060]

   QUOTED_CHAR = <QUOTED_CHAR>
      ; <QUOTED_CHAR> as defined in [RFC-2060]

   string = <string>
      ; <string> as defined in [RFC-2060]
      ; Note that  the namespace prefix is to a mailbox and following
      ; IMAP4 convention, any international string in the NAMESPACE
      ; response MUST be of modified UTF-7 format as described in
      ;  [RFC-2060].
```

## 7. Security Considerations

In response to a LIST command containing an argument of the Other Users' Namespace prefix, a server SHOULD NOT list users that have not granted list access to their personal mailboxes to the currently authenticated user. Providing such a list, could compromise security by potentially disclosing confidential information of who is located on the server, or providing a starting point of a list of user accounts to attack.

## 8. 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.

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

[IMAP-URL], Newman, C., "IMAP URL Scheme", RFC 2192, September 1997.

## 9. Acknowledgments

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