

Network Working Group
Internet-Draft
Intended Status: Proposed Standard

Arnt Gulbrandsen
Oryx Mail Systems GmbH
December 15, 2008

IMAP Response Codes
draft-gulbrandsen-imap-response-codes-07.txt

Status of this Memo

This Internet-Draft is submitted to IETF in full conformance with the provisions of [BCP 78](#) and [BCP 79](#).

Copyright (c) 2008 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to [BCP 78](#) and the IETF Trust's Legal Provisions Relating to IETF Documents (<http://trustee.ietf.org/license-info>) in effect on the date of publication of this document. Please review these documents carefully, as they describe your rights and restrictions with respect to this document.

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF), its areas, and its working groups. Note that other groups may also distribute working documents as Internet-Drafts.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

The list of current Internet-Drafts can be accessed at <http://www.ietf.org/ietf/lid-abstracts.txt>. The list of Internet-Draft Shadow Directories can be accessed at <http://www.ietf.org/shadow.html>.

This Internet-Draft expires in June 2009.

Internet-draft

December 2008

Abstract

IMAP responses consist of a response type (OK, NO, BAD), an optional machine-readable response code and a human-readable text.

This document collects and documents a variety of machine-readable response codes, for better interoperation and error reporting.

1. Conventions Used in This Document

Formal syntax is defined by [\[RFC5234\]](#) as modified by [\[RFC3501\]](#).

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

2. Introduction

[\[RFC3501\]](#) [section 7.1](#) defines a number of response codes which can help tell an IMAP client why a command failed. However, experience has shown that more codes are useful. For example, it is useful for a client to know that an authentication attempt failed because of a server problem as opposed to a password problem.

Currently many IMAP servers use English-language human-readable text to describe these errors, and a few IMAP clients attempt to translate this text into the user's language.

This document names a variety of errors as response codes. It is based on errors checked and reported in some IMAP server implementations, and on needs in some IMAP clients.

This document doesn't require any servers to test for these errors, or any clients to test for these names. It only names errors for better reporting and handling.

[RFC Editor: Please remove this paragraph.] In general, this document aims to do that which is widely considered good, and nothing more. Several controversial and/or complex features were discussed, but just listing the simple and desirable response codes is enough for one document.

[3.](#) Response Codes

This section defines all the new response codes. Each definition is followed by one or more examples.

Gulbrandsen

Expires June 2009

[Page 2]

Internet-draft

December 2008

UNAVAILABLE Temporary failure because a subsystem is down. For example, an IMAP server which uses an LDAP or Radius server for authentication might use this when the LDAP/Radius server is down.

C: a LOGIN "fred" "foo"

S: a NO [UNAVAILABLE] User's backend down for maintenance

AUTHENTICATIONFAILED Authentication failed for some reason which the server is not willing to elaborate. Typically this includes "unknown user" and "bad password".

This is the same as not sending any response code, except that when a client sees AUTHENTICATIONFAILED, it knows that the problem wasn't e.g. UNAVAILABLE, so there's no point in trying the same login/password again later.

C: b LOGIN "fred" "foo"

S: b NO [AUTHENTICATIONFAILED] Authentication failed

AUTHORIZATIONFAILED Authentication succeeded, but authorization failed. This is only applicable when the authentication and authorization identities are different.

C: c AUTHENTICATE PLAIN

[...]

S: c NO [AUTHORIZATIONFAILED] No such auth-ID

EXPIRED Authentication succeeded or the server didn't have the necessary data any more, but access is no longer permitted using that passphrase. The client or user should get a new passphrase.

C: d login "fred" "foo"

S: d NO [EXPIRED] That password isn't valid any more

PRIVACYREQUIRED The operation is not permitted due to a lack of privacy. If TLS is not in use, the client could try STARTTLS (see [\[RFC3501\] section 6.2.1](#)) and then repeat the operation.

C: d login "fred" "foo"

S: d NO [PRIVACYREQUIRED] Connection offers no privacy

C: d select inbox

S: d NO [PRIVACYREQUIRED] Connection offers no privacy

CONTACTADMIN The user should contact the system administrator or support desk.

C: e login "fred" "foo"

S: e OK [CONTACTADMIN]

NOPERM The access control system (e.g. ACL, see [\[RFC4314\]](#)) does not permit this user to carry out an operation, such as selecting or creating a mailbox.

C: f select "/archive/projects/experiment-iv"

S: f NO [NOPERM] Access denied

INUSE An operation has not been carried out because it involves sawing off a branch someone else is sitting on. Someone else may be holding an exclusive lock needed for this operation, or it may involve deleting a resource someone else is using, typically a mailbox.

The operation may succeed if the client tries again later.

C: g delete "/archive/projects/experiment-iv"

S: g NO [INUSE] Mailbox in use

EXPUNGEISSUED Someone else has issued an EXPUNGE for the same mailbox. The client may want to issue NOOP soon. [\[RFC2180\]](#) discusses this subject in depth.

C: h search from fred@example.com
S: * SEARCH 1 2 3 5 8 13 21 42
S: h OK [EXPUNGEISSUED] Search completed

CORRUPTION The server discovered that some relevant data (e.g. the mailbox) are corrupt. This response code does not include any information about what's corrupt, but the server can write that to its logfiles.

C: i select "/archive/projects/experiment-iv"
S: i NO [CORRUPTION] Cannot open mailbox

SERVERBUG The server encountered a bug in itself or violated one of its own invariants.

C: j select "/archive/projects/experiment-iv"
S: j NO [SERVERBUG] This should not happen

Gulbrandsen

Expires June 2009

[Page 4]

Internet-draft

December 2008

CLIENTBUG The server has detected a client bug. This can accompany all of OK, NO and BAD, depending on what the client bug is.

C: k1 select "/archive/projects/experiment-iv"
[...]
S: k1 OK [READ-ONLY] Done
C: k2 status "/archive/projects/experiment-iv" (messages)
[...]
S: k2 OK [CLIENTBUG] Done

CANNOT The operation violates some invariant of the server and can never succeed.

C: l create "////////"
S: l NO [CANNOT] Adjacent slashes is not supported

LIMIT The operation ran up against an implementation limit of some kind, such as the number of flags on a single message or number of flags used in a mailbox.

C: m STORE 42 FLAGS f1 f2 f3 f4 f5 ... f250

S: m NO [LIMIT] At most 32 flags in one mailbox supported

OVERQUOTA The user is or would be over quota after the operation.
(The user may or may not be over quota already.)

Note that if the server sends OVERQUOTA but doesn't support the IMAP QUOTA extension defined by [[RFC2087](#)], then there is a quota, but the client cannot find out what the quota is.

C: n1 uid copy 1:* oldmail

S: n1 NO [OVERQUOTA] Sorry

C: n2 uid copy 1:* oldmail

S: n2 OK [OVERQUOTA] You are now over your soft quota

ALREADYEXISTS The operation attempts to create something which already exists, such as when the CREATE or RENAME directories attempt to create a mailbox and there is one of that name.

C: o RENAME this that

S: o NO [ALREADYEXISTS] Mailbox "that" already exists

NONEXISTENT The operation attempts to delete something which does not exist. Similar to ALREADYEXISTS.

C: p RENAME this that

S: p NO [NONEXISTENT] No such mailbox

[4.](#) Formal Syntax

The following syntax specification uses the Augmented Backus-Naur Form (ABNF) notation as specified in [[RFC5234](#)]. [[RFC3501](#)] defines the non-terminal "resp-text-code".

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.

```
resp-text-code =/ "UNAVAILABLE" / "AUTHENTICATIONFAILED" /  
                  "AUTHORIZATIONFAILED" / "EXPIRED" /  
                  "PRIVACYREQUIRED" / "CONTACTADMIN" / "NOPERM" /  
                  "INUSE" / "EXPUNGEISSUED" / "CORRUPTION" /  
                  "SERVERBUG" / "CLIENTBUG" / "CANNOT" / "LIMIT"  
                  / "OVERQUOTA" / "ALREADYEXISTS" / "NONEXISTENT"
```

5. Security considerations

Revealing information about a passphrase to unauthenticated IMAP clients has bad karma.

Response codes are easier to parse than human-readable text. This can amplify the consequences of an information leak. For example, selecting a mailbox can fail because the mailbox doesn't exist, because the user doesn't have the "l" right (right to know the mailbox exists) or "r" (right to read the mailbox). If the server sent different responses in the first two cases in the past, only malevolent clients would discover it. With response codes it's possible, perhaps probable, that benevolent clients forward the leaked information to the user. Server authors are encouraged to be particularly careful with the NOPERM and authentication-related responses.

6. IANA considerations

The IANA is requested to create a new registry, tentatively named `imap-response-codes`, and populate it as follows:

REFERRAL	RFC 2221
ALERT	RFC 3501
BADCHARSET	RFC 3501

PARSE	RFC 3501
PERMANENTFLAGS	RFC 3501
READ-ONLY	RFC 3501
READ-WRITE	RFC 3501
TRYCREATE	RFC 3501
UIDNEXT	RFC 3501
UIDVALIDITY	RFC 3501
UNSEEN	RFC 3501
UNKNOWN-CTE	RFC 3516
UIDNOTSTICKY	RFC 4315
APPENDUID	RFC 4315
COPYUID	RFC 4315
URLMECH	RFC 4467
TOOBIG	RFC 4469
BADURL	RFC 4469
HIGHESTMODSEQ	RFC 4551
NOMODSEQ	RFC 4551
MODIFIED	RFC 4551
COMPRESSIONACTIVE	RFC 4978
CLOSED	RFC 5162
BADCOMPARATOR	RFC 5255
ANNOTATE	RFC 5257
METADATA	RFC (draft-daboo-imap-annotatemore-16.txt)
UNAVAILABLE	RFC (this)
AUTHENTICATIONFAILED	RFC (this)
AUTHORIZATIONFAILED	RFC (this)
EXPIRED	RFC (this)
PRIVACYREQUIRED	RFC (this)
CONTACTADMIN	RFC (this)
NOPERM	RFC (this)
INUSE	RFC (this)
EXPUNGEISSUED	RFC (this)
CORRUPTION	RFC (this)
SERVERBUG	RFC (this)
CLIENTBUG	RFC (this)
CANNOT	RFC (this)
LIMIT	RFC (this)
OVERQUOTA	RFC (this)
ALREADYEXISTS	RFC (this)
NONEXISTENT	RFC (this)

sentence or two mentioning the registry's URL instead.

The new registry should only be extended by publishing an RFC. The IANA may to add placeholders for internet-drafts at its discretion.

7. Acknowledgements

Peter Coates, Mark Crispin, Philip Guenther, Philip Van Hoof, Alexey Melnikov, Ken Murchison, Chris Newman, Timo Sirainen, Dale Wiggins and Sarah Wilkin helped with this document.

8. Normative References

[RFC3501] Crispin, "Internet Message Access Protocol - Version 4rev1", [RFC 3501](#), University of Washington, June 2003.

[RFC5234] Crocker, Overell, "Augmented BNF for Syntax Specifications: ABNF", [RFC 5234](#), Brandenburg Internetworking, THUS plc, January 2008.

9. Informative References

[RFC2087] Myers, "IMAP4 QUOTA extension", [RFC 2087](#), Carnegie Mellon, January 1997.

[RFC2180] Gahrns, "IMAP4 Multi-Accessed Mailbox Practice", [RFC 2180](#), Microsoft, July 1997.

[RFC4314] Melnikov, "IMAP4 Access Control List (ACL) Extension", [RFC 4314](#), December 2005.

10. Author's Address

Arnt Gulbrandsen
Oryx Mail Systems GmbH
Schweppermannstr. 8
D-81671 Muenchen
Germany

Fax: +49 89 4502 9758

Email: arnt@oryx.com

(RFC Editor: Please delete everything after this point)

Open Issues

I took TOOWEAK out since it doesn't seem to have real purpose: "The server requires a stronger authentication mechanism. If the connection is not encrypted, the client could also try the same mechanism via an encrypted connection." But now I remember why it was there: The server may offer e.g. AUTH=CRAM-MD5, but not be able to carry that out for every user. Maybe it should be returned with a better name. I'd like to hear whether anyone actually does this.

The name, if any, should reflect that the server cannot carry out this particular mechanism for this particular authentication-id. This may be because it's too weak (a policy decision) or because the server lacks data for this (user,mechanism) combination.

Changes since -00

- CHILDMAILBOXEXISTS merged into INUSE.
- ACCESSDENIED renamed ACL to clarify its scope.
- NOBODYPART scheduled for deletion if noone minds.
- EXISTS renamed ALREADYEXISTS to avoid confusion with the EXISTS response. Mustn't overload developer brains. (Do unto others.)
- Added a security note about how response codes makes some information leaks worse.
- A couple of open issues.

Changes since -01

- Two people independently argued that merging ALREADYEXISTS and NONEXISTENT was bad because of RENAME. Open issue closed.
- An example for each response code.
- EXPUNGED renamed, see EXISTS above.
- EXPUNGEISSUED semantics changed to be 2180-neutral. It should now

be equally useful no matter which part of 2180 the server implements.

Internet-draft

December 2008

- CONTACTADMIN vs. ALERT, an open issue.
- Added an IANA considerations section registering every (?) response code defined so far.
- Added contact details to CONTACTADMIN, by request.
- Resolved the CA/SB/C issue: The three responses may be handled similarly by some clients, but they may equally well be handled differently, so they should not be folded.

Changes since -02

- Removed the contact details for CONTACTADMIN. I think that was creeping featuritis, not likely to be implemented.
- Removed NOBODYPART, noone suggested use for it.
- Edited CORRUPTION to suggest that detailed information belongs in the server logs. The client/user can bug the admin to look in the log, but expecting users to transmit information is stupid.
- Updated the IANA list for 5255 and 5257.

Changes since -03

- Explained the criteria for inclusion/exclusion better.
- Fixed remove/delete typo, fix status type
- Better text in the CANNOT example
- Instruct the IANA to extend the registry only when an RFC is published

Changes since -04

- ACL renamed NOPERM on request of Timo.
- Added METADATA, which I had overlooked.
- Turned ANNOTATE <VARIOUS> into just ANNOTATE, added METADATA <VARIOUS> in the same way.

Gulbrandsen

Expires June 2009

[Page 10]

Internet-draft

December 2008

Changes since -05

- Fix typo (by rewriting the sentence)

Changes since -06

- added PRIVACYREQUIRED
- Random formatting, since this now close to RFC

