Abstract

Every version of the FTP specification has added a few new commands, with the early ones summarized in RFC 959. RFC 2389 established a mechanism for specifying and negotiating FTP extensions. The number of extensions, both supported by the mechanism and some that are not, continues to increase. An IANA registry of FTP Command and Feature names is established to reduce the likelihood of conflict of names and the consequent ambiguity. This specification establishes that registry.

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1. Introduction

Every version of the FTP specification has added a few new commands, with the early ones summarized in RFC 959 [RFC0959]. RFC 2389 [RFC2389] established a mechanism for specifying and negotiating extensions to the FTP protocol specified in RFC 959, by means of "FEAT Strings" identifying extensions supported by the FTP server, and sent in response to a "FEAT" command. The number of extensions continues to grow, not all of them supported by FEAT. An IANA registry is established to reduce the likelihood of conflict of names and the consequent ambiguity and to encourage the sharing of information. This specification establishes that registry.

1.1. Discussion List

[[ RFC Editor: please remove this section before publication. ]] Until and unless a WG is created, this proposal will be discussed on the list apps-discuss@ietf.org

2. Registry Definition

2.1. Registry Name

The recommended name of this registry is "FTP Commands and Extensions".

2.2. Registry Format

IANA is requested to establish a registry for FTP commands and extensions. Registration requests and registry entries should include the following:

Command Name – The FTP command, either new or modified, used in the extension or with which the extension is used.
Following the long-standing practice to capitalize command names in specification documents for FTP, the command names are entered in all uppercase. For extensions amending the operation of a command, a plus sign ("+") is appended to the command name. However, an extension might not be bound to one command (or a small number of commands), but affect the overall command parameter handling and/or transaction processing; in this case, the string "-N/A-" is entered.

It is intended to have the registry entries ordered by ascending ASCII collation order of this column (including the "+") suffix if present).

Extension name - The name of the extension.

FTP extensions predating RFC 2389 [RFC2389], and some extensions published after it, did not specify a keyword to identify the extension in a FEAT response. Some later specifications established FEAT strings with the respective command names as their keywords. In order to provide for keywords for future specifications in such cases, this document establishes 'placeholder' keywords to reserve reasonable feature names for future standardization. Similarly, placeholder keywords are used for the basic FTP commands specified in RFC 959 [RFC0959] and those of its predecessors that are still in use. These placeholder keywords are placed in the registry for convenience; it is not intended that they be returned in FEAT responses. To compensate for this idiosyncrasy, the column in the registry is entitled "FEAT Code", and to clearly distinguish between the two cases, defined FEAT keywords codes are listed in all uppercase, whereas 'placeholder' keywords (henceforth called "pseudo FEAT codes") are listed in lowercase. Future specifications are allowed to "upgrade" a placeholder to a true keyword unless it is specifically declared 'immutable' below, but otherwise IANA maintains uniqueness of feature names (FEAT codes) based on case-insensitive comparison.

Description - A brief description of the extension and, where appropriate, the command.
FEAT String – (optional in registration requests to the IANA)

The string expected to be included in the response to the FEAT command [RFC2389] if the extension is supported.

In many cases, the FEAT string required to identify an extension only consists of the "FEAT Code", making this item redundant. Therefore, this item should only be specified if it is intended to register a FEAT string that contains mandatory elements other than the "FEAT Code" itself.

Due to space restrictions, and to allow registrants to provide additional information as well, IANA should present these registration items (if given) in numbered footnotes to the table, not in an additional table column.

Command Type – The type (or 'kind') of the command.

Section 4.1 of RFC 959 [RFC0959] introduced a subdivision of FTP commands into three types: Access control, transfer Parameter {setting}, and Service {execution}. For clarity and as a service to the user of the registry, this subdivision is extended to all registered FTP commands, using the characteristic initial of the type, 'a', 'p', or 's', respectively, filed in the registry column entitled "type"; combinations are allowed, e.g. 'p/s'.

Conformance Requirements – The support expectation for the command.

RFC 959 specifies mandatory-to-implement commands and optional commands. This classification is carried over to all registered commands, using a column entitled "conf" carrying a single character -- either 'm' or 'o', for "mandatory" and "optional", respectively. Similarly, obsoleted or historic entries are left in the registry to avoid conflicts with deployed implementations, and these entries are marked with 'h' (for "historic"). Beyond the initial registrations, Standards Action [RFC5226] is needed to register new "mandatory" entries or to move such entries to "historic".
2.3. Criteria for Registration

This registry is primarily intended to avoid conflicting uses of the same extension names and command keywords for different purposes, not to demonstrate that an extension is somehow "approved". The "expert review" method will be used, but the designated expert is expected to check only that at least one of the two criteria that follow are met.

1. The extension is documented in a permanent and readily available public specification (This is the same as the "Specification Required" registration policy defined in [RFC5226].)

2. The extension is actually implemented in FTP client and server systems that are generally available (not necessarily either free or unencumbered, but available).

For an extension or command to be marked "mandatory" ('m' in the "conf" column), an IETF Standards Track Specification is required. An IESG Standards Action is allowed to direct IANA to change the Conformance Requirements listed for any entry.

2.4. Base FTP Commands

The following commands are part of the base FTP specification [RFC0959] and are listed in the registry with the immutable pseudo FEAT code "base".

Mandatory commands:

ABOR, ACCT, ALLO, APPE, CWD, DELE, HELP, LIST, MODE, NLST, NOOP, PASS, PASV, PORT, QUIT, REIN, REST, RETR, RNFR, RNTO, SITE, STAT, STOR, STRU, TYPE, USER

Optional commands:

CDUP, MKD, PWD, RMD, SMNT, STOU, SYST
Note: STD 3 [RFC1123] clarified and updated the status and implementation requirements of these standard FTP commands, and it contains important complementary information for the following commands:

LIST, NLST, PASV, REST, SITE, STOU

2.5. Obsolete Commands

The following commands were specified as experimental in an extension to an early version of the FTP specification [RFC0775] but later deprecated by RFC 1123 [RFC1123], because Standard FTP [RFC0959] specifies their standard successors. They are listed in the registry with the immutable pseudo FEAT code "hist".

XCUP, XCWD, XMKD, XPWD, XRMD

Implementation note: Deployed FTP clients still make use of the deprecated commands and most FTP servers support them as aliases for the standard commands.

The following commands were specified as part of the "FOOBAR" IPng effort in RFC 1545 [RFC1545] and, later, RFC 1639 [RFC1639] and are now obsolete. They are listed in the registry with the immutable pseudo FEAT code "hist".

LPRT, LPSV
### Section 2:

- **base** - FTP standard commands [RFC0959]
- **hist** - Historic experimental commands [RFC0775], [RFC1639]
- **secu** - FTP Security Extensions [RFC2228]
- **feat** - FTP Feature Negotiation [RFC2389]
- **nat6** - FTP Extensions for NAT/IPv6 [RFC2428]

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</tr>
</tbody>
</table>
Table 1

Notes:

#1 While an IETF Standards Action would be required to make the FEAT mechanism [RFC2389] mandatory, implementation of that extension mechanism is clearly required in conjunction with any extension or feature that depends on it.

#2 FEAT String for RFC 4217: AUTH TLS
FEAT String for RFC 2773: AUTH KEA-SKIPJACK

#3 FEAT String: REST STREAM

#4 FEAT String: TYPE {semicolon-separated list of supported types}

4. Acknowledgments

Any work to update or extend FTP depends on the base specification in RFC 959. The contributions of its editors, Jon Postel and Joyce Reynolds, are gratefully acknowledged. The option negotiation mechanism specified in RFC 2389 and the accumulation of features that has followed it made this registry relevant; the authors of those documents are acknowledged as well.
Barry Leiba and Alexey Melnikov made several suggestions about earlier drafts of this document, most of which have been incorporated.

Anthony Bryan spotted a few typographical errors.

Scott Bradner suggested a clarification to the "expert review" text that has been incorporated.

The authors appreciate the comments and support for this work received from FTP implementers and many IETF participants. Comments from the IESG helped to shape this document and registry to improve its utility.

5. IANA Considerations

IANA is requested to establish the registry described in Section 2 using the initial content specified in Section 3 and including the body of 2.4 and 2.5 as explanatory text in the preface of the registry.

New entries should be added to this registry when extensions to FTP are approved or defined in published RFCs or when extensions that are already in use and well-documented are identified. In other words, the requirement for registration is a slightly relaxed version of "Specification Required" [RFC5226] with Expert Review. See Section 2.3 for specifics and exceptions.

6. Security Considerations

The creation of this registry provides improved documentation and protection against interoperability problems. It introduces no new security issues.

7. References

7.1. Normative References
7.2. Informative References


Appendix A. Change Log

[[ RFC Editor: Please remove this Appendix before publication. ]]

A.1. Changes in Version -01

Updated document to reflect new date and IPR statement.

A.2. Changes in Version -02

- Several small changes in response to initial AD review.
- Changed registry model from "extension" to "command" + "extension".
- Corrections from Alfred Hoenes, followed by adding his initial registry list and adding him as co-author.
- Added description of the derivation of Table 1 to Section 3.
- Swapped columns 2 and 3 in Table 1.
- Consolidated "cmd" column content format to tag command amendments and FTP features without a particular command, and renamed space eating column 5 to "conf".
- Added missing footnotes to Table 1.
- Aligned Section 2 with Table 1, adding much information on column format; removed orphan; specified collation of entries by "cmd".
- Introduced Standards Track requirement for commands in the registry to be designated as mandatory in Section 2.3 and Section 2; specified particular IESG change control for the "conf" column in the registry.
- Split list in Section 2.4 into Mandatory and Optional, added pointer to RFC 1123.
- Mention std. replacements per RFC 959 in Section 2.5.
A.3. Changes in Version -03

Version -03 was produced in response to IETF Last Call and subsequent IESG comments:

- Removed References section entry for `RFC 2119` -- not used.
- Added all "base" (`RFC 959`/1123) commands and obsolete commands (RFCs 0775, 1545/1639) to registry after discussion during Last Call and with IESG. Tentatively recast title and several bits of the document to refer to "FTP Commands and Extensions", not just extensions and made related text changes.
- Clarified instructions to IANA including the "peer reviewed publication" requirement in `Section 2.3`.
- Adjusted references so that those which support commands in the registry are all informative.

- Removed language more appropriate to a proposal than to a finished spec (e.g., a few uses of "it appears useful").
- Clarified the IANA Considerations text about "specification required" to make it consistent with `Section 2.3`. Specifically, specifications of a quality needed to permit interoperable implementations are not required although they are certainly desirable.
- After an extended discussion about the possible role of this document in making some extensions mandatory to implement, returned it to its status as a registry specification only. The former text that made the `RFC 2389` and 2428 extensions mandatory has been removed. `RFC 2389` (the FEAT mechanism itself) is now identified as mandatory for the extensions that depend on it (with a new Note); `RFC 2389` (the nat6 extensions) are now simply optional as far as FTP is concerned as they should probably remain unless the IETF concludes that nat6 is either required or very
broadly deployed.

- More editorial fixes.

### A.4. Changes in Version -04

Final editing patches -- probably will not be posted until after IESG signoff.

- Correction of small typos spotted after -03 was posted.

- Another attempt at reformatting the table for better readability.

- Cleanup of comments used in the XML to keep the editors synchronized. These changes do not affect the text (or other) output forms of the document.

- Changed the registration criteria (See Section 2.3) at IESG request.
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