FTP Command and Extension Registry

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 those 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.

Status of This Memo

   This is an Internet Standards Track document.

   This document is a product of the Internet Engineering Task Force
   (IETF). It represents the consensus of the IETF community. It has
   received public review and has been approved for publication by the
   Internet Engineering Steering Group (IESG). Further information on
   Internet Standards is available in Section 2 of RFC 5741.

   Information about the current status of this document, any errata,
   and how to provide feedback on it may be obtained at
   http://www.rfc-editor.org/info/rfc5797.

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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 a conflict of
   names and the consequent ambiguity and to encourage the sharing of
   information. This specification establishes that registry.

2. Registry Definition

2.1. Registry Name

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

2.2. Registry Format

   As specified in this RFC, IANA has established 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, if an extension affects the overall command parameter
handling and/or transaction processing, instead of being bound to
one command (or a small number of commands), 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 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, 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
      titled "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 titled "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".

   Reference - A reference to an RFC or other definition of the
      extension and/or to implementations supporting it (see the next
      section).

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 RFC 5226 [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

3. Initial Contents of Registry

   As a service to users of the registry and the authors of existing
   specifications, all FTP commands and features published in RFCs after
   STD 3 [RFC1123] and up to the time of this writing were included in
   the registry upon creation.

   The following pseudo FEAT codes have been assigned, according to
   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]

cmd	FEAT Code	description	type	conf	RFC#s/References and Notes
ABOR	base	Abort	s	m	959
ACCT	base	Account	a	m	959
ADAT	secu	Authentication/ Security Data	a	o	2228, 2773, 4217
ALLO	base	Allocate	s	m	959
APPE	base	Append (with create)	s	m	959
AUTH	secu	Authentication/ Security Mechanism	a	o	2228
AUTH+	AUTH	Authentication/ Security Mechanism	a	o	2773, 4217 #2
CCC	secu	Clear Command Channel	a	o	2228
CDUP	base	Change to Parent Directory	a	o	959
CONF	secu	Confidentiality Protected Command	a	o	2228
CWD	base	Change Working Directory	a	m	959
DELE	base	Delete File	s	m	959
ENC	secu	Privacy Protected Command	a	o	2228, 2773, 4217
EPRT	nat6	Extended Port	p	o	2428
EPSV	nat6	Extended Passive Mode	p	o	2428

FEAT	feat	Feature Negotiation	a	m #1	2389
HELP	base	Help	s	m	959
LANG	UTF8	Language (for Server Messages)	p	o	2640
LIST	base	List	s	m	959, 1123
LPRT	hist	Data Port {FOOBAR}	p	h	1545, 1639
LPSV	hist	Passive Mode {FOOBAR}	p	h	1545, 1639
MDTM	MDTM	File Modification Time	s	o	3659
MIC	secu	Integrity Protected Command	a	o	2228, 2773, 4217
MKD	base	Make Directory	s	o	959
MLSD	MLST	List Directory (for machine)	s	o	3659
MLST	MLST	List Single Object	s	o	3659
MODE	base	Transfer Mode	p	m	959
NLST	base	Name List	s	m	959, 1123
NOOP	base	No-Op	s	m	959
OPTS	feat	Options	p	m #1	2389
PASS	base	Password	a	m	959
PASV	base	Passive Mode	p	m	959, 1123
PBSZ	secu	Protection Buffer Size	p	o	2228
PBSZ+	PBSZ	Protection Buffer Size	p	o	4217
PORT	base	Data Port	p	m	959
PROT	secu	Data Channel Protection Level	p	o	2228
PROT+	PROT	Data Channel Protection Level	p	o	4217
PWD	base	Print Directory	s	o	959
QUIT	base	Logout	a	m	959
REIN	base	Reinitialize	a	m	959
REST	base	Restart	s/p	m	959, 1123
REST+	REST	Restart (for STREAM mode)	s/p	m	3659 #3
RETR	base	Retrieve	s	m	959
RMD	base	Remove Directory	s	o	959
RNFR	base	Rename From	s/p	m	959
RNTO	base	Rename From	s	m	959
SITE	base	Site Parameters	s	m	959, 1123
SIZE	SIZE	File Size	s	o	3659
SMNT	base	Structure Mount	a	o	959
STAT	base	Status	s	m	959

STOR	base	Store	s	m	959
STOU	base	Store Unique	a	o	959, 1123
STRU	base	File Structure	p	m	959
SYST	base	System	s	o	959
TYPE	base	Representation Type	p	m	959 #4
USER	base	User Name	a	m	959
XCUP	hist	{precursor for CDUP}	s	h	775, 1123
XCWD	hist	{precursor for CWD}	s	h	775, 1123
XMKD	hist	{precursor for MKD}	s	h	775, 1123
XPWD	hist	{precursor for PWD}	s	h	775, 1123
XRMD	hist	{precursor for RMD}	s	h	775, 1123
-N/A-	TVFS	Trivial Virtual File Store	p	o	3659

                                 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 [RFC4217]: AUTH TLS
      FEAT String for [RFC2773]: 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 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 versions 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.

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 has established the registry described in Section 2 using the
initial content specified in Section 3 and including the body of
Sections 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 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

   [RFC0959] Postel, J. and J. Reynolds, "File Transfer Protocol",
              STD 9, RFC 959, October 1985.

   [RFC2389] Hethmon, P. and R. Elz, "Feature negotiation mechanism for
              the File Transfer Protocol", RFC 2389, August 1998.

   [RFC5226] Narten, T. and H. Alvestrand, "Guidelines for Writing an
              IANA Considerations Section in RFCs", BCP 26, RFC 5226,
              May 2008.

7.2. Informative References

   [RFC0775] Mankins, D., Franklin, D., and A. Owen, "Directory
              oriented FTP commands", RFC 775, December 1980.

   [RFC1123] Braden, R., "Requirements for Internet Hosts - Application
              and Support", STD 3, RFC 1123, October 1989.

   [RFC1545] Piscitello, D., "FTP Operation Over Big Address Records
              (FOOBAR)", RFC 1545, November 1993.

   [RFC1639] Piscitello, D., "FTP Operation Over Big Address Records
              (FOOBAR)", RFC 1639, June 1994.

   [RFC2228] Horowitz, M., "FTP Security Extensions", RFC 2228,
              October 1997.

   [RFC2428] Allman, M., Ostermann, S., and C. Metz, "FTP Extensions
              for IPv6 and NATs", RFC 2428, September 1998.

   [RFC2773] Housley, R. and P. Yee, "Encryption using KEA and
              SKIPJACK", RFC 2773, February 2000.

   [RFC4217] Ford-Hutchinson, P., "Securing FTP with TLS", RFC 4217,
              October 2005.

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