FTP - File Transfer Protocol

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FTP

❑ FTP

- File Transfer Protocol
- Used to transfer data from one computer to another over the internet
- Client-Server Architecture
- Separated control/data connections

❑ FTP connections

- Control connection
  ➢ Created when an FTP session is established
  ➢ Only for passing control information
- Data connection
  ➢ Each time that data is sent, a distinct TCP data connect is established

FTP

❑ Data connection Modes

- Active Mode

- Passive Mode

- Request For Comments (RFCs):
  - ➢ RFC 959 – File Transfer Protocol
  - ➢ RFC 2228 – FTP Security Extensions
  - ➢ RFC 2428 – FTP Extensions for IPv6 and NATs
  - ➢ RFC 2640 – UTF-8 support for file name
  - ➢ RFC 2324 – Hyper Text Coffee Pot Control Protocol

FTP

❑ Security concern

- As we seen, FTP connections (both command and data) are transmitted in clear text

- What if somebody sniffing the network?

  ➢ We need encryption

❑ Solutions

- FTP over SSH

  ➢ A normal FTP session tunneled through a SSH channel

- SSH File Transfer Protocol (SFTP)

  ➢ Both commands and data are encrypted while transmitting

  ➢ One connection, but poor performance

- FTP over TLS (ftps, ftpes)

  ➢ Only commands are encrypted while transmitting

  ➢ Better performance
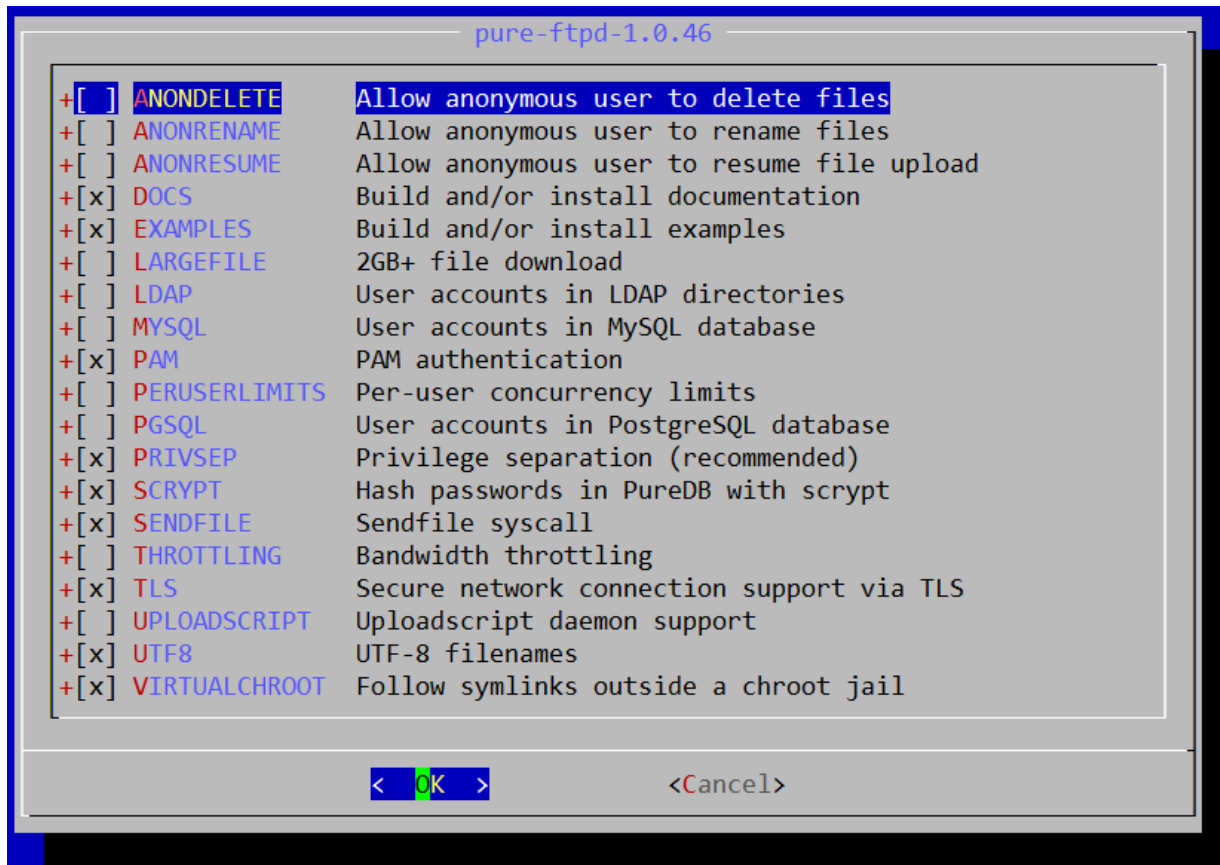
FTP
- Pure-FTPd (1)

❑ Introduction

- A small, easy to set up, fast and secure FTP server
- Support chroot
- Restrictions on clients, and system-wide.
- Verbose logging with syslog
- Anonymous FTP with more restrictions
- Virtual Users, and Unix authentication
- FXP (File eXchange Protocol)
- FTP over TLS
- UTF-8 support for filenames

FTP
- Pure-FTPd (2)

❑ Installation

- Ports: /usr/ports/ftp/pure-ftpd

- Options

```
                       pure-ftpd-1.0.46
  +[ ] ANONDELETE      Allow anonymous user to delete files
  +[ ] ANONRENAME      Allow anonymous user to rename files
  +[ ] ANONRESUME      Allow anonymous user to resume file upload
  +[x] DOCS            Build and/or install documentation
  +[x] EXAMPLES        Build and/or install examples
  +[ ] LARGEFILE       2GB+ file download
  +[ ] LDAP            User accounts in LDAP directories
  +[ ] MYSQL           User accounts in MySQL database
  +[x] PAM             PAM authentication
  +[ ] PERUSERLIMITS   Per-user concurrency limits
  +[ ] PGSQL           User accounts in PostgreSQL database
  +[x] PRIVSEP         Privilege separation (recommended)
  +[x] SCRYPT          Hash passwords in PureDB with scrypt
  +[x] SENDFILE        Sendfile syscall
  +[ ] THROTTLING      Bandwidth throttling
  +[x] TLS             Secure network connection support via TLS
  +[ ] UPLOADSCRIPT    Uploadscript daemon support
  +[x] UTF8            UTF-8 filenames
  +[x] VIRTUALCHROOT   Follow symlinks outside a chroot jail


            <   OK   >              <Cancel>
```

FTP
- Pure-FTPd (3)

- Other options

nctucs [/usr/ports/ftp/pure-ftpd] -wangth- sudo make extract

…

You can use the following additional options:

LANGUAGE=lang (default: english)
- Enable compilation of one language support
  available lang: brazilian-portuguese, catalan, czech, danish, dutch,
  english, french, french-funny, german, hungarian, italian, korean,
  norwegian, polish, romanian, russian, simplified-chinese, slovak,
  spanish, swedish, traditional-chinese, Turkish

- LANGUAGE
  - Change the language of output messages

❑ Startup

- Add pureftpd_enable="YES" in /etc/rc.conf

FTP
- Pure-FTPd Configurations(1)

❑ Configurations:

- File: /usr/local/etc/pure-ftpd.conf

- Documents

  ➢ Configuration sample: /usr/local/etc/pure-ftpd.conf.sample

    – All options are explained clearly in this file.

  ➢ Other documents

    – See /usr/local/share/doc/pure-ftpd/*

```
nctucs [/usr/ports/ftp/pure-ftpd] -wangth- ls
AUTHORS                          README.LDAP
CONTACT                          README.MySQL
COPYING                          README.PGSQL
HISTORY                          README.TLS
NEWS                             README.Virtual-Users
README                           THANKS
README.Authentication-Modules pure-ftpd.png
README.Configuration-File        pureftpd.schema
```

FTP
- Pure-FTPd Configurations(2)

```
# Restrict users to their home directory
ChrootEveryone        yes

# If the previous option is set to "no", members of the following group
# won't be restricted. Others will be. If you don't want chroot()ing anyone,
# just comment out ChrootEveryone and TrustedGID.
TrustedGID            0

# Disallow authenticated users - Act only as a public FTP server.
AnonymousOnly         no
# Disallow anonymous connections. Only accept authenticated users.
NoAnonymous           yes

# If you want simple Unix (/etc/passwd) authentication, uncomment this
UnixAuthentication    yes

# Port range for passive connections - keep it as broad as possible.
PassivePortRange      30000 50000

# This option accepts three values:
# 0: disable SSL/TLS encryption layer (default).
# 1: accept both cleartext and encrypted sessions.
# 2: refuse connections that don't use the TLS security mechanism,
#    including anonymous sessions.
# Do _not_ uncomment this blindly. Double check that:
# 1) The server has been compiled with TLS support (--with-tls),
# 2) A valid certificate is in place,
# 3) Only compatible clients will log in.
TLS 2

# UTF-8 support for file names (RFC 2640)
# Set the charset of the server filesystem and optionally the default charset
# for remote clients that don't use UTF-8.
# Works only if pure-ftpd has been compiled with --with-rfc2640
# FileSystemCharset  UTF-8
# ClientCharset  UTF-8
```

FTP
- Pure-FTPd Problem Shooting

❑ Logs Location

- In default, syslogd keeps ftp logs in /var/log/xferlog

❑ Most frequent problems

- pure-ftpd: (?@?) [ERROR] Unable to find the 'ftp' account
  - ➢ It's ok, but you may need it for Virtual FTP Account.
- pure-ftpd: (?@?) [ERROR] Sorry, but that file doesn't exist: [/etc/ssl/private/pure-ftpd.pem]
  - ➢ If you set TLS = 2, then this file is needed.
- How to generate a pure-ftpd.pem?
  - ➢ See README.TLS

FTP
- Pure-FTPd Tools

❑ pure-*

```
nctucs [~] -wangth- ls /usr/local/sbin/pure-*
/usr/local/sbin/pure-alwaysfail    /usr/local/sbin/pure-mrtginfo
/usr/local/sbin/pure-authd         /usr/local/sbin/pure-quotacheck
/usr/local/sbin/pure-ftpd          /usr/local/sbin/pure-uploadscript
/usr/local/sbin/pure-ftpwho
nctucs [~] -wangth- ls /usr/local/bin/pure-*
/usr/local/bin/pure-pw             /usr/local/bin/pure-statsdecode
/usr/local/bin/pure-pwconvert
```

❑ pure-ftpwho

- List info of users who are currently connecting to the FTP server.

❑ pure-pw

- Manage Virtual Users in PureDB format

- pure-pw(8)

- See README.Virtual-Users

FTP
- More Tools

- ❑ ftp/pureadmin
  - Management utility for the PureFTPd
- ❑ ftp/lftp
  - Shell-like command line ftp client
  - Support TLS
- ❑ ftp/wget, ftp/curl
  - Retrieve files from the Net via HTTP(S) and FTP
- ❑ ftp/mget
  - Multithreaded commandline web-download manager
- ❑ FileZilla
  - A graphical cross-platform FTP client
  - Support TLS
- ❑ Pure-FTPd WebUI
  - PHP based web interface for Pure-FTPd