

FTP - File Transfer Protocol

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? (1996-2018)

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Related Documents

- RFCs for Reference
 - 959 File Transfer Protocol.
 - 2428 FTP Extensions for IPv6 and NATs.
 - 2577 FTP Security Considerations.
 - 2585 Internet X.509 Public Key Infrastructure Operational Protocols: FTP and HTTP.

FTP

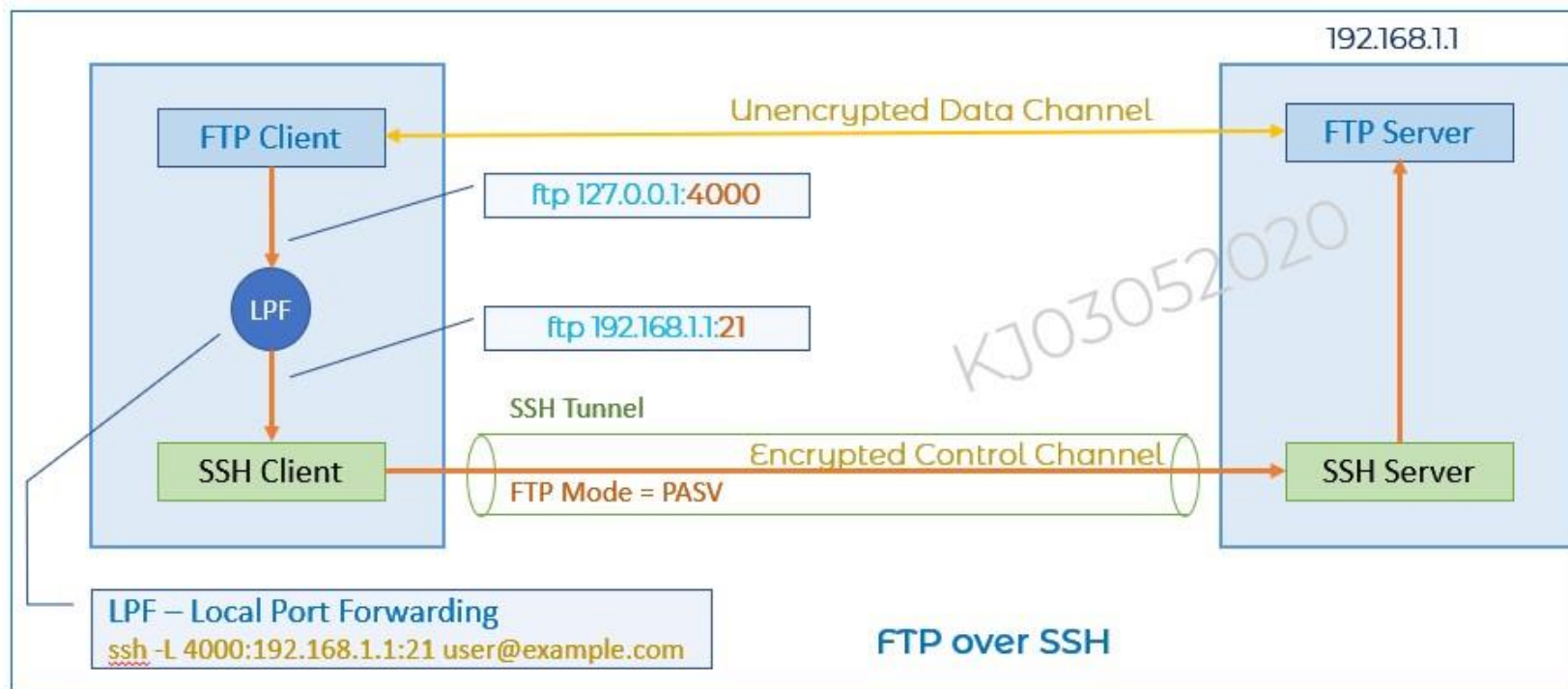
- FTP (File Transfer Protocol)
 - FTP is an application layer client/server protocol used to transfer files over the Internet.
 - The FTP protocol uses separated control/data connections.
- Data Connection Modes
 - Active
 - Passive

FTP Security Issue

- Security concern
 - As we have seen, FTP connections (both command and data) are transmitted in clear text
 - What if somebody sniffs the network?
 - We need encryption
- Solutions
 - FTP over SSH
 - SSH File Transfer Protocol (SFTP)
 - FTP over TLS (ftps, ftpes) (RFC 2228, 4217)

FTP over SSH

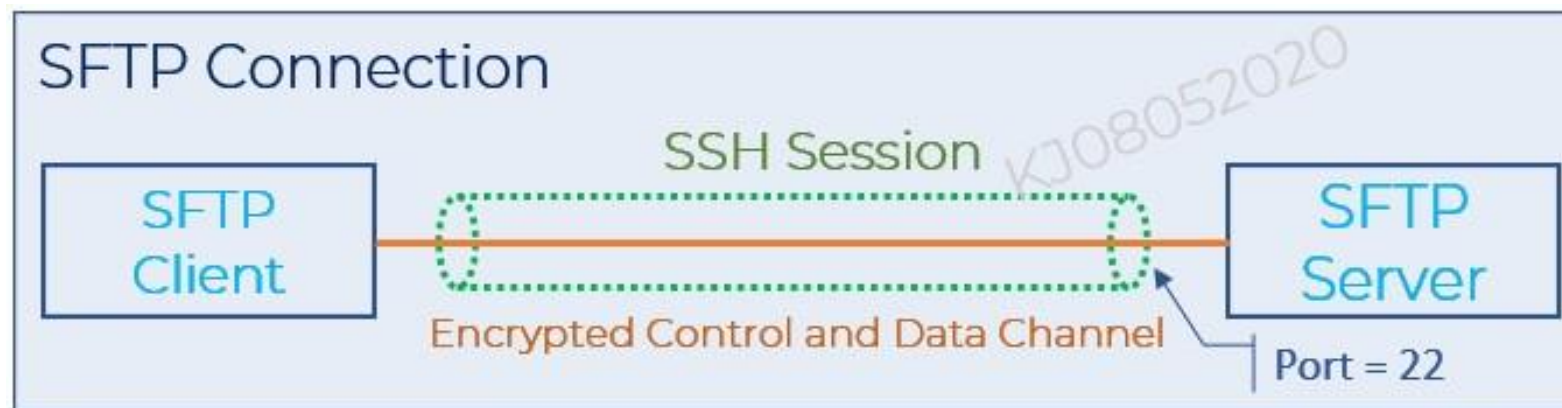
- FTP tunneled through an SSH connection
- Only control channel are tunneled.
- Utilizes port forwarding capabilities of SSH to tunnel the FTP session.



Source: <https://infosec-reading.blogspot.com/2020/05/difference-between-sftp-ftps-ftp-over.html>

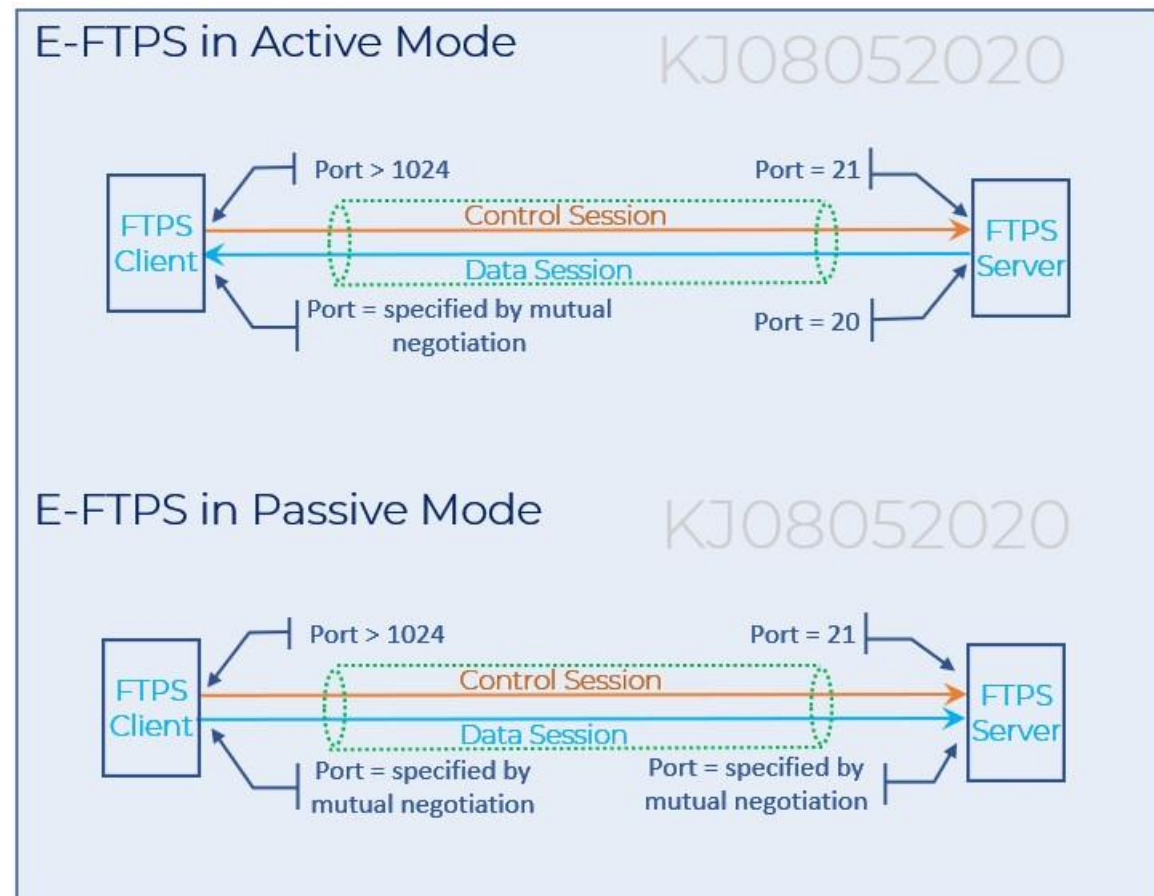
SSH File Transfer Protocol (SFTP)

- It provides high level security using AES, 3DES and other algorithm to encrypt all data that flows between systems.
- SFTP also protects against password sniffing and man-in-the-middle attacks
- It protects the confidentiality and integrity of the data using encryption and cryptographic hash functions.
- Performance is poor due to single connection.



FTP over SSL (FTPS)

- FTPS is an extension to existing ftp that adds support for the TLS/SSL to encrypt the control session and if required the data session.
- Only commands are encrypted while transmitting.
- Better performance



FTP - Pure-FTPd(1/3)

- 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(2/3)

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

```
pure-ftpd-1.0.49_1
+ [ ] 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] VIRTUALCHROOT Follow symlinks outside a chroot jail

< OK > <Cancel>
```

FTP - Pure-FTPd(3/3)

- Other options

```
nctucs [/usr/ports/ftp/pure-ftpd] 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(1/3)

- 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] 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(2/3)

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**

FTP - Pure-FTPd Configurations(3/3)

```
# 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 [~] 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-uploadsript
/usr/local/sbin/pure-ftpwho

nctucs [~] ls /usr/local/bin/pure-*
/usr/local/bin/pure-pw                /usr/local/bin/pure-statsdecode
/usr/local/bin/pure-pwconvert
```

- [pure-ftpwho\(8\)](#)

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

- [pure-pw\(8\)](#)

- Manage Virtual Users in PureDB format
- 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 command line web-download manager
- FileZilla (ftp/filezilla)
 - A graphical cross-platform FTP client
 - Support TLS

Reference

- Difference Between SFTP, FTPS, FTP Over SSH, SCP

<https://infosec-reading.blogspot.com/2020/05/difference-between-sftp-ftp-over-ssh-scp.html>