

*:96 Overheads

Part 5: FTP More about this course about Internet application protocols can be found at URL:

`http://www.dsv.su.se/jpalme/internet-course/Int-app-prot-kurs.html`

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File Transfer Protocol (FTP)

- Login on the client computer.
- Establish a connection between two hosts.
- Log in, using password, on an account at the server.
- Can then perform commands to list files, change directory, send and retrieve files but only files accessible to that account at that server.

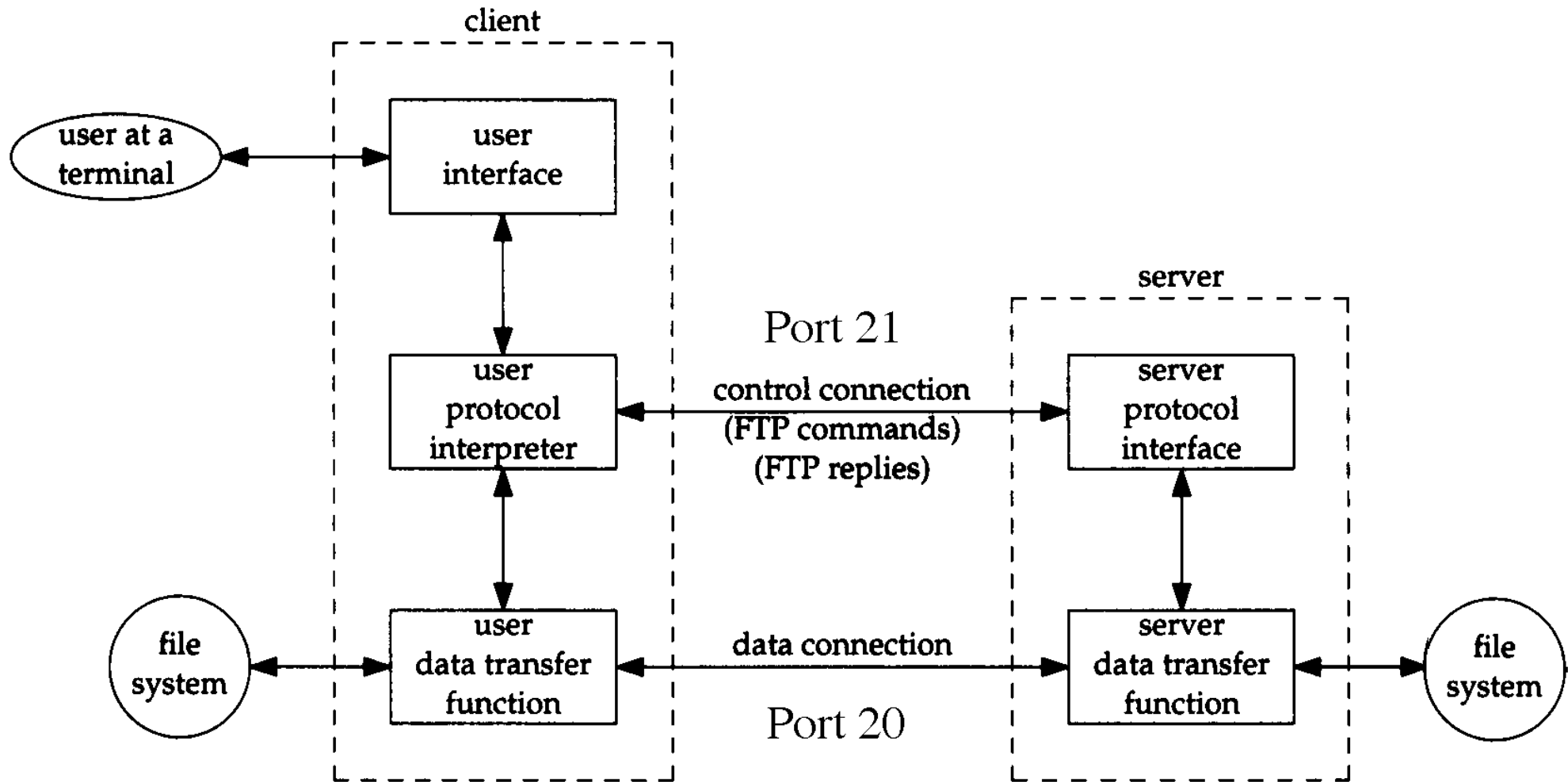
FTP file types

Only the formats in italics below are in reality usually used today:

File type:	<i>ASCII, EBCDIC, Image (Binary), Local (transforms byte sizes)</i>
Format:	<i>Nonprint, Telnet vertical format control, Fortran carriage control</i>
Structure:	<i>Continuous stream of bytes, record structure, page structure (historical)</i>
Transmission mode:	<i>Stream, Block, Compressed (very simple run length compression)</i>

FTP architecture channels and ports

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Picture from Stevens: TCP/IP Illustrated, volume 1 page 420

Some FTP commands

Command	Description
RETRIEVE (RETR)	Transfer a file from the server to the client
STORE (STOR)	Transfer a file from the client to the server.
STORE UNIQUE (STOU)	Transfer a file from the client to the server, give it a new unique name on the server.
APPEND (APPE)	Transfer a file from the client to the server, if the file already exists, append the file at the end of the existing file.
RESTART (REST)	Start transfer from a checkpoint of the file instead of from the start, applies to the immediately following transfer command.
RENAME FROM (RNFR)	Old path name of a file to be renamed.
RENAME TO (RNTO)	New path name of a file to be renamed
ABORT (ABOR)	Abort the previous FTP service command.
DELETE (DELE)	Delete a file at the server.
REMOVE DIRECTORY (RMD)	Remove a directory at the server.
MAKE DIRECTORY (MKD)	Create a directory at the server.
LIST (LIST)	List the files in a directory in the server.

FTP error codes

First digit:

- 1yz Preliminary positive
- 2yz Positive
- 3yz Positive intermediate
- 4yz Transient negative
- 5yz Permanent negative

Second digit:

- x0z Syntax error
- x1z Information
- x2z Connection control
- x3z Authentication, accounting (login)
- x4z Unspecified
- x5z Filesystem status

Examples:

- 125 Data connection open, transfer starting
- 200 Command OK
- 214 Help message for human user
- 331 Username OK, password required
- 425 Cannot open data connection
- 500 Syntax error, unrecognized command
- 501 Syntax error, invalid arguments
- 502 Unimplemented MODE type

*Table from Stevens:
TC P/IP Illustrated,
volume 1 page 420*

Anonymous FTP

User name: Anonymous

Password: <your e-mail address>

Access: Restricted access to public files only

Example of an FTP dialogue with the UNIX line-oriented user interface

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```
/home/ester/dsv/dsv-jp> ftp sunic.sunet.se
Connected to sunic.sunet.se.
220 sunic.sunet.se FTP server (Version wu-2.4(3) Sun Oct 1 17:47:58
MET 1995) ready.
Name (sunic.sunet.se:jpalm): anonymous
331 Guest login ok, send your complete e-mail address as password.
Password: jpalm@dsv.su.se
230 Guest login ok, access restrictions apply.
ftp> cd rfc
250 CWD command successful.
ftp> dir
200 PORT command successful.
150 Opening ASCII mode data connection for /bin/ls.
```


total 76779

```

-rw-r--r-- 1 root wheel 62646 Jan 7 1996 .cache
-rw-r--r-- 1 root wheel 262206 Jan 4 1996 .cache+
drwxr-xr-x 2 root wheel 512 Jul 20 04:10 .cap
-rw-r--r-- 1 root daemon 74112 Jul 31 04:10 .mirror
-rw-r--r-- 1 root daemon 116 Nov 6 1995 .rfc-index
drwxr-xr-x 2 1625 daemon 512 Mar 7 13:09 .waisindexes
-r--r--r-- 1 root wheel 6319 Jul 29 19:25 fyi-index.txt
drwxr-xr-x 2 root wheel 512 Nov 8 1995 rfc-editor
-r--r--r-- 1 root wheel 267821 Jul 30 16:14 rfc-index.txt
lrwxrwxrwx 1 root daemon 11 Apr 27 04:11 rfc-instructions.txt
                                -> rfc1543.txt
-r--r--r-- 1 root wheel 12062 Mar 23 15:30 rfc-retrieval.txt
-r--r--r-- 1 root wheel 12056 Jan 13 1996 rfc-retrieval.txt~
-r--r--r-- 1 root wheel 3348 Oct 15 1992 rfc10.txt
-r--r--r-- 1 root wheel 315315 Oct 15 1992 rfc1000.txt

```

ftp> get rfc1933.txt

200 PORT command successful.

150 Opening ASCII mode data connection for rfc1933.txt (47005 bytes).

226 Transfer complete.

local: rfc1933.txt remote: rfc1933.txt

48240 bytes received in 0.2 seconds (2.4e+02 Kbytes/s)

ftp> help

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Commands may be abbreviated. Commands are:

!	cr	macdef	proxy	send
\$	delete	mdelete	sendport	status
account	debug	mdir	put	struct
append	dir	mget	pwd	sunique
ascii	disconnect	mkdir	quit	tenex
bell	form	mls	quote	trace
binary	get	mode	recv	type
bye	glob	mput	remotehelp	user
case	hash	nmap	rename	verbose
cd	help	ntrans	reset	?
cdup	lcd	open	rmdir	
close	ls	prompt	runique	

Example of an FTP dialogue using a custom graphical program

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New Connection...

Enter host name, userid, and password (or choose from the shortcut menu):

Host:**User ID:****Password:****Directory:****Shortcuts:**

rfc ▼

Name	Size	Date
rfc1930.txt	22K	30/03/96
rfc1931.txt	27K	02/04/96
rfc1932.txt	74K	05/04/96
rfc1933.txt	46K	05/04/96
rfc1934.txt	86K	05/04/96
rfc1935.txt	30K	08/04/96
rfc1936.txt	36K	08/04/96
rfc1937.txt	18K	03/05/96
rfc1938.txt	44K	11/07/96
rfc1939.txt	46K	09/05/96
rfc1940.txt	60K	09/05/96
rfc1941.txt	148K	13/05/96
rfc1942.txt	68K	13/05/96
rfc1943.txt	51K	13/05/96
rfc1944.txt	65K	16/05/96
rfc1945.txt	135K	16/05/96

Put File...

Get File...

- Automatic
- Text
- Binary

Status

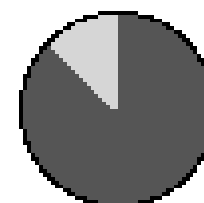
Getting file...

File

rfc1933.txt
Text File
47 005 bytes

Transfer

41 051 bytes
1 784 bytes/sec
0:04 time left



Stop ⌘.

Example of FTP access using a web browser

