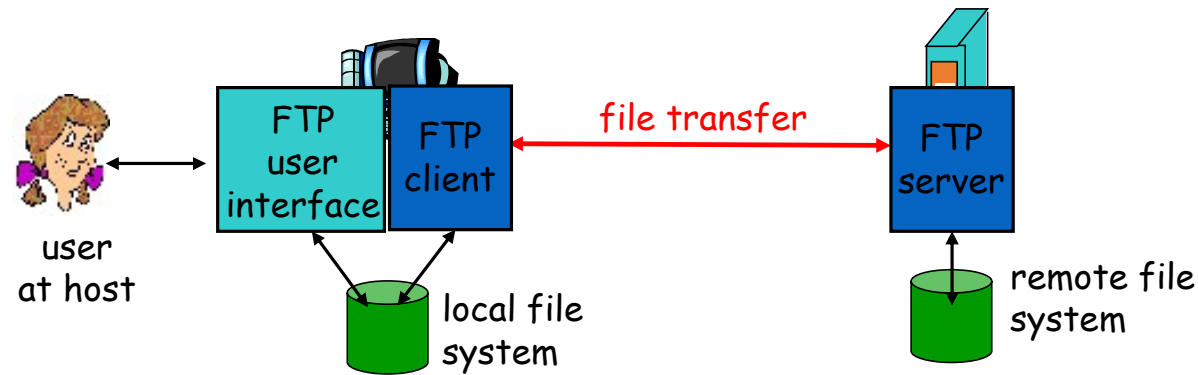


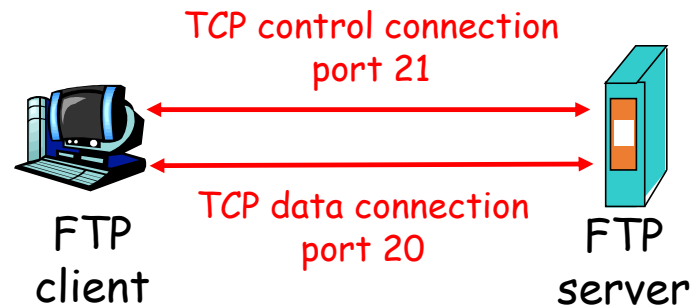
FTP: the File Transfer Protocol



- ❑ transfer file to/from remote host
- ❑ client/server model
 - *client*: side that initiates transfer (either to/from remote)
 - *server*: remote host
- ❑ ftp: RFC 959
- ❑ ftp *server*: port 21

FTP: separate control, data connections

- ❑ FTP client contacts FTP server at port 21, TCP is transport protocol
- ❑ client authorized over control connection
- ❑ client browses remote directory by sending commands over control connection.
- ❑ when server receives file transfer command, server opens 2nd TCP connection (for file) to client
- ❑ after transferring one file, server closes data connection.



- ❑ server opens another TCP data connection to transfer another file.
- ❑ control connection: "out of band"
- ❑ FTP server maintains "state": current directory, earlier authentication

FTP commands, responses

Sample commands:

- sent as ASCII text over **control channel**
- **USER** *username*
- **PASS** *password*
- **LIST** return list of file in current directory
- **RETR** **filename** retrieves (*gets*) file
- **STOR** **filename** stores (*puts*) file onto remote host

Sample return codes

- **status code** and **phrase** (as in HTTP)
- **331** Username OK, password required
- **125** data connection already open; transfer starting
- **425** Can't open data connection
- **452** Error writing file

```
C:\Windows\system32\cmd.exe

C:\Users\Skyline>ftp
ftp> o unix.kmitl.ac.th
Connected to neutrino.crsc.kmitl.ac.th.
220-Welcome to KMITL Unix and FTP Services..
220
User <neutrino.crsc.kmitl.ac.th:<none>>: ktsakcha
331 Please specify the password.
Password:
230 Login successful.
ftp> ?
Commands may be abbreviated.  Commands are:

!           delete          literal          prompt          send
?           debug           ls              put             status
append      dir                  mdelete        pwd            trace
ascii       disconnect        mdir           quit           type
bell        get                mget          quote          user
binary      glob              mkdir          recu          verbose
bye         hash              mls           remotehelp
cd          help              mput          rename
close      lcd              open          rmdir
ftp>
ftp> bye
221 Goodbye.

C:\Users\Skyline>
```

Common FTP Commands

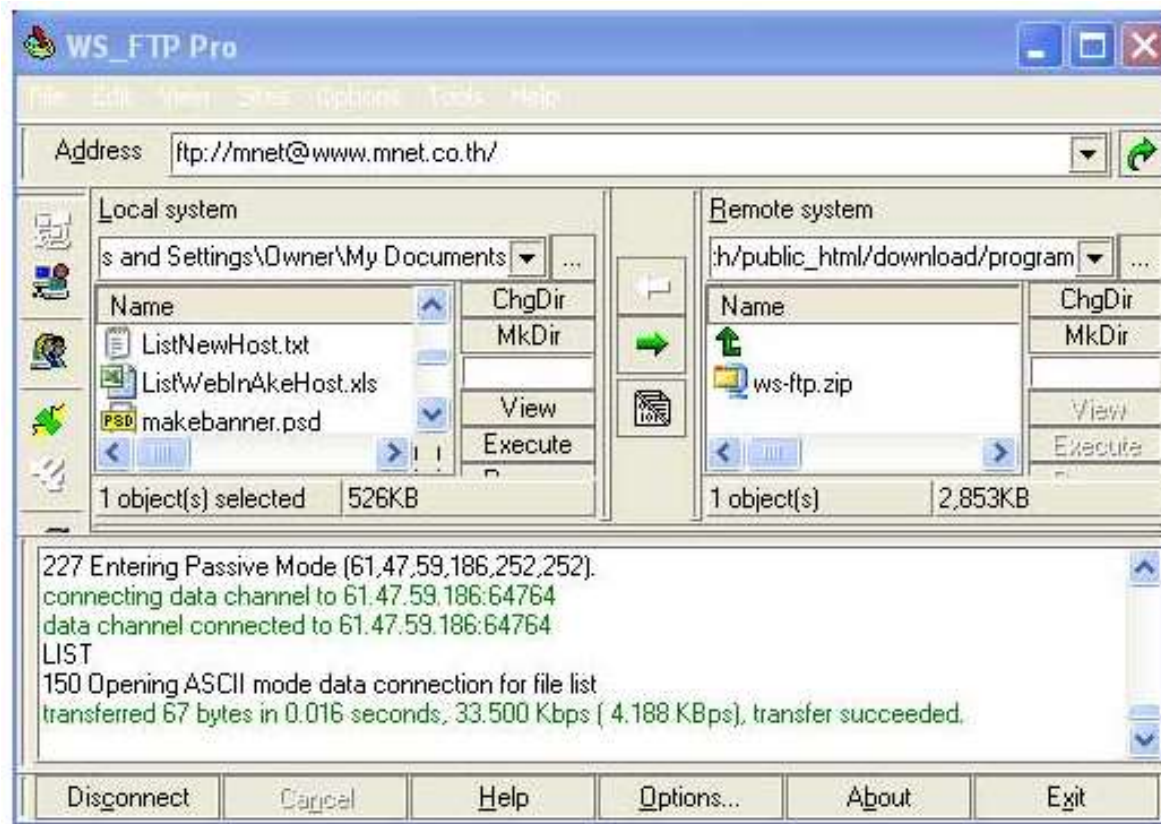
Command	Meaning
?	<i>to request help or information about the FTP commands</i>
ascii	<i>to set the mode of file transfer to ASCII (this is the default and transmits seven bits per character)</i>
binary	<i>to set the mode of file transfer to binary (the binary mode transmits all eight bits per byte and thus provides less chance of a transmission error and must be used to transmit files other than ASCII files)</i>
bye	<i>to exit the FTP environment (same as quit)</i>
cd	<i>to change directory on the remote machine</i>
close	<i>to terminate a connection with another computer</i>
delete	<i>to delete (remove) a file in the current remote directory (same as rm in UNIX)</i>
get	<i>to copy one file from the remote machine to the local machine</i>
help	<i>to request a list of all available FTP commands</i>
lcd	<i>to change directory on your local machine (same as UNIX cd)</i>

Common FTP Commands

Command	Meaning
ls	<i>to list the names of the files in the current remote directory</i>
mkdir	<i>to make a new directory within the current remote directory</i>
mget	<i>to copy multiple files from the remote machine to the local machine; you are prompted for a y/n answer before transferring each file</i>
mput	<i>to copy multiple files from the local machine to the remote machine; you are prompted for a y/n answer before transferring each file</i>
open	<i>to open a connection with another computer</i>
put	<i>to copy one file from the local machine to the remote machine</i>
pwd	<i>to find out the pathname of the current directory on the remote machine</i>
quit	<i>to exit the FTP environment (same as bye)</i>
rmdir	<i>to to remove (delete) a directory in the current remote directory</i>

```
C:\WINDOWS\system32\command.com
G:\DOCUMENT1\AGNUN>ftp ftp.internic.net
Connected to ftp.internic.net.
220 Internic FTP Server
User (ftp.internic.net:(none)): anonymous
331 Anonymous login ok, send your complete email address as your password
Password:
230 Anonymous access granted, restrictions apply
ftp> pwd
257 "/" is the current directory
ftp> ls -al
200 PORT command successful
150 Opening ASCII mode data connection for file list
..
domain
226 Transfer complete
ftp: 15 bytes received in 0.00Seconds 15000.00Kbytes/sec.
ftp> cd domain
250 CWD command successful
ftp> ls -al
200 PORT command successful
150 Opening ASCII mode data connection for file list
db.cache.md5
in-addr.arpa.gz
..
arpa.zone.gz.sig
ip6.arpa.gz.md5
root.zone.gz.sig
in-addr.arpa.gz.md5
..listing
named.root.md5
db.cache
db.cache.sig
edu.zone.gz.sig
named.cache.md5
ip6.arpa.md5
named.cache
edu.zone.gz.md5
arpa.zone.gz
arpa.zone.gz.md5
named.cache.sig
root.zone.gz
named.root.sig
edu.zone.gz
ip6.arpa.gz
INTERNIC_ROOT_ZONE.signatures.asc
root.zone.gz.md5
named.root
INTERNIC_ROOT_ZONE.signatures
226 Transfer complete
ftp: 441 bytes received in 0.00Seconds 441000.00Kbytes/sec.
ftp> bye
221 Goodbye.

G:\DOCUMENT1\AGNUN>
```



ดาวน์โหลดโปรแกรม WS_FTP Pro 

2: Application Layer 64