4 File Transfer

This chapter discusses File Transfer Protocol (FTP) as well as various features of NCSA Telnet for the Macintosh for transferring Macintosh and other files.

File-Transfer Terminology

The following terms are frequently used in this chapter:

ASCII file
: An *ASCII*, or *text*, file is one that you can read. You can use it with standard editors on the Macintosh or host. When text files are transferred, they are translated to a format appropriate for the receiving machine.

Binary file
: A *binary*, or *image*, file cannot be read by standard text editors. Unlike ASCII text files, binary files are not changed in any way when transferred.

Client/server
: The *client* is the computer system that requests services, and the *server* is the system that provides services.

: The client is not always your Macintosh, despite appearances. When you use NCSA Telnet to connect to a host, your Macintosh is the telnet client. When you request a file transfer from your Macintosh, the transfer is actually initiated on the host, making the host the FTP client and your Macintosh the FTP server. Your Macintosh can be both a telnet client and an FTP server at the same time.

File transfer
: In a *file transfer*, the contents of a file are copied to a file on another computer.

MacBinary file
: A *MacBinary file* has been encoded in the MacBinary file format so it can be stored for downloading later to a Macintosh. Because the file contains all the information contained in a normal Macintosh file, a MacBinary file can be used for transferring applications and other Macintosh-specific files. MacBinary files are virtually useless on any other machine.

About FTP and NCSA Telnet

NCSA Telnet has an internal FTP server that permits reliable file transfers between a Macintosh and any FTP host on the network. File transfers are initiated from the FTP host. With the NCSA Telnet implementation of FTP, you can:

- Stream transferring files in either text (ASCII) or binary (image) format
- Change the directory
- Show the name of the current directory
- List files in the current directory (with wildcard specifications)
- Send and receive multiple files with one command (using wildcards)

File transfers are processed in the background. While a file transfer is in progress, you can perform other NCSA Telnet activities such as switching sessions, adding new sessions, or changing parameters. When one FTP connection is active, requests for another are ignored.

Using an FTP Client

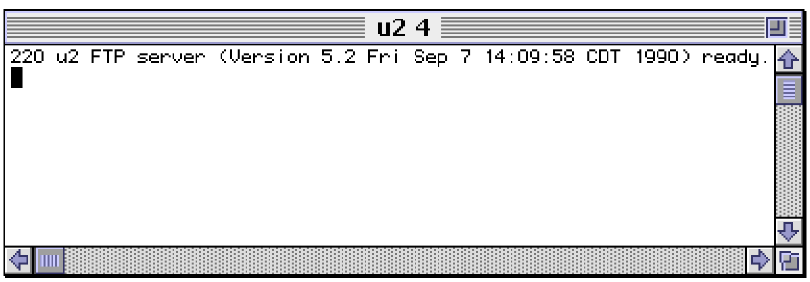
NCSA Telnet lets you use an FTP client to connect directly to the FTP port of a host machine, which means you can transfer a file directly between the remote host and your Macintosh.

This is simpler than the normal process, which requires you to log on to a UNIX account, transfer a file from the remote host to your UNIX account, and finally transfer the file from your UNIX account to your Macintosh.

When you use an FTP client to transfer files directly between a UNIX host and your Macintosh, you do not need to log on to a secondary UNIX account for FTP to use as a temporary go-between.

Follow these steps to log on to and use an FTP client:

1. Select **Open Connection** from the **File** menu. The **Open Connection** dialog box appears.
2. In the **Open Connection** dialog box, check the **FTP Session** box. This opens a window displaying an FTP client connection message similar to the one below:



   Checking the **FTP Session** box is exactly the same as opening a connection to a UNIX machine on port 21, which is the FTP port. Therefore, if you set up an alias to port 21 of a remost UNIX host, all sessions opened to that alias are FTP clients. For more information about aliases and session configuration records, see the description of the **Alias** option in "Editing Session Configuration Records" on page 2–5.

3. Enter **`user`** followed by your login name and press RETURN. Example:

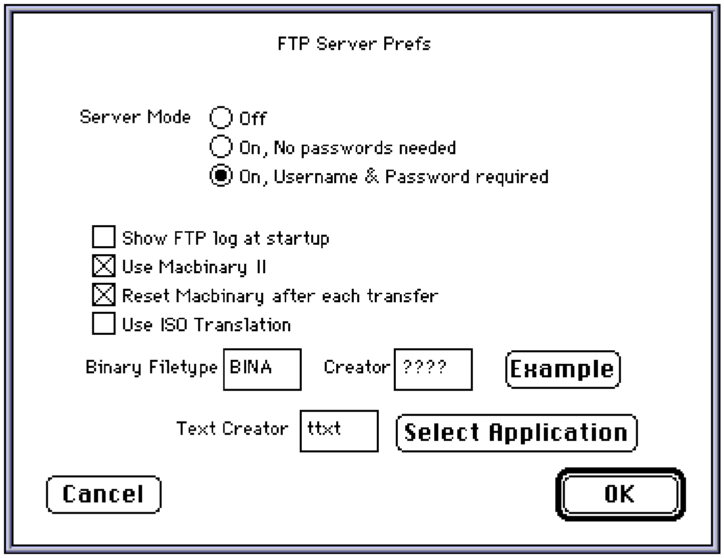
   `user` *loginname* RETURN

4. The host prompts for your password. Enter your password and press RETURN.
5. If you are logged on successfully, the host sends a message that you are connected properly.

Once logged on, use the FTP client just as you would normally use an FTP session.

Configuring an FTP Server

To configure an FTP server, select **Edit▸FTP Server** from the **Preferences** menu. The **FTP Server Preferences** dialog box appears:



Each option in this dialog box is described below.

Option — **Description**

Server Mode

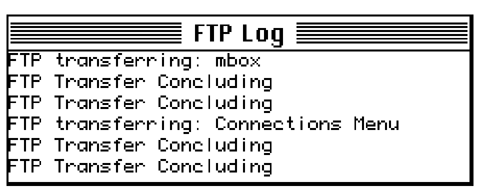
NCSA Telnet's FTP server can operate in three modes: off, on with no passwords, and on with passwords. When you select **Off**, NCSA Telnet refuses all FTP connections to your Macintosh. When you choose **On, No passwords needed**, NCSA Telnet allows anyone to connect to your Macintosh through FTP. When you select **On, Username & Password required**, NCSA Telnet requires connecting users to supply a valid username and password before gaining access to your Macintosh through FTP.

WARNING: Do *not* leave the FTP server in **On, No passwords needed**. This mode allows *anyone* access to your entire filesystem. NCSA Telnet includes this mode merely for quick and simple file transfers. It is not appropriate for a permanent configuration setup.

For information regarding the configuration of usernames and passwords for FTP, see "Controlling Access" on page 4-4.

Show FTP log at startup

When you check this option, the FTP log is displayed when NCSA Telnet is launched. The FTP log shows current and past transactions:



Use Macbinary II

When you select this option, NCSA Telnet uses MacBinary transfer mode when in binary mode. You can turn MacBinary mode on and off either from this dialog box or by sending `quote macb enable` or `quote macb disable` to the FTP server.

Reset Macbinary after each transfer When you select this option, the MacBinary transfer mode returns to your preferred default (**enabled** or **disabled**) each time you open a new FTP session, regardless of how you set the mode in a previous session. This saves you the trouble of tracking whether Macbinary transfer mode is enabled each time you want to transfer files.

NOTE: Each FTP session corresponds to the opening of each FTP command connection, not to the individual file transfer.

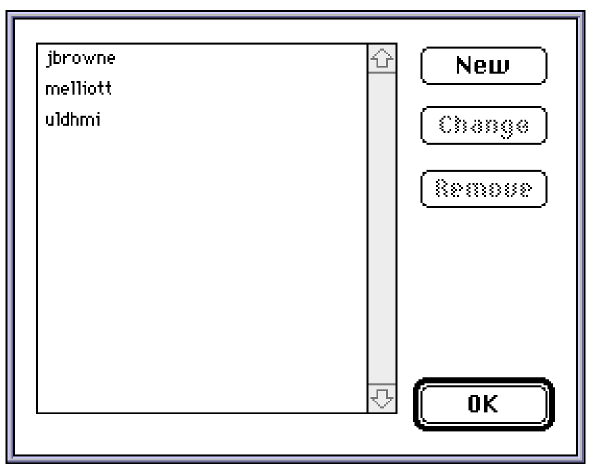
Use ISO Translation When you select this option, filenames sent in directory listing to the connected FTP user are first translated into the International Standards Organization (ISO) character set.

Binary Filetype and **Creator** Use the **Binary Filetype** and **Creator** boxes to specify the file type and file creator type for files transferred in binary mode when MacBinary transfer mode is disabled. Clicking on the **Example** button opens the **File** dialog box; use the the dialog box to select a file, then determine that file's file type and file creator type. For more information regarding file types and file creator types, see the discussion of the **Capture File Creator** option in "Global Preferences" on page 2–1.

Text Creator Use the **Text Creator** box and **Select Application** button to select the four-letter file creator type given to files transferred to your Macintosh through ASCII transfer mode.

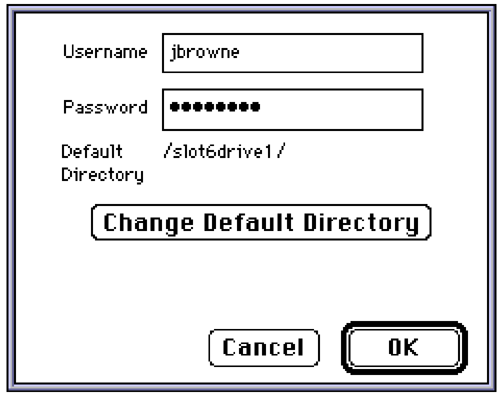
Controlling Access

To control who has FTP access to your Macintosh, select **Preferences▸FTP Users** from the **Edit** menu. An **FTP Users Preferences** dialog box appears that is similar to the following, which lists three users (jbrowne, melliott, and uldhmi):



Highlighting a username, then clicking on the **Remove** button cancels that user's access privileges.

Clicking on either the **New** or **Change** button opens a dialog box similar to the one below, which lets you add a new FTP user or change information about an existing FTP user:



In this sample, the user receiving FTP access is `jbrowne`, whose password is not displayed. When jbrowne logs on, his default directory will be `/slot6drive1/`.

Option	Description
Username	In this box enter the name you want NCSA Telnet to recognize at the username prompt.
Password	Enter the user's password in this box. Newly entered passwords are displayed in normal text. When you change records, this box always displays eight bullets (•) regardless of the length of the actual password. Passwords are stored in an encrypted format in the preferences file. **NOTE:** The encryption method used on passwords is quite simple and prevents casual users from discovering your passwords. But you should never give anyone a copy of your `Preferences` file.
Default Directory	When a user logs on with the correct username and password, NCSA Telnet's FTP server sets the working directory to the default, which is identified here. Clicking on the **Change Default Directory** button lets you change this user's default directory.

Preparing to Transfer Files

Before you attempt to transfer files using FTP, make sure the following conditions are met:

- Your host system supports FTP file transfer. If you do not know whether it does, see your system administrator.
- You have not disabled the file transfer capability of NCSA Telnet. You can check two conditions to determine whether the FTP capability is disabled:
  - » In the **FTP Server Preferences** dialog box, **Server Mode** is set to **Off**. Change this setting to **On**.
  - » When you attempt to start up FTP, your machine does not respond to the FTP command. Check to see if you have configured the FTP server.

Invoke FTP on the Host

Since the remote host initiates FTP transfer, FTP commands vary depending on the host system. For full documentation of FTP and commands within FTP, refer to the manuals for the host computer. On UNIX systems you can read online documentation by entering:

```
% man ftp
```

Issue the FTP Command

On most computer systems, at the prompt you enter the FTP command and the IP name or IP address of the target machine.

You can enter the FTP command in one of three ways. Use whichever method you are comfortable with. In the following examples of the three procedures, the IP name of the Macintosh is `mymachine` and its IP number is `192.17.20.22`:

1. Enter either the machine name or IP address and then press RETURN:

   `% ftp mymachine` or `% ftp 192.17.20.22`

2. Select **Send FTP Command** from the **Network** menu (or press ⌘-F). Either causes NCSA Telnet to enter the FTP command and issue a return character.
3. Enter **`ftp`**, press the SPACEBAR key, select **Send IP Number** from the **Network** menu (which automatically enters your IP address), and then press RETURN.

Your host computer may not accept FTP commands from any of these procedures, so you may have to test some variations to find the easiest method for your site.

Regardless of how you invoke FTP, most FTP clients respond like this:

```
Connected to 192.17.20.22.
220 Macintosh Resident FTP server, ready
Name (192.17.20.22:uldhmi):
```

Most FTP clients prompt for your username and password. If you have configured the FTP server for passwords (see “Configuring an FTP Server” on page 4-3), then you must enter a password. Otherwise, press RETURN to bypass the prompts. If you are not prompted for a username and password, assume that you are logged on and enter your FTP commands at the FTP prompt.

NOTE: When an FTP connection is active, the cursor changes to a small file icon:

When the FTP connection terminates, this icon changes back to the standard I-beam cursor.

Enter Additional FTP Commands

After FTP is invoked and passwords are checked, most FTP clients prompt you for individual FTP commands. These commands are documented in manuals for the host computer. Most FTP implementations have similar commands because they are modeled after the Berkeley UNIX version of FTP.

Once you are in FTP, you can access online help for a list of available commands. FTP commands that are common to most implementations are listed below:

Command	Action
`ascii`	Sets mode to ASCII (text) transfer mode, which is the default
`binary`	Sets mode to binary (image or I) transfer mode
`cd`	Changes the directory on your Macintosh

`dir`	Shows filenames in the Macintosh's default directory
`get` *filename*	Gets specified file from the Macintosh and sends it to the host
`help`	Shows an online list of FTP commands
`put` *filename*	Sends specified file from the host to the Macintosh
`pwd`	Shows the name of the current Macintosh directory

Set the Transfer Mode

ASCII is the default mode for FTP transfers. To transfer graphic or binary data files, you must change the transfer mode to binary format *before* you enter the `put` or `get` commands that transfer files. To set the transfer mode to binary, enter either **`binary`** or **`bin`**.

If you intend to use the file you are transferring with a Macintosh-specific application, you may also need to set MacBinary transfer mode. See "MacBinary Files" on page 4–9.

To set or reset the transfer mode to ASCII format, enter **`ascii`**.

Examples in "Transferring Files" on page 4–7 demonstrate FTP transactions with an ASCII file and with a binary file.

Change the Current Directory

FTP transfers files to the default directory on your Macintosh. To change the directory, enter **`cd`** at the FTP prompt (`ftp>`).

The `cd` command (which is one of the common FTP commands) requires you to manually specify a directory by entering a pathname; you do not use a dialog box. In the directory's pathname, the Macintosh requires that you enter a colon (:) or slash (/) to separate folder names.

For example, to change the default directory to a directory named *myfolder* on your local Macintosh named *hd20*, enter one of the following at the FTP prompt:

`ftp>` **`cd ":hd20:myfolder"`** or `ftp>` **`cd "/hd20/myfolder"`**

To identify your default transfer directory, enter the `pwd` command at the FTP prompt. In our example, entering the `pwd` command after the preceding cd command results in:

```
ftp> pwd
"/hd20/myfolder" is the current directory
```

Transferring Files

Now you are ready to transfer files via FTP.

WARNING: Do not close an NCSA Telnet connection while a file transfer is in progress. Trying to do so causes the file transfer to fail.

To a Macintosh

Even though you seem to be initiating the transfer from the Macintosh, the transaction actually operates from the host. For example, to transfer a file *from the host to your Macintosh*, enter the `put` command:

`ftp>` **`put`** *filename.ext*

The following example demonstrates how to use the `put` command to transfer an ASCII (text) file named `temp2` from a remote host to a local Macintosh:

```
% ftp -n 192.17.20.124
Connected to 192.17.20.124.
220 Macintosh Resident FTP server, ready
ftp> put temp2
200 This space intentionally left blank <  >
150 Opening connection
226 Transfer complete
262145 bytes sent in 32.61 seconds (7.8 Kbytes/s)
ftp> quit
221 Goodbye
%
```

To a Host

To send a file *from your Macintosh to a remote host*, enter the `get` command:

ftp> **get** *filename.ext*

The following example demonstrates how to use the `get` command to transfer a binary (image) file named `bridge.pic` from a local Macintosh to a remote host. The `cd` command is used to locate the directory, `/HD20/pictures`, in which the file resides.

```
% ftp -n 192.17.20.124
Connected to 192.17.20.124.
220 Macintosh Resident FTP server, ready
ftp> bin
200 Type set to I, binary transfer mode
ftp> cd "/hd20/pictures"
250 Chdir okay
ftp> get bridge.pic
200 This space intentionally left blank < >
150 Opening connection
226 Transfer complete
262144 bytes received in 9.22 seconds (28 Kbytes/s)
ftp> quit
221 Goodbye
%
```

To send a text file after this binary (image) file transfer is complete, you must first enter **ascii** to reset the transfer mode to ASCII (text).

Multiple Files

Some versions of FTP let you enter one command (either `mput` or `mget`) plus wildcard characters to transfer multiple files sequentially.

When you use wildcards in FTP `get` commands, you must enclose the filename in quotation marks. For example, enter **get "*.image"**. Do not use quotation marks with `put` commands.

WARNING: If you transfer multiple binary (image) files using a UNIX host, note that there is a bug in the `mget` command as implemented on some systems (especially 4.2 BSD UNIX systems). When used in binary mode, the `mget` command adds a carriage return to filenames as they are transferred. The files themselves are not affected. Use a UNIX utility to remove the carriage return from the filename. When used to transfer multiple ASCII (text) files, the `mget` command causes no problems.

MacBinary Files

You may occasionally need to transfer Macintosh-only files (such as applications and most data files) to a non-Macintosh host, then download them later without losing any Macintosh-specific data (such as icons and creation dates).

Follow these instructions, and remember that the MacBinary transfer protocol is available only when FTP is in binary mode:

1. Select **MacBinary Enabled** from the **File** menu. When MacBinary is enabled, all `get` and `put` commands transfer Macintosh files in MacBinary format.

   You can alternately enable and disable MacBinary by selecting this option from the **File** menu. A checkmark (✓) appears next to the command when it is enabled.

2. Enter either **`binary`** or **`bin`** at the FTP prompt to set the file transfer mode to binary.

NOTE: If you are writing host-based scripts to download from or upload to a Macintosh in MacBinary mode, enter **`quote MACB ENABLE`** to enable MacBinary mode and **`quote MACB DISABLE`** to disable MacBinary mode.