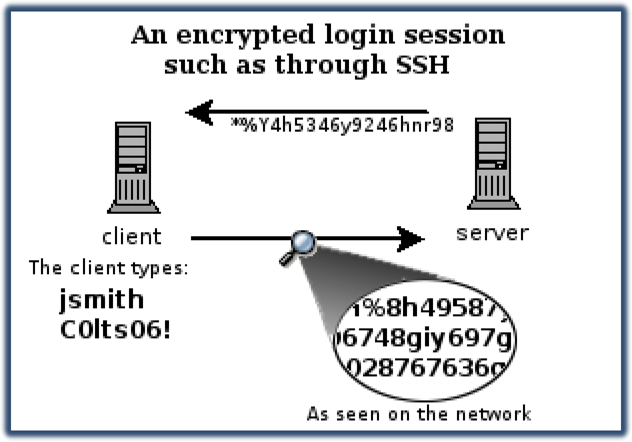
SSH and Remote File Transfer with UTCS Machines

What is SSH/FTP?

SSH stands for "Secure SHell" and is a UNIX-based command interface and protocol for getting secure access to a remote computer. From the comfort of your own remote computer, it will allow you to log in to a UTCS machine and execute commands via an encrypted secure channel over an insecure network. We call it "*SSH-ing in*" to a computer.



You will be the "client" securely connecting to a remote UTCS "server"

You can also transfer files between hosts using FTP (File Transfer Protocol), a network protocol used to transfer files over a TCP-based network.

Which UTCS machine do I connect to?

Check out this list of public UNIX hosts in the UTCS department. These are the names and status of all available UNIX machines, or hosts, for you to connect to.
First, find a host that is functioning correctly and not down (status will be "*up*"). Second, try not to use a host with a high number of connected users, in the *"#Users*" column. These users are all connected to the same host and share that machine's computing power.
Note: This requires log-in with a UTCS account.

How do I SSH?

If you're on Linux/Mac:

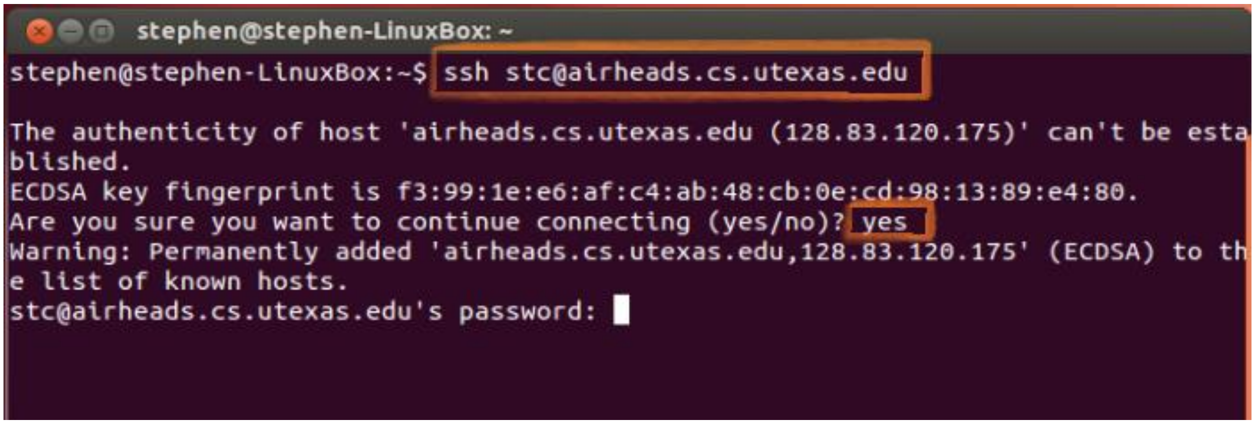
Open up a new Terminal. Still remember the name of the UTCS server you want to connect to? Perfect. Have your UTCS account username and password handy? You're all set.
Execute the following command, replacing the appropriate fields with your own username and hostname:

```
ssh username@hostname.cs.utexas.edu
```

For example, let's say my username is "*stc*" and I want to connect to *airheads*. I would use:

```
ssh stc@airheads.cs.utexas.edu
```

The first time you connect you will see a security warning about the authenticity of the host and storing a key. This is to protect you against a network attack called *spoofing* (which you can read about here). Enter `yes` to continue.



```
stephen@stephen-LinuxBox:~$ ssh stc@airheads.cs.utexas.edu

The authenticity of host 'airheads.cs.utexas.edu (128.83.120.175)' can't be esta
blished.
ECDSA key fingerprint is f3:99:1e:e6:af:c4:ab:48:cb:0e:cd:98:13:89:e4:80.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'airheads.cs.utexas.edu,128.83.120.175' (ECDSA) to th
e list of known hosts.
stc@airheads.cs.utexas.edu's password: 
```

Logging into the `airheads` host from a Linux machine

All you have to do now is enter your UTCS password and voilà! You've created your own SSH session! You now have command-line access to execute commands on the *airheads* host.

Logging out:

When you're done with your session, simply execute the `exit` command to log out of the host (or alternatively `logout`).

Transferring Files:

From a terminal on your local computer, you can take advantage of the `scp` command, which remotely copies a file from host to host. Note: *This is separate from the SSH session.*

To transfer a file from your local computer to the remote Linux server:

```
      scp localFile user@hostname:path_to_directory
```

You will be required to log in with your UTCS account.

For example, let's say I want to copy the file `HelloWorld.java` from my local machine into the Downloads folder on the "airheads" UTCS machine. I would use the following command:

```
      scp HelloWorld.java myUsername@airheads.cs.utexas.edu:~/Downloads/
```

If you're copying over a folder, use the `-r` option to recursively copy all of the folder's contents:

```
      scp -r ~/Documents/MyFolder user@airheads.cs.utexas.edu:~/Downloads/
```

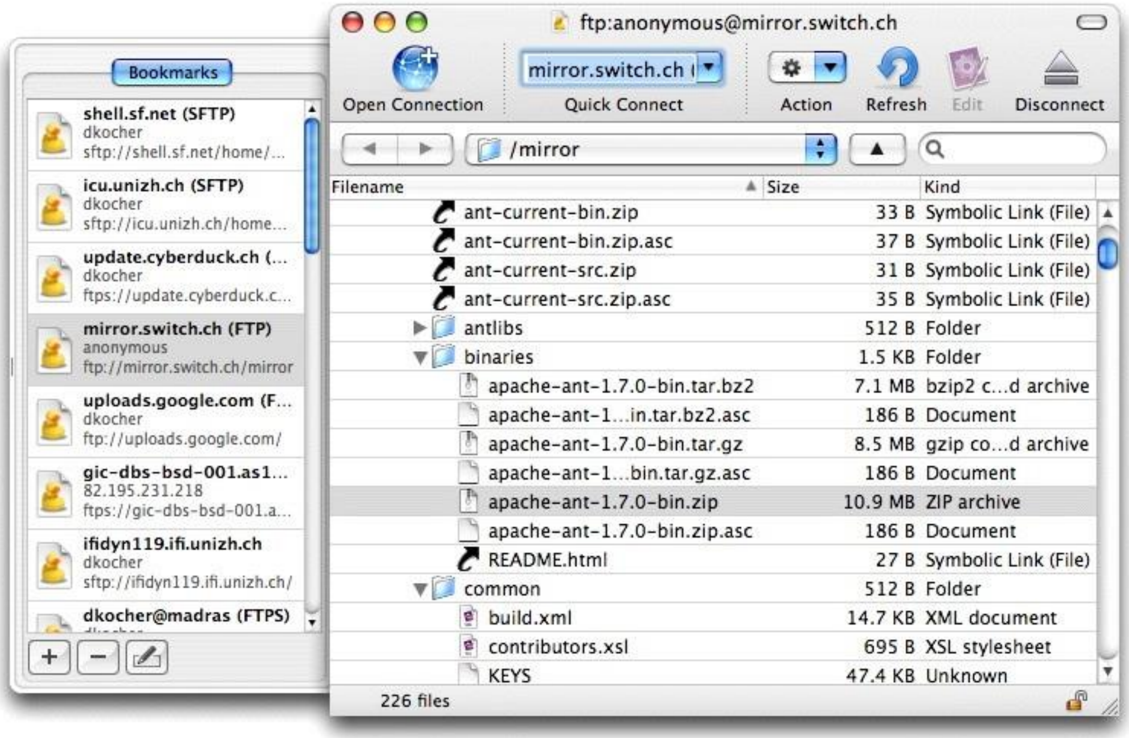
To transfer a file from the remote Linux server to your local machine, simply switch the order of the arguments:

```
      scp user@hostname:path_to_file directory_on_my_machine
```

For example, let's say I want to copy the `UnixTest.java` file from the Documents folder on the remote machine "airheads" to the Downloads folder on my local machine. I would use the following command:

```
        scp user@airheads.cs.utexas.edu:~/Documents/HelloWorld.java ~Downloads/
```

Alternatively, you could download an FTP client, such as Cyberduck (Mac/Windows), for a drag-and-drop interface. If you're using Cyberduck, simply click "Open Connection" at the top-left and enter the same info you used to SSH with PuTTY (*host name, username, password, etc.).*



shell.sf.net (SFTP)
dkocher
sftp://shell.sf.net/home/...

icu.unizh.ch (SFTP)
dkocher
sftp://icu.unizh.ch/home...

update.cyberduck.ch (...
dkocher
ftps://update.cyberduck.c...

mirror.switch.ch (FTP)
anonymous
ftp://mirror.switch.ch/mirror

uploads.google.com (F...
dkocher
ftp://uploads.google.com/

gic-dbs-bsd-001.as1...
82.195.231.218
ftps://gic-dbs-bsd-001.a...

ifidyn119.ifi.unizh.ch
dkocher
sftp://ifidyn119.ifi.unizh.ch/

dkocher@madras (FTPS)

Filename	Size	Kind
ant-current-bin.zip	33 B	Symbolic Link (File)
ant-current-bin.zip.asc	37 B	Symbolic Link (File)
ant-current-src.zip	31 B	Symbolic Link (File)
ant-current-src.zip.asc	35 B	Symbolic Link (File)
antlibs	512 B	Folder
binaries	1.5 KB	Folder
apache-ant-1.7.0-bin.tar.bz2	7.1 MB	bzip2 c...d archive
apache-ant-1...in.tar.bz2.asc	186 B	Document
apache-ant-1.7.0-bin.tar.gz	8.5 MB	gzip co...d archive
apache-ant-1...bin.tar.gz.asc	186 B	Document
apache-ant-1.7.0-bin.zip	10.9 MB	ZIP archive
apache-ant-1.7.0-bin.zip.asc	186 B	Document
README.html	27 B	Symbolic Link (File)
common	512 B	Folder
build.xml	14.7 KB	XML document
contributors.xsl	695 B	XSL stylesheet
KEYS	47.4 KB	Unknown

Cyberduck, an example FTP client that provides an easy interface for transferring files remotely

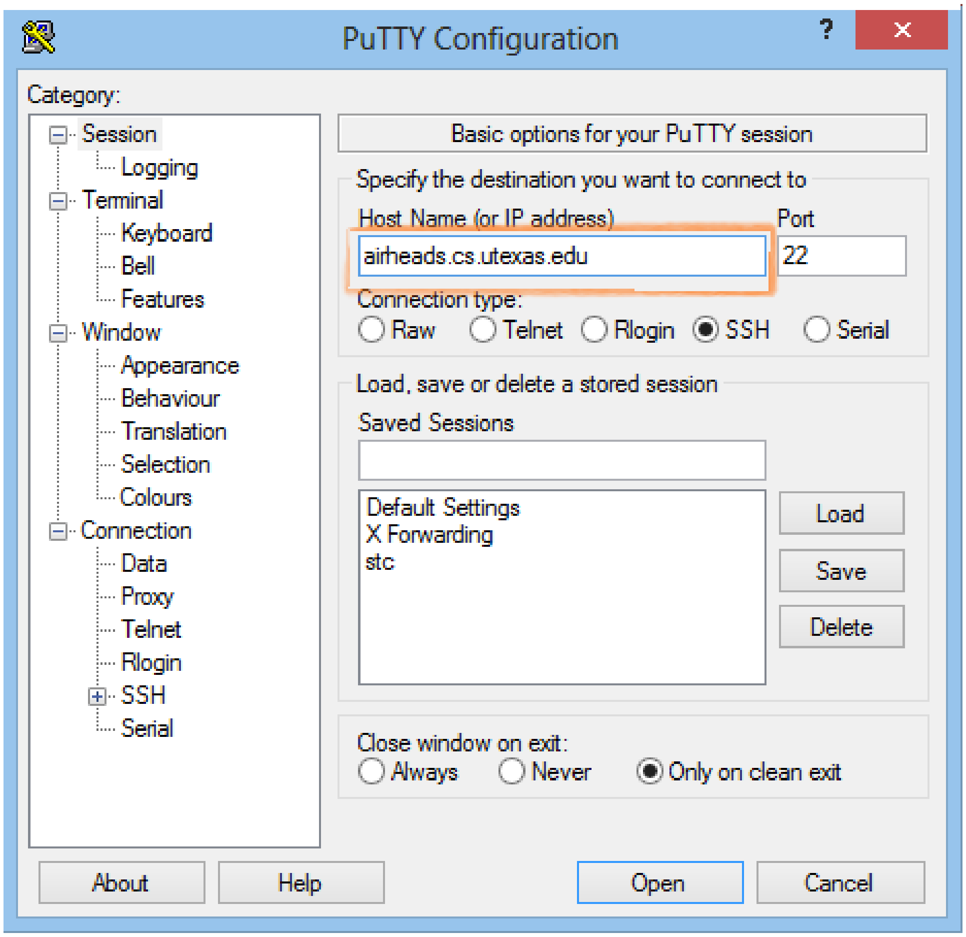
If you’re on Windows:

Since full SSH functionality is not built-in for Windows, you’ll need to use a third-party SSH client program to do it for you. One of the most popular tools is PuTTY. Download the PuTTY executable (*putty.exe*) to your computer and run it.

You should see the PuTTY Configuration window appear. All of the default settings are fine for now – all we care about is what to put in the “*Host Name*” entry. Remember the name of the UTCS host you want to connect to? Put it in the following form, replacing *hostname* with the name of the UTCS machine:

`hostname.cs.utexas.edu.`

Let’s pretend I want to connect to the host called *airheads*. Tack on `.cs.utexas.edu` to the end of the host name: `airheads.cs.utexas.edu`



PuTTY Configuration

Host Name (or IP address): airheads.cs.utexas.edu

Port: 22

Connection type: ○ Raw ○ Telnet ○ Rlogin ● SSH ○ Serial

Saved Sessions:

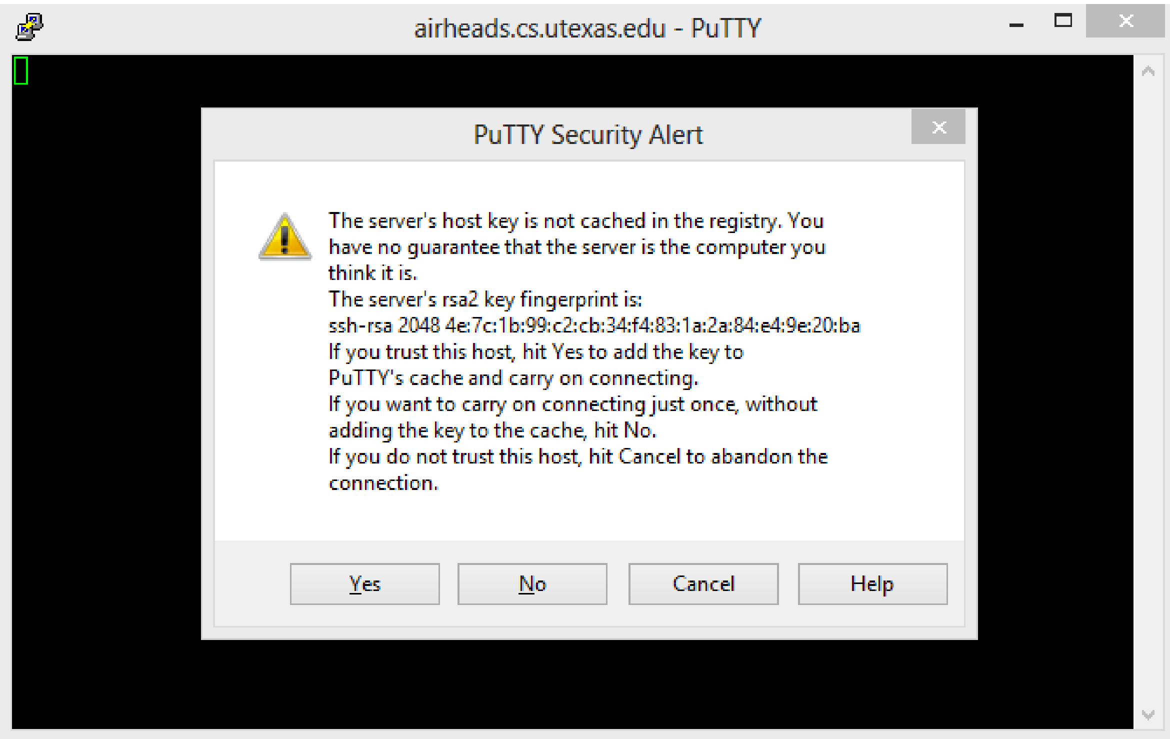
Default Settings
X Forwarding
stc

Close window on exit: ○ Always ○ Never ● Only on clean exit

Connecting to the airheads host using PuTTY on Windows

Put that in the “Host Name” input box and click Open at the bottom of the window. You are now opening an SSH connection to that machine.

The first time you connect you will see a security warning about the server's host key. This is to protect you against a network attack called *spoofing* (which you can read about here). If you trust the host machine (*you're pretty safe connecting to UTCS machines*) then click Yes.



airheads.cs.utexas.edu - PuTTY

PuTTY Security Alert

```
The server's host key is not cached in the registry. You
have no guarantee that the server is the computer you
think it is.
The server's rsa2 key fingerprint is:
ssh-rsa 2048 4e:7c:1b:99:c2:cb:34:f4:83:1a:2a:84:e4:9e:20:ba
If you trust this host, hit Yes to add the key to
PuTTY's cache and carry on connecting.
If you want to carry on connecting just once, without
adding the key to the cache, hit No.
If you do not trust this host, hit Cancel to abandon the
connection.
```

This is expected the first time you connect to a host

All you have to do now is enter your UTCS username and password and voilà! You're in! You have command-line access to execute commands on the *airheads* host.

One extra tip: To save a few seconds, you can optionally include your UTCS username in the "Host Name" entry in the following format:

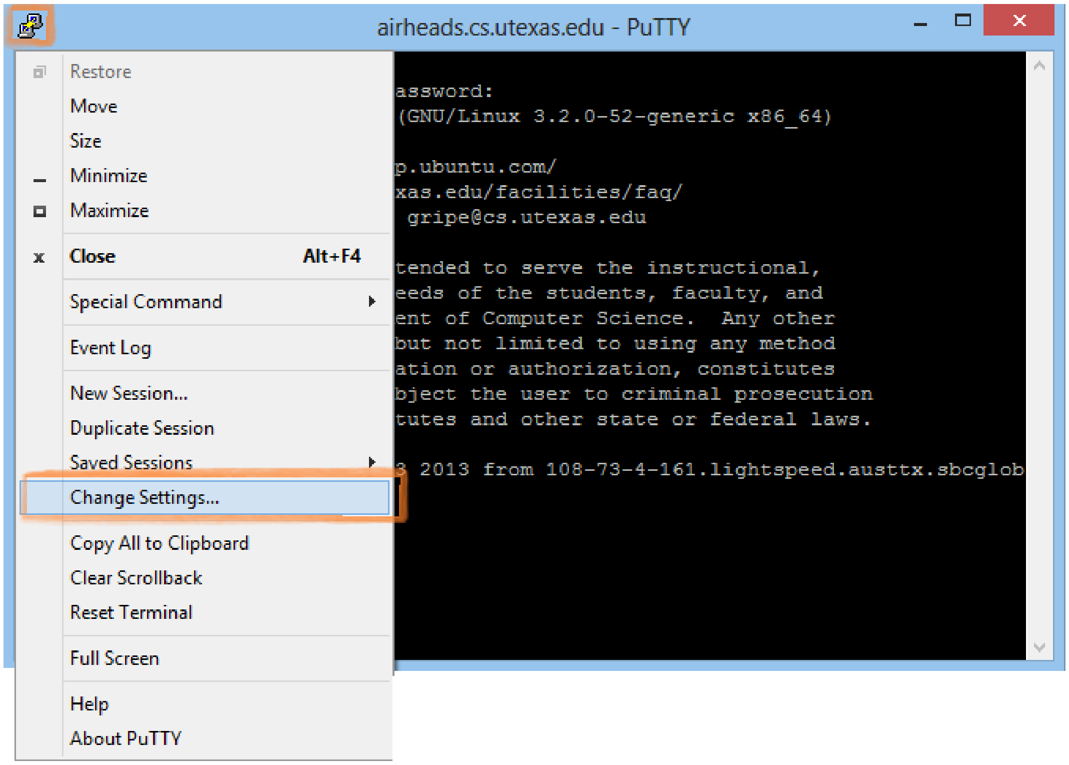
```
        username@hostname.cs.utexas.edu
```

For example, if my username is *foo* and I want to log into *airheads*, I would input:

```
        foo@airheads.cs.utexas.edu
```

This will simply allow you to skip the username step when you log in with your UTCS account.

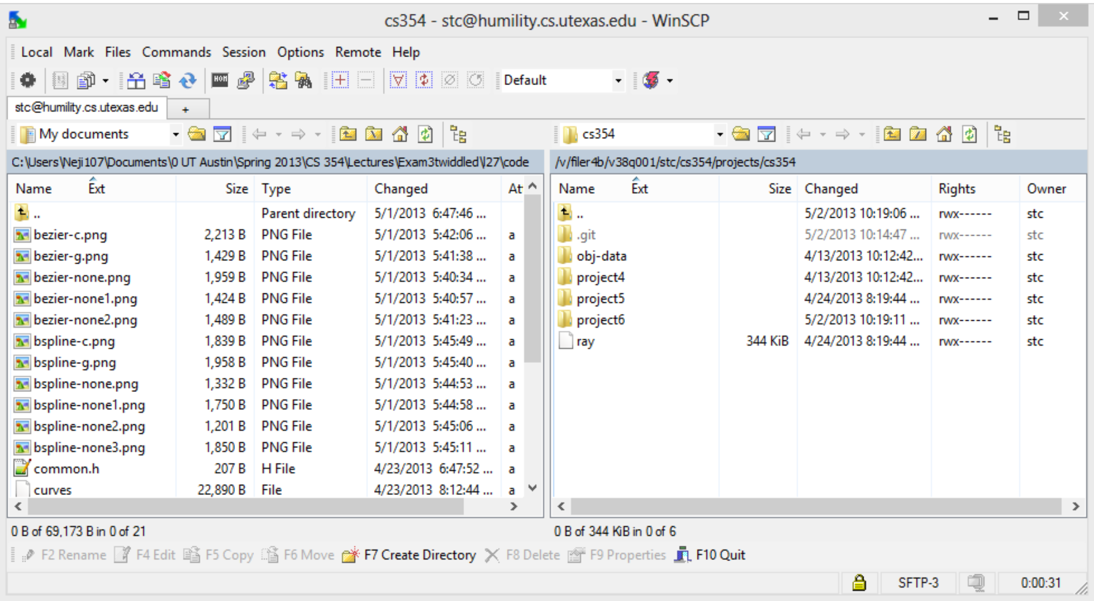
<u>Save your PuTTY session</u>:
Let's say you're happy with your current SSH get-up and plan to repeat this configuration next time by connecting to the exact same host. You can save your current session by clicking the PuTTY icon in the top-left and choosing "Change Settings".



```
assword:
(GNU/Linux 3.2.0-52-generic x86_64)

p.ubuntu.com/
xas.edu/facilities/faq/
 gripe@cs.utexas.edu

tended to serve the instructional,
eeds of the students, faculty, and
ent of Computer Science.  Any other
but not limited to using any method
ation or authorization, constitutes
bject the user to criminal prosecution
tutes and other state or federal laws.

3 2013 from 108-73-4-161.lightspeed.austtx.sbcglob
```

Enter a name for *Saved Sessions* and hit Save. Now every time you start up PuTTY, you'll see the name of your saved session under, you guessed it, "Saved Sessions". Double-click the name to automatically start a SSH session with the same configuration.

<u>Transferring Files:</u>
One of the easiest ways to transfer files is to use an SFTP/FTP client program for Windows, such as the popular WinSCP tool. The WinSCP interface allows you to drag-and-drop files between two hosts. Log into WinSCP using the same info you used to SSH with PuTTY (*host name, username, password, etc.).*



cs354 - stc@humility.cs.utexas.edu - WinSCP
Local Mark Files Commands Session Options Remote Help
Default
stc@humility.cs.utexas.edu
+
My documents
cs354
F2 Rename
F4 Edit
F5 Copy
F6 Move
F7 Create Directory
F8 Delete
F9 Properties
F10 Quit
SFTP-3
0:00:31

C:\Users\Neji107\Documents\0 UT Austin\Spring 2013\CS 354\Lectures\Exam3twiddled\27\code

Name	Ext	Size	Type	Changed	At
..			Parent directory	5/1/2013 6:47:46 ...	
bezier-c.png		2,213 B	PNG File	5/1/2013 5:42:06 ...	a
bezier-g.png		1,429 B	PNG File	5/1/2013 5:41:38 ...	a
bezier-none.png		1,959 B	PNG File	5/1/2013 5:40:34 ...	a
bezier-none1.png		1,424 B	PNG File	5/1/2013 5:40:57 ...	a
bezier-none2.png		1,489 B	PNG File	5/1/2013 5:41:23 ...	a
bspline-c.png		1,839 B	PNG File	5/1/2013 5:45:49 ...	a
bspline-g.png		1,958 B	PNG File	5/1/2013 5:45:40 ...	a
bspline-none.png		1,332 B	PNG File	5/1/2013 5:44:53 ...	a
bspline-none1.png		1,750 B	PNG File	5/1/2013 5:44:58 ...	a
bspline-none2.png		1,201 B	PNG File	5/1/2013 5:45:06 ...	a
bspline-none3.png		1,850 B	PNG File	5/1/2013 5:45:11 ...	a
common.h		207 B	H File	4/23/2013 6:47:52 ...	a
curves		22,890 B	File	4/23/2013 8:12:44 ...	a

0 B of 69,173 B in 0 of 21

/v/filer4b/v38q001/stc/cs354/projects/cs354

Name	Ext	Size	Changed	Rights	Owner
..			5/2/2013 10:19:06 ...	rwx------	stc
.git			5/2/2013 10:14:47 ...	rwx------	stc
obj-data			4/13/2013 10:12:42...	rwx------	stc
project4			4/13/2013 10:12:42...	rwx------	stc
project5			4/24/2013 8:19:44 ...	rwx------	stc
project6			5/2/2013 10:19:11 ...	rwx------	stc
ray		344 KiB	4/24/2013 8:19:44 ...	rwx------	stc

0 B of 344 KiB in 0 of 6

Use WinSCP to transfer files between your computer (left) and the remote machine (right)

Alternatives:

If you want more Linux-like capabilities but are stuck on Windows, consider the following options:

- Cygwin – UNIX-like environment and command-line interface for Windows
- Dual boot – host multiple operating systems on one computer and pick one on startup
- Virtual Machine – use a virtualization tool, such as VirtualBox, load a “guest” operating system while another is running