

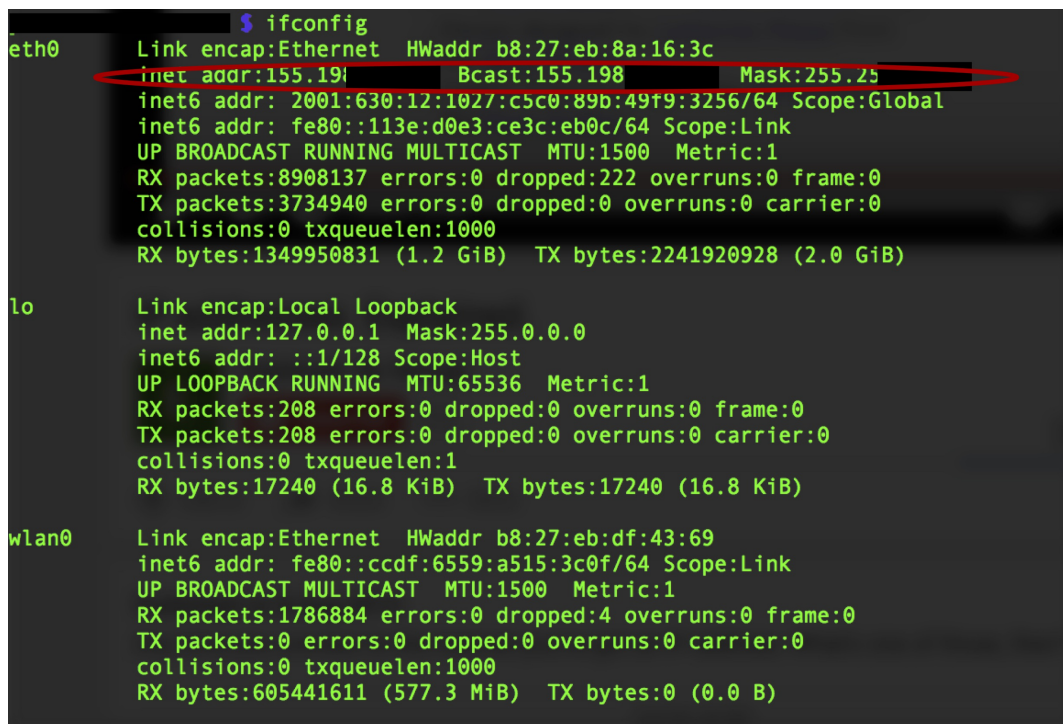
Remote connection to your Raspberry Pi

Checking your IP address from the terminal

We can use a command to check the different internet connections available on our system: *ifconfig* or *ifconfig -a*.

```
$ ifconfig
```

This command allows to know the IP addresses assigned to our RPi. The *wlan0*, indicates the status of the WiFi, and *eth0* shows the status of the Ethernet (wired) connection). In the next screen shoot shows an example of a RPi connected to the internet using the ethernet port. The red oval shows where to find the IP address assigned to the RPi.



```
$ ifconfig
eth0      Link encap:Ethernet  HWaddr b8:27:eb:8a:16:3c
          inet addr:155.191.155.198  Bcast:155.198.155.198  Mask:255.255.255.255
          inet6 addr: 2001:630:12:1027:c5c0:89b:49f9:3256/64 Scope:Global
          inet6 addr: fe80::113e:d0e3:ce3c:eb0c/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:8908137 errors:0 dropped:222 overruns:0 frame:0
          TX packets:3734940 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:1349950831 (1.2 GiB)  TX bytes:2241920928 (2.0 GiB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:208 errors:0 dropped:0 overruns:0 frame:0
          TX packets:208 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:17240 (16.8 KiB)  TX bytes:17240 (16.8 KiB)

wlan0     Link encap:Ethernet  HWaddr b8:27:eb:df:43:69
          inet6 addr: fe80::ccdf:6559:a515:3c0f/64 Scope:Link
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:1786884 errors:0 dropped:4 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:605441611 (577.3 MiB)  TX bytes:0 (0.0 B)
```

If you do not know what is an **IP address**, please go to the next [link](#) for a quick explanation. The IPs can be dynamic or static, but what is the difference? When a device is assigned a static IP address, the address does not change. Most devices use dynamic IP addresses, which are assigned by the network when they connect and change over time.

Why do I need to know my IP address?

We already know how to connect through weaved service, but we know the connection last just 30 minutes and lets just to work on a terminal session at the time. Therefore, with the help of weave and another command we can connect to or RPi for longer and using multiple terminals.

- First connect as usual to your weaved account and then connect to your RPi using the terminal of your laptop or desktop as you already did when you [set up weaved](#).
- Then, you need to know the IP address assigned to your RPi:
-

```
$ ifconfig
```

Once you know the IP (e.g. your IP is 192.31.123.122), you can access using other terminal to the RPi as:

```
$ ssh pi@192.31.123.122
```

Remember that the **root username** is **pi**, the syntax for the ssh command is: `ssh username@IP` or `ssh username@machine_name`.

Note: Since at Imperial network the IPs are dynamic, the IP is constantly changing, so could be that the IP changes in a day or hours (could be sometimes longer) and you need to repeat the procedure using weaved.

Copying files from my laptop to my RPi

Using terminal

If are programing in your laptop and you want to transfer your code to test it in your RPi, you can use either Security Shell ([ssh](#)) or File Transfer Protocol ([sftp](#)).

SSH

Commands	Description	Example	Syntax
<code>scp</code>	Copy files from your machine to your RPi.	<code>scp program.py pi@123.232.232.3:/home/pi</code>	<code>scp filename username@IP_of_machine:/path/where/to/Cc</code>
<code>scp -r</code>	Copy folders from your machine to your RPi.	<code>scp -r code pi@123.232.232.3:/home/pi</code>	<code>scp -r folder username@IP_of_machine:/path/where/to/Cc</code>

SFTP

Commands	Description	Example	Syntax
<code>sftp</code>	Establishing SFTP session.	<code>sftp pi@123.232.232.3</code>	<code>sftp username@remote_hostname_or_IP</code>
		<code>sftp pi@123.232.232.3:/home/pi/code</code>	<code>sftp username@remote_hostname_or_IP:/pa</code>

	Establishing SFTP session from where we want to get or put a file.	
--	--	--

Once establish the connection through SFTP, we can transfer files as:

Description	Description	Syntax
Transferring Remote Files to the Local System	Once we get into to SFTP session and we would like download files from our remote host.	<code>get remoteFile</code>
	Copy the remote file to a different name by specifying the name afterwards.	<code>get remoteFile localFile</code>
	Copy a directory and all of its contents by specifying the recursive option.	<code>get -r someDirectory</code>
Transferring Local Files to the Remote System	We can use the command "put".	<code>put localFile</code>
	The same flags that work with "get" apply to "put". So to copy an entire local directory	<code>put -r localDirectory</code>

Note: More details and examples of SFTP in this [link](#).

Using Software

Instead a terminal, we can use to transfer files using a software that mounts any remote server storage as a local disk in the Finder.app on Mac and the File Explorer on Windows. We suggest:

- [Cyberduck](#)

Cyberduck Quick Reference Guide

By Andrew Fogo & Becca Schmidt



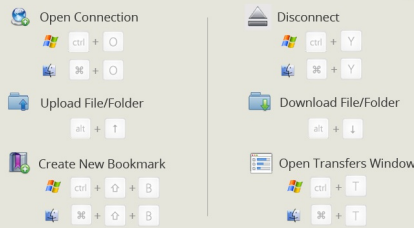
Open a Connection

1. Open the **Open Connection** dialog box by either
 - (a) Clicking the Open Connection icon (🌐) on the toolbar
 - (b) Selecting **File > Open Connection** from the menu bar
 - (c) Pressing **ctrl + O** (PC) or **⌘ + O** (Mac) on your keyboard
2. From the dropdown box, select your desired connection type
3. Enter your necessary credentials
4. Press the **Connect** button



Your directory and list of files will appear.

Helpful Shortcuts



Transfer Files

First make sure you are in your desired connection location.

Upload

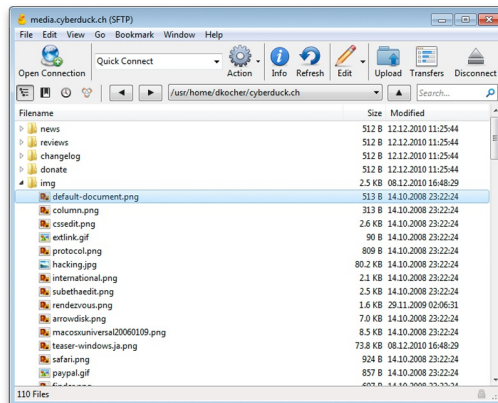
1. Upload file(s) or folder(s) by either
 - (a) Clicking the Upload icon (📤) on the toolbar
 - (b) Selecting **File > Upload** from the menu bar
 - (c) Pressing **alt + ↑** on your keyboard
 - (d) Clicking the Action icon (⚙️) and selecting Upload
2. Browse for the file(s) or folder(s) you wish to upload
3. Press the **Choose** button

The Transfer dialog box will appear and indicate the status of the transfer.

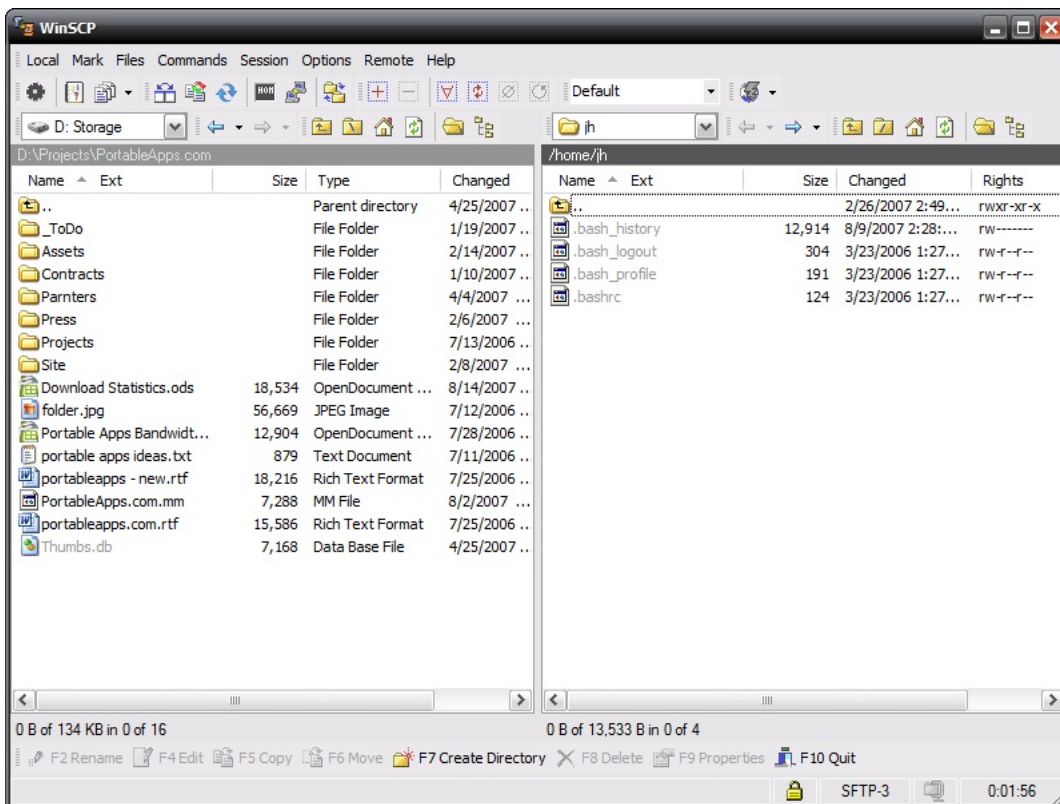
Download

1. Select the file(s) or folder(s) you wish to download
2. Download file(s) or folder(s) by either
 - (a) Right click your mouse and press download
 - (b) Selecting **File > Download** from the menu bar
 - (c) Pressing **alt + ↓** on your keyboard
 - (d) Clicking the Action icon (⚙️) and selecting Download

Tip: You may also drag & drop files or folders to upload and download them.



- For just Windows you can use: [WinSCP](#)



Creating and deleting a new user

You can create additional users on your Raspbian installation with the **adduser** command.

Enter `sudo adduser bob` and you will be prompted for a password for the new user *bob*. Leave this blank if you do not want a password. However, we recommend that each user get a password to access remotely in the future, for example:

```
$ ssh bob@123.343.1.105
```

You can delete a user on your system with the command `userdel`. Apply the `-r` flag to remove their home folder too:

```
sudo userdel -r bob
```

The default `pi` user on Raspbian is a sudoer. This gives the ability to run commands as root when preceded by `sudo`, and to switch to the root user with `sudo su`.

Optional

The next command is for updating and upgrading the Linux packages in the operative system, but it won't be executed during the workshop since it can take a while. It is always good to keep the system up to date.

In order to avoid problems due to connectivity in our terminal session when updating and upgrading the operative system, we can open a Screen session as explained in the first week at the end of the [RPI setup section](#). so we leave the command here for you to use in the future:

1. Starting a *Screen*:

```
$ sudo screen -S session1
```

2. Once in the *Screen* session:

```
$ sudo apt-get -y update && sudo apt-get -y upgrade
```