

Working from home on a PC

Introduction

Fun fact: It is possible to remotely log in to the CS department's Linux machines from anywhere, using a system called ssh. This means that, using only your ingenuity and the technology at your disposal, you can log into one of the Sun Lab machines and run commands in the shell from your computer in your dorm room.

Why would I want to do that? Well, it's pretty cool. And you'll be able to do your homework assignments and hand them in without leaving your room to come to the CIT. All you have to do is follow these slightly complicated instructions.

This guide will show you how to:

- Set up remote log in using PuTTY, so you can ssh into a Sun Lab machine.
- Set up X forwarding using Xming, so you can use programs that have GUIs.
- Set up file transfers using WinSCP, so you can move files between your computer and the CS filesystem.

Let's get started.

1 Remote log in

1.1 1.1 Download the software

You'll need two programs to log in remotely. They are:

- **PuTTY:** this is an ssh client. It will allow you to log in to the department machines. You can download it here:
<http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html>
You will want to download `putty.exe` and `puttygen.exe` for Windows on Intel x86.
- **PuTTYgen:** this allows you to create a key that you will need to authenticate to the system and use PuTTY. Conveniently, it can also be downloaded at the above location.

- **WinSCP:** this will allow you to transfer files from your home computer to the CS filesystem. It can be found here: <http://winscp.net/eng/download.php> (you want WinSCP 4.2.8 Installation Package)

PuTTY and PuTTYgen are standalone programs that do not need to be installed. Once you've downloaded them, they're ready to use. You'll need to install WinSCP, but we'll get to that later.

1.2 Create a key

1. Create a folder somewhere on your computer called "puttykeys".
2. Open PuTTYgen by double clicking on the file you downloaded.
3. In the "Parameters" subsection (at the bottom of the window) choose the "SSH-2 DSA" option.
4. Time to make some keys! Press the "Generate" button.
5. You'll be asked to generate some randomness by moving the mouse around the blank area in the "Key" section. Do it. As the progress bar fills in, your mouse movements will be translated into a random key.
6. Eventually, the program will have enough input to generate a key. Enter a passphrase in the "Key passphrase" field, and repeat it in the "Confirm passphrase" field. This can be anything, but remember to make it memorable and secure! You can also give the key a name in the "Key comment" field. You will have to enter your passphrase every time you ssh into the department machines.
7. Press the "Save public key" button. Save it as `csfs.pub` in the puttykeys folder you created.
8. Now press the "Save private key" button. Save it in the same folder as "`csfs.ppk`" (PuTTYgen should add the `.ppk` file extension automatically). You'll need to bring the public key file (`csfs.pub`) to the Sun Lab. Recommendations: email it to yourself or bring it on a flash drive.

1.3 1.3 Meanwhile, at the Sun Lab...

1. Open a terminal shell.
2. Put `csfs.pub` in your home directory.
3. Type `ssh-key-setup csfs.pub`
4. Your work is done here. You can leave the Sun Lab.

Good work so far. Isn't this fun?

1.4 Set up PuTTY

1. Back on your home computer, open PuTTY.
2. In the “Host Name (or IP address)” box, enter `ssh.cs.brown.edu`
3. In the “Connection type” subsection, make sure “SSH” is selected.
4. Click on the minus sign next to “SSH” in the Category menu to expand this category. Select “Auth”.
5. Make sure the “Attempt keyboard-interactive auth” box is checked.
6. Press the “Browse” button. Find where you saved your private key (it should be named “`csfs.ppk`”) and select it.
7. Select “X11” in the “SSH” section of the Category menu. Check the “Enable X11 forwarding” box.
8. Now select “Session” in the “Category” menu to return to the main screen. Type “Brown CS” in the “Saved Sessions” box, and press the “Save” button to store these settings.

1.5 Using PuTTY

1. From now on, when you open PuTTY, you should see the “Brown CS” label in the “Saved Sessions” section. Double click on this label.
2. PuTTY will ask you to log in. Use your CS login and the password you chose in PuTTYgen.
3. You should see something like `cs1ab3b /home/yourlogin $`. This means that you are logged into the `cs1ab3b` machine in the Sun Lab. Crazy, right?
4. You can now do anything you could do in the shell if you were physically in the Sun Lab, with the notable exception of running programs that have GUIs (like DrRacket, Eclipse, gedit).

2 X forwarding

Linux programs that have GUIs (Graphical User Interfaces) are written according to the X display protocol. In order to run these programs, you’ll need an X server, which receives display information over your ssh connection and displays them on your computer. First we will download Xming, a Linux-like environment for Windows which includes an X server.

2.1 Install Xming

Go to Xming setup to download and run setup.exe. Install Xming with all of the default settings.

2.2 Using the X server

1. When you run Xming's XServer, an X symbol should show up in the notification area of your taskbar. This means that the X server is running. If you're using Windows 7, you can find this by navigating to the bottom-right hand corner of your screen - there should be a small up arrow. Click on this - you'll see the Xming icon.
2. Now open PuTTY and log in. Try running a program like gedit or Eclipse. The program should start and function as usual. You may notice a lag, especially if you are working from off campus. The best situation for working away from the CIT using graphical programs is on Brown's campus using an ethernet cable.

3 File Transfer

Using PuTTY and X forwarding, you can log in remotely and run programs, but what if you want to transfer files between your computer and the CS filesystem? To do this you'll need a program called WinSCP. It can be found here: <http://winscp.net/eng/download.php> (you want WinSCP 5.1.7 Installation Package).

3.1 Set up WinSCP

1. Download and open the WinSCP installer. Click ok for the language of your choice.
2. Press next and accept the License Agreement. The click next again. Choose "Typical Installation".
3. Select Commander Interface, and click next.
4. Click install.
5. Let the program install (takes a few seconds). Then click finish. WinSCP should open.
6. Now that WinSCP is open, In the "Host name" box, type "ssh.cs.brown.edu". Enter your login in the "User name" box, but leave the "Password" box blank. Press the "..." button next to the "Private key file" box, and find your private key (csfs.ppk). Make sure the File protocol selection is SFTP.
7. Press the Save button. Accept the default session name (yourlogin@ssh.cs.brown.edu).

3.2 Using WinSCP

1. From now on, when you open WinSCP, you should see the “yourlogin@ssh.cs.brown.edu” label in the “Saved Sessions” section. Double click on this label.
2. Some status will be shown. If it asks whether or not you trust the computer, the answer is yes.
3. You’ll be asked for a password use the one you chose in PuTTYGen for your private key. The first time you log in you may receive a warning about accepting and caching the key.
4. You’ll see some status messages, and then the WinSCP interface should open. The left side of the screen represents your computer, and the right side represents the CS Filesystem.
5. You can navigate around both file systems, and drag and drop files between them as necessary. Congratulations, you can now work effectively from home!