

Connecting to Cranfield HPC systems from off-campus using a Linux desktop

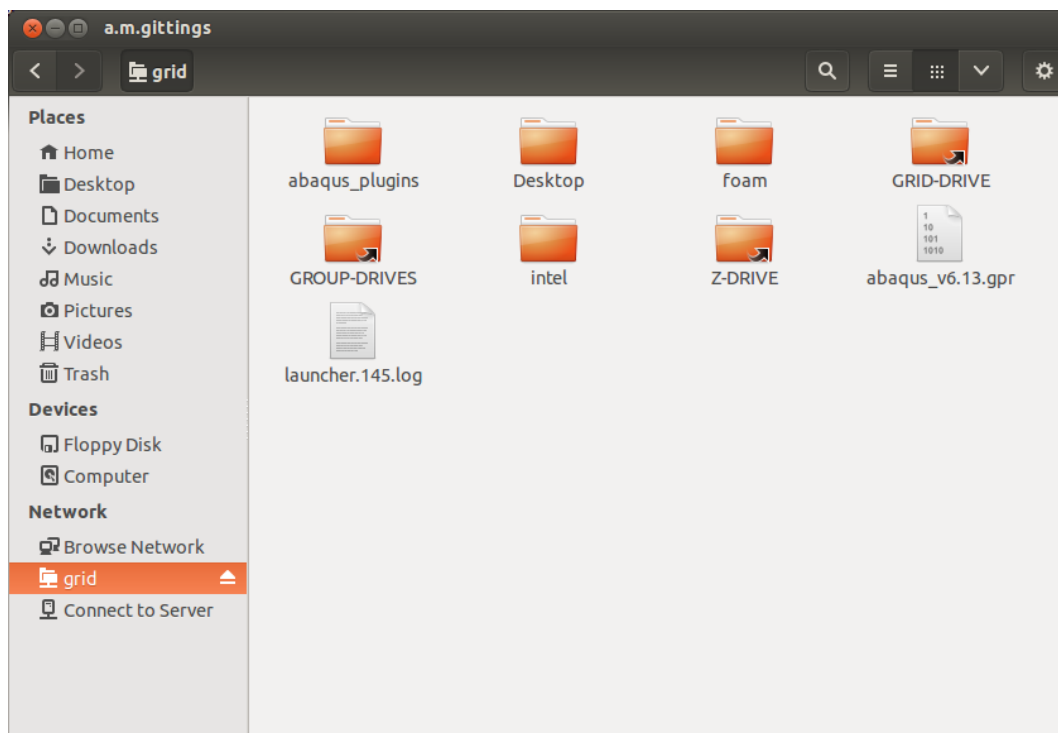
Prerequisites

1. A working Linux Installation (this example uses Ubuntu)
2. Connection to the Internet

Objectives

In order to be able to connect to the Linux HPC systems and your Linux desktop machine when off-campus, you will need to set up an SSH tunnel. This is because the HPC machines are not directly accessible from the Internet.

The tunnel configuration will only need to be performed once – unless you delete the contents of your Linux desktop's home folder.

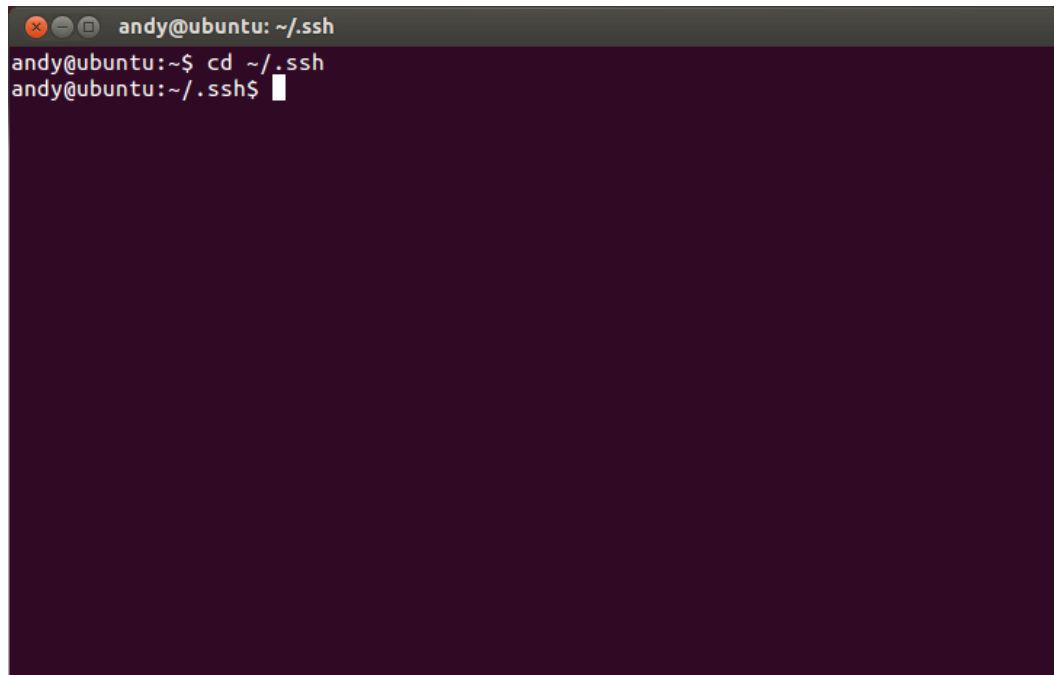


Example of GRID home folder once connected

Configuring the tunnel

1. Open a Linux terminal window and change directory into the .ssh folder in your home directory:

```
cd ~/.ssh
```



2. Use your favourite editor to create a file named “config” in this folder, and place the following text in this file (ensure you change the items below in **red** to your own username!):

```
Host hpctunnel
HostName hpcgate.cranfield.ac.uk
LocalForward 8020 grid.central.cranfield.ac.uk:22
LocalForward 8021 hpclogin-1.central.cranfield.ac.uk:22
User your-username

Host grid
HostName localhost
Port 8020
ForwardX11 yes
User your-username

Host astral
HostName localhost
Port 8021
ForwardX11 yes
User your-username
```

The “config” file should look as follows (in this example my username is a.m.gittings):

A terminal window titled 'andy@ubuntu: ~/.ssh' showing the contents of the .ssh/config file. The user has navigated to the .ssh directory and run 'cat config'. The output shows three host configurations: 'hpctunnel', 'grid', and 'astral'. Each configuration includes HostName, LocalForward, and User settings. The 'hpctunnel' host is configured for hpcgate.cranfield.ac.uk with local forwards to grid.central.cranfield.ac.uk:22 and hpclogin-1.central.cranfield.ac.uk:22. The 'grid' and 'astral' hosts are configured for localhost with local forwards on ports 8020 and 8021 respectively, and X11 forwarding enabled.

```
andy@ubuntu: ~/.ssh
andy@ubuntu:~$ cd .ssh
andy@ubuntu:~/.ssh$ cat config
Host hpctunnel
HostName hpcgate.cranfield.ac.uk
LocalForward 8020 grid.central.cranfield.ac.uk:22
LocalForward 8021 hpclogin-1.central.cranfield.ac.uk:22
User a.m.gittings

Host grid
HostName localhost
Port 8020
ForwardX11 yes
User a.m.gittings

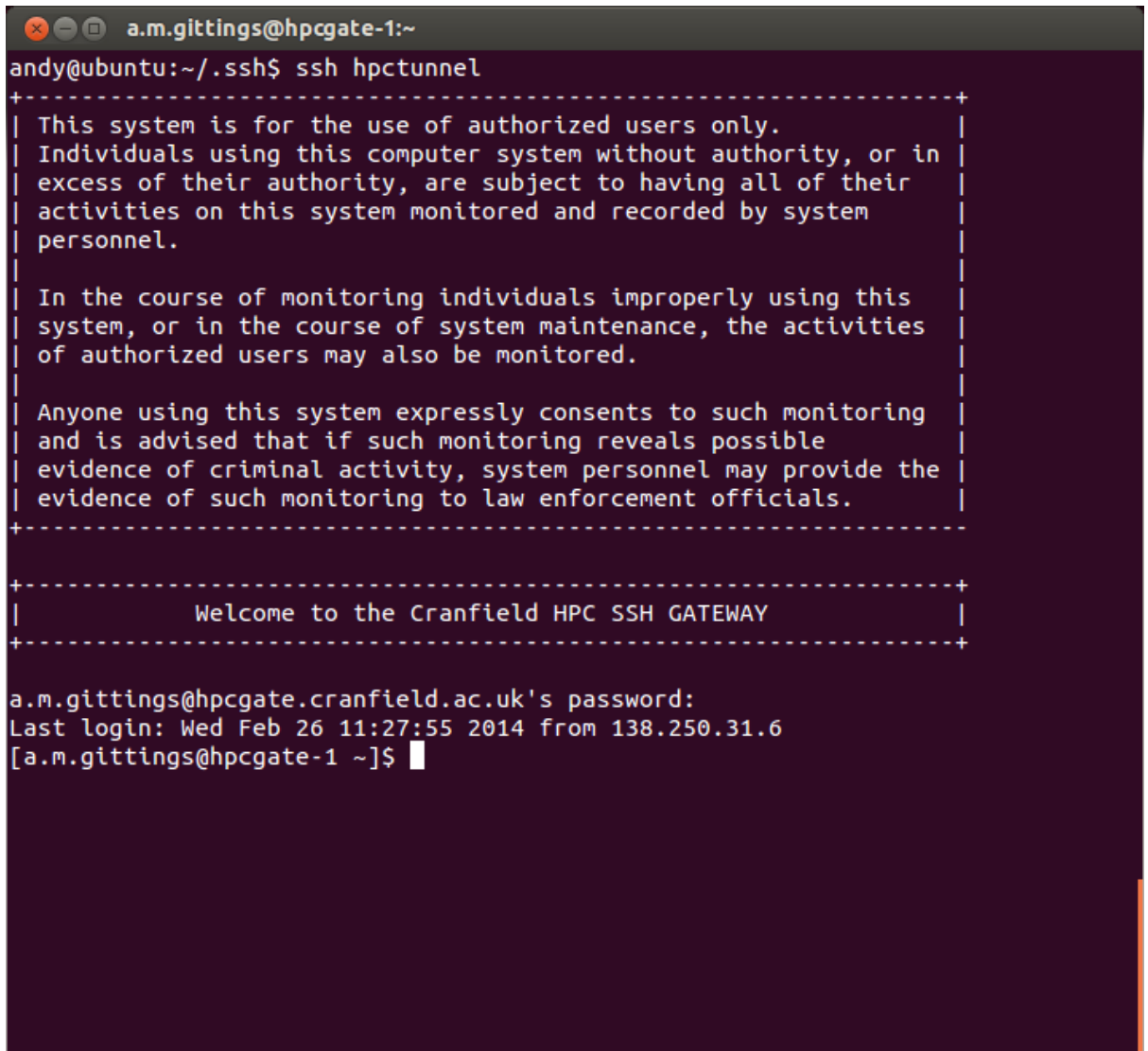
Host astral
HostName localhost
Port 8021
ForwardX11 yes
User a.m.gittings
andy@ubuntu:~/.ssh$
```

Opening the tunnel

Before you can start using the HPC machines remotely, you need to open the tunnel you configured in the previous section.

1. Open a Linux terminal window and SSH to the tunnel:

`ssh hpctunnel`

A terminal window titled 'a.m.gittings@hpcgate-1:~' showing an SSH session. The user 'andy@ubuntu' runs 'ssh hpctunnel'. The terminal displays a system warning about authorized users, a welcome message for the Cranfield HPC SSH Gateway, and login details for 'a.m.gittings@hpcgate.cranfield.ac.uk'. The prompt '[a.m.gittings@hpcgate-1 ~]\$' is visible at the bottom.

```
a.m.gittings@hpcgate-1:~
andy@ubuntu:~/ssh$ ssh hpctunnel
+-----+
| This system is for the use of authorized users only.          |
| Individuals using this computer system without authority, or  |
| in excess of their authority, are subject to having all of    |
| their activities on this system monitored and recorded by     |
| system personnel.                                             |
|                                                                |
| In the course of monitoring individuals improperly using this |
| system, or in the course of system maintenance, the          |
| activities of authorized users may also be monitored.         |
|                                                                |
| Anyone using this system expressly consents to such monitoring|
| and is advised that if such monitoring reveals possible      |
| evidence of criminal activity, system personnel may provide   |
| the evidence of such monitoring to law enforcement officials.  |
+-----+
+-----+
|                               Welcome to the Cranfield HPC    |
|                               SSH GATEWAY                       |
+-----+
a.m.gittings@hpcgate.cranfield.ac.uk's password:
Last login: Wed Feb 26 11:27:55 2014 from 138.250.31.6
[a.m.gittings@hpcgate-1 ~]$
```

Enter your password when prompted.

Once logged in, the SSH tunnel is in place and you may minimise this terminal window (do not close the window or the connection will be broken).

Command line access

If you simply need command line access to the GRID or Astral you can simply use the tunnel created in the previous step and type either “grid” or “astral” at the command prompt to access the appropriate machine (example below for the GRID):

```

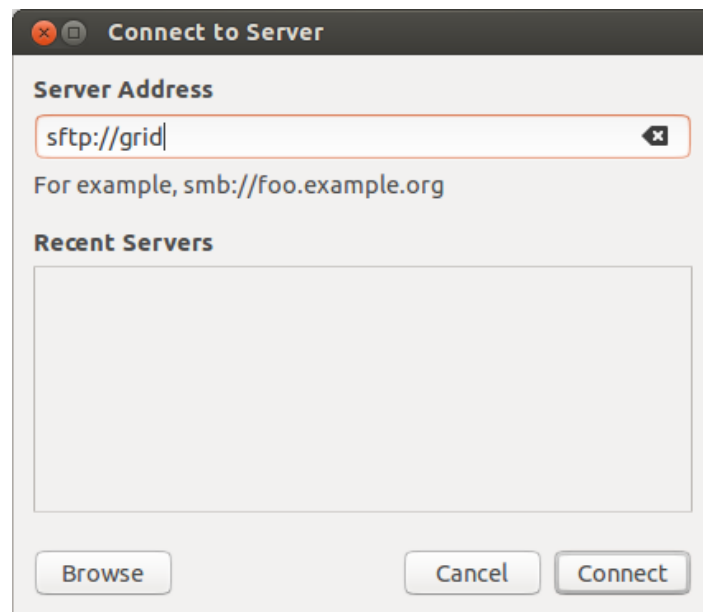
a.m.gittings@hpcgate-1:~
+-----+
+-----+
+-----+
|               Welcome to the Cranfield HPC SSH GATEWAY               |
+-----+
+-----+
a.m.gittings@hpcgate.cranfield.ac.uk's password:
Last login: Wed Feb 26 11:27:55 2014 from 138.250.31.6
[a.m.gittings@hpcgate-1 ~]$ grid
+-----+
| This system is for the use of authorized users only.                  |
| Individuals using this computer system without authority, or in      |
| excess of their authority, are subject to having all of their        |
| activities on this system monitored and recorded by system          |
| personnel.                                                            |
|                                                                        |
| In the course of monitoring individuals improperly using this        |
| system, or in the course of system maintenance, the activities      |
| of authorized users may also be monitored.                           |
|                                                                        |
| Anyone using this system expressly consents to such monitoring       |
| and is advised that if such monitoring reveals possible              |
| evidence of criminal activity, system personnel may provide the     |
| evidence of such monitoring to law enforcement officials.            |
+-----+
|
|      /\  /\  /\  /\
|  (  G  |  R  |  I  |  D  ) Login server: Vampire
|      \/  \/  \/  \/
|
+-----+
*****
*
*               PLEASE NOTE:
*
*   This system now contains both 4 & 8 CPU nodes. To
*   make most efficient use of the system, where possible
*   request 4 CPUs in your batch submission script - unless
*   you specifically need 8 cores.
*
*****
a.m.gittings@grid.central.cranfield.ac.uk's password:
Last login: Thu Feb 20 15:49:54 2014 from 138.250.31.6

```

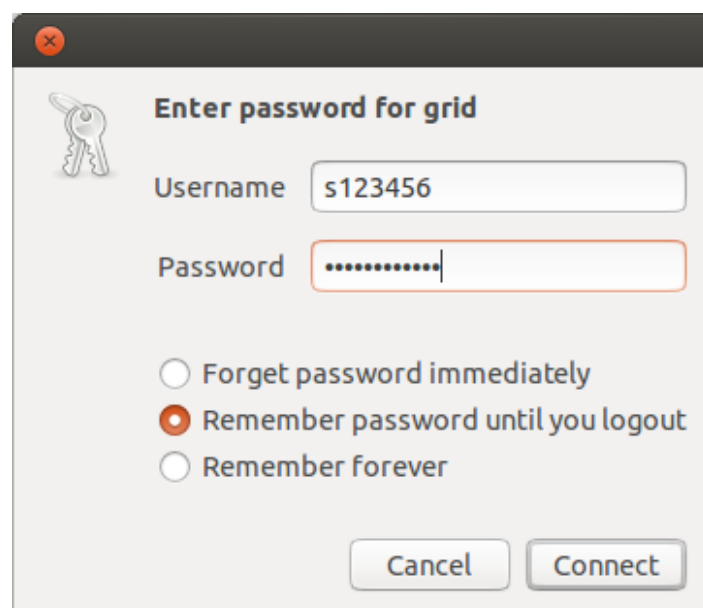
GUI File Access

If you need to access your GRID or Astral file store from the Linux desktop, you need first to have the HPC tunnel running – there is no need to log in to the GRID or Astral from the tunnel.

Assuming you have the tunnel running you can access your GRID file store as follows (from the Linux desktop Connect to Server option):



You will be prompted for your University username and password:



Once authenticated you will see your GRID home folder.

For Astral file access use the following paths (instead of sftp://grid):

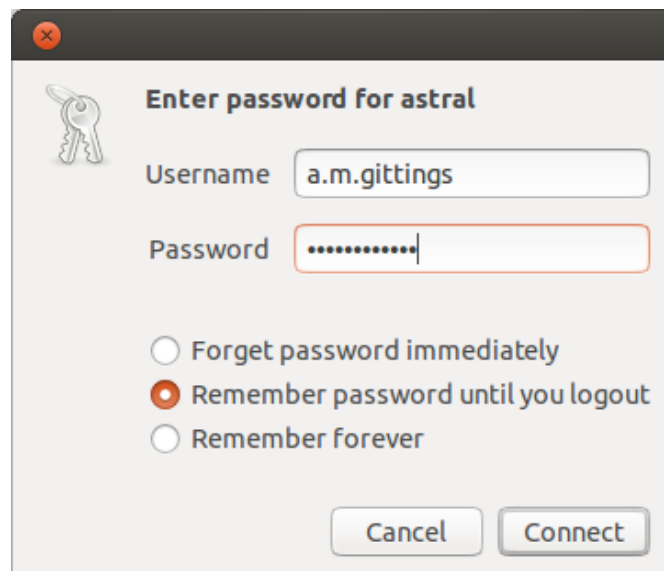
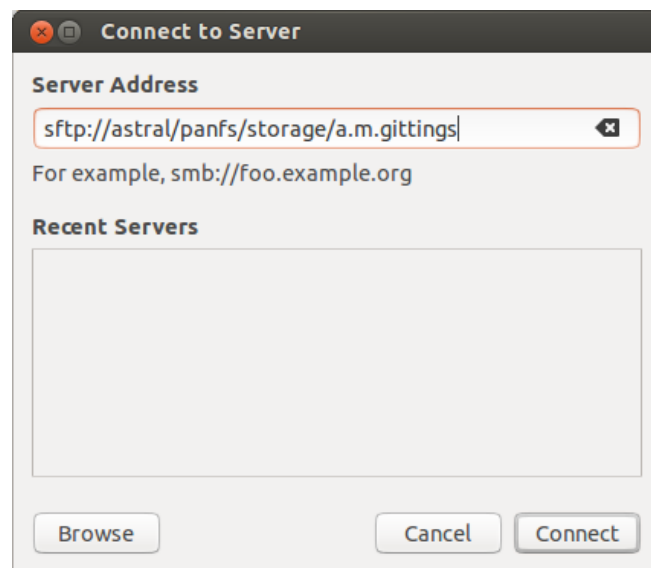
Scratch Space

sftp://astral/panfs/storage/**your-username**

Home folder

sftp://astral/panfs/storage/home/**your-username**

For example to connect to my scratch space as user a.m.gittings:



Once authenticated your folder will be displayed.