

Working Remotely & Synchronously

(How to work when it snows...)

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Motivation: Working Remotely

Remote access to:

- Dice/afs filesystem
- Internal Resources, eg internal websites, svn
- Access to journals

Why:

- Working in external lab (eg wet lab)
- Conferences
- Working from home

- Self-managed machine
- Laptop

Motivation: Keeping things Synchronised

When using multiple computers:

- How do you ensure you are working on the latest version of files?
- Copying settings between computers.
- Form of backup

Aside: Dice vs Self Managed

You have the option of running either DICE, or converting to self-managed.

Cons:

printing, afs, backups, support

Pros:

control over software, diskspace

If you convert to self-managed, you will need these techniques to access your afs-filespace.

Remote access

Connecting from outside:

- SSH
- VPN
- AFS
-

Connecting internally:

- Remote Desktop-ing with VNC

Secure-Shell: SSH

- SSH is a very powerful (commandline) tool.
- SSH gives you a 'terminal' to a remote machine, as if you were sitting in front of it.

`ssh username@hostname`

- Clients for Linux (usually built-in), Mac (built-in), Windows (Putty[1])
- The informatics ssh-login server is:

`ssh.inf.ed.ac.uk`

- But note that it does not respond to pings.

[1] Putty Available from: <http://www.chiark.greenend.org.uk/~sgtatham/putty/>

Informatics ssh

From outside:

ssh s0897465@ssh.inf.ed.ac.uk

Logging into compute servers (from inside the network)

Informatics Student Compute Server:

ssh s0897465@student.compute

DTC Server:

ssh s0897465@jupiter1

X Forwarding

- The switch -X enables 'X-forwarding'
- This allows you to run graphical program on another computer, and have the gui forwarded to you computer.

```
ssh -X s0897465@jupiter1  
gedit
```

[if -X does not work, often -Y will work. -Y is better, but not all servers support it.]

Copying Files

```
scp user@srchost:filename user@dsthost:filename
```

scp allows you to copy files from one computer to another.
srcHost: and dstHost: are optional if it is the local machine.

```
scp s0897465@ssh.inf.ed.ac.uk:myFile.pdf .
```

Aliases

- Avoid having to specify a username & long hostname each time: create a ~/.ssh/config

~/.ssh/config:

•-----

```
host bristol
user ktls0867
hostname someserver.bristol.ac.uk
```

•\$ssh bristol

Public Key Authorisation

To avoid having to type in a password in: distribute your public key. [1]

- Keys are a string of text:

```
ssh-rsaAAAAB3NzaC1yc2EAAAABIwAAAQEAp1DpHt5RVQujamq3HG15H3WgWJE3xZ9qcUrWgrv/Mz8iXyvVTE6Lkw8Tz58x
B0FA3Das3doZlijqTLCzcHXDRnRFlrd8E87XfsEYsSnM7wAQO6VizgDyrDt/vdxhcrehEey5ZC11uCWpFMbu7F/kOD8KfboxUQODghr7rfFpW/zjXQ
Cw9cXk+6L11a85mhlC6I+nrhZRSkpSw6tlvXNn5zoPP1G2+1mzbDMwNx4i/KiSyjFdMfTpEPpSacbHa9TE7JUNnQ7HjtHUqqwbBwqarCgSyodPSL
RDiDb2r9RAISfE0S8VW9EjToo3t1foWEHvsZmLc2tqA5vcA6zmGejyGQ== michael@michael-ubuntu-macbook
```

You need to create a public/private key pair *on the machine you are logging in **from**:*
(Usually stored in `~/.ssh/id_rsa` and `~/.ssh/id_rsa.pub`)

- If they do not exist, they can be created with `ssh-keygen`.

- Copy the contents of `~/.ssh/id_rsa.pub` into `~/.ssh/authorized_keys` on the machine you want to log **into**.

See also **ssh-copy-id**

(This works for logging into informatics, but see[2])

[1] http://www.eng.cam.ac.uk/help/jpmg/ssh/authorized_keys_howto.html

[2] <https://wiki.inf.ed.ac.uk/DICE/AFSProblemsSolutions>

Mounting filesystems over ssh

It is possible to access your filespace over ssh, as if it were a directory:

Linux: SSHFS
(Gnome: built into GUI)
MAC: macfuse
Windows: winscp

Persistent Remote Jobs

nice should be a prefix all your jobs. eg. “nice matlab”

screen effectively 'dettaches' the shell from the terminal, which allows you to log in, start jobs, log out, log back in and re-open the shell that you started the jobs in.

nohup allows you to start processes, which will continue to run even when the shell session closes.

(Note:problems with AFS for anything longer than 18hrs)

SSH Port Forwarding

Route your internet traffic over another computer, i.e. browse the internet as if you are using that computer.

1: Configure firefox to use host: localhost, port:7777 as the SOCKS(5) proxy (leave the others blank). [Preferences->Advanced->Network-> Settings->Manual Proxy]

2: Setup the port-forwarding:

```
ssh -D 7777 username@server
```

This will let you read journals as if you are inside the uni network
(Also possible to do with PUTTY)

VPN

Make a connection to the informatics network from outside, so it appears that you are connected internally.

Clients for Windows, Linux, Mac,

Documentation:

<http://www.inf.ed.ac.uk/systems/network/OpenVPN/>

**** Be aware that with a naïve configuration – ALL your traffic will be routed through the university network!! ****

Mounting AFS

It should be possible to connect to your afs
filesystem from anywhere

Instructions for Linux, Mac, Windows:

<https://wiki.inf.ed.ac.uk/DICE/OpenAFSPilot>

<https://wiki.inf.ed.ac.uk/DICE/AFSInstallationNotes>

AFS Credential Issues

By default, AFS requires that a password is entered every 18 hours to allow processes to continue using it.

This means that simulations/processes/daemons running longer than 18hrs will be unable to access the filesystem, and may/will crash

There are ways around this...

VNC

It is possible to setup remote desktop-ing using VNC :

The commands to set this up are here:

<https://wiki.inf.ed.ac.uk/DocsByUsers/RemoteWorking>

Note 1: You may need to ssh- into the machine with the VNC on it, and issue a 'renc' command (the last paragraph), before being able to be able to log in.

Note 2: processes using this machine may have problems with AFS credentials.

Synchronising Data

Problems:

- Using many computers (different OSes, DICE and non-DICE)
- Sharing files with collaborators (regular basis) and other people (one off)
- Seamless backing up of your files.
- Getting big files from other people over the internet.

Dropbox

- Runs on Windows, Mac and Linux (including DICE)
- Uploads your files to the cloud in the background
- Maintains 30 day history (revisions of files and undelete)
- Allows to share a folder between users.
- Allows to create a web link to any of your files (which you can use to share with others)
- Thanks to AirDropper allows you to request files from people (even big ones)

Dropbox

Limitations:

- Free version is limited to 2Gb, but if you register using this link you get an extra 250Mb:

<https://www.dropbox.com/referrals/NTQxMjk1OTk?src=global>

- It is a bit tricky to set it up on a DICE machine, but we have figured it out:

<https://www.wiki.ed.ac.uk/display/intrescomp/How+to+install+Dropbox+on+DICE>

Xmarks/LastPass

WebBrowser plugins to synchronise your bookmarks/logins across computers.

(Distributed) Version Control

To be covered. Services such as github and bitbucket offer space and excellent Uis. (Github repositories are public)

Rsync/Unison

Allow you to synchronise the changes in 2 directories on different machines.

Gmail

Can be configured to fetch your sms email, and send e-mails originating from your account. Accessible everywhere, v.fast searching,

VNC OLD

S1: Connect to the host which will act as the server over ssh.

```
ssh s0897465@student.compute
```

S2: Setup your VNC password

```
vncpasswd
```

S3: Launch the VNC Server:

```
vncserver
```

“New 'charlotte.inf.ed.ac.uk:1 (s0897465)' desktop is charlotte.inf.ed.ac.uk:1

S4: Log out of server (vnc server will still be running)

C1: Connect to the server:

```
vncviewer student.compute:1
```

Warning, this is not secure, it should only be used on trusted networks (e.g. within informatics). If you are worried about security, this can be tunneled over ssh. See for example:

<http://www.cl.cam.ac.uk/research/dtg/attarchive/vnc/sshvnc.html>