

# HPC Workshop

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## Setup ssh

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```
# generate a rsa keypair in ~/.ssh
# id_rsa contains your private key and should be kept secret at all costs
# id_rsa.pub contains your public key and can be shared without risk
# when prompted for password, leave it empty
ssh-keygen -t rsa -b 4096 -C "<email>"

# copy the public key to spartan to allow login with key instead of password
ssh-copy-id <username>@spartan.hpc.unimelb.edu.au

# configure ssh so you can just type "ssh spartan"
# this is just for convenience (I'm very lazy)
cd ~/.ssh
echo "Host spartan" > config
echo "  Hostname spartan.hpc.unimelb.edu.au" >> config
echo "  User <username>" >> config
echo "  IdentityFile ~/.ssh/id_rsa" >> config
```

## Syncing stuff to spartan

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```
# create a project folder that we will keep synced to spartan
cd ~
mkdir projects

# create a test project
cd projects
mkdir test-project

# sync everything to spartan
rsync -avz ./ spartan:~/projects
```

## Example: run R script

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```
# go to projects directory
> cd ~/projects
# create r-test directory and cd into it
> mkdir r-test
> cd r-test
# create batch file and set executable permission
> touch run
> chmod +x run
```

Now let's create an R file, call it `test.r` :

```
data <- c(1, 2, 3)
print(data)
```

Now let's edit our batch script at `~/projects/R-test/run` :

```
#!/usr/bin/env bash
# SBATCH --time <timeout>

# the first line sets up your environment and says this file is a bash script
# the second line sets flags for the batch job

# load the R command
module load R

# run R script in bash mode
srun Rscript test.r out.txt
```

Now, let's sync this project to spartan

```
> rsync -avz ~/projects/ spartan:~/projects
```

Then, login to spartan, and run the job

```
> ssh spartan
```

```
[spartan] > sbatch projects/r-test/run
```

There should be a file named `out.txt` and `slurm-XXXXXXX.out` placed in the directory.

`out.txt` is the output from R, and `slurm-XXXXXXX.out` contains the output from the bash script.

## Important commands

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To do this	Run this
login to spartan	<code>ssh spartan</code>
list a directory	<code>ls -Al &lt;dir&gt;</code>
create a file	<code>touch &lt;filename&gt;</code>
change permissions on a file	<code>chmod &lt;change&gt; &lt;filename&gt;</code>
make a file executable	<code>chmod +x &lt;filename&gt;</code>
sync projects to spartan	<code>rsync -avz ~/projets/ spartan:~/projects</code>
show file contents	<code>less &lt;filename&gt;</code>
run batch script on node	<code>sbatch &lt;filename&gt;</code>
check run queue	<code>squeue -u &lt;username&gt;</code>
run command on node	<code>srun &lt;command or script&gt;</code>