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Exercise Introduction

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Cluster Login Linux/OSX

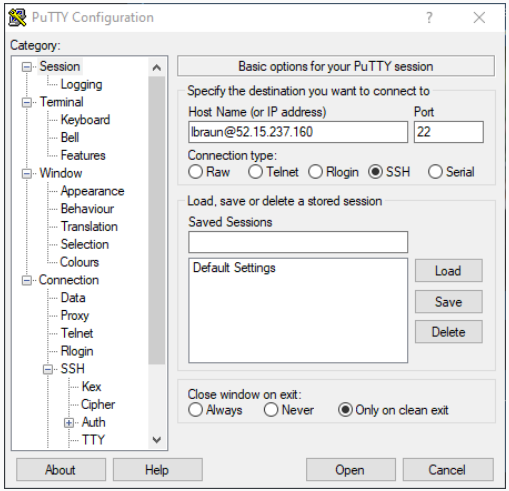
```
$ ssh userXX@52.15.237.160 -L 90XX:localhost:90XX
```

Use the user-account an password we give you. To access the jupyter notebook you need to forward a port. The use 90 and the last two digits of your username for the port number.

Cluster Login Windows - Session Settings

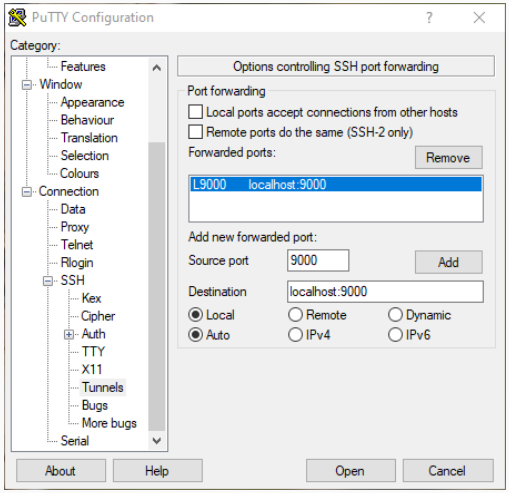
Download standalone version of putty:

`https://the.earth.li/~sgtatham/putty/latest/w64/putty.exe`



Cluster Login Windows - Tunnel Settings

Under Connection, SSH, Tunnel enter source port *9000* and destination *localhost:9000* and click add:



tmux

- We recommend using tmux, a terminal multiplexer.
- tmux will keep your session running even when you are disconnected.

Launch tmux:

```
$ ssh userXX@52.15.237.160 -L 90XX:localhost:90XX
$ tmux
```

tmux - Cheatsheet

Most important keyboard shortcuts:

```
CTRL-b,d - detach
CTRL-b,c - create window
CTRL-b,n - switch to next window
CTRL-b,p - switch to previous window
CTRL-b,% - split window vertically
CTRL-b,o - switch window pane
CTRL-b,z - zoom pane
CTRL-b,[ - copy/paste mode (allows also to scroll back up)
```

More at:
`https://devhints.io/tmux`

Exercise Repository

Clone gpu-mangrove exercises:

```
$ git clone https://gitlab.com/lorenzbraun/gpu-mangrove-exercises.
  git
```

Load python environment and launch jupyter notebook

```
$ source /opt/py_env/bin/activate
$ cd gpu-mangrove_exercises
$ jupyter notebook
```

You will be shown a link similar to this one, which you need to open in the browser:
`http://localhost:`
`9000/?token=e460611ebd3843cb745e99af8c046802d23884b09e8cacde`

From here we will continue in the Jupyter notebook

Slurm 101

- Job scheduling system for clusters
- Submit a job via a script

```
$ sbatch script.sh
```

- Useful options:

```
--nodes, -N            number of nodes
--nodelist, -w         comma-separated list of nodes
--gres=gpu:X           allocate X GPUs
--cpus-per-task, -c    number of CPUs
--wrap "<commands>"    execute <commands> (instead of a script)
```

- List of all options: `https://slurm.schedmd.com/sbatch.html`
- Show currently running jobs with squeue

Test CUDA Environment

```
$ mkdir /local/$USER && cd /local/$USER
$ module load cuda llvm cuda-flux
```

Compile and execute test application:

```
$ cp -r /usr/local/cuda/samples samples
$ cd samples/1_Utilities/deviceQuery
$ make
$ ./deviceQuery
```