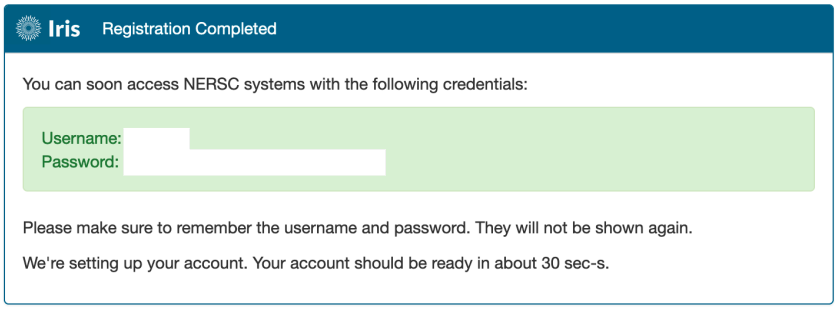
These instructions are also available at:

Getting Your Training Account

1. Fill out the training account application form here https://iris.nersc.gov/train using the Training Code: “azvr”
2. You should see something like this:



Important: make a copy of your login and password (eg. using a screenshot). You won’t be able to change these, nor recover them later!!!

From now on, we assume the user has access to a `trnXXX` valid training account on NERSC with a user name `<user>`.

Accessing NERSC’s Systems

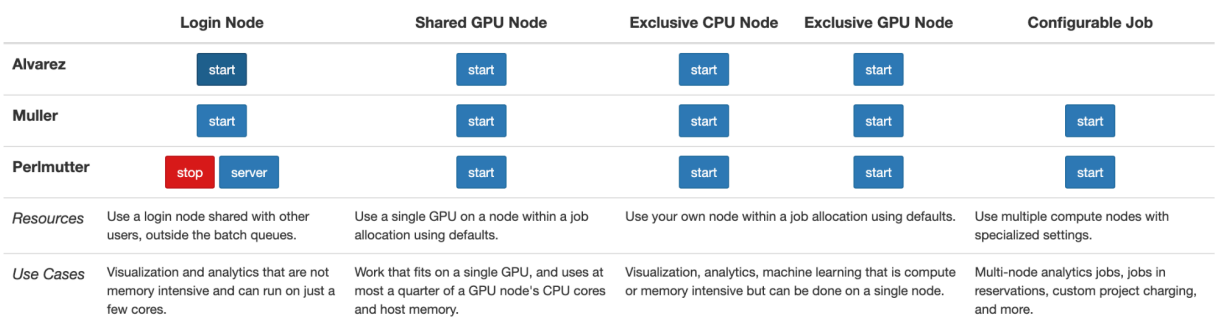
You have two options: Jupyter or SSH:

3. (jupyter) Go to: https://jupyter.nersc.gov/ and sign in with your credentials from step 2
4. (ssh) In a Unix/Linux terminal, type:
   ```
   elvis@laptop> ssh < user>@perlmutter.nersc.gov
   ```

Accessing the Terminal from within Jupyter

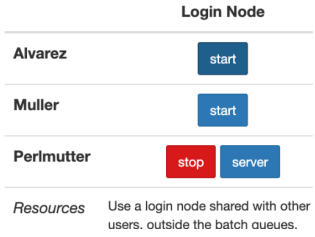
You might not want to install a terminal emulator and ssh – in that case, you can access a terminal window on jupyter.nersc.gov (step 3 above) as follows:

5. After logging into jupyter.nersc.gov (step 3) you should see something like this:



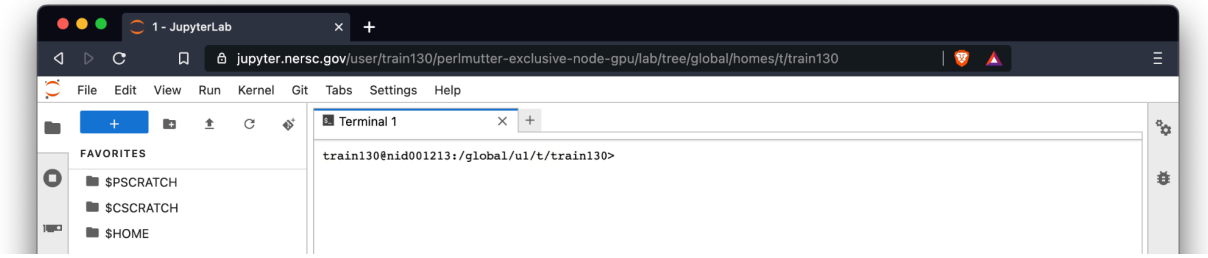
(You might not see the bright red "stop" button, and probably fewer rows/columns – that's OK)

6. Select "Server" in the "Login Node" column and "Perlmutter" row



7. After a short while, you should see a blue button (with a "+" sign) in the top left hand corner. Push it, and then select "Terminal" (you might need to scroll)

8. If you did everything correctly, you should see a terminal window in the left-hand tab:



Installing the Jupyter Kernels at NERSC

This tutorial requires specialized kernels to be installed – that's an automated process which you need to initiate in your training account

9. Access a shell on Perlmutter (either step 4, or step 5-8)
10. Clone the tutorial repository:

```
elvis@login12> git clone
https://github.com/JuliaParallel/julia-hpc-tutorial-sc24
```

11. Enter the tutorial folder:
    ```
    elvis@login12> cd julia-hpc-tutorial-sc24
    ```

12. Run the install script:
    ```
    elvis@login12> ./install.sh
    ```
    (this might take some time – that's OK)

Running Gray-Scott on Perlmutter/NERSC

These instructions are for the Perlmutter system at NERSC and are based on the ORNL Gray Scott Tutorial (qr code after step 18, below)

Configuring Gray-Scott on Perlmutter

13. Access a shell on Perlmutter (either step 4, or step 5-8)
14. Obtain Gray-Scott from GitHub, first access your scratch area and create a user-specific directory, clone the repository pointing at the GrayScott-JACC branch.
    ```
    14.1 cd $SCRATCH
    14.2 mkdir $USER
    14.3 cd $USER
    14.4 git clone --branch GrayScott-JACC
https://github.com/JuliaORNL/GrayScott.jl.git
    ```

15. Run the script prepared for this tutorial
    GrayScott.jl/scripts/config_perlmutter.sh
    to set up modules, environment, and packages.
    ```
    source GrayScott.jl/scripts/config_perlmutter.sh
    ```

Running Gray-Scott jobs on Perlmutter

16. Create an area for Gray-Scott runs outside the repository (e.g. run001, future runs will be in run002, run003, etc.)
    ```
    mkdir run001
    ```

17. Copy the Gray-Scott settings file and the job_perlmutter.sh to the run directory
    ```
    17.1 cp GrayScott.jl/examples/settings-files.json run001
    17.2 cp GrayScott.jl/scripts/job_perlmutter.sh run001
    ```

18. Submit your first job to Perlmutter. It should generate an adios bp file output, and total runtime should be around 12 seconds using a single MPI process and NVIDIA GPU.
    ```
    18.1 cd run001
    18.2 sbatch job_perlmutter.sh
    ```

To validate the output, please refer to the [ORNL Gray Scott Tutorial]

Slurm Jobscript Cheatsheet

These are the parameters you need to give to Slurm in order to submit jobs as a training account user.

Note: the GPU node reservation goes from 1:30pm - 5pm ET, Sun Nov 17th. During the reservation you should use:

19. To use 1 GPU only (sample flags for `sbatch` or `salloc`) use Slurm parameters
    `-A ntrain1 --reservation=julia_sc24 -C gpu -N 1 -c 32 -G 1 -t 30:00 -q shared`

20. To use multiple nodes (sample flags for `sbatch` or `salloc`) use Slurm parameters:
    `-A ntrain1 --reservation=julia_sc24 -C gpu -N 2 -t 30:00 -q regular`

Outside of the reservation, you should use:

21. To use 1 GPU only (sample flags for `sbatch` or `salloc`) use Slurm parameters
    `-A ntrain1 -C gpu -N 1 -c 32 -G 1 -t 30:00 -q shared`

22. To use multiple nodes (sample flags for `sbatch` or `salloc`) use Slurm parameters:
    `-A ntrain1 -C gpu -N 2 -t 30:00 -q regular`