Lab_2 Agenda

Task 1 - Data/File Transfer

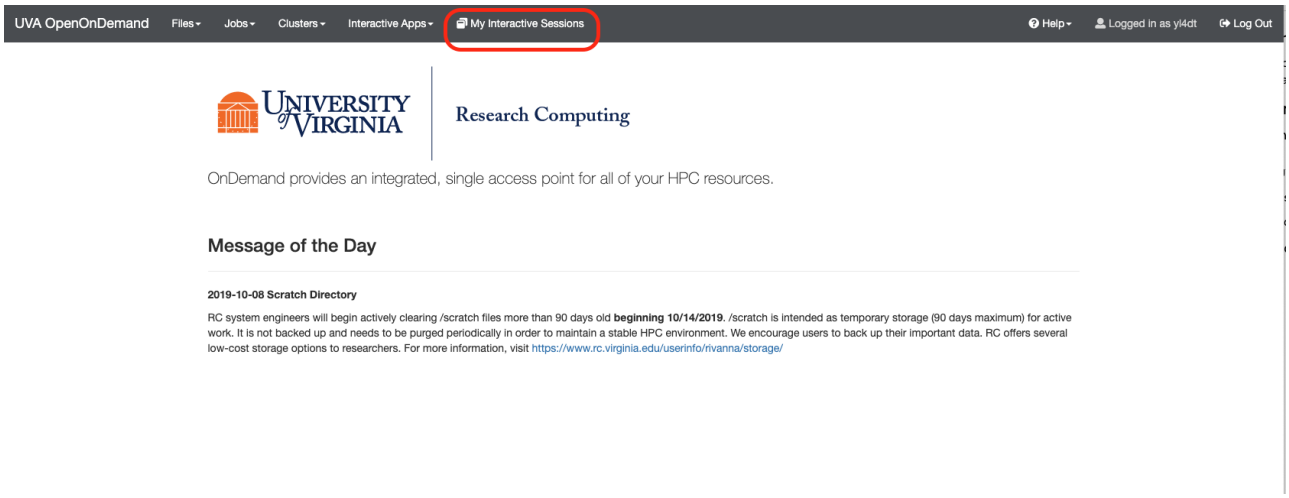
There are many tools you may use to transfer data from your local device to Rivanna. UVa recommends to use Globus, which is a simple, reliable, and fast way to access and move your research data between systems. If you have no experience with Globus, please check out the instruction here.

Task 2 - Using Rivanna for Your Experiments

2.1 Using An Interactive Session

Step 1: Open Rivanna Dashboard.
Step 2: Log into Rivanna with your UVA NetBadge ID and password.
Step 3: Connect to an interactive session:

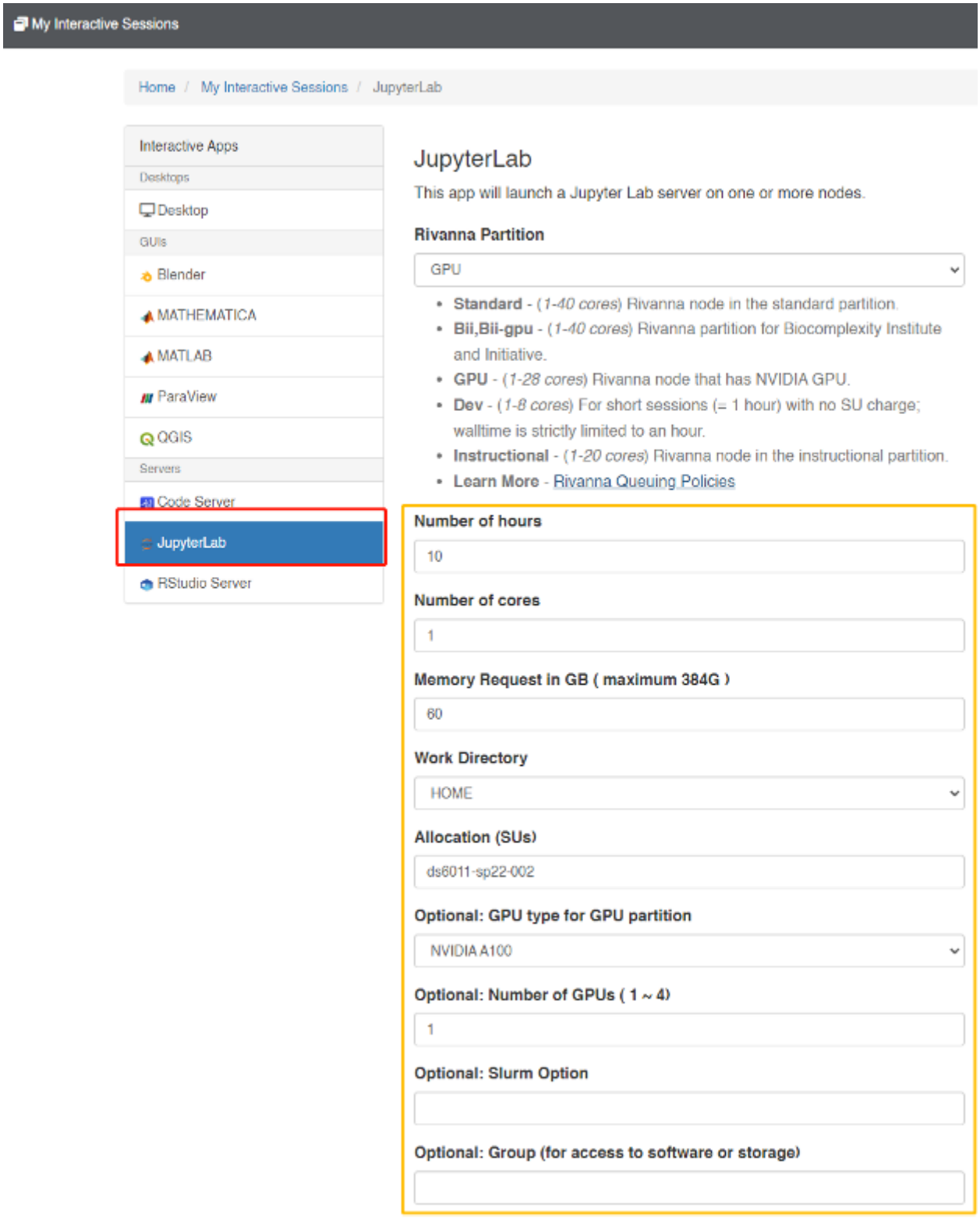
1. Click on “My Interactive Sessions”:



Step 4: Create an Interactive Job with JupyterLab:

1. In the “Interactive Apps” list, click “JupyterLab” under “Servers” (red box).
2. Set up your JupyterLab that suits your own needs (yellow box). Here we provide a sample setting for this lab:
    - Rivanna Partition - GPU
    - Number of hours - 10
    - Number of cores - 1
    - Memory Request in GB - 10
    - Work Directory - HOME
    - Allocation (SUs) - ds7003-fall22
    - GPU type for GPU partition - A100 / V100 / K80
    - Number of GPUs - 1

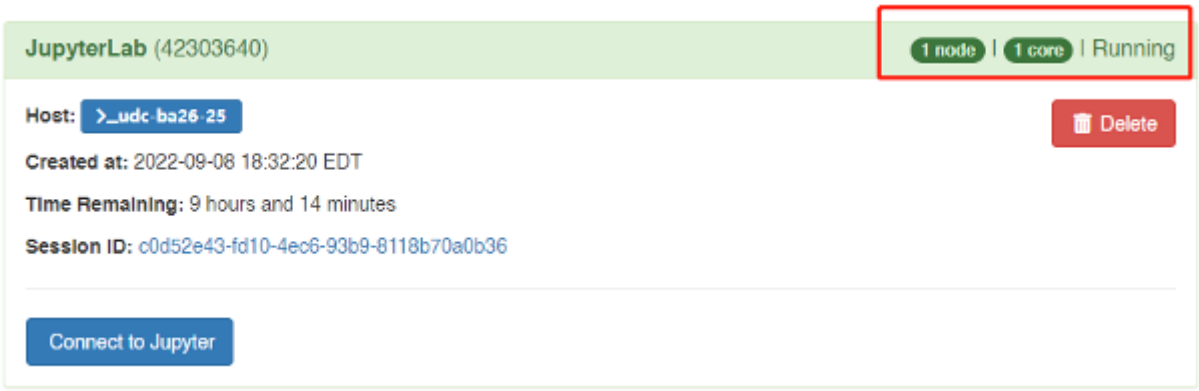
3. Click “Launch”.



Step 5: Wait for your job to be ready

The status mark at the top right corner displays the status of your current job. ‘Queued’ here means your job is sitting in queue.

When your job is successfully created and running, the status mark will turn into 'Running'



Step 6: Upload your notebooks and start running

1. Click "Connect to Jupyter".
2. In the file system navigator on the left, go to "/home/your_computing_id/ondemand/data/sys/dashboard/batch_connect/sys/jupyter_lab/output/#Your Session ID#/". Or you can use the "Upload Files" function to upload the notebooks to the designated location on JuptyerLab.
3. Open the notebooks and run.

2.2 Using Slurm to Spawn/Schedule Jobs

Di is going to present how to use Slurm to spawn and schedule jobs during the lab.

Task 3 - Lab Exercise

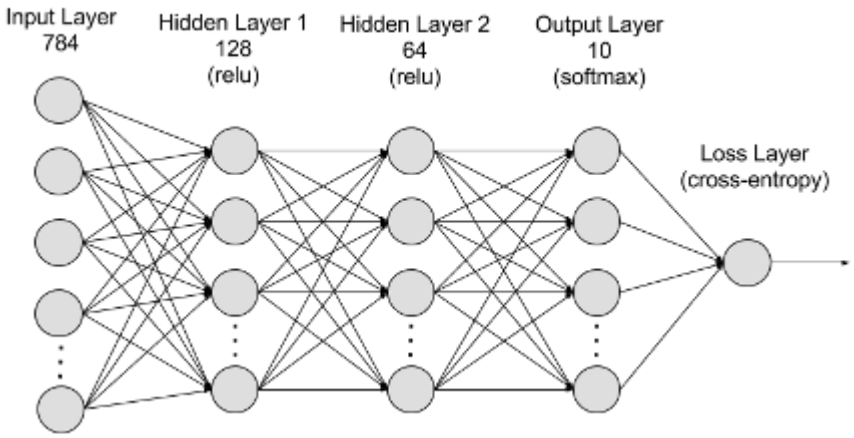
Please run the following files to Rivanna in an interactive JupyterLab session. Both files can be downloaded from here.

- Example 1: A simple CNN using TensorFlow(MNIST_using_TensorFlow.ipynb)
- Example 2: A simple CNN using PyTorch(MNIST_using_PyTorch.ipynb)

Task 4 - Your Turn

4.1 Modify the given notebooks, or write your own scripts that:

1. Follow the following structure:



2. And Achieve the following goals by adding in a timer to measure the execution cost, for simplicity, the execution cost here just refers the time used to run the experiments:
    - Record the execution time that each epoch uses under TF and PyTorch, as well as the total time used for the entire experiment,
    - Perform Part a. on different GPUs(e.g. A100, V100), and record the execution time under different settings,
    - Write down your thoughts on how to speed up the experiments, or the related strategies to optimize the experiment execution.