CS 4473/5473: PDN & CS 4113/5113 Distributed Operating Systems

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OSCER Accounts and Schooner

Goal: The OU Supercomputing Center for Education and Research (OSCER) is one of the University's most unique unit that provides specialized compute, storage and network resources for researchers. The resources that they provide gives the university a competitive advantage over other universities that do not maintain their own super computing resources. In addition to research support is their support to the education mission of the university, in particular by providing compute resources needed to prepare you for the high-performance computing workforce.

In this assignment you will register for an OSCER account, do some background reading, and perform a few tasks to get acclimated to the resources.

This activity has three parts an account registration, background, and a coding task. Certain tasks will be specific to only one of the classes (PDN or DOS) and some will apply to both.

Account Registration: work through the following steps to register your OSCER account. Note: if you are an international graduate student, it will take up to two weeks for your account to go through the export control approval process. Register early.

1. Look at the account mapping on the canvas page and find your name and oscer account. The account is of the form **oucspdn**xxx (CaSe SenSiTive!!!)
2. Go to the OSCER registration page and fill it out: https://ousurvey.qualtrics.com/jfe/form/SV_exMG0fbmXp1YWrz
    a. Double check your oucspdnxxx username.
    b. Use your oucspdnxxx username as the preferred username (replace xxx with the appropriate number).
    c. Use oucspdn as the group or project name.
    d. Use "Dr. Richard Veras" for advisor and richard.m.veras@ou.edu for the advisor email.
    e. If there is any option you are uncertain of, then leave the default (ex. Bash for the option for shell)

Background Task: In the first part you will watch/read a few resources and write a very short summary. When using a supercomputer through ssh is very easy to lose sight of the scale and complexity of these systems.

Both Classes: Watch one or more of the following videos:

1. This is the short one
   https://www.youtube.com/watch?v=jBsc83_4RsQ
2. The Journey to Frontier (A top DOE system)
   https://www.youtube.com/watch?v=Ny_NvpuaAiQ
3. A history of supercomputing at NASA (**this is probably the most interesting one**)
   https://www.youtube.com/watch?v=t5ArVnTp_Kg

Programming Tasks: You will submit a results.pdf with screenshots demonstrating that you completed each task. If you use a different build environment, then you can demonstrate that you can do these tasks in that in environment. That being said, I prefer that you go through these so you can help others.

A. Both Class
   a. Logging into Schooner:
      https://www.ou.edu/oscer/support/machine_access
   b. Submitting a Job (Read and run the examples up to "Non-Parallel Job")
      https://www.ou.edu/oscer/support/running_jobs_schooner
   c. Setting up your environment. The following instructions will show you how to set up an interactive session through VSCode. Most of the time you will not use this, but in the situations where you need to debug your code interactively this will save you a mountain of time.
      https://www.ou.edu/oscer/support/VS_Code
B. PDN
   a. Submitting an MPI Job. Read and run "Parallel Job"
      https://www.ou.edu/oscer/support/running_jobs_schooner
C. DOS
   a. Running Python on Schooner (emphasis on the warning)
      https://www.ou.edu/oscer/support/python/python-basic-setup
   b. (optional, but recommended) Setting up Python and VS Code
      https://www.ou.edu/oscer/support/python/python-with-vs-code
   c. Read the following and create a file in your scratch folder
      https://www.ou.edu/oscer/support/hpc_scratch_folder
   d. Using singularity with Slurm to run docker images on the supercomputer.
      https://docs.rc.fas.harvard.edu/kb/singularity-on-the-cluster/
      (alternate) https://guiesbibtic.upf.edu/recerca/hpc/running-singularity-containers

Additional Resources: In case you are all out of bubble gum.

1. Extra Slurm resources
   https://www.youtube.com/watch?v=51SyuTBk72k

2. Tutorial for building a cluster that uses slurm
   https://www.youtube.com/watch?v=l5n62HgSQF8