

PG_Y: OSCER Accounts for the Schooner Supercomputer

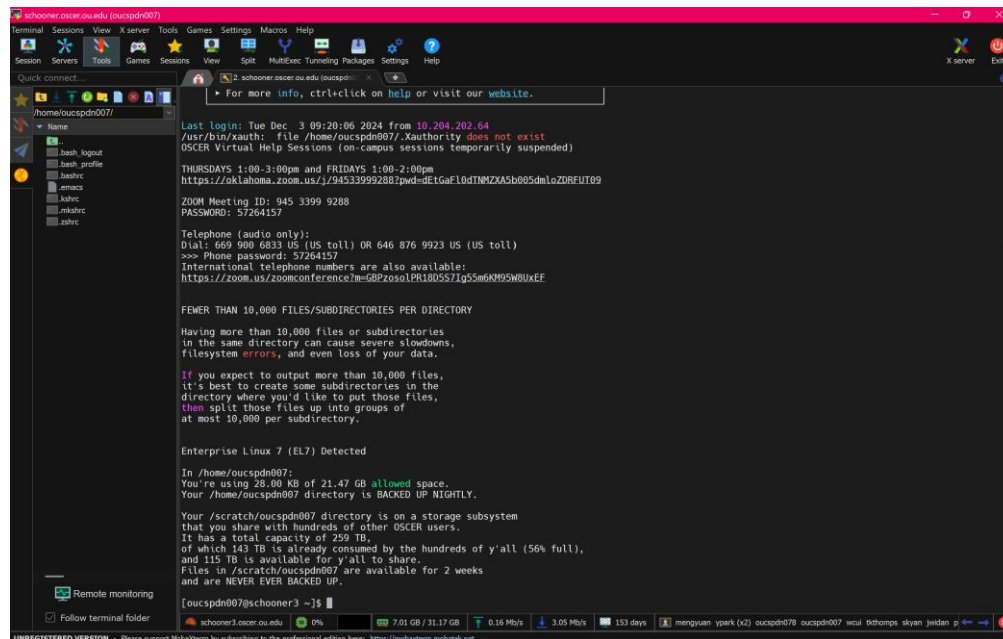
Summary of Video #1 - High Performance Computing:

This video gives a behind-the-scenes look at a university's supercomputer. It supports advanced research across disciplines such as fluid dynamics, aerospace, genomics, astronomy, and any computation-heavy scientific work. The current system consumes significant power leading to high electricity and maintenance costs but is highly reliable. Individual nodes and disks fail regularly, but don't cause the whole system to fail. Additionally, hundreds of jobs can run simultaneously for hours, days, and even months. This requires hot and cold aisle containment to maintain temperatures across racks. Finally, in updating the system, instead of a full rip-and-replace, they keep as much of the current hardware as possible while gradually upgrading nodes as research needs evolve.

Programming Tasks:

A. Both Class

a. Logging into Schooner:



b. Submitting a Job (Read and run the examples up to “Non-Parallel Job”):

Terminal window showing a Zoom meeting with a Linux shell. The terminal displays the Zoom URL, directory information for /home/oucspdn007, and a series of commands and outputs for file management and permissions. A red box highlights the error messages for the 'sbatch' command.

```
https://zoom.us/j/zoomconference?m=GBP2ozo1PR18D5S71g55m6KM95WBUxEF

HOME DIRECTORY PURPOSE: SMALL, PERMANENT FILES

Your home directory is for small input files, software etc
that you need to retain for months or even years.

NOTE: Your home directory is /home/oucspdn007

Enterprise Linux 7 (EL7) Detected

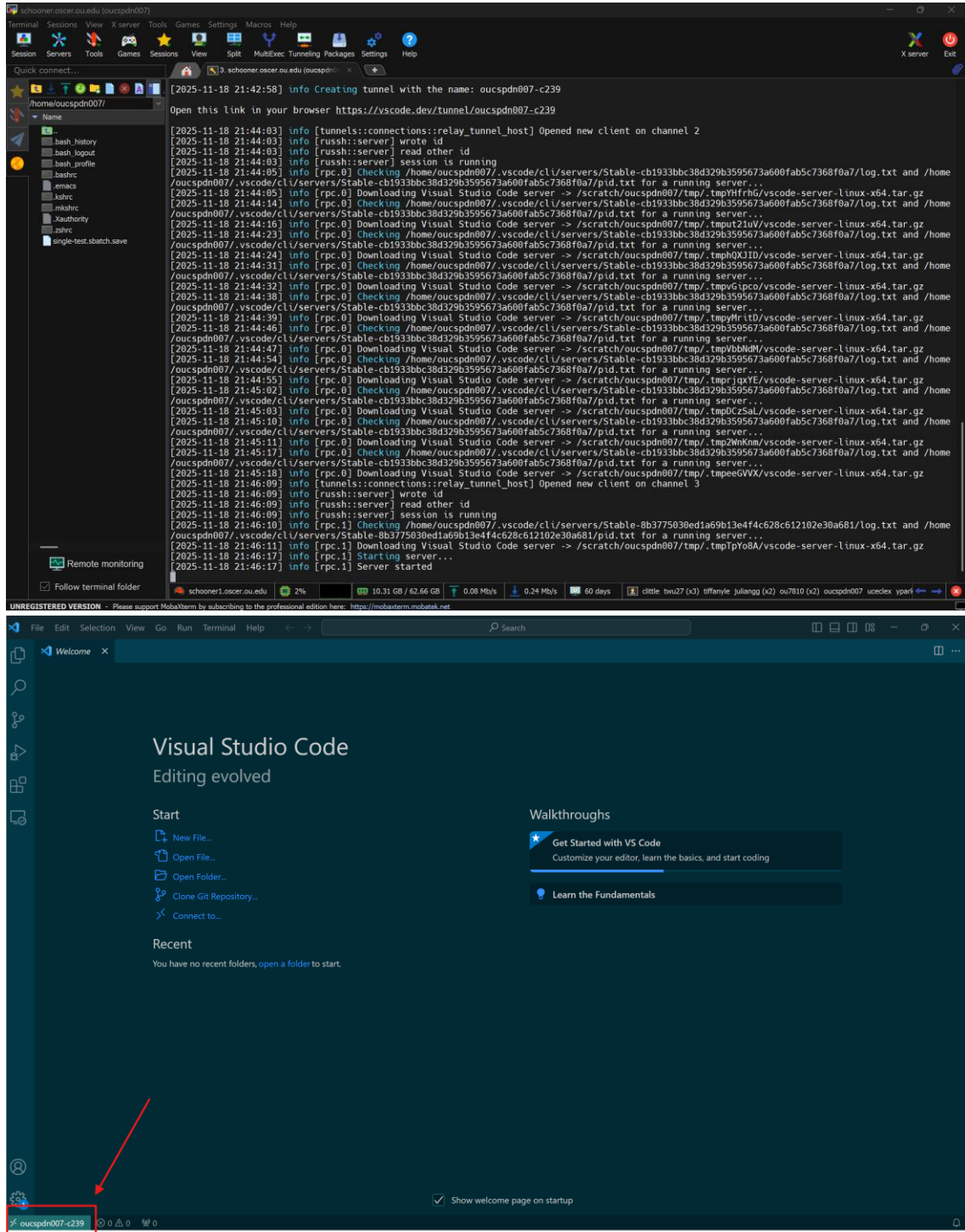
In /home/oucspdn007:
You're using 44.06 KB of 21.47 GB allowed space.
Your /home/oucspdn007 directory is BACKED UP NIGHTLY.

Your /scratch/oucspdn007 directory is on a storage subsystem
[that you share with hundreds of other OSCER users.
It has a total capacity of 250 TB,
of which 143 TB is already consumed by the hundreds of y'all (56% full),
and 115 TB is available for y'all to share.
Files in /scratch/oucspdn007 are available for 2 weeks
and are NEVER EVER BACKED UP.

[oucspdn007@schooner1 ~]$ ls
single-test.sbatch.save
[oucspdn007@schooner1 ~]$ nano
      .bash_history      .bash_profile      .emacs      .mkshrc      .Xauthority
      .bash_logout      .bashrc      .kshrc      single-test.sbatch.save      .zshrc
[oucspdn007@schooner1 ~]$ nano
      .bash_history      .bash_profile      .emacs      .mkshrc      .Xauthority
      .bash_logout      .bashrc      .kshrc      single-test.sbatch.save      .zshrc
[oucspdn007@schooner1 ~]$ nano single-test.sbatch
[oucspdn007@schooner1 ~]$ e19
-bash: e19: command not found
[oucspdn007@schooner1 ~]$ chmod +x single-test.sbatch
[oucspdn007@schooner1 ~]$ sbatch single-test.sbatch
sbatch: error: This does not look like a batch script. The first
sbatch: error: line must start with #! followed by the path to an interpreter.
sbatch: error: For instance: #!/bin/sh
[oucspdn007@schooner1 ~]$ nano single-test.sbatch
[oucspdn007@schooner1 ~]$ #SBATCH --partition=csl_partition>
[oucspdn007@schooner1 ~]$ #SBATCH --container=e19hw
[oucspdn007@schooner1 ~]$ #SBATCH --chdir=/path/to/working/directory
[oucspdn007@schooner1 ~]$ sbatch single-test.sbatch
Submitted batch job 27597786
[oucspdn007@schooner1 ~]$
```

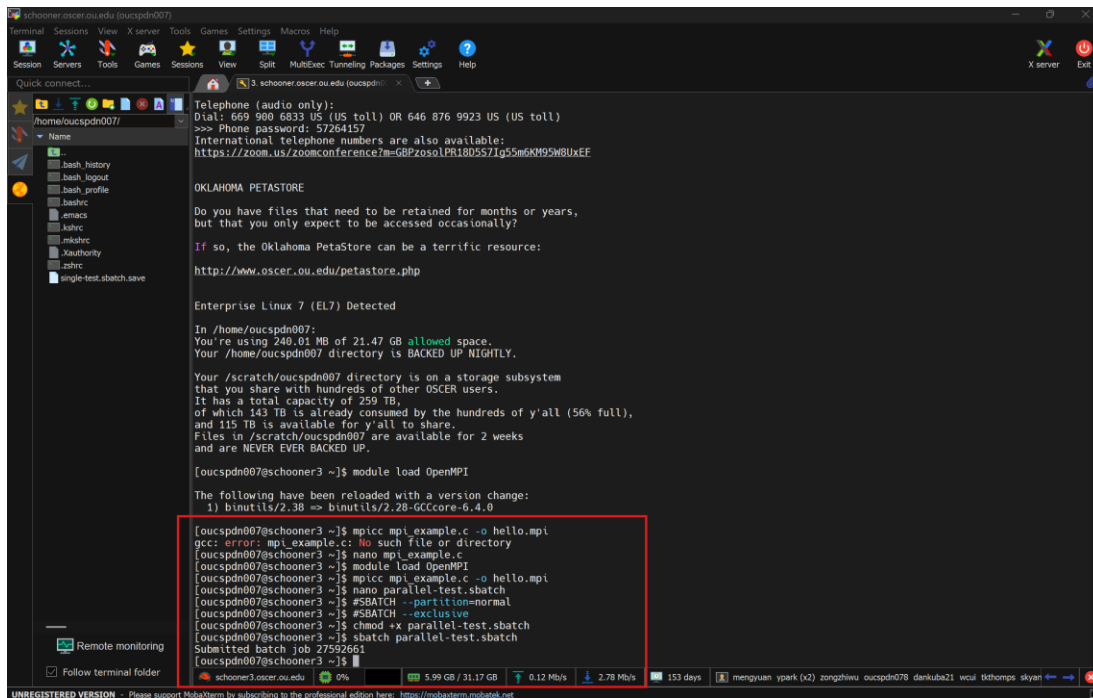
UNREGISTERED VERSION - Please support MobaxTerm by subscribing to the professional edition here: <https://mobaxterm.mobatek.net>

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.



B. PDN

a. Submitting an MPI Job. Read and run “Parallel Job”:



```
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help

Quick connect...
3 schooner.oscer.ou.edu (oucspdn007)

/home/oucspdn007/
Name
  .bash_history
  .bash_logout
  .bash_profile
  .bashrc
  .cshrc
  .mkshrc
  .xauthority
  .zshrc
  single-test.sbatch.save

Remote monitoring
Follow terminal folder

Telephone (audio only):
Dial: 669 980 6833 US (US toll) OR 646 876 9923 US (US toll)
>>> Phone password: 57264157
International telephone numbers are also available:
https://zoom.us/j/zoomconference?m=GBPzosa1PH18D5571g55mdKH95WBUXeF

OKLAHOMA PETASTORE

Do you have files that need to be retained for months or years,
but that you only expect to be accessed occasionally?

If so, the Oklahoma PetaStore can be a terrific resource:
http://www.oscer.ou.edu/petastore.php

Enterprise Linux 7 (EL7) Detected

In /home/oucspdn007:
You're using 240.01 MB of 21.47 GB allowed space.
Your /home/oucspdn007 directory is BACKED UP NIGHTLY.

Your /scratch/oucspdn007 directory is on a storage subsystem
that you share with hundreds of other OSCER users.
It has a total capacity of 259 TB,
of which 143 TB is already consumed by the hundreds of y'all (56% full),
and 115 TB is available for y'all to share.
Files in /scratch/oucspdn007 are available for 2 weeks
and are NEVER EVER BACKED UP.

[oucspdn007@schooner3 ~]$ module load OpenMPI

The following have been reloaded with a version change:
1) binutils/2.38 => binutils/2.28-GCCcore-6.4.0

[oucspdn007@schooner3 ~]$ mpicc mpi_example.c -o hello.mpi
gcc: error: mpi_example.c: No such file or directory
[oucspdn007@schooner3 ~]$ nano mpi_example.c
[oucspdn007@schooner3 ~]$ module load OpenMPI
[oucspdn007@schooner3 ~]$ mpicc mpi_example.c -o hello.mpi
[oucspdn007@schooner3 ~]$ nano parallel-test.sbatch
[oucspdn007@schooner3 ~]$ #SBATCH --partition=normal
[oucspdn007@schooner3 ~]$ #SBATCH --exclusive
[oucspdn007@schooner3 ~]$ chmod +x parallel-test.sbatch
[oucspdn007@schooner3 ~]$ sbatch parallel-test.sbatch
Submitted batch job 27592661
[oucspdn007@schooner3 ~]$
```