## 

## 3/3/20:

* Notes from yesterday:

  + using sed to rewrite into the origin file leads to weird behavior; use ‘-i’
* Note: I’m not really sure how much of this I can properly make use of, but I’m here nonetheless

#### Notes about SeaWulf:

* + Irrelevant history: LI-Red merged recently with SW
  + There’s a scratch directory that’s emptied out every 30 days
  + On the [anaconda/2] environment, there are so many packages in it that it’s virtually “broken”
  + most bioinformatics software installed in anaconda/2 (?)
  + slurm is the only current job scheduling system

    - [maui] used to be used
    - TORQUE used to be used
    - sbatch sends the script to the slurm workload manager
  + Don’t use login nodes for computation
    - (Dave will hunt you down and send politely aggressive emails to your PI [who doesn’t exist yet])
  + As of now, a node can only be used by one user at a time

    - Apparently it may be possible to change this…?
  + It’s possible to view the jobs currently running

    - ex: squeue -u [username]
  + Practical thing: currently no email notification for job completion implemented
  + Compilers:

    - GNU
    - Intel Parallel Studio (?)
  + User X11 forwarding, install an X server on computer in order to use GUI-based program
* Transferring files via MobaXTerm

  + (Note: this is just a test to see if I can remember basic instructions)
  + Home directory files on left, SeaWulf files on right (?)
* Yesterday I totally made no use of the CVW resources I had access to - I didn’t notice the quiz at the top of the page…

#### Job schedulers

* + What is slurm?

    - s commands

      * sbatch
      * squeue
      * scancel
        + possible to cancel all jobs for netID
      * sinfo
  + Redirects users’ submitted jobs to nodes

    - Some nodes may be idle - this doesn’ t necessarily mean they’re usable; some may be reserved by the scheduler
  + computing hours used to run behind-the-scenes scheduling decision-making

#### Examples of queues:

* + debug
  + …
  + gpu
  + p100
  + gpu-long
    - max run time 48 hours
  + gpu-large
    - max run time 8 hours
  + short-24core
    - max run time 4 hours (this probably isn’t relevant, but I’m passing the time by writing whatever I feel like)
  + short-28core
  + short-40core
  + medium-40core
  + large-40core
  + long-40core

    - maximum run time of 48 hours
  + extended-40core

    - maximum run time of 1 week

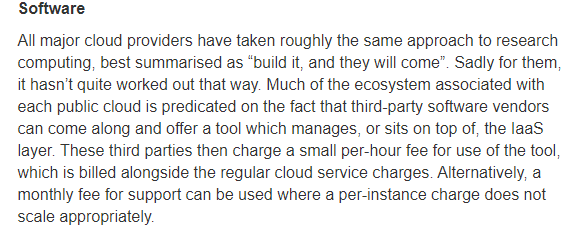
#### Random remembrance:

* + I remember Zhi-Peng was chewed out for running a job on a single job without parallelizing it

    - Sharing resources exemplifies the collaboratory nature of science
* Random snippets of code that I don’t know how to use:


  + module initadd [module name] (???)
  + module purge
  + module load shared slurm/17.11.12 (I don’t know what this does0

#### HPC research/news

* + <https://www.hpcwire.com/2018/03/15/how-the-cloud-is-falling-short-for-research-computing/>
  + 
  + <https://www.businesswire.com/news/home/20190705005263/en/Worldwide-Cloud-High-Performance-Computing-HPC-Market>
    - Something something about 12% growth from now till 2024, and Asia’s competitive rise or something about AI

#### Conda commands

* + <https://docs.conda.io/projects/conda/en/4.6.0/_downloads/52a95608c49671267e40c689e0bc00ca/conda-cheatsheet.pdf>
* I wonder if I can take this time to organize my file system?

#### General notes:

* + “Could you share the slides?”
  + D has been using [HPC] for a few years now...
  + A large part of [ ] is the accustomization to other minds and voices
  + There’s a guy who came in slightly late, but who knows how to get comfortable (?)
  + “Embarrassingly parallel” <https://en.wikipedia.org/wiki/Embarrassingly_parallel>
  + I have no idea what’s going on
  + <https://www.businesswire.com/news/home/20190705005263/en/Worldwide-Cloud-High-Performance-Computing-HPC-Market>

    - 300% projected growth in Asia
  + How does a [ ] center prioritize decisions?

    - Overall -> case by case; users are more sophisticated at this level…

#### Incognito Q processing:

* + How to prove that an exponentiated Hermitian is Unitary?
  + I just got a recommendation for a paper to read, by Hrushikesh

    - “When someone lights a fire… you start running”
* It is now after the workshop, and I am hoping to wrap this up in 30 minutes

  + Tasks to do:

    - Try writing a shell script
    - Do the for, while loops examples from today
    - Send a message to Dave thanking him and giving him some feedback
    - Minimize the number of tabs in this window
    - Consolidate resources that I’ve gained, make them

#### Consolidated tabs:



##### Cornell Virtual Workshop <https://cvw.cac.cornell.edu/topics>

* + - I’ve had this for a while, but I don’t know if I’m ever going to properly make use of this… These resources are really nice, but until I’ve learned to do tasks in preplanned time blocks, I won’t be able to do extra stuff like this.
    - I am still very proud that I secured the username “qubit.” How petty.
    - Potential procedure:

      * Find a buddy who would like to do this with you
      * Allocate resources (programs, MobaXTerm), a time block, and space for notes

        + Use the “Glossary” spreadsheet
      * Take the quiz beforehand
      * Skim through sections for structure absorption
      * Read through sections
      * Do exercises
      * ???
    - Topics of Interest

      * [An Introduction to Linux](https://cvw.cac.cornell.edu/Linux/)
      * [Python for High Performance](https://cvw.cac.cornell.edu/python/)
      * [Applications of Parallel Computing](https://cvw.cac.cornell.edu/APC/)
      * Roadmap of MPI Topics

        + Essential

[Message Passing Interface (MPI)](https://cvw.cac.cornell.edu/MPI)message passing basic concepts and terminology

[MPI Point-to-Point Communication](https://cvw.cac.cornell.edu/MPIP2P)message passing between single MPI processes

[MPI Collective Communications](https://cvw.cac.cornell.edu/MPIcc)more powerful patterns among groups of MPI processes, e.g., one-to-all or functions such as gather

* + - * + Optional

[MPI Advanced Topics](https://cvw.cac.cornell.edu/MPIAdvTopics)useful additional techniques, e.g., overlaying your data with datatypes to speed message passing

[MPI One-Sided Communication](https://cvw.cac.cornell.edu/MPIoneSided)sending messages via RDMA

* + 2017 IACS annual report - <https://iacs.stonybrook.edu/_pdf/IACS_ANNUAL%20REPORT_2017.pdf>
  + What are the careers in high performance computing?
    - <https://www.quora.com/What-are-the-careers-in-high-performance-computing-HPC>

## 3/2/20:

* I don’t even know if bullet opints are relevant to what I want to write down...
* Directories vs folders

  + Windows uses Folders, but LInux has directories
* .sh -> shell script
* (At some point I anticipate a changing of format of my notes - currently this isn’t very effective. Do I even have a goal for this workshop?)

* Things to look out for:

  + Path
  + “Environment variable”
* CentOS diverged from another kind of programming language

  + Just on Mac vs Mac connected to Seawulf
  + Linux vs Unix
* Talked with Rebecca Drucker about how I don’t know anything

  + I was honest about not being someone who was supposed to be there

    - “I’m sorry if you were misdirected”
      * “No, I came here of my own accord”
  + She took a 1-credit course, 1 day a week
  + I’m an undergraduate (she figured this out after I said that I don’t have a PI - it’s good that I was honest about this…)

    - If I didn’t talk to her, then no one in the room would’ve known that I’m an undergraduate

      * Still, unless I tell others, they don’t have any reason to acknowledge this
* awk was the precursor to Perl…?

  + awk works in cases that cut won’t work in...

* chmod +x example\_script.sh
  + “add execution ability”
* What do I want to do afterwards?

  + Run through all the code and run it once? This seems like extra - I should be doing work right now…?
* How do people ask questions?

  + They ask them with a purpose - knowing exactly what they want. And then they’re not afraid to keep asking until something clicks. I’m at a disadvantage here because I’m used to asking questions rhetorically, and not for help.
* Reflections for today:

  + Did I get what I wanted to get?

    - I didn’t even set goals ahead of time


      * Talk with at least one graduate student…?

        + I think I did this…?

* Resume-point tomorrow:

  + for loops
  + be ready to pay full attention, and give responses to questions

    - actually, this isn’t a class - this isn’t the most important thing...
* After attending this workshop, I wonder if I remembered anything of importance, or I’m still letting myself get absorbed in ideas that don’t have any grounding…

  + I am not an expert in *anything*. I don’t even know how to code Python at the moment properly (in a moment I’m going to check this by going online and searching up some basic Python problem). I’ve made huge promises about what I’m capable of to other people, I think.

    - Actually, I haven’t made promises to anyone… I’ve made it clear that I’m clueless in the area of expertise that I’m in. Perhaps it would be better if I was able to first be an expert and then be sociable and talk about things?

      * Actually, I have this totally backwards. The experts are probably people who’ve found ways to get feedback from others, instead of trying to do everything on their own.
  + Dave Carlson works on ecology and evolution, but I’m not sure of the details…

    - He’s familiar with files that end in .fasta and .fastq - and I have no idea what those are
    - He’s able to redirect misunderstandings or even complete disconnections (I was totally clueless and slow, but I’m glad that I spoke up about it, because he was able to redirect me and things made sense later)
  + Thus far I don’t think I’ve let Yulun or anyone else in the QC class I’m auditing know that I’m an undergraduate