Basic Linux Demo 2

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Demo: Searching for files and Redirection

- Necessary to be able to find your files again:
    - find <location> -name <filename>
        - Create a file "delme" and find it
            - touch delme
            - find /home/<caseID> -maxdepth 1 -name delme
- You can redirect and write/append your output to a particular file
    - <command> **>** <output-file>
        - echo "My currently running processes" > delme   # redirect
        - ps -ef | grep ^<caseID> | awk ' { print $2 }' >> delme   # append
    - Check the output and delete it
        - cat delme
        - rm delme

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Demo: Pipes to filter your output

Commands can be linked together by pipes represented by "|", from left to right.

To find the number of files in your directory:
- ls | wc -l

To print your command history
- history | grep touch

Demo: Transfer files - scp and rsync

Transfer class demo materials at "csds438" directory from Markov at /usr/local location to VM csds438

SSH to csds438 (virtual machine) and invoke the scp command to transfer the files from Markov cluster to your home directory (~) in VM:

- scp -r <caseID>@markov.case.edu:/usr/local/doc/DATASCIENCE/datascience/**csds438/cuda** ~
  - <caseID>@markov.case.edu's password:
  - hello.cu   100% 1663   490.8KB/s   00:00
  - hello   100% 683KB 6.7MB/s   00:00

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Demo: Regular expression

Regular expression is a pattern, set by certain strings sequence to <u>act as the filter</u> to the command
- grep <keyword or expression> <filename>

List all the files matching the keyword expression
- ls ~/t?s*

Get PIDs matching the expression - keywords 30 to 39
- ps -ef | awk ' { print $2 }' | grep **3[0-9]**

Matching PIDs starting with (^) 3
- ps -ef | awk ' { print $2 }' | grep ^3[0-9]

Demo: Search & Replace

- Create a dog-cat file with instances of dogs
  - vi dog-cat
- Search for dog and replaces all those instances with cat
  - sed -i 's/dog/cat/g' dog-cat   # type it; may not be able to copy it
- Check the file
  - cat dog-cat
- Delete the file
  - rm dog-cat

Demo: HPC Environment

- Check the PATH and LD_LIBRARY_PATH environment variables
  - echo $PATH
  - echo $LD_LIBRARY_PATH
- Check the path to intel C compiler (icc)
  - which icc
- Check the version of the compiler
  - icc -V

Demo: Environment Variables

- Check $PATH and $LD_LIBRARY_PATH without loading python
    - echo $PATH | grep python
    - echo $LD_LIBRARY_PATH | grep python
- Load python module
    - module load python
- Check the matlab paths added in $PATH and $LD_LIBRARY_PATH
    - echo $PATH | grep python
    - echo $LD_LIBRARY_PATH | grep python

Demo: LMOD Commands

- Check the available Software (Intel compiled by default):
  - module avail <software> or module spider <software>
- Check GCC compiled Software
  - module swap intel gcc; module spider <software>
- Check the Software module already loaded:
  - module list
- Check the Software environment variables associated:
  - module display <software>
- Load Software Module:
  - module load <software>
  - Check: echo $PATH; echo $LD_LIBRARY_PATH
- Unload Software:
  - module unload <software>

Demo: Installing Software in your Home Dir

Refer to HPC Software Installation Guide

- Information about your server/platform
  - uname -a
    - Linux hpc3 **3.10.0-1062.9.1.el7.x86_64** #1 SMP Mon Dec 2 08:31:54 EST 2019 x86_64 x86_64 x86_64 **GNU/Linux**
    - This indicates Intel Xeon 64 (x86_64) bit platform (architecture based on Intel 8086 CPU) for GNU/Linux Kernel version (**3.10.0-1062.9.1.el7.x86_64)** el7=>enterprise linux OS version 7)"
- Exact OS version
  - cat /etc/redhat-release
    - Red Hat Enterprise Linux Server release 7.7 (Maipo)
- For detail information
  - lscpu   # e.g. flags sse (Streaming SIMD Extensions)