Bash Scripts & Acropolis: Using the SSCS Servers

EPIC RA Orientation

August 20, 2018

What is the Command Line?

Method of interacting with computer program (in our case, file structure) using successive lines of text within the terminal (Mac, Linux) or terminal emulator (Windows).

In Mac, go to Launchpad → Search Bar → Terminal.

In Windows, open PuTTY or equivalent.

It has been 3 years since I've used any terminal emulator on Windows, so the presentation will focus on using Terminal in Mac.

NOTE: All commands in this presentation are shown using the TEXTSC font. When entering commands in the command line, use all lower case unless otherwise noteds

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Commonly used Command Line commands

- CD [dir]: change directory to [dir]
  - relative vs absolute paths, .. to move up a folder
- LS: list files
- MV [a] [b]: move or rename file [a] to [b]
- MAN [cmd]: manual for command [cmd] with all the flags
- MKDIR [dir]: creates a new directory [dir]
- TOUCH [fname]: creates a new empty file [fname]

Don't delete files using rm unless you are very comfortable.

Permanent deletion.

Other useful Command Line commands

- CAT [file]: Prints the content of the file [file].
- HEAD -n [X] [file]: First [X] lines of the file [file]
- TAIL -n [X] [file]: Last [X] lines of the file [file]
- GREP [str] [files]: Searching plain-text files (e.g. logs) for the regular expression [str] in the files [files]
- Ctrl + C: Force quit

Command Line Stata

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However, for better control, run Stata via scripts. This is our preferred method for submitting Stata tasks to the server.

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What is a script?

A set of Command Line commands, along with the conditions on which they are run.

Bash is a command processor that can read and execute commands from a shell script. Think of Bash as an implementation of a shell and think of a shell as the user interface to the operating system.

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Components of a Bash script

100.sh

```
1  #!/bin/bash
2  #PBS -N maps_cc
3  #PBS -l nodes=1:ppn=8,mem=16gb
4  #PBS -V
5  #PBS -j oe
6  #
7  cd "/share/epic/arrhenius/Crop Choice/Code"
8  # execute program
9  stata-mp -b do 100_maps_acr.do
10
```

Line 1: Must be "#!/bin/bash", the path to the (bash) interpreter to run the program

Lines 2-5: Portable Batch System (PBS) environment conditions for running the script. -N is the name. -l specifies the computing resources.

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What is Acropolis

Acropolis is the economics computing cluster, overseen by the Social Sciences Computing Services (SSCS).

How do I access Acropolis?

One way is via the command line using secure shell (ssh):

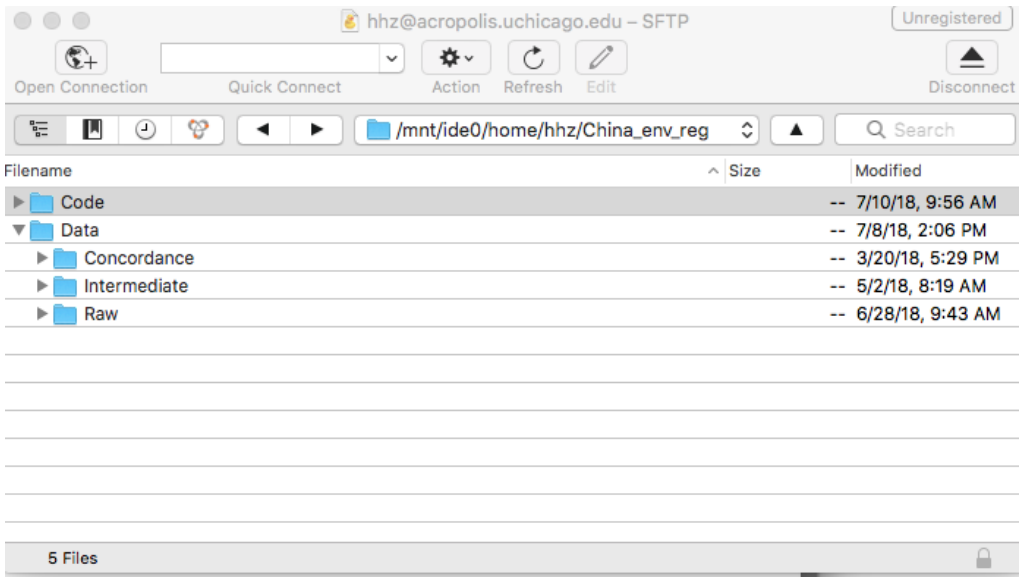
```
SSCSs-MacBook-Pro-6:~ henryzhang$ ssh -Y hhz@acropolis.uchicago.edu
Warning: the ECDSA host key for 'acropolis.uchicago.edu' differs from the key fo
r the IP address '205.208.26.5'
Offending key for IP in /Users/henryzhang/.ssh/known_hosts:1
Matching host key in /Users/henryzhang/.ssh/known_hosts:2
Are you sure you want to continue connecting (yes/no)? yes
hhz@acropolis.uchicago.edu's password:
```

After logging in,

```
henryzhang — ssh -Y hhz@acropolis.uchicago.edu — 80×24
Last login: Wed Jul 18 17:30:24 2018 from 10.150.132.211
################################################################################
## You are accessing a University of Chicago Information System.              ##
## Information System usage may be monitored, recorded, and subject to        ##
## audit.                                                                     ##
##  Use  of  this  machine  is restricted  to those determined to be          ##
## eligible by the  University.                                               ##
##  By accessing this system you represent that you are authorized to         ##
## do so and you consent to monitoring and recording of your activity.        ##
## Unauthorized use of the information system is prohibited and subject to    ##
## to criminal and  civil penalties.                                          ##
##    The  University reserves the right to record, monitor, and audit        ##
## usage.                                                                     ##
################################################################################

http://sscs.uchicago.edu/page/server-support-faqs#cluster

If you have any questions, please contact server support at
ssc-server-support@listhost.uchicago.edu

For in person assistance we are available at 5736 South Woodlawn from 9am-5pm.
Our office is in the basement. Come around back by the ramp and ring the door be
ll.
hhz@acropolis ~$
```

How do I access Acropolis?

Another way is via a GUI like Cyberduck. Cyberduck allows you to quickly download/upload and directly edit files on Acropolis, but is prone to crashing.



Acropolis tips: Running a script

Use CD to go the directory of the script file.

Type NOHUP QSUB [scriptname] &

- NOHUP: Command to ignore the hangup signal (hup). Allows commands to continue running undisturbed when you log out of your Acropolis session
- QSUB: Submit an executable script to the batch server
- & returns control of the command line to the user (otherwise, you would not have control until the script is done)

This will automatically create a log file for each do-file you run.

Checking a script

Type QSTAT to see the status of all your scripts, by the name you listed in -N

If you want to delete a script, type QDEL and then the name of the script that appears from QSTAT, e.g. "137342.acropolis"

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Acropolis tips

- Apply for an account at "https://iota.src.uchicago.edu/". Just mention whom you work for and what you'll do with your server access
- Your root directory is "/home/[your username]"
- Use TAIL -n 10 [log file name] to quickly see if any issues arose (specifically in Stata, error codes)
- Be conscientious about how much memory you allocate. You likely do not need more than 16GB. Most tasks are CPU-constrained, not memory-constrained.

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Stata on Acropolis tips

- If you receive a message like "unable to write to [...] file", the likely culprit is a nonexistent or misspecified Acropolis directory
- Do **not** include any pause statements in any do-file you run on the server. This will cause the program to incessantly cycle and the log file will balloon due to the repeated error message that pausing is not allowed.
- If you have a file that you plan to run interactively (for debugging) and also on the server, create a local switch 'acropolis' at the top of your do-file and if 'acropolis' == 1, then set pause off

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