2014-04-25.sagews

April 25, 2014

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1 Math 480b Sage Course

1.1 The Command Line Terminal

1.2 April 25, 2014

Screencast: REMEMBER!!!!!! (with sound)

Plan

- Homework your grading of hw3 is due today at 6pm. I will collect and redistribute it by Saturday morning so at least youll get some feedback on your project. your hw4 is due Sunday at 6pm.
- Lecture today on Command Line Terminal

1.3 The Command Line

- We will talk about bash (=bourne again shell), which is by far the most popular.
- This is what you get when you click +New; Command Line Terminal in SMC. Its also what you get when you open a terminal on Linux or OS X. It is NOT what you get when you open cmd.exe on Windows.
- You can execute all of the (non-interactive) commands we will mention here in a Sage worksheet or from the sage command-line terminal or from an IPython notebook by preceding them with!

! pwd

/projects/74af30b7-ad25-4308-a02e-c71fcd84de6e/sage2014/lectures/2014-04-25

2014-04-25.sagews

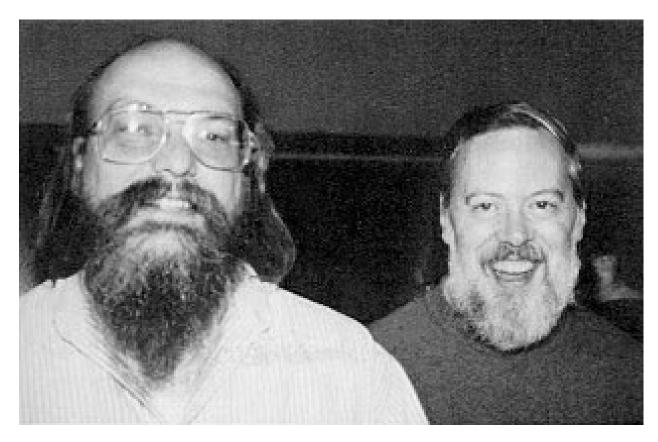
- You type stuff at a prompt and output appears. The command line terminal is extremely powerful. It mostly solves a similar problem to OS Xs finder and other file explorers, but in a completely different way. Some things that are very hard in a graphical UI become utterly trivial in the command line, and conversely.
- The most import basic commands: memorize these
 - pwd = print working directory (where you are like the folder you are browsing)
 - ls = list the files in the working directory
 - cd path = change ddirectory; use forward slashes. Use .. to go up.
 - mv src1 src2 ... dest = move a file (or files) or directory from one place to another (in particular, rename)
 - cp src1 src2 ... dest = copy a file from one place to another; use cp -r to recursively copy a directory
 - man command = manual about how to use a command
- Illustrate each of these in a terminal. (NOTE: In SMC, the terminal history currently vanishes after a while this will likely change though.)

1.4 History

- get it with the up and down arrows.
- type history to see it.
- type ![number] to re-run the numbered command.

1.5 History

```
# These guys created Unix in the 70s...
salvus.file("Ken_n_dennis.jpg")
```



Actual 1979 Unix (Version 7) running: salvus.file("unix1979.png")

```
52850 Jun 8 1979 hptmunix
-rwxr-xr-x 1 sys
drwxrwxr–x 2 bin
                      320 Sep 22 05:33 lib
                       96 Sep 22 05:46 mdec
drwxrwxr–x 2 root
−rwxr−xr−x 1 root
                    50990 Jun 8 1979 rkunix
                    51982 Jun 8
                                 1979 rl2unix
-rwxr-xr-x 1 root
                    51790 Jun 8 1979 rphtunix
-rwxr-xr-x 1 sys
-rwxr-xr-x 1 sys 51274 Jun 8 1979 rptmunix
                  48 Sep 22 05:50 tmp
drwxrwxrwx 2 root
drwxrwxr–x12 root
                      192 Sep 22 05:48 usr
# ls -1 /usr
total 11
                      128 Sep 22 05:45 dict
drwxrwxr–x 3 bin
                     32 Sep 22 05:48 dmr
drwxrwxrwx 2 dmr
drwxrwxr–x 5 bin
                      416 Sep 22 05:46 games
                      496 Sep 22 05:42 include
drwxrwxr-x 3 sus
                      528 Sep 22 05:43 lib
drwxrwxr–x10 bin
drwxrwxr–x11 bin
                      176 Sep 22 05:45 man
drwxrwxr–x 3 bin
                      208 Sep 22 05:46 mdec
                      80 Sep 22 05:46 pub
drwxrwxr–x 2 bin
                  96 Sep 22 05:45 spool
drwxrwxr-x 6 root
drwxrwxr–x13 root
                 208 Sep 22 05:42 src
# ls -1 /usr/dmr
total 0
```

It looks similar 35 years later! !ls -l /usr

1.6 What makes the terminal so powerful

- Use tab completion (in the actual terminal) to complete file names
- You can use patterns to specify the files or directories that are arguments to commands
- You can redirect the input or output of a command.
- You can combine commands together via pipes (sort of like composing functions).
- You can temporarily pause (control-Z) and restart (fg) commands (and much more).
- There are thousands (!) of additional commands like the above, which all work in a uniform way.

Slowly and carefully illustrate the above points using the following commands: ls, grep, du, man, sage, ipython, gp, git

1.7 Summary of key ideas

- The man command documents every command
- Use patterns to specify filenames
- Use foo [...] bar [...] to make the output of foo be the input to bar
- Use foo [...] output_file to redirect the output of foo to the given file, and Use foo [...] input_file to make input to foo come from the given file.
- The most important commands are: man, ls, cd, mv, cp

Other: In SMC (and OS X), you can open a file or folder in the graphical interface by typing open filename