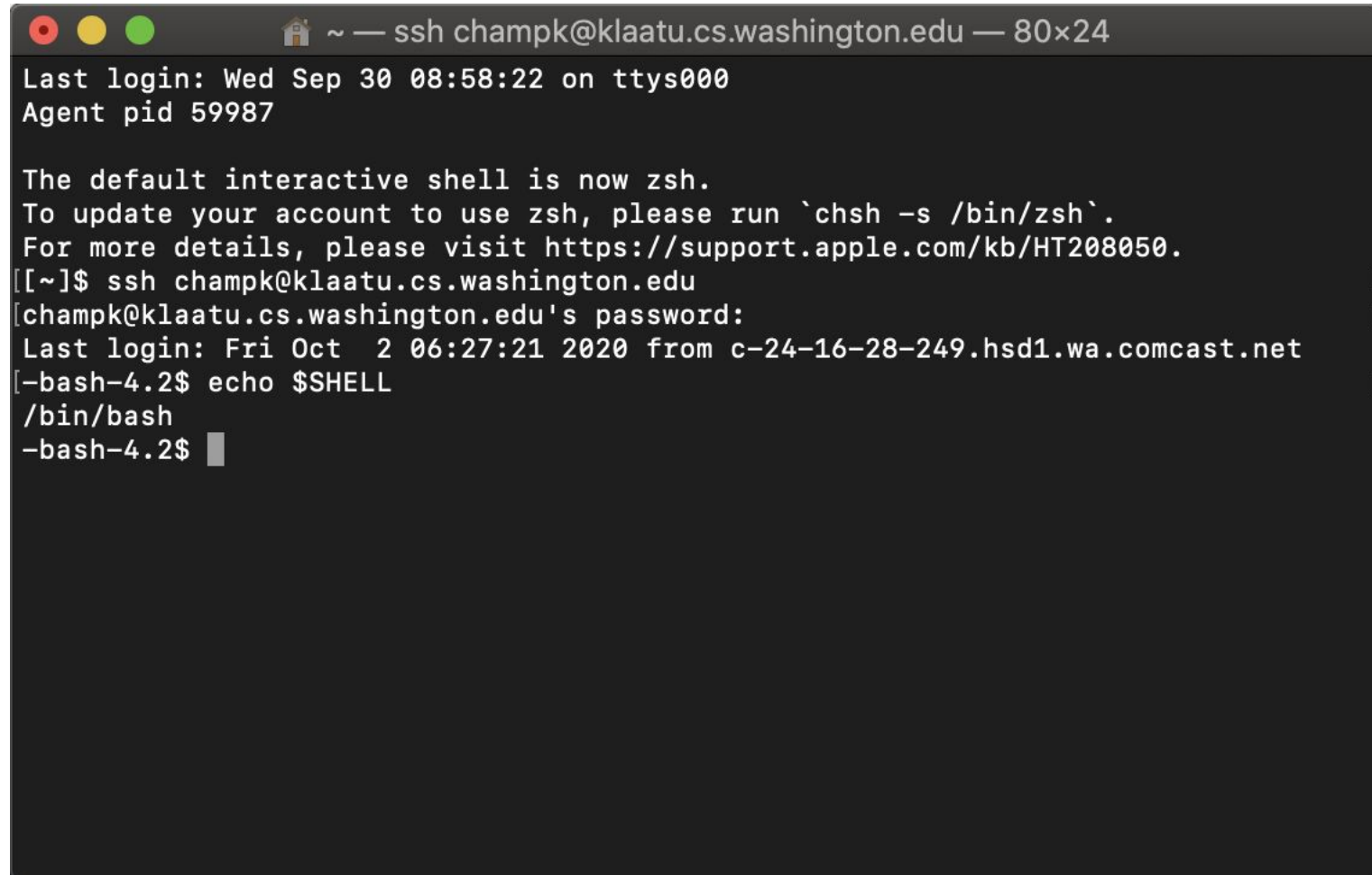# Lecture 2: Meet the Linux Shell

CSE 374: Intermediate Programming Concepts and Tools

Administrivia

- Exercise 0 will release today

- Class webpage now live

- Class discussion board available

- Linux accounts will be available later this afternoon
  - Username = uwnetid
  - Password = tempPassword

- Linux account issues? Fill out form: https://forms.gle/SDNkjSfmB7GLsFrT6

- Fill out student survey: https://forms.gle/2nqB8HnAHhXeLWCD7

Meet the Linux Shell

- **Text based interface for Linux operating system**

- **We will be using the "Bash" shell**
  - There are different versions, but for this course we will only be using bash

- **Use echo $SHELL to check which shell you are using**

- **Bash in a unix shell and command language that is the default login shell for most Linux and MacOS**

- **Interpreted, not compiled**
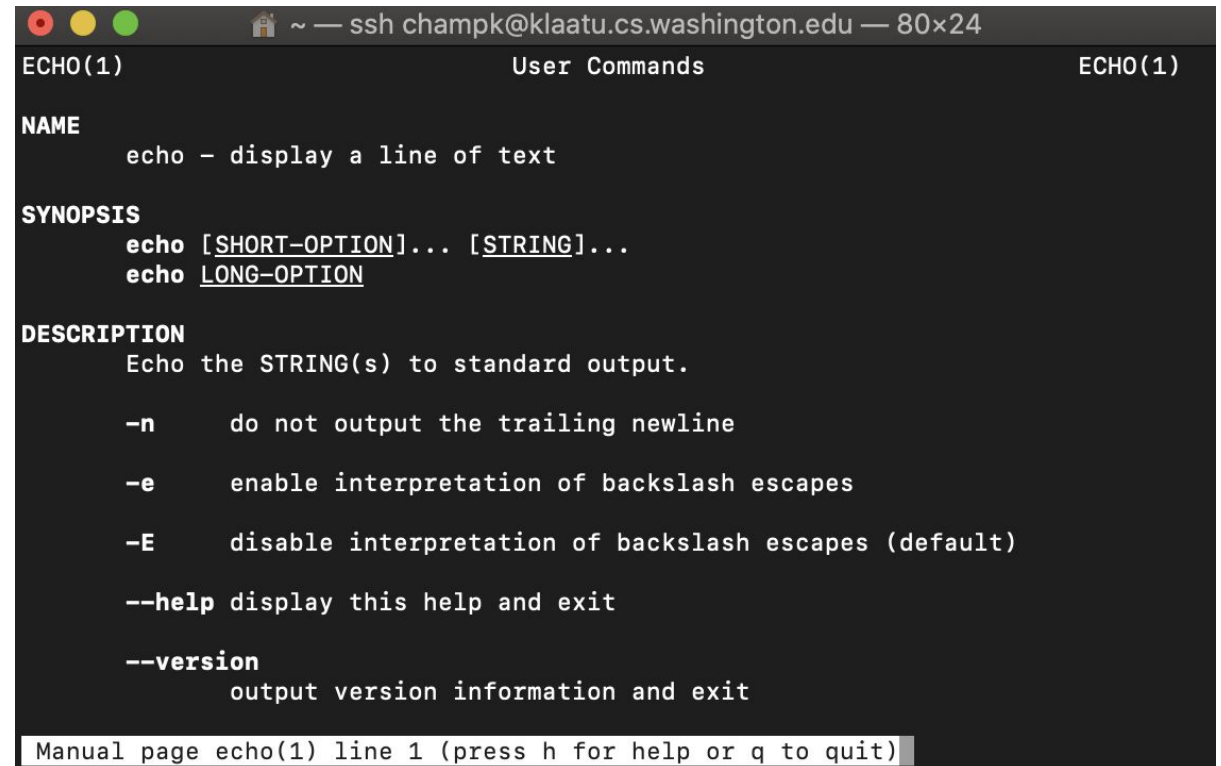 - You're on your own when things go wrong

Local MacOS terminal connecting to remote Linux machine

Commands in the Shell

▪The shell is a text-based interface that takes commands instead of clicks

▪Commands are pre-existing programs
- <command name> <options> <input || output>

▪To learn about an individual command use "man"
- <command name> man
- Short for "manual page"
- Can also use the --help option

```
●●●                🏠 ~ — ssh champk@klaatu.cs.washington.edu — 80×24
ECHO(1)                        User Commands                        ECHO(1)

NAME
       echo - display a line of text

SYNOPSIS
       echo [SHORT-OPTION]... [STRING]...
       echo LONG-OPTION

DESCRIPTION
       Echo the STRING(s) to standard output.

       -n      do not output the trailing newline

       -e      enable interpretation of backslash escapes

       -E      disable interpretation of backslash escapes (default)

       --help display this help and exit

       --version
               output version information and exit

Manual page echo(1) line 1 (press h for help or q to quit)
```

echo man page

Shell Interaction Basics

1. Open the terminal application on your local computer

2. Connect to Klaatu Linux server with

3. ssh <username>@klaatu.cs.washington.edu

4. Enter in your password, you will not see characters as you type

Basic Interactions:

▪You can use copy and paste with with your usual short cuts

▪You can navigate through your executed commands by using the up and down arrows
  – Convenient way to rerun commands or to fix small errors in previous command

▪The history command will print the commands you've used this session to the terminal

Linux Demo

Running Programs

- You can run a program by typing its path into the terminal

- Some folders are globally visible, so you only need the program's name
  - /bin/ is globally visible because it is in the PATH shell variable

- To run a program in the current directory you need to give the path
  - ./local_program
  - Running local_program by itself will not work because it's not globally visible

- All commands are bash files that are executed when you hit "enter" on a terminal line
  - You can write and execute your own! More on that later

Files

- A collection of data used for long term storage
  - Stored on a hard drive
  - Hard drive is the physical portion of a computer that stores large amounts of data sits outside the CPU

- Files have…
  - Name
    - Unique string within the folder
  - Type
    - Indicated by the extension at the end of the name
  - Content
    - Data contained within the file
  - Location
    - Folder trail from drive to name
    - "breadcrumb"

Finder GUI view of folder

ls –l view of folder

File System

- Files contain other files, branching out from the root "/" forming a tree-like hierarchy

- Files are located with a path of folders separated by "/" this is called the "file path"

- Paths starting with "/" are called absolute paths
  - Start searching from the root of the file system
  - EX: /usr/documents/myFiles/myFile.txt

- Paths that do NOT start with "/" are called relative paths
  - Starts searching from current directory
  - EX: myFiles/myFile.txt

- pwd command will print the current directory
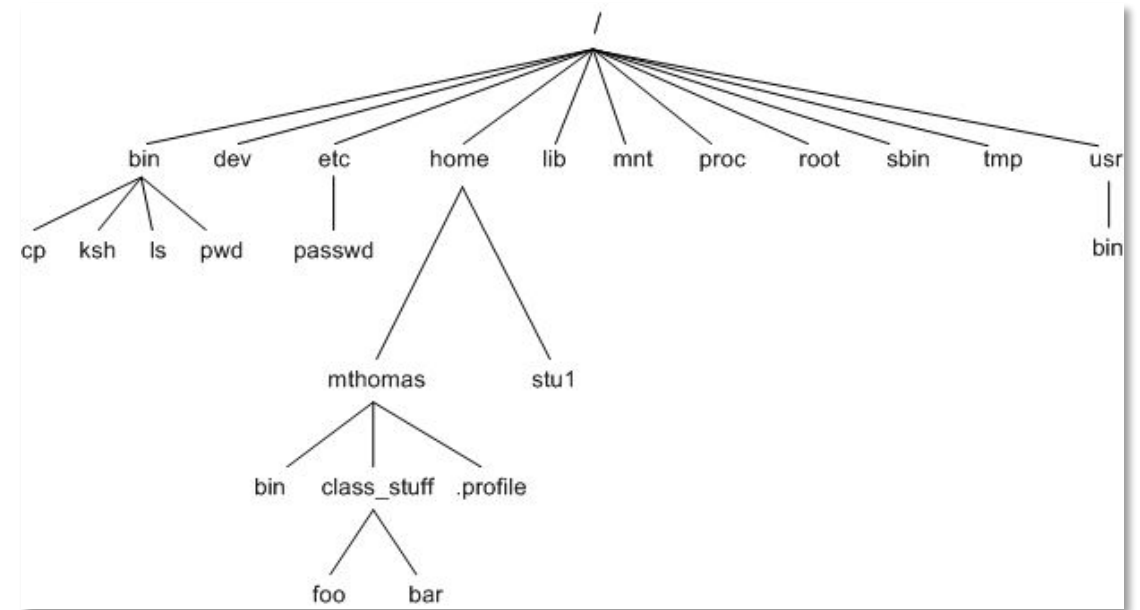
Tree diagram of file structure

https://homepages.uc.edu/~thomam/Intro_Unix_Text/File_System.html

Navigating the File System

- cd – change directory
  - cd <file path>

- Terminal commands for paths
  - ~ your home directory
    - EX: cd ~ #change location to home directory
  - . current directory
  - .. parent directory
    - EX: ls .. #print contents of parent directory

Beef up:
- **Change this slide to be about navigating the file system with bash**
- **Recursive traversal vs non**

Useful Commands

Command	Operation	Example
`ls`	See folder contents	`ls -l`
`cd <folderName>`	Move into given folder	`cs Downloads`
`cp <source> <destination>`	Make a copy of given file in given destination	`cp file.txt myDir/`
`mv <oldName> <newname>`	Rename or move given existing file to given name/destination	`mv fil.txt file.txt`
`cat <fileName>`	Print file contents to terminal window	`cat file.txt`
`touch <filename>`	Create empty file with given name	`touch file.txt`
`echo <string>`	Print given string to terminal window	`echo "hello world"`
`pwd`	Print working directory	`pwd`
`mkdir <directoryName>`	Create an empty directory at location specified	`mkdir ~/newDir`
`exit`	Exit the shell	`exit`

Other Useful Commands

Command	Operation	Example
`pico <fileName>`	Create or edit file	`pico filename`
`echo <text>`	Print text	`echo hello world`
`pwd`	Print working directory's absolute path	`pwd`
`touch <filename>`	Create empty file	`touch filename`
`mkdir`	Create empty directory	`mkdir`
`find -name <filename>`	Search for file	
`exit`	Exit the shell	

Moving files between machines

- **Tar**
- **Wget**
- **Scp**
- **Filezilla**

Demo: File Manipulation
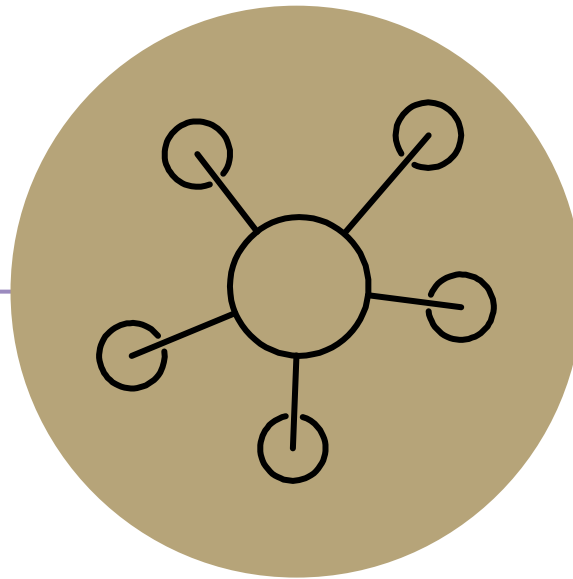
Questions?

Lecture Participation Poll #2

Log onto pollev.com/cse374
Or
Text CSE374 to 22333