



System Administration & Security

COMP 175 | Fall 2021 | University of the Pacific | Jeff Shafer

Linux Fundamental Skills: Bash Scripting

Overview

- This Week
 - Bash Scripting
 - **Lab 6** - Web Server (Part 3)
 - **Lab 7** - VPN

Why Scripting?

- **Saves time & effort** – No need to remember complex sequences of commands
- **Parameters** – The same script can be used in different situations (different input files, different options, ...)
- **Automation** – Script can be scheduled to run automatically

Shell Scripts vs Python Scripts

Shell Scripts

- Simple primitives for common tasks
 - I/O redirection
 - Pipelines combining existing programs
 - Filesystem-oriented tasks
- Reuse existing system utilities (programs)
- Lightweight, universally available
- Best for: Throwing away tasks?

Python Scripts

- Simpler to automate arbitrary / custom tasks
 - It's a *programming language* first
- Data structures!
 - Lists, arrays, dictionaries
 - Object-oriented
- More sophisticated exception handling
- Best for: Complicated tasks?



You should be comfortable working with both types of tools

Linux Shells

- **bash** – Bourne Again Shell
 - Extended version of legacy **sh** shell
 - Features:
 - Job control
 - Unlimited command history
 - Functions
 - Unlimited size arrays
 - Strengths: Installed everywhere
 - Weakness: Syntax is “not intuitive”

- Many other shells to choose from: **ksh, tcsh, zsh, fish, ...**

Bash Scripting



```
#!/bin/bash
```

Shell Scripting

Crash Course

Beginner Level

<https://www.youtube.com/watch?v=v-F3YLd6oMw>

Bash Debugging

➤ Debug mode!

- Very helpful in understanding “what is happening?!?”
- Will print out each expanded command (after variable substitution) prior to execution

```
#!/bin/bash

set -x      # start debugging

# Your code goes here
# .....

set +x      # stop debugging
```

Wrap-Up

➤ Questions?

➤ Concerns?

➤ **This Week**

➤ **Lab 6** - Web Server (Part 3)

➤ **Lab 7** - VPN