Linux Sys-Admin 101
Five Day Class Itinerary

DAY ONE

Section 1: Introduction

Operating Systems

UN*X/Linux History

- In the beginning there was Bell Labs
- SysV, BSD, and the UN*X family tree
- Enter Linux

GPL and Open Source

- The GPL
- Open Source
- Open Source security: Good or Bad?
- GPL/Open Source Summary

Section 2: Overview of The UN*X/Linux System

The Structure of the Linux Kernel and the GNU OS

The Filesystem Layout, Important Config Files, & Services

- The main filesystem layout
- The /etc/ directory and important config files
- TCP/IP config files and restarting the network service
  - Exercise 2.1: Starting/Stopping the network service
- Apache config files
  - Exercise 2.2: Setting up a public web page

DAY TWO

- Sendmail config files
  - Exercise 2.3: Setting up a public sendmail server
- Postfix config files
- BIND DNS config filesSystem V Initialization Scripts
- The xinetd Daemon
- SSH config files
  - sshd server side configs

- ssh client side configs
- Using Authorized Keys
- Rackspace specific file system paths
- The Filesystem Hierarchy Standard
- Per User Paths and Aliases
  - The PATH variable
  - Exercise 2.4: Per user path experiment and using virtual terms
  - Exercise 2.5: Using command aliases

The RH-Linux Run Levels and Startup Scripts

- Run levels
- Run levels and `chkconfig`
- Booting, the init, and changing run levels
  - The boot process
  - Changing run levels
    - Exercise 2.6: Watching the system change runlevels
  - What starts and what kills?
- User logins and related files

"Everything's A File"

The Hard Drive, Partitions, and Filesystems... Oh My!

- Partitions
- Linux distros moving toward LVM
- Using fdisk
- Growing live filesystems with fdisk, partprobe & resize2fs
  - Resize Root Example

DAY THREE

The Hard Drive, Partitions, and Filesystems (cont'd)

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  - Logical Volume Management
    - Exercise 2.7: Hands on LVM Lab

Mounting File Systems

- Overview of filesystems in UN*X/Linux
- How /etc/fstab works
- Mounting basics

Section 3: The Basics of Getting Stuff Done In Linux

CLI Piping

File Redirection, Concatenation, and The Cron

- File redirection and concatenation
  - Exercise 3.1a: Counting users
- The system level cron scheduler
- User level crontab files
  - Exercise 3.1b: Logging daily user counts with cron

Other Useful Commands

- Other useful Linux/POSIX command line tools
  (grep, locate, which, find/exec, wc, head/tail, sort, cut,
  strings, tr, sed etc)
- "The elegance of command line empowerment"

DAY FOUR

bash Command Line Navigation

- Command line completion
- Other CLI/Bash Keyboard Tricks

Working With Files

- Understanding different file types
- Viewing, Creating, editing, and moving files
- Symlinks and hardlinks

File Matching Patterns vs. Reg. Exprns.

- File matching (by shells, find, cpio, tar, etc.)
- Regular Expressions (by grep, vi, more, awk, sed, etc.)
  - meta characters
  - examples and caution

Users, Groups, and File Permissions

- **R**ead, **W**rite, e**X**ecute permission bits and how to change
  them
  - chmod: Changing modes

- chmod: Numeric mode
- Directory permissions

/etc/passwd, /etc/shadow, and /etc/group files

Helpful Summaries

Section 4: The Kernel, Modules, and RPMs

The Kernel and Using Modules

- Info on Kernel Source and dir paths
- Kernel modules and their locations on the filesystem
- Working with hardware kernel driver modules
- Manually working with modules (lsmod, depmod, rmmod)
- Finding and configuring kernel modules
  - Tips for tracking down unfamiliar kernel modules
- Automatically configuring modules (/etc/modprobe.conf)
  - The /etc/modprobe.d/ directory
  - Exercise 4.1: Using /etc/modprobe.conf
  - Resist manual forcing via /etc/rc.d/rc.local
  - The new "Red Hat Way" for loading kernel modules

Red Hat Package Management

- Overview of the RPM System
- Basic use of RPM and checking system packages
- Package installing/upgrading basics
- Advanced RPM use in security forensics
- Intro to yum RPM package management automation
  - Rackspace Email yum
  - Using yum
- Rackspace Email yum config and repository settings
- Real world pkg management yum automation w/runcmd