Teaching Linux from a Windows Point of View
Mike’s Premise

• Windows is the predominant Desktop OS
• While Linux is wildly popular on Servers and Mobile devices, it has comparatively very little exposure on Desktops
• Desktops are the systems most users begin their practical exposure of OSes on the Desktop
• All operating systems have parallel functions, although the procedures will vary.
• We must take advantage of user’s Windows experience to act as a jump off point to accelerate the understanding of Linux!
How do we go about this?

• We need to determine what we need to teach our students about Linux in as granular a set of topics as possible
• We need to have some amount of assumption as to what Windows users know about the Windows OS
• We need to look at each of these Linux topics and determine which will be easier to learn using user’s Windows OS experience
  – Topics that can be taught immediately as we are confident that most if not all Windows users have experience in that subject
  – Linux topics that have excellent Windows’ analogies but we cannot assume users have done so in Windows
  – Linux topics that due to substantial variance with Windows requires self-standing lecture
Mike’s Four Rules to Decide to Teach a Topic

1. Does this topic properly cover a certification objective?
   - Does this topic make learning a certification topic easier?
2. Does this topic make a student a better tech?
3. Cuz’ It’s Cool (CiC)
4. Teaching people things they don’t need to know (To prove to them they don’t need to know it)
The Certification Objectives

• The CompTIA 220-902 exam includes multiple Linux objectives
  – We need to carefully inspect the objectives to get a handle on what exactly CompTIA wants us to know Linux-wise
  – While there are a few references in other objectives, the bulk is under Objective 2.0

• 2.0 Other Operating Systems and Technologies
  – 2.1 Identify common features and functionality of the Mac OS and Linux operating systems
2.1 Identify common features and functionality of the Mac OS and Linux operating systems

Best practices
- Scheduled backups
- Scheduled disk maintenance
- System updates/App Store
- Patch management
- Driver/firmware updates
- Antivirus/anti-malware updates
2.1 Identify common features and functionality of the Mac OS and Linux operating systems

Tools
- Backup/Time Machine
- Restore/snapshot
- Image recovery
- Disk maintenance utilities
- Shell/Terminal
- Screen sharing
- Force Quit
2.1 Identify common features and functionality of the Mac OS and Linux operating systems

- Multiple desktops/Mission Control
- Key Chain
- Spot Light
- iCloud
- Gestures
- Finder
- Remote Disc
- Dock
- Boot Camp
GET TO DA TERMINAL!
Organizing Shell Commands

Navigation/Manipulation
- ls
- cd
- pwd
- mv
- cp
- rm

Permissions
- su/sudo
- passwd
- chmod
- chown
What do we do With the Rest?

- iwconfig/ifconfig
- ps
- apt-get
- vi
- dd
- grep
- shutdown

Perhaps Tools or Best Practices will give us a clue?
2.1 Identify common features and functionality of the Mac OS and Linux operating systems

Tools
- Backup/Time Machine
- Restore/snapshot
- Image recovery
- Disk maintenance utilities
- Shell/Terminal
- Screen sharing
- Force Quit

DD
DD
DD
DD

Shutdown
2.1 Identify common features and functionality of the Mac OS and Linux operating systems

Best practices

- Scheduled backups
- Scheduled disk maintenance
- System updates/App Store
- Patch management
- Driver/firmware updates
- Antivirus/anti-malware updates
We Need to Fill in Some Blanks

• Certain Linux concepts not explicitly addressed by CompTIA objectives must be covered to help learners understand A+ objectives

• Basic Navigations
  – File/Directory naming conventions (for navigation)
  – Pipes (for grep)
  – Device naming (sda, eth0, tty, et al) – for dd command

• Permissions
  – Must have a practical example where changing permissions makes a difference
  – Group/User administration (for chmod/chown)

• Job Scheduling
  – Cron/crontab (for scheduling)
Making Better Techs

• Certain basic Linux concepts simply aren’t clearly covered by A+ objectives
  – Why Linux exists
  – Understanding distros
  – Making Linux work in a Windows world (Samba)
  – Configuring .conf files
  – Alternatives to vi

Begin vi rant!
The Certification Objectives

• Go with Debian
• Ubuntu is probably a safe bet
• CompTIA has listed specific shell commands
• Introduce Linux via history, motivation, distros, directory structure
• Most Linux training should concentrate on shell commands
  – Basic Navigation
  – Permissions
  – Disk Maintenance
  – Networking (ifconfig, iwconfig, ping)
  – Application Installation/Update (“simple” and “hard”)
A Better Tech

• A technician of the A+ experience level should know a number of core Linux topics not mentioned in A+ objectives
  – Mounting/unmounting mass storage
  – Partitioning and formatting
  – IP address manipulation (dynamic, static, IPv6)
  – Awareness of desktop options
CIC (Cuz it’s cool)

• Samba (name a system, join a domain, share a folder)
• Alternative distros
• Alternative file systems
Topics you DON’T need to know

• Compiling source code
• “Weird” distros (Gentoo, Raspian)
• Manually changing desktops (KDE to Gnome for example)
Applying Windows Knowledge to Linux Instruction
What does your Student Know About Windows?

• Distribution
  – Closed Source
  – Install/Upgrade

• GUI
  – Windows Desktop/Metro

• File Structure
  – Hasn’t changed since XP

• Applications
  – Windows Store is somewhat recent and not heavily used in the Desktop/Server world

• Command Line
  – They know it exists – but can they do anything
Instruction Strategies

• Most of Windows comes first
  – Installation
  – Mass storage (Installation, partitioning, formatting)
  – “Inner works”
    • Registry
    • Folder structure
    • NTFS permissions/Users/Groups
    • Basic Networking (folder sharing)
  – Application Administration

From here you have two options
Instruction Strategies (Option 1)

• Teach Windows command line, alone (EVERYTHING)
  – You’ve covered many cmd line utilities already so finish it all!
• At the completion of the Windows command line topics, start a “Linux” Topic
• Introduce Linux via short overview
  – We will do a light version in a moment
• Install Ubuntu Linux (stand alone, Live CD, VM, whatever)
  – Unity Desktop overview
  – System Settings
  – Ubuntu Software Center
Instruction Strategies (Option 1) - Continued

• Introduce Terminal
  – Root, su/sudo
  – Navigation, directory structure
  – Copy, move

• Permissions (Chmod, chown)

• Disk Maintenance (gparted, dd)

• Networking (ifconfig, iwconfig, ping)

• Application Installation/Update (apt-get)

• (Go where you want from here)
Instruction Strategies (Option 2)

• Teach Windows command line and Linux command line AT THE SAME TIME
  – You have to go slow
  – Need separate Linux and windows systems (hard to do with VMs)
• Complete the same Windows topics as in Option 1, however, save Windows CMD line till later.
• Introduce Linux via short overview
  – We will do a light version in a moment
• Install Ubuntu Linux (stand alone, Live CD, VM, whatever)
  – Unity Desktop overview
  – System Settings
  – Ubuntu Software Center
Instruction Strategies (Option 2) - Continued

- Introduce Windows CMD shell and Linux Terminal side by side
  - Administrator, Root, su/sudo
  - Navigation, directory structure (Windows then Linux)
  - Copy, move (Windows then Linux)
- Permissions (Review NTFS, compare to Linux permissions)
- Disk Maintenance (Review Windows tools, gparted, dd)
- Networking (ipconfig/ping in Windows, ifconfig, iwconfig, ping in Linux)
- Application Installation/Update (Windows store, apt-get)
- (Go where you want from here)
Why Linux? A Brief History

• Unix was the dominant OS in academia since the early 1970s
• Originally given away by AT&T
• Post AT&T breakup sold by Bell Labs
• The Free Software Foundation
  • GNU
  • Copyleft
• GNU/Linux
• Distros
Operating System Distribution

- Windows - Proprietary
- Linux – GNU
- Distro Tour!
  - Ubuntu
  - Mint
  - Fedora/Red Hat
  - Gentoo
  - Raspian
  - Android
Graphical User Interface

- Windows – The Desktop (Metro or Modern)
- Linux – Gnome, KDE, Unity
Applications

Windows – Self standing programs, Store
Linux – Repositories
Questions?

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