Linux System Administration

Level 1

Lecture 2: Initial Configuration

Updating Systems: the problem

- What we (incorrectly) call “Linux” is actually a collection of hundreds of separate programs
- Many programs only work if certain other files (such as libraries) are present on the system
- Installing one app may require dozens of other apps or libraries on which it depends, each of which in turn depends on **other** libraries
- “Dependency Hell” turns into a nightmare

Package Management: the solution

- Apps are installed from a zipped “package”
- Package headers contain dependency info – i.e., which other packages it needs to function
- Package manager application keeps database of what packages are installed, and what versions
  - DB does not include apps you compiled
- Package manager won't let you install apps until dependencies are resolved

Linux Package Management

- Most distros are “based on” one of two types:
  - RPM-based (Red Hat)
    - Red Hat/Fedora, SuSE, Mandrake, Connectiva, et. al.
  - dpkg-based (Debian)
    - Debian, Knoppix, Xandros, Lindows et. al.
- Slackware has its own, rather complicated
- Gentoo compiles everything from scratch

Red Hat-based (RPM) distros

- All use the Redhat Package Manager (`rpm`), to which there are many front ends:
  - `up2date` – Red Hat's system updater
  - `yast` – SuSE's Yet Another Setup Tool
    - Soon to be Open-Sourced!
  - `yum` – Yellowdog Updater, Modified
  - `apt-rpm` – for Debian bigots using RPM-based distros. Looks & feels like Debian's Advanced Package Tool.

Red Hat's Up2date and RHN

- This is the throbbing red icon on your panel
- Designed for use by paying customers (RHEL)
  - Works a little differently in Fedora
- Alerts you when updates are available
- Painfully slow until reconfigured to use a mirror, instead of Red Hat's servers
  - Configure in `/etc/sysconfig/rhn/sources`

yum

- Works with “repositories”
  - Configure these in `/etc/yum.conf`
- Caches list of available rpms in `/var/cache/yum`
- Automatically resolves dependency problems
  - Finds, downloads and installs all packages needed
- Easily configured to manage multiple machines

Using yum

- Update all packages on system:

  `# yum update`

- Install new package:

  `# yum install` *`packagename`*

- Remove a package:

  `# yum remove` *`packagename`*

Advanced Package Tool (apt)

- Debian tool ported to RH by Connectiva
- Set up your list of repositories in

  `/etc/apt/sources.list`
- GUI front end available: Synaptic
- Always update your local apt database first:

  `# apt-get update`
- Then download & install the updates:

  `# apt-get upgrade`

Security problem

- Joe Blackhat 0wnz a router or DNS server
- You THINK you're downloading updates from Red Hat or an authorized mirror, but...
- You're REALLY downloading a Trojan from Joe Blackhat's site
- Now YOUR system is 0wned and you don't even know it

Security solution

- Packages are “signed” by their maker (e.g. Red Hat) with a secret cryptographic key
- A matching “public key” will decrypt & verify, but cannot be used to sign
- Red Hat's public key installs when you first run up2date; you must install others by hand

Emergency Boot Disks

- You need to know the version number of your kernel: `ls /boot`
- Then `mkbootdisk` *`kernelversion`*
- Must be re-done with every kernel upgrade
- Usually only works on the system that created it

Using the EBD

- To boot normally, do nothing or hit Enter
- To boot into single-user mode:

```
boot: linux single
```

  - Note that no password is needed for root access to the system
- Also available from 1st installation CD:

```
boot: linux rescue
```

Tom's Root Boot

- "The most Linux you can fit on one floppy"
- Excellent emergency/recovery tool
- Gives root access to all drives without password
- Download from toms.net or put "toms root boot" in a search engine

Setting your hostname

- Must be set in two places to work properly
  - `/etc/hosts`
  - `/etc/sysconfig/network` - this is a script that runs on startup.
- Both of these are system files (i.e., you must be root to edit them)
- This is internal only – other systems will not be able to resolve this name through DNS

Configuring printers

- Red Hat tools:
  - `redhat-config-printer`
  - `printconf-gui`
  - `printconf-tui`
- CUPS project tools
  - `lpadmin`
  - `http://localhost:631`
- Use one group or the other; not both

Users

- Users are known by UID, not name
  - Human users start with UID 500
  - Root's UID = 0
- Listed in `/etc/passwd`
- Passwords (hashed) in `/etc/shadow`
- Configure with `redhat-config-users`
- CLI tools: `useradd, userdel, usermod, passwd`

Groups

- Each user belongs to one “primary group”
  - Red Hat distros use “user private groups”
- Plus any number of other groups
- Use to set permissions on files & directories
- Manage in `redhat-config-users`
- CLI tools: `groupadd`, `groupdel`, `groupmod`

Conclusion

- Ideally, you should update BEFORE connecting system to a network
- Many update choices; you're not locked in to one vendor (e.g. windowsupdate.com)
- Red Hat tools begin with `redhat-config-`
- In SuSE, all configuration is done in YaST
- In all cases, configs are text files in `/etc`