

System V Init

(or “What happens when I boot my Linux machine?”), and

Getting Involved with Free Soft.

System Administration DeCal

Joshua Kwan

November 18, 2008

Administrivia

- Lucky you, some of you got **bonus labs** for not turning in your proposals on time or not finishing all the labs.
- Those will be released on Thursday and will be due next next Tuesday (Dec. 1)
- Do them, AND everything else you're missing.

Semester Recap

- It's only been 7 weeks of actual class!
- Now, you have a **good foundation** for learning anything else you like
- Learned about: the shell, shell scripting, network services, power tools, users and groups, compiling software, & network services... a whirlwind tour!

Today

- Your Linux computer must run many things in order to get you to a desktop.
- Load drivers, system event loggers, network servers, X-Windows session, etc.
- **How does it work?**

System V Init

- Remnant of a gigantic beast from long ago. (“System V” = 1983!!)
- A very simple, easy to understand system for running things at **startup** and **shutdown**
- It’s the first program the **Linux kernel** runs when your system boots, and it starts everything else.

init(8) blow-by-blow

- System boots.
- init reads `/etc/inittab` which contains the list of **run levels**.
- For each **run level**, you can have a different set of startup and shutdown tasks.
- Runs all scripts in `/etc/rcX.d` (where X is the runlevel) sequentially.

Anatomy of an init script

- All init-compatible scripts conform to a standard of recognized arguments.
- You can run each rc.d script with “start”, “stop”, “restart”, or “reload”.
- Ex: `/etc/rc2.d/S19mysql start`
- When booting up, all scripts are run with “start” argument, etc.

Script filenames

- Start with either a S or a K
- If it starts with S, call “start” on it
- If it starts with K, call “stop” on it
- Starting runlevel could mean starting certain things and stopping others.
- Numbers matter, e.g. S19mysql - service is started in numerical order. S18 will start first

init demo!

Special runlevels

- Default run level - varies by distribution. Often 2 or 3
- 1 - single user maintenance mode (no SSH!)
- 0 - shut down system and power off
- 6 - shut down system and reboot
- Vservers don't have init, sorry! Try it on a local Ubuntu install.

init shortcomings

- All scripts are run sequentially - they must terminate before the next one is run
- e.g. while waiting for one script, run all other non-dependent ones.
- Also, (classic) init has no dependency system. You can't tell what depends on e.g. the network being started.
- Solution: new init system, such as Upstart (used by Ubuntu)

init = Serious Business

- Why is speeding up boot process important for e.g. Ubuntu?
- For most people, the faster you get to a desktop, the faster the OS seems to be.
 1. Faster boot = Better OS = more money
 2. ???
 3. Profit!!

Boot chart for serenity.klika.si (Sun Apr 10 13:33:49 CEST 2005)

uname: Linux 2.6.11-1.1233_FC4 #1 Fri Apr 8 00:56:56 EDT 2005 i686
release: Fedora Core release #4x86 (Fawkes)
CPU: Intel(R) Pentium(R) M processor 1500MHz (1)
kernel options: no root-LABEL=/ init=/sbin/bootchart rhgb
time: 1.15

