

1.30.18



- .vimrc & how do you get API-like colors in vi?
- Boot Stuff
- Let's get a little better at Shell Programming

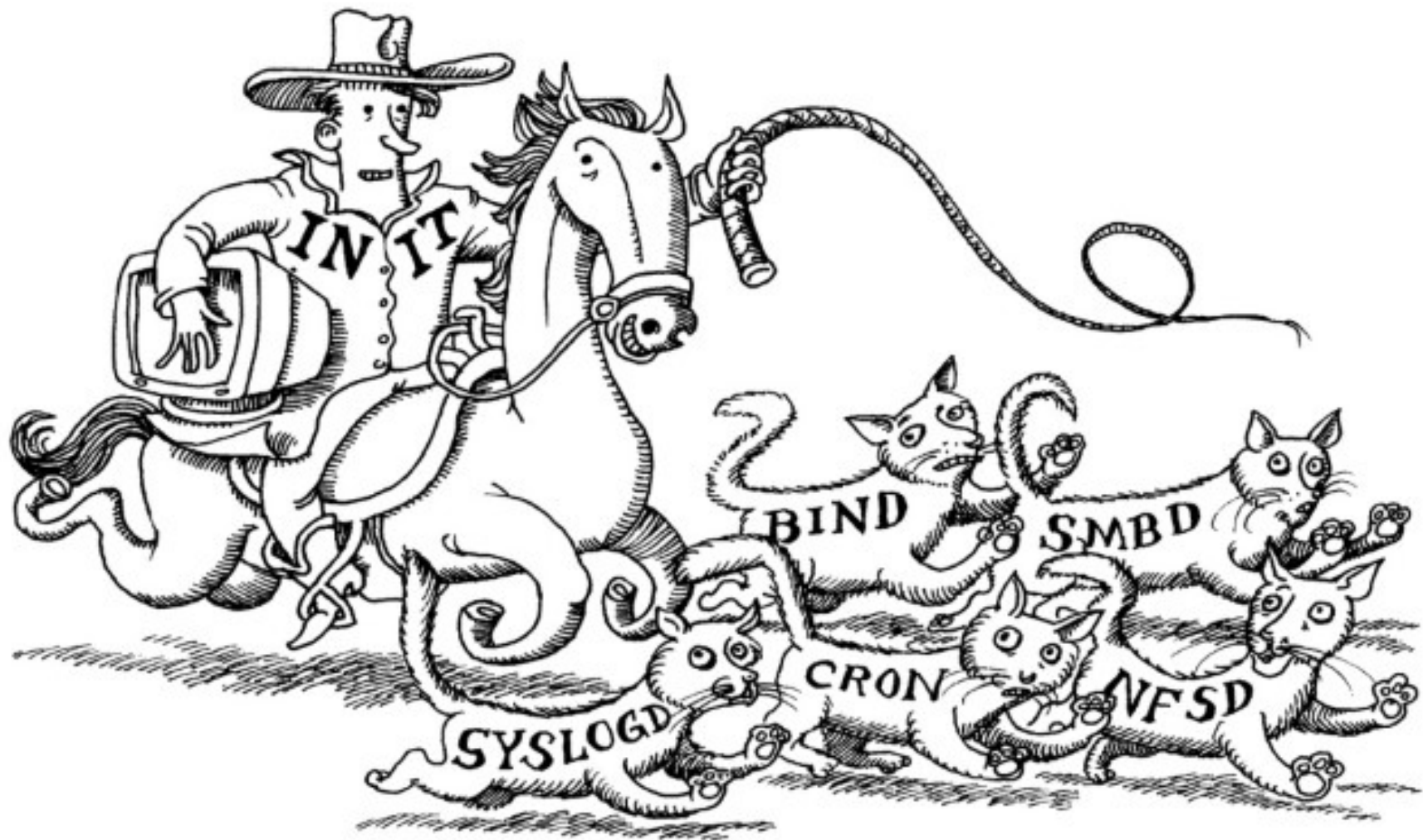
More vim



- Modifying the way vi looks and works
- On Pi2Eye2 ...
 - Review login processes /etc/profile (whatever it calls)
> \$HOME/.profile (whatever it calls)
 - \$HOME/.bashrc
 - In CSC3200 directory, edit checkargs.py
 - Look at ~/.vimrc

<http://stackoverflow.com/questions/164847/what-is-in-your-vimrc>

BOOT ME

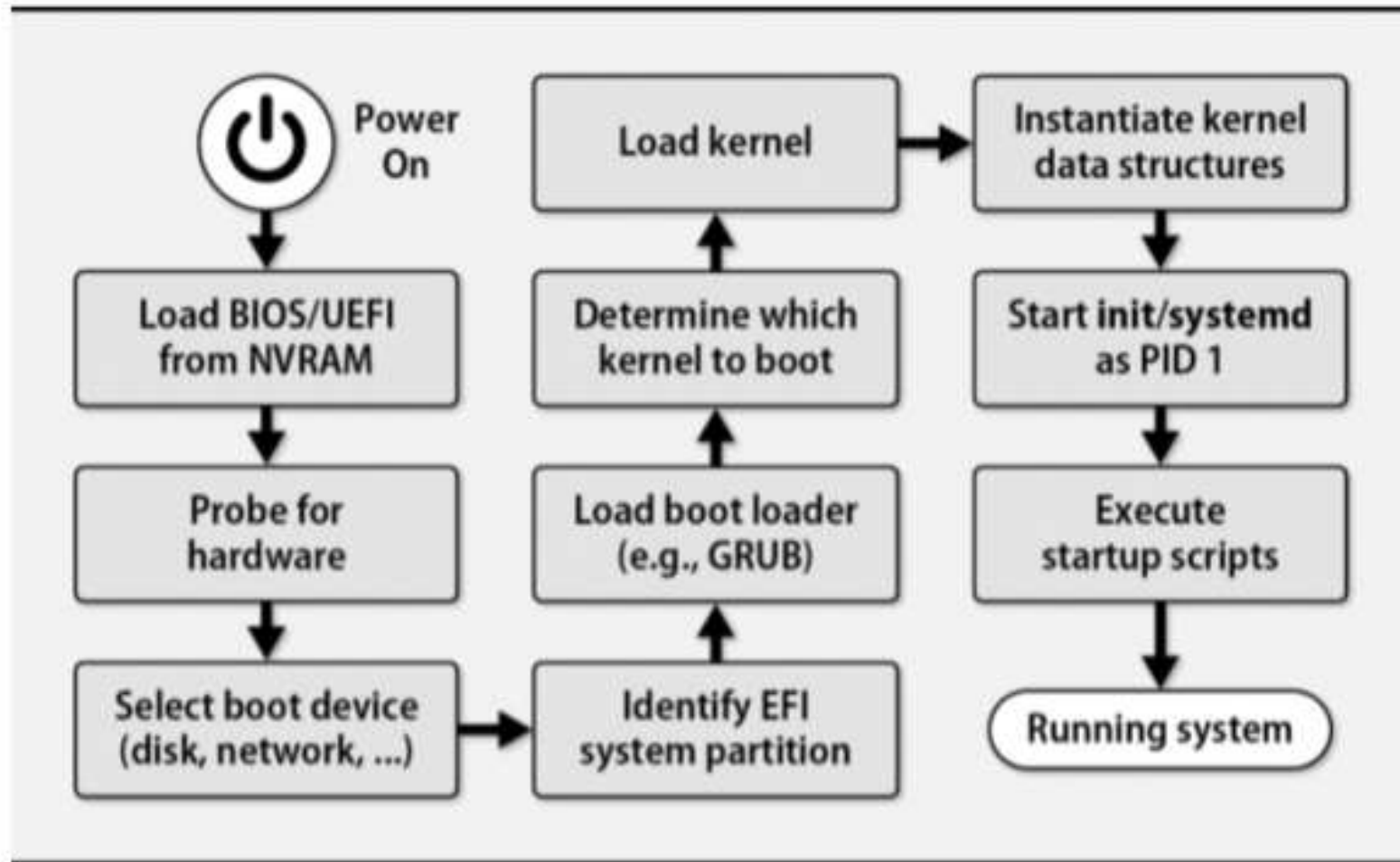


Boot me, please



- **Boot Stuff**
 - ?Why will a Pi not display on an HDMI display if it is not connected during boot?
 - How do you make it so it will work?
 - Why will a keyboard work if it is not connected during boot?
- **Loading the Pi's Kernel**
 - Different than standard Ubuntu or Centos or RedHat or MacOS (Birkley Unix)
 - /boot config files and the overlays...
 - /boot/overlays/README < Check it out (more / vi)
- **Kernel Loading**
 - Different flavor of GRand Unified Boot Loader (GRUB)

Boot me, please



Consider UEFI and BIOS synonymous ... What does BIOS stand for?

Boot me, please (more)



- **Processes and init (spawned child processes)**
 - `ps -ef | tee /tmp/filename | more`
 - log in again (new putty window?) and see what process spawned your shell
- **What is a daemon?**
 - A sleeping process that doesn't wake up unless some event occurs (i.e. an ssh trying to log into the system)
- **Why are daemons important?**
 - They eat much, much less processing than a normal background / sleep process.
 - Spawn another process (login/bash) or (vsftpd/ftp) when triggered.

Tasks done by /etc files during boot



- Setting the name of the computer (/etc/hostname)
- Setting the time zone (/etc/timezone)
- Checking the disks with fsck
- Mounting the system's disks (/etc/mtab or /etc/mounttab)
- Removing old files from the /tmp directory
- Configuring network interfaces
- Starting up daemons and network services

Init Levels



- At level 0, the system is completely shut down.
- Levels 1 and S (same) represent single-user mode.
- Levels 2 through 5 include support for networking.
- Level 6 is a “reboot” level.
- Levels 0 and 6 are special in that the system can’t actually remain in them; it shuts down or reboots as a side effect of entering them.

A peak at /etc/inittab (No longer exists on latest release of Raspbian)

Format:

<id>:<runlevels>:<action>:<process>

The "id" field MUST be the same as the last
characters of the device (after "tty").

```
1:2345:respawn:/sbin/getty --noclear 38400 tty1
```

```
2:23:respawn:/sbin/getty 38400 tty2
```

Check processes, “who,” and then log in as another user;
check processes again.

Check your tty options with `stty`

What causes those processes to get started?



- Look through /etc/rc?.d
- Look through /etc/init.d
- Look at the README files
- `sudo systemctl status -l`

Why is it important to shut down properly?



- Imagine being an OS and you have computed the network or file or processing statistics and you are in the middle of writing a log file...
 - File system corruption
- Working on whatever and they pull the plug on you...
 - File system corruption
- Always perform a graceful **shutdown** (lots of ways)...
 - `sudo poweroff`
 - `sudo shutdown -g0 -i0 -y`
 - `sudo init 0`

Shell Environment



- env - Look at the environment variables
- Change some of them on both Pi2Eye2
- set
- set -o
- alias review
- EXERCISE... make it so that when you type “..” you move up one directory

More Shell Scripting



- Lots of built-in commands (you won't find them in /bin or /usr/bin) in shells...
- From the old bourne shell (/bin/sh)...
:, ., break, cd, continue, eval, exec, exit, export, getopts, hash, pwd, readonly, return, set, shift, test, [, times, trap, umask, unset, alias, unalias
- New in bash (/bin/bash) ...
alias, bind, builtin, command, declare, echo, enable, help, let, local, logout, printf, read, shopt, type, typeset, ulimit

More Shell Scripting (some review)



- First, let's explore our executable path (\$PATH)
- What is the significance /dev/stdin?
 - `echo < `cat filename``
- What is the significance /dev/stdout?
- What is the significance /dev/stderr?
- Let's look at a couple of shell scripts that manipulate regular expressions
 - ~ /bin/inttemp
 - end of /etc/profile
- Where do you find other examples with working syntax?

Enough



- **For Thursday...**
 - Two Page Review of Chapter 2 (Booting) (due today)
 - Two Page Review of Chapter 3 (Godly Powers)
 - Homework getting updated tonight (on Moodle)