

Random Unix Stuff



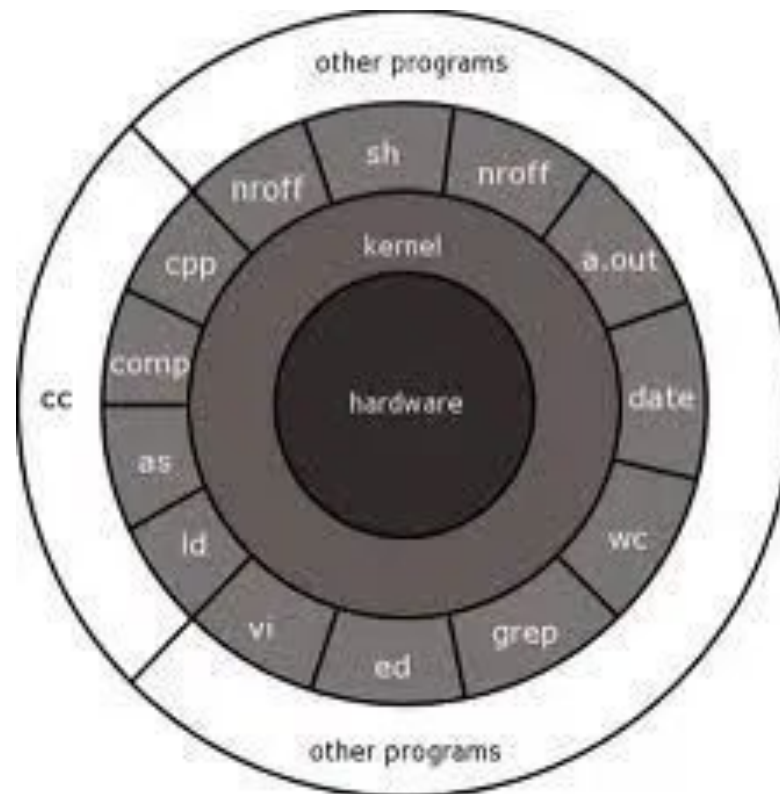
ECE 373

Let's try something new...

- Base terminology
- Unix crash-course
- Linux Distributions - what are they?
- Various links, resources

Basic terms and thoughts

- Kernel - Gateway between hardware and software; “the OS”



Basic terms and thoughts, cont.

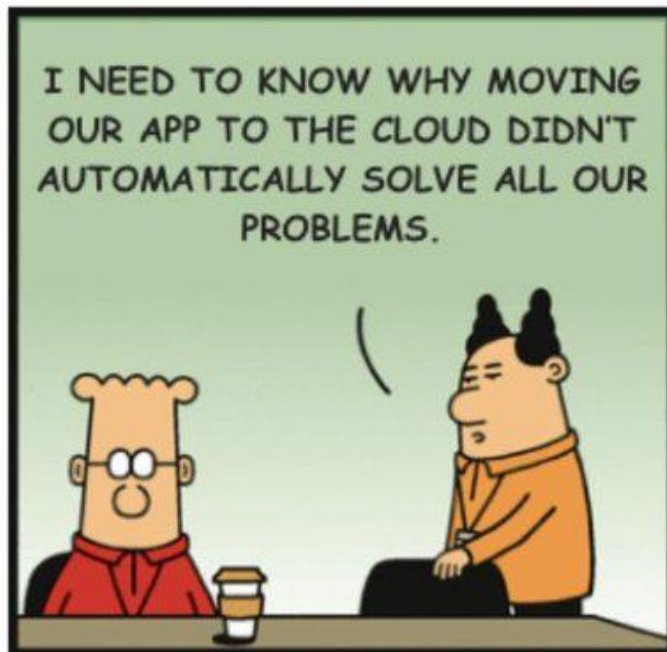
- Distribution: Collection of kernel, packages, and package management systems
 - Constitutes an installable system
 - Similar to MacOS, Windows installations
- Shell: bash, ksh, etc. What you run commands from
- Filesystem: Unix collection of disks, network mountpoints, etc., cobbled together to make a hierarchy
 - Starts at “root (/)”
 - Similar to C: drive in Windows
- RCS: Revision Control System - tag and manage code changes
 - git - more or less defacto for code management today

Basic terms and thoughts, cont.

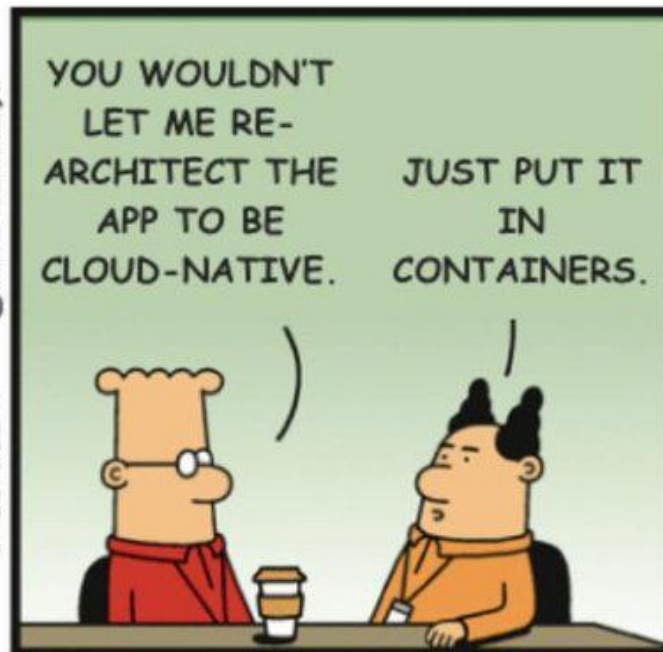
- Upstream: refers to development model for many open source projects
 - Rolling development model
 - Releases carved off rolling train model
- Patches: how changes get made to ongoing projects
 - Uses diff-format
 - Applies incremental changes to central tree
- Maintainer: person responsible for applying patches to project
 - Usually has final say, authoritative say
 - Linux kernel project full of hierarchy of maintainers
 - Linus Torvalds ultimately top maintainer, defers other decisions to sub-maintainers

Basic terms and thoughts, cont.

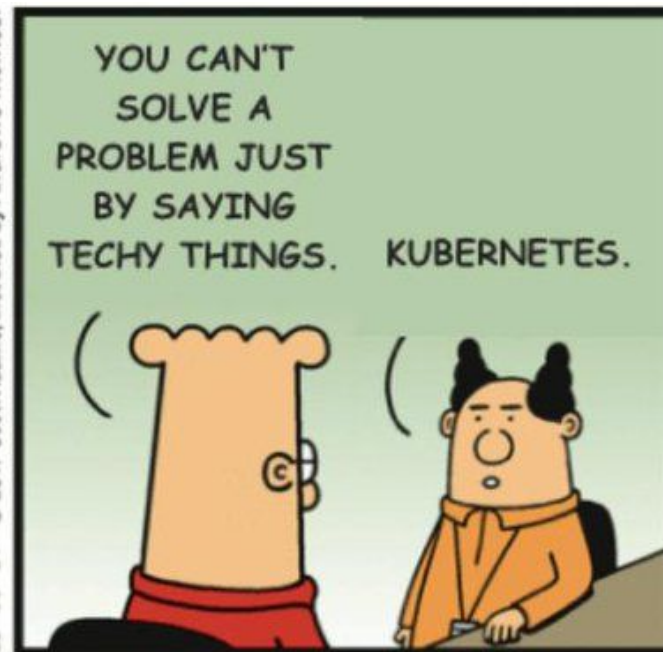
- Containers: the new “hot thing”
 - Mechanism to isolate processes, files, and/or networking
 - Much lighter-weight than a virtual machine
 - Utilizes OS/kernel knobs and hooks to achieve isolation
- Kubernetes: the *really* new “hot thing”
 - Orchestration framework to manage containers



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Crash-course

Commands:

`man` - show the manual pages (man pages)

`ls` - list contents of a directory

`pwd` - print working directory

`systemctl` - systemd control application

`bash` - your shell, along with scripting language

`dmesg` - Linux kernel log display

`watch` - useful to repeat commands, such as log counters

`tar` - “Tape ARchive”, Unix way to collect files into single one

Linux Distributions

- Companies created around building different distributions
- Different goals, different use cases
- The old days...
 - SuSE - German-based distribution, known for X Windows advancements before others did
 - Red Hat - based in Boston, known mostly for RPM manager (package manager)
 - Slackware - Peter Volkerding, bare-bones Linux distribution based on tarballs

Linux Distributions, cont.

- Companies evolved to enterprise needs
- Making money on free software?!?!
 - All about the support...
- Red Hat
 - Fedora Project: non-enterprise distribution, used for testing and hardening enterprise packages
 - RHEL: Red Hat Enterprise Linux
- SuSE
 - OpenSuSE: similar to Fedora for SuSE
 - SLES: SuSE Linux Enterprise Server
- Canonical
 - Ubuntu: Releases YYMM (e.g. 18.04, 19.10, etc.)
 - Can pay for support
 - LTS - long-term support

Linux Distributions, cont.

- Many derivatives
 - CentOS - “free” RHEL (it’s dead, Jim)
 - Rocky Linux - the “new” CentOS (same founder)
 - Oracle Linux (unbreakable) - RHEL derivative
 - Gentoo - source-based
- The Cloud!
 - CoreOS, Fedora CoreOS
 - Project Atomic
 - Clear Linux
 - Alpine

Links, resources

- LWN.net - Linux Weekly News; great resource for open source news in general (subscription-based)
- Email archives - many archives exist, great to see how developers operate and treat code
 - vger.kernel.org
 - lore.kernel.org
 - spinics.net
- Linux Foundation
 - Large amounts of sponsorship of many projects and conferences for open source
 - Many formal classes, certifications available

Links, resources, cont

- IRC channels: freenode.net, popular IRC server
 - Internet Relay Chat (the original Slack...)
 - Rooms filled with people usually fairly helpful
 - Be respectful, be mindful of server rules
- Conferences
 - Many tech conferences sponsor students
 - Might be hard in today's environment...
 - Great opportunities for collaboration and learning
 - See new innovations, chat with people in the trenches