



# What's new with CentOS at Facebook

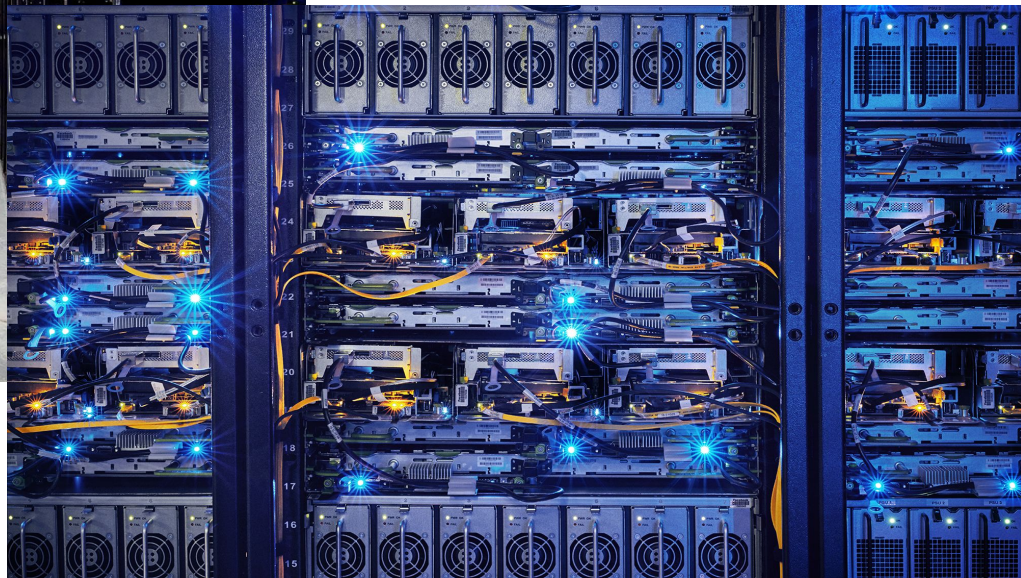
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Production Engineers - Operating Systems

# Agenda

- Infrastructure
- CentOS at Facebook
- Deployment and management

Infrastructure



# Infrastructure

How does it work?

- OS team manages the fleet bare metal experience
- OS as a platform
- Individual teams are responsible for their own hosts
- Built on an Open Source foundation
- Linux, CentOS, rpm/yum/dnf, Chef, systemd

# Infrastructure

Upstream first

- Community sets the direction
- We move fast; Open Source often moves faster
- We don't need to write everything ourselves
- Sharing our code means sharing the maintenance and having others extend it
- DevConf.CZ 2017 talk: <https://tinyurl.com/y7gx6nro>

# CentOS at Facebook



# CentOS at Facebook

## Why CentOS?

- Stable releases
- Binary compatibility
- Security updates
- Mature and well understood tooling
- EPEL
- Close relationship with Fedora

# CentOS at Facebook

FTL - Fast Thin Layer

- Backports from Fedora Rawhide for stuff we care about
- Mostly plumbing and low-level packages
  - GitHub: [facebookincubator/rpm-backports](https://github.com/facebookincubator/rpm-backports)
- %facebook macro to gate internal stuff
- CentOS + FTL = stable distro, moving fast

# CentOS at Facebook

## Kernel

- Upstream kernel (or as close as possible)
- Development in master
- btrfs, cgroup2, PSI, eBPF
- Testing and rollout automation
- Blog: <https://tinyurl.com/sftvy7v>

# CentOS at Facebook

## systemd

- systemd backport tracking upstream
- Internal CI/CD pipeline for regression testing
- Feature development
- GitHub: facebookincubator/systemd-compat-libs
- GitHub: facebookincubator/pysystemd
- All Systems Go 2019 talk: <https://tinyurl.com/v7lxmq3>

# CentOS at Facebook

## Network management

- Using network-scripts fleetwide
  - GitHub: [fedora-sysv/initscripts](#)
- Hook support
- Control on network restarts
- Troubleshooting
- Feature development and bug fixes

# CentOS at Facebook

## Packaging

- Standard packaging stack: rpm, dnf/yum
- rpmdb at scale
  - dcrpm to mitigate corruption and remediate
  - GitHub: facebookincubator/dcrpm
  - Using an alternate rpmdb: ndb
- Feature development
  - RPM: fsync, CoW experiments
  - Yum: Torrent plugin, package cleanup

# CentOS at Facebook

## Provisioning

- Hosts are netbooted
- Installer: Anaconda => Image-based installer
- Leverage the containers build system
- Chef is used to configure the image

# CentOS at Facebook

## Containers

- More workloads moving to containers over the years
- FB-specific container manager
- cgroup2, btrfs, systemd
- Blog: <https://tinyurl.com/y68evmjy>



# Deployment and management

# Deployment and management

## Chef

- Chef for config management
- Philosophy: <https://tinyurl.com/mgxb923>
  - Layered configuration through attribute-based APIs
  - Separation of policy and mechanism
  - Idempotency
  - Configuration as programming
- GitHub: facebook/chef-utils
- GitHub: facebook/chef-cookbooks

# Deployment and management

## Major OS upgrades

- Reprovisioning for OS upgrades
- Clean slate
  - Deprecated unwanted features
  - Policy changes coupling
  - Leverage the general host maintenance window
- Tooling and automation for rollouts

# Deployment and management

## Minor OS upgrades

- Incremental Rolling OS upgrades
- Every two weeks we sync down the latest updates...
- ...and roll them out over two weeks
- 'yum upgrade' kicked off via fb\_yum in Chef
- High level monitoring of rollout health
- Easy stop button and opt out for individual packages

# Deployment and management

Where are we now

- Most of the fleet is on CentOS 7
- Rolling out CentOS Stream
  - Easier rolling updates
  - Contributing to upstream
- CentOS 7 EOL targeted by end of the year
- DevConf.CZ 2020 talk: <https://tinyurl.com/tu5gbvk>

# Questions

# Thank you!

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**facebook**