KubeCon

CloudNativeCon

THE LINUX FOUNDATION
OPEN SOURCE SUMMIT
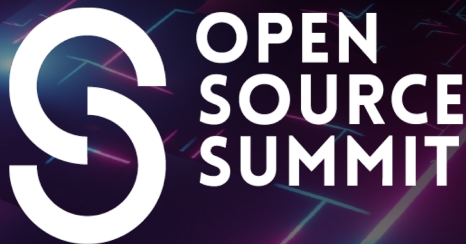
AI_dev
Open Source GenAI & ML Summit

China 2024

Agenda

- Why Migration and Challenge

- eBay Cloud Platform

- Migration Solution Introduction

- Identify and Solve Production Issues

- Upstream Contribution
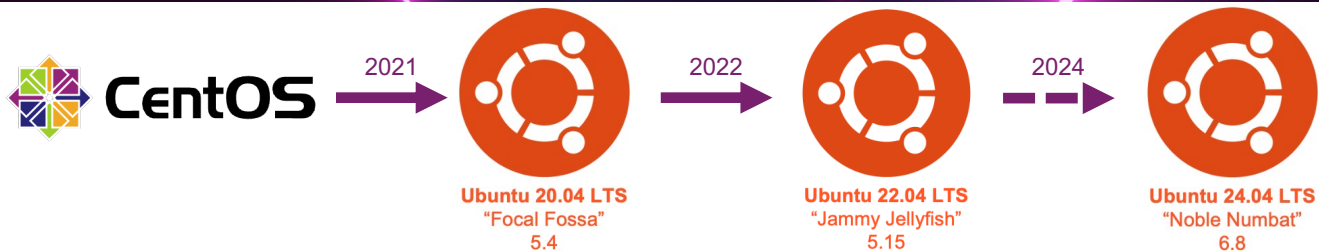
Why Migration and Challenge

- Licensing models, TCO

- Linux Distributions EOL
  - Lack of official support
  - Compatibility issues
  - Software security vulnerabilities

- Challenge
  - Data security
  - Transparent to customers
  - Quickly upgrade nodes in limited time window
  - Balance upgrade coverage and normal business operation

eBay Cloud Platform

CentOS → 2021 → Ubuntu 20.04 LTS "Focal Fossa" 5.4 → 2022 → Ubuntu 22.04 LTS "Jammy Jellyfish" 5.15 → 2024 → Ubuntu 24.04 LTS "Noble Numbat" 6.8

- Nodes 130K+

- Pods 2M+

- OS
  - Ubuntu 22.04
  - Ubuntu 20.04

- Monthly release/rollout

Immutable OS
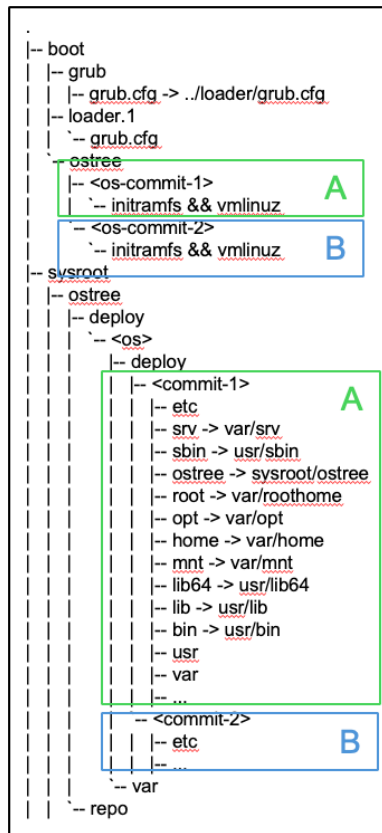
- OSTree

- System update for Linux-based OS

- Deploy new OS
  - Atomic Upgrade/Rollbacks
  - OSTree commit create deployment at /sysroot/ostree/deploy/<os>/deploy/<commit>
  - /etc, 3-way merge, the changing will be propagated
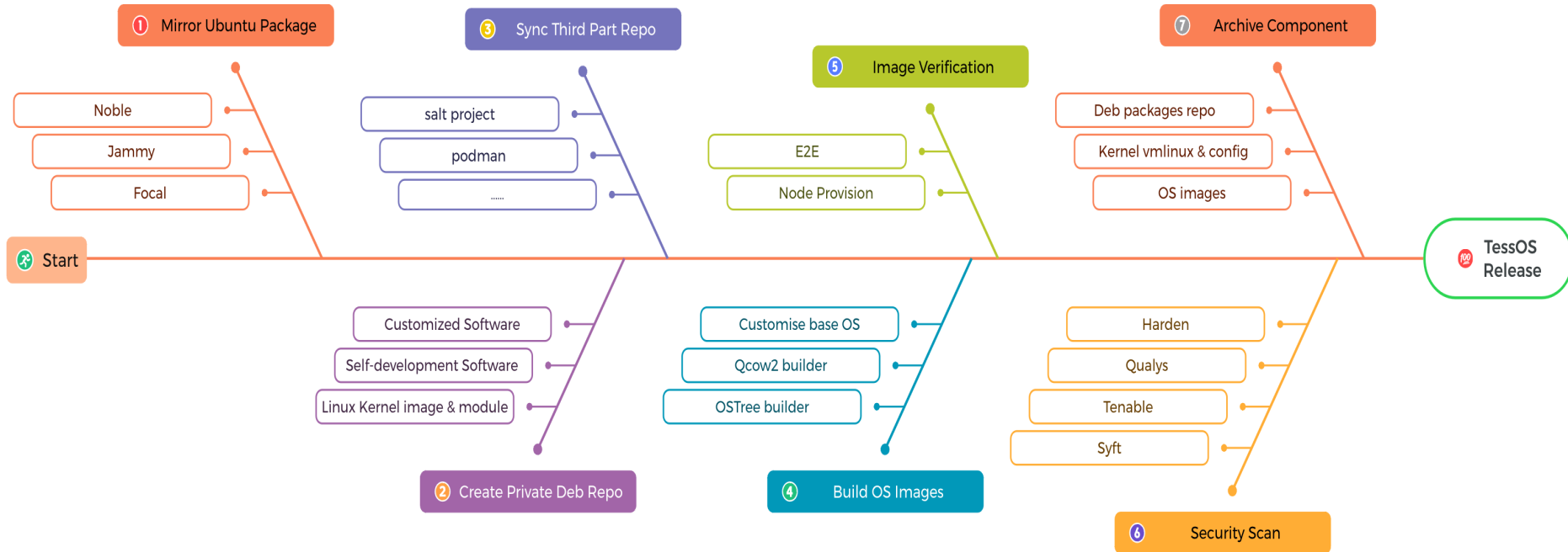 - Install kernel data at /boot/ostree

- System layout

Physical device

```
.
|-- boot
|   |-- grub
|   |   |-- grub.cfg -> ../loader/grub.cfg
|   |-- loader.1
|   |   `-- grub.cfg
|   |-- ostree
|   |   |-- <os-commit-1>                    A
|   |   |   `-- initramfs && vmlinuz
|   |   |-- <os-commit-2>                     B
|   |   |   `-- initramfs && vmlinuz
|-- sysroot
|   |-- ostree
|   |   |-- deploy
|   |   |   `-- <os>
|   |   |       |-- deploy
|   |   |       |   |-- <commit-1>            A
|   |   |       |   |   |-- etc
|   |   |       |   |   |-- srv -> var/srv
|   |   |       |   |   |-- sbin -> usr/sbin
|   |   |       |   |   |-- ostree -> sysroot/ostree
|   |   |       |   |   |-- root -> var/roothome
|   |   |       |   |   |-- opt -> var/opt
|   |   |       |   |   |-- home -> var/home
|   |   |       |   |   |-- mnt -> var/mnt
|   |   |       |   |   |-- lib64 -> usr/lib64
|   |   |       |   |   |-- lib -> usr/lib
|   |   |       |   |   |-- bin -> usr/bin
|   |   |       |   |   |-- usr
|   |   |       |   |   |-- var
|   |   |       |   |   |-- ...
|   |   |       |   |-- <commit-2>            B
|   |   |       |   |   |-- etc
|   |   |       |   |   |-- ...
|   |   |       |   `-- var
|   |   `-- repo
```

- Booting and Running
  - Parse `ostree=` kernel command line argument
  - ostree-prepare-root.service
  - Deployment is mount as RW rootfs
  - /usr: immutable, RO bind-mount
  - /var: runtime data, shared across upgrade

TessOS Maintain

- OS release workflow

OSTree Builder

- GitHub: deb-ostree-builder
- PR: Support Ubuntu OSTree build

| pre hook | → | ostree deploy | → | migrate hook | → | reboot | → | post hook |

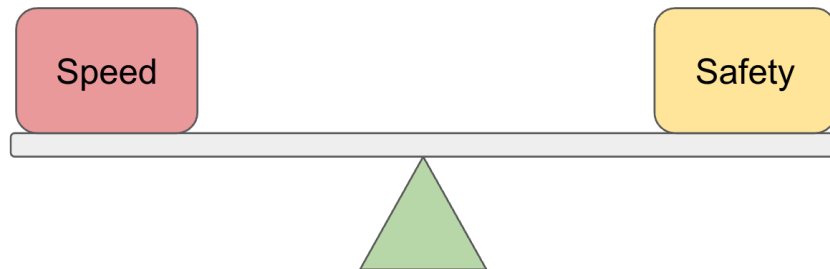CentOS/Ubuntu .... Ubuntu
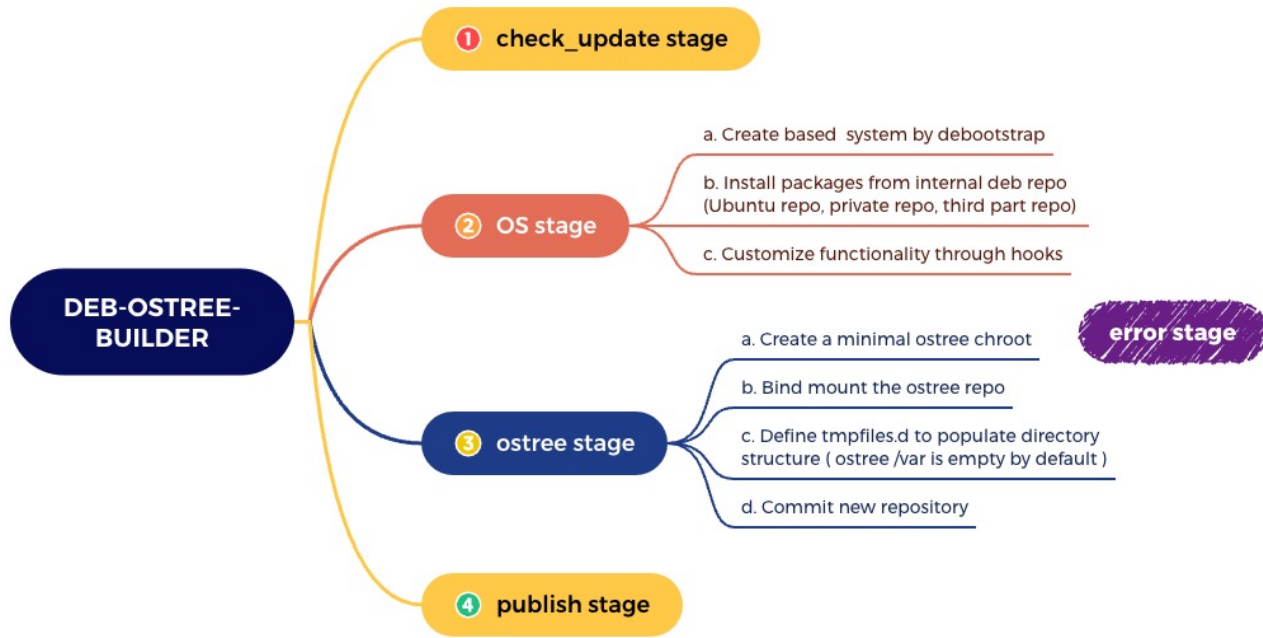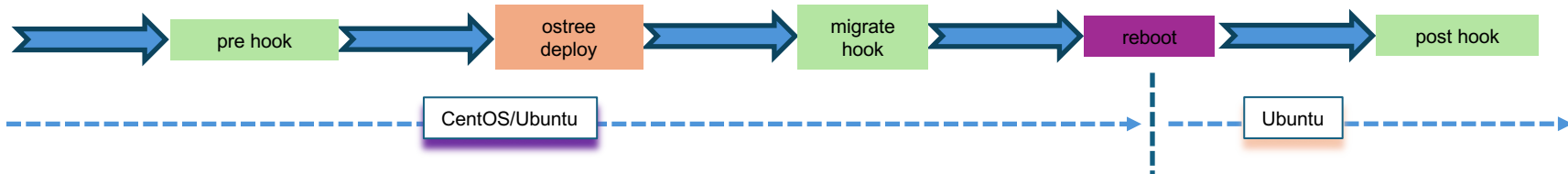
- Pre hook
  - Move user data (/var) to new deployment for Centos
  - Update grub file if need

- Migrate hook
  - Migrate config file (/etc) for application

- Post hook
  - Setup for new OS

- Monthly Patching
  - > 90% Nodes / Monthly

Speed | Safety

Identify and Solve Production Issues

- Identify Problems
  - collection and standardization HW and OS metrics
  - data observability
  - real-time data analysis

- Dig into the Details
  - diagnostic tools(cpu, network, storage, bpf, etc.)
  - LnP testing environment
  - kernel debugging OS

- Develop Solutions
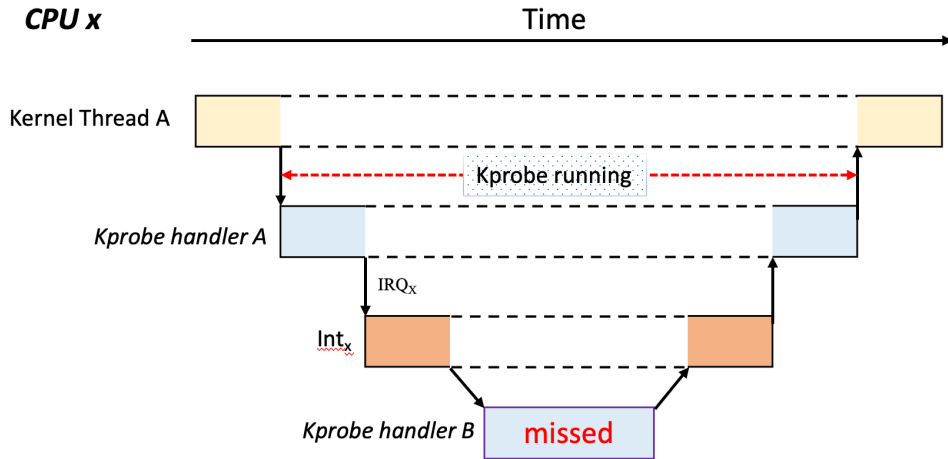
Upstream Contribution

- Support Ubuntu OSTree builds

- Fixed memory leak in audit module for Ubuntu 22.04

- SCSI Device Probing Non-deterministic

- Kprobe No Re-entrant

Kprobes Non-reentrant

- [Kprobes event missing](#)
- CONFIG_KPROBES_ON_FTRACE
- [tracepoint: Allow livepatch module add trace event](#)


```
kernel/tracepoint.c | 4 ++--
1 file changed, 2 insertions(+), 2 deletions(-)

diff --git a/kernel/tracepoint.c b/kernel/tracepoint.c
index f23144af5743..8d1507dd0724 100644
--- a/kernel/tracepoint.c
+++ b/kernel/tracepoint.c
@@ -571,8 +571,8 @@ static void for_each_tracepoint_range(
 bool trace_module_has_bad_taint(struct module *mod)
 {
        return mod->taints & ~((1 << TAINT_OOT_MODULE) | (1 << TAINT_CRAP) |
-                              (1 << TAINT_UNSIGNED_MODULE) |
-                              (1 << TAINT_TEST));
+                              (1 << TAINT_UNSIGNED_MODULE) | (1 << TAINT_TEST) |
+                              (1 << TAINT_LIVEPATCH));
 }
```

Thank You