OpenBMC In Practice

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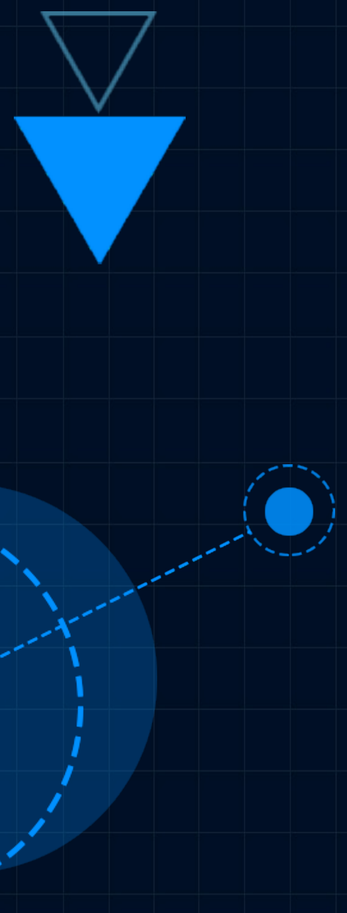
Bytedance STE



Agenda

OpenBMC Introduction

Practice

Community Contribution

Future plans

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Future plans

What is OpenBMC

- Open Source implementation of BMC
- A Linux Foundation project
- A full function Linux distribution running in embedded SoC
  - U-boot
  - Linux kernel
  - Systemd
- Strong community
  - IBM, Google, Facebook, Intel, Yadro, Dell, …
  - Inspur, Lenovo, **Bytedance**, …

BMC Development

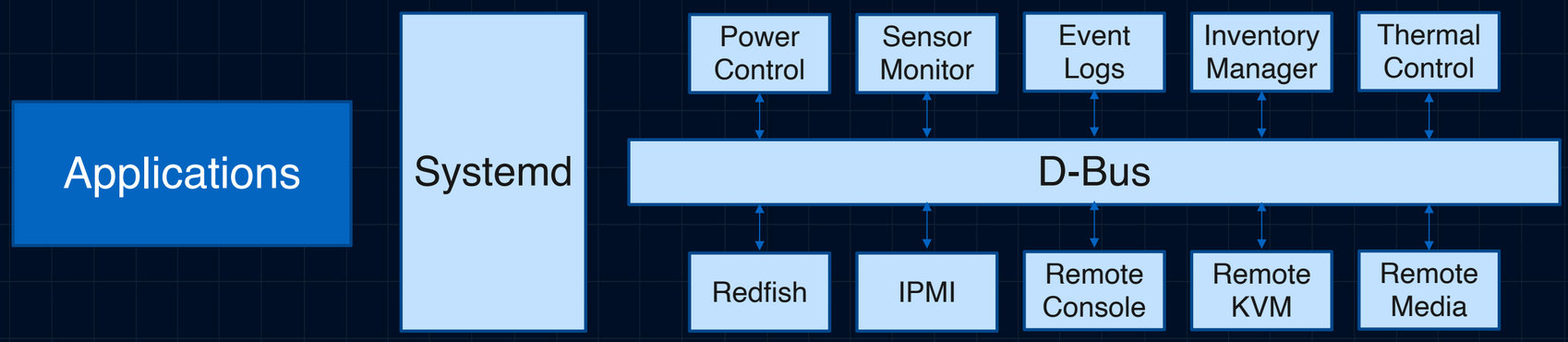
	Earlier projects	OpenBMC
Control of features	🟡	🟢
Fast bug fixes	🔴	🟢
Control of security updates	🔴	🟢
Effort to develop	🟢	🟡
Open Source Community Code Reviews	🔴	🟢

Modern Architecture

- Linux kernel 5.14.6
- Systemd 249 (249.4+)
- GCC 11.2.0
- C++20
- CI in QEMU master (6.0.50)
- Security patches always updated

OpenBMC

OpenBMC Architecture



Industry Trends

- Facebook
  - FB OpenBMC already in production (different from upstream)
- Google
  - gbmc already in production (downstream changes)
- IBM
  - In production on P9 OpenPOWER servers
  - In development on P10 Enterprise servers

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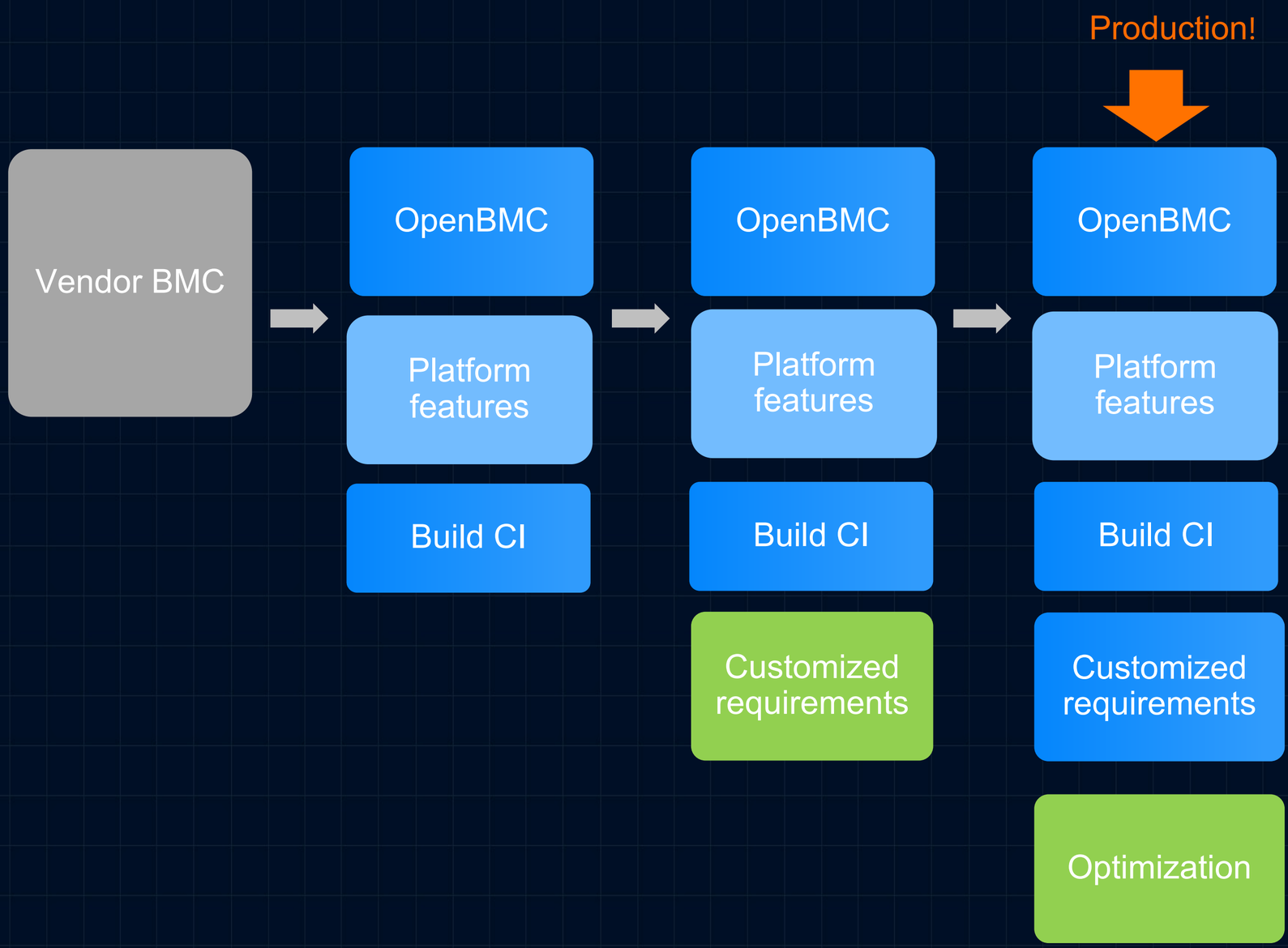
Bytedance‘s path in OpenBMC



Practice

- Intel x86 specific
  - PECI, node-manager, etc
- Power
  - x86-power-control
- Sensors
  - entity-manager/dbus-sensors
  - virtual-sensor
  - static sensors from yaml
- FRU
  - Patched entity-manager for customized EEPROM layout

Practice

- SEL
  - phosphor-logging -> ipmid
  - Cached SEL for performance
- Fan
  - phosphor-pid-control
- code-update
  - phopsphor-bmc-code-mgmt
  - Plus patches for CPLD/FPGA, etc

Practice - CI

- openbmc-build-scripts
- Auto build with Gerrit
  - Development build by Push and MR
  - Sign and release build on Tag
- QEMU CI
- HW CI

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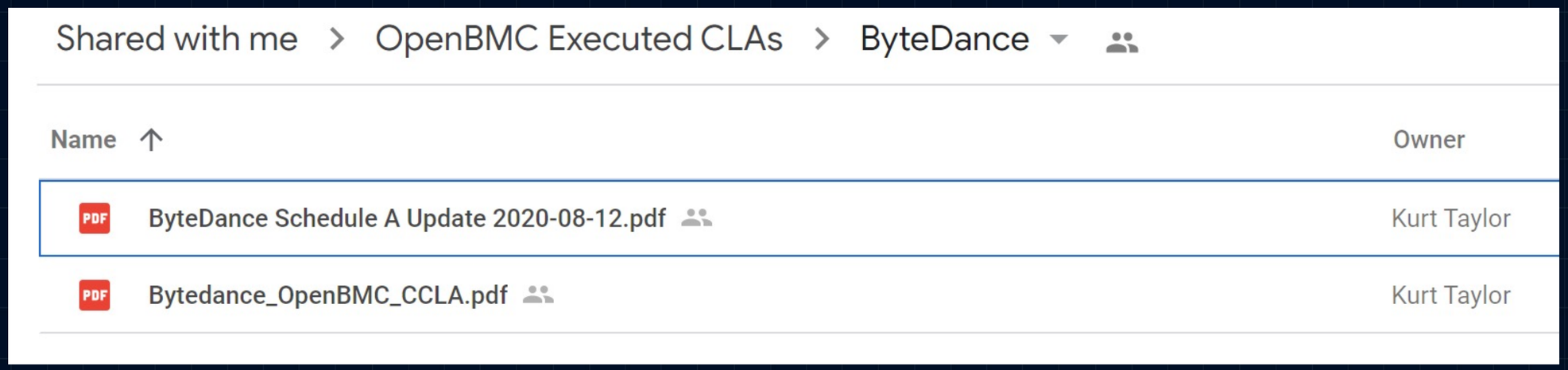
Community

- OpenBMC CCLA



Community - OpenBMC

- 170+ patches
- Various domains
  - meta-bytedance and meta-g220a
  - dbus-sensors, virtual-sensor
  - ipmid
  - code-update
  - networkd
  - webui
  - logging, SEL
  - build-scripts

Community - New features

- SEL from logging entry
  - Unified logging methods
- Cached SEL
  - Performance improvement
- 64MiB flash layout with new aspeed-sdk
- Virtual USB network
- IPv6 support in rsyslog
- Proxy support in CI

Community - QEMU

- g220a-bmc
- The first Bytedance's machine model in QEMU

```
# ./qemu-system-arm --version
QEMU emulator version 6.0.50 (v6.0.0-2786-gd4127349e3)
Copyright (c) 2003-2021 Fabrice Bellard and the QEMU Project developers

# ./qemu-system-arm -machine help | grep g220a
g220a-bmc            Bytedance G220A BMC (ARM1176)
```

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Future plans

- Performance improvement
  - Cached ipmi sensors
  - dbus-sensors optimization
- New features
  - Dual flash - golden image
  - KVM screenshot
- New Hardware
  - AST2600

Q&A

字节跳动 STE 团队技术交流

该二维码 7 天内 (10 月 27 日前) 有效，重新进入将更新

Thanks