OCP SUMMIT

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San Jose, CA

OPEN
Compute Project

Facebook OpenBMC Updates

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Facebook

OCP Summit Recap

- **OCP Summit'15**

  - Proof-Of-Concept - Wedge

- **OCP Summit'16**

  - Server Management - Yosemite

  - Storage Management - Lightning

- **OCP Summit'17**

  - New Platforms - Wedge100, Backpack, YosemiteV2, TiogaPass, Bryce Canyon

  - Updates - AST25xx, U-Boot/2016.07, Linux/4.1.15

  - Security Feature - Verified Boot POC
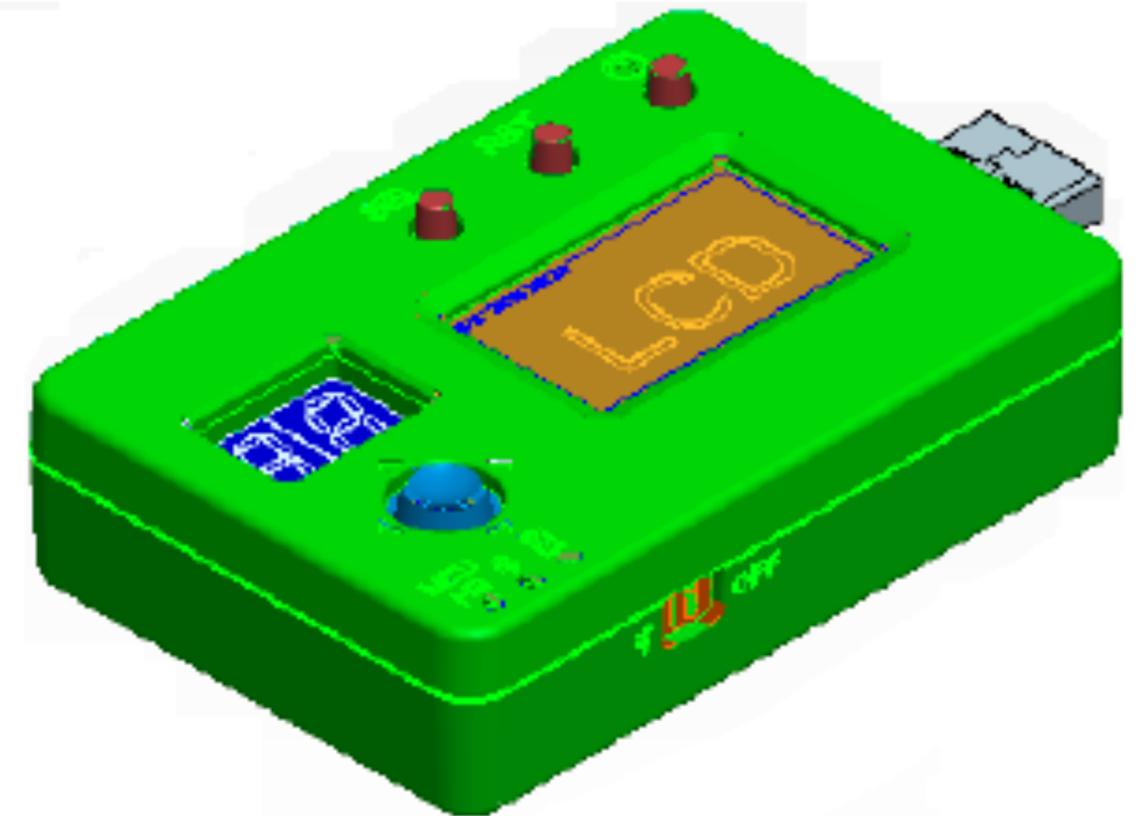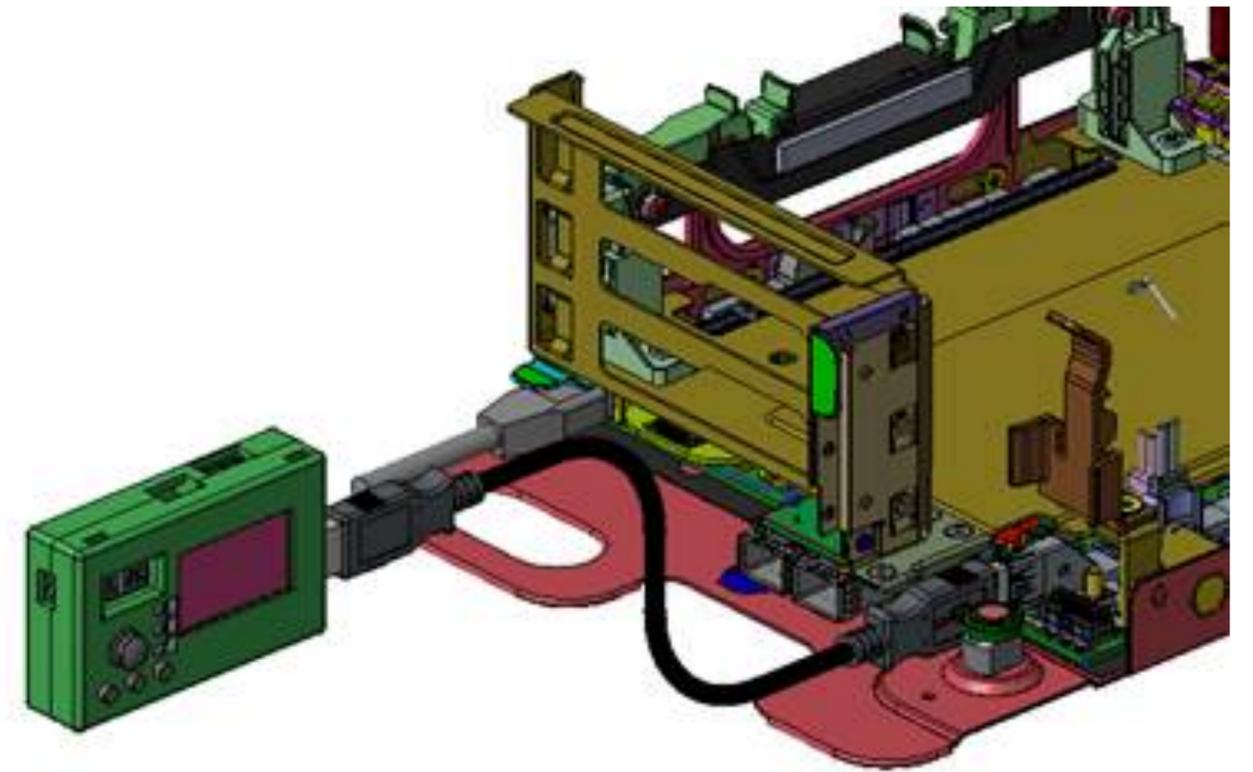
OCP '18 Agenda
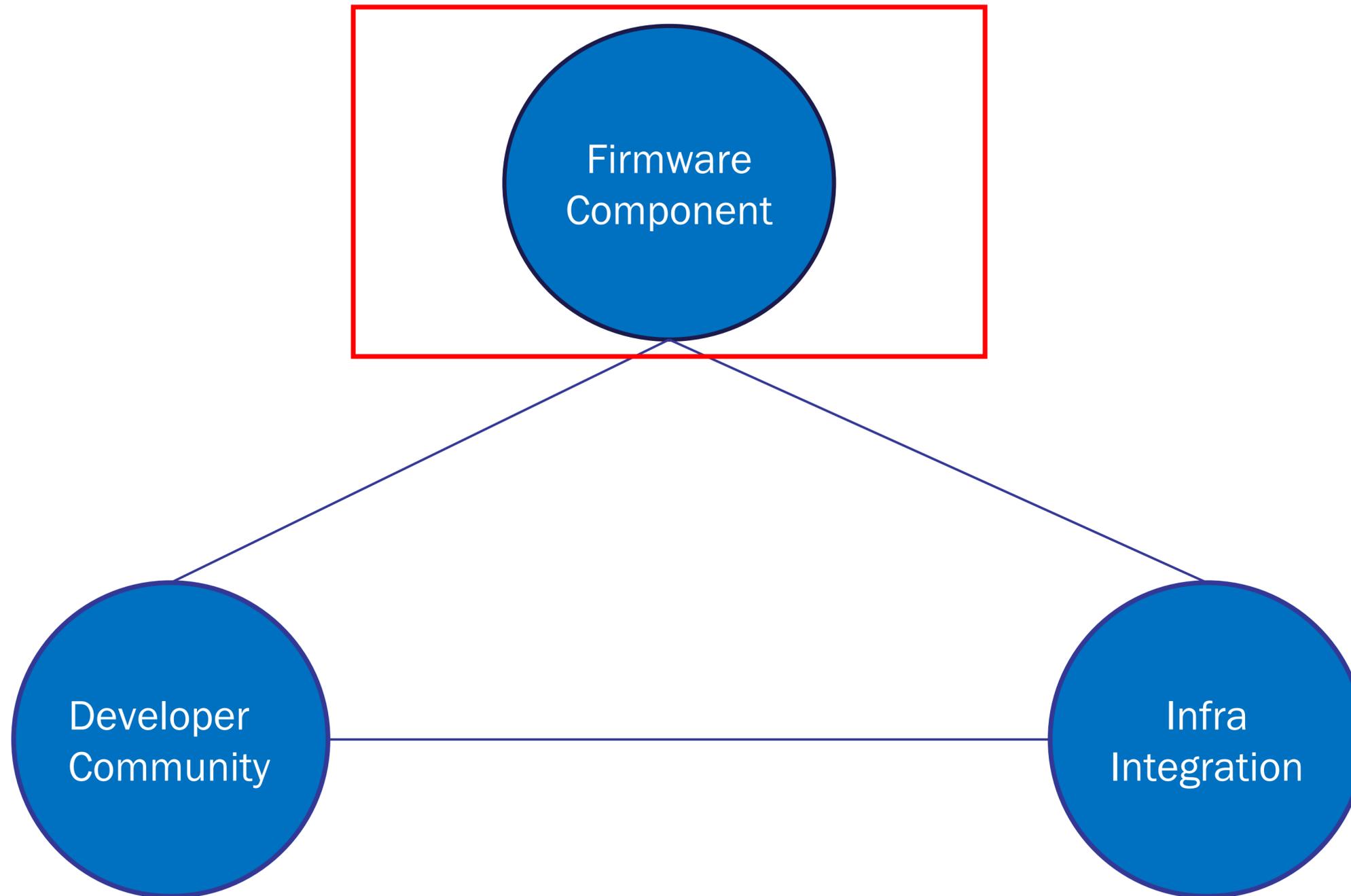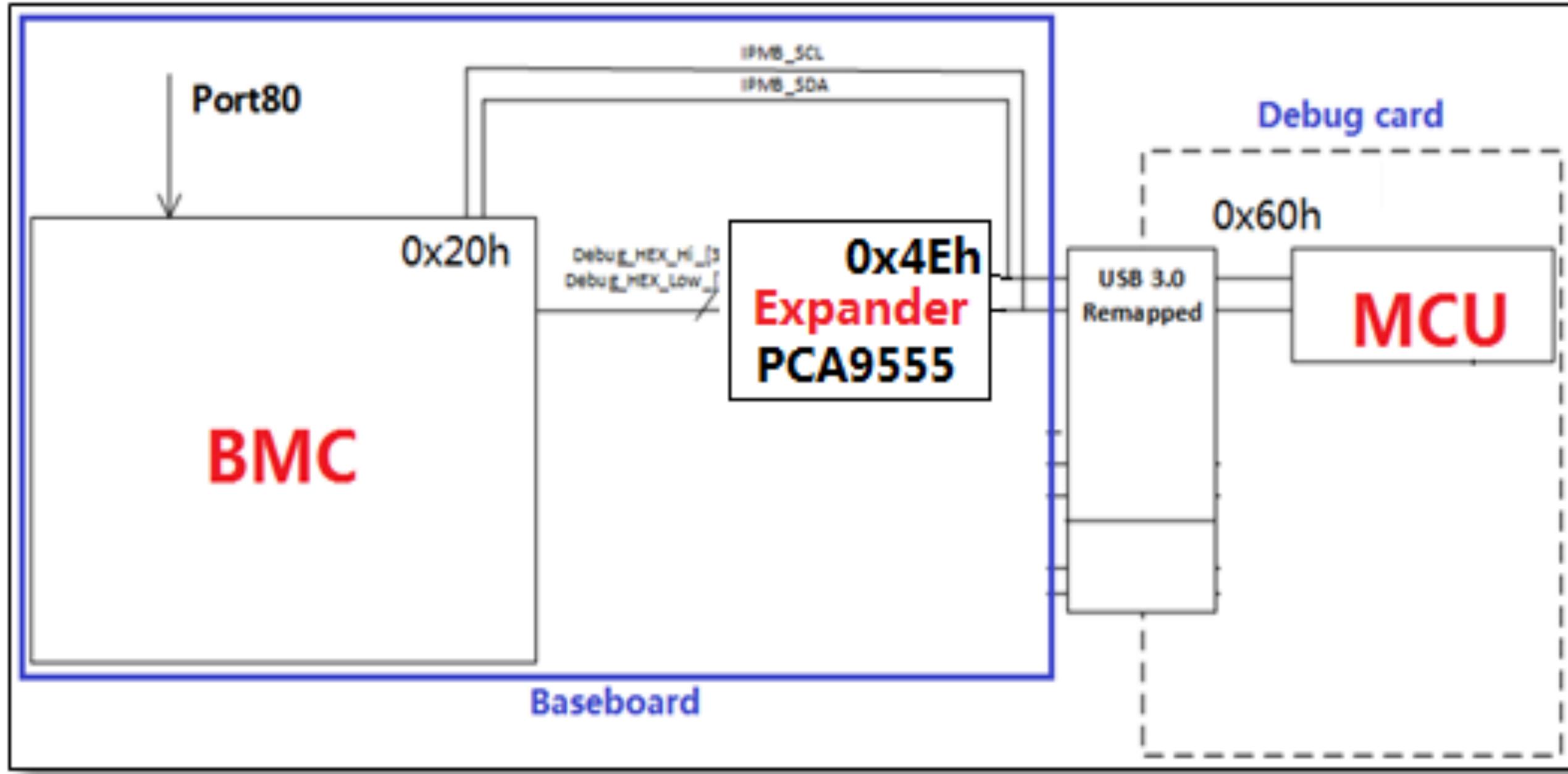
Since Last Summit

- Updates
  - Python2->Python3 Migration
  - Yocto: Krogoth->Rocko
  - Verified Boot
- Features:
  - YosemiteV2 Hot Service
  - OCP LCD Debug Card
  - At-Scale Debug

OCP LCD Debug Card

- **LCD**
  - System Information
  - POST Code
  - GPIO Status
  - SEL
  - Critical Sensors
- **Control**
  - Power
  - Reset
  - Console Selection
  - Hot Service

Host System->Debug Card Interface
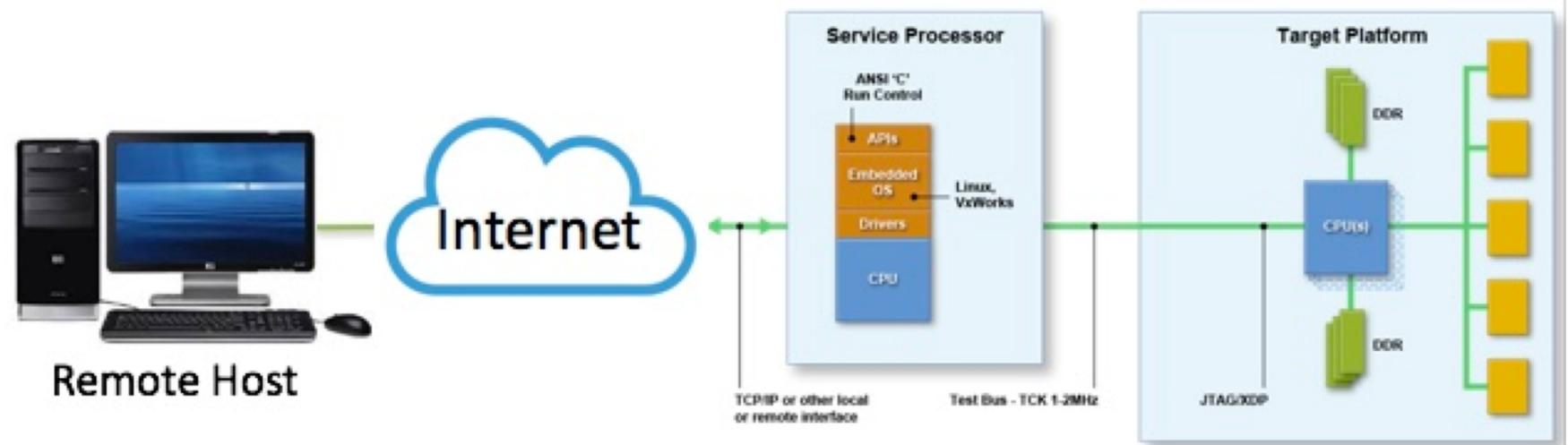
Example Debug Pictures#1

POST Code Status

GPIO Status

Example Debug Pictures#2

Critical Sensor Info

At-Scale Debug

Host

DAL | Run Control

CScripts

Intel® ITP

USB Cable

SUT

intel

Remote Host

Internet

Service Processor

ANSI 'C' Run Control

APIs

Embedded OS → Linux, VxWorks

Drivers

CPU

TCP/IP or other local or remote interface

Test Bus - TCK 1-2MHz

Target Platform

DDR

CPU(s)

DDR

JTAG/XDP
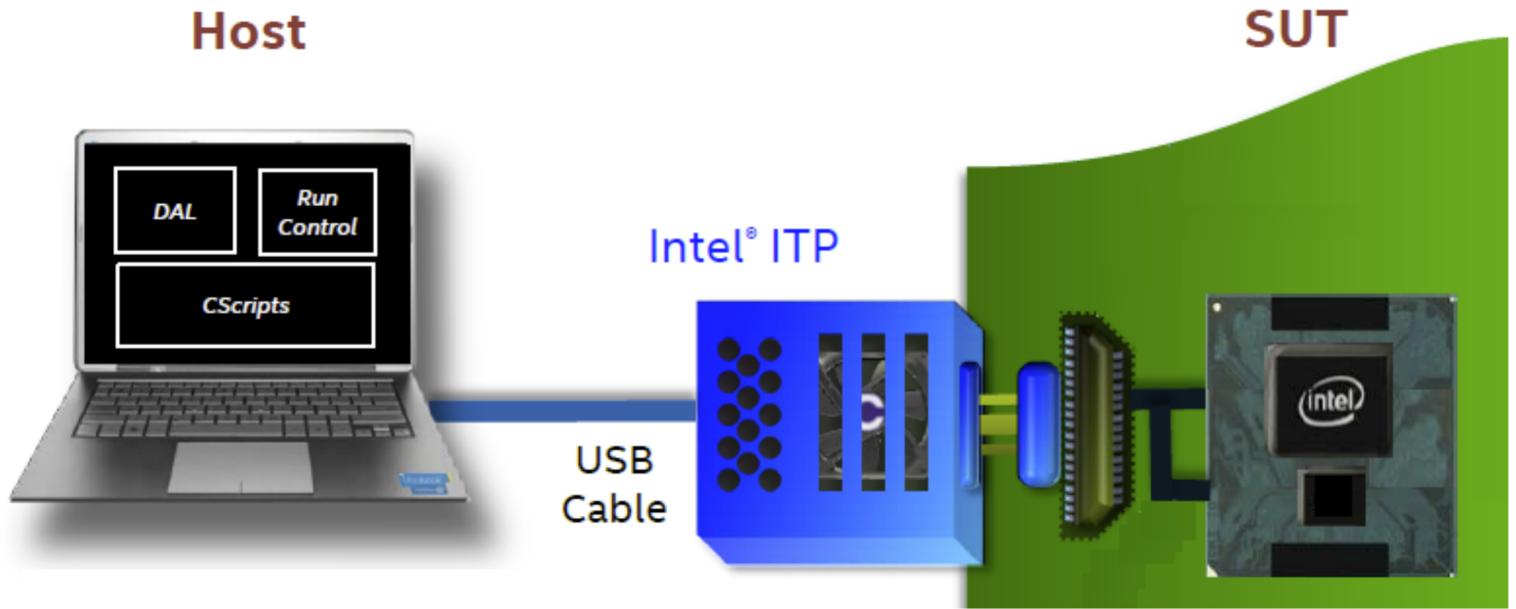
*Image courtesy of ASSET InterTech

OpenBMC@FB

Network

6-Pack

Backpack FC/LC

Backpack CMM

Wedge   Wedge100   Wedge100S

Storage

Knox   Mater   Honey Badger   Lightning   Bryce Canyon

Compute

Freedom   Wind Mill   Leopard   Yosemite   Tioga Pass   YosemiteV2
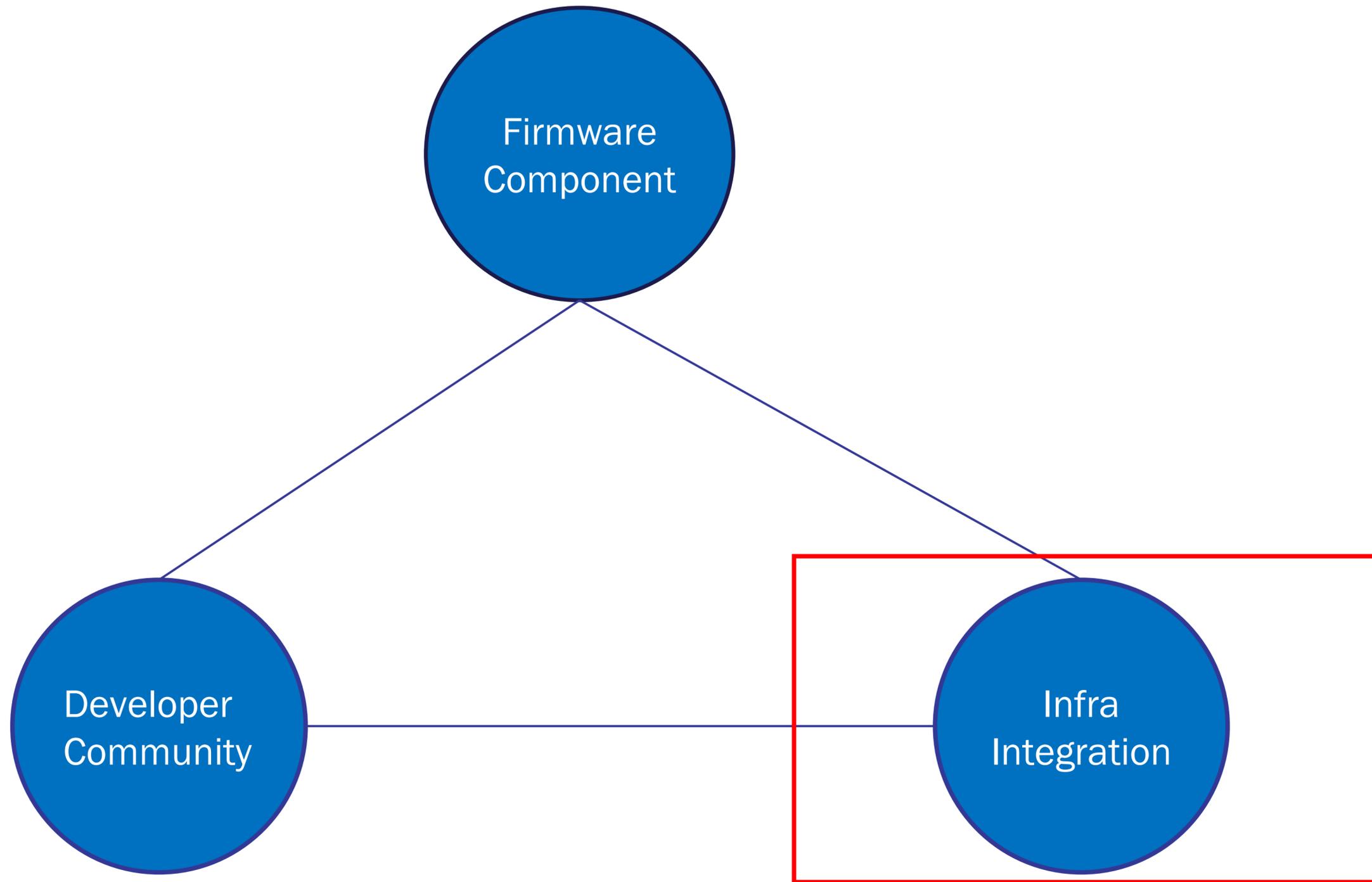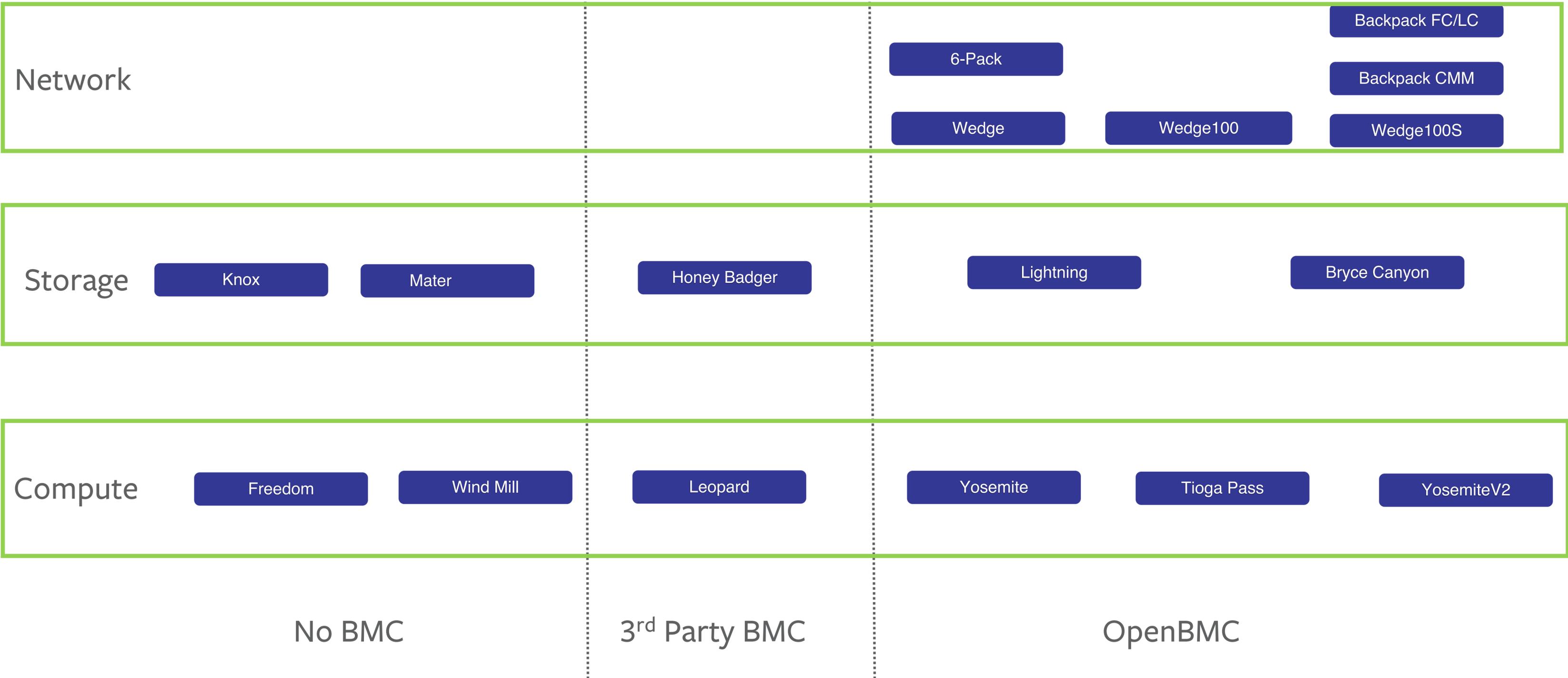
No BMC   3rd Party BMC   OpenBMC

Monitoring, Updates, and Configuration
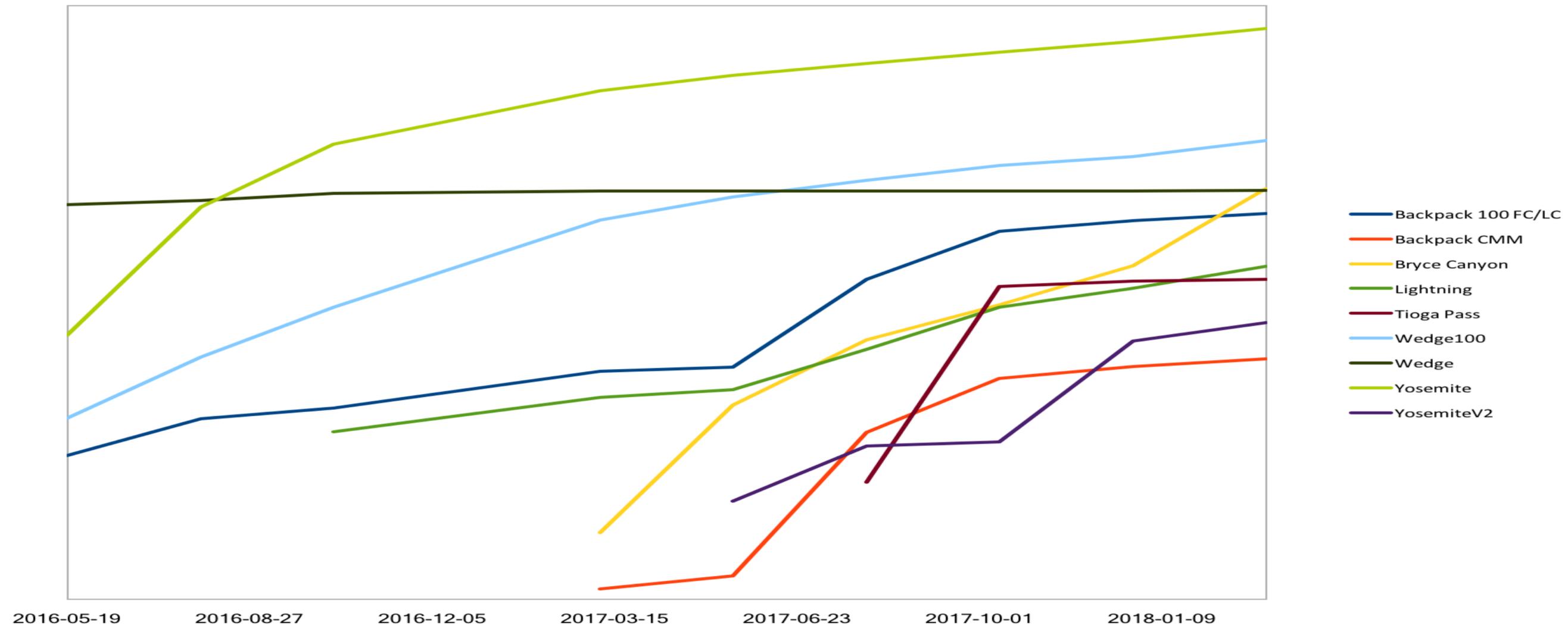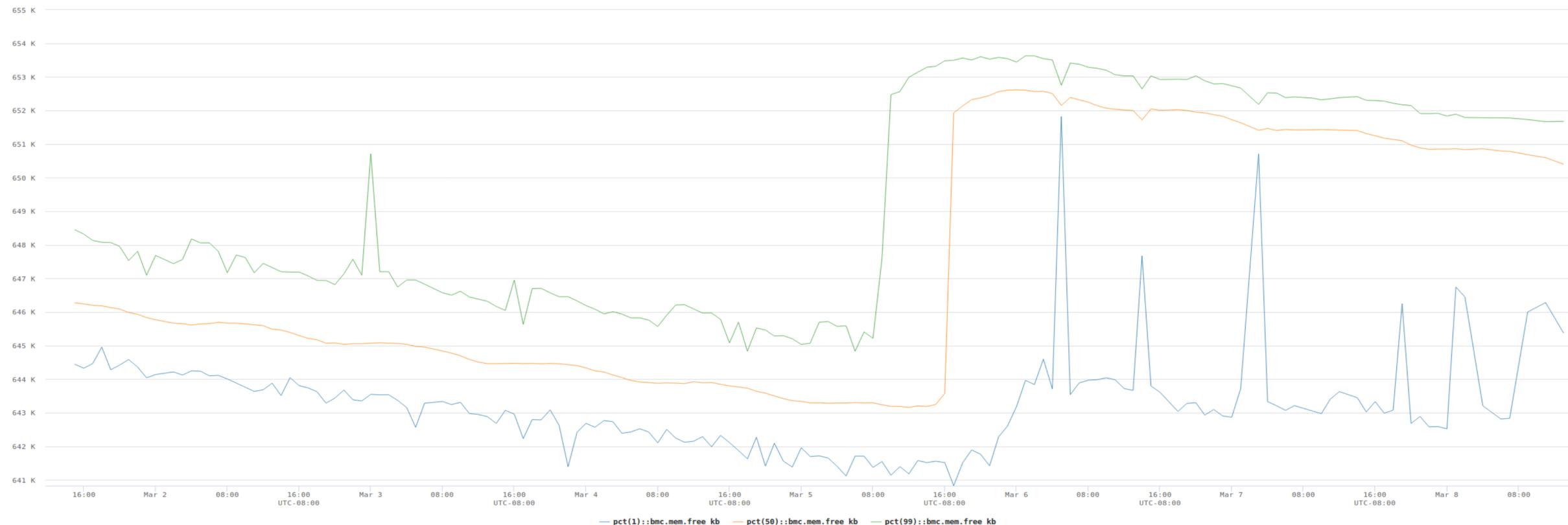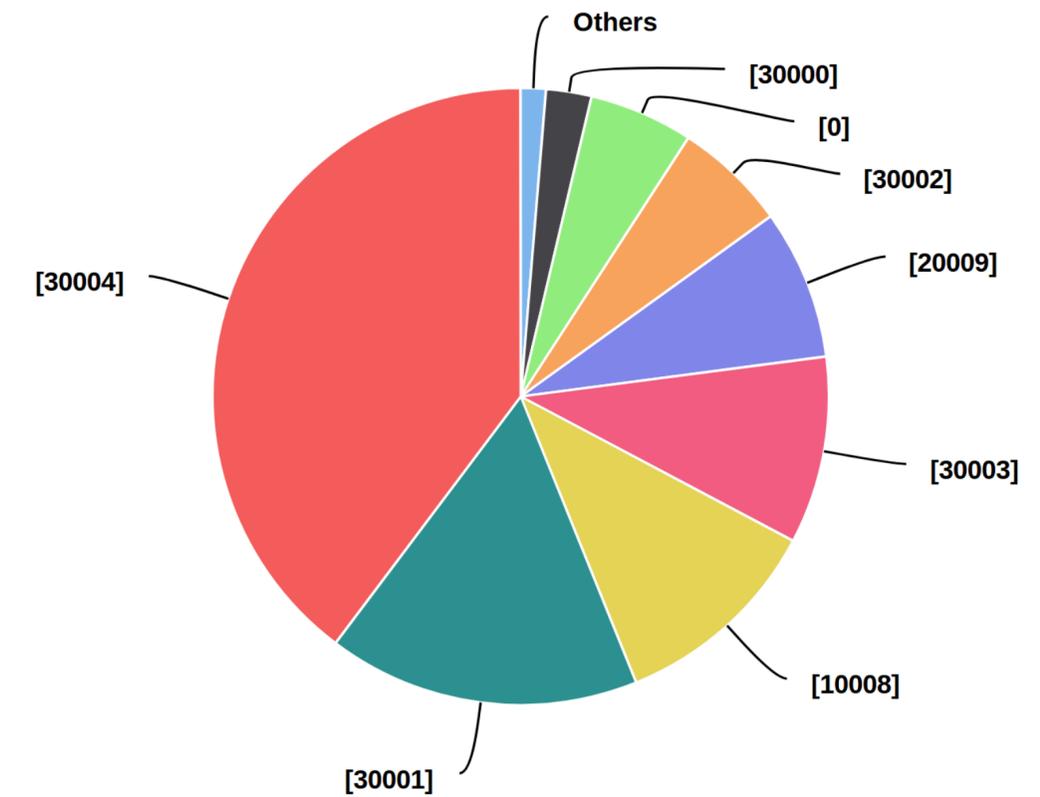
- Growing number and variety of deployed
- Trending away from host-based/in-band implementations
- Leverage OpenBMC as a capable Linux system

Monitoring OpenBMC

- Periodic fleet-wide polling of REST APIs
  - Beringei time-series database
  - Base image version, memory usage
- Syslog pipelines logs
  - Host serial console
  - OpenBMC system logs

Updating OpenBMC

- Improved resilience and speed

  - Improved unit test coverage

  - More prerequisite checks

  - More nohup

  - Less back-and-forth over SSH

  - Default to HTTP (with checksum validation) instead of SCP

- Queue of out-of-date systems computed from version data from monitoring

```
INFO:2018-02-14 16:38:04,733 132496 KiB free memory.
INFO:2018-02-14 16:38:04,894 Validating partitions in u-boot (/dev/mtd0, 0x60000 bytes), env (/dev/mtd1, 0x20000 bytes), kernel (/dev/mtd2, 0x200000 bytes), rootfs
(/dev/mtd3, 0xc00000 bytes), data0 (/dev/mtd4, 0x1100000 bytes).
INFO:2018-02-14 16:38:06,089 0x0060000@0x0000000(u-boot) has known good md5sum.
INFO:2018-02-14 16:38:06,143 data_crc32: 0xaa0307eb
INFO:2018-02-14 16:38:06,645 0x0020000@0x0060000(env) has valid data crc32.
INFO:2018-02-14 16:38:06,816 load_address: 0x40008000, magic: 0x27051956, name: Linux-2.6.28.9, image_type: 2, cpu_architecture: 2, header_crc32: 0x982fa4f5,
creation_time: 2017-02-15, compression_type: 0, data_crc32: 0x86689ef6, entry_address: 0x40008000, os: 5, data_size: 1732472
INFO:2018-02-14 16:38:10,117 0x0280000@0x0080000(kernel) has valid data crc32.
INFO:2018-02-14 16:38:10,171 load_address: 0x40800000, magic: 0x27051956, name: yosemite-image-yosemite-20170215, image_type: 3, cpu_architecture: 2, header_crc32:
0x20588132, creation_time: 2017-02-15, compression_type: 3, data_crc32: 0xc0a56c2b, entry_address: 0x40800000, os: 5, data_size: 12155837
INFO:2018-02-14 16:38:27,367 0x0c00000@0x0300000(rootfs) has valid data crc32.
INFO:2018-02-14 16:38:48,519 0x1100000@0x0f00000(data0) readable.
INFO:2018-02-14 16:38:49,155 Kernel parameters before changes: debug console=ttyS0,57600n8 root=/dev/ram rw
INFO:2018-02-14 16:38:51,820 Kernel parameters after changes: debug console=ttyS0,57600n8 root=/dev/ram rw mtdparts=spi0.0:0x0060000@0x0000000(u-
boot),0x0020000@0x0060000(env),0x0280000@0x0080000(kernel),0x0c00000@0x0300000(rootfs),0x1100000@0x0f00000(data0),-@0(flash0)
INFO:2018-02-14 16:38:53,392 Proceeding with reboot.
```

Configuring OpenBMC

- Host-based Chef and simple tarball solutions in use on different portions of fleet

- Experimented with Ansible

- Working default configurations now included in base images at Yocto build time

```
3 ■■■□□ meta-facebook/recipes-support/ntp/ntp_%.bbappend          View  v

...    ...   @@ -0,0 +1,3 @@
         1   +FILESEXTRAPATHS_prepend := "${THISDIR}/files:"
         2   +
         3   +SRC_URI += "file://ntp.conf"
```

Configuring OpenBMC

- SLAAC provides initial IPv6 address
- DHCPv6 provides assigned IPv6 address, DNS servers, DNS search path
- NTP and rsyslog use DNS short names
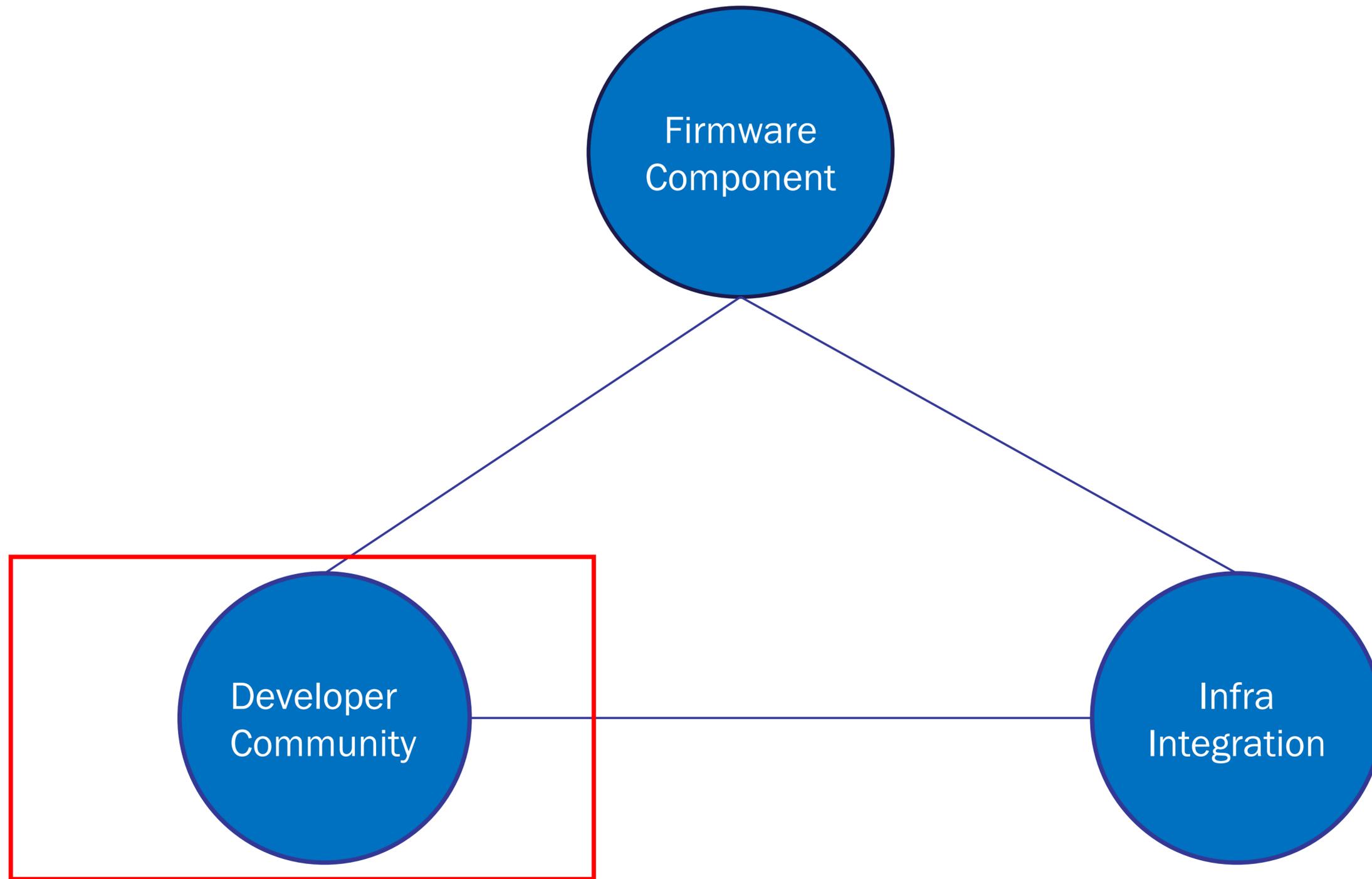
Developer Community

- OpenBMC Distributions
  - https://github.com/openbmc
  - https://github.com/facebook/openbmc
  - Multiple **private** derivative distros!!
- Goal
  - Shared Development
  - Industry standard Interfaces
  - Unified OpenBMC Distribution
- Community Project
  - Major Partners
  - Linux Foundation Project