

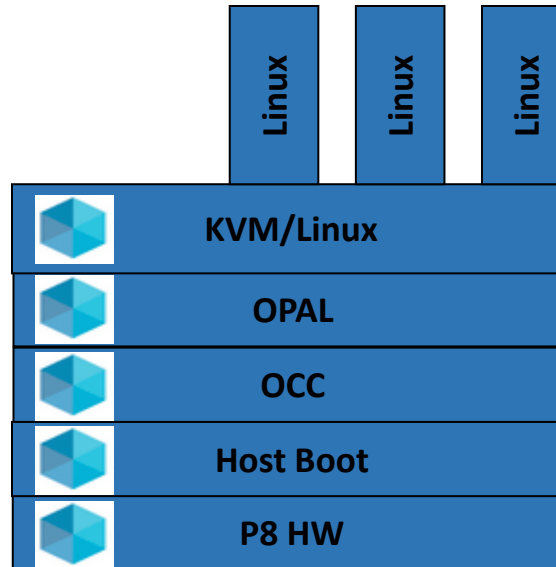


A reference BMC for Power and Beyond

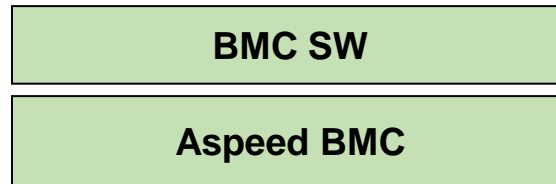
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OpenPOWER is Open

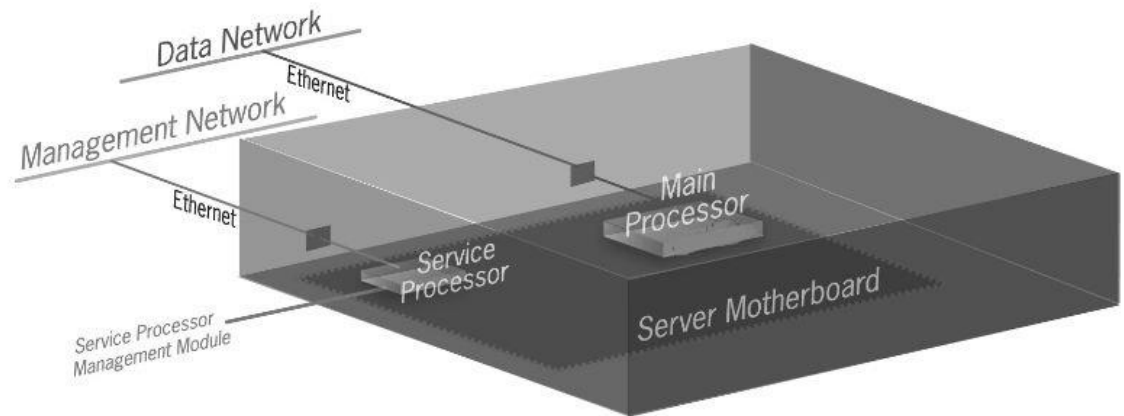


Almost all open



What is a BMC?

- BMC – Baseboard Management Controller
 - System On a Chip
 - Manages Procs, DIMMs, Fans, Power Supplies, etc
 - Reports externally to management software
 - Data and Management separate operators



What is OpenBMC

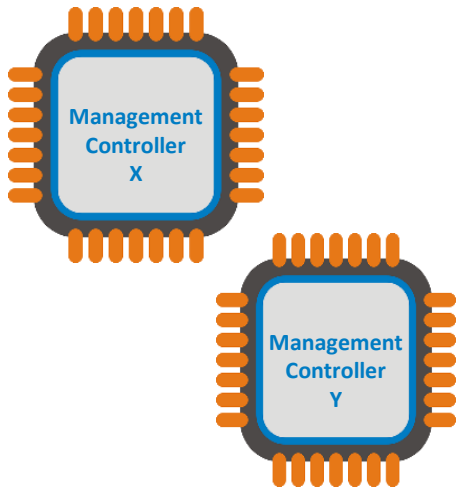
- Provides simplified management of:
 - Environment
 - Inventory
 - Sensors and event logs
- Based on OpenEmbedded technologies built via Yocto
- Embedded Linux stack
 - Linux Kernel 4.6, Yocto 2.1, python, SSH
- Applications communicate via D-Bus
- Users communicate via REST

What is OpenBMC

- 100% compatible with OpenPOWER Hostboot/Opal
 - Aka BIOS
 - <https://github.com/open-power/op-build>
- Can simply be a reference implementation
- Currently runs on...
 - Barreleye, S822LC, S822LC For HPC, P8 Reference
 - Some P9 boards
 - AST2400 and AST2500 BMC hardware

Features of OpenBMC

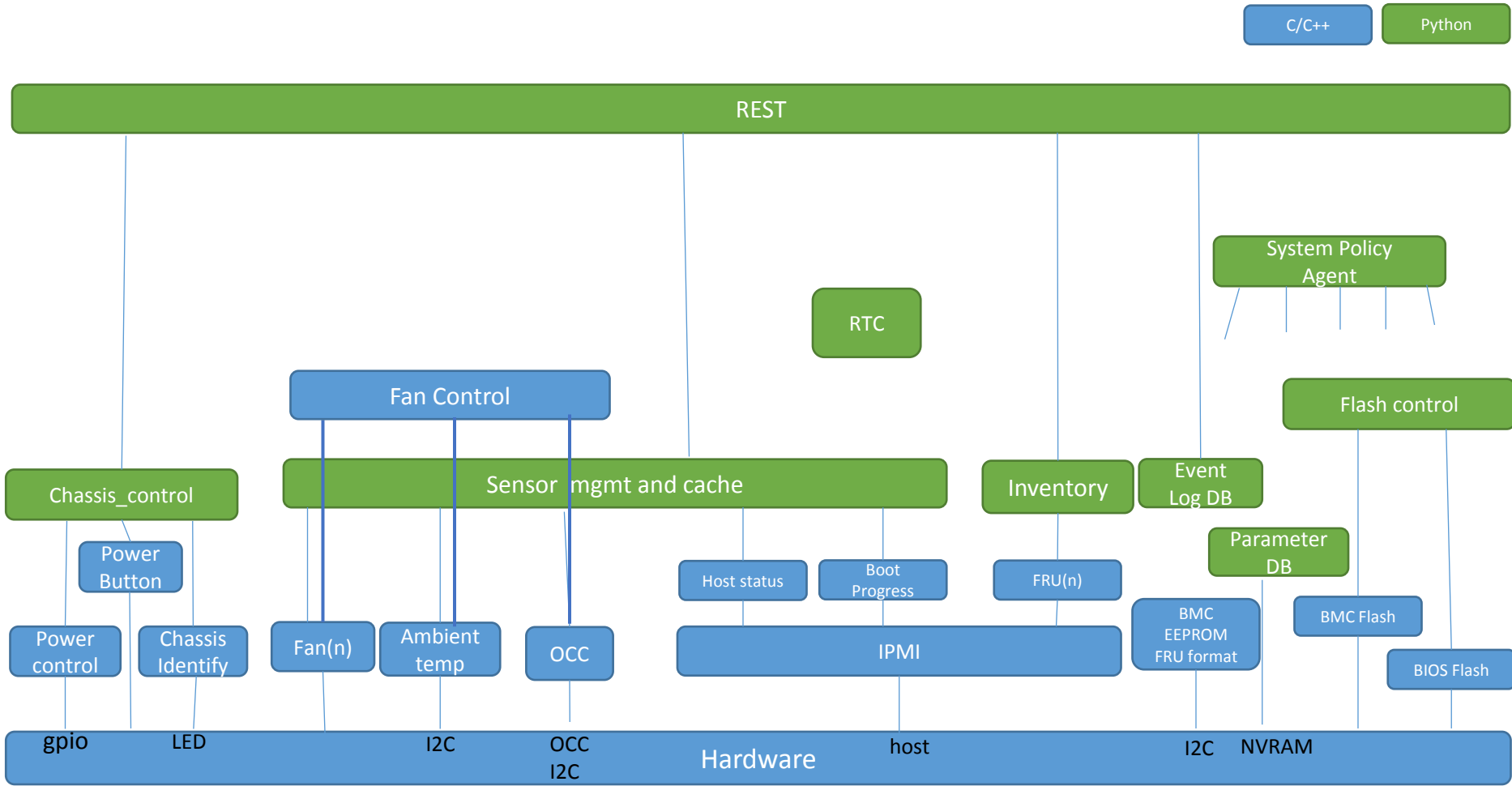
- Dbus is the heart
 - Swap out hardware and User Interfaces
 - Bindings for C/C++, python and more



OpenBMC Dbus Interface Examples

- Attach an interface, get the benefits
 - **Org.openbmc.Service**
 - Obtain information about the service
 - “status”, “information”
 - **Org.openbmc.delete**
 - The Parent interface is delete’able
 - **Org.openbmc.InventoryItem**
 - Properties for all inventory
 - “Fault”, “Present”

Applications



Connect via REST

- <https://github.com/openbmc/docs/blob/master/rest-api.md>
- `<uri>`
Show properties of this uri
- `<uri>/`
Show children
- `<uri>/list`
Recursively show children
- `<uri>/enumerate`
Recursively show children uri's with all properties
- `<uri>/attr/<property>`
Set/Get single property
- `<uri>/action/<method>`
Call a method (POST/PUT)
- `<uri>/schema`
Show the methods and properties

Lets see some examples!!!

- Login

- `curl -c cjar -b cjar -k -H "Content-Type: application/json" -X POST https://<ip>/login -d "{\"data\": [\"root\", \"OpenBmc\"] }"`

- Temperatures ok?

- `curl -c cjar -b cjar -k https://<ip>/org/openbmc/sensors/temperature/ambient`

- Power On the Server

- `curl -c cjar -b cjar -k -H "Content-Type: application/json" -X POST https://<ip>/org/openbmc/control/chassis0/action/powerOn -d "{\"data\": [] }"`

Where is this code?

- Github repository:
 - <https://github.com/openbmc>
- Get Started - Readme
 - <https://github.com/openbmc/openbmc>
- Schema
 - <https://github.com/openbmc/docs/blob/master/dbus-interfaces.md>

No Hardware Required

```

QEMU
Phosphor OpenBMC (Phosphor OpenBMC Project Reference Distro) 0.1.0 qemuarm tty1
qemuarm login:          Starting Network Service...
[ OK ] Started Phosphor OpenBMC host IPMI to DBUS example implementation.
[ OK ] Started Serial Getty on ttyAMA0.
[ OK ] Started Phosphor OpenBMC QEMU application example.
[ OK ] Started Phosphor OpenBMC fan management daemon.
      Starting SSH Key Generation...
[ OK ] Started Serial Getty on ttyAMA1.
[ OK ] Reached target Login Prompts.
      Starting Login Service...

Phosphor OpenBMC (Phosphor OpenBMC Project Reference Distro) 0.1.0 qemuarm tty1
qemuarm login:

```

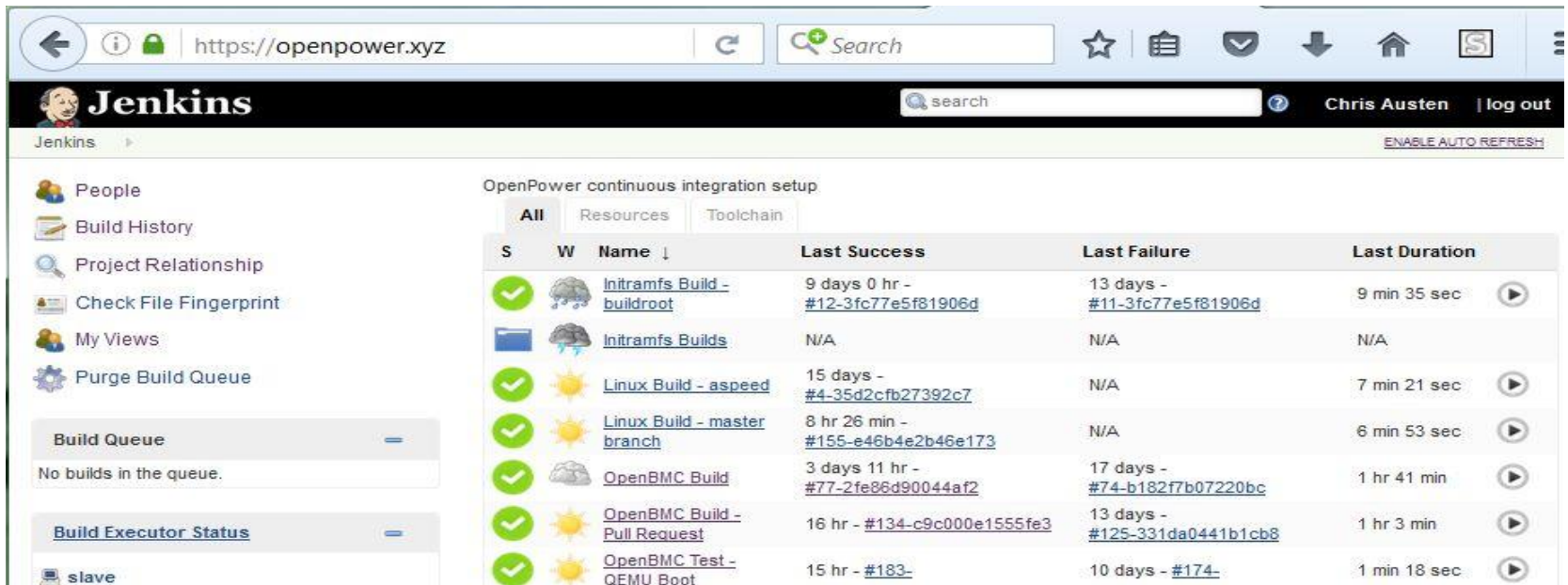
```

causten@causten-VirtualBox: ~
causten@causten-VirtualBox:~
$ curl -k https://192.168.7.2/org/openbmc/
{
  "data": [
    "/org/openbmc/NetworkManager",
    "/org/openbmc/HostIpmi",
    "/org/openbmc/examples",
    "/org/openbmc/HostServices",
    "/org/openbmc/records"
  ],
  "message": "200 OK",
  "status": "ok"
}causten@causten-VirtualBox:~
$ ssh root@192.168.7.2
root@192.168.7.2's password:
root@qemuarm:~#

```

- OpenBMC simulation does not require hardware
- Useful for non hardware specific applications.
 - Event Logs, userid creation/policies
 - REST interactions
 - Early POC dev

Automated Build Verification



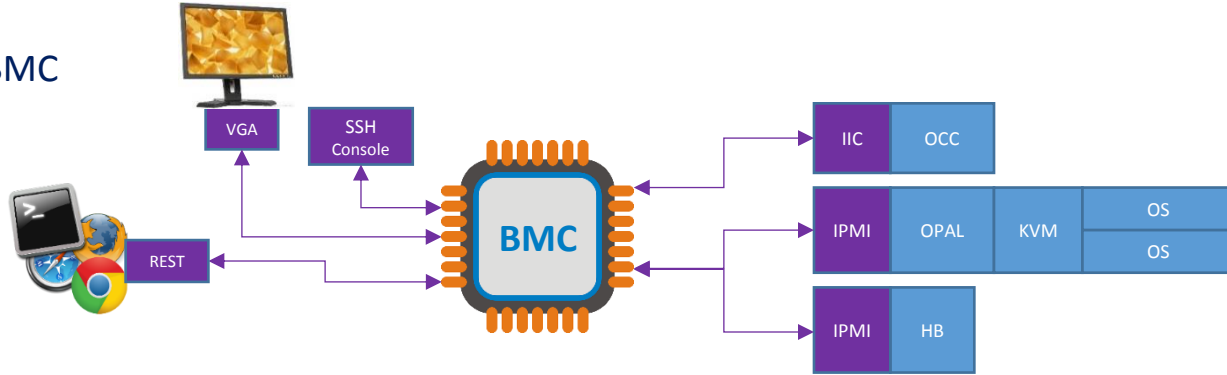
The screenshot shows the Jenkins web interface. The browser address bar is <https://openpower.xyz>. The Jenkins logo and name are visible at the top left. The main content area displays a table of build jobs under the heading "OpenPower continuous integration setup".

S	W	Name ↓	Last Success	Last Failure	Last Duration
✓	☁	Intramfs Build - buildroot	9 days 0 hr - #12-3fc77e5f81906d	13 days - #11-3fc77e5f81906d	9 min 35 sec
	☁	Intramfs Builds	N/A	N/A	N/A
✓	☀	Linux Build - aspeed	15 days - #4-35d2cfb27392c7	N/A	7 min 21 sec
✓	☀	Linux Build - master branch	8 hr 26 min - #155-e46b4e2b46e173	N/A	6 min 53 sec
✓	☁	OpenBMC Build	3 days 11 hr - #77-2fe86d90044af2	17 days - #74-b182f7b07220bc	1 hr 41 min
✓	☀	OpenBMC Build - Pull Request	16 hr - #134-c9c000e1555fe3	13 days - #125-331da0441b1cb8	1 hr 3 min
✓	☀	OpenBMC Test - QEMU Boot	15 hr - #183-	10 days - #174-	1 min 18 sec

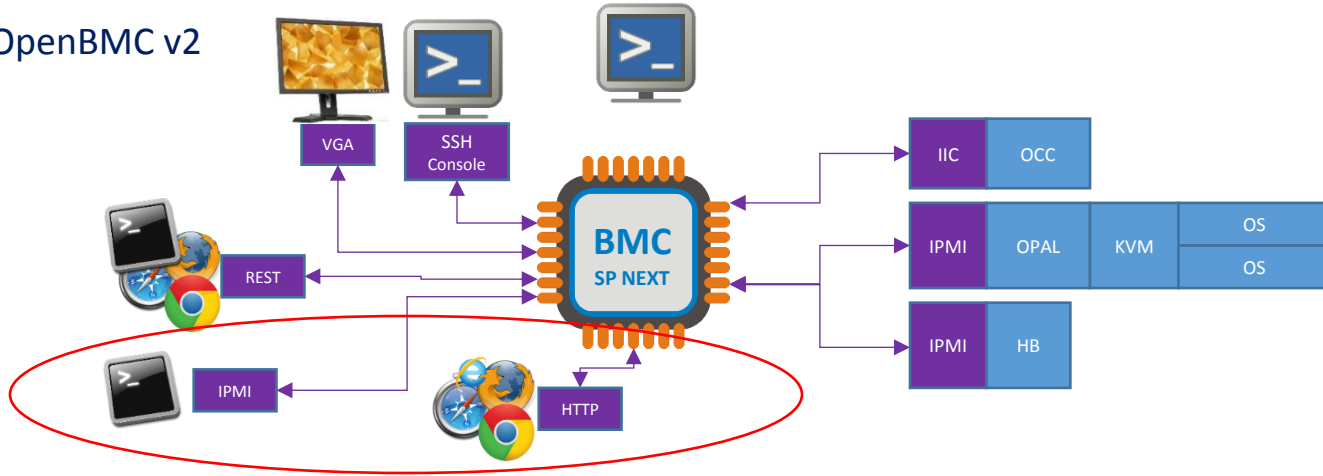
- <https://github.com/openbmc/openbmc>
 - Code is available to everyone
- <https://openpower.xyz>
 - Automated Jenkins server
 - Every commit... tested

Interfaces to Cover for P9

OpenBMC



OpenBMC v2



Features we are developing

- Error and Trace Logs
- Code Update
- SLP Support
- OpenFSI debug support
- Virtualized interface to host
- “out of band” IPMI
- User Interface ← *looking for Sponsor Users*

Where to next?

- POWER9 HPC IBM server
- POWER9 Ziaus
- POWER9 Reference Server for OpenPOWER
- Your server?

Join Us

- Possible areas feature enhancements...
 - OpenStack Ironic
 - Redfish
 - Web User Interface
 - Remote IPMI
 - Energy Scale utilities
 - Designs beyond the data center
 - QEMU enhancements for board
 - Documentation

- Sponsor Users needed

Thank You

- Chris Austen
 - austenc@us.ibm.com
- Code:
 - <https://github.com/openbmc>
- IRC
 - IRC Freenode.net #openbmc

