OPEN POSSIBILITIES.

Yosemite v1 Mono Lake Platform Enablement - “Open All The Way Down”
Yosemite v1 Mono Lake Platform Enablement – “Open All The Way Down”

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Yosemite v1 Chassis

- Designed by Facebook
- Consists of 4 slots in a chassis called Yosemite allowing up to 4 servers per sled.
- Designed specifically for Facebook datacenters for hyperscale workload
- Contributed to the Open Compute Project in 2015 -
Yosemite v1 Chassis

Facebook designs are now accessible for everyone – Thank you Facebook!


A rack of Yosemite v1 is 48 nodes providing 192 discrete CPUs + cores
Mono Lake Platform

Mono Lake platform consists of Intel Xeon D-1500 Series "Broadwell" processors.

Comes with FB OpenBMC.

A released but immature Intel FSP and closed source UEFI BIOS Firmware.

Legacy FSP Projects

<table>
<thead>
<tr>
<th>FSP Project Name</th>
<th>Directory Name</th>
<th>FSP Specification Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>5th Generation Intel® Core™ processors and chipsets (formerly Broadwell)</td>
<td>BroadwellFspBinPkg</td>
<td>v1.0</td>
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<tr>
<td>Intel® Xeon® Processor D Product Family (formerly Broadwell-DE)</td>
<td>BroadwellDEFspBinPkg</td>
<td>v1.0</td>
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Platform Challenges

Moving from a single purpose hyperscale platform to a general-purpose computing platform.

Circularity gives us the motivation to do this work and ultimately the community benefits.

An open platform that can meet computing needs for most business sectors [sans the Intel FSP].
Endless Possibilities

Different Form Factors

High scalability

OCP everywhere
Host Firmware

Intel Xeon D-1500 Series “Broadwell-DE” SoC, 16 cores/32 threads

coreboot integrated with a custom FSP and LinuxBoot payload

Replaces the original closed source UEFI BIOS firmware

Note: The SPS/ME firmware is only available from Intel under NDA
Coreboot

Initial implementation for Mono Lake was previously available on coreboot.org on the 4.11 branch

- Was not in a production-worthy state

Fixes and Enhancements:

- Ported in SMM handler v2 code from master
- Ported in IMPI KCS driver bugfixes from master
- Numerous other IMPI fixes and enhancements
- Cleaned up ACPI tables
- Updated to use latest microcode
- Cleaned up devicetree and Kconfig

All code has been upstreamed to coreboot.org on the 4.11 branch
Custom Broadwell-DE FSP

| Public FSP from Intel only supports up to 8 cores / 16 threads | SysPro is licensed by Intel to build and distribute custom FSPs | Our custom FSP supports up to 16 cores / 32 threads | Also includes fixes to a few other issues that we’ve identified |

Note: Our FSP is not available publicly per Intel license terms.
LinuxBoot (U-root) Payload

Enhancements:

Included systemboot to support VPD, IMPI, BMC EOP, etc.

Added systemboot support for generic booters
  • boot (in place of localboot)
  • pxeboot (in place of fbnetboot)

Added support for additional file systems: btrfs, xfs, ext4

Note: Requires larger BIOS region to fit everything

Upstreaming still in progress
## BMC Firmware

| ASPEED AST1250 BMC in Yosemite v1 chassis | Yosemite v1 chassis can hold up to 4 Mono Lake server cards | Firmware based on Facebook’s OpenBMC implementation |

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Firmware Summary

Open firmware solutions (or as open as they can be) for Mono Lake

See Mono Lake systems booting in the OCP Experience Center
Call to Action

→ Will Submit to OCP for review next week!

→ Looking for feedback through code reviews and testing
Open Discussion