

Open Source Firmware status on AMD platforms 2023 - 4th edition





FOSDEM'23 - Open Source Firmware, BMC and Bootloader
devroom

Michał Żygowski





Michał Żygowski
Firmware Engineer

-  [@_miczyg_](https://twitter.com/_miczyg_)
-  michal.zygowski@3mdeb.com
-  linkedin.com/in/miczyg
-  facebook.com/miczyg1395
- Braswell SoC, PC Engines and Protectli maintainer in coreboot
- OpenPOWER System Software Technical Workgroup chair
- dedicated to the open-source firmware since 2017
- interested in advanced hardware and firmware security features



- coreboot licensed service providers since 2016 and leadership participants
- UEFI Adopters since 2018
- Yocto Participants and Embedded Linux experts since 2019
- Official consultants for Linux Foundation fwupd/LVFS project since 2020
- IBM OpenPOWER Foundation members since 2020

- **Puma** - Steppe Eagle core architecture, AMD 2nd Gen G series embedded SoCs (PC Engines apu2)
- **Bulldozer** - Interlagos core architecture, AMD Opteron 6200 series (server), KGPE-D16
- **Piledriver** - Abu Dhabi core architecture, AMD Opteron 6300 series (server), KGPE-D16
- **Piledriver** - Trinity core architecture, AMD A{4,6,8,10} series APUs(laptop), Lenovo G505s
- **Picasso** - Zen+ core architecture, Ryzen 3000 APU series with RX Vega (desktop & laptop)
- **Cezanne** - Zen3 core architecture, Ryzen 5000 series (desktop & laptop)
- **Mendocino** - Zen2 core architecture, Ryzen 7000-series Mobile CPUs with RDNA2 graphics, previously **Sabrina**, as Mendocino name was embargoed
- **Phoenix** - Zen4 core architecture, Ryzen 7000-series Mobile CPUs with RDNA3 graphics, previously **Morgana**, as Phoenix name was embargoed
- **Glinda** - very new and very little information about it, also probably a temporary codename

- Picasso and Cezanne complete and usable (~~Cezanne FSP not public yet~~), **FSP already published**
- PSP BIOS A/B recovery in amdfwtool support WIP:
 - [amdfwtool: Add support for AMD's BIOS recovery feature](#) (probably duplicates the below patch)
 - [amdfwtool: Add support for AMD's BIOS A/B recovery feature](#) (merged)
- [PSP FW extraction in amdfwtool support WIP](#) (still not merged)
- [First patches for Sabrina SoC](#)
- Community sentiment in 2021 was rather more on negative side then positive regarding the old AMD open platforms already (see [coreboot mailing list](#) and [leadership meeting minutes](#))
 - more on that matter later in the presentation

2022:

- new coreboot releases come with new feature/option deprecation announcements
- many older AMD boards do not implement the newest coreboot platform initialization interfaces (features/options) and as a result are getting dropped from top of tree
- thanks to the companies like PC Engines (who supported open source development through 3mdeb) and a few coreboot developers like Kyösti Mälkki, the platforms kept living in coreboot
- family14 in review and family16 support is upstream for the newest interfaces
- Trinity and Kabini lack support for the new interfaces

2023:

- another year passed and even more old AMD platforms have been hit by deprecations
- family14, Trinity and Kabini removed from the master branch and moved to 4.18 branch
- boards affected:
 - PC Engines apu1
 - MSI MS-7721 (FM2-A75MA-E35)
 - Lenovo AMD G505s
 - HP Pavilion m6 1035dx
 - ASUS F2A85-M (LE, PRO), A88XM-E and AM1I-A
 - ASRock E350M1 and IMB-A180
 - and others

- despite 3mdeb's best efforts family14 (used by PC Engines apu1) did not land in tree before new release, even though the first patches were sent in May 2021!
 - the patches also covered AMD Trinity (used by Lenovo AMD G505s) for which 3mdeb tried to support community but had no hardware to test on
- at this point all old AMD platforms are doomed (sooner or later), PC Engines apu2 (family16) which got merged will live for some time on coreboot master branch
- KGPE-D16 first patches covering bootblock support to bring back the platform to master branch have been sent on February 2022
 - There are over 50 patches here and this is just a beginning!
 - Unfortunately we lack reviewers

- AMD Cezanne pretty much stabilized, **two non-Chromebook laptops** sent for review from Starlabs:
 - [mb/starlabs/cezanne: Add Cezanne Byte Mk I](#)
 - [mb/starlabs/cezanne: Add Cezanne StarBook Mk VI variant](#)
 - The blob situation does not allow to build a working image though
- AMD Mendocino and Phoenix still in development with the former being in more advanced state, FSP not published yet
- AMD Glinda has zero public information about the processors and the development on coreboot review system has just begun



[Ryzen photo](#) by Fritzchens Fritz, CC0 1.0 Universal Public Domain Dedication

- Starlabs could build coreboot firmware for their AMD laptops thanks to the publication of Cezanne FSP to [amd blobs](#) repository in September 2022
- [PSP blobs](#) are also present but not all, certain blobs are provided by mainboard code in hex text files, i.e. APCB which is responsible for defining memory topology and configuration to PSP, and these are probably problematic here
- License for FSP and PSP blob is also available on the [repository](#). It permits redistribution in binary form unmodified, prohibiting disassembly, decompilation, etc.
- The FSP publication interval is quite long (1.5 a year between Picasso FSP and Cezanne FSP release to public, and 1.25 a year after Cezanne APU release FSP has been published)

AMD server status - last year vs now



2022:

- No updates about the OSF on servers unfortunately. Neither on oreboot
- OSFW Slack channels you can find concerning information about AMD OSF support on servers.

2023:

- Some new initiative from Oxide on OSF for AMD Milan (EPYC 7002 series) server platform presented at [OSFC 2022](#)
- Nothing new on official OSF support on servers from AMD

[AMD EPYC photo](#) by Raysonho @ Open Grid Scheduler / Grid Engine, CC0, via Wikimedia Commons

- It is pretty difficult to keep old AMD boards in upstream without a strong support from the silicon vendor or a big corporation backing the maintainership efforts
 - Continuous work is required to get the code to good quality and tested
 - Old AMD boards are simply unable to survive in such conditions and will naturally die/move to a branch
- We think that lack of strategy for long-term support, that can keep AMD in the top of tree largely decrease value of project for whole community.
- Dasharo Community is open for any outcast from coreboot project. We working hard to create a sustainable strategy.
- 3mdeb had often disagreed with the current coreboot strategy on leadership meetings. Crowdfunding and other ideas that could solve the problem were rejected. For more information please visit [coreboot leadership meeting minutes](#)

Announcement about PC Engines open-source firmware support

We (3mdeb) regret to announce the end of PC Engines' sponsorship for open-source firmware. Our commitment to hardware support remains strong through Dasharo open-source firmware distribution. We would like to shift to releases and feature set driven by community support. Full announcement: https://docs.dasharo.com/variants/pc_engines/post-eol-fw-announcement/

To ensure stable and reliable firmware updates, we're exploring a subscription model. Your input is crucial! Please take our [survey](#).

- We welcome all coreboot outcasts in Dasharo
 - Of course it will be community-driven effort and the work would be done in free time thus the releases may not be that frequent
 - It seems to be the only meaningful way to keep old AMD platforms alive and benefit from new coreboot features
- Value offered by Dasharo:
 - [high quality documentation](#) explaining: initial deployment, firmware update and recovery
 - hardware and software tools available
 - active and helpful community on Matrix
 - binary releases
 - transparent validation
- Sign up to [Dasharo newsletter](#) to get up to date information about supported platforms and the their status

- Would gladly talk more about the AMD open-source firmware support after FOSDEM with interested people
 - Let's sync via FOSDEM Matrix
 - Or simply join Dasharo Matrix:
<https://matrix.to/#/#dasharo:matrix.org>
- 3mdeb will also hold two events in March:
 - Dasharo User Group forum event which will include a variety of discussions on different topics related to Dasharo
 - Dasharo Developers vPub as a follow up of DUG event where developers can discuss topics that are of interest to them in a more relaxed environment
 - more details in [this blog.post](#)

Q&A



Thank you