

Open Source BIOS at Scale

We gave it a try, it worked. You can jump in!

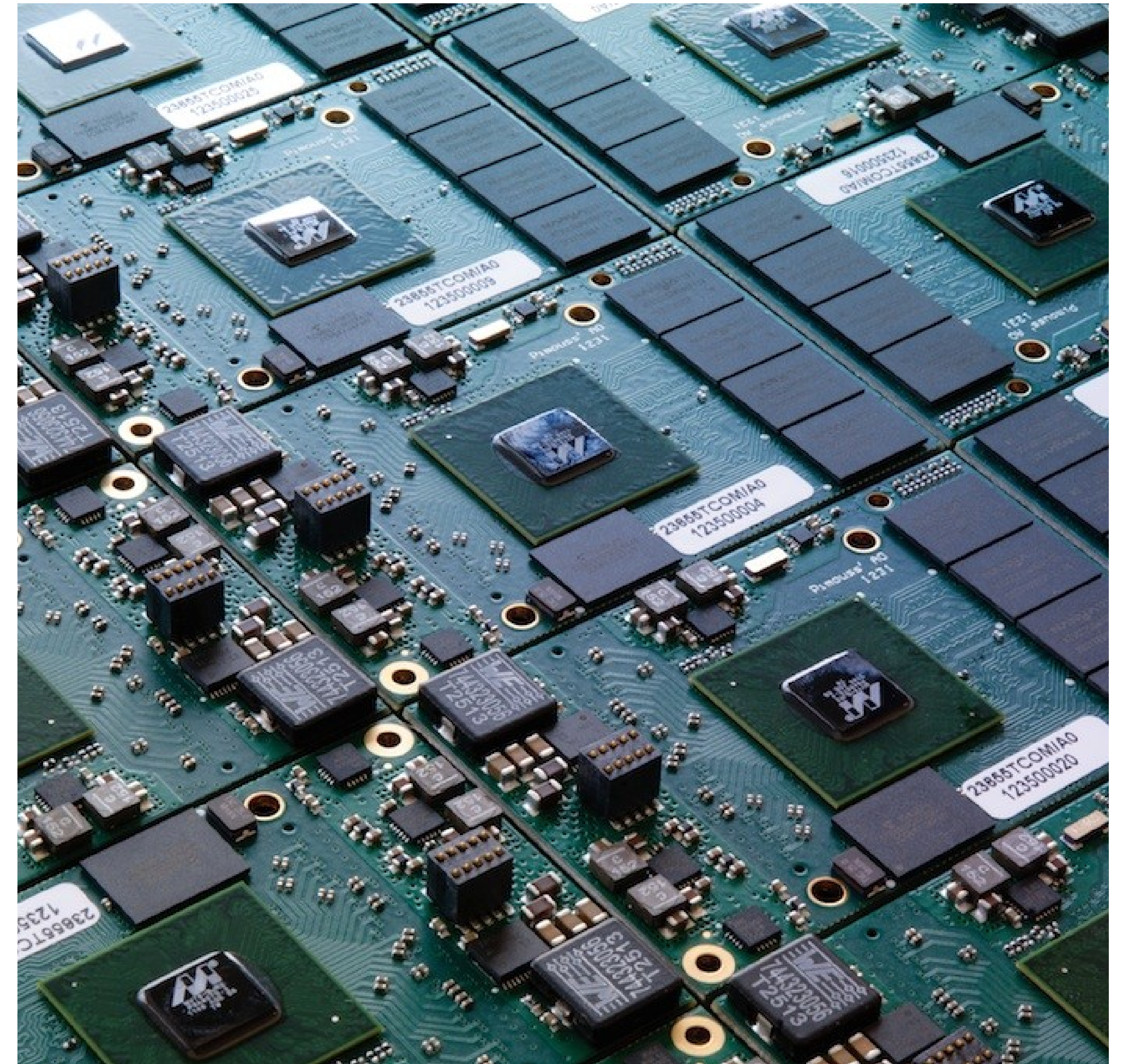
Hosting: Online, Dedibox

Cloud: Scaleway

We design our own servers

- ARM 32: C1 cloud offer
- X86: Intel Avoton C2000
C2 cloud offer
Dedibox SC/XC 2016
- X86: Intel Denverton C3000

Scaleway is growing and hiring 



Develop an Open Source BIOS

We design our own servers : a custom BIOS is required

- Configure the SoC / board
- PXE Boot
- Local drive Boot
- Provide ACPI, SMBios tables ...
- Interface with our BMC
- Secure update process
- Remote console (Serial)

Why Open Source

We tried BIOS vendors **but**:

- Some sources + some binaries
- Almost no documentation
- Pay extra for support
- Slow support
- Pay a fee by devices

➔ **Locked: no source, poor support!**

You 'just' get: Intel's Init + UEFI + CSM (legacy) + a nice menu

Intel's CRB reference BIOS

- Not allowed in production

No solution covers all our needs

- BMC interface not covered

➔ **Some development was needed!**

**We design our own servers : let's
build our own BIOS**

coreboot + FSP + TianoCore



coreboot

coreboot: community driven

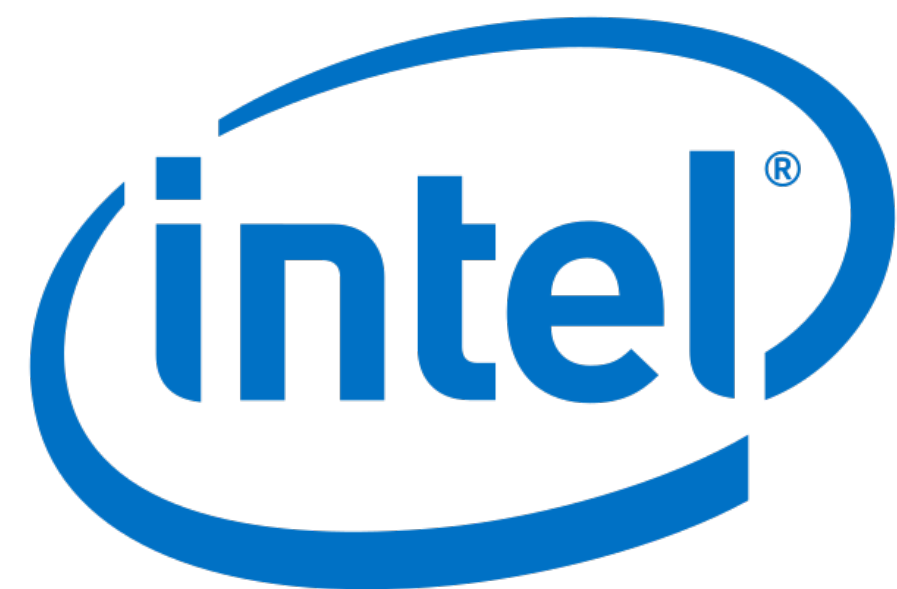
- Early init
- Multiprocessor init
- ACPI, SMBios tables...

Firmware Support Package: by Intel

- MRC
- Silicon Init



tianocore



TianoCore: (Intel's) Open Source

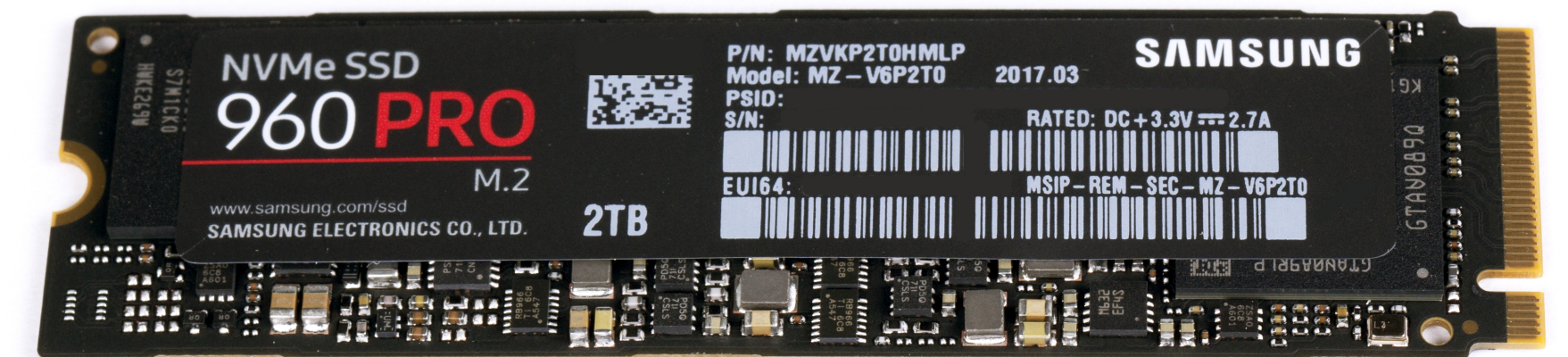
- UEFI implementation

So we took everything from
Intel and the community,
compiled it and it worked!

Of Course not!

Just a few fixes

- CPU Cores were **stuck at 800MHz**
- Bad DDR4 SMBIOS info from FSP MRC code
- **Undocumented** GPIO Lock Interface
- Missing ACPI Tables (P-States, T-States and C-States)
- PCIe NVMe + FSP **initialization failure**



Pros / Cons

Cons

- A -little- longer to develop
- No nice graphical menu
- No legacy BIOS (seabios as CSM)
- Intel's bugs hits us instead of our BIOS vendor
- No BIOS professional support, but no fee :)
- Early contribution is hard:
Intel NDA + porting strategy

Pros

- 95% of existing code
- It fits our needs!
- Perf inline with reference BIOS
- Extra features with our BMC
 - UART Verbosity rate config
 - Low level Flash Protection
- Discussing with Intel support = influence on release content
ex: MRC verbosity

Conclusion

It was an investment, but it was a useful one!

We're happy to have full stack control.

We are producing tens of thousands
of servers with this BIOS!

Questions?

So when will *you* do it?

FOSDEM 2018

Open Source Bios at Scale

Julien Viard de Galbert <jviarddegalbert@online.net>

Looking for an amazing job? Join us NOW ! <https://careers.scaleway.com/>