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"Last Mile" Barriers to Removing Legacy BIOS

Fall 2017 UEFI Plugfest

October 30 – November 3, 2017

Presented by Brian Richardson (Intel Corporation)

Agenda

- What is the “Last Mile”?
- Wait … we’re still talking about BIOS? Why?
- Advantages using UEFI Class 3
- Areas of Focus
- Call to Action

"Last Mile" Barriers to Removing Legacy BIOS

What is the “Last Mile”?

Last mile: the last step of delivering infrastructure to customers…

"Last Mile" Barriers to Removing Legacy BIOS

Wait … we're still talking about BIOS? Why?

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There is still a reliance on 16-bit BIOS via the Compatibility Support Module (CSM)

1. People still use software that depends on 16-bit BIOS runtime
2. Power-users “disable UEFI” to bypass secure boot or setup multi-OS boot

Reminder: UEFI System Classes

UEFI Class 0

- Legacy BIOS
- No UEFI or UEFI PI interfaces

UEFI Class 1

- Uses UEFI/PI interfaces
- Runtime exposes only legacy BIOS runtime interfaces

UEFI Class 2

- Uses UEFI/PI interfaces
- Runtime exposes UEFI and legacy BIOS interfaces

UEFI Class 3

- Uses UEFI/PI interfaces
- Runtime exposes only UEFI interfaces

… and there's one "unspoken class"

UEFI Class 0

- Legacy BIOS
- No UEFI or UEFI PI interfaces

UEFI Class 1

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- Runtime exposes only legacy BIOS runtime interfaces

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Enabling secure boot essentially creates another UEFI Class

UEFI Class 3+

- Uses UEFI/PI interfaces
- Runtime exposes only UEFI interfaces
- **UEFI Secure Boot ON**

Why are BIOS & CSM still a thing?

- One specific tool doesn’t work with UEFI, so users turn on the CSM as a fix
  (as we say in Georgia, duct tape is cheaper than welding)

- Some users blame UEFI or Secure Boot whenever something doesn’t work
  (if you don’t believe me, search for “UEFI” on Twitter)

Issues Relying on 16-bit Legacy

Security Risks

- No standards for secure boot or signed code execution

Complicates Validation

- Requires two validation paths (CSM ON & CSM OFF)

Supporting Modern Technology

- New technologies may not provide backward compatibility

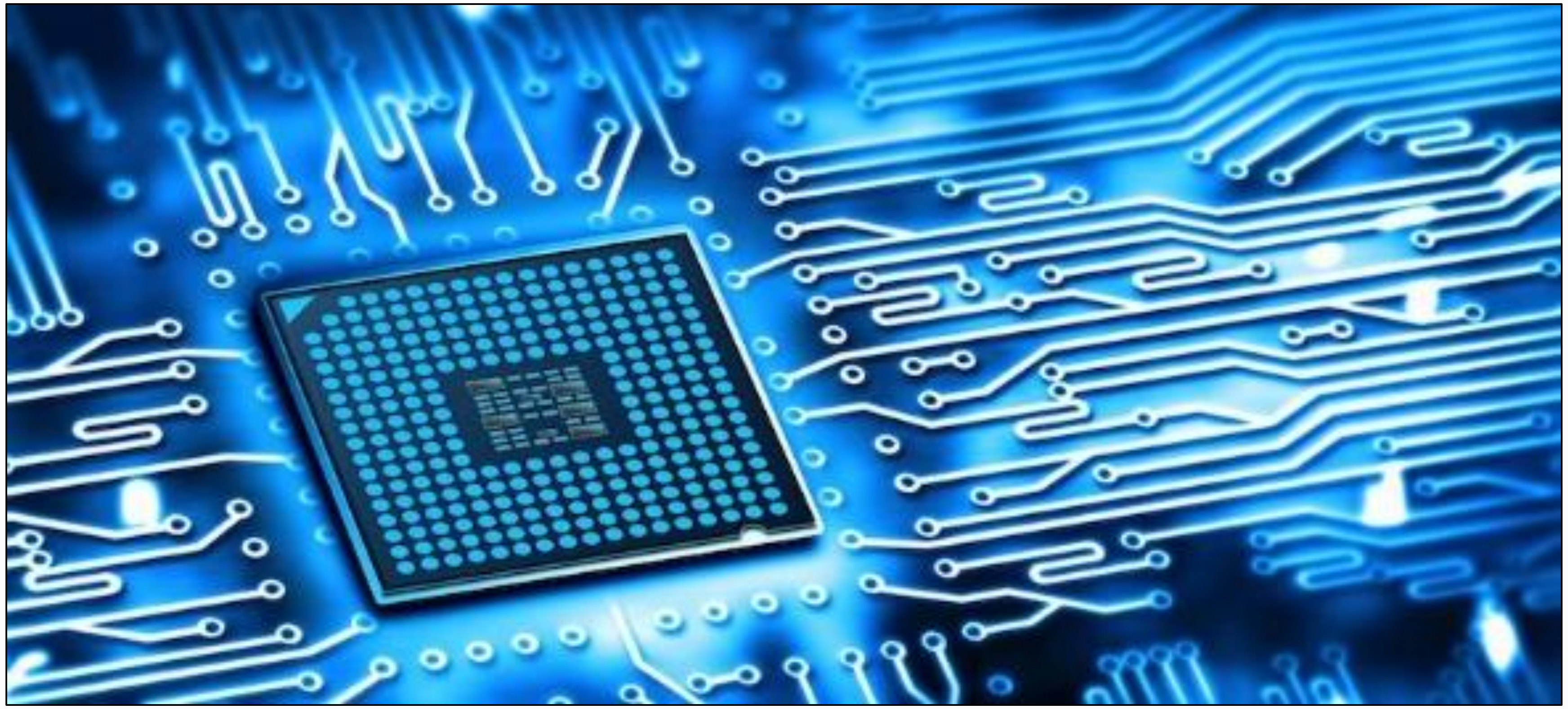
What is the “last ~~mile~~ km” for UEFI?

Retiring legacy code and related processes

- Tools (disk duplication, testing, update)
- Network Boot (PXE) to legacy images

Remove user motivations to stick with BIOS

- Improve experience with UEFI Secure Boot
- Promote enhanced UEFI features (HTTPS Boot, OS Recovery, Signed Capsule, …)



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Advantages using UEFI Class 3

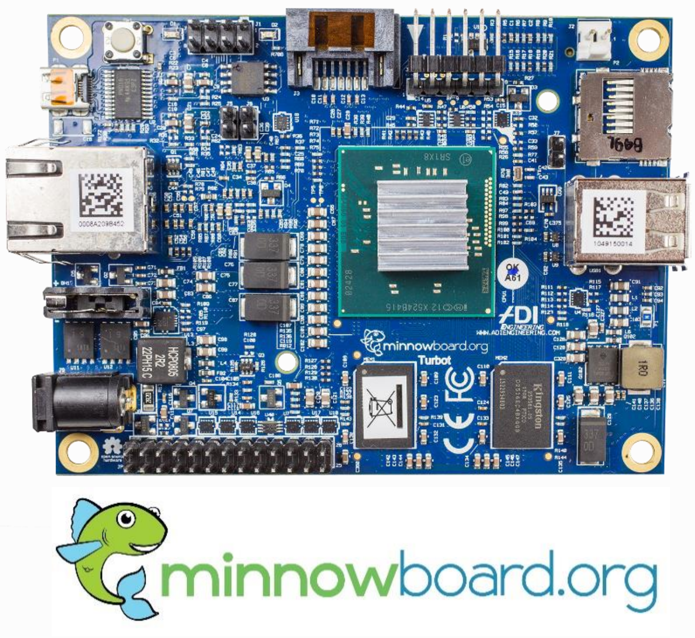
Advantages using UEFI Class 3

- Smaller code size (ROM & OpROM)
- Smaller validation/support footprint
- Encourage use of new technologies

Industry is moving away from CSM

Many Intel Architecture platforms are UEFI Class 3/3+ out of the box

- Many platforms with CSM (UEFI Class 2) have it disabled by default (required when UEFI Secure Boot is enabled)
- Now mandated for specific platforms
- See ‘Security requirements’ on “UEFI requirements for Windows editions on SoC platforms” @ microsoft.com



Intel is deprecating legacy support

Intel is removing legacy BIOS support from client & data center platforms by 2020

- Platforms will be strictly UEFI Class 3
- No 16-bit OpROM (VGA, LAN, Storage)

This will break any customer process that depends on “disabling UEFI” (“CSM ON”)

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Areas of Focus

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- Improve user experience with UEFI Secure Boot (OS install, tools, recovery)
- Eliminate components with no UEFI support
- Remove DOS/BIOS dependencies from manufacturing/maintenance tools
- Educate customers on migrating network boot to UEFI (PXE & HTTPS)

Areas of Focus

- Improve user experience with UEFI Secure Boot (OS install, tools, recovery)
- Eliminate components with no UEFI support

This is the typical consumer scenario, and the most restrictive from a validation standpoint. So…

- Validate your tools with secure boot on
- Customers shouldn’t have to disable secure boot or enable CSM to solve common recovery problems

Areas of Focus

- Improve user experience with UEFI Secure Boot (OS install, tools, recovery)
- Eliminate components with no UEFI support
- Remove DOS/BIOS dependencies from

It’s a supply chain problem… *wait, we’re the supply chain!*

- Drivers, peripherals, and utilities work without CSM
- No DOS requirements for pre-OS validation/tools (try UEFI Shell or Python)

Areas of Focus

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- Eliminate components with no UEFI support

No DOS requirements for pre-OS validation or maintenance tools (try UEFI Shell or Python)

- Remove DOS/BIOS dependencies from manufacturing/maintenance tools

Can you run manufacturing tests with UEFI Secure Boot enabled (UEFI Class 3+)?

- Educate customers on migrating network boot to UEFI

Areas of Focus

- Promote improved functionality powered by UEFI (i.e. why are HTTPS & OS Recovery awesome?)
- Remove our customer’s incentives to stick with outdated tools that require DOS & BIOS

- Remove DOS/BIOS dependencies from manufacturing/maintenance tools

- Educate customers on migrating network boot to UEFI (PXE & HTTPS)

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Call to Action

Call to Action

- Many UEFI platforms still enable legacy BIOS compatibility using CSM
- CSM expose security issues and delays 100% migration to UEFI
- Many modern features have no equivalent legacy functionality and require booting in “UEFI mode”
- Intel is planning to deprecate legacy compatibility by 2020, and is working with partners on a smooth industry transition

Thanks for attending the Fall 2017 UEFI Plugfest

For more information on the UEFI Forum and UEFI Specifications, visit http://www.uefi.org

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