"Last Mile" Barriers to Removing Legacy BIOS

Fall 2017 UEFI Plugfest
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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

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... and there’s one “unspoken class”

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UEFI Class 1
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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
- UEFI Secure Boot ON

Enabling secure boot essentially creates another UEFI Class
**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
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- 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

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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

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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

- 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

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

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

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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

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