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ARM

ARM Trusted Firmware
ARM UEFI SCT update

UEFI US Fall Plugfest – September 20 - 22, 2016

Presented by Charles García-Tobin (ARM)

Agenda

- ARM Trusted Firmware
  - What and why
- UEFI SCT update
  - progress

ARM Trusted Firmware (ARM TF) a little history

- 4 years ago … (ish)

Wild west before ARM TF

- Power management development model

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Proprietary
SW+FW

Wild west before ARM TF

- Power management development model

Proprietary HW

+

Proprietary SW+FW

Wild west before ARM TF

- Power management development model

Proprietary HW

+

Proprietary SW+FW

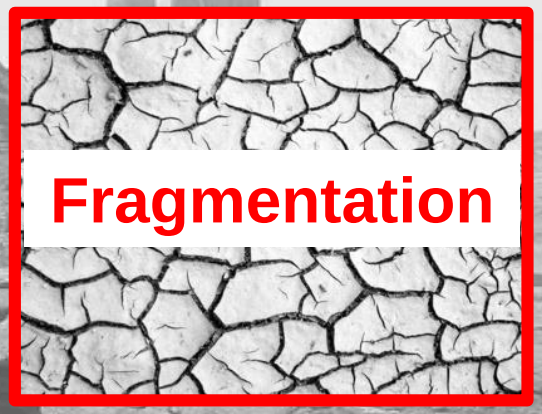
=

Products

...

Wild west before ARM TF

- Development model caused a few problems



Number of PM drivers = Number HW vendors × Number of vendor SoCs

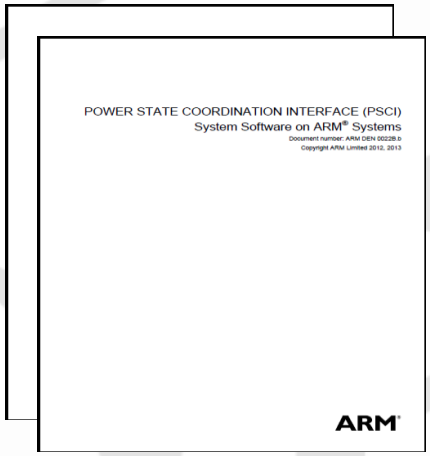
So we created specs

Power State Coordination Interface

- Powering cores up or down for idle, 2ndary boot, hotplug
- System reset/shutdown

SMC calling convention

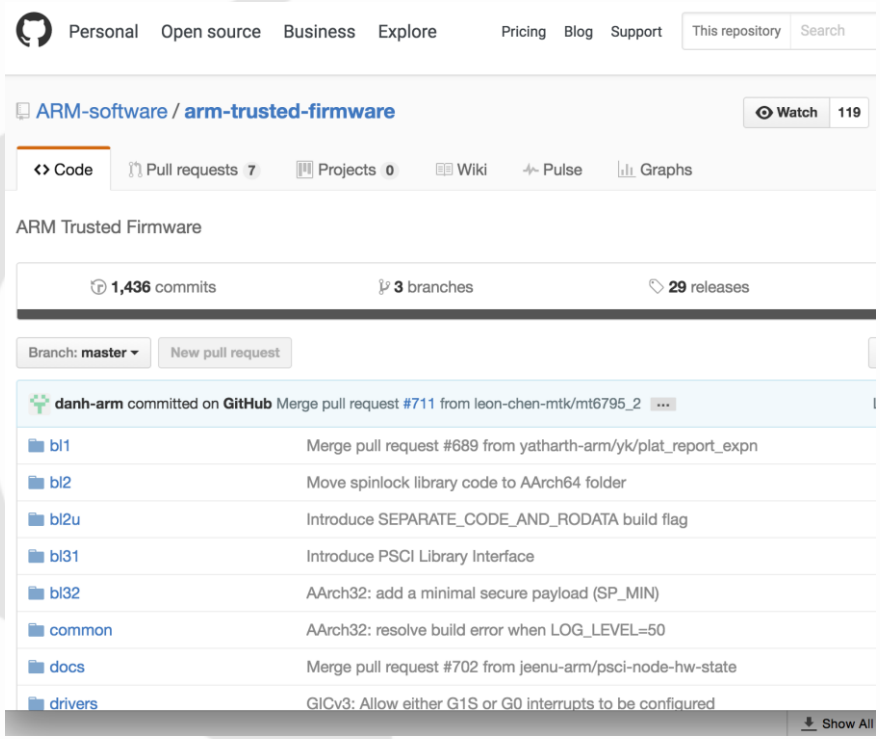
- Helps in supporting multiple vendors in secure firmware



- Spec available today in ARM infocenter:
  - PSCI: http://infocenter.arm.com/help/topic/com.arm.doc.den0022c/DEN0022C_Power_State_Coordination_Interface.pdf
  - SMC: http://infocenter.arm.com/help/topic/com.arm.doc.den0028a/index.html

But specs are nothing without code

- So we created the ARM Trusted Firmware project
- Implements PSCI and SMC calling convention
- Provides reference early boot
- Applicable to all segments
- Open Source at GitHub
  - BSD License
  - Contributions welcome

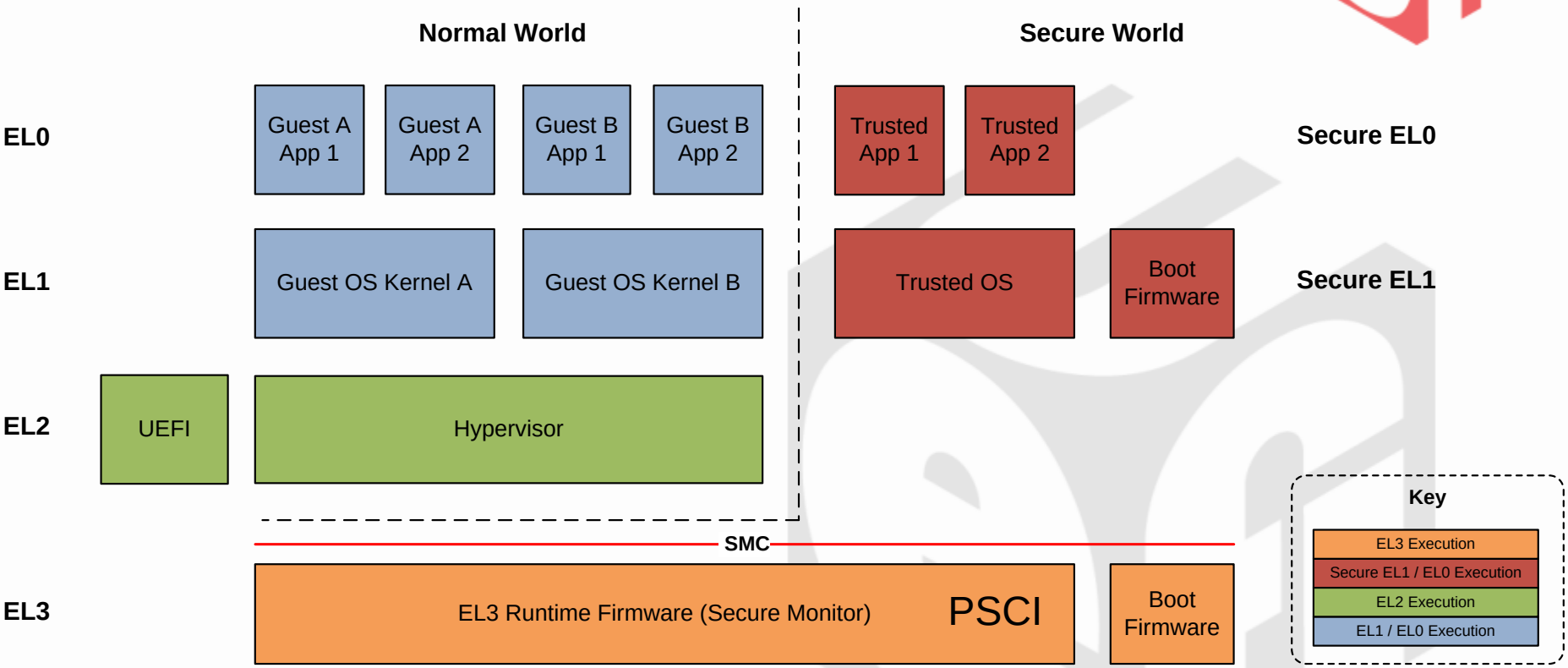


https://github.com/ARM-software/arm-trusted-firmware

Things better as a result

- PSCI is supported by every major OS vendor
- PSCI is supported by every major Hypervisor vendor
- ARM TF has been taken as reference by most silicon vendors
- It is the standard for ARMv8-A

What is ARM Trusted Firmware?



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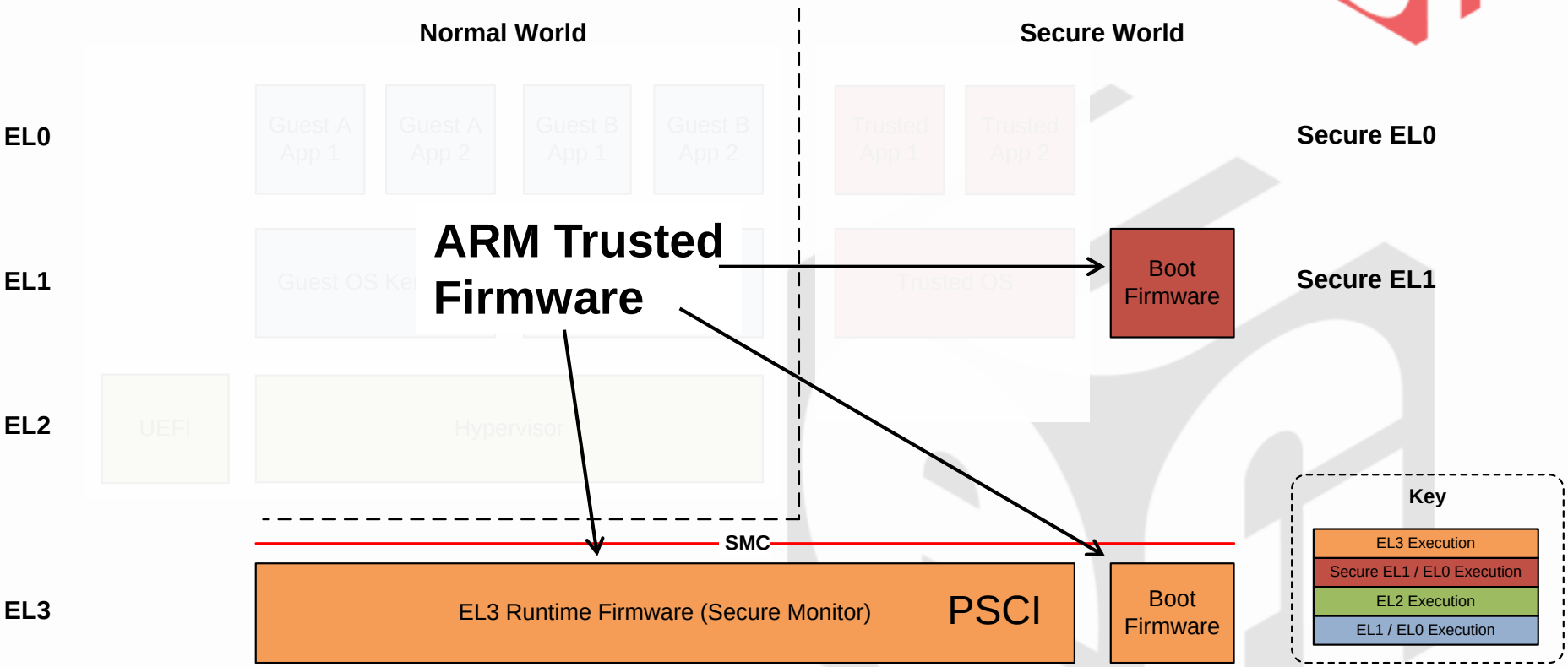
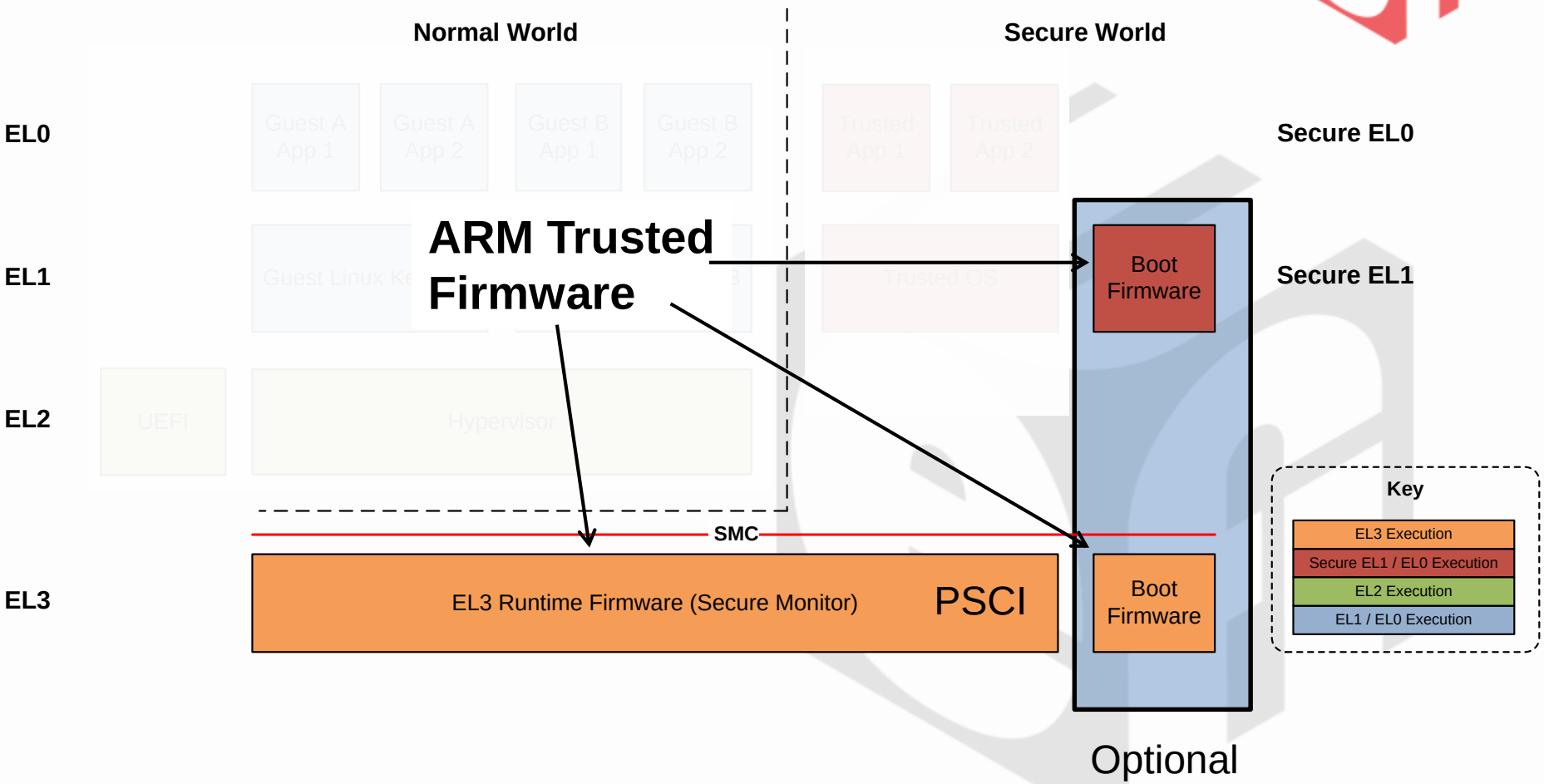
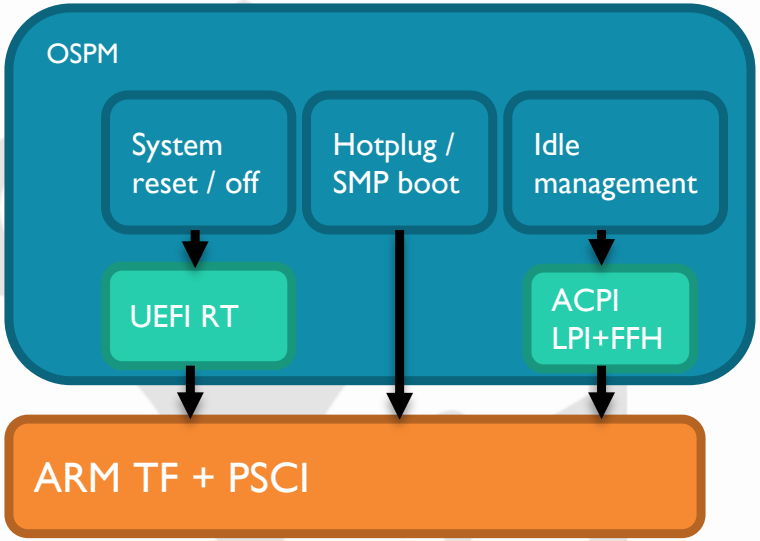


What is ARM Trusted Firmware?



How does it relate to UEFI specs?

- ACPI core power is intimately tied to PSCI
  - LPI states introduced in 6.0 map directly to PSCI
- Provides a generic implementation for UEFI reset run time services
- Trusted boot flow provides SEC on our reference platforms



SCT update

SCT update

- UEFI 2.5 AArch64 beta version
  - Number of updates and fixes
    - Various fixes in test for network statistics, ExitBootService, simple file system and watchdog
    - Submitted six patches
    - 10,000 warning fixed(Guid definitions, incompatible pointers) in the UEFI-SCT
  - Available here:
    https://github.com/UEFI/UEFI-SCT/tree/master/Binaries/2016SeattlePlugfest

- UEFI 2.6 AArch64 alpha version
  - Add support for
    - Ramdisk/NVMe part test have been submitted
  - Available here:
    https://github.com/UEFI/UEFI-SCT/tree/UEFI-2.6-SCT-DEV/Binaries/2016SeattlePlugfest

SCT discussions

- SCT availability and development model
- Proposed protocols to help with testing partial implementations
- We have run into issues with robustness of shell over Seriallo
  - It crashes when the SCT framework tries to open the Seriallo protocol in exclusive mode.

Thanks for attending the
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For more information on the Unified EFI Forum and UEFI Specifications, visit
http://www.uefi.org

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