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Intel® Universal Scalable Firmware (USF) Strategy and Intel® Firmware Support Package (Intel® FSP)

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Agenda

- Intel ® Universal Scalable Firmware Strategy
- Intel ® Universal Scalable Firmware Practice
- Intel ® Firmware Support Package Overview
- Intel ® Firmware Support Package SMM

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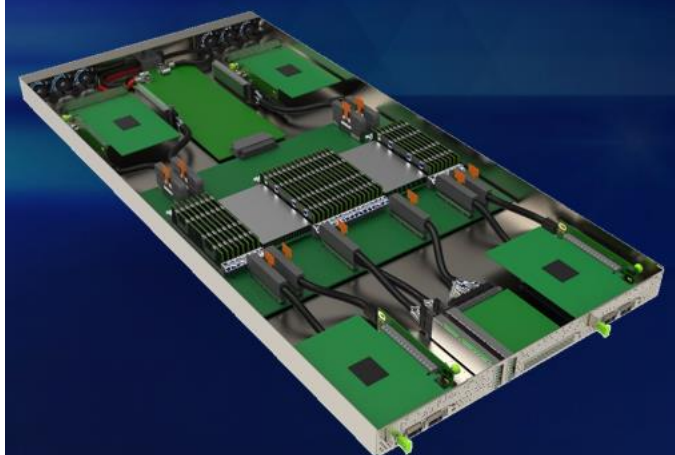
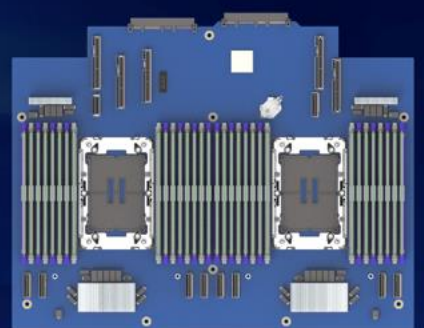
Reusable Compute Block

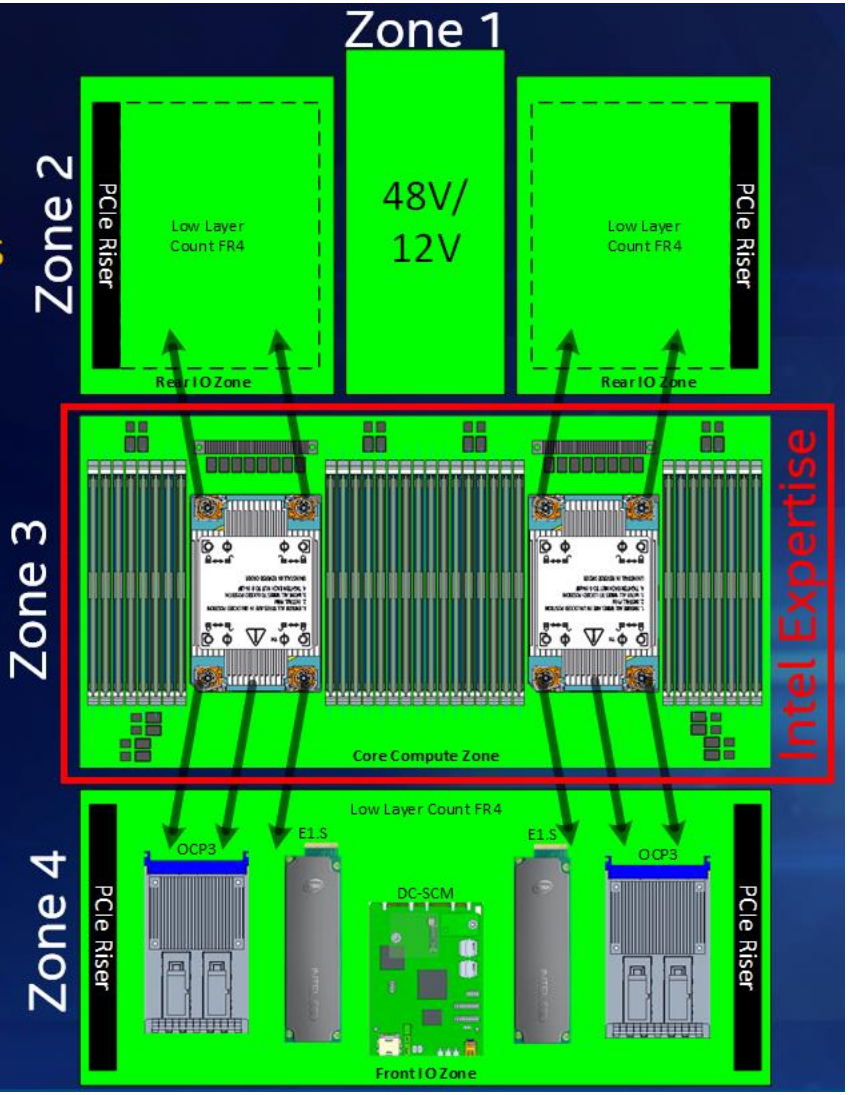
Intel vision is a server with four primary zones

- Zone 1: Power and cooling
- Zone 2: North IO
- Zone 3: Reusable Compute Block
- Zone 4: South IO

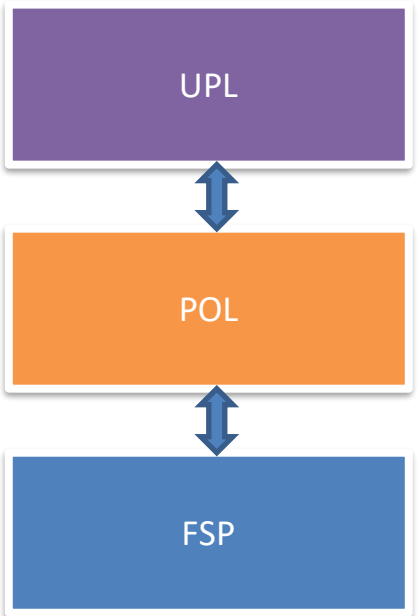


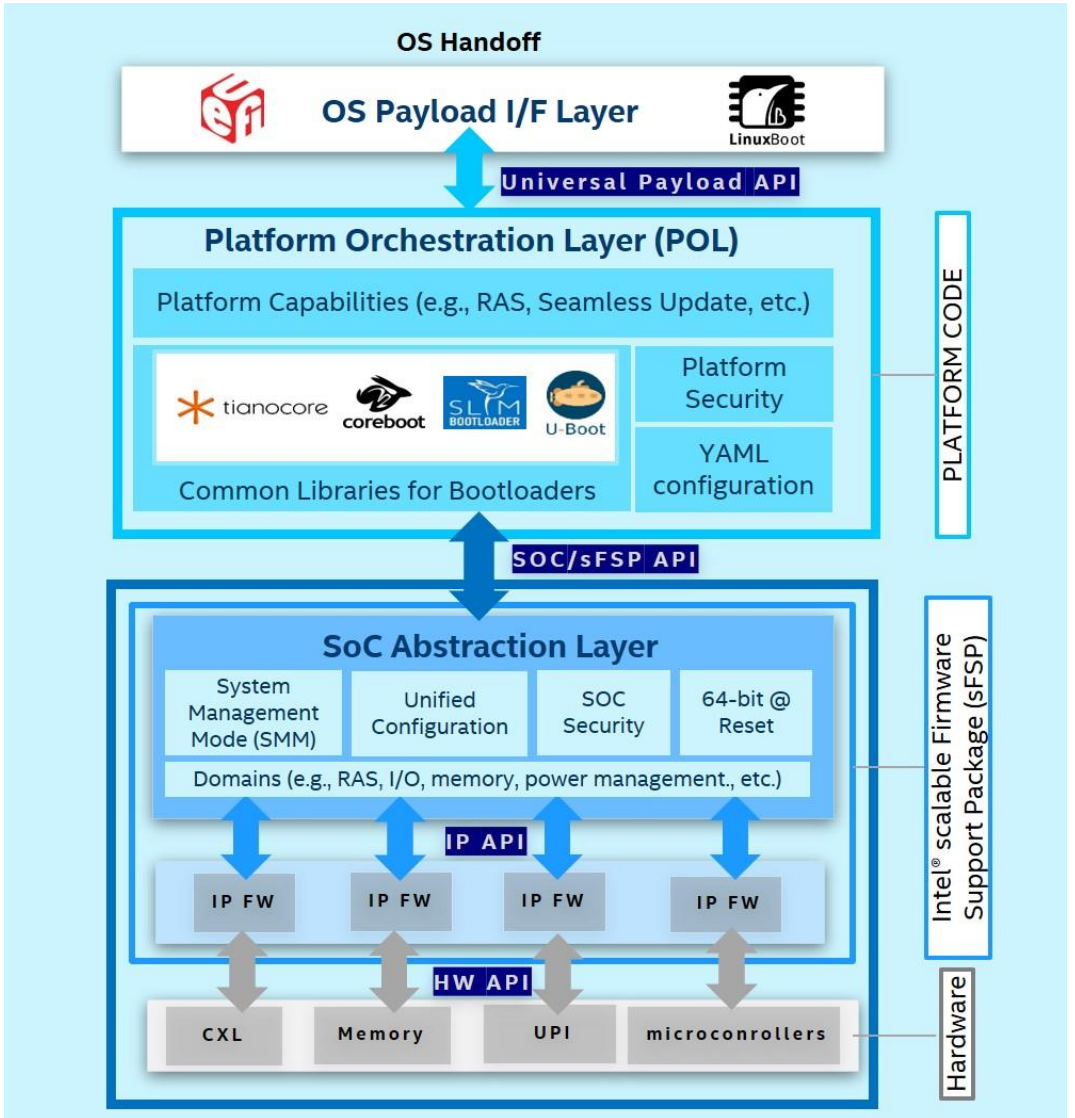


Zone 3
Implemented

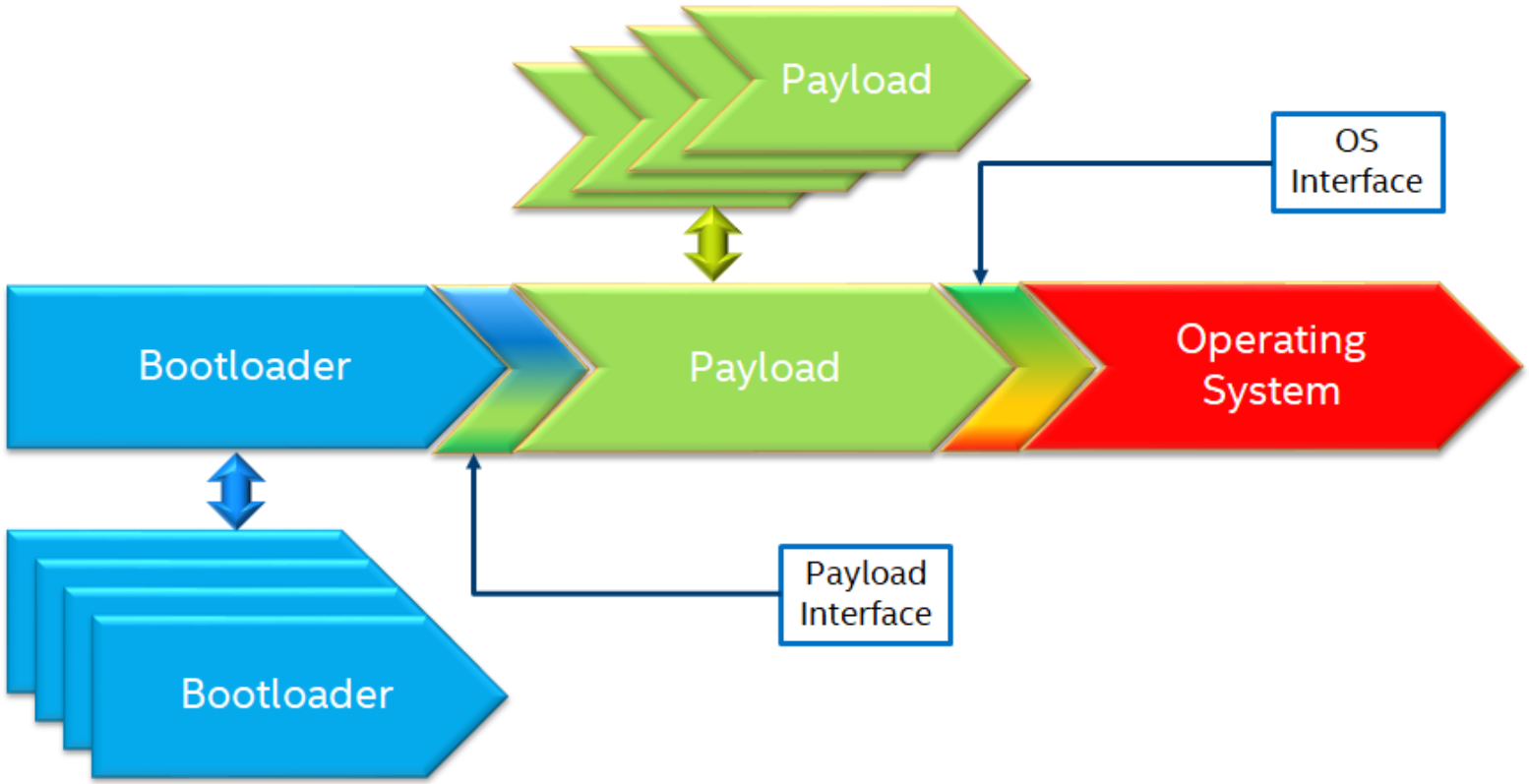


Universal Scalable Firmware (USF) Architecture





Universal Payload (UPL)



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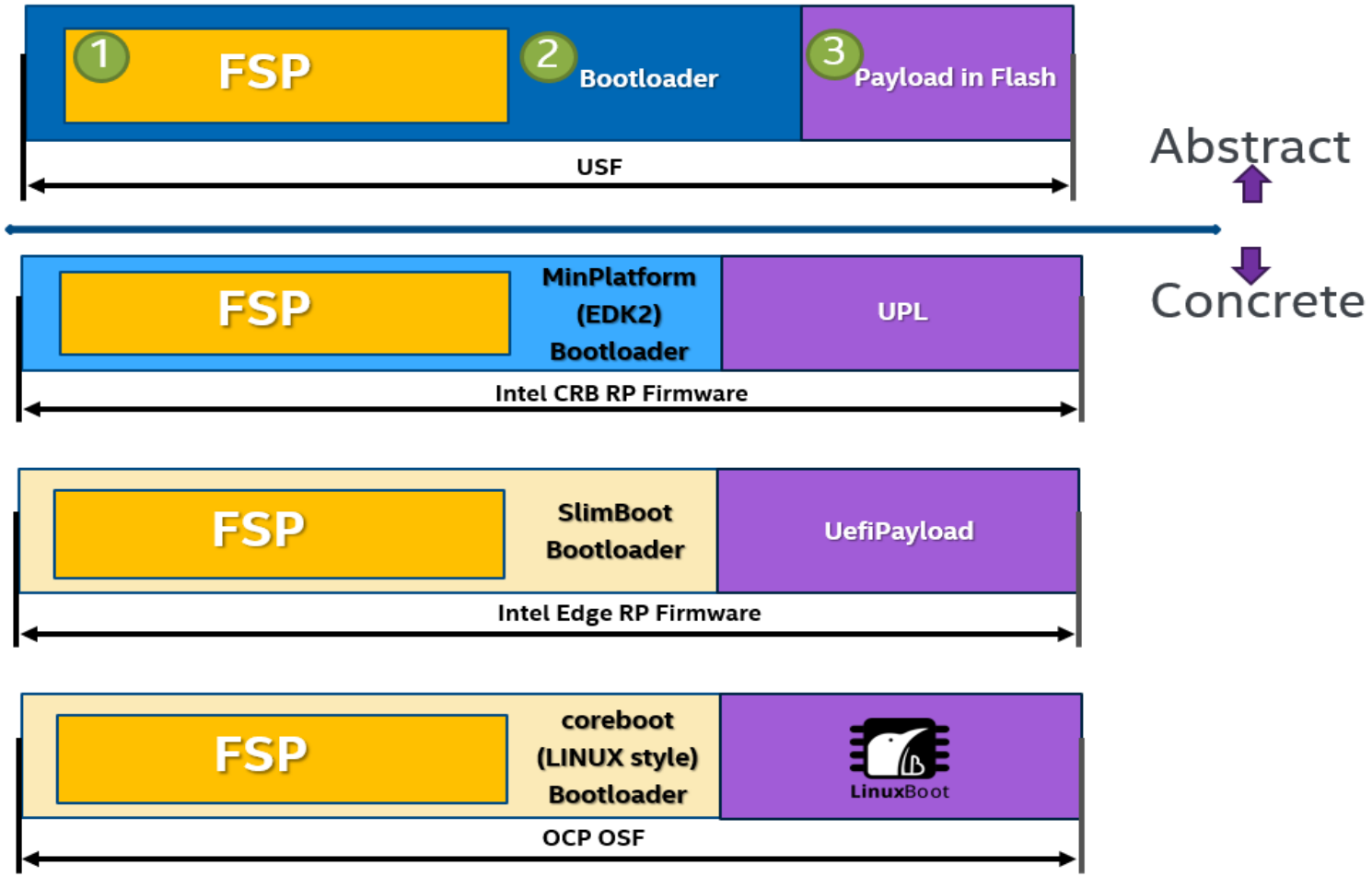
Universal Scalable Firmware (USF) Concrete Practice



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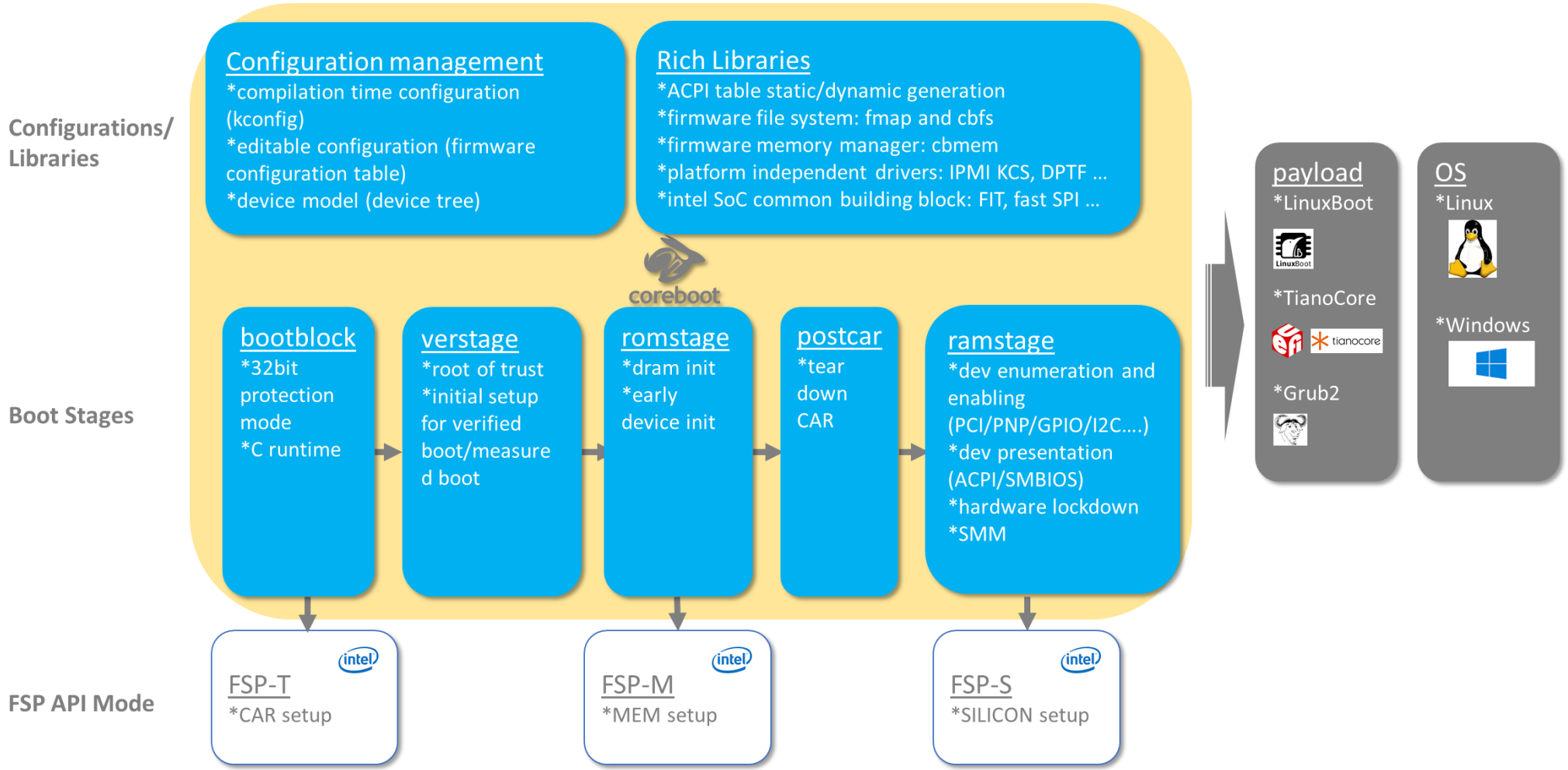
Universal Scalable Firmware (USF) ByteDance Practice for Intel® Xeon® 4th-generation Processors



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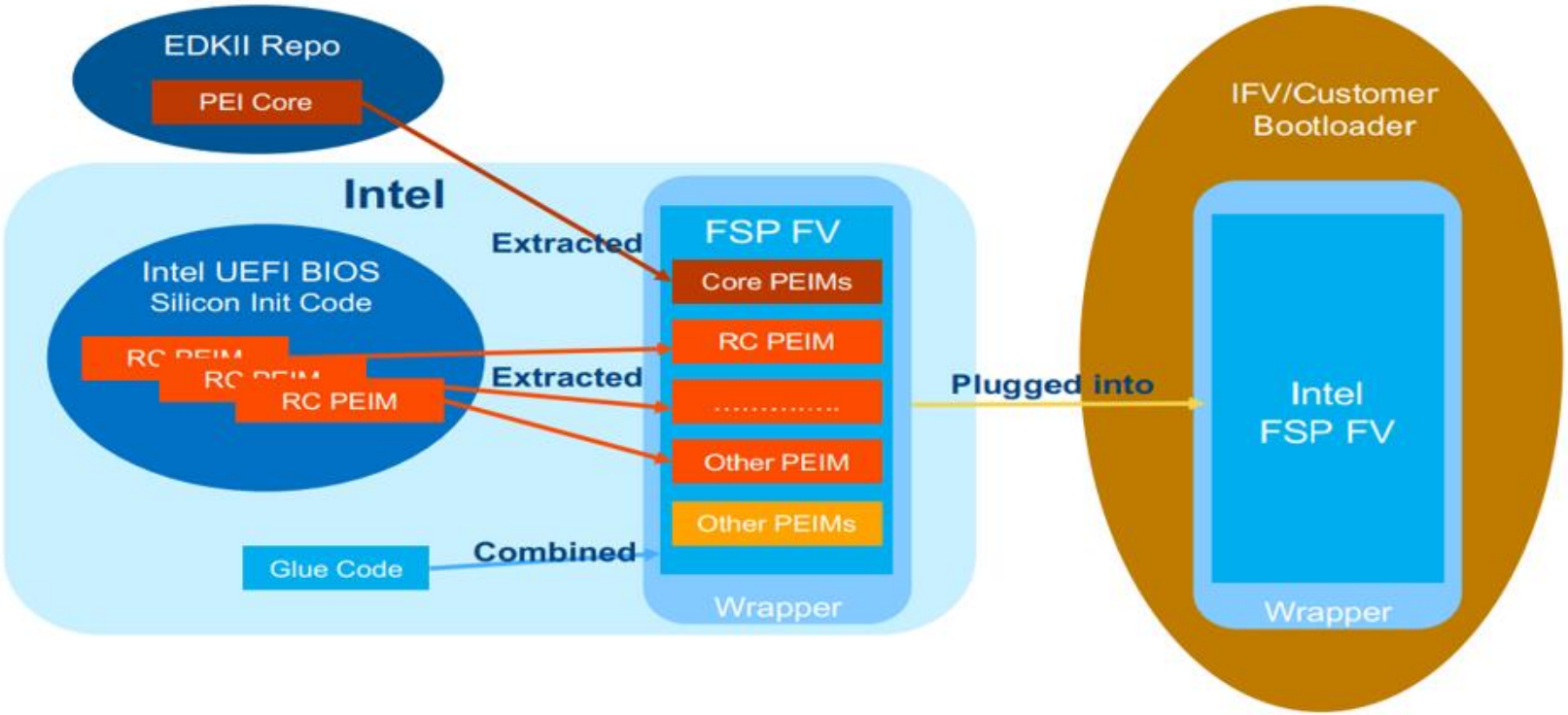
Why Intel® Firmware Support Package (Intel® FSP)

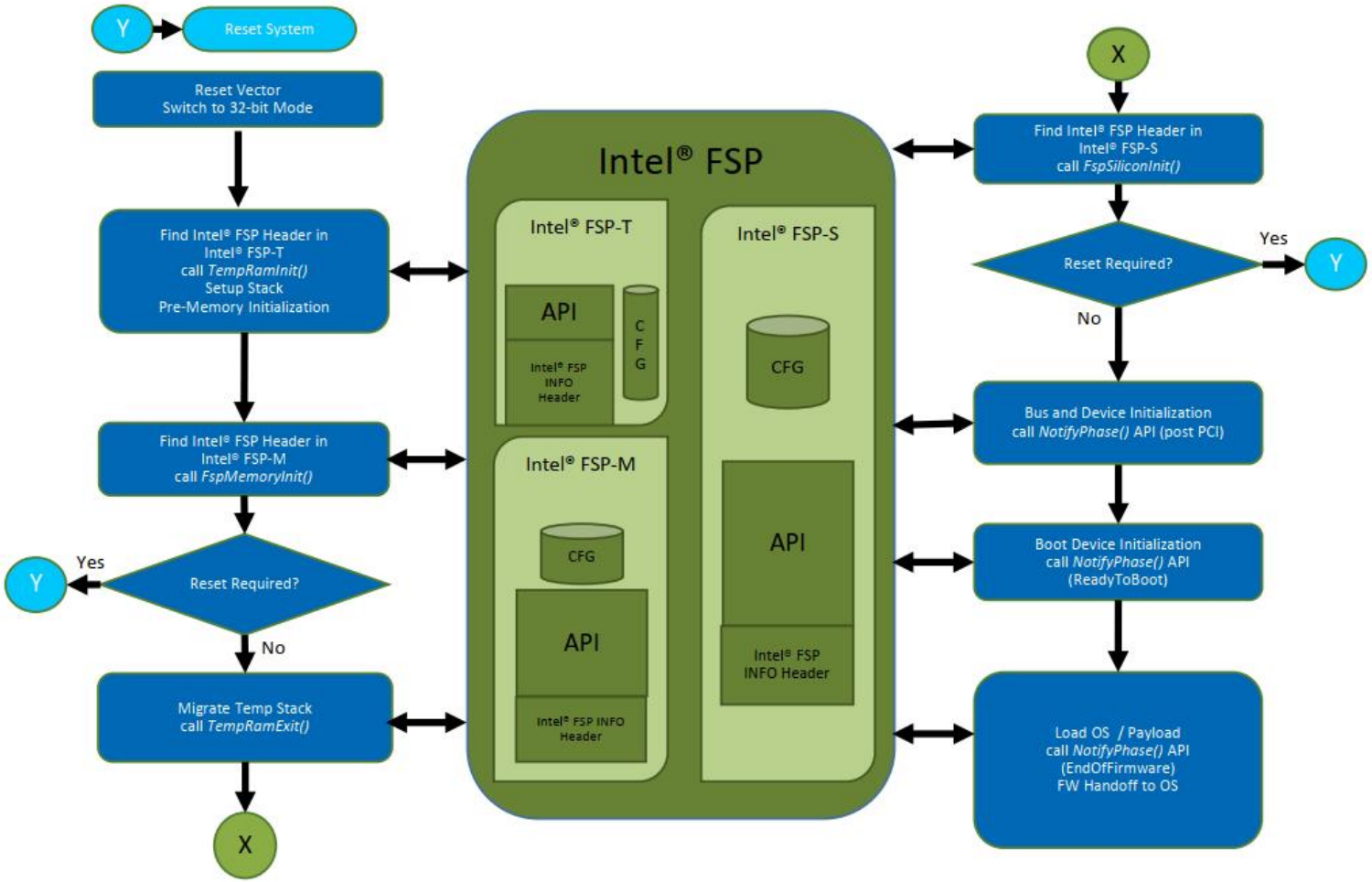


Intel® FSP Design Philosophy

System Firmware
Full solution, all the features, ready to use, with licensing and royalties from third parties

Intel® Firmware Support Package (Intel® FSP)
Only the engine – can be put into any vehicle, but the customer provides the vehicle

Intel® FSP Generic Boot Flow



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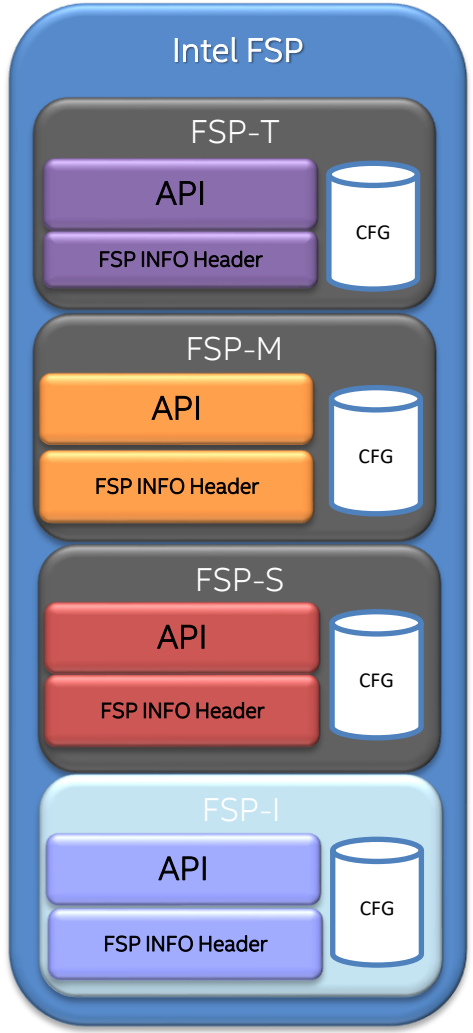
Intel® FSP - SMM Background

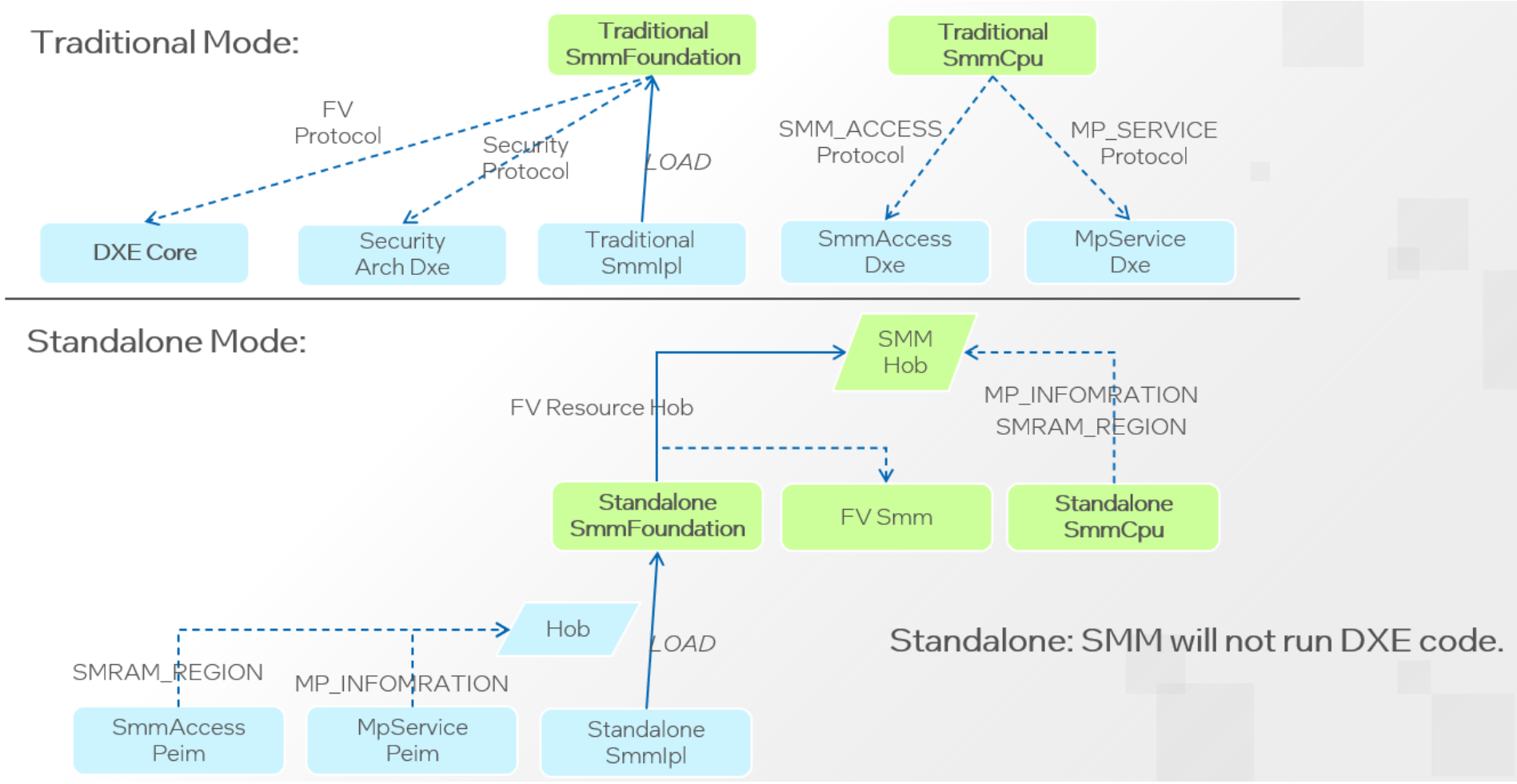
- Till FSP2.4, FSP does not support SMM related function and bootloaders own SMM foundation and features in SMM itself.
- However, for mainly SMM functions: server RAS/Security runtime features, it is too hard to support it without hardware/silicon IPs exposed for some bootloader (like coreboot/SlimBoot).
- In FSP2.4, we will have a unified solution for both EDKII and non-EDKII bootloader with FSP-SMM to support SMM foundation and features.

Intel® FSP - SMM API

- The Intel® FSP binary follows the UEFI Platform Initialization Firmware Volume Specification format.
  - Split into 4 separate FSP ingredients
- FSP-SMM: SMM initialization phase(FSP owns SMRAM
  - Primary purpose of this phase is to provide a collection of **silicon** SMI handlers that provide value-add services that a bootloader can use.
    - **FspSmmInit()** : Initialize SMM Foundation, dispatch all Standalone MM drivers, build SMM environment, install all MM handlers.

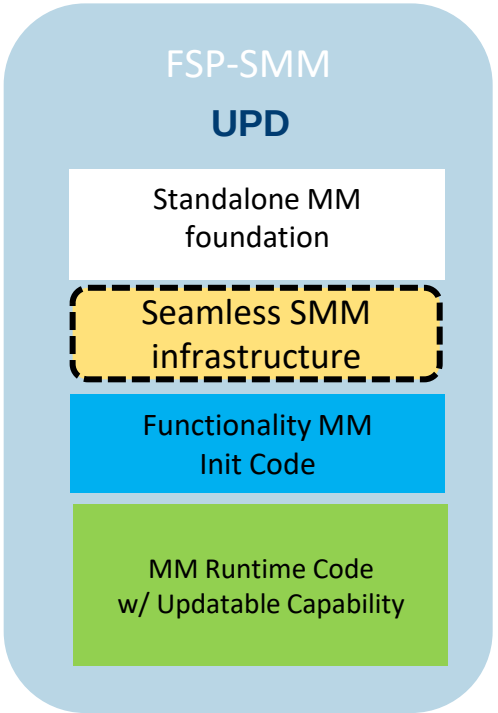


SMM Traditional Mode Vs. Standalone Mode



Intel® FSP - SMM Stack

- Intel® FSP-SMM infrastructure
- Standalone MM infrastructure
- Optional*: Seamless SMM infrastructure
  - SMM code injection
  - SMM Driver Update(SDU)
- RAS mm functions
  - Init code
  - MM runtime code
  - Optional* under SSDU infra: Updatable capability



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Thanks!