



OPEN
Compute Project



OCP U.S. SUMMIT 2017

Santa Clara, CA



OpenBMC Updates

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Facebook.

OPEN HARDWARE.

OPEN SOFTWARE.

OPEN FUTURE.



Agenda

1

Quick Recap

2

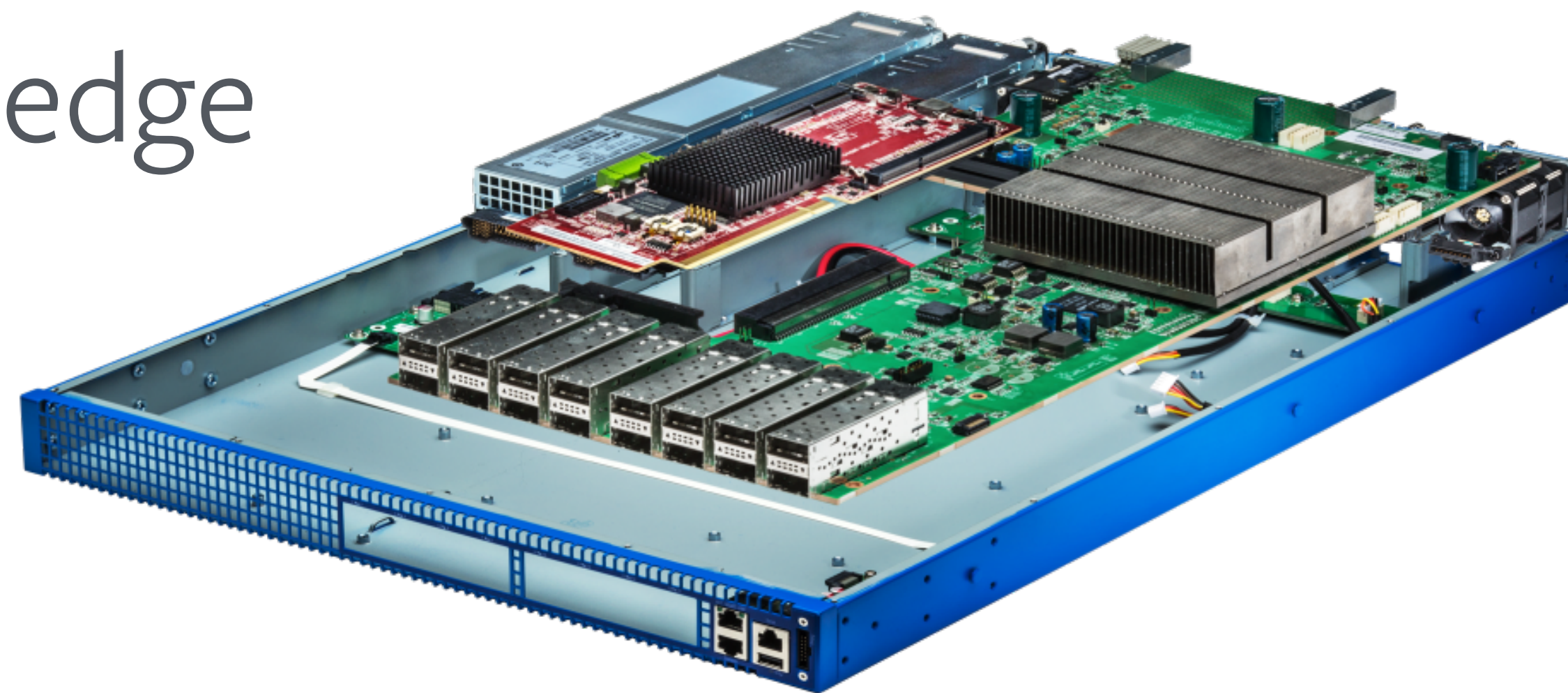
OpenBMC Updates'17

3

Verified Boot

OpenBMC history

- Started in Facebook in 2014 Jun
- Developed for Facebook TOR, Wedge
- Leverage Yocto Environment
- Open sourced through github
- Presented in 2015 OCP



OpenBMC Overview

	3rd Party BMC	OpenBMC
Source Code	• Proprietary, Closed	• Designed by Facebook • Open Source @ Github
User Interface	• ipmitool - Raw Bytes	• SSH to BMC Linux Shell • REST API - JSON objects
Security	• RMCP+ over UDP • Known vulnerabilities	• Secure Shell (ssh) • http(s)
Authentication/Authorization	• BMC-centric username/password database	• Centralized certificate based
Multi-Node Management	• Need to virtualize BMC with multiple IP addresses	• Supported Natively with node/slot number

OCP Summit Recap

- OCP Summit'15
 - Proof-Of-Concept – Wedge
- OCP Summit'16
 - Server Management– Yosemite
 - Storage Management - Lightning
- OCP Summit'17
 - Next..

Agenda

1

Quick Recap

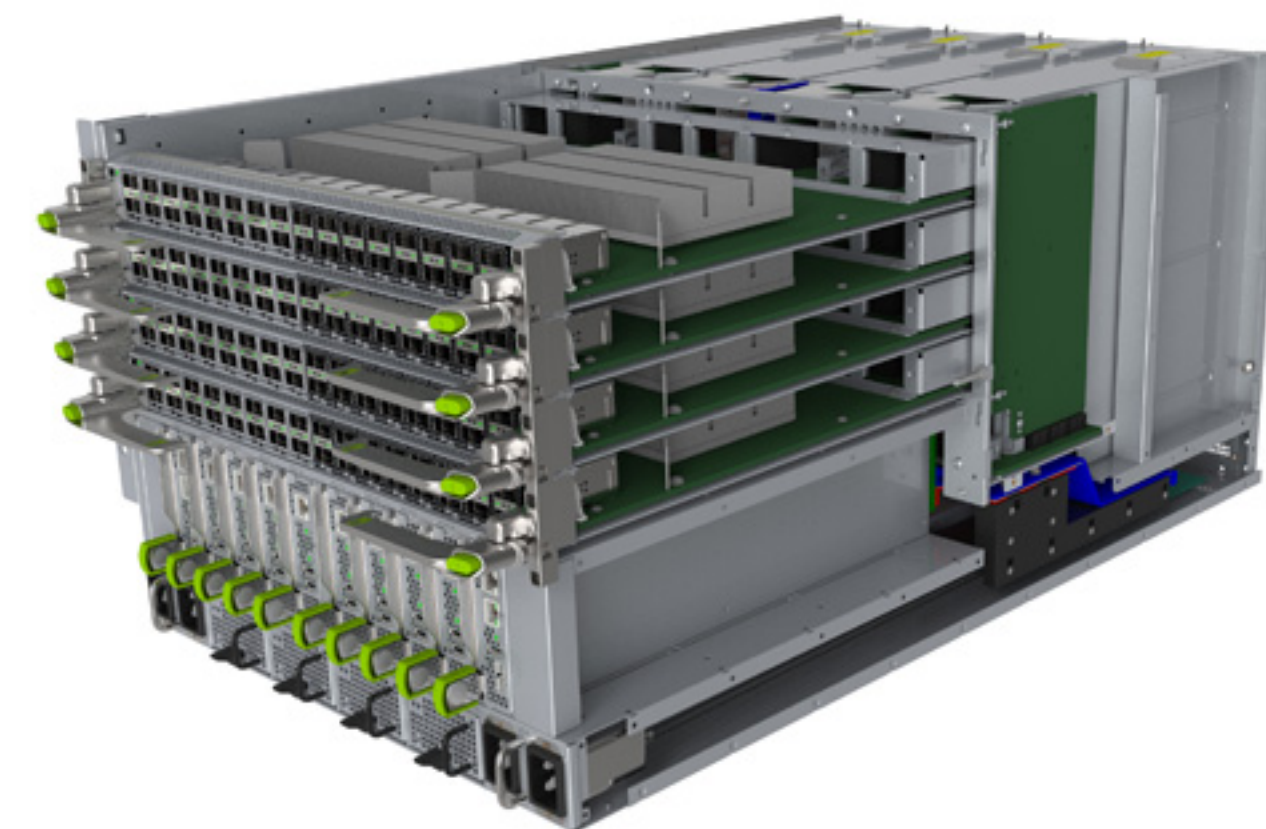
2

OpenBMC Updates'17

3

Verified Boot

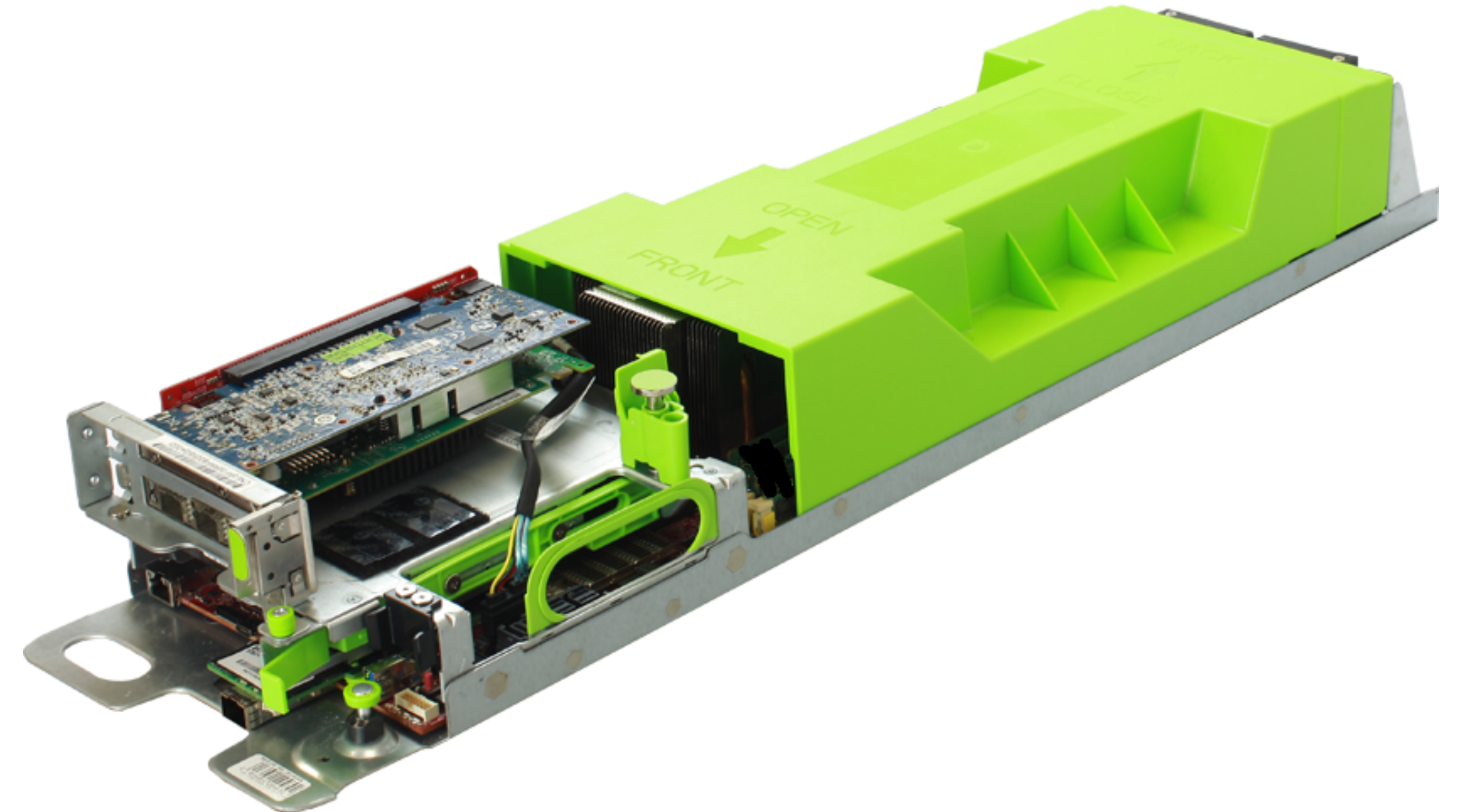
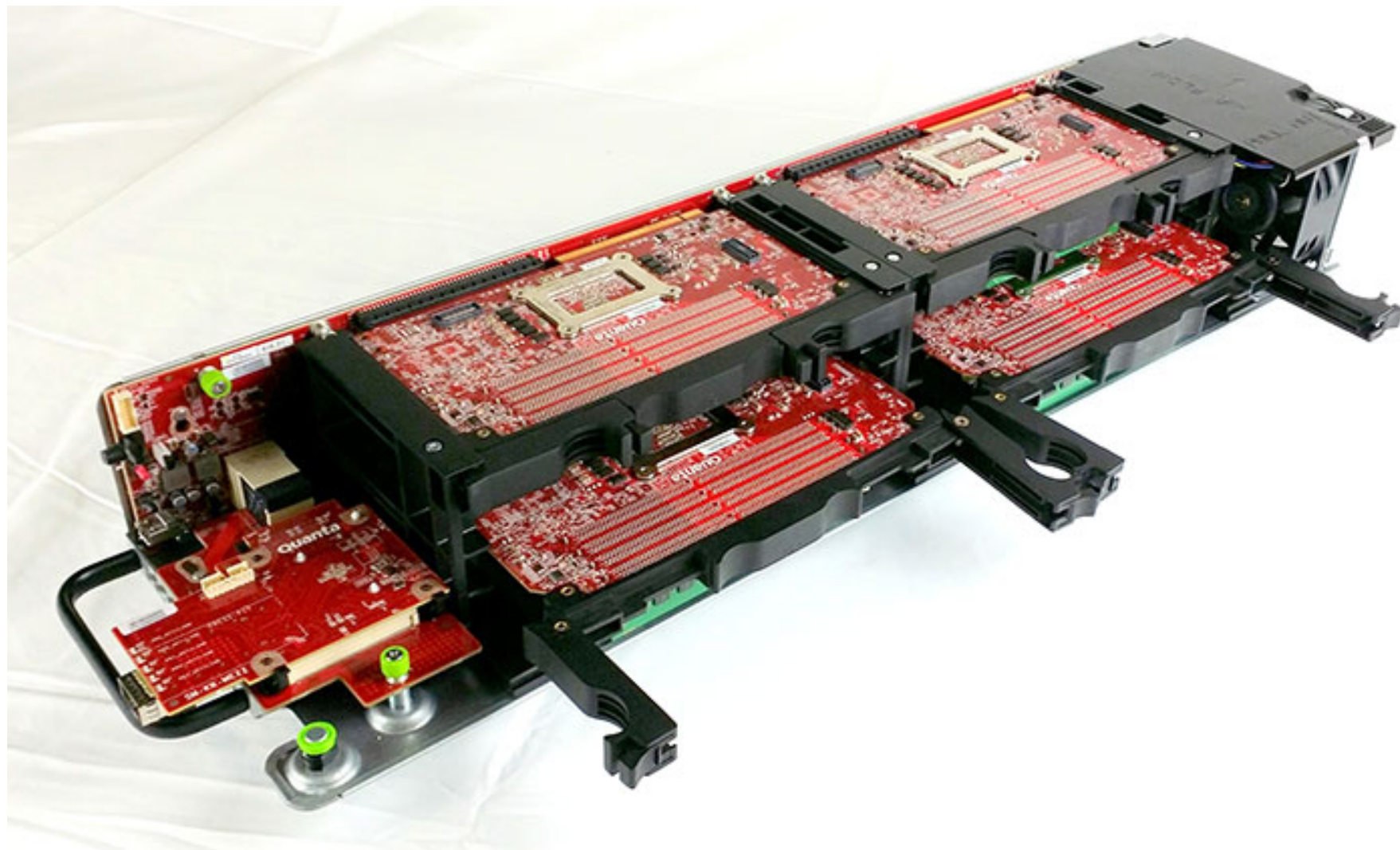
Platform Updates'17



Network Platforms

Platform Updates'17

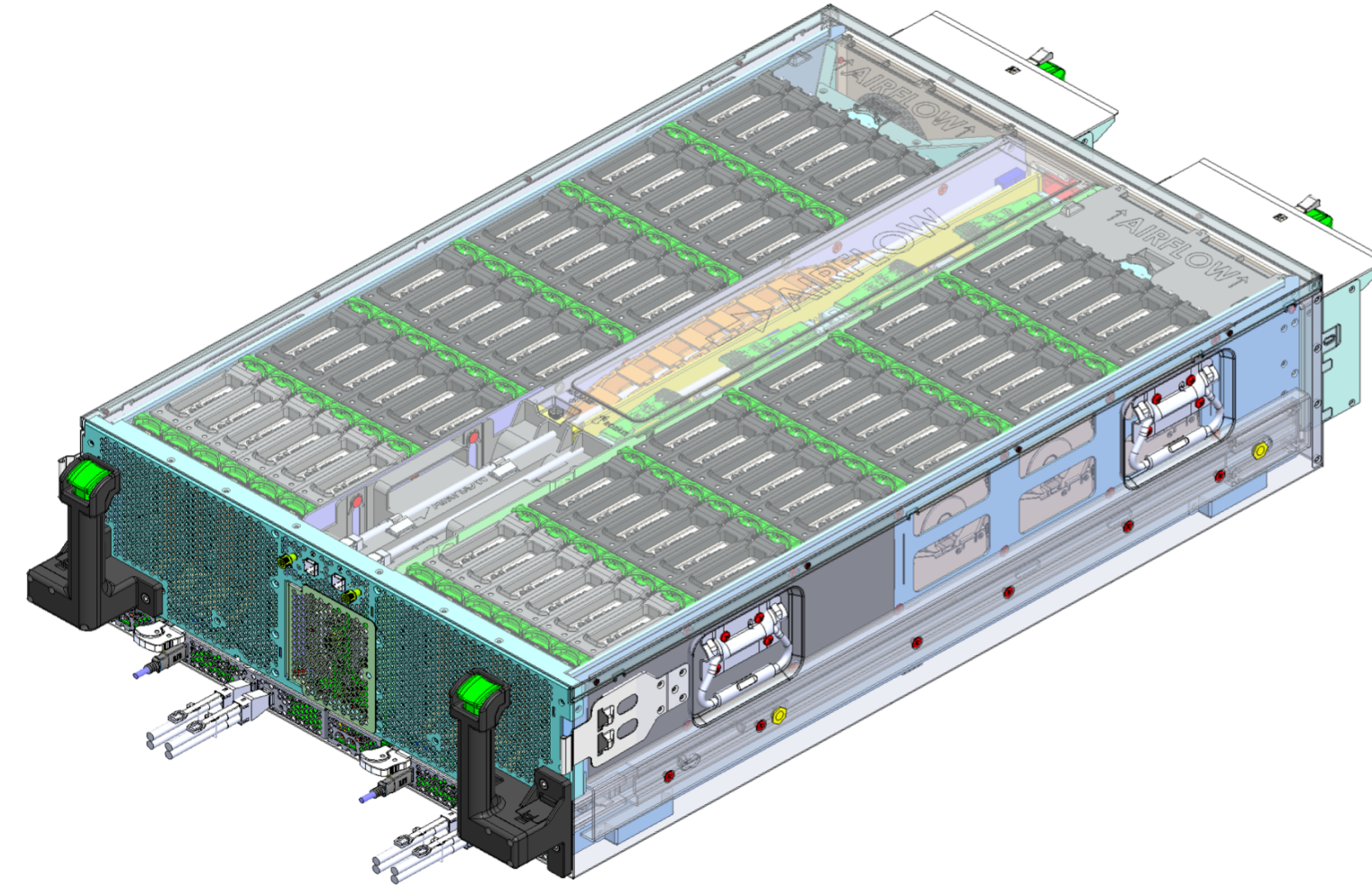
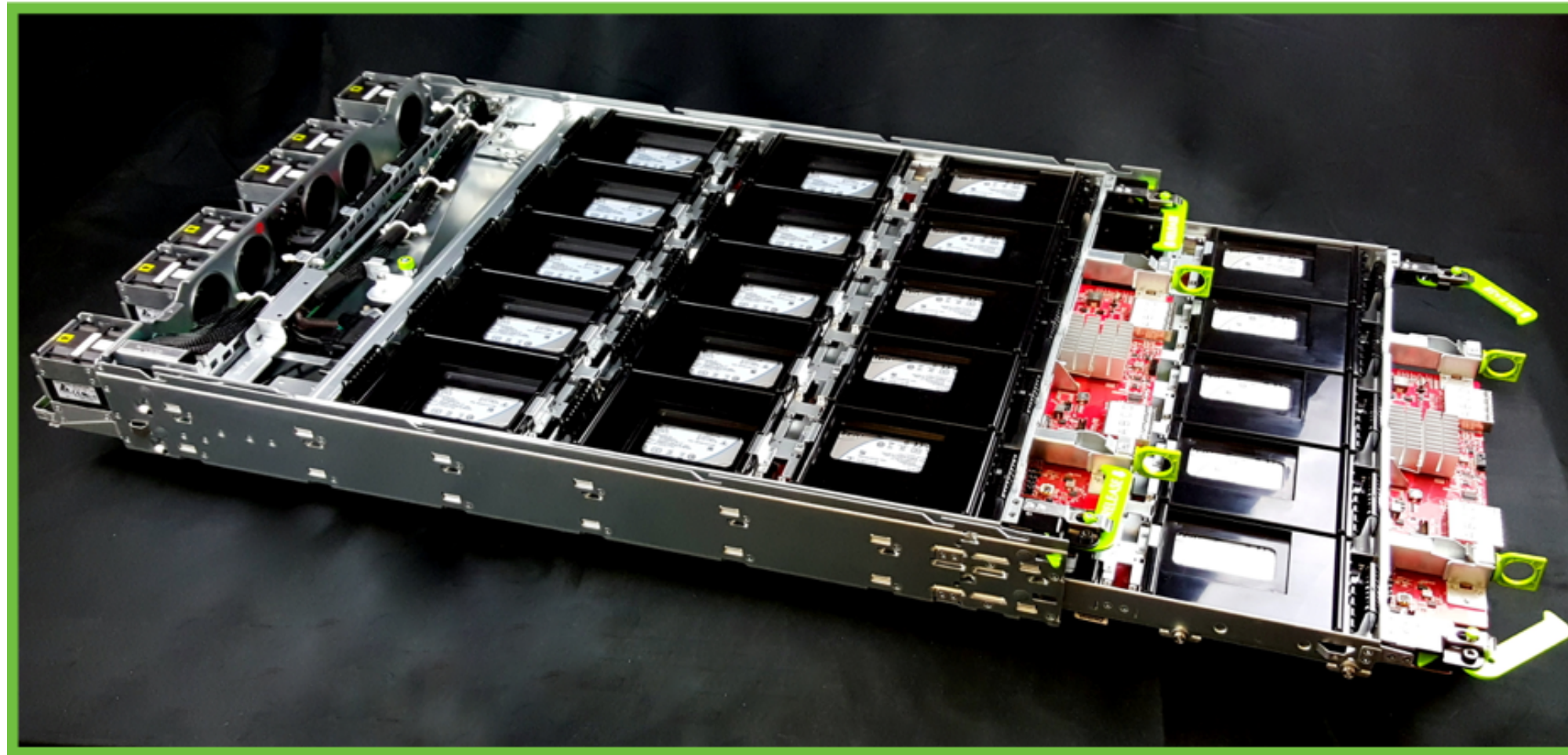
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Server Platforms

Platform Updates'17

contd..



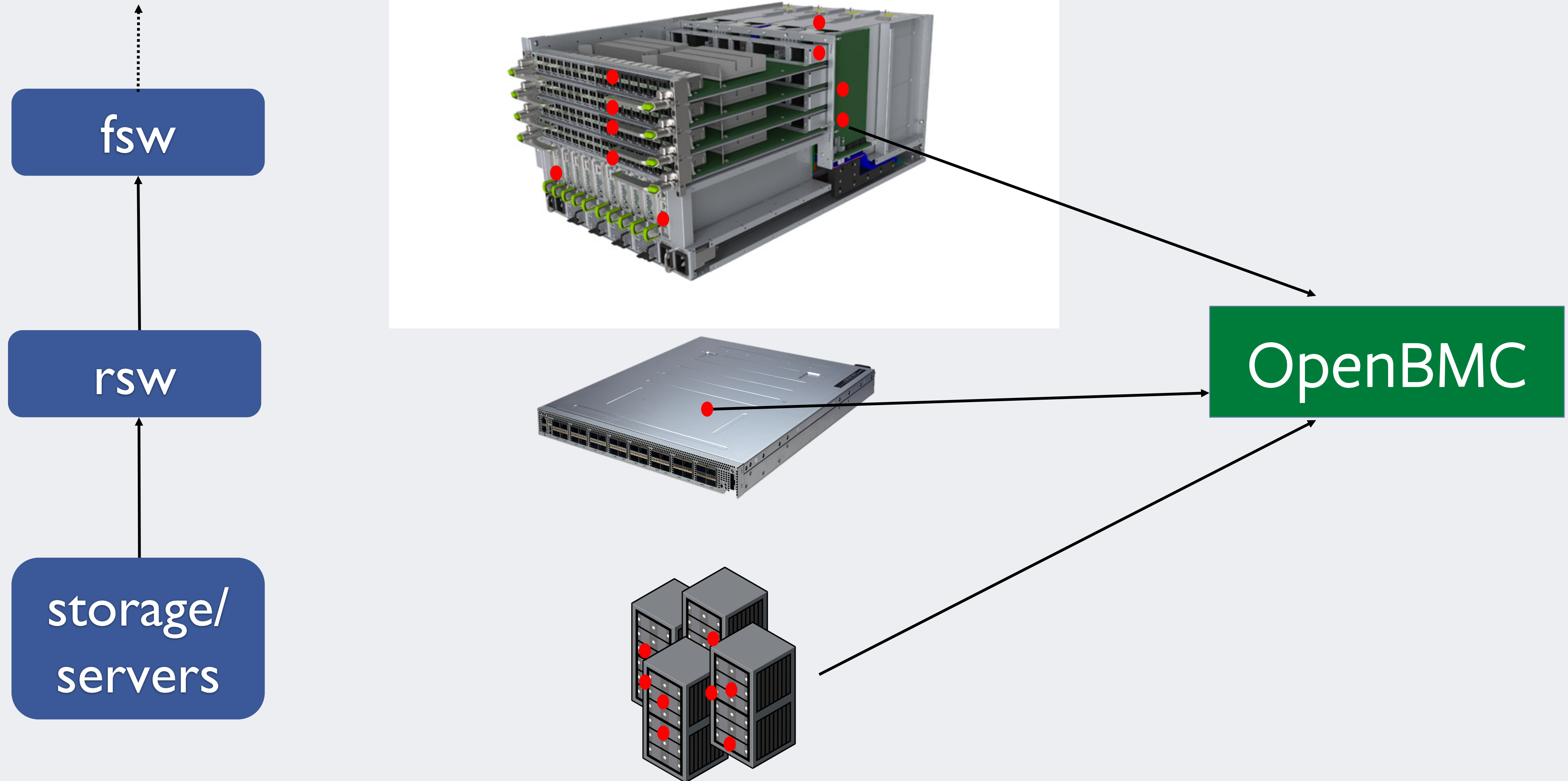
Storage Platforms

Software Updates'17

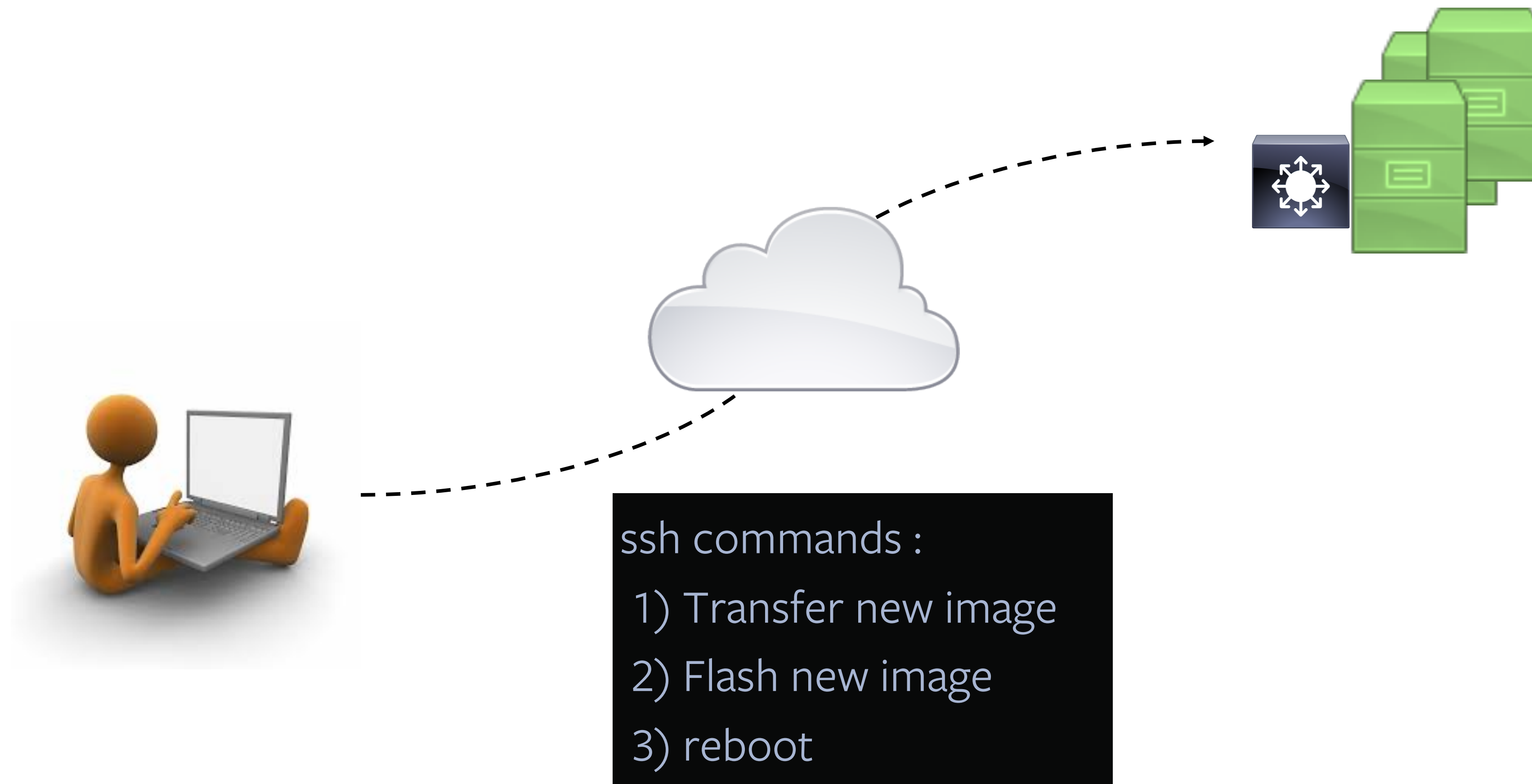
- SDK Stack Update
 - SoC: AST25xx
 - U-Boot: 2013.07 -> 2016.07
 - Kernel: 2.6.28.x -> 4.1.x

Monitoring & Deployment @scale

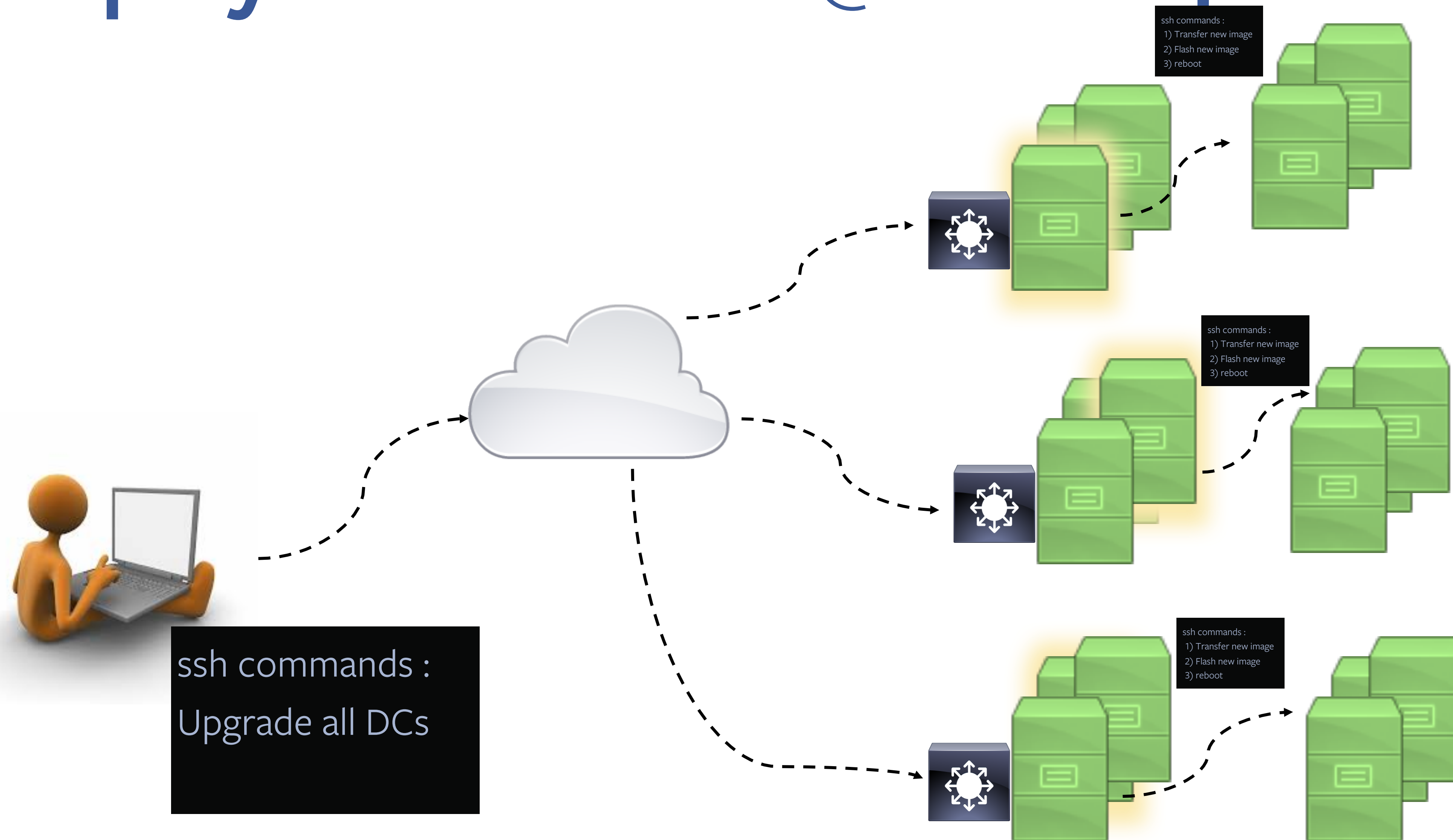
OpenBMC @scale



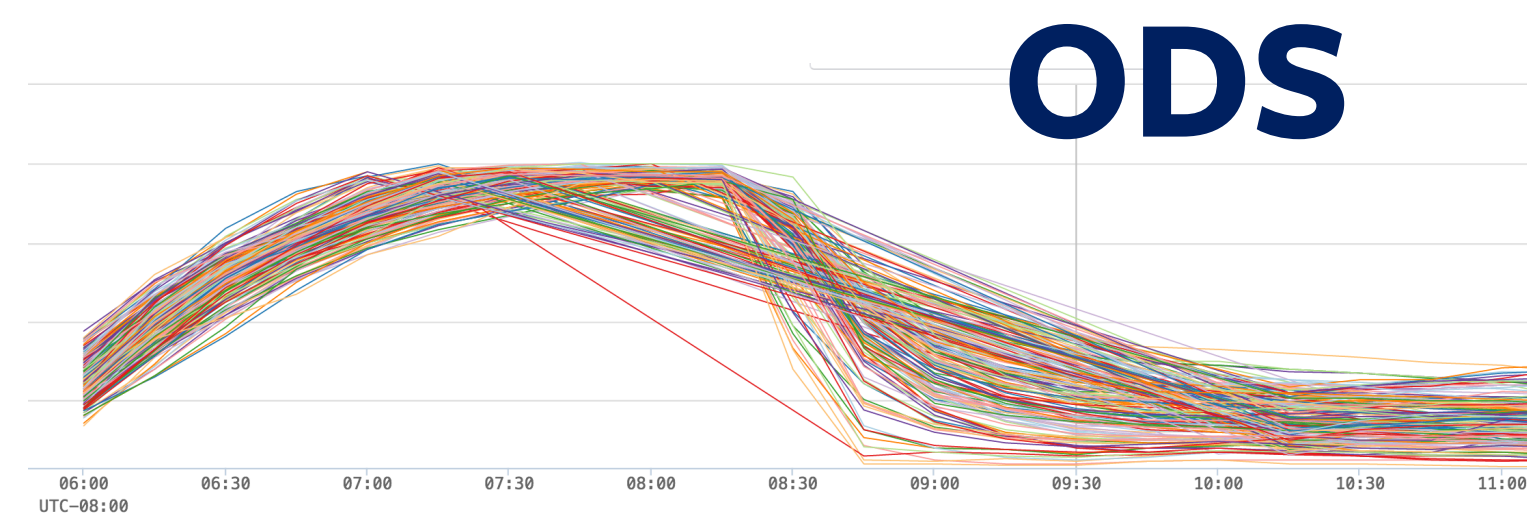
Deploy new version to 1 OpenBMC



Deploy new version @scale OpenBMC



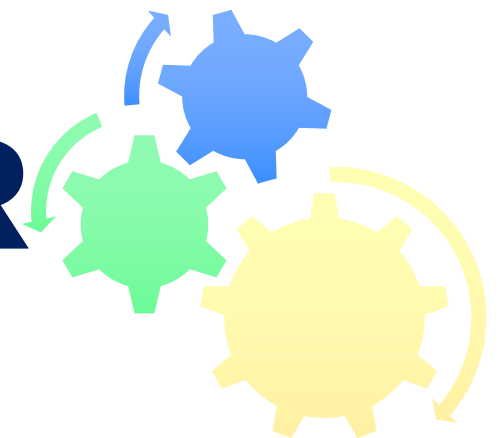
Monitoring



Alert



FBAR



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OpenBMC Updates'17

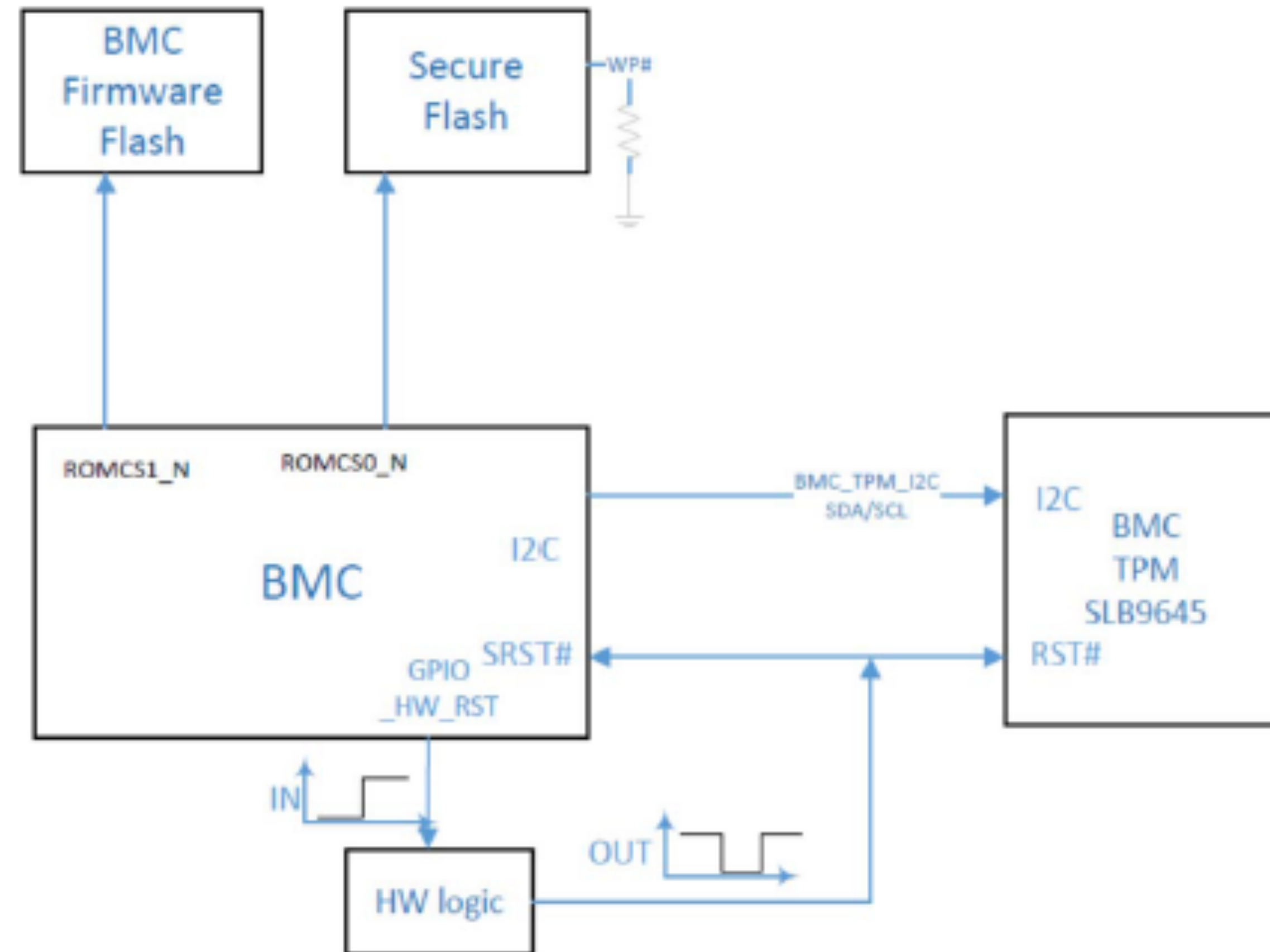
3

Verified Boot

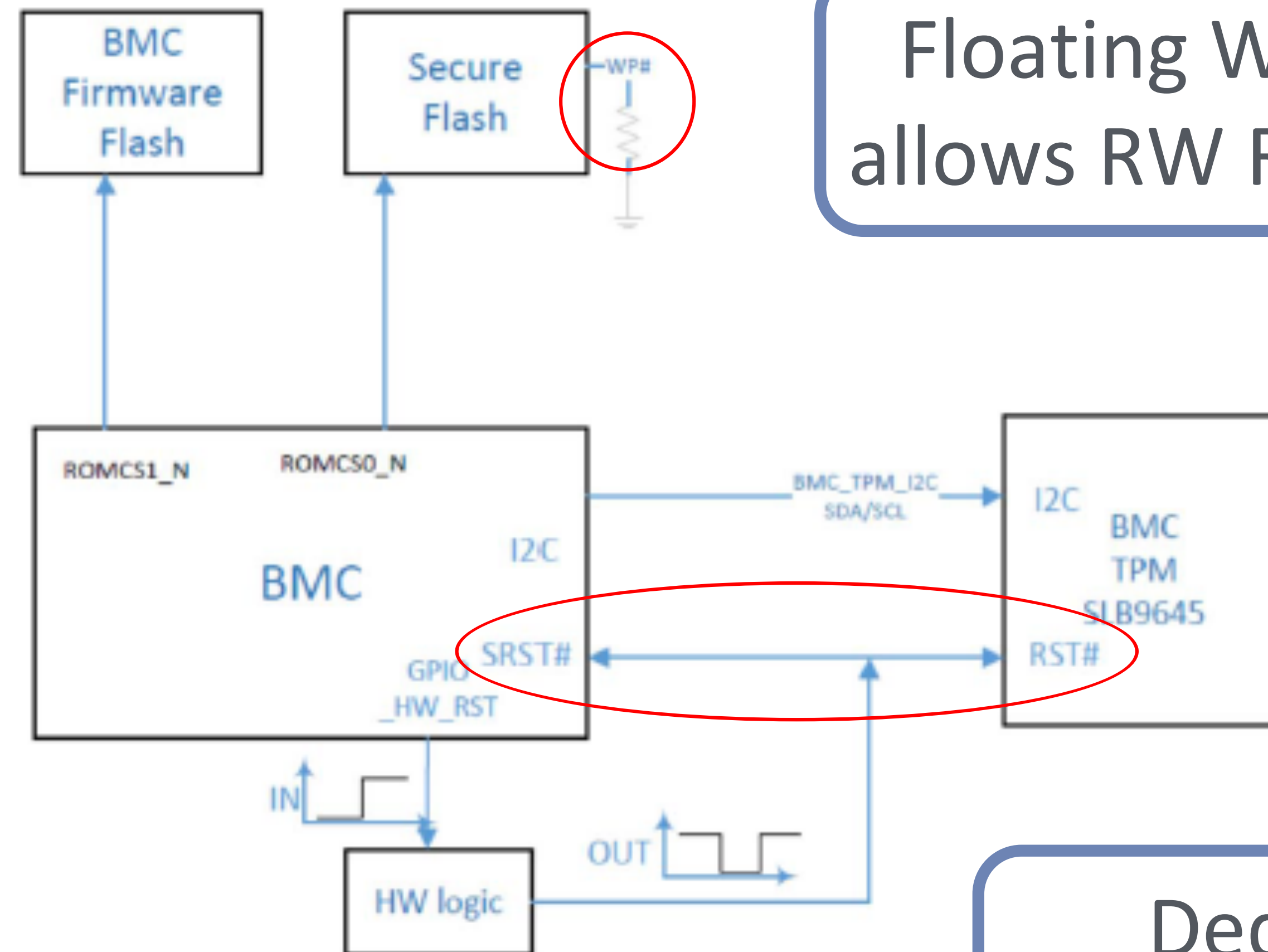
Verified Boot

- H/W Support
 - Two SPI Flash Boot Devices – 1 Read-Only using WP#
 - TPM for BMC – Glue logic to reset BMC+TPM
- U-Boot changes
 - Root of Trust – SPL
 - Key hierarchy to allow online signing and key rotation
 - Verify FIT – Blob Kernel + RootFS
 - Verified Boot Status – Allow audit and take corrective action
 - Recovery flow – IPv6, DHCPv6 and TFTP

Verified Boot H/W



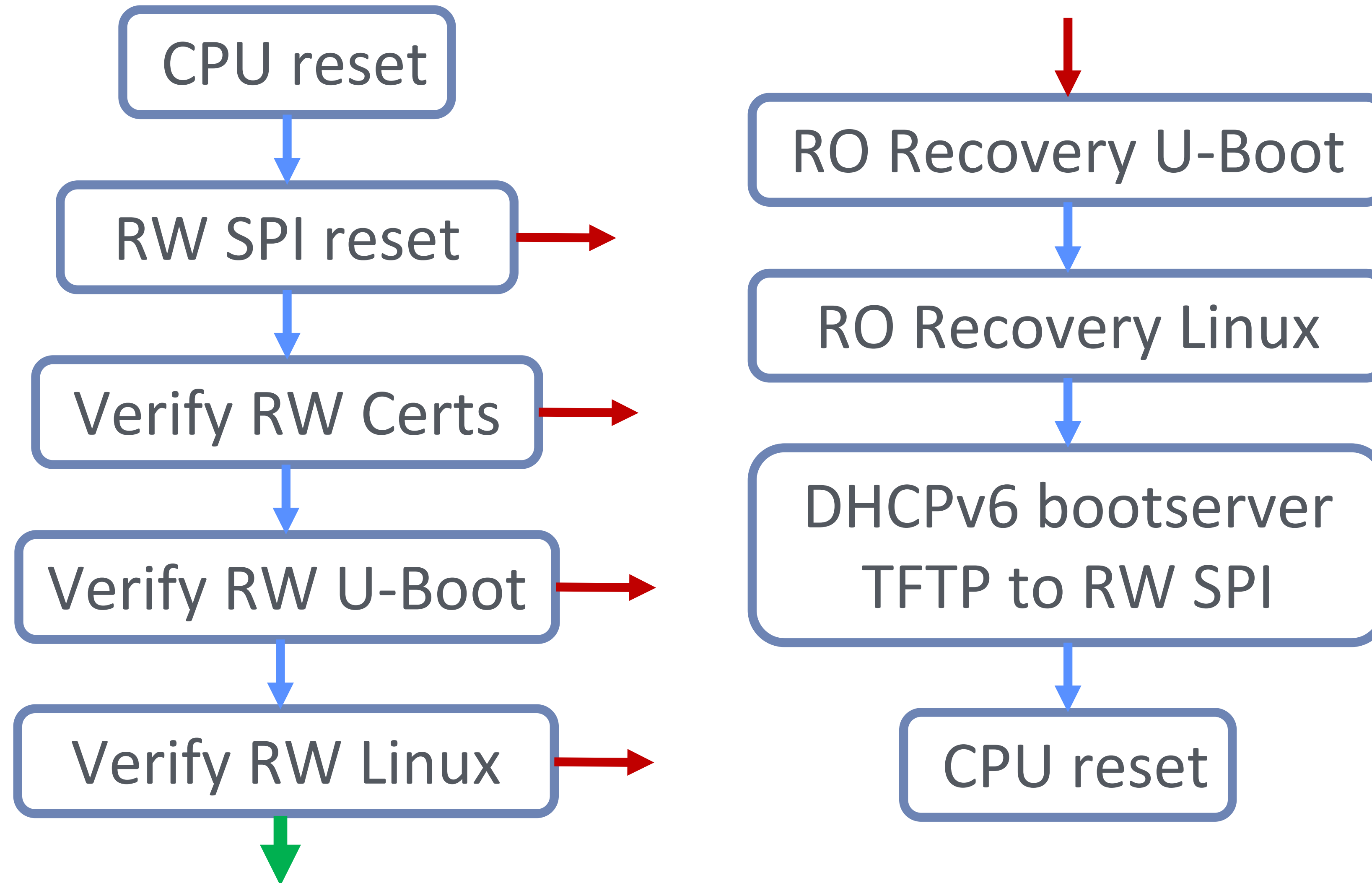
Verified Boot H/W



Floating WP#
allows RW ROM

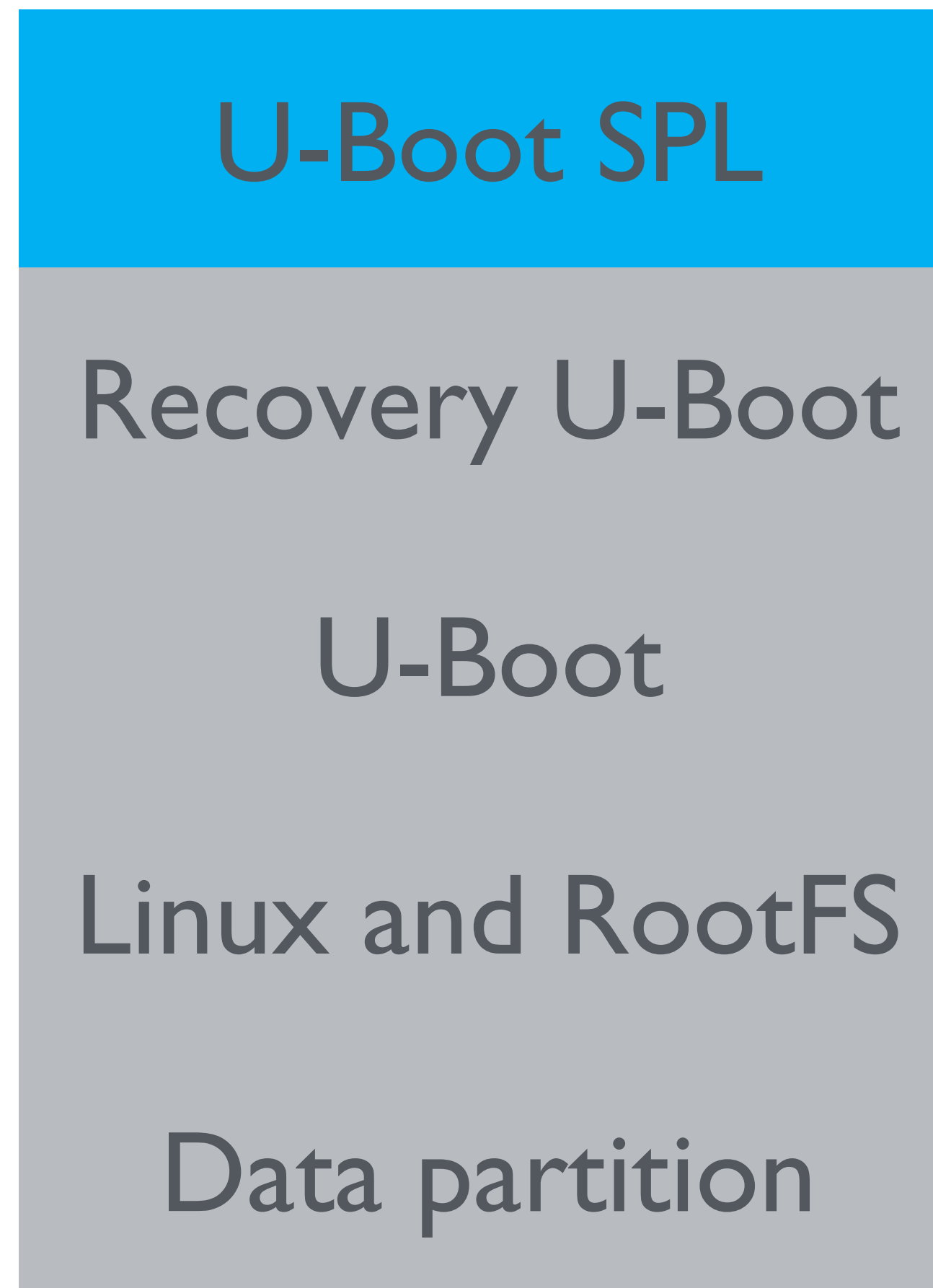
Dedicated TPM
RST only if BMC resets

Verified Boot Flow



Symmetric SPI Flash layout

Secure Flash

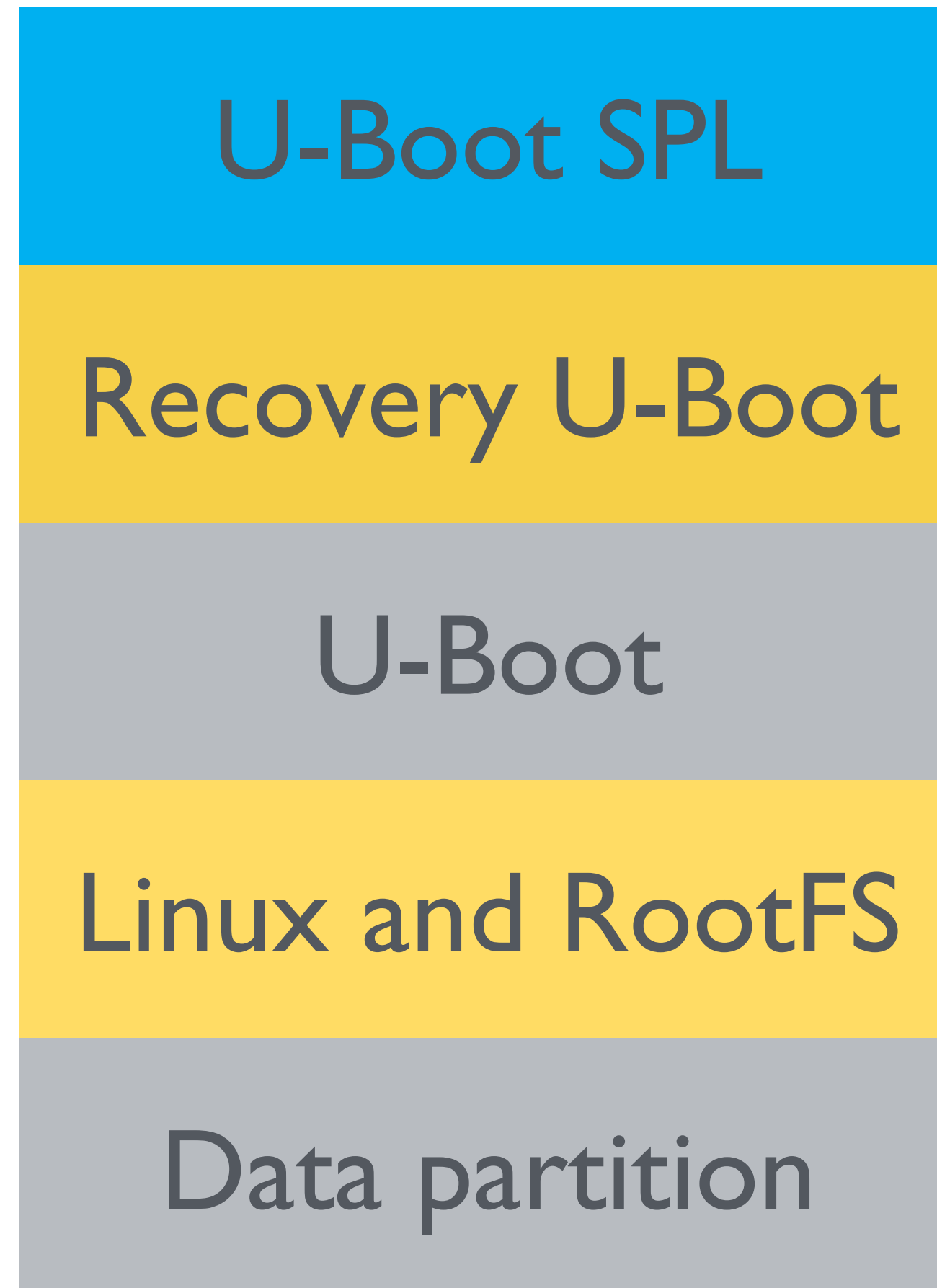


BMC Flash

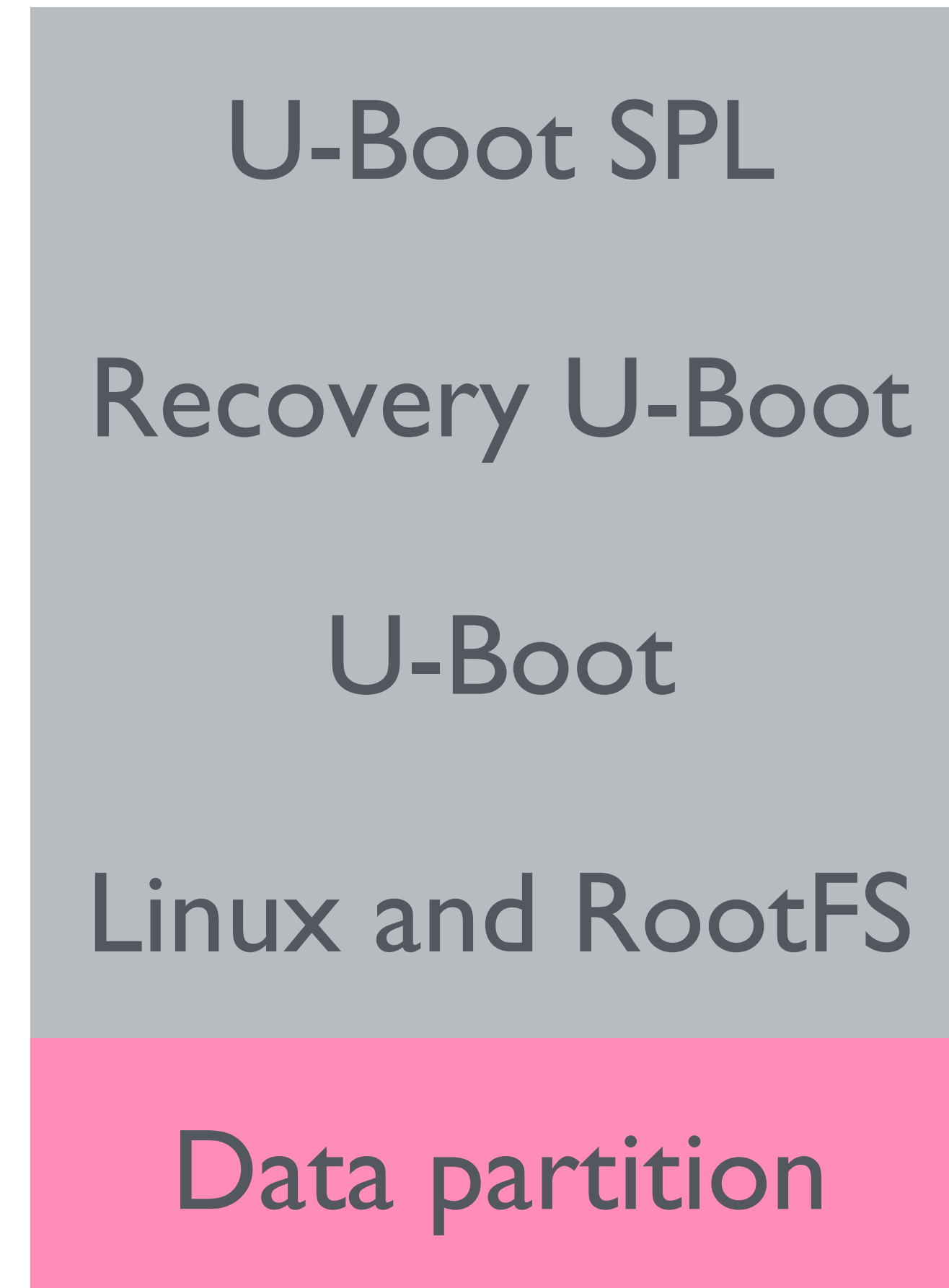


Symmetric SPI Flash layout

Secure Flash



BMC Flash



Summary

- System Management Solution for
 - DC equipment: Network, Servers, and Storage
- Deployed @Scale
 - Managed like any other DC equipment
- Call for Collaboration
 - @<https://github.com/facebook/openbmc>

Questions?



**THIS JOURNEY
1% FINISHED**

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