Device Management Control (DMC)

Effective Out-Of-Band Device Management System Architecture

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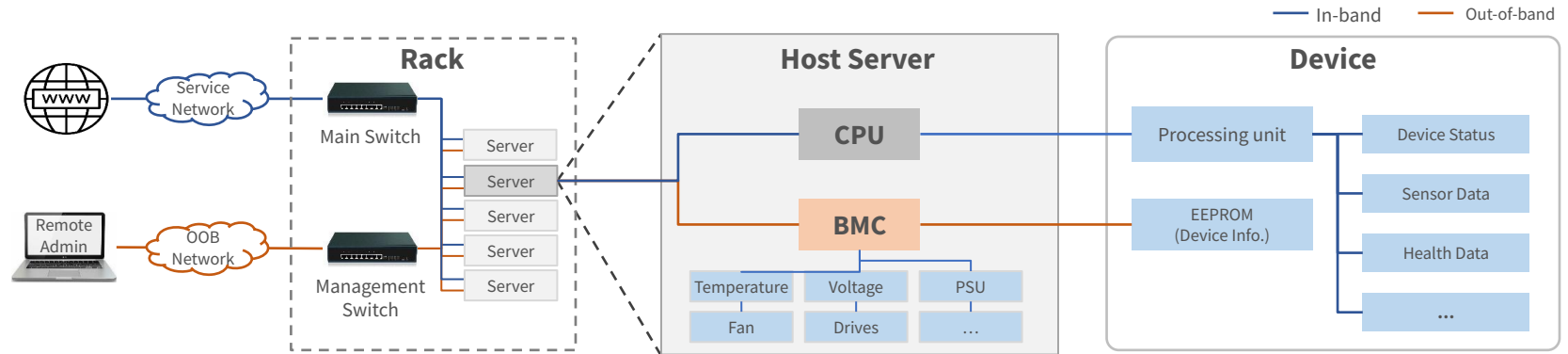
OCP
FUTURE
TECHNOLOGIES
SYMPOSIUM

Background : Out-Of-Band(OOB) Management

Board Management Control (BMC)
- Management subsystem to monitor and manage system hardware
- Work without relying on server CPUs, BIOS and operating system
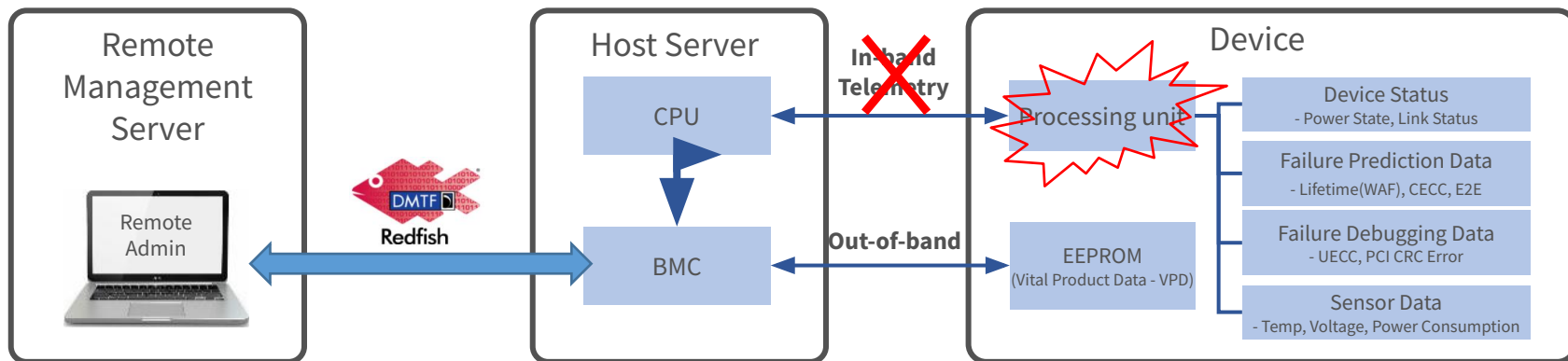
OOB Management
- No dependency on CPUs, operating systems, BIOS, network, in-band management and device status

Limitation : Current Storage Device Management

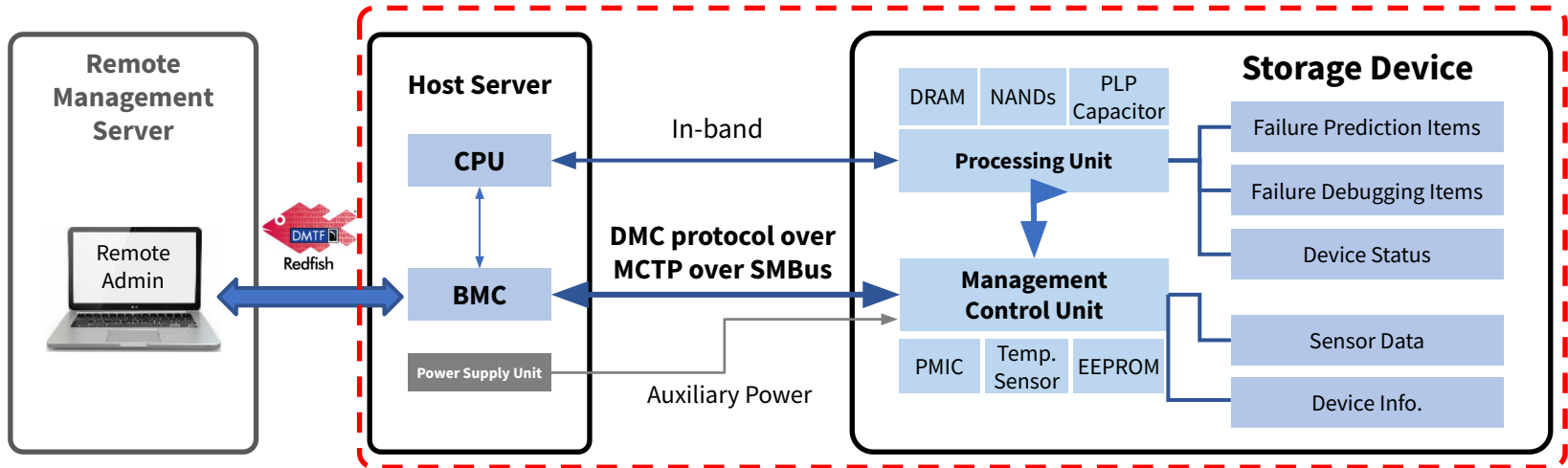Storage Device provides many In-band Telemetry Data.

In-band management can't work when device fails or system error occurs.

DMC Architecture - Proposal

Management Control Unit(MCU) is directly connected to the BMC.

DMC Protocol to retrieve device status / log and get system status from BMC
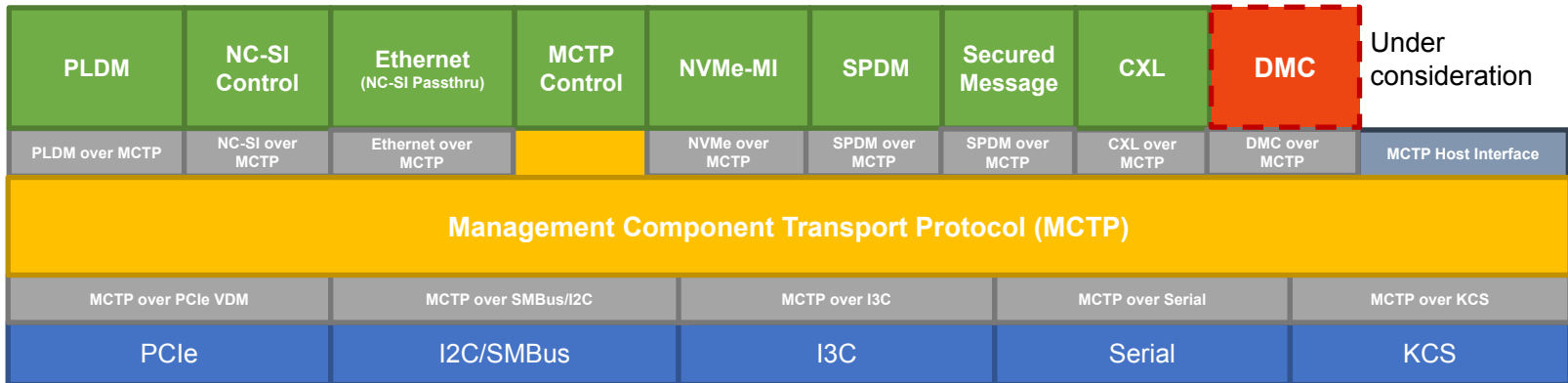
DMC : Hardware Requirements

- MCU connects to BMC directly
  Even if device is in abnormal stage, BMC can still monitor device status.

- **MCU can store and deliver device log data**
  Sensor Data(Temperature, Power, etc.), Device Status(PCIe link state, Power state, etc.),
  Health Data(Lifetime-WAF, CECC/UECC count/address, PCIe CRC error count, etc.)

- **Get system status from BMC**
  Device can take protective action for system errors including FAN and/or PSU error.

- Additional Features
  Firmware Update via OOB, Device Controller Reset, etc.

DMC : Implementation in PMCI

Need to standardize Data Model and Message Protocol for Storage OOB Management

PLDM	NC-SI Control	Ethernet (NC-SI Passthru)	MCTP Control	NVMe-MI	SPDM	Secured Message	CXL	DMC	
PLDM over MCTP	NC-SI over MCTP	Ethernet over MCTP		NVMe over MCTP	SPDM over MCTP	SPDM over MCTP	CXL over MCTP	DMC over MCTP	MCTP Host Interface
Management Component Transport Protocol (MCTP)									
MCTP over PCIe VDM		MCTP over SMBus/I2C		MCTP over I3C		MCTP over Serial		MCTP over KCS	
PCIe		I2C/SMBus		I3C		Serial		KCS	

Under consideration

Legend:
- Physical layer
- Binding
- Transport
- Host Interface
- Data model/Message
- DMC

PMCI* Protocol Stack

* Platform Management Communications Infrastructure(PMCI) WG of the DMTF

DMC : PoC collaboration with Inspur

Implementation of DMC Solution on Poseidon system and SSD with Inspur

Expect to collaborate with OCP H/W Management Project and DMTF

OpenBMC in Poseidon System

DMC Implementation in SSD

DMC protocol over MCTP over SMBus

- Poseidon V2 E3.X Reference System
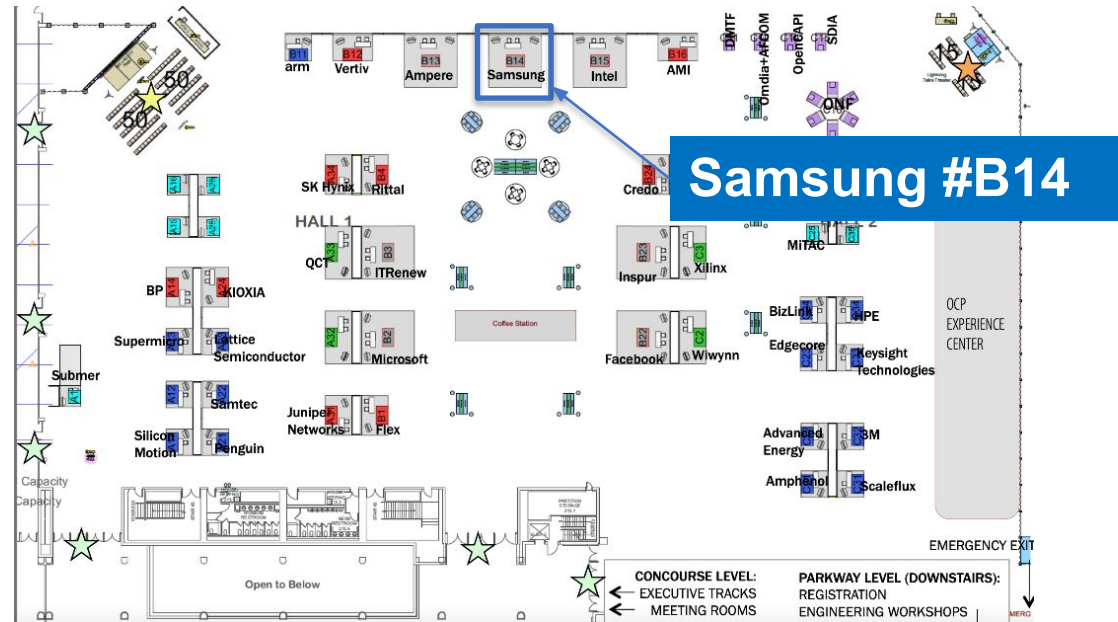- OpenBMC on DC-SCM
  + DMC Command, MCTP, SMBus, ARP

- DMC-SSD
  + DMC Command, MCTP, SMBus, ARP
  + Device Info. , Sensor, etc.

Call to action

- We want to collaborate …

    - To define data-sets and features for DMC

    - To standardize protocol including command format for DMC

- Interested Group

    - OCP H/W Management Project, OpenBMC and DMTF

Demo on OCP Global Summit

- Visit Samsung Booth for Demo

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