BMC Requirements for Internal Component Communications

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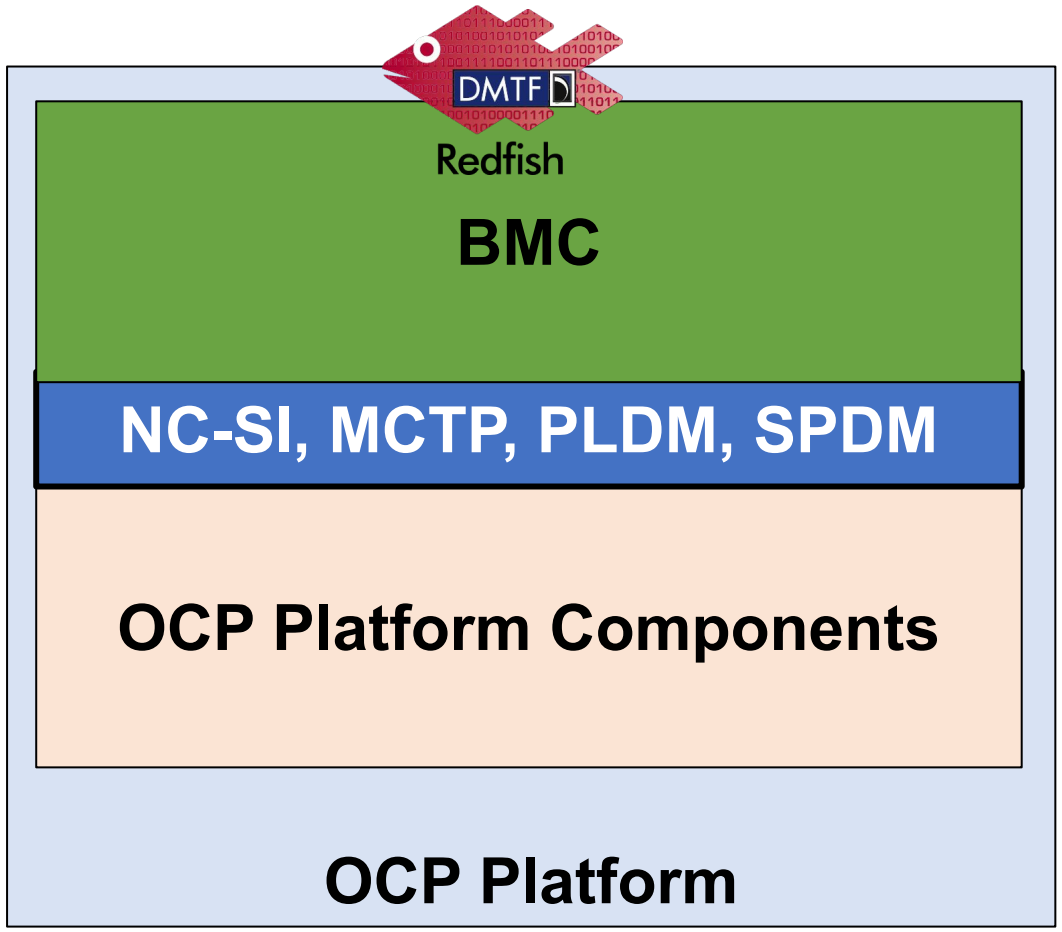
BMC-Component Communications

- Required for the management of OCP Platforms
- Goal is to enable standards-based intercommunications between different types of OCP platform components
- DMTF provides a common foundation for manageability
- OCP can leverage and adopt existing and emerging DMTF standards

DMTF Standards for OCP Platform Management Communications



Network Controller Sideband Interface (NC-SI)
Management Component Transport Protocol (MCTP)
Platform Level Data Model (PLDM)
Secure Protocol Data Model (SPDM)

Are DMTF standards for

Internal facing interfaces and protocols for platform management subsystem communications

DMTF PMCI Working Group

- Platform Management Communications Infrastructure (PMCI)
  - PMCI suite of standards provide “Inside the box” communication and functional interfaces between components within the platform management subsystem
  - Creates specifications for MCTP, PLDM, NC-SI, and SPDM

- Applicability to OCP
  - OCP Platforms Management
  - OCP Device Management
  - Security…

- OCP NIC 3.0 Design Specification leverages multiple PMCI standards including:
  - DSP0236 - MCTP Base Specification
  - DSP0222 - Network Controller Sideband Interface (NC-SI) Specification
  - DSP0267 - Platform Level Data Model (PLDM) for Firmware Update Specification
  - DSP0248 - Platform Level Data Model (PLDM) for Platform Monitoring and Control Specification

Management Component Transport Protocol (MCTP)

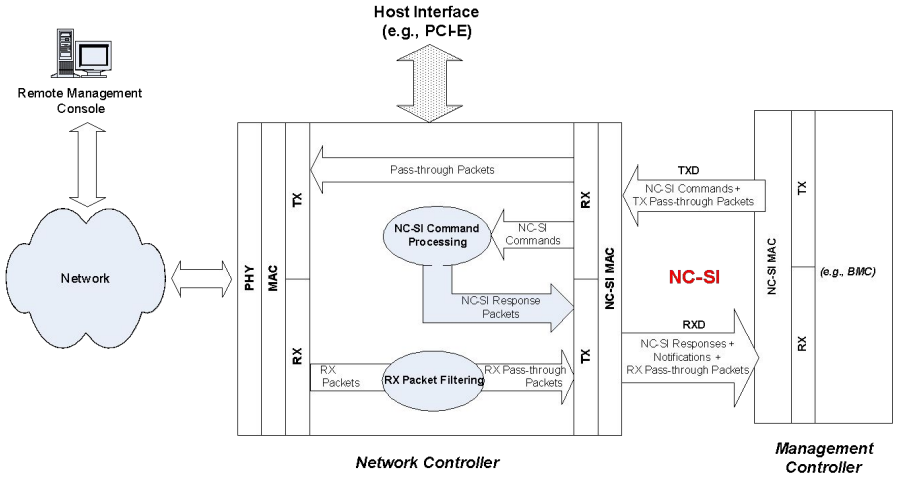
- Base transport for “inside-the-box” communication
- Suitable for use with multiple media: SMBus, PCIe, etc.
- Suitable for all computer platform types
- Supports logical addressing based on Endpoint IDs
- Provides simple message fragmentation/reassembly
- Built-in capability discovery and supports path transmission unit discovery
- Carries multiple message types: MCTP Control, PLDM, NC-SI, NVMe, SPDM

Platform Level Data Model (PLDM)

- An effective interface & data model for efficient access to
  - Low-level platform inventory, BIOS, and config data
  - Platform monitoring/control, alerting, event log, etc.
- Defines low level data representations and commands
- Provides transport independent Request/Response Model
- Supports a subtype to distinguish types of PLDM Msgs
  - Allows messages to be grouped based on the functions
  - Allows the discovery of the functionality supported
- PLDM specs: Base, IDs & Codes, SMBIOS data transfer, BIOS control and configuration, Platform Monitoring and Control, FRU, Firmware Update, and Redfish Device Enablement (RDE)

Network Controller Sideband Interface (NC-SI)

- A common interoperable sideband interface and protocol to transfer management traffic between a Baseboard Management Controller (BMC) & network controller (NC)
- Supports Multiple Types of Management Traffic
- Pass-Thru Management Traffic enables BMC-Network communication via NC
- NC-SI Command/Response Packets
  - Command (Response) sent by BMC (NC) to NC (BMC)
  - Request/Response Semantics
  - Functions: Control, Configuration, Status, Statistics,…
- NC-SI Notification Packets
  - Generated and sent by NC to MC
  - Functions: OS/Link Status Change; NC Soft Reset



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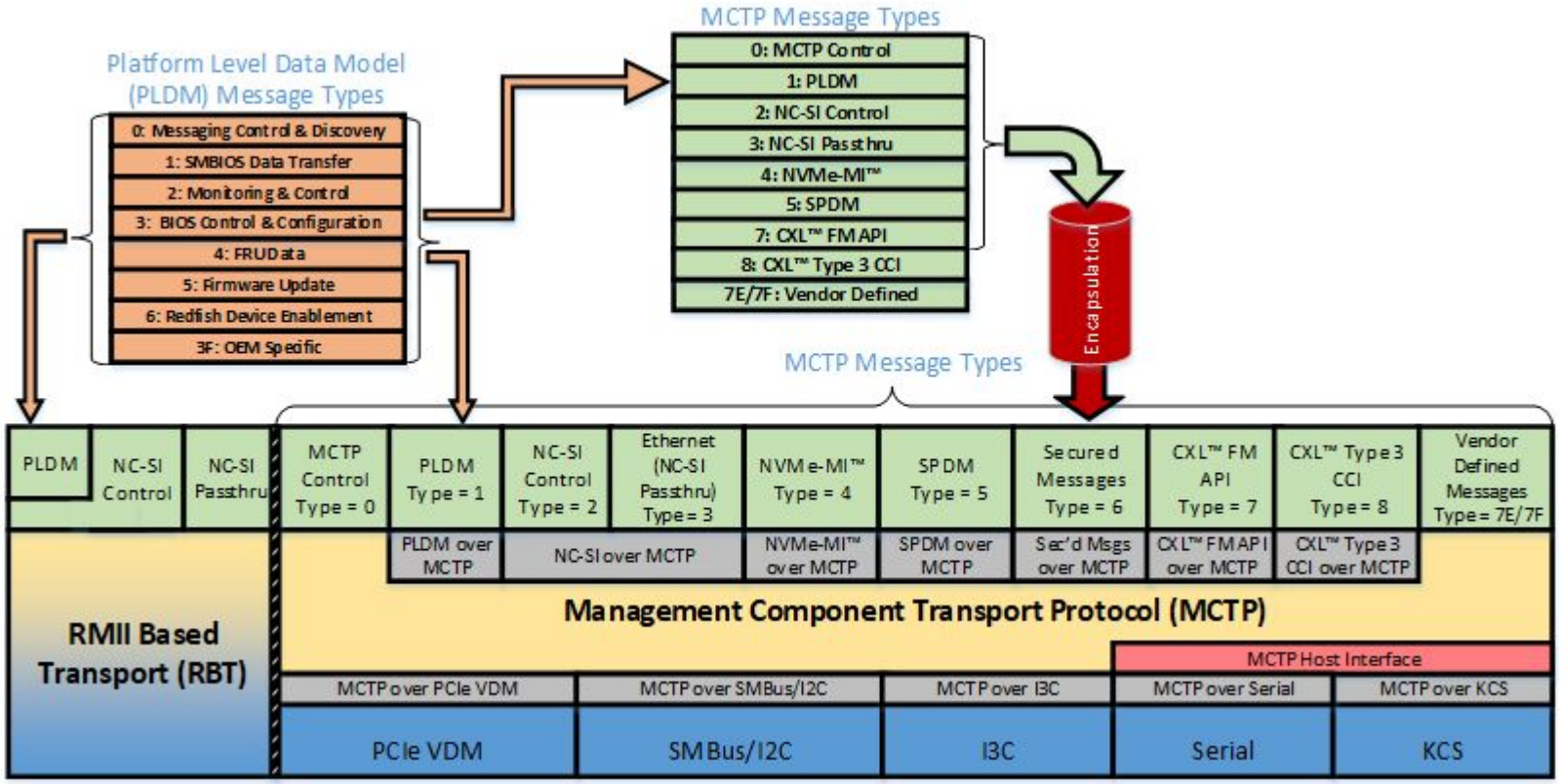
Security Protocol Data Model (SPDM)

- Specifies a method for:
  - Managed device authentication
  - Firmware measurement
  - Certificate retrieval
- Defines the formats for both request and response messages
- Enables end-to-end security between platform components
- Provides the ability to send secured messages:
  - A generic record format used for encryption
  - Message authentication of application data

PMCI Stack


Platform Level Data Model (PLDM) Message Types
0: Messaging Control & Discovery
1: SMBIOS Data Transfer
2: Monitoring & Control
3: BIOS Control & Configuration
4: FRU Data
5: Firmware Update
6: Redfish Device Enablement
3F: OEM Specific
MCTP Message Types
0: MCTP Control
1: PLDM
2: NC-SI Control
3: NC-SI Passthru
4: NVMe-MI™
5: SPDM
7: CXL™ FM API
8: CXL™ Type 3 CCI
7E/7F: Vendor Defined
Encapsulation
MCTP Message Types
PLDM
NC-SI Control
NC-SI Passthru
MCTP Control Type = 0
PLDM Type = 1
NC-SI Control Type = 2
Ethernet (NC-SI Passthru) Type = 3
NVMe-MI™ Type = 4
SPDM Type = 5
Secured Messages Type = 6
CXL™ FM API Type = 7
CXL™ Type 3 CCI Type = 8
Vendor Defined Messages Type = 7E/7F
PLDM over MCTP
NC-SI over MCTP
NVMe-MI™ over MCTP
SPDM over MCTP
Sec'd Msgs over MCTP
CXL™ FM API over MCTP
CXL™ Type 3 CCI over MCTP
RMII Based Transport (RBT)
Management Component Transport Protocol (MCTP)
MCTP Host Interface
MCTP over PCIe VDM
MCTP over SMBus/I2C
MCTP over I3C
MCTP over Serial
MCTP over KCS
PCIe VDM
SMBus/I2C
I3C
Serial
KCS