



Platform Management Components Intercommunications (PMCI):

Technology Overview

Patrick Caporale, Lenovo
PMCI Co-Chair, DMTF
April 2020

Copyright © 2020 DMTF

Agenda

- PMCI Working Group
- Platform Management Subsystem
- PMCI Protocol Stack
- Management Component Transport Protocol (MCTP)
- Network Controller Sideband Interface (NC-SI)
- Platform Level Data Model (PLDM)
- Security Protocol and Data Model (SPDM)

Goals of this Presentation

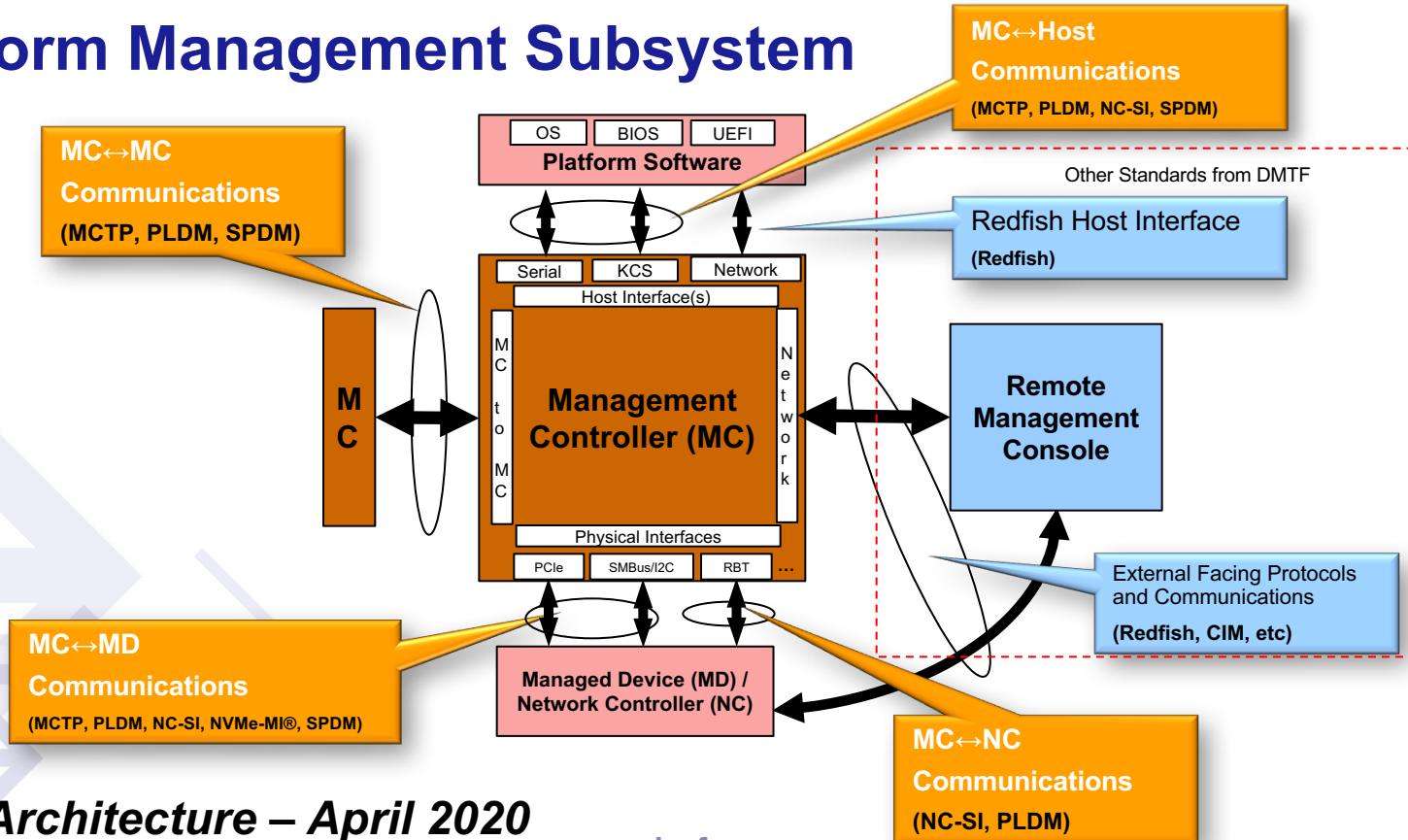
- Provide an overview of PMCI technologies and standards
- Discuss management challenges addressed by PMCI technologies

PMCI Working Group

- Platform Management Component Intercommunications
- PMCI suite of standards provide 'inside-the-box' communication and function interfaces between components within the platform management subsystem
 - Management Controller (MC) to Management Controller
 - Management Controller to Network Device (NC)
 - Management Controller to Managed Device (MD)
 - Host Interface to Management Controller
- Formed in 2005, initial standards released in 2007
 - Creates specifications for MCTP, PLDM, NC-SI, and SPDM
- Over a decade of implementations within server and desktop provides

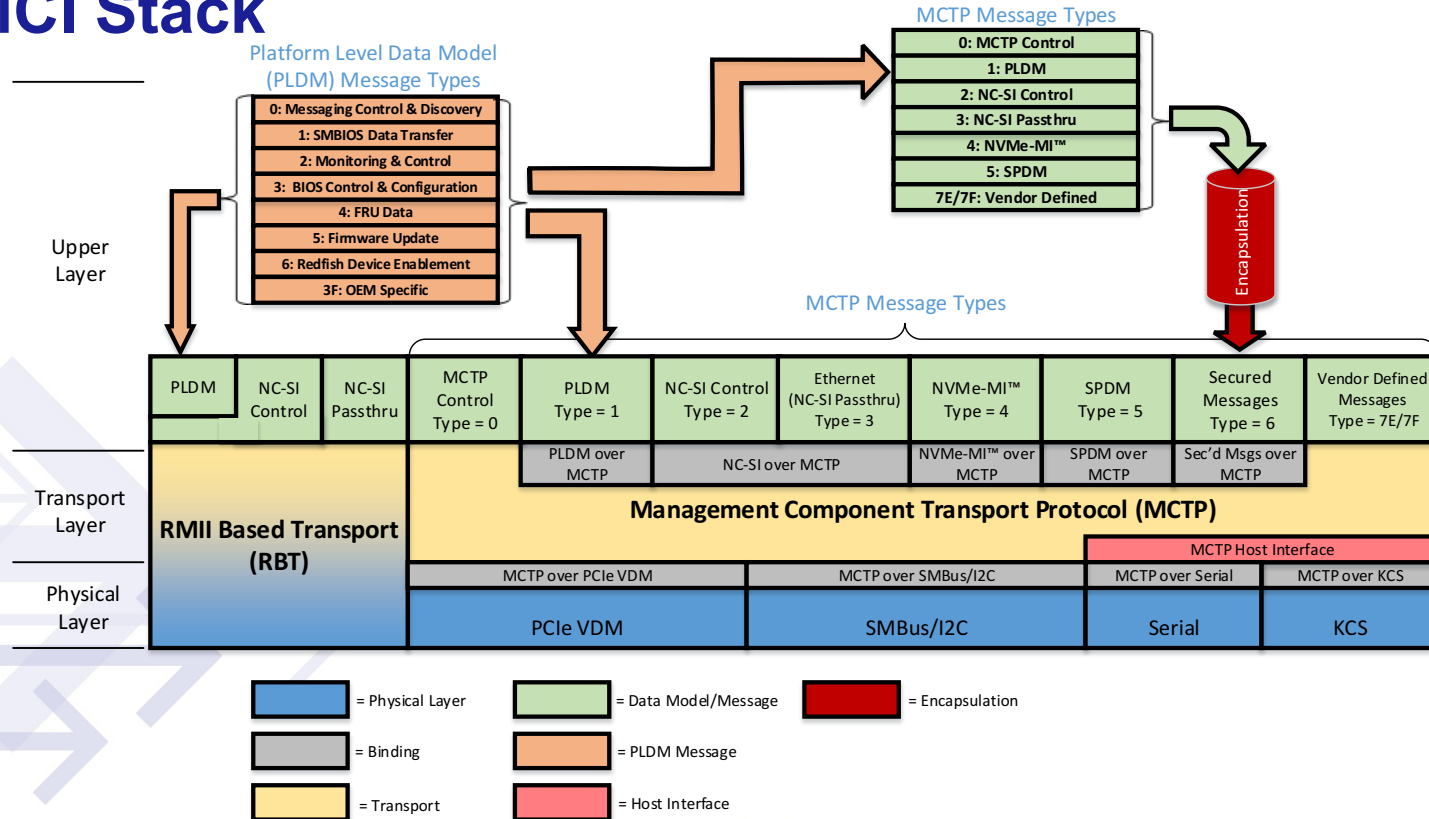
PMCI technologies and interfaces are complementary and enabling to DMTF external facing data models/remote management protocols

Platform Management Subsystem



PMCI Architecture – April 2020

PMCI Stack





Management Component Transport Protocol (MCTP)

- Base transport for “inside-the-box” communication
- Suitable for use with multiple media: SMBus/I2C, 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-MI™, SPDM

MCTP Base Specification = DSP0236

Additional MCTP specifications at www.dmtf.org/standards/pmci

Network Controller Sideband Interface (NC-SI)

- A common interoperable sideband interface and protocol:
 - Used to transfer management traffic between a management controller (MC) and network controller (NC).
 - Can be transported via MCTP or RBT
- NC-SI Communications
 - Pass-through Management Traffic
 - NC-SI Command/Response Packets
 - Command (Response) sent by MC (NC) to NC (MC).
 - Request/Response Semantics.
 - Functions: Control, Configuration, Status, Statistics, etc.
 - NC-SI Notification Packets
 - Generated and sent by NC to MC.
 - Functions: OS/Link Status Change, NC Soft Reset.

NC-SI Base Specification = DSP0222

Additional NC-SI specifications at www.dmtf.org/standards/pmci

RMII Based Transport (RBT)

- NC-SI Binding over Reduced Media Independent Interface™ (RMII)
 - Physical-level interface is based on RMII
 - Media-level interface is based on Ethernet
- Defines hardware arbitration scheme
 - Enables sharing a single RMII-based NC-SI bus
 - Prevents two or more NC-SI packages from transmitting at the same time

RBT defined within NC-SI Specification = DSP0222

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, firmware update, etc.
 - Redfish enablement for managed devices (RDE)
- Defines low level data representations and commands
- Provides transport independent Request/Response Model
- Supports a subtype to distinguish types of PLDM Messages
 - Allows messages to be grouped based on the functions
 - Allows the discovery of the functionality supported

PLDM Base Specification = DSP0240

Additional PLDM specifications at www.dmtf.org/standards/pmci

Security Protocol and Data Model (SPDM)

- Developed by Security Task Force within PMCI Working Group
- Defines message exchange, sequence diagrams, message formats, and other relevant semantics for authentication, firmware measurement, and certificate retrieval.
- Support for session key exchange protocols in version 1.1
 - Work in Progress
- Support for secured messages over MCTP through new binding specification
 - Coming Soon!

SPDM Base Specification = DSP0274

Additional SPDM specifications at www.dmtf.org/standards/pmci

Summary

- Platform Management Component Intercommunications (PMCI) WG defines:
 - “Inside the box” communication/functional interfaces between components
- PMCI interfaces complementary/enabling to external facing data models and protocols
- Management Component Transport Protocol (MCTP):
 - Transport for internal communications & carry multiple message types
- Network Controller Sideband Interface (NC-SI)
 - An interface to transfer management traffic between MC & NC
- Platform-Level Data Model (PLDM)
 - An interface/data model for low-level management data/functions
 - Extensible request/response style transport independent messaging
- Security Protocol and Data Model (SPDM)
 - Authentication, firmware measurement, and certificate retrieval
 - Session key exchange
 - Secured Messages over MCTP

PMCI specifications at www.dmtf.org/standards/pmci



Acknowledgement

Thanks to all the contributors and participants of the PMCI Working Group!



**For more information,
visit dmtof.org**

**Learn about the PMCI working group at
dmtof.org/standards/pmci**

Thank you!