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Data Center-Secure Control Module 2.0 Specification Update

OCP GLOBAL SUMMIT

NOVEMBER 9-10, 2021

Server

DC-SCM 2.0 Specification Update

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DC-SCM2.0 Overview

HW MANAGEMENT

SERVER

A collaboration to expand upon the DC-SCM 1.0 specification to allow for future scalability and longevity across multiple generations of enterprise platforms. To support evolving manageability interfaces, range of entities being securely managed and forthcoming use cases such as multi-node server designs.

AMD ami AMPERE ASPEED DELL Hewlett Packard Enterprise

IBM intel LATTICE SEMICONDUCTOR Lenovo Microsoft

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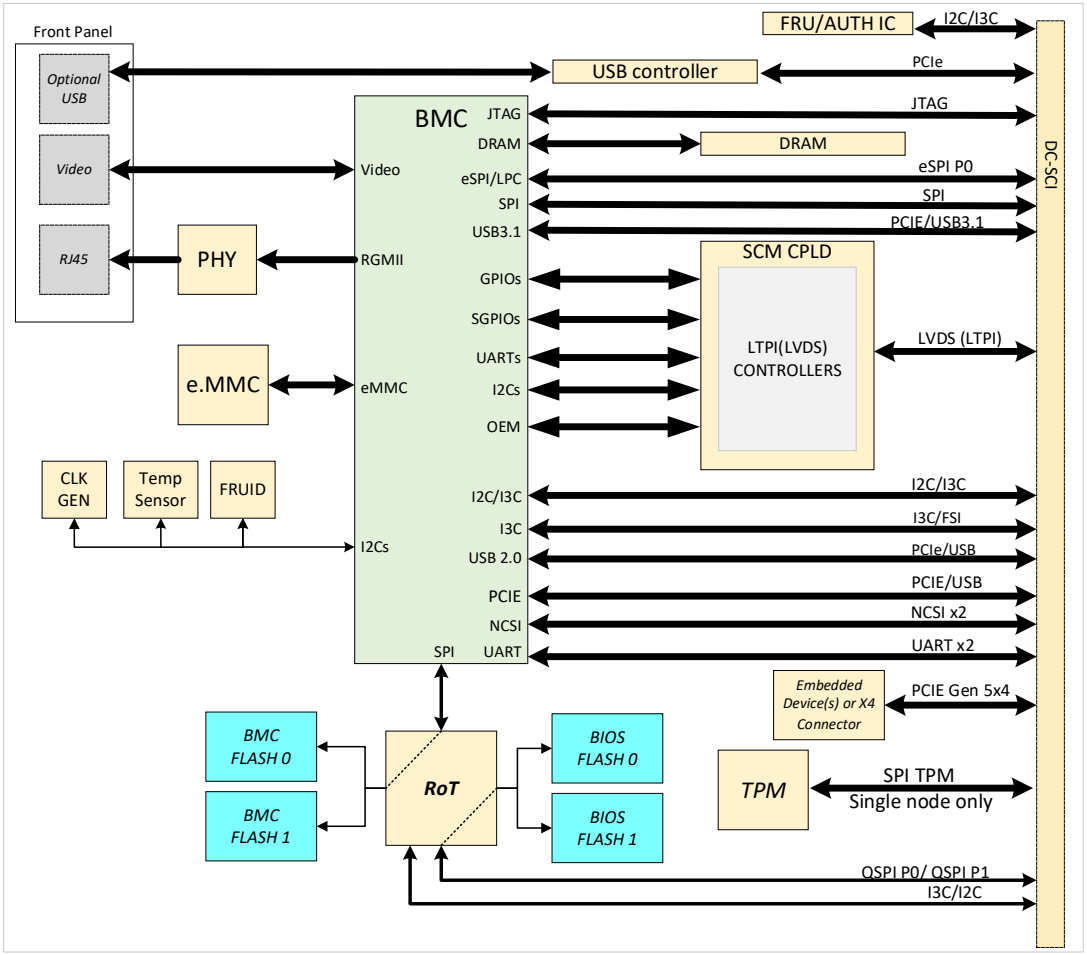
DC-SCM 2.0 changes from 1.0

- "Plug & Code" model to achieve universality among Host Processor Modules (HPM) and DC-SCMs
- Evolved interfaces for broader and future looking use cases with more typical examples toward maximizing interoperability
- Refined power states, limits and discovery rules for improved electrical compatibilities
- Overlayed dual-node alternate pin definition
- Evolved high-speed serial interface & protocol (LTPI) for pin reduction, remote BMC peripheral expansion & low latency transfers
- Mechanical foolproof break in compatibility between 1.0 & 2.0 (connector skew)

DC-SCM2.0 example use diagram



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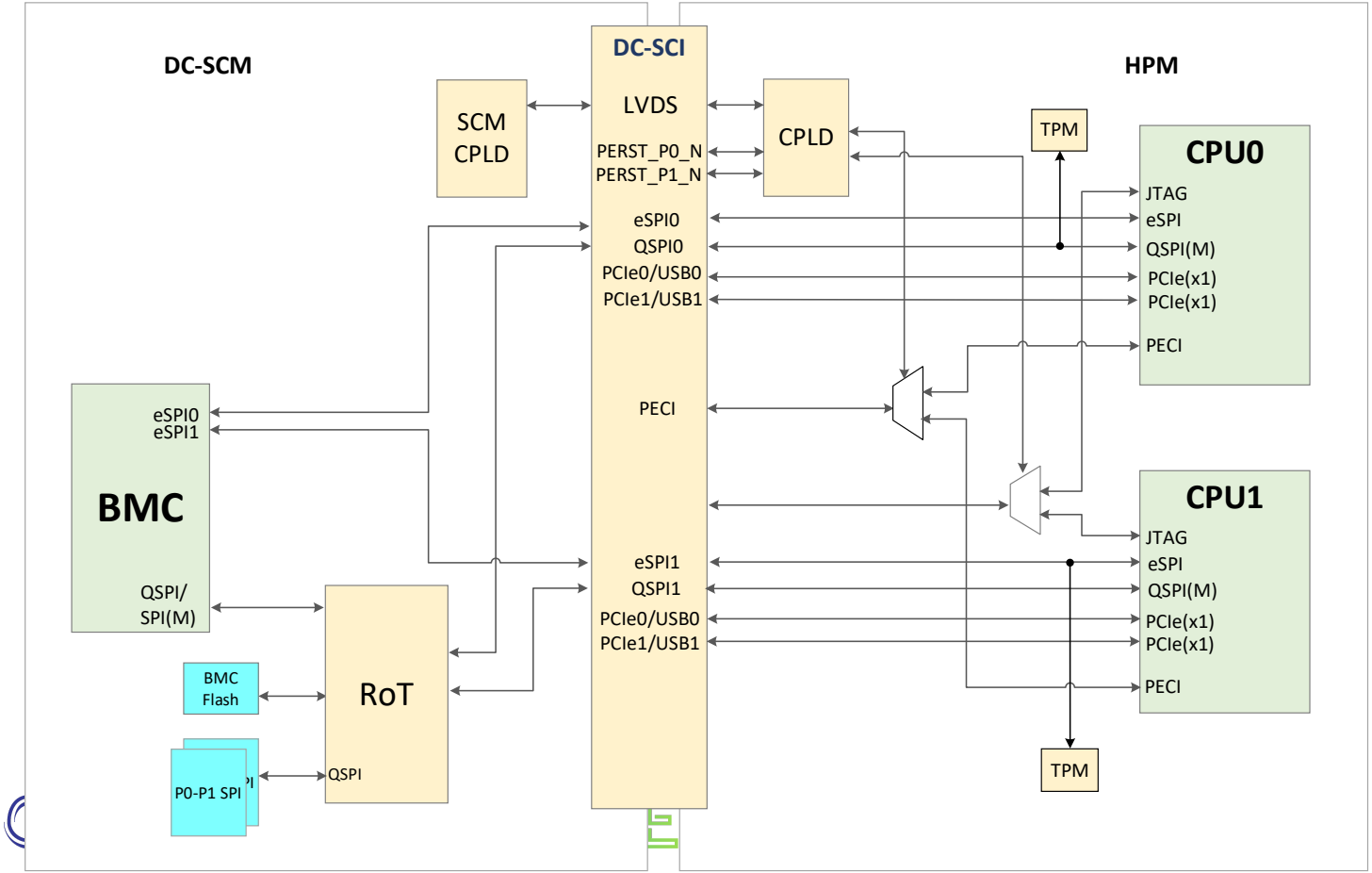
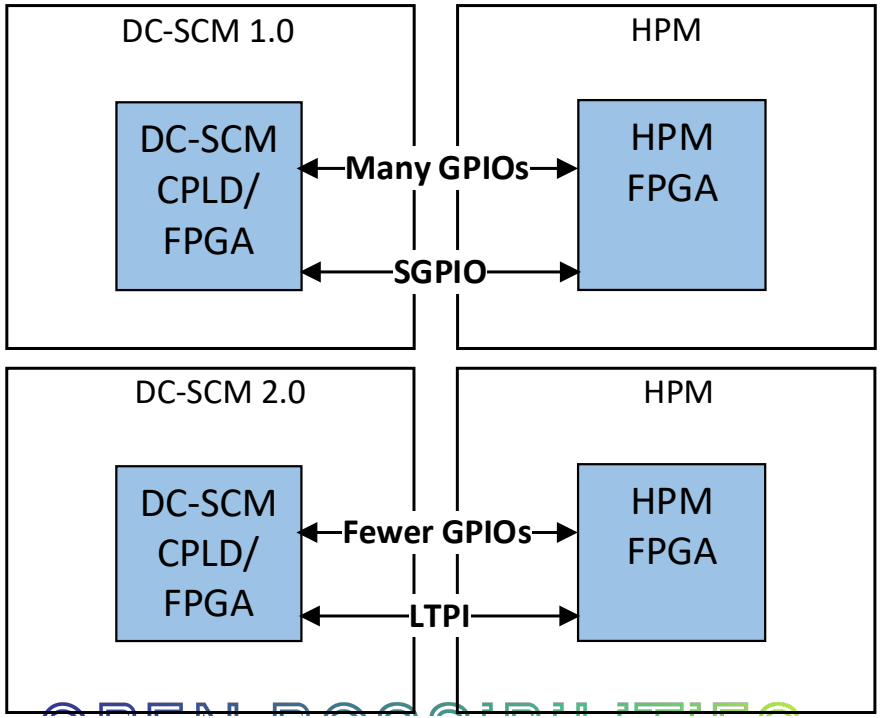
DC-SCM2.0 dual-node example



DC-SCM2.0 LTPI – LVDS Tunneling Protocol & Interface

Kasper Wszolek and Yi Zeng (Intel) own this section



Slow, Single ended,
Fixed length
GPIO bit shifter

High Speed, differential,
Lower latency, Multi-channel,
GPIOs + remote peripherals

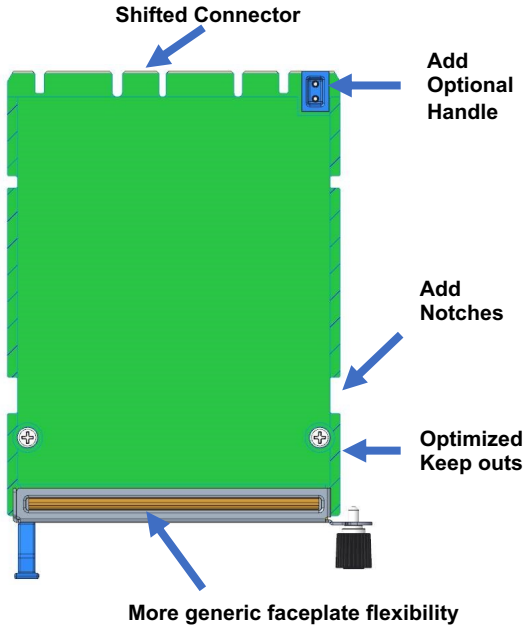
See LTPI workshop on-demand video and spec for more details

DC-SCM2.0 Mechanical Changes

Glen Hanna (Intel) owns this section of the spec

Many great ideas from Andrew Junkins (Lenovo)

- All refinements targeted at horizontal form factor only
- Same X-Y board dimensions
- Removed vertical formfactor in the 2.0 spec
- Same 168 pin standard 4C+ connector, shifted to prevent cross version mis-plugs
- Improved keep-outs to maximize usable 3D and board space
- Added eject and install/hold down options
- More generic models for I/O face plate /port flexibility
- Removal of specific daughter card sizes/locations such as TPM and platform root of trust



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DC-SCM2.0 Power Sequencing & Discovery

- "Plug-n-Code" is enabled via "Plug-N-Detect-Else-Halt" Guidance with optional step bypasses in closed / non-cross compatibility necessary environments
- Power state common nomenclatures (Pre-STBY, STBY, S5, S0)
- DC-SCM 2.0 sourced trickle power rail for HPM FRU/ Authentication IC, aiding discovery before engaging system specific rails/interfaces
- Narrowed voltage tolerance to improve DC-SCM peripheral options (from 10-14V to 12.0V +-10% with a new max target wattage)
- Increased battery drain max by 200nA
- Refined physical handshakes and example virtual handshakes

DC-SCM2.0 Interface Definition

- Common bus/signal/partition name & instance nomenclatures
- Best fit pin assignments / bus counts / voltages / mutually-exclusive alternate pin functions for multi-generational expected use cases.
- Accommodates all asks within pin count constraints
- Targeted min BOM cost where possible e.g., 2 clocks vs always a fanout buffer
- Alternate pin functions in typical-to-exotic order
- Defined minimum system power state where bias is allowed for every signal, driving clear rules for cross-power domain logic (avoiding contention + leakage)
- Multi-voltage pin allowances based on DC-SCM 2.0 + HPM combination
- Refined typical example interface drawings to aid adopters

High-Level Interface Deltas between 1.0 and 2.0

Features	DC-SCM1.0	DC-SCM2.0
SGPIO	yes	removed
LTPI (serialization over LVDS)	no	new
I2C 3.3V	yes	yes
I2C/I3C 1.8V		new
I3C	1.0V	1.8V
I3C/FSI 1.0/1.2		new
PCIE topology	yes	Enhanced options
USB topology		Host & managed USB enhanced options
Dual node support		new
SPI	yes	more alt-functions
NCSI	yes	2x with alt-functions
VCC_SCM_HPM_FRU		new
VIRTUAL_RESEAT	yes	removed
HPM_FW_RECOVERY	yes	removed

DC-SCM Future Exploration Topics

- New or optional expansion connector for more pins where needed
- Compliance test vehicle
- Continually evaluate evolving interfaces/voltages/HPM use cases

Call to Action

Project Wiki : https://www.opencompute.org/wiki/Hardware_Management/Hardware_Management_Module

Mailing list: https://ocp-all.groups.io/g/OCP-HWMgt-Module

Call to community to add what is missing/wish-list to public wiki

Specification contribution targeted for 2022

Please visit the Experience Center for LTPI demos

Thank you!

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