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Data Center Manageability Interface (DCMI 1.0)

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What is DCMI?

- Open Specification targeted at needs of Internet Portal Data Centers (IPDCs) to provide manageability for very large volume of servers
- Provides a low cost and simplified interface to platform hardware and power management capabilities.
- Designed from ground up with feedback from IPDCs and OEMs to be vendor independent and to ensure interoperability.
  - Cont…

What is DCMI?

- Supports reliable and resilient management via in-band and out-of-band interfaces
- Provides reliability and resilience guidelines to ensure consistency of user experience
- Uses industry standard IPMI2.0 as the foundation

DCMI Motivation

- **Promote an open standard to provide:**
  - **Consistency in the manageability command interfaces across different vendors**
  - **Consistency in the user experience of manageability command interfaces**
  - **Automation in large-scale data centers through soliciting input from DC operators**
- **Promote an ability to check the conformance of DCMI Specification by providing DCTS (DCMI Conformance Test Suite) available for Windows and Linux (Source and binary included).**

For Specification updates, white paper and tools
http://www.intel.com/go/dcmi

DCMI 1.0 Adoption model

- Current IPMI 2.0 compliant BMC firmware's can migrate to provide DCMI 1.0 by
  - Additional validation to support the required level of reliable and resilience requirements
  - Supporting the command interface specified in the DCMI 1.0

DCMI 1.0 leverages IPMI2.0

DCMI 1.0 Endorsements

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Overview

- Defines a subset of IPMI 2.0 functions common across all DC operators requirements
- Defines a set of additional commands targeted for optimization towards Data Centers
- Provides guidelines for reliability and resilience at the server level and provide a framework for developing SLAs

Interface Requirements

- **Covers the basic manageability requirements anticipated by Data Center as the first step on each server**

Platform	Security	Communication Access
1) Server Identification	1) Authentication	1) Physical Interfaces
2) Power On/Off/Reset	2) Encryption	2) Protocol
3) Event Logging	3) Privilege Levels	3) Session Support
4) Temperature Monitoring		4) Security Attributes
5) Limited Power Management		5) Discovery

Covered in the DCMI 1.0 Interface Specification
Status: Published

Reliability & Resilience Guidelines

Reliability

Predictable and consistent behavior of the manageability controller within the server and across the Data Centers.

Resilience

The ability of the manageability controller to recover from or adjust to changes in the external factors of the data enters and continue to provide availability of DCMI capabilities.

Functional	Out-Of-Band Transport	In-Band Transport
1. Command and response latency 2. Consistent User experience – Serial Over LAN (SOL) – Power on/off/reset. – High availability	1. Expected Network Bandwidth/Footprint 2. Resilience to network surges 3. No impact to Host system	1. Failure does not impact OOB. 2. Resilient to any failure's.

Covered in the DCMI 1.0 RR Specification

Status: In Stakeholder Review

Platform Requirements

Function	Function Details	In-band (I)/ Out-of-band (O) Capability*	Mandatory (M)/ Optional(O)
Identification	• BMC ID/Version Info • System GUID • Asset Tag	I, O I, O I, O	M M M
Chassis Power	• Power On • Power Off • Power Reset	O I, O I, O	M M M
Event Logging	• Get Log in IPMI SEL format • Clear Log	I, O I, O	M M
Temperature Monitoring	• Inlet Temperature (s) • CPU Temperature (s) • Baseboard Temperature (s)	I, O I, O I, O	M M M
Limited Power Management	• Set Power Limit • Get Power Limit • Get Power Reading	I, O I, O I, O	O O O

Security Requirements

- In general, the combination of authentication and encryption are classified into three modes of operation
  - *Simple Security* - no need for securing the environment, like lab or fully secured facility
  - *Authentication Only* - Used on Secure environments which looks for user audits
  - *Authentication and Encryption* - Used in general unsecured situations.
- Standard IPMI 2.0 Cipher suites apply.
- Based on DC operators recommendation added SHA-256* algorithms support.
- Privilege levels are apply at the transport and command level.

* Proposed and accepted to be part of the next errata for IPMI 2.0

Communication Access Requirements

Manageability Access	Interface	Protocol	Single/ Multi Session	Security	M/O
In-band	KCS*	SMS	Single	Host OS	M
Out-of-band	LAN (VLAN)	RMCP+ (+ SOL)	Multi	Authentication Encryption Privilege Levels	M
Out-of-band	Serial	TMODE	Single	Authentication Privilege Levels	O

- **Server Discovery**
  - **In-band Discovery mechanisms**
  - **Out-of-band Discovery mechanisms**

*Other IPMI host interfaces will be comprehended as needed

DCMI Conformance Test Suite (DCTS)

- DCTS provides a baseline set of tests for verifying compliance with the Data Center Management Interface (DCMI) 1.0 specification
- DCTS designed to perform “Black Box” testing.
- The primary objectives of the test suite are:
  - Ensure consistency in the specification's interface description
  - Increase customers confidence in interoperability between different implementations
  - Identify which parts of the specification have been implemented
  - Help implementers and users understand how the DCMI interfaces are expected to be called

Call to Action

- **Download and review DCMI1.0 Interface Specification and provide feedback.**
  - http://www.intel.com/go/dcmi
- **Engage with Intel to learn more about DCMI and how to become a promoter/adopter**
- **Adopt DCMI1.0 in your server implementations targeted at IPDC segment.**

Q&A