– DCMI –

Data Center Manageability Interface Specification v1.0, Revision 1.0

Addenda, Errata, and Clarifications

Addendum Document Revision 1

Date: 4/21/2009

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Introduction

This document presents errata and clarifications applying to the *Data Center Manageability Interface Specification, v1.0, Revision 1.0.* The section, table, and figure references are taken from the published version and revision of that specification unless otherwise noted. Where examples of text changes are given text additions are identified with underlines and text deletions are identified with strike-through.

As of this writing, revision, the DCMI specifications are available at:
http://www.intel.com/go/DCMI

Errata Numbers

The errata numbers pick up from where numbers for previous errata documents left off. This is done to help avoid confusion when referring to errata across revisions of the specification and errata documents. Some errata numbers are skipped in this document. This is intentional. The errata numbers are derived from numbers used for tracking errata and clarification requests within the DCMI stakeholders. The gaps in the sequence result from requests that have been dropped or that are still in progress.

E1 Addenda & Clarification: Missing Commands

Certain commands that are mandatory in IPMI for implementing functions were not explicitly listed as required by the DCMI specification. The command tables are updated as follows:

Table 6-1, Platform Command Definition

	NetFn	CMD	M/O[1]	Min Privilege Level
Discovery Command				
Get DCMI Capability Info	DCGRP (2Ch)	01h	M	User
Chassis Commands				
Get Chassis Capabilities	Chassis (00h)	00h	M	User
Get Chassis Status	Chassis (00h)	01h	M	User
Chassis Control	Chassis (00h)	02h	M	Admin
Chassis Identify	Chassis (00h)	04h	M	Operator
Get ACPI Power State	App (06h)	07h	M	User
Logging Commands				
Get SEL Info	Storage (0Ah)	40h	M	Operator
Reserve SEL	Storage (0Ah)	42h	M	Operator
Get SEL Entry	Storage (0Ah)	43h	M	Operator
Clear SEL	Storage (0Ah)	47h	M	Operator
IPM Device "Global" Commands				
Get Asset Tag	DCGRP (2Ch)	06h	M	User
Get Device ID	App (06h)	01h	M	User
Get System GUID	App (06h)	37h	M	User
Messaging Commands				
Get Message	App	33h	M	System Interface[2]
Send Message	App	34h	M	User[3]
Sensor & Storage Commands				
Get DCMI Sensor Info	DCGRP (2Ch)	07h	M	Operator
Get SDR Repository Info	Storage (0Ah)	20h	M	Operator
Reserve SDR Repository	Storage (0Ah)	22h	M	Operator
Get SDR	Storage (0Ah)	23h	M	Operator
Get Sensor Threshold	S/E (04h)	27h	M	Operator
Get Sensor Reading	S/E (04h)	2Dh	M	Operator
Power Management				
Get Power Reading	DCGRP (2Ch)	02h	O	Admin
Get Power Limit	DCGRP (2Ch)	03h	O	Admin
Set Power Limit	DCGRP (2Ch)	04h	O	Admin
Activate/Deactivate Power Limit	DCGRP (2Ch)	05h	O	Admin

App = Application Network Function Code
S/E = Sensor/Event Network Function Code
DCGRP = DCMI Group Extension Network Function Code

[1] Mandatory or Optional Features

[2] Command is only executable via the system interface.

[3] A User can use a Send Message command to deliver a message to system software, but Operator privilege is required to use it to access other channels.

Table 7-1, Manageability Access and Security Command List

	NetFn	CMD	P/R/Both[1]	M/O[2]
Provision Commands				
Set LAN Configuration Parameters	Transport	01h	P	M
Get LAN Configuration Parameters	Transport	02h	A	M
Set Channel Access	App	40h	P	M
Get Channel Access	App	41h	A	M
Set User Access	App	43h	P	M
Get User Access[3]	App	44h	A	M
Set User Name	App	45h	P	M
Get User Name	App	46h	A	M
Set User Password	App	47h	P	M
Set User Payload Access	App	4Ch	P	M
Get User Payload Access	App	4Dh	P	M
Set SOL Configuration Parameters	Transport	21h	P	M
Get SOL Configuration Parameters	Transport	22h	P	M
Set Session Privilege Level	App	3Bh	P	M
Runtime Commands				
Activate Payload	App	48h	R	M
Deactivate Payload	App	49h	R	M
Get Payload Activation Status	App	4Ah	R	M
Get Payload Instance Info	App	4Bh	R	M
Get Channel Payload Support	App	4Eh	R	M
SOL Activating	Transport	20h	R	M
Get Channel Authentication Capabilities	App	38h	R	M
Get Channel Info	App	42h	A	M
Get Channel Cipher Suites	App	54h	A	M
Get Session Challenge	App	39h	R	M
Activate Session	App	3Ah	R	M
Close Session	App	3Ch	R	M
Get Session Info	App	3Dh	R	M
Serial Support Extension				
Set Serial Configuration	Transport	10h	P	O
Get Serial Configuration	Transport	11h	A	O
Set Serial Mux	Transport	12h	A	O
Set Serial Routing Mux	Transport	1Ch	A	O

[1] Provisioning (P), Runtime (R), Both (A)
[2] Mandatory Features (M), Optional Features (O)
[3] Used to find the Number of Users

E2 Clarification and Typos: Eliminate strikethrough, correct terminology, and clarify requirement for configuration options.

The specification had some leftover strike-through formatted text. This text is being deleted. Additionally, the term 'baud rate' is changed to 'bit rate' to align with the IPMI specification. This clarification is made to ensure that the configuration options are offered and to avoid any misconception that DCMI implementations are expected or required to automatically select bit rates for SOL

Section 5.4.1.3

Before:

Specific Data Center requirements

1. Shall support a baud rate of 115.2 Kbps.
2. Should support baud rate of 9.6Kbps to 115.2 Kbps

After:

Specific Data Center requirements

1. Shall support a bit rate of 115.2 Kbps.
2. Should support all IPMI-specified bit rate configuration options from 9.6Kbps to 115.2 Kbps

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E5 Addenda & Clarification: Conflict with using Gratuitous ARPs

Item #1 in section 5.3.1.2 states Gratuitous ARP shall be disabled, whereas section 5.5.1.2 states "Gratuitous ARP can be used for discovery process by matching MAC address."
Clarification is offered to ensure that for the platform management subsystem using Static IP address source, Gratuitous ARP should be enabled by default and also shall provide the ability to control the Gratuitous ARP as specified in the [IPMI] .

Item #1 in Section 5.3.1.2

Before:

1. Gratuitous ARP shall be disabled by default when the platform is shipped or whenever platform management subsystem firmware is upgraded, unless an alternative configuration is requested by the Data Center customer.

After:

1. Gratuitous ARP control shall be provided as specified in [IPMI] and Gratuitous ARP generation shall be disabled by default when the platform is shipped or whenever platform management subsystem firmware is upgraded, unless the Data Center customer requests an alternative configuration. Platform management subsystems using DHCP IP Address source should not enable Gratuitous ARP.

E7 Clarification: Table 6-1, Platform Command Definition (in markup)

The designation of the Get DCMI Capability Info as being a "User" privilege level command is potentially confusing, since the command is actually available as a pre-session command, as stated in the command description. The Min Privilege Level text is modified and a table note added as follows:

Table 6-1, Platform Command Definition

	NetFn	CMD	M/O[1]	Min Privilege Level
Discovery Command				
Get DCMI Capability Info	DCGRP (2Ch)	01h	M	Session-less[2]

…

App = Application Network Function Code
S/E = Sensor/Event Network Function Code
DCGRP = DCMI Group Extension Network Function Code
[1] Mandatory or Optional Features
[2] Command can be executed at any privilege level and is available before and after establishing a session.

E8 Errata: Table 6-1 Command Privilege Levels in Platform Command Definition

Some of the commands such as 'Get Sensor Reading' are defined as requiring Operator privilege. This is more restrictive than IPMI which typically only requires User privilege for reading. Modifications are done to the table in Section 6 Table 6-1 to match the [IPMI].

	NetFn	CMD	M/O[1]	Min Privilege Level
Chassis Commands				
Chassis Control	Chassis (00h)	02h	M	Operator
Chassis Identify	Chassis (00h)	04h	M	Operator
Logging Commands				
Get SEL Info	Storage (0Ah)	40h	M	User
Reserve SEL	Storage (0Ah)	42h	M	User
Get SEL Entry	Storage (0Ah)	43h	M	User
Sensor & Storage Commands				
Get SDR	Storage (0Ah)	23h	M	User
Get Sensor Reading	S/E (04h)	2Dh	M	User

E10 Clarification: Power Management Function

The clarification provided to show that if the optional power management capability is supported then all the power management commands shall be supported, the fix is provided in form of a footnote to the table.
Table 3-1

Power Management	Set Power Limit Get Power Limit Get Power Reading	I, O I, O I, O	O[1] O[1] O[1]

1 These commands are mandatory if DCMI power management is supported by the platform.

E11 Sensor Threshold and Event Generation Requirements

The current specification does not indicate how the thresholds for mandatory sensors must be implemented, and which events must be logged.

Inlet Temperature: Defined as the temperature of the inlet edge of the chassis. This measures the airflow temperature entering the chassis.

There shall be one or more inlet temperature sensors supplied by the chassis.

CPU Temperature: Defined as the temperature of the processor(s). There shall be one or more temperature sensors provided for each individual processor package.

Ambient Temperature: Defined as the temperatures measured in strategic locations on the server motherboard to provide temperature mapping across the platform. There shall be one or more baseboard temperature sensors provided for the platform.

In order to specify sensor requirements, the following text and table are added to the specification:

Unless otherwise specified:

- DCMI Mandatory Sensors shall support event message generation to enable event logging.
- Sensors shall support per sensor event message generation enable/disable.
- Per offset event message generation enable/disable is optional.
- There shall be a Type 01h, Full Sensor Record SDR for each sensor.
- The underlying implementation is allowed to have thresholds that are not listed in the supported thresholds mask of the corresponding SDRs.

	Name/Description	Code	M/O
Sensor:	**Inlet Temperature**		
Associated Entity ID	Inlet Temperature	40h	M
Sensor Type Code:	Temperature	01h	M
Event / Reading Type Code:	Threshold	01h	M
Supported Thresholds / Events (Event Offsets)	Upper Non-critical - going high	07h	O
	Upper Critical - going high	09h	M
Sensor:	**CPU (Processor) Temperature**		
Associated Entity ID	CPU Temperature	41h	M
Sensor Type Code:	Temperature	01h	M
Event / Reading Type Code:	Threshold	01h	M
Supported Thresholds / Events (Event Offsets)	Upper Non-critical - going high	07h	O
	Upper Critical - going high	09h	M
Sensor:	**Baseboard Temperature**		
Associated Entity ID	Baseboard	42h	M
Sensor Type Code:	Temperature	01h	M
Event / Reading Type Code:	Threshold	01h	M
Supported Thresholds / Events (Event Offsets)	Upper Non-critical - going high	07h	O
	Upper Critical - going high	09h	M

E13 Clarification on definition of Mandatory Capabilities field, Table 6-3, DCMI Capabilities Parameters

The table has redundant Mandatory capabilities in the supported DCMI capabilities as well as redundant information regarding Mandatory, recommended and Optional in the table.

The following clarification removes the redundancy and repetition of information and mentions clearly the intent of the table.

Table 6-3

Parameter	#	Parameter Data (non-volatile unless otherwise noted)
Supported Optional DCMI Capabilities[1]	1	This field returns the supported capabilities available in the server that are in conformance to DCMI specification for both Platform and Manageability access. All reserved bits shall be set to 0b byte 1 Reserved byte 2 Optional Platform capabilities All bits: 0b = Not Compliant with DCMI Specification 1b = Compliant with DCMI Specification [7-1] Reserved [0] Power Management byte 3 Manageability Access Capabilities All bits: 0b = Not present 1b = Available [7-3] Reserved [2] Out-Of-Band Secondary LAN Channel Available. [1] Out-Of-B Serial TMODE Available [0] In-band KCS Channel Available
Platform Attributes	2	This field returns the platform attributes required for the platform capabilities. All reserved bits shall be set to 0b byte 1:2 SEL Attributes [15] SEL automatic rollover enabled (SEL Overwrite) 0b = Not present 1b = Available [14-12] Reserved (0b) [11-0] Number of SEL entries (Maximum 4096) (the number of entries supported must be 256 or greater to be in conformance) byte 3 Identification Attributes All bits: 0b = Not present 1b = Available [7-3] Reserved [2] Asset Tag Support [1] DHCP Host Name Support [0] Reserved byte 4 Reserved

[1] All mandatory requirements are assumed to be supported.

Table 6-2

This DCMI Get Capabilities Info Command will respond to the updated field expectations for Revision 02h and above.

	Byte	data field
Request Data	1	Group Extension Identification = DCh
	2	Parameter Selector
Response Data	1	Completion Code. Refer to Section A.1 - DCMI Completion Codes.
	2	Group Extension Identification = DCh
	3:4	DCMI Specification Conformance Byte 1 - Major Version Byte 2 - Minor Version
	5	Parameter Revision = 02h
	6: N	Parameter data, per **Error! Reference source not found.**

Section 6.1

Before

The function is responsible for providing the available capabilities of the platform specific to Data Center. The command is session-less and can be called similar to the Get Authentication Capability command. This command is a bare-metal provisioning command, and the availability of features does not imply the features are configured.

After

The function is responsible for providing the optional capabilities of the platform specific to Data Center. The command is session-less and can be called similar to the Get Authentication Capability command. This command is a bare-metal provisioning command, and the availability of features does not imply the features are configured.

E14 Clarification on Mandatory requirements

Section 2.5 bullet 1 the requirement for Remote Power on/off/reset does not specify the chassis and command relevance, the statement has been fixed with the following change

a. Reliable Local and Remote Chassis Power on/off/reset commands.

E16 Addenda Event Logging

Section 3.1.3 Event Logging has been added to quantify the minimum expectations of the event logging.

The following requirements are added

3. The IPMI SEL must be at least 256 entries.
4. At minimum, the critical temperature events shall be logged to the IPMI SEL when they occur.
5. It is recommended to log uncorrectable memory errors to the IPMI SEL (DCMI specification does not specify DIMM sensors as mandatory sensors).

E18 Clarification FRU Information

Table 6-4 FRU Product Data is considered redundant; the table has been removed from the section.

E21 Clarification IPMI Commands Privilege Levels

The privilege levels of the power management command should be set appropriately min privilege level instead of Admin level. The following clarification fixes the privilege levels appropriately.

Table 6-1 Platform Command Definition

	NetFn	CMD	M/O[1]	Min Privilege Level
Power Management				
Get Power Reading	DCGRP (2Ch)	02h	O	User
Get Power Limit	DCGRP (2Ch)	03h	O	User
Set Power Limit	DCGRP (2Ch)	04h	O	Operator
Activate/Deactivate Power Limit	DCGRP (2Ch)	05h	O	Operator

E22 Addenda Chassis Identify Command

Section 6.2.3 – Chassis Identify Command requires the "Force Identify On" capability to be a mandatory capability for DCMI Specification.

Before:

This command causes the chassis to physically identify itself by a mechanism chosen by the system implementation; such as turning on blinking user-visible lights or emitting beeps via a speaker, LCD panel, etc. Unless the optional "Force Identify On" capability is supported and used, the *Chassis Identify* command automatically times out and de-asserts the indication after a configurable time-out. Software shall periodically resend the command to keep the identify condition asserted. This will restart the timeout.

After:

This command causes the chassis to identify itself by a mechanism chosen by the system implementation; such as turning on blinking user-visible lights or emitting beeps via a speaker, LCD panel, etc. The "Force Identify On" capability in the command shall be supported.

E24 Clarifications Incorrect Cross-references

3.1.2 should reference Section 28, not 6.2.
6.2.1 should reference section 28.2, not 29.2.
6.2.2 should reference section 28.3, not 29.3.

E25 Clarifications Inconsistent usage of Ambient and Baseboard Temp

3.1.4 "Ambient" is replaced by "Baseboard" (Also the figure 3-1 is fixed).

E27 Addenda Enhancing Power Measurement Reporting in DCMI

DCMI specification incorporate enhanced power-reporting data. This includes a standardized way to retrieve different periods of averaging, minimum and maximum system power readings and a standardized way to retrieve per-power-supply data. The capability is provided for platform management subsystem to publish a list of available rolling averages periods for retrieving the power data using Get Power Reading. The following additions and modifications to the specification will address the change. This optional Capability parameter is available in Get DCMI Capabilities Info command with Parameter Revision 02h and above as described in the E13 for Table 6-2.

Table 6-3 DCMI Capabilities Parameter

Enhanced System Power Statistics attributes	5	This field returns list of Enhanced System Power Statistic capabilities. This parameter has a direct relationship with Table 6.8, Get Power Reading Command. See section "6.6.1, Get Power Reading" for details. **byte 1** The number of supported rolling average time periods (Note the maximum number of supported rolling average time periods reported by the platform management subsystem is limited by the DCMI transport response length) **bytes 2:n**: Rolling Average Time periods (where "n" is (value of "byte 1" + 1) [7:6]: Time duration units 00b: Seconds 01b: Minutes 10b: Hours 11b: Days [5-0]: Time duration NOTE: Zero "Time Duration" is acceptable and means "NOW" or current reading.

Section 6.6.1 Get Power Reading

Table 6-8, Get Power Reading Command

Request Data	1	Group Extension Identification = DCh
	2	Mode 01h – System Power Statistics 02h – Enhanced System Power Statistics
	3	Mode 01h System Power Statistics Attributes Reserverd for future, use 00h Mode 02h Enhanced System Power Statistics Attributes byte 3 Rolling Average Time periods Only the time periods specified in Parameter 5 of Get DCMI Capabilities Info Command are supported.
	4	Reserved
Response Data	1	Completion Code. Refer to Section A.1 - DCMI Completion Codes.
	2	Group Extension Identification = DCh
	3:4	Current Power in watts
	5:6	Minimum Power over sampling duration in watts Note: Sampling duration depends on Mode selection.
	7:8	Maximum Power over sampling duration in watts Note: Sampling duration depends on Mode selection.
	9:10	Average Power over sampling duration in watts Note: Sampling duration depends on Mode selection.
	11:14	IPMI Specification based Time Stamp based on SEL
	15:18	Statistics reporting time period Timeframe in milliseconds, over which the controller collects statistics
	19	Power Reading State [0:5] Reserved [6] 1b – Power Measurement active 0b – No Power Measurement is available. [7] Reserved

E28 Addenda and Clarifications DHCP Discovery requirements

The DCMI specification states that Host name shall be set to "DCMI" and this breaks existing OEM implementations, who are already publishing a unique host name as part of the DHCP discovery process. Clarification is offered to allow the OEMs to publish DHCP Host names apart from standard "DCMI" with agreement from IPDC. The management controller at the minimum shall publish its DHCP host name as "DCMI".

In Section 5.5.1.2

Before

Out-of-band Discovery Requirements

Apart from supporting the in-band discovery messages through out-of-band transports.

DHCP enabled management controllers

The management controllers shall publish itself as a DCMI controller when using DHCP DISCOVER mechanisms by setting option 12 Host Name of DHCP Discover packet to

have the host name indicate "DCMI". The management controller shall provide discovery mechanism using DCMI Get Capabilities Info command to identify the availability of this requirement in the platform.

After

Out-of-band Discovery Requirements

Apart from supporting the in-band discovery messages through out-of-band transports.

DHCP enabled management controllers

The management controllers shall publish a unique non-Null Host Name using DHCP option 12 when sending DHCP Discover packets during DHCP negotiations. The maximum size of the hostname field is set by the DHCP Discovery packet format.

Unique Host Name string shall be represented as "*<IPDC-OEM Prefix><OEM Unique Identifier>*", IPDC-OEM prefix may not be unique but could be used by OEM for identification; the default IPDC-OEM prefix should be "DCMI".

As an example the Unique Host Name string could be "DCMI12345678", if IPDC-OEM agree with a prefix XYZ then the Unique Host Name string could be "XYZ12345678".

The management controller shall provide discovery mechanism using DCMI Get Capabilities Info command to identify the availability of this requirement in the platform.

E29 Clarifications Get ACPI Power State Command

The specification does not state clearly the intended usage and relevance of the Get ACPI Power State Command. The Clarification is offered in the form of inclusion of the intended usage model of the Get ACPI Power State Command.

In Section 6.2.4
Before

The command can also be used to retrieve the present power state information that has been *set into the controller*. This is an independent setting from the system power state that may not necessarily match the actual power state of the system. Unspecified bits and codes are reserved and shall be returned as 0.

After

The command can also be used to retrieve the present power state information that has been set into the management controller. As a minimum requirement, the ACPI Power State shall not indicate S0 until the ACPI-aware operating system is booted.

The intended usage of the command is to allow remote agents monitor the ACPI power state of the ACPI-aware Operating Systems during power operations such as power on/off/reset to detect OS issues during booting and shutdown.