BMC

Special IPMI Commands and Sensors

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Chapter 1. Special IPMI Commands

1.1 IPMI Standard Command

1.1.1 Get Device ID (NetFn: 0x06, Command: 0x01)

Only the fields highlighted in green are AIC specific.

The firmware version is <Firmware Revision 1>.<Firmware Revision 2>.<Byte 1 of Auxiliary Firmware Revision Information>.

	Byte	Data Field
Request Data	-	-
Response Data	1	Completion Code
	2	Device ID
	3	Device Revision
	4	Firmware Revision 1 (Major Firmware Revision)
	5	Firmware Revision 2 (Minor Firmware Revision)
	6	IPMI Version
	7	Additional Device Support
	8:10	Manufacturer ID, LS Byte first.
	11:12	Product ID, LS Byte first.
	13	Byte 1 of Auxiliary Firmware Revision Information
	14	Byte 2 of Auxiliary Firmware Revision Information
	15	Byte 3 of Auxiliary Firmware Revision Information
	16	Byte 4 of Auxiliary Firmware Revision Information

1.1.2 Restore Default Configuration (NetFn: 0x32, Command: 0x66)

	Byte	Data Field
Response Data	1	Completion Code

Note:This AMI OEM command restores default c onfiguration on the components which are disabled by another AMI OEM command Set Preserve Configuration Status (NetFn: 0x32, Command: 0x83) All components are disabled for BMC default

1.1.3 Set Service Configuration (NetFn: 0x32, Command: 0x6A)

Only the fields highlighted in green are AIC specific.

The firmware version is <Firmware Revision 1>.<Firmware Revision 2>.<Byte 1 of Auxiliary Firmware Revision Information>.

	Byte	Data Field
Request Data	1:4	Service ID (LS byte first) SSH: 0x20 0x00 0x00 0x00
	5	Service Enable/Disable 0x0: Disable the service 0x1: Enable the service Others: Invalid
	6:22	Interface Name String in ASCII, 16 bytes, max and terminated with a null (0x00) character. Strings with fewer than 16 characters are 0x00 padded to 17 bytes
	23:26	Non Secure Port (LS byte first first) The range is from 1 to 65535.
	27:30	Secure Port (LS byte first first) The range is from 1 to 65535.
	31:34	Session Inactivity Timeout (LS byte first first)
	35	Maximum Allowed Sessions The value is set to 0x00 (Non Editable Data) or 0xFF.
	36	Current Active Session The value is set to 0x00.
Response Data	1	Completion Code

1.1.4 Set SNMP Configuration (NetFn: 0x32, Command: 0x7D)

	Byte	Data Field
Request Data	1	User ID
	2	SNMP Enable/Disable 0x0: Disable SNMP 0x1: Enable SNMP Others: Invalid
	3	SNMP Access Type Disable SNMP: 0x0: Disable Others: Invalid Enable SNMP: 0x1:Read only 0x2:Read Write Others: Invalid
	4	SNMP Encryption Type I Disable SNMP: 0x0: Disable Others: Invalid Enable SNMP:

		0x1: SHA (not applicable to “Disable to Enable”) 0x2: MD5 (not applicable to “Disable to Enable”) 0x3: SHA256 0x4: SHA384 0x5: SHA512 Others: Invalid
	5	SNMP Encryption Type II Disable SNMP: 0x0: Disable Others: Invalid Enable SNMP: 0x1: DES 0x2: AES Others: Invalid
	6	0x0: Fixed value
	7	SNMP View Level 0x0:Reserved 0x1:Reserved 0x2: User View 0x3: Operator View 0x4: Admin View 0x5: OEM View Others: Invalid
Response Data	1	Completion Code

1.1.5 Set Preserve Configuration Status (NetFn: 0x32, Command: 0x83)

	Byte	Data Field
Request Data	1	Selector 0x3: IPMI 0x9: Authentication
	2	Status 0x0: Disable 0x1: Enable
Response Data	1	Completion Code

1.1.6 Get Preserve Configuration Status (NetFn: 0x32, Command: 0x84)

	Byte	Data Field
Request Data	1	Selector 0x3: IPMI

Response Data		0x9: Authentication
	1	Completion Code
	2	Status 0x0: Disable 0x1: Enable

1.1.7 Set the sysadmin Account (NetFn: 0x32, Command: 0x91)

	Byte	Data Field
Request Data	1	Operation 0x0: Disable the account 0x1: Enable the account 0x2: Set password Others: Invalid
	(2:1+N)	Optional (Depends on operation) Disable the account: (No optional bytes) Enable the account: (No optional bytes) Set password: The 'N' should be minimum 8 bytes and maximum 64 bytes.
Response Data	1	Completion Code0x0: Disable

1.1.8 Set NTP Configuration (NetFn: 0x32, Command: 0xA8)

	Byte	Data Field
Request Data	1	Parameter 0x1: Primary server address 0x2: Secondary server address 0x3: NTP status 0x4: Restart NTP Service Others: Invalid
	(2:1+N)	Optional (Depends on parameter) Primary server address: The 'N' is 128 bytes. Server address convert ASCII to hex (MSB first). Secondary server address: The 'N' is 128 bytes. Server address convert ASCII to hex (MSB first). NTP status The 'N' is 1 byte for the status. 0x0: Disable NTP 0x1: Enable NTP Others: Invalid Restart NTP Service: (No optional bytes)
Response Data	1	Completion Code

1.2 IPMI AIC OEM Command

Only the IPMI standard commands with AIC specific implementation are listed below.

1.2.1 Get BMC Firmware Name (NetFn: 0x3A, Command: 0x33)

	Byte	Data Field
Request Data	-	-
Response Data	1	Completion Code
	2:14	BMC Platform Name

1.2.2 Set all LED pattern (NetFn: 0x3A, Command: 0x02)

	Byte	Data Field
Request Data	1	Control ID LED and health LED 00h：Lock LED status and turn off all LED 01h：Lock LED status and turn on all LED FFh：Unlock LED
Response Data	1	Completion Code

1.2.3 Get NTP synchronization status (NetFn: 0x3A, Command: 0x72)

	Byte	Data Field
Request Data	-	-
Response Data	1	Completion Code
	2	NTP synchronization status 00h：Automatic sync mode, sync failed. 01h：Automatic sync mode, sync is successful. 02h：Automatic sync mode, but sync has not yet succeeded. 03h：Manual mode.

1.2.4 Get NTP configuration (NetFn: 0x36, Command: 0xB7)

	Byte	Data Field
Request Data	1	Parameter： 01h：Primary server name 02h：Second server name 03h：NTP configuration status
Response Data	1	Completion Code
	2:N	For Parameter 01h: Primary NTP server name For Parameter 02h: Second NTP server name For Parameter 03h: 00h：Disable status of NTP. 01h：Enable status of NTP. 02h：Failure status of NTP.

1.2.5 Get PWM group output (NetFn: 0x36, Command: 0xFB)

	Byte	Data Field
Request Data	-	-
Response Data	1	Completion Code
	2	Fan mode: 00h：Manual control mode. 01h：Optimal control mode.
	3	Protect status: 00h： Protection mode disabled. 01h： Protection mode enabled.
	4:19	Display currently all duty for 16 PWM
	20:35	Display manually all duty for 16 PWM

1.2.6 Set PWM group manual control (NetFn: 0x36, Command: 0xFA)

	Byte	Data Field
Request Data	1	Protect setting 00h： Disable protection mode. 01h： Enable protection mode.
	2:17	Set duty for 16 PWM
Response Data	1	Completion Code

1.2.7 Set PWM group optimal control (NetFn: 0x36, Command: 0xF9)

	Byte	Data Field
Request Data	-	-
Response Data	1	Completion Code

1.2.8 Get power on minutes (NetFn: 0x36, Command: 0xD6)

	Byte	Data Field
Request Data	-	-
Response Data	1	Completion Code
	2:5	Power on minutes

1.2.9 Set WDT2 Timer for Next Boot Image (NetFn: 0x36, Command: 0xD9)

	Byte	Data Field
Request Data	1	WDT2 Timer (0.1 seconds) The minimum is 1 seconds Example: 0x32 = 5 second
Response Data	1	Completion Code

1.2.10 Get multiple sensor reading (NetFn: 0x36, Command: 0xBD)

	Byte	Data Field
Request Data	1	No.1 Sensor number
	2	No.1 Sensor LUN
	3:4	No.2 Sensor number No.2 Sensor LUN
	5:N	Sensor number Sensor LUN
Response Data	1	Completion Code
	2	No.1 Sensor reading
	3	No.1 Sensor LUN
	4:5	No.2 Sensor reading
		No.2 Sensor LUN
	6:N	Sensor number Sensor LUN

1.2.11 Get CPU Info (NetFn: 0x3A, Command: 0x2B)

	Byte	Data Field
Request Data	-	-
Response Data	1	Completion Code
	2:33	CPU information. If the platform supports dual CPUs, the information for both CPUs is identical.

1.2.12 Master write read (NetFn: 0x3A, Command: 0x6A)

	Byte	Data Field
Request Data	1	Channel number It's ignored when Bus Type = 0x1.
	2	Bus ID It's 0x0 when Bus Type = 0x0.
	3	Bus Type 0x0: Public IPMB bus. The Channel Number is used to select the target bus. 0x1: Private bus. The Bus ID is used to select the target bus. Others: Invalid
	4	8-bit Slave Address
	5	Read Count The maximum is 50 bytes.
	6:N	Data to write. The maximum is 50 bytes.
Response Data	1	Completion Code
	2:N	Bytes read from the specified slave address. The maximum is 50 bytes.

1.2.13 Get /Set Drive Slot (NetFn: 0x3A, Command: 0xC0)

	Byte	Data Field
Request Data	1:4	4 Byte Mask for Single / Multiple Drive Slot

		Bit31 (Bit7 of Request Data Byte 1): Must be 0 Bit30 (Bit6 of Request Data Byte 1): Must be 0 … Bit27 (Bit3 of Request Data Byte 1): Must be 0 Bit26 (Bit2 of Request Data Byte 1): Must be 0 Bit25 (Bit1 of Request Data Byte 1): Drive Slot 26 Bit24 (Bit0 of Request Data Byte 1): Drive Slot 25 Bit23 (Bit7 of Request Data Byte 2): Drive Slot 24 … Bit16 (Bit0 of Request Data Byte 2): Drive Slot 17 Bit15 (Bit7 of Request Data Byte 3): Drive Slot 16 … Bit8 (Bit0 of Request Data Byte 3): Drive Slot 9 Bit7 (Bit7 of Request Data Byte 4): Drive Slot 8 … Bit1 (Bit1 of Request Data Byte 4): Drive Slot 2 Bit0 (Bit0 of Request Data Byte 4): Drive Slot 1
	5:6	Set one bit in the following options. Multiple bits set are invalid. Single Slot option doesn't work for Multiple Slot, but Multiple Slot option can work for Single Slot. Bit15 (Bit7 of Request Data Byte 5): Multiple Slot –Get/Set Link status Bit14 (Bit6 of Request Data Byte 5): Multiple Slot –Get PRSNT Bit13 (Bit5 of Request Data Byte 5): Multiple Slot –Set PERST0 and PERST1 Bit12 (Bit4 of Request Data Byte 5): Multiple Slot –Get/Set Yellow LED Slow Blink Bit11 (Bit3 of Request Data Byte 5): Multiple Slot –Get/Set Yellow LED Fast Blink Bit10 (Bit2 of Request Data Byte 5): Multiple Slot –Get/Set Yellow LED On Bit9 (Bit1 of Request Data Byte 5): Multiple Slot –Get/Set Yellow LED Off Bit8 (Bit0 of Request Data Byte 5): Multiple Slot –Get/Set Green LED Slow Blink Bit7 (Bit7 of Request Data Byte 6): Multiple Slot –Get/Set Green LED Fast Blink Bit6 (Bit6 of Request Data Byte 6): Multiple Slot –Get/Set Green LED On Bit5 (Bit5 of Request Data Byte 6): Multiple Slot –Get/Set Green LED Off Bit4 (Bit4 of Request Data Byte 6): Multiple Slot –Get/Set PERST1 Bit3 (Bit3 of Request DataByte 6): Multiple Slot –Get/Set PERST0 Bit2 (Bit2 of Request Data Byte 6): Multiple Slot –Get/Set +12V Bit1 (Bit1 of Request Data Byte 6): Multiple Slot –Get/Set+3.3V Bit0 (Bit0 of Request Data Byte 6): Multiple Slot –Get/Set Dual PortEnable Byte 5, Byte 6 set 0: Single Slot -Get All
	For Set Drive Slot	
	7	Drive Slot Bit Set 0x0: Set Deactive 0x1: Set Active Others: Invalid
Response Data	1	Completion Code

For Get Drive Slot for Single Slot	
2:5	Bit15 (Bit7 of Response Data Byte 2): Must be 0 Bit14 (Bit6 of Response Data Byte 2): PR SNT Bit13 (Bit5 of Response Data Byte 2): Must be 0 Bit12 (Bit4 of Request Data Byte 2): Multiple Slot –Get/Set Yellow LED Slow Blink Bit11 (Bit3 of Request Data Byte 2): Multiple Slot –Get/Set Yellow LED Fast Blink Bit10 (Bit2 of Request Data Byte 2): Multiple Slot –Get/Set Yellow LED On Bit9 (Bit1 of Request Data Byte 2): Multiple Slot –Get/Set Yellow LED Off Bit8 (Bit0 of Request Data Byte 2): Multiple Slot –Get/Set Green LED Slow Blink Bit7 (Bit7 of Request Data Byte 3): Multiple Slot –Get/Set Green LED Fast Blink Bit6 (Bit6 of Request Data Byte 3): Multiple Slot –Get/Set Green LED On Bit5 (Bit5 of Request Data Byte 3): Multiple Slot –Get/Set Green LED Off Bit4 (Bit4 of Response Data Byte 3): PER ST1 Bit3 (Bit3 of Response Data Byte 3): PERST0 Bit2 (Bit2 of Response Data Byte 3): +12V Bit1 (Bit1 of Response Data Byte 3): +3.3V Bit0 (Bit0 of Response Data Byte 3): Dual Port Enable 0xFFFF: Data access failed
For Get Drive Slot for Multiple Slot	
2:5	4 Byte Mask for Drive Slot Bit Each bit indicates 0 for deactive and 1 for active. Bit31 (Bit7 of Request Data Byte 1): Must be 0 Bit30 (Bit6 of Request Data Byte 1): Must be 0 … Bit27 (Bit3 of Request Data Byte 1): Must be 0 Bit26 (Bit2 of Request Data Byte 1): Must be 0 Bit25 (Bit1 of Request Data Byte 1): Drive Slot 26 Bit24 (Bit0 of Request Data Byte 1): Drive Slot 25 Bit23 (Bit7 of Request Data Byte 2): Drive Slot 24 … Bit16 (Bit0 of Request Data Byte 2): Drive Slot 15 Bit15 (Bit7 of Request Data Byte 3): Drive Slot 14 … Bit8 (Bit0 of Request Data Byte 3): Drive Slot 7 Bit7 (Bit7 of Request Data Byte 4): Drive Slot 6 … Bit1 (Bit1 of Request Data Byte 4): Drive Slot 2 Bit0 (Bit0 of Request Data Byte 4): Drive Slot 1

1.2.14 Get Drive Information (NetFn: 0x3A, Command: 0xC5)

	Byte	Data Field
Request Data	1	Slot Number 1 ~ 26: Valid Others: Invalid
Response Data	1	Completion Code
	2:9	Manufacturer Name (MNAME)

	0xFFFFFFFFFFFFFFFF: Data access failed
10:33	Product Name (PNAME) 0xFF (24 bytes): Data access faile
34:73	Product Part/Model Number (PPMN) 0xFF (40 bytes): Data access failed
74:75	Product Version (PVER) 0xFFFF: Data access failed
76:95	Product Serial Number (PSN) 0xFF (20 bytes): Data access failed
96	Form Factor (FF) 0xFF: Data access failed
97:112	Total NVM Capacity 0xFF (16 bytes): Data access failed
113:120	Firmware Revision 0xFFFFFFFFFFFFFFFF: Data access failed
121:122	Warning Composite Temperature Threshold (WCTEMP) 0xFFFF: Data access failed
123:124	Critical Composite Temperature Threshold (CCTEMP) 0xFFFF: Data access failed
125	Controller Multi-Path I/O and Namespace Sharing Capabilities (CMIC) 0xFF: Data access failed

1.2.15 Get Other Programmable Component Status (NetFn: 0x3A, Command: 0xCA)

Request Data

Response Data

Byte	Data Field
-	-
1	Completion Code
2	Local MCU Status: 7 6 5 4 3 2 1 0 description X X X X X X X 1 Primary Node X X X X X X 1 X Secondary Node X X X X X 1 X X MCU ready X X X X 1 X X X MCU Active mode X X X 1 X X X X Updating firmware
3	Peer MCU Status: 7 6 5 4 3 2 1 0 description X X X X X X X 1 Primary Node X X X X X X 1 X Secondary Node X X X X X 1 X X MCU ready X X X X 1 X X X MCU Active mode X X X 1 X X X X Updating firmware
4:7	Local MCU FW Version Report 0xFFFFFFFF for invalid data.
8:11	Peer MCU FW Version Report 0xFFFFFFFF for invalid data.
12:13	BBU1 FW Version
14:15	BBU2 FW Version

1.2.16 Set Other Programmable Component Update (NetFn: 0x3A, Command: 0xCB)

	Byte	Data Field
Request Data	1	Other Programmable Component 0x0: Local MCU 0x1: BBU1 0x2: BBU2 Others: Invalid After update, local MCU takes effect immediately, but others don't.
	2	Length of Path Name = N
	2:N	Path Name for Other Programmable Component The path name like "/tmp/firmware_image" can be up to 80 bytes.
Response Data	1	Completion Code

1.2.17 Set I2C bus recovery (NetFn: 0x3A, Command: 0xD1)

	Byte	Data Field
Request Data	1	Bus ID
Response Data	1	Completion Code

1.2.18 Set BBU power remain slot (NetFn: 0x3A, Command: 0xE0)

	Byte	Data Field
Request Data	1	First Slot 0xFF clear slot
	2	Second Slot 0xFF clear slot If both slots are set to 0xFF, no drive will be powered off.
Response Data	1	Completion Code
	2	First Slot
	3	Second Slot

1.2.19 Get PSU Information (NetFn: 0x36, Command: 0x20)

	Byte	Data Field
Request Data	1	PSU ID
Response Data	1	Completion Code
	2:3	Status word
	4:7	V input
	8:11	I input
	12:15	V out
	16:19	I out
	20:23	Temperature 1
	24:27	Temperature 2
	28:31	Fan speed 1
	32:35	Fan speed 2
	36:39	Power out
	40:43	Power in
	44:47	Power out max

48:111	MFR ID
112:175	MFR MODEL
176:239	MFR Serial
240:303	MFR FW revision

1.2.20 Set LED State (NetFn: 0x36, Command: 0xB3)

	Byte	Data Field
Request Data	1	0x00: Fixed
	2	ID 0x00: System Alert LED 0x01: System ID LED 0x02: User define LED 0x03: RC1 status LED 1 (Green) 0x04: RC 1 status LED 2 (Red) 0x05: RC 2 status LED 1 (Green) 0x06: RC 2 status LED 2 (Red) 0x07: RC 3 status LED 1 (Green) 0x08: RC 3 status LED 2 (Red) 0x09: RC 4 status LED 1 (Green) 0x0a: RC 4 status LED 2 (Red)
	3	State 0x00: LED off 0x01: LED on 0x02: LED blink slow 0x03: LED blink fast
Response Data	1	Completion Code

Implementation:

1. To avoid user confusion, the system alarm LED cannot be set to ON manually because the BMC automatically controls.
2. The BMC will only turn on the RC status LED (Green) when it can communicate with the RC. If the RC cannot communicate, the light will be turned off.
3. The system ID LED can also be triggered via ipmitool chassis identify.
4. The rules for BMC and user to control LED are as follows:

BMC control LED	Customer control LED	LED state
Turn ON or Blink	Turn OFF	ON or Blink
Turn OFF	Turn ON or Blink	ON or Blink
Turn ON or Blink	Turn ON or Blink	ON or Blink
Turn OFF	Turn OFF	

In simple terms, the BMC will only control the LED after the user turns it off.

1.2.21 Get LED State (NetFn: 0x36, Command: 0xB4)

	Byte	Data Field
Request Data	1	0x00: Fixed
	2	ID 0x00: System Alert LED 0x01: System ID LED 0x02: User define LED 0x03: RC1 status LED 1 (Green) 0x04: RC 1 status LED 2 (Red) 0x05: RC 2 status LED 1 (Green) 0x06: RC 2 status LED 2 (Red) 0x07: RC 3 status LED 1 (Green) 0x08: RC 3 status LED 2 (Red)

		0x09: RC 4 status LED 1 (Green) 0x0a: RC 4 status LED 2 (Red)
Response Data	1	Completion Code
	2	State 0x00: LED off 0x01: LED on 0x02: LED blink slow 0x03: LED blink fast

Chapter 2. Specific Sensors in SDR

2.1 PSUx_Status

PMBus STATUS_WORD (79h) message contents			SDR Sensor Bit Number
Byte	Bit Number	Status Bit Name	
Low	7	BUSY	X
	6	OFF	Bit6
	5	VOUT_OV_FAULT	Bit5
	4	IOUT_OC_FAULT	Bit4
	3	VIN_UV_FAULT	Bit3
	2	TEMPERATURE	Bit2
	1	CML	Bit1
	0	NONE OF THE ABOVE	Bit0
High	7	VOUT	Bit14
	6	IOUT/POUT	Bit13
	5	INPUT	Bit12
	4	MFR_SPECIFIC	Bit11
	3	POWER_GOOD#	Bit10
	2	FANS	Bit9
	1	OTHER	Bit8
	0	UNKNOWN	Bit7

p.s: x represents the number of PSUs in the system.
Example: There are 2 PSUs in the system. It represents PSU1_Status and PSU2_Status.