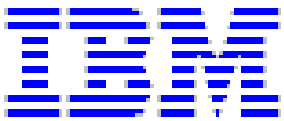

BMC Log Service Translation Guide

IBM x366
IBM x460
IBM x260

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1 Introduction

1.1 Purpose

This document is intended for IBM Service and Support for the following IBM products:

- Zeus x366
- Hermes x460 /MXE-460
- Maia x260

Since the BMC code base is common for all of these products, a single document applies. In this document, these products are collectively known as 'Zeus'.

This document specifically deals with situations in which it is required that the BMC IPMI log is the only available source of machine log information. Since this log is designed to the industry standard IPMI specification, it is not formatted in a way that yields explicit service information. This document provides limited translation capabilities for trained service personnel.

When to use BMC logs:

- When a Service Processor is not present in the system, or the Service Processor has failed.
- When internal Lighpath LEDs are not readily accessible
- More Lightpath information may be needed; for example in the following cases:

NMI	LED lit
PCI BRD	LED lit
CPU BRD	LED lit
I/O BRD	LED lit

- The system is hung.
- The first part replaced did not fix the problem.

1.2 Viewing BMC logs

There are currently three different methods for BMC System Event Log (SEL) retrieval; BIOS SETUP/CONFIGURATION, DSA and SMBridge. This is important because each of these retrieval methods displays the SEL in a different format. Another very important point is that the majority of data in the SEL is of an informational nature and not useful for problem determination. Once an error entry is identified, this document will provide a look up for a suggested service action plan. This table lookup will be similar to looking up a POST error code in the Hardware Maintenance Manual (HMM) or Problem Determination Guide.

1.3 BIOS SETUP/CONFIGURATION VIEW

Let's look at a single SEL entry using the BIOS SETUP/CONFIGURATION view as shown below. This view can be accessed under SETUP/ ADVANCED SETUP / BMC SETTINGS / BMC SYSTEM EVENT LOG.

Three key fields are: ***Entry Number, Entry Details*** and ***Sensor Number***.

Noting that there can be up to 512 entries in the SEL, the ***Entry Number*** shows where we are in the log and helps from a navigation perspective. SEL entries also occur in chronological order, which is helpful to know when the BMC displays an uncalibrated timestamp due to its lack of a real time clock. The timestamp below is uncalibrated because the year is 1970.

The second field of interest is the ***Entry Details***. The Entry Details field is important because in the majority of cases, it will help classify the log entry is an informational or a critical error. The following key words in the Entry Details field can be used to quickly identify an informational entry:

Deasserted
Presence
Inserted/ Present
Removed / Absent
On / Off
Reset

Notice that in the example below, that none of these key words are shown. At this point we cannot conclude this is an informational message. We must now move to the final step in our classification algorithm, i.e. looking at the Sensor Number.

```
+-------------------------------------------------------------------------+
|                          BMC System Event Log                           |
+-------------------------------------------------------------------------+
|   Get Next Entry                                                        |
|   Get Previous Entry                                                    |
|   Clear BMC SEL                                                         |
|                                                                         |
|   Entry Number=       00001 / 00232                                     |
|   Record ID=          0001                                              |
|   Record Type=        02                                                |
|   Timestamp=          1970/01/14  17:44:40                              |
|   Entry Details:      Generator ID= 0020                                |
|                       Sensor Type= 09                                   |
|                       Assertion Event                                   |
|                       Power Unit                                        |
|                       OEM Specific Type                                 |
|                                                                         |
|                                                                         |
|                                                                         |
|                       Sensor Number= A8                                 |
|                       Event Direction/Type= 71                          |
|                                                                         |
|                       Event Data= A1 20 00                              |
+-------------------------------------------------------------------------+
```

Figure 1-1, SEL entry for BIOS SETUP/CONFIGURATON

In this case we see that the sensor number is A8. When using the BIOS CONFIGURATION/SETUP view, all sensor numbers are shown in hexadecimal format so A8 is more correctly written as A8h. We will now check to see if the sensor number A8h lies within the following error ranges of hexadecimal values:

15h - 2Dh

38h - 4Fh
70h - 80h
90h - 9Bh
ABh
B0h - B5h
B7h
C5h - CFh

In comparing the ranges, we see that A8h is not listed in the range of errors, so we can classify this entry as informational. Had this been an error entry we could have looked up the suggested service action by using the Sensor Number A8h as the error code.

1.4 SMBridge View

So far our classification algorithm for each entry has been:

1) Look at the Entry Details field and go to the final step, (step 2) if no keyword is found.
2) Compare the Sensor Number with known Sensor Number error ranges.

This same algorithm will now be applied to the SMBridge view. In looking at Figure 2-2, we see that the SMBridge view has very similar information to the BIOS SETUT/CONFIGURATION view. Our key fields, Entry Number, Entry Details, and Sensor Number are still shown but this time the in a more tabular form. Since the key fields are the same, the only real difference has to do with the sensor number which is displayed as an integer value proceeded by a # sign. Therefore to make our classification algorithm work, we need only to look up the error sensor number in integer range table.

The integer sensor number error ranges are as shown:

21 - 45
56 - 79
112 - 128
114 - 155
171
176 - 181
183
197 – 207

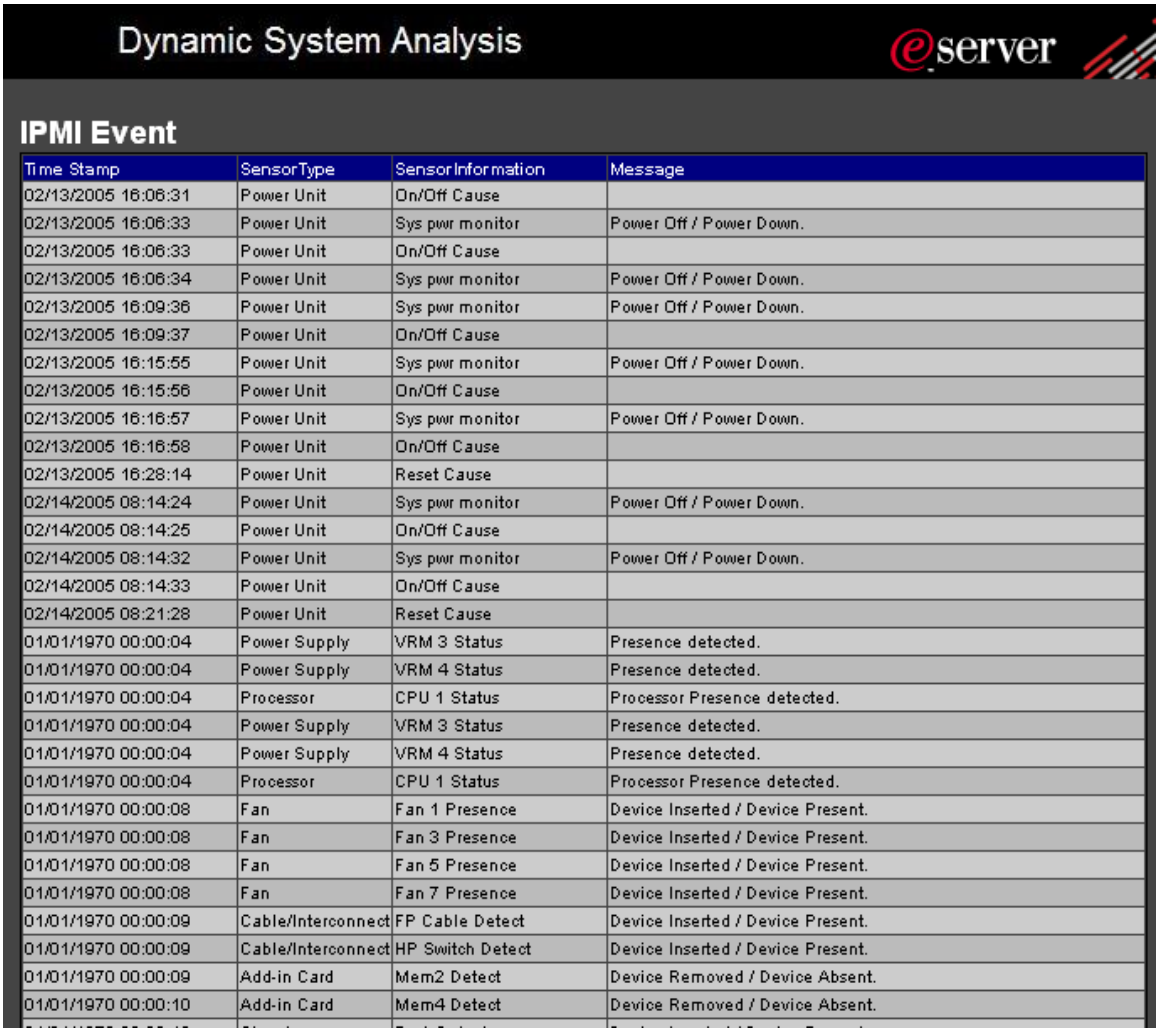
Entry Number	Timestamp	Sensor Number	Entry Details	Entry Details (continued)
1=	2005/02/02 16:46:42,	#182	OEM Reserved,	Upper Non-critical - going high (deassertion event)
2=	2005/02/02 16:46:42,	#182	OEM Reserved,	Upper Critical - going high (deassertion event)
3=	2005/02/02 16:47:40,	#168	Power Unit,	OEM
4=	1970/01/01 00:00:04,	#38	Power Supply,	Presence detected
5=	1970/01/01 00:00:04,	#39	Power Supply,	Presence detected
6=	1970/01/01 00:00:04,	#144	Processor,	Processor Presence detected
10=	1970/01/01 00:00:08,	#80	Fan,	Device Inserted/Device Present
11=	1970/01/01 00:00:08,	#82	Fan,	Device Inserted/Device Present
12=	1970/01/01 00:00:08,	#84	Fan,	Device Inserted/Device Present
13=	1970/01/01 00:00:08,	#86	Fan,	Device Inserted/Device Present

14=	1970/01/01 00:00:09,	#131	Cable,	Device Inserted/Device Present
15=	1970/01/01 00:00:09,	#134	Cable,	Device Inserted/Device Present
19=	1970/01/01 00:00:10,	#169	Power Unit,	OEM
20=	1970/01/01 00:00:10,	#173	Cable,	Device Inserted/Device Present
21=	1970/01/01 00:00:10,	#205	Cable,	State Deasserted
22=	1970/01/01 00:00:11,	#112	Power Supply,	Presence detected
23=	1970/01/01 00:00:12,	#81	Fan,	Device Inserted/Device Present
24=	1970/01/01 00:00:12,	#83	Fan,	Device Inserted/Device Present
25=	1970/01/01 00:00:12,	#85	Fan,	Device Inserted/Device Present
26=	1970/01/01 00:00:12,	#87	Fan,	Device Inserted/Device Present
27=	1970/01/01 00:00:13,	#140	Add-in Card,	Device Removed/Device Absent
28=	1970/01/01 00:00:13,	#132	Cable,	Device Inserted/Device Present
29=	1970/01/01 00:00:13,	#133	Cable,	Device Inserted/Device Present
30=	1970/01/01 00:00:14,	#160	Add-in Card,	Device Inserted/Device Present
31=	1970/01/01 00:00:14,	#162	Add-in Card,	Device Removed/Device Absent
32=	1970/01/01 00:00:14,	#168	Power Unit,	OEM
33=	1970/01/01 00:00:15,	#169	Power Unit,	OEM
34=	1970/01/01 00:00:15,	#174	Cable,	Device Inserted/Device Present

Figure 1-2, SEL, SMBridge View

1.5 DSA View

From figure 2-3, you will notice that the DSA view is slightly different. In an effort to make the log more readable, the Sensor Number has actually been looked up and translated into Sensor Information. If the Sensor Type and Message column look familiar, it's because these columns contain the same information as the Entry Details field. So from our classification algorithm perspective, the Step 1 keyword search will remain unchanged. If no keyword is found, use the Sensor Information to look up the classification and suggested service action.



Dynamic System Analysis

IPMI Event

Time Stamp	SensorType	SensorInformation	Message
02/13/2005 16:06:31	Power Unit	On/Off Cause	
02/13/2005 16:06:33	Power Unit	Sys pwr monitor	Power Off / Power Down.
02/13/2005 16:06:33	Power Unit	On/Off Cause	
02/13/2005 16:06:34	Power Unit	Sys pwr monitor	Power Off / Power Down.
02/13/2005 16:09:36	Power Unit	Sys pwr monitor	Power Off / Power Down.
02/13/2005 16:09:37	Power Unit	On/Off Cause	
02/13/2005 16:15:55	Power Unit	Sys pwr monitor	Power Off / Power Down.
02/13/2005 16:15:56	Power Unit	On/Off Cause	
02/13/2005 16:16:57	Power Unit	Sys pwr monitor	Power Off / Power Down.
02/13/2005 16:16:58	Power Unit	On/Off Cause	
02/13/2005 16:28:14	Power Unit	Reset Cause	
02/14/2005 08:14:24	Power Unit	Sys pwr monitor	Power Off / Power Down.
02/14/2005 08:14:25	Power Unit	On/Off Cause	
02/14/2005 08:14:32	Power Unit	Sys pwr monitor	Power Off / Power Down.
02/14/2005 08:14:33	Power Unit	On/Off Cause	
02/14/2005 08:21:28	Power Unit	Reset Cause	
01/01/1970 00:00:04	Power Supply	VRM 3 Status	Presence detected.
01/01/1970 00:00:04	Power Supply	VRM 4 Status	Presence detected.
01/01/1970 00:00:04	Processor	CPU 1 Status	Processor Presence detected.
01/01/1970 00:00:04	Power Supply	VRM 3 Status	Presence detected.
01/01/1970 00:00:04	Power Supply	VRM 4 Status	Presence detected.
01/01/1970 00:00:04	Processor	CPU 1 Status	Processor Presence detected.
01/01/1970 00:00:08	Fan	Fan 1 Presence	Device Inserted / Device Present.
01/01/1970 00:00:08	Fan	Fan 3 Presence	Device Inserted / Device Present.
01/01/1970 00:00:08	Fan	Fan 5 Presence	Device Inserted / Device Present.
01/01/1970 00:00:08	Fan	Fan 7 Presence	Device Inserted / Device Present.
01/01/1970 00:00:09	Cable/Interconnect	FP Cable Detect	Device Inserted / Device Present.
01/01/1970 00:00:09	Cable/Interconnect	HP Switch Detect	Device Inserted / Device Present.
01/01/1970 00:00:09	Add-in Card	Mem2 Detect	Device Removed / Device Absent.
01/01/1970 00:00:10	Add-in Card	Mem4 Detect	Device Removed / Device Absent.

Figure 1-3 SEL, DSA View

1.6 Differences Between x366, x460, x260

This document is common for all listed machine types because they are based on a common design and code base. However, there are differences noted below.

Depending on the product Zeus (x366), Maia (X260), or Hermes (x460), some sensors will be available while others are unavailable. These sensors, differentiated as such, are specified in the following table.

Table 1-1: Zeus, Maia, and Hermes Unavailable Sensors

Sensor Name	Sensor Number	Zeus	Maia	Hermes
Fuel Gauge, Rack, 1 PS, 110VAC	15h		✔	
Fuel Gauge, Rack, 1 PS, 220VAC	16h		✔	
Fuel Gauge, Rack, 2 PS, both 110VAC	17h		✔	
Fuel Gauge, Rack, 2 PS, both 220VAC	18h		✔	
Fuel Gauge, Rack, 2 PS, 1-110VAC and 1-220VAC	19h		✔	
Fuel Gauge, Tower, 1 PS	1Ah	✔		✔
Fuel Gauge, Tower, 2 PS	1Bh	✔		✔
Fuel Gauge, Tower, 3 PS	1Ch	✔		✔
Fuel Gauge, Tower, 4 PS	1Dh	✔		✔
Rack Not Redundant	1Eh		✔	
Tower Not Redundant	1Fh	✔		✔
Rack 12V Faults	2Ch		✔	
Tower 12V Faults	2Dh	✔		✔
Rack Power Supply 1 Fault	38h		✔	
Rack Power Supply 2 Fault	39h		✔	
Tower Power Supply 1 Fault	3Ah	✔		✔
Tower Power Supply 2 Fault	3Bh	✔		✔
Tower Power Supply 3 Fault	3Ch	✔		✔
Tower Power Supply 4 Fault	3Dh	✔		✔
PS 4 Slot Filler Fan Fault	4Fh	✔		✔
Rack DASD 0 Detect	5Eh		✔	
Rack DASD 1 Detect	5Fh		✔	
Rack DASD 2 Detect	60h		✔	
Rack DASD 3 Detect	61h		✔	
Rack DASD 4 Detect	62h		✔	
Rack DASD 5 Detect	63h		✔	
Tower DASD 0 Detect	64h	✔		✔
Tower DASD 1 Detect	65h	✔		✔
Tower DASD 2 Detect	66h	✔		✔
Tower DASD 3 Detect	67h	✔		✔
Tower DASD 4 Detect	68h	✔		✔
Tower DASD 5 Detect	69h	✔		✔
Tower DASD 6 Detect	6Ah	✔		✔
Tower DASD 7 Detect	6Bh	✔		✔
Tower DASD 8 Detect	6Ch	✔		✔
Tower DASD 9 Detect	6Dh	✔		✔
Tower DASD 10 Detect	6Eh	✔		✔
Tower DASD 11 Detect	6Fh	✔		✔
Rack PS 1 Status	70h		✔	
Rack PS 2 Status	71h		✔	
PS 3 Status	72h	✔		✔
PS 4 Status	79h	✔		✔
Tower PS 1 Status	7Ah	✔		✔
Tower PS 2 Status	7Bh	✔		✔

Sensor Name	Sensor Number	Zeus	Maia	Hermes
Tower SAS Backplane 1 Detect	A6h	✔		✔
Tower SAS Backplane 2 Detect	A7h	✔		✔
Ping Received	AAh	✔	✔	
Rack SAS Backplane Detect	ADh		✔	
Rack SAS Backplane Incorrect Configuration	CDh		✔	
Tower SAS Backplane Incorrect Configuration	CEh	✔		✔

In addition, only one Fuel Gauge sensor will be active at any time depending on the conditions of the installed and operational power supplies.

2 Core Sensor Table

Core sensors from BMC are shown below.

Table 2-1: BMC Core Sensors

Sensor Name	No.	Sensor Type	Reading Type	Logged Assertions	Logged De-Assertions	Event or Error	Repair Actions
Power Unit Status	01h	09h	6Fh	0x00 – Power Off 0x04 – AC Lost	0x00 – Power Off	info	
BMC Watchdog	03h	23h	6Fh	0x00 – Timer Expired, status only 0x01 – Hard Reset 0x02 – Power Down 0x03 – Power Cycle		info	
SEL Full		D0h	01h	0x07 – over 75% full 0x09 – over 90% full 0x0B – 100% full		info	

3 Main Sensor Table

Thresholds for threshold based sensors are noted as shown below. Note that only a few of the assertions are actual errors. The repair actions recommendations are only for use when the sensor logs an error condition.

UNC = Upper Non-Critical	
UC = Upper Critical	
UNR = Upper Non-Recoverable	**ERROR**
LNC = Lower Non-Critical	
LC = Lower Critical	
LNR = Lower Non-Recoverable	**ERROR**
NR = Non-Redundant	
LF = Low Fuel	
OS = Over Spec	**ERROR**

Table 3-1: Zeus Sensors

Sensor Name	No.	Sensor Type	Reading Type	Logged Assertions	Logged De-Assertions	Event or Error	Repair Actions
Fuel Gauge, Rack, 1 PS, 110VAC	15h	03h	01h	NR,LF,**OS**		Error	1.Replace Power Supply 2. Replace Power Backplane
Fuel Gauge, Rack, 1 PS, 220VAC	16h	03h	01h	NR,LF,OS		Error	*See above*
Fuel Gauge, Rack, 2 PS, both 110VAC	17h	03h	01h	NR,LF,OS		Error	*See above*
Fuel Gauge, Rack, 2 PS, both 220VAC	18h	03h	01h	NR,LF,OS		Error	*See above*
Fuel Gauge, Rack, 2 PS, 1-110VAC and 1-220VAC	19h	03h	01h	NR,LF,OS		Error	*See above*
Fuel Gauge, Tower, 1 PS	1Ah	03h	01h	LF,OS		Error	1.Replace Power Supply 2. Replace Power Backplane
Fuel Gauge, Tower, 2 PS	1Bh	03h	01h	NR,LF,OS		Error	*See above*
Fuel Gauge, Tower, 3 PS	1Ch	03h	01h	NR,LF,OS		Error	*See above*
Fuel Gauge, Tower, 4 PS	1Dh	03h	01h	NR,LF,OS		Error	*See above*
Rack Not Redundant	1Eh	08h	03h	00h – State Deasserted 01h – State Asserted		Warn	1. Check AC cord to power supplies 2. Replace defective power supply.
Tower Not Redundant	1Fh	18h	0Bh	00h – Redundant 01h – Not Redundant		Warn	1. Check AC cord to power supplies

Sensor Name	No.	Sensor Type	Reading Type	Logged Assertions	Logged De-Assertions	Event or Error	Repair Actions
							2. Replace defective power supply.
VRD 1 Status	24h	08h	6Fh	01h - Power Unit Failure	01h – Power Unit Failure	Error	Replace CPU card
VRD 2 Status	25h	08h	6Fh	01h - Power Unit Failure	01h - Power Unit Failure	Error	Replace CPU card
VRM 3 Status	26h	08h	6Fh	00h – Presence detected 01h - Power Unit Failure 07h – Configuration	00h – Presence detected 01h - Power Unit Failure 07h – Configuration	Event Error Error	1.Check VRMs installed 2. Replace VRM
VRM 4 Status	27h	08h	6Fh	00h – Presence detected 01h - Power Unit Failure 07h – Configuration	00h – Presence detected 01h - Power Unit Failure 07h – Configuration	Event Error Error	1.Check VRMs installed 2. Replace VRM
Rack 12V Faults	2Ch	09h	70h	02h – 240VA Fault	02h – 240VA Fault	Error	1.Replace Power Backplane
Tower 12V Faults	2Dh	09h	71h	02h – 240VA Fault	02h – 240VA Fault	Error	1.Replace Power Backplane
Ambient Temp	32h	01h	01h			--	
Hurricane Temp	36h	01h	01h	UNC,UNR	UNC,UNR	--	
Rack Power Supply 1 Fault	38h	08h	70h	01h – Power Unit Failure	01h – Power Unit Failure	Error	1. Check AC Cord 2. Replace Power Supply
Rack Power Supply 2 Fault	39h	08h	70h	01h – Power Unit Failure	01h – Power Unit Failure	Error	*See above*
Tower Power Supply 1 Fault	3Ah	08h	6Fh	01h – Power Unit Failure	01h – Power Unit Failure	Error	1. Check AC Cord 2. Replace Power Supply
Tower Power Supply 2 Fault	3Bh	08h	6Fh	01h – Power Unit Failure	01h – Power Unit Failure	Error	*See above*
Tower Power Supply 3 Fault	3Ch	08h	6Fh	01h – Power Unit Failure	01h – Power Unit Failure	Error	*See above*
Tower Power Supply 4 Fault	3Dh	08h	6Fh	01h – Power Unit Failure	01h – Power Unit Failure	Error	*See above*
Fan 1 Tach	40h	04h	01h	LC	LC	Error	1. Reseat Fan 2. Replace Fan
Fan 2 Tach	41h	04h	01h	LC	LC	Error	*See above*
Fan 3 Tach	42h	04h	01h	LC	LC	Error	*See above*
Fan 4 Tach	43h	04h	01h	LC	LC	Error	*See above*
Fan 5 Tach	44h	04h	01h	LC	LC	Error	*See above*
Fan 6 Tach	45h	04h	01h	LC	LC	Error	*See above*
Fan 7 Tach	46h	04h	01h	LC	LC	Error	*See above*
Fan 8 Tach	47h	04h	01h	LC	LC	Error	*See above*
Fan Configuration Invalid	4Eh	04h	03h	00h – State Deasserted 01h – State Asserted		Error	1. Make sure all fans are installed and working
PS 4 Slot Filler Fan Fault	4Fh	0Ah	03h	00h – State Deasserted 01h – State Asserted		Error	1. Reseat Fan 2. Replace Fan
Fan 1 Detect	50h	04h	08h	00h – Device Removed/Absent 01h – Device		Info	Info only

Sensor Name	No.	Sensor Type	Reading Type	Logged Assertions	Logged De-Assertions	Event or Error	Repair Actions
				Inserted/Present			
Fan 2 Detect	51h	04h	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	Info only
Fan 3 Detect	52h	04h	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	Info only
Fan 4 Detect	53h	04h	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	Info only
Fan 5 Detect	54h	04h	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	Info only
Fan 6 Detect	55h	04h	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	Info only
Fan 7 Detect	56h	04h	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	Info only
Fan 8 Detect	57h	04h	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	Info only
Rack DASD 0 Detect	5Eh	0Dh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	
Rack DASD 1 Detect	5Fh	0Dh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	
Rack DASD 2 Detect	60h	0Dh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	
Rack DASD 3 Detect	61h	0Dh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	
Rack DASD 4 Detect	62h	0Dh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	
Rack DASD 5 Detect	63h	0Dh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	
Tower DASD 0	64h	0Dh	08h	00h – Device		Info	

Sensor Name	No.	Sensor Type	Reading Type	Logged Assertions	Logged De-Assertions	Event or Error	Repair Actions
Detect				Removed/Absent 01h – Device Inserted/Present			
Tower DASD 1 Detect	65h	0Dh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	
Tower DASD 2 Detect	66h	0Dh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	
Tower DASD 3 Detect	67h	0Dh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	
Tower DASD 4 Detect	68h	0Dh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	
Tower DASD 5 Detect	69h	0Dh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	
Tower DASD 6 Detect	6Ah	0Dh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	
Tower DASD 7 Detect	6Bh	0Dh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	
Tower DASD 8 Detect	6Ch	0Dh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	
Tower DASD 9 Detect	6Dh	0Dh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	
Tower DASD 10 Detect	6Eh	0Dh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	
Tower DASD 11 Detect	6Fh	0Dh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	
Rack PS 1 Status	**70h**	**08h**	**6Fh**	00h – Presence Detected **01h – Power Supply Failure** **03h – Power Supply AC loss**	00h – Presence Detected **01h – Power Supply Failure** **03h – Power Supply AC loss**	Event **Error** **Error**	1. Check AC Power 2. Replace Power Supply 3. Replace Power Backplane
Rack PS 2 Status	71h	08h	6Fh	00h – Presence	00h – Presence	Event	1. Check AC Power

Sensor Name	No.	Sensor Type	Reading Type	Logged Assertions	Logged De-Assertions	Event or Error	Repair Actions
				Detected 01h – Power Supply Failure 03h – Power Supply AC loss	Detected 01h – Power Supply Failure 03h – Power Supply AC loss	Error Error	2. Replace Power Supply 3. Replace Power Backplane
PS 3 Status	72h	08h	6Fh	00h – Presence Detected 01h – Power Supply Failure 03h – Power Supply AC loss	00h – Presence Detected 01h – Power Supply Failure 03h – Power Supply AC loss	Info Error Error	1. Check AC Power 2. Replace Power Supply 3. Replace Power Backplane
PS 4 Status	79h	08h	6Fh	00h – Presence Detected 01h – Power Supply Failure 03h – Power Supply AC loss	00h – Presence Detected 01h – Power Supply Failure 03h – Power Supply AC loss	Info Error Error	See above
Tower PS 1 Status	7Ah	08h	6Fh	00h – Presence Detected 01h – Power Supply Failure 03h – Power Supply AC loss	00h – Presence Detected 01h – Power Supply Failure 03h – Power Supply AC loss	Info Error Error	1. Check AC Power 2. Replace Power Supply 3. Replace Power Backplane
Tower PS 2 Status	7Bh	08h	6Fh	00h – Presence Detected 01h – Power Supply Failure 03h – Power Supply AC loss	00h – Presence Detected 01h – Power Supply Failure 03h – Power Supply AC loss	Info Error Error	*See above*
NMI State	80h	13h	6Fh	03h – Software NMI		Error	1. Check for other error indications 2. Reboot system
FP Cable Detect	83h	1Bh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	
USB Cable Detect	84h	1Bh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	
SP RS485 Cable Detect	85h	1Bh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	
Hot Plug Switch Cable Detect	86h	1Bh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	
RSA II Detect	8Ch	17h	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	
CPU 1 Status	**90h**	**07h**	**6Fh**	**00h – IERR** 01h – Thermal Trip	**00h – IERR** 01h – Thermal Trip	**Error** Error	1. Make sure heatsink is properly installed.

Sensor Name	No.	Sensor Type	Reading Type	Logged Assertions	Logged De-Assertions	Event or Error	Repair Actions
				05h – Configuration 07h – Processor Presence detect **08h – Processor disabled**	05h – Configuration 07h – Processor Presence detect **08h – Processor disabled**	Error Event **Error**	2. Replace Processor 3. Replace CPU Board
CPU 2 Status	91h	07h	6Fh	00h – IERR 01h – Thermal Trip 05h – Configuration 07h – Processor Presence detect 08h – Processor disabled	00h – IERR 01h – Thermal Trip 05h – Configuration 07h – Processor Presence detect 08h – Processor disabled	Error Error Error Event Error	*See above*
CPU 3 Status	92h	07h	6Fh	00h – IERR 01h – Thermal Trip 05h – Configuration 07h – Processor Presence detect 08h – Processor disabled	00h – IERR 01h – Thermal Trip 05h – Configuration 07h – Processor Presence detect 08h – Processor disabled	Error Error Error Event Error	*See above*
CPU 4 Status	93h	07h	6Fh	00h – IERR 01h – Thermal Trip 05h – Configuration 07h – Processor Presence detect 08h – Processor disabled	00h – IERR 01h – Thermal Trip 05h – Configuration 07h – Processor Presence detect 08h – Processor disabled	Error Error Error Event Error	*See above*
CPU 1 Mismatch	94h	D2h	6Fh	00h – Vtt Enable Check 01h – Potomac in Cranford only 02h – Tulsa with old VRM 03h – Cache VID mismatch 04h – CPU Mismatch 05h – CPU Speed	00h – Vtt Enable Check 01h – Potomac in Cranford only 02h – Tulsa with old VRM 03h – Cache VID mismatch 04h – CPU Mismtch 05h – CPU Speed	Error	1. Make sure CPU FRU numbers are correct for entire system. 2. If not correct, replace CPU
CPU 2 Mismatch	95h	D2h	6Fh	00h – Vtt Enable Check 01h – Potomac in Cranford only 02h – Tulsa with old VRM 03h – Cache VID mismatch 04h – CPU Mismatch 05h – CPU Speed	00h – Vtt Enable Check 01h – Potomac in Cranford only 02h – Tulsa with old VRM 03h – Cache VID mismatch 04h – CPU Mismtch 05h – CPU Speed	Error	*See above*
CPU 3 Mismatch	96h	D2h	6Fh	00h – Vtt Enable Check 01h – Potomac in Cranford only 02h – Tulsa with old VRM 03h – Cache VID mismatch 04h – CPU Mismatch 05h – CPU Speed	00h – Vtt Enable Check 01h – Potomac in Cranford only 02h – Tulsa with old VRM 03h – Cache VID mismatch 04h – CPU Mismtch 05h – CPU Speed	Error	*See above*
CPU 4 Mismatch	97h	D2h	6Fh	00h – Vtt Enable Check 01h – Potomac in	00h – Vtt Enable Check 01h – Potomac in	Error	*See above*

Sensor Name	No.	Sensor Type	Reading Type	Logged Assertions	Logged De-Assertions	Event or Error	Repair Actions
				Cranford only 02h – Tulsa with old VRM 03h – Cache VID mismatch 04h – CPU Mismatch 05h – CPU Speed	Cranford only 02h – Tulsa with old VRM 03h – Cache VID mismatch 04h – CPU Mismtch 05h – CPU Speed		
CPU 1 Temp	98h	01h	01h	UNC,UNR	UNC,UNR	Error	1. Check CPU heat sink 2. Check Fan Speed (should be elevated) 3. Replace CPU
CPU 2 Temp	99h	01h	01h	UNC,UNR	UNC,UNR	Error	*See above*
CPU 3 Temp	9Ah	01h	01h	UNC,UNR	UNC,UNR	Error	*See above*
CPU 4 Temp	9Bh	01h	01h	UNC,UNR	UNC,UNR	Error	*See above*
CPU 1 Bad VID	9Ch	07h	03h	00h – State Deasserted 01h – State Asserted		Error	1. Reseat CPU/VRM 2. Replace CPU
CPU 2 Bad VID	9Dh	07h	03h	00h – State Deasserted 01h – State Asserted		Error	*See above*
CPU 2 Bad VID	9Eh	07h	03h	00h – State Deasserted 01h – State Asserted		Error	*See above*
CPU 3 Bad VID	9Fh	07h	03h	00h – State Deasserted 01h – State Asserted		Error	*See above*
Memory Card 1 Present	A0h	17h	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		info	
Memory Card 2 Present	A1h	17h	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		info	
Memory Card 3 Present	A2h	17h	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		info	
Memory Card 4 Present	A3h	17h	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		info	
Scalibility Card Detect	A4h	17h	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		info	
Rack Detect	A5h	18h	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		info	
Tower SAS Backplane 1 Detect	A6h	1Bh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	
Tower SAS Backplane 2 Detect	A7h	1Bh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Info	

Sensor Name	No.	Sensor Type	Reading Type	Logged Assertions	Logged De-Assertions	Event or Error	Repair Actions
System Reset Source	A8h	09h	71h	01h – Reset		Event	
System On/Off Source	A9h	09h	70h	00h – Power on or off		Event	
Ping Received	AAh	1Bh	70h	01h – State Asserted		Event	
PCI Slot Faults	ABh	21h	70h	00h – Fault Status	00h – Fault Status	Error	Need to get the next entry which is an "OEM SEL without timestamp". See OEM table below
PCI PME	ACh	09h	70h	03h – PME (WOL)		Event	
Rack DASD Backplane Detect	ADh	1Bh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Event	
Media Cable Detect	AEh	1Bh	08h	00h – Device Removed/Absent 01h – Device Inserted/Present		Event	
Memory Card 1 Power Status	B0h	08h	6Fh	01h – Power Supply Failure	01h – Power Supply Failure	Error	1. Has AC Power been removed (if yes, then ignore) 2. Check for other power faults 3. Replace Memory card
Memory Card 2 Power Status	B1h	08h	6Fh	01h – Power Supply Failure	01h – Power Supply Failure	Error	*See above*
Memory Card 3 Power Status	B2h	08h	6Fh	01h – Power Supply Failure	01h – Power Supply Failure	Error	*See above*
Memory Card 4 Power Status	B3h	08h	6Fh	01h – Power Supply Failure	01h – Power Supply Failure	Error	*See above*
CPU Card Power Status	B4h	08h	71h	01h – Power Supply Failure	01h – Power Supply Failure	Error	1. Has AC Power been removed (if yes, then ignore) 2. Check for other power faults 3. Replace CPU card
PCI/Native I/O Card Power Status	B5h	08h	71h	01h – Power Supply Failure	01h – Power Supply Failure	Error	1. Has AC Power been removed (if yes, then ignore) 2. Check for other power faults 3. Replace PCI card
SEL fullness	B6h	D0h	7Fh	UNC,UC,UNR	UNC,UC,UNR	Event	1. Clear BMC Log
Super I/O Card Power Status	B7h	08h	70h	01h – Power Supply Failure	01h – Power Supply Failure	Error	1. Has AC Power been removed (if yes, then ignore) 2. Check for other power faults 3. Replace SuperIO card
CPU 1 Processor hot	C0h	01h	03h	00h – State Deasserted 01h – State Asserted		Event	1. Check Fans 2. Check Heatsink
CPU 2 Processor hot	C1h	01h	03h	00h – State Deasserted 01h – State Asserted		Event	*See above*
CPU 3 Processor	C2h	01h	03h	00h – State Deasserted		Event	*See above*

Sensor Name	No.	Sensor Type	Reading Type	Logged Assertions	Logged De-Assertions	Event or Error	Repair Actions
hot				01h – State Asserted			
CPU 4 Processor hot	C3h	01h	03h	00h – State Deasserted 01h – State Asserted		Event	*See above*
Machine Check on Memory Card	**C5h**	**0Ch**	**70h**	**01 – Uncorrectable Error**		**Error**	1. Check for DIMM errors(replace DIMM) 2. Replace Memory Card 3. Replace CPU Card
Machine Check on Memory DIMM	**C6h**	**0Ch**	**71h**	**01 – Uncorrectable Error**		**Error**	1. Replace Memory DIMM 2. Replace Memory Card 3. Replace CPU Card
Machine Check on Link or Card	C7h	12h	71h	02h – SPINT		Error	1. Investigate SPINT data
Machine Check	C8h	12h	70h	02h – SPINT		Error	1. Replace CPU card 2. Replace PCIX card
CPU VRD 1 Hot	CAh	01h	03h	00h – State Deasserted 01h – State Asserted		Error	1. Check Fans
CPU VRD 2 Hot	CBh	01h	03h	00h – State Deasserted 01h – State Asserted		Error	1. Check Fans
SP Incorrect Configuration	CCh	17h	03h	00h – State Deasserted 01h – State Asserted		Error	1. Reseat RSA2 Slimline 2. Replace RSA2 Slimline
Rack DASD Backplane Incorrect Configuration	CDh	1Bh	03h	00h – State Deasserted 01h – State Asserted		Error	1. Check HDD configuration 2. Replace HDD Backplane
Tower SAS Backplane Incorrect Configuration	CEh	1Bh	03h	00h – State Deasserted 01h – State Asserted		Error	1. Check HDD configuration 2. Replace HDD Backplane
Power Supply Incorrect Configuration	CFh	0Ah	03h	00h – State Deasserted 01h – State Asserted		Error	1. Check PS configuration 2. Replace Power Backplane

4 OEM Sensor List

There are several sensors on the Zeus products which require passing 8 or 16 bits of usually bit mapped OEM event data information for power goods, 12V faults, etc. These are specified in the following table. They are all bit-mapped except for power supply faults which are an 8-bit code.

Figure 1- Zeus OEM Sensor Reading Types

Sensor Name	Sensor Number	Sensor Type	Sensor Reading Type	OEM Sensor Event Data Byte 2	OEM Sensor Event Data Byte 3	Bit on Means / Repair Actions
Rack 12V Faults	2Ch	18h	03h	0 – CPU 12V 1 – 12V Radial 2 – 12V E 3 – 12V D 4 – Reserved 5 – 12V C 6 – 12V B 7 – 12V A	--	Fault / 1. Power Backplane 2. CPU card 2. CPU Card 2. Mem Card 1-2 2. Mem Card 3-4 - - - - - 2. PCIX Board 2. SAS Backplane/PCIX 2. PCIX Board
Tower 12V Faults	2Dh	18h	03h	0 – CPU 12V 1 – 12V Radial 2 – 12V E 3 – 12V D 4 – Reserved 5 – 12V C 6 – 12V B 7 – 12V A	0 – 12V F 1 – 12V G 2..7 – Reserved	Fault / 1. Power Backplane 2. CPU card 2. CPU Card 2. Mem Card 1-2 2. Mem Card 3-4 - - - - - 2. PCIX Board 2. PCIX Board, tapes 2. PCIX Board 2. SAS Backplane 2. SAS Backplane
Rack Power Supply 1 Fault	38h	08h	6Fh	Defined by 1300W PS Spec	--	Check Power Supply AC Replace Power Supply
Rack Power Supply 2 Fault	39h	08h	6Fh	Defined by 1300W PS Spec	--	Check Power Supply AC Replace Power Supply
Tower Power Supply 1 Fault	3Ah	08h	6Fh	Defined by 775W PS Spec	--	Check Power Supply AC Replace Power Supply
Tower Power Supply 2 Fault	3Bh	08h	6Fh	Defined by 775W PS Spec	--	Check Power Supply AC Replace Power Supply
Tower Power Supply 3 Fault	3Ch	08h	6Fh	Defined by 775W PS Spec	--	Check Power Supply AC Replace Power Supply
Tower Power Supply 4 Fault	3Dh	08h	6Fh	Defined by 775W PS Spec	--	Check Power Supply AC Replace Power Supply
System Reset Source	A8h	18h	03h	0 – CEC is Up 1 – Power Supply 2 – CEC Power 3 – PCI-X 4 – BMC 5 – Super I/O 6 – Arium 7 – Remote	0 – Button 1 – Super I/O Fast 2 – Southbridge Port 92 3 – Power Good Fault 4..7 – Reserved	Source / INFO ONLY
System On/Off	A9h	18h	03h		--	Source /

Sensor Name	Sensor Number	Sensor Type	Sensor Reading Type	OEM Sensor Event Data Byte 2	OEM Sensor Event Data Byte 3	Bit on Means / Repair Actions
Source				0 – EPOW 1 – Remote Off 2 – BMC Off 3 – Super I/O Off 4 – Remote On 5 – BMC On 6 – Super I/O On 7 – Reserved		Power Backplane Info Info Info Info Info Info
Ping Received	AAh	1Bh	03h	0 – Link 1 1 – Link 2 2 – Link 3 3..7 Reserved	--	Ping / INFO ONLY
PCI Slot Faults	ABh	21h	03h	0 – Slot 6 1 – Slot 5 2 – Slot 4 3 – Slot 3 4 – Slot 2 5 – Slot 1 6.. 7 – Reserved	--	Fault / 1. Reseat/replace adapter shown 2 Replace PCIX card
PCI PME	ACh	18h	03h	0 – Slot 1 1 – Slot 2 2 – Slot 3 3 – Slot 4 4 – Slot 5 5 – Slot 6 6..7 – Reserved	--	PME / INFO ONLY – POWER MANAGEMENT EVENT
CPU Card Power Status	B4h	15h	03h	0 – QB Cache 1 – QA Cache 2 – Vtt 3 – 12V 4..7 – Reserved	0 – Hurricane SMI 1.2V 1 – Hurricane Vtt MR 1.5V 2 – QB Vcc PLL 3 – QA Vcc PLL 4 – Hvtr IB 2.5V 5 – Backplane 6 – Hvtt IB 1.8V 7 – IB MR Reg 1.8V	Good / Reseat CPU card Replace CPU card
PCI-X Card Power Status	B5h	15h	03h	0 – I/O Card 1 – CEC Card 2 – Super I/O Card 3..4 – Reserved 5 – 2.5V Calgary HSSIB 6 – 2.5V Calgary PLL 7 – Reserved	0– 1.8V Calgary 2 HSSIB 1– 1.8V Calgary 1 HSSIB 2 – 1.5V Calgary PLL 3 – 5V Aux 4 – Calgary Core 1.5V 5 – 1.5V 6 – 5V 7 – 3.3V	Good / Reseat CPU card Replace PCIX card
Super I/O Card Power Status	B7h	15h	03h	0 – SAS Core 1.2V 1 – Board 2.5V 2 – SAS 1.2V 3 – Video 2.5V 4 – Video 1.8V 5 – Video Core 1.8V 6..7 – Reserved	--	Good / Reseat IO card Replace IO card
Machine Check on	C5h	0Ch	6Fh	0 – Memory Card 1	--	Fault /

Sensor Name	Sensor Number	Sensor Type	Sensor Reading Type	OEM Sensor Event Data Byte 2	OEM Sensor Event Data Byte 3	Bit on Means / Repair Actions
Memory Card				1 – Memory Card 2 2 – Memory Card 3 3 – Memory Card 4		Check lightpath LEDs Replace Memory Card
Machine Check on Memory DIMM	C6h	0Ch	6Fh	0 – DIMM 1 1 – DIMM 2 2 – DIMM 3 3 – DIMM 4 4 – DIMM 5 5 – DIMM 6 6 – DIMM 7 7 – DIMM 8	0 – DIMM 9 1 – DIMM 10 2 – DIMM 11 3 – DIMM 12 4 – DIMM 13 5 – DIMM 14 6 – DIMM 15 7 – DIMM 16	Fault / Check lightpath LEDs Replace DIMM
Machine Check on Link or Card	C7h	12h	6Fh	0 – Remote Node 1 – Scalaibility 2 – Quad Bus A 3 – Quad Bus B 4 – CPU Card 5 – I/O Bus Interface 6 – System	0 – Link 1 1 – Link 2 2 – Link 3 3 – CPU Card 4 – PCI-X Card 5 – Super I/O Card 6 – RAID Card	Fault / Replace: Check lightpath LEDs CP CPU Card/ PCIX Card CPU Card/ PCIX Card CPU Card PCIX Card CPU Card/ PCIX Card See SP log See SP log See SP log CPU Card PCIX Card I/O Card RAID Card
Machine Check	C8h	12h	6Fh	0 – Hurricane 1 – Calgary B 2 – Calgary A 3 – Remote CheckStop 4..7 – Reserved	--	Fault / Replace: CPU Card PCIX Card / PCI Adapter PCIX Card / PCI Adapter See SP log

5 BIOS Logged Events

System BIOS is able to communicate with the BMC and log architected events. There are two portions to BIOS logging – POST events, which occur during system power up, and SMI events, which are generally run time errors detected by hardware.

5.1 OEM SEL BIOS Entry Definitions

While the IPMI specification defines a wide variety of sensor types and record IDs for possible system events, IBM xSeries servers will log OEM specific messages in the BMC SEL. To provide consistency across all xSeries systems, the OEM record ID and OEM sensor type definitions will remain consistent. The table below will document each OEM record ID and sensor type used by xSeries systems as well as a text description of the event. Outside system software should use this table to provide BMC SEL NLS translations to end users.

Sensor Type	Sensor Type Code	Byte Definitions/Description
OEM POST with Time Stamp	0xC0	Byte 11 POST Error / Event Type 0x00 POST PCI POST Event/Error 0x01 POST PCI Processor Event / Error 0x02 POST Memory Event / Error 0x03 POST Scalability Event / Error 0x04 POST Bus Event / Error 0x05 POST Chipset Event / Error Byte 12-15 Defined per Error / Event Type in below tables Byte 16 Revision Number Format
OEM POST No Time Stamp	0xE0	Byte 4 POST Error / Event Type 0x00 POST PCI POST Event/Error 0x01 POST PCI Processor Event 0x02 POST Memory Error 0x03 POST Scalability Event 0x04 POST Bus Event 0x05 POST Chipset Event Byte 6-15 Defined per Error/Event Type in below tables Byte 16 Revision Number Format
OEM SMI Handler with Time Stamp	0xC1	Byte 11 SMI Error / Event Type 0x00 SMI PCI Event / Error 0x01 SMI Processor Event / Error 0x02 SMI Memory Event / Error 0x03 SMI Scalability Event / Error 0x04 SMI Bus Event / Error 0x05 SMI Chipset Event / Error Byte 12-15 Defined per Error / Event Type in below tables Byte 16 Revision Number Format
OEM SMI	0xE1	Byte 4 SMI Error / Event Type

Handler No Time Stamp		0x00 SMI PCI Event / Error 0x01 SMI Processor Event / Error 0x02 SMI Memory Event / Error 0x03 SMI Scalability Event / Error 0x04 SMI Bus Event / Error 0x05 SMI Chipset Event / Error Byte 6-15 Defined per Error/Event Type in below tables Byte 16 Revision Number Format

Figure 2-POST OEM SEL Definitions

5.2 POST OEM SEL Formats

5.2.1 POST OEM SEL Formats with Time Stamp

Byte	Contents	Description	Repair Actions
11	0x00	POST PCI Event / Error	
	0x01	POST Processor Event / Error	
	0x02	POST Memory Event / Error	
12	0x00	POST Event/Error occurred. **Next non-timestamped OEM SEL entry will contain details of the specific event/error.**	← See Next
13:15		Reserved	
16	0x00	Revision Number	

Figure 3- POST OEM SEL Format

5.2.2 POST PCI Event / Error SEL Format

Byte	Description	Repair Actions
4	0x00 POST PCI Event / Error	
5	Error Type 0x00 Device OK 0x01 Required ROM space not available 0x02 Required IO space not available 0x03 Required memory not available 0x04 Required memory below 1MB not available 0x05 ROM checksum failed 0x06 BIST failed 0x07 Planar device missing or disabled by user 0x08 PCI device has an invalid PCI configuration space header	 See 1801 POST error See 1801 POST error See 1801 POST error See 1801 POST error Remove card, replace Remove card, replace Info

	0x09 Specific PCI Device added (details to follow) 0x0A Specific PCI Device removed (details to follow) 0x0B Device title for removed devices 0x0C Device title for added devices 0x0D Requested resources not available 0x0E Title for added devices 0x0F Vendor ID sub-message 0x10 Device ID sub-message 0x11 Previous slot sub-message 0x12 Slot sub-message 0x13 Planar video disabled due to add in video card 0x14 Partial disable value 0x15 Title for partial disable 0x16 33Mhz dev on 66Mhz bus 0x17 Details for 33mhz card on 66mhz bus 0x18 Merge cable missing 0x19 Node1 to Node2 cable missing 0x1A Node1 to Node3 cable missing 0x1B Node2 to Node3 cable missing 0x1C Nodes could not merge 0x1D no 8 way SMP cable 0x1E Primary North Bridge to PCI Host Bridge IB Link has Failed 0x1F Redundant PCI Host Bridge IB Link has Failed	Remove card, replace Info Info Info Info See 1801 POST error Info Info Info Info Info Info Info Info Info Info See SP log See SP log See SP log See SP log See SP log See SP log Reseat/replace PCIX, CPU card Reseat/replace PCIX, CPU card
6	Chassis Number (0xFF if not applicable)	info
7	Slot Number (0xFF if not applicable)	info
8	Bus Number (0xFF if not applicable)	info
9	Device ID (MSB) (0xFF if not applicable)	info
10	Device ID (LSB) (0xFF if not applicable)	info
11	Vendor ID (MSB) (0xFF if not applicable)	info
12	Vendor ID (LSB) (0xFF if not applicable)	info
13	Reserved	
14	Reserved	
15	Reserved	
16	Revision Number = 0x00	

Figure 4- POST P CI Event / Error SEL Format

5.2.3 POST Processor Event / Error SEL Format

Byte	Description	Repair Actions
4	0x01 POST Processor Event / Error	
5	Error Type 0x00 Processor Failed BIST 0x01 Unable to Apply Microcode (Patch) Update 0x02 POST Does Not Support Current Stepping of Processor	 Replace proc Update BIOS Update BIOS

	0x03 CPU Mismatch Detected	All procs must match
6	Chassis Number (0x00 if not applicable)	Info
7	Processor Number (0x00 if not applicable)	Info
8 – 15	Reserved	
16	Revision Number = 0x00	

Figure 5- POST Processor Event / Error SEL Format

5.2.4 Memory Event / Error SEL Format

Byte	Description	Repair Actions
4	0x02 Memory Event / Error	
5	0x00 Hurricane Uncorrectable memory error occurred for Zeus/Maia/Hermes 0x01 Hurricane Correctable memory threshold occurred for Zeus/Maia/Hermes	Reseat/replace DIMM in byte 6,7,8 Reseat/replace DIMM in byte 6,7,8
6	Chassis (0 if not applicable)	Info
7	Memory Card (1-4)	Info
8	Memory DIMM (1-4)	Info
9	Failing Symbol for Correctable Error	Info
10 -15	Reserved	
16	Revision Number = 0x00	

Figure 6- POST Memory Event / Error SEL Format

Byte	Description	Repair Actions
4	0x02 Memory Event / Error	
5	Event Type 0x02 DIMM Status	
6	0x00 DIMM Enabled 0x01 DIMM Disabled – Failed ECC Test 0x02 DIMM Disabled – Failed POST/BIOS Memory Test 0x03 DIMM Disabled – Non-supported memory device 0x04 DIMM Disabled – Non matching or missing DIMMs	1. Check DIMM P/N. 2. Reseat/replace DIMM in byte 7,8,9
7	Chassis (0 if not applicable)	
8	Memory Card 1-N (0 if not applicable)	
9	Memory DIMM 1-N (0 if not applicable)	
10 -15	Reserved	
16	Revision Number = 0x00	

Figure 7- POST Memory DIMM Event / Error SEL Format

Byte	Description	Repair Actions

4	0x02 Memory Event / Error	
5	Event Type 0x03 Memory Card Status	
6	0x00 Card Enabled 0x01 Card Disabled – Failed BIST	Reseat/replace MEM CARD in byte 7,8
7	Chassis (0 if not applicable)	
8	Memory Card 1-N (0 if not applicable)	
9 – 15	Reserved	
16	Revision Number = 0x00	

Figure 8- POST Memory Card Event / Error SEL Format

5.3 SMI OEM SEL Formats

5.3.1 SMI Event / Error SEL Format with Time Stamp

Byte	Description	Repair Actions
11	0x00 SMI PCI Event / Error - See next non-time stamped entry for details. 0x01 SMI Processor Event / Error - See next non-time stamped entry for details. 0x02 SMI Memory Event / Error - See next non-time stamped entry for details. 0x03 SMI Scalability Event / Error - **see bytes 12-14 below** 0x04 SMI Bus Event / Error - See next non-time stamped entry for details. 0x05 SMI Chipset Event / Error - See next non-time stamped entry for details.	← ← ← see SP Log ← ←
12	0x00 Scalability Link Down 0x01 Scalability Link Up 0x02 Scalability Link Double Wide Down 0x03 Scalability Link Double Wide Up 0x80 Scalability Link PFA 0x81 Scalability Link Invalid Port 0x82 Scalability Link Invalid Node	see SP Log
13	0x01 – 0x08 Chassis Number (One based)	Info
14	0x01 – 0x03 Scalability Port Number (One based) 0x00 – Scalability Double Wide Link	Info
15	Reserved	
16	Revision Number = 0x00	

Figure 9-SMI Scalability Event/Error SEL Format

5.3.2 SMI PCI Event / Error SEL Format

Byte	Description	Repair Actions
4	0x00 SMI PCI Event / Error	
5	Error Type 0x00 Unknown SERR/PERR Detected on PCI Bus (Bytes 6-15 are 0x00 if not applicable) 0x01-0x0F PCI Standard Error Messages for PCI Devices & Primary Interface of PCI-to-PCI Bridge 0x01 SERR: Address or Special Cycle DPE 0x02 PERR: Master Read Parity Error 0x03 SERR: Received Target Abort 0x04 PERR: Master Write Parity Error 0x05 SERR: Device Signaled SERR 0x06 PERR: Slave Signaled Parity Error 0x07 SERR: Signaled Target Abort 0x08 PERR: Additional Correctable ECC Error 0x09 SERR: Received Master Abort 0x0A PERR: Additional Uncorrectable ECC Error 0x0B SERR: Split Completion Discarded 0x0C PERR: Correctable ECC Error 0x0D SERR: Unexpected Split Completion 0x0E PERR: Uncorrectable ECC Error 0x0F SERR: Received Split Completion Error Message 0x10 Reserved 0x11-0x1F Same as 0x01-0x0F for Secondary Interface of PCI-to-PCI Bridge 0x20-0x3F PCI Target Error Messages for PCI Host Bridge (Calgary) 0x20 PERR: PCI ECC Error (Corrected) 0x21 SERR: PCI Bus Address Parity Error 0x22 PERR: PCI Bus Data Parity Error 0x23 SERR: SERR# Asserted 0x24 PERR: PERR Received by Calgary on a PCIX Split Completion 0x25 SERR: Invalid Address 0x26 Reserved 0x27 SERR: TCE Extent Error 0x28 Reserved 0x29 SERR: Page Fault 0x2A Reserved 0x2B SERR: Unauthorized Access 0x2C Reserved 0x2D SERR: Parity Error in DMA Read Data Buffer 0x2E Reserved 0x2F SERR: PCI Bus Time Out 0x30 Reserved 0x31 SERR: DMA Delayed Read Timeout 0x32 Reserved 0x33 SERR: Internal Error on PCIX Split Completion 0x34 Reserved 0x35 SERR: DMA Read Reply (RIO) Timeout 0x36 Reserved 0x37 SERR: Internal RAM Error on DMA Write 0x38 Reserved	**ALL ERRORS:** 1. Identify PCI device from bytes 6-15 below. 2. Reseat/replace PCI device identified above. 3. Verify latest device driver for device identified above. 4. Replace PCIX adapter.

	0x39 SERR: MVE Valid Bit Off 0x3A Reserved 0x3B SERR: MVE Index Invalid 0x3C Reserved 0x3D Reserved 0x3E Reserved 0x3F Reserved 0x40-0x5F PCI Master Error Messages for PCI Host Bridge (Calgary) 0x40 PERR: ECC Error (Corrected) **0x41 SERR: SERR# Detected** 0x42 PERR: PCI Bus Data Parity Error **0x43 SERR: No DEVSEL#** 0x44 Reserved **0x45 SERR: Bus Time Out** 0x46 Reserved **0x47 SERR: Retry Count Expired** 0x48 Reserved **0x49 SERR: Target-Abort** 0x4A Reserved **0x4B SERR: Invalid Size** 0x4C Reserved **0x4D SERR: Access Not Enabled** 0x4E Reserved **0x4F SERR: Internal RAM Error on MMIO Store** 0x50 Reserved 0x51 SERR: Split Response Received 0x52 Reserved 0x53 SERR: PCIX Split Completion Error Status Received 0x54 Reserved 0x55 SERR: Unexpected PCIX Split Completion Received 0x56 Reserved 0x57 SERR: PCIX Split Completion Timeout 0x58 Reserved 0x59 SERR: Recoverable Error Summary Bit 0x5A Reserved 0x5B SERR: CSR Error Summary Bit 0x5C Reserved 0x5D SERR: Internal RAM Error on MMIO Load 0x5E Reserved 0x5F Reserved 0x60-0x7F PCI Machine Check Messages for PCI Host Bridge (Calgary) 0x60 Reserved 0x61 SERR: Bad Command 0x62 Reserved 0x63 SERR: Length Field Invalid 0x64 Reserved 0x65 SERR: Load Greater Than 8 & No Write Buffer Enabled 0x66 Reserved 0x67 SERR: PCIX Discontiguous Byte Enable Error	

	0x68 Reserved 0x69 SERR: 4K Address Boundary Crossing Error 0x6A Reserved 0x6B SERR: Store Wrap State Machine Check 0x6C Reserved 0x6D SERR: Target State Machine Check 0x6E Reserved 0x6F SERR: Invalid Transaction PM/DW 0x70 Reserved 0x71 SERR: Invalid Transaction PM/DR 0x72 Reserved 0x73 SERR: Invalid Transaction PS/DW 0x74 Reserved 0x75 SERR: DMA Write Command FIFO Parity Error 0x76 Reserved 0x77 Reserved 0x78 Reserved 0x79 Reserved 0x7A Reserved 0x7B Reserved 0x7C Reserved 0x7D Reserved 0x7E Reserved 0x7F Reserved **0x80 PCI-to-PCI Bridge Discard Timer Error** **0x81-0xFF Reserved**	
6	Chassis Number (0x00 if not applicable)	
7	Slot Number	
8	Bus Number	
9	Device ID (LSB)	
10	Device ID (MSB)	
11	Vendor ID (LSB)	
12	Vendor ID (MSB)	
13	Status Register (LSB)	
14	Status Register (MSB)	
15	DevFun Number	
16	Revision Number = 0x00	

Figure 10- SMI PCI Event / Error SEL Format

5.3.3 SMI Processor Event / Error SEL Format

Byte	Description	Repair Actions
4	0x01 SMI Processor Event / Error	1. Contact level 3 support for detailed analysis if possible (these errors are rare) 2. See SMI MCA Data D below.

5	0x00 Data A	
6	Reserved	
7	Reserved	
8 - 9	Bank	
10 – 11	APIC ID	
12 – 15	CK4	
16	Revision Number = 0x00	

Figure 11-SMI MCA Data A SEL Format

Byte	Description	Repair Actions
4	0x01 SMI Processor Event / Error	1. Contact level 3 support for detailed analysis if possible (these errors are rare) 2. See SMI MCA Data D below.
5	0x01 Data B1	
6	Reserved	
7	Reserved	
8 – 11	Address high	
12-15	Address low	
16	Revision Number = 0x00	

Figure 12-SMI MCA Data B1 SEL Format

Byte	Description	Repair Actions
4	0x01 SMI Processor Event / Error	1. Contact level 3 support for detailed analysis if possible (these errors are rare) 2. See SMI MCA Data D below.
5	0x02 Data B2	
6	Reserved	
7	Reserved	
8 – 11	Timestamp high	
12 - 15	Timestamp low	
16	Revision Number = 0x00	

Figure 13-SMI MCA Data B2 SEL Format

Byte	Description	Repair Actions
4	0x01 SMI Processor Event / Error	1. Contact level 3 support for detailed analysis if possible (these errors are rare)

		2. See SMI MCA Data D below.
5	0x03 Detail C	
6	Reserved	
7	Reserved	
8 – 11	MCA Status Register high	
12 - 15	MCA Status Register low	
16	Revision Number = 0x00	

Figure 14-SMI MCA Data C SEL Format

Byte	Description	Repair Actions
4	0x01 SMI Processor Event / Error	1. Contact level 3 support for detailed analysis if possible (these errors are rare)
5	0x04 Detail D	
6	Chassis Number (00 if not applicable)	
7	Error type 0x00 Recoverable 0x01 Unrecoverable	2. If Unrecoverable, replace CPU from byte 8.
8	Processor ID	
9 – 15	Reserved	
16	Revision Number = 0x00	

Figure 15-SMI MCA Data D SEL Format

5.3.4 SMI Memory Event / Error SEL Format

Byte	Description	Repair Actions
4	0x02 SMI Memory Event / Error	Info only
5	0x00 Sparing/RBS Event	
6	0x00 Sparing/RBS Start 1 0x02 Sparing/RBS Done 1	
7	Failed Row	
8	Spare Row	
9 – 15	Reserved	
16	Revision Number = 0x00	

Figure 16-SMI Sparing/RBS 1 SEL Format

Byte	Description	Repair Actions
4	0x02 SMI Memory Event / Error	Info only

5	0x00 Sparing Event	
6	0x01 Sparing Start 2 0x03 Sparing Done 2	
7	Failed Row 1	
8	Failed Row 2	
9	Spare Row 1	
10	Spare Row 2	
11- 15	Reserved	
16	Revision Number = 0x00	

Figure 17-SMI Sparing/RBS 2 SEL Format

Byte	Description	Repair Actions
4	0x02 SMI Memory Event / Error	
5	0x01 Memory Mirroring Failover Occurred (Running from mirrored memory image)	Replace memory DIMM identified by Lightpath LEDs
6-15	Reserved	
16	Revision Number = 0x00	

Figure 18-SMI Mirroring SEL Format

5.3.5 SMI FSB Bus Event / Error SEL Format

Byte	Description	Repair Actions
4	0x04 SMI Bus Event / Error	
5	Bus Type 0x00 FSB	
6	0x00 FSB A Fatal 0x01 FSB A NonFatal 0x02 FSB B Fatal 0x03 FSB B NonFatal	1. If fatal, for FSB A, test CPU1&2. Replace failed device. 2. If fatal, for FSB B, test CPU3&4. Replace failed device. 3. Replace CPU card.
7 – 8	FSB FERR or NERR or Zero	
9 – 15	Reserved	
16	Revision Number = 0x00	

Figure 19-SMI Front Side Bus Event SEL Format

Author Notes:

Sect 1 – from Warren Price, except 1.6 (differences between…) which comes from the BMC_Zeus_Spec_23.doc (Chuck Young/Carl Morrell)

Sect 2 – from BMC Core Spec (these are common to all BMC platforms)
Sect 3 – from BMC_Zeus_Spec_23.doc (Chuck Young/Carl Morrell) should use latest version.
Sect 4 – from BMC_Zeus_Spec_23.doc (Chuck Young/Carl Morrell) should use latest version.
Sect 5 – from BMC_Zeus_Spec_23.doc (Chuck Young/Carl Morrell) should use latest version.
Sect 6 – from bios_bmc_design_guide.doc (Bill Schwartz) should use latest version.
All repair actions (Chap 2, 3,4, 5) columns are from the author.

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