

Interacting with the COB IPMC via the Shelf Manager

The following assumes that you are already able to build the IPMC software and will explain how to use `ipmitool` to upload the new code to the IPMC from linux w/o having to use the Actel dongle from the Windows box.

`ipmitool1.8.9-pps-10` has been installed in the central package repository at `/reg/g/rce/packages/bin` with the names `ipmitool` and `ipmitool-pps`.

- Create the software image to upload (called the firmware by PPS, `hpm1fw.img`) by `make hpm`
- From the same network as the shelf manager (currently `cds`), execute:

```
ipmitool-pps -I lan -H shlfmgr02 -t 0x86 -b 0 -A NONE hpm upgrade hpm1fw.img activate
```

- `-H shlfmgr02` is the hostname of the Shelf Manager
 - `-t 0x86` is the IPMB address of the COB you are upgrading
 - `hpm1fw.img` is the path to the software image file created by `make hpm`
- If there is a problem with the upgrade, you can try rolling back to the old software with the command:
 - `ipmitool-pps ... hpm rollback`

The help that is packaged with `ipmitool` is pretty good, so there's more info to be found there.

Here's a couple that will probably be useful:

- To deactivate the payload (initiate M4->M5 transition):

```
ipmitool-pps -I lan -H shlfmgr02 -t 0x86 -b 0 -A NONE picmg policy set 0 2 0
```

- To activate the payload (initiate M1->M2 transition):

```
ipmitool-pps -I lan -H shlfmgr02 -t 0x86 -b 0 -A NONE picmg policy set 0 1 0
```

And here are a couple of commands which can be typed into the IPMC console to do fun things:

- Reset commands over console:

```
[B8 00 0D 0A 40 00 XX]

XX = 00 current mode
   = 01 normal mode
   = 02 standalone mode
   = 03 manual standalone

So:
[B8 00 0D 0A 40 00 00]
[B8 00 0D 0A 40 00 01]
[B8 00 0D 0A 40 00 02]
[B8 00 0D 0A 40 00 03]
```

- Reset Non-volatile Parameters and Reboot (will cause INIT callbacks to execute)

```
[B8 00 41 0A 40 00]
```

- Set Handle Switch

```
[B8 00 08 0A 40 00 00 XX]
```

00 = Open
01 = Closed
02 = Hardware Switch

So:

```
[B8 00 08 0A 40 00 00 00]
```

```
[B8 00 08 0A 40 00 00 01]
```

```
[B8 00 08 0A 40 00 00 02]
```

- Reset the SDR repository

```
[B8 00 33 0A 40 00]
```

Synchronization Clock Interface

These commands can be used to enable/disable the Synchronization Clock Interface buffers on the COB. This can also (more correctly) be driven via the ATCA e-Keying mechanism. These commands will override whatever e-keying has taken place.

GET:

```
ipmitool -I lan -H <shelf_ip> -t <slot_ipmb_address> -b 0 -A NONE raw 0x2e 0x38 0x0a 0x40 0x00 0x00 0x00 <pin>
```

SET:

```
ipmitool -I lan -H <shelf_ip> -t <slot_ipmb_address> -b 0 -A NONE raw 0x2e 0x39 0x0a 0x40 0x00 0x00 0x00 <pin>  
<state>
```

Where:

<shelf_ip> is either the IP address or hostname of the shelf manager

<slot_ipmb_address> is (0x80 + slot*2) for the ASIS 2, 5, and 6 slot shelves. (Not for the 14 slot.)

<pin> is

BP_CLK0_OE = 0x30

BP_CLK1_OE = 0x31

BP_CLK2_OE = 0x32

BP_CLK3_OE = 0x33

BP_CLK4_OE = 0x34

BP_CLK5_OE = 0x35

<state> 1 for enabled, 0 for disabled.

Custom COB IPMI commands

[pre-COB5 Custom IPMI Commands](#)

These commands can be issued using ipmitool.

```
ipmitool-pps -I lan -H <shelfmanager> -t <COB Address> -b 0 -A NONE raw <SLAC_NETFN> <CMD> [DATA_0] [DATA_1]  
... [DATA_N]
```

Where:

<shelfmanager> is the hostname/IP address of the Shelf Manager (ex. shasta-sm)

<COB address> is the IPMB address of the COB board (ex. 0x82, 0x84, 0x86, 0x88, 0x8a, 0x8c)

<SLAC_NETFN> The NetFn for our custom command extensions which is 0x34

<CMD> [DATA_X] is the command to be issued and associated parameter as described below

or in the IPMC console window:

```
[D0 00 <CMD> [DATA_0] [DATA_1] ... [DATA_N]]
```

Write to Cluster Element BSI: <CMD> = 0x03

The format for this command is

Offset Length Description

0	1	BAY Mask
1	1	RCE Mask
2	1	Do interrupt (Does Nothing)
3	2	Address
5	2	Length to write
7	N	Data to write (if length < 16) (if length > 16, fill with incrementing data starting with data)

NOTE: Including Bays w/o RCEs or which are not present
in BAY Mask will not result in an error.

Similarly, including RCEs which are not present or are
currently being reset will not result in an error, nor
will RCEs currently held in reset be released from reset
as a result of issuing this command.

Read from Cluster Element BSI: <CMD> = 0x04

The format for this command is

Offset Length Description

0	1	BAY Number
1	1	RCE Number
2	2	Address
4	2	Length to read (Though 2 bytes long, IPMI practically limits this to <16)

Read COB Data Board ID PROM: <CMD> = 0x05

The format for this command is

Offset Length Description

0	1	BAY Number
---	---	------------

Returns the ID

0	8	MSB -> LSB 8 byte ID
---	---	----------------------

RCE Reset Command: <CMD> = 0x0A

The format for this command is

Offset Length Description

0	1	BAY Mask
1	1	RCE Mask

This command returns

Offset Length Description

0	1	Completion Code
1	1	Mask of Bays with errors

NOTE: Including Bays w/o RCEs or which are not present
in BAY Mask will not result in an error.

Similarly, including RCEs which are not present or are
currently being reset will not result in an error, nor
will RCEs currently held in reset be released from reset
as a result of issuing this command.

Read from RTM EEPROM: <CMD> = 0x0B

The format for this command is

Offset Length Description

0	1	EEPROM Select (0=RTM Fru Info EEPROM, 1=RMB EEPROM)
1	1	Address
2	1	Length to read

Write to RTM EEPROM: <CMD> = 0x0C

The format for this command is

Offset Length Description

0	1	EEPROM Select (0=RTM Fru Info EEPROM, 1=RMB EEPROM)
1	1	Address
2	1	Length to write

3 N Data to write

Raw I2C Read: <CMD> = 0xF7

The format for this command is

Offset	Length	Description
0	1	I2C Bus
1	1	Device Address (7 bit address)
2	1	Length to read

This command returns

Offset	Length	Description
0	1	Completion Code
1	N	Data read

Raw I2C Write: <CMD> = 0xF8

The format for this command is

Offset	Length	Description
0	1	I2C Bus
1	1	Device Address (7 bit address)
2	1	Length to write
3	N	Data to write

This command returns

Offset	Length	Description
0	1	Completion Code

I2C Test Command: <CMD> = 0xF6

The format for this command is

Offset	Length	Description
0	1	The BAY to test I2C devices in
1	1	The expected RCE mask
2	1	The expected Power

This command returns

Offset	Length	Description
0	1	Completion Code
1	1	Error Code

Get Bay Power Command: <CMD> = 0x0e

The format for this command is

Offset	Length	Description
0	1	The BAY number

This command returns

Offset	Length	Description
0	1	Completion Code
1	2	Voltage in mV (ADIN)
3	2	Current in mA

Get Bay Temperatures: <CMD> = 0x0f

The format for this command is

Offset	Length	Description
0	1	BAY number
1	1	RCE number (optional)

This command returns

Offset	Length	Description
0	1	Completion Code
1	1	Board Temperature
2	1	Junction Temperature

Get Bay GPIO: <CMD> = 0x12

The format for this command is

Offset	Length	Description
0	1	BAY number

This command returns

Offset	Length	Description
0	1	Completion Code

Which of the following is returned depends on which BAY is requested:

For a CMB Bay (0-4)

1	1	RCE Detected Mask
2	1	RCE Reset Mask
3	1	RCE BSI Ready Mask
4	1	RCE FPGA Done Mask
5	1	CMB Voltage OK Mask
6	1	CMB Power Allocation (in 1/5 Watts)

For the CEN Bay

1	1	CEN Voltage OK Mask
2	1	SFP Present Mask
3	1	SFP LOS Mask

For the RTM Bay

1	1	RTM Handle Closed
2	1	RMB Present
3	1	RMB Enable

Get Bay Raw GPIO: <CMD> = 0x13

The format for this command is

Offset	Length	Description
0	1	BAY number
1	1	Register (0=Input, 1=Output, 2=Polarity, 3=Config, 4=Int Mask"

This command returns

Offset	Length	Description
0	1	Completion Code
1	N	Register Values for Bank N

Set Monitor Dump Period: <CMD> = 0x07

The format for this command is

Offset	Length	Description
0	1	Dump Index [0=BAY, 1=RCE, 2=BSI, 3=SFP, 4=FP_DISP, 5=COB_GPIO, 6=GPIO_FULL, 7=RTM, 8=CEN, 9=I2C, 255=ALL]
1	2	Seconds [0=Never Dump, 0xffff=Default]

Set Monitor Dump Period: <CMD> = 0x08

The format for this command is

Offset	Length	Description
0	1	Dump Index [0=BAY, 1=RCE, 2=BSI, 3=SFP, 4=FP_DISP, 5=COB_GPIO, 6=GPIO_FULL, 7=RTM, 8=CEN, 9=I2C, 255=ALL]

Returns

0	2	Seconds [0=Never Dump]
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Dump Monitor Immediate: <CMD> = 0x09

The format for this command is

Offset	Length	Description
0	1	Dump Index [0=BAY, 1=RCE, 2=BSI, 3=SFP, 4=FP_DISP, 5=COB_GPIO, 6=GPIO_FULL, 7=RTM, 8=CEN, 9=I2C, 255=ALL]

Fixup FRU Info ID: <CMD> = 0x14

The format for this command is

Offset	Length	Description
0	1	FRU number

Set FRU Info Asset Tag: <CMD> = 0x15

The format for this command is

Offset	Length	Description
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0	1	FRU number
1	N<=32	Asset Tag (NULL terminated ASCII string)

Set Standalone Slot Number: <CMD> = 0x11

The format for this command is

Offset	Length	Description
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0	1	Slot Number
---	---	-------------

Refresh Shelf Info: <CMD> = 0x0D

The format for this command is

Offset	Length	Description
--------	--------	-------------

N/A	N/A	There are no arguments to this command
-----	-----	--

Cold Data Reset: <CMD> = 0xF9

The format for this command is

Offset	Length	Description
--------	--------	-------------

N/A	N/A	There are no arguments to this command
-----	-----	--

Set Zombie RCE: <CMD> = 0xFA

The format for this command is

Offset	Length	Description
--------	--------	-------------

0	1	Bay Number
---	---	------------

1	1	RCE Number
---	---	------------

2	1	Zombie State [0=Not a Zombie, 1=BRAINS!]
---	---	--

When an RCE is marked as a Zombie, the IPMC will not allow it to hold up the booting of the board. (For example, it will mark the switch port configuration in the DTM BSI as "Disabled" if the DPM is not Ready.

Supported IPMI/ATCA commands

These commands can be issued using ipmitool.

FRU Control Command (cold/warm reset)

```
ipmitool-pps -I lan -H <shelfmanager> -t <COB Address> -b 0 -A NONE picmg frucontrol <FRU-ID> <OPTION>
```

Where:

<shelfmanager> is the hostname/IP address of the Shelf Manager (ex. shasta-sm)

<COB address> is the IPMB address of the COB board (ex. 0x82, 0x84, 0x86, 0x88, 0x8a)

<FRU-ID> is the FRU-ID of the IPMC which is 0x00

<OPTION> is:

0x00	- Cold Reset
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Short-hand commands

The following commands are provided as scripts in the bin of our group area. <shelf> is a shelf name. <slot> is a slot number, from 1 to the number of slots in the crate. <element> is the element number, with 0xff meaning all elements and 0xfe meaning all DPMs, as above.

- `ipmi_activate`
Activate a shelf's payload.

```
usage: ipmi_activate <shelf> <slot>
```

- `ipmi_deactivate`
Deactivate a shelf's payload.

```
usage: ipmi_deactivate <shelf> <slot>
```

- **ipmi_id**
Read COB Data Board ID PROM.

```
usage: ipmi_id <shelf> <slot> <board>
```

- **ipmi_read**
Read from the Cluster Element BSI.

```
usage: ipmi_read <shelf> <slot> <element> <address> [<length>]
```

- **ipmi_write**
Write the Cluster Element BSI.

```
usage: ipmi_write <shelf> <slot> <element> <address> <data> [...]
```