

Release Note for AIC PCIe Gen4 JBOX 4-Slot Switch

October 19, 2021

Changelog

10/19/2021 (FW 1.4.1.2 + 4-Slot MFG 1.1.1.1) - Part Number (SEP-00040102_A01 + SEQ-0001D101_A01)

1. SDK version 4.2 -> 4.4
2. "DstAddr" Byte will not be received when receiving MCTP commands
3. MCTP message add pec byte
4. Add Serial Command Line Interface Functions: serialnumber
5. Add Serial Command Line Interface Functions: fwrb

05/17/2021 (FW 1.4.1.1 + 4-Slot MFG 1.1.1.1)

1. Initial revision
2. Built with SDK 0.2.1.0

1. MCTP over I2C Transport

Common Request format:

BYTE/BIT	7	6	5	4	3	2	1	0
0	DST I2C ADDR=0x61							RW=0
1	CMDCODE=0x0f							
2	BYTE COUNT							
3	SRC I2C ADDR							RW=1
4	HEADER VERSION=0x01							
5	DST EID=0x00							
6	SRC EID=0x00							
7	SOM	EOM	PKT SEQUENCE #		TO=1	MSG TAG		
8	MSG TYPE=0x3f							IC=0
9	VENDOR ID HIGH=0x1b							
10	VENDOR ID LOW=0x76							
11	PAYLOAD ID=0x20							
12	PKT SEQUENCE COUNT							
13								
14	APP MSG TAG							
15	COMMAND							
16	PAYLOAD LEN							
17								
18	RESPONSE LEN							
19								
20-N-1	PAYLOAD DATA							
N	PEC							

Field	Value
BYTE COUNT	Bytes in this packet following ByteCount, but not including, the PEC byte.
SOM	Set to 1b if this packet is the first packet of a message
EOM	Set to 1b if this packet is the last packet of a message.
PKT SEQUENCE #	Packet sequence number
MSG TAG	Identifies a unique message
PKT SEQUENCE COUNT	Packet sequence number
APP MSG TAG	BMC's message identifier.
COMMAND	OEM defined commands for MCTP Requests.

PAYLOAD LEN	Length of Payload in bytes.
RESPONSE LEN	Expected Response length in bytes.
PAYLOAD DATA	Parameters of the command
PEC	CRC-8 error-checking byte, calculated on all the message bytes.

Common Response format:

BYTE/BIT	7	6	5	4	3	2	1	0
0	DST ADDR							RW
1	CMDCODE							
2	BYTE COUNT							
3	SRC ADDR							RW
4	HEADER VERSION							
5	DST EID							
6	SRC EID							
7	SOM	EOM	PKT SEQUENCE #		TO	MSG TAG		
8	MSG TYPE							IC
9	VENDOR ID HIGH							
10	VENDOR ID LOW							
11	PAYLOAD ID							
12	PKT SEQUENCE COUNT							
13								
14	APP MSG TAG							
15	COMMAND STATUS							
16	RESPONSE LEN							
17								
18	RESIDUAL DATA LEN							
19								
20-N-1	RESPONSE DATA							
N	PEC							

Field	Value
COMMAND STATUS	The status of the requested command 0x00: OK 0x02: Invalid control command 0x06: Response length less than expected.

	0x07: Response length more than expected.
RESPONSE LEN	Length of Response in bytes.
RESIDUAL DATA LEN	Remaining Response length in bytes for overruns.
RESPONSE DATA	Response of the command.
PEC	CRC-8 error-checking byte, calculated on all the message bytes.

1.1. How to get firmware and mfg version

1.1.1. Request

BYTE/BIT	7	6	5	4	3	2	1	0
15	COMMAND=0x01							
16	PAYLOAD LEN=0x00							
17								
18	RESPONSE LEN=0x08							
19								

1.1.2. Response

BYTE/BIT	7	6	5	4	3	2	1	0
20	Firmware Major							
21	Firmware Minor							
22	Firmware Unit							
23	Firmware Dev							
24	MFG MpMajor							
25	MFG MpMinor							
26	MFG Pmajor							
27	MFG Pminor							

1.2. How to get sensor value

1.2.1. Request

BYTE/BIT	7	6	5	4	3	2	1	0
15	COMMAND=0x02							
16	PAYLOAD LEN=0x02							
17								
18	RESPONSE LEN=0x34							
19								
20	METHOD							
21	INDEX							

Field	Value
METHOD	0x00: Display a single value 0x01: Display a group value
INDEX	If METHOD = 0x00 0x00: Chip Temperature 0x21: PCIE slot 1 state 0x22: PCIE slot 2 state 0x23: PCIE slot 3 state 0x24: PCIE slot 4 state 0x25: PCIE slot 5 state 0x26: PCIE slot 6 state 0x27: PCIE slot 7 state 0x28: PCIE slot 8 state If METHOD = 0x01 0x00: Temperature 0x01: PCIE slot state

1.2.2. Response

BYTE/BIT	7	6	5	4	3	2	1	0
20-N	VALUE							

1.3. How to set the board position.

1.3.1. Request

BYTE/BIT	7	6	5	4	3	2	1	0
15	COMMAND=0x03							
16	PAYLOAD LEN=0x01							
17								
18	RESPONSE LEN=0x01							
19								
21	POSITION							

Field	Value
POSITION	0x00: Left 0x01: Right

1.3.2. Response

BYTE/BIT	7	6	5	4	3	2	1	0
20	POSITION							

1.4. How to get pcie register.

1.4.1 Request

BYTE/BIT	7	6	5	4	3	2	1	0
15	COMMAND=0x04							
16	PAYLOAD LEN=0x01							
17								
18	RESPONSE LEN=0x0e							
19								
21	PCIE SLOT							

Field	Value
PCIE SLOT	0x01~0x08: The PCIE slot 1 to slot 8.

1.4.2. Response

BYTE/BIT	7	6	5	4	3	2	1	0
20	VENDOR ID							
21								
22	Device ID							
23								
24	Revision ID							
25	CLASS CODE							
26	SUBCLASS							
27	PROGRAMMING INTERFACE							
28	SUBSYSTEM VENDOR ID							
29								
30	SUBSYSTEM DEVICE ID							
31								
32	LINK SPEED							
33	LINK WIDTH							

2. SES Inband Features

After loading the driver (driver source:

<https://www.broadcom.com/products/storage/nvme-switch-adapter/pcie-gen-4-switch-adapter/p411w-32p>), SES can be accessed.

2.1. SES Pages

00h - List of supported diagnostic pages

01h - SES configuration

02h - SES enclosure control / enclosure status

05h - SES threshold control / threshold status

07h - SES element descriptor

0Eh - SES download microcode control / SES download microcode status

2.2. SES Elements

04h - Temperature Sensor

0Eh - Enclosure

2.3. Implementation on SES Elements

Only the fields highlighted in green are supported.

2.3.1. Temperature Sensor Element

2.3.1.1. Temperature Sensor Control Element

BYTE/BIT	7	6	5	4	3	2	1	0
0	COMMON CONTROL							
	SELECT	PRDFAIL	DISABLE	RST SWAP	Reserved			
1	RQST IDENT	RQST FAIL	Reserved					
2	Reserved							
3	Reserved							

2.3.1.2. Temperature Sensor Status Element

BYTE/BIT	7	6	5	4	3	2	1	0
0	COMMON STATUS							
	Reserved	PRDFAIL	DISABLED	SWAP	ELEMENT STATUS CODE			
1	IDENT	FAIL	Reserved					
2	TEMPERATURE							
3	Reserved				OT FAILURE	OT WARNING	UT FAILURE	UT WARNING

Field	Value
ELEMENT STATUS CODE	OK: Everything is Ok NON-CRITICAL: If either warning limit is exceeded CRITICAL: If either failure limit is exceeded
FAIL	A warning or failure condition is detected
TEMPERATURE	Temperature reading
OT FAILURE	Temperature has exceeded the failure high threshold value
OT WARNING	Temperature has exceeded the warning high threshold value
UT FAILURE	Temperature is below the failure low threshold value
UT WARNING	Temperature is below the warning low threshold value

2.3.2. Enclosure Element

2.3.2.1. Enclosure Control Element

BYTE/BIT	7	6	5	4	3	2	1	0
0	COMMON CONTROL							
	SELECT	PRDFAIL	DISABLE	RST SWAP	Reserved			
1	RQST IDENT	Reserved						
2	POWER CYCLE REQUEST		POWER CYCLE DELAY					
3	POWER OFF DURATION						REQUEST FAILURE	REQUEST WARNING

2.3.2.2. Enclosure Status Element

BYTE/BIT	7	6	5	4	3	2	1	0
0	COMMON STATUS							
	Reserved	PRDFAIL	DISABLED	SWAP	ELEMENT STATUS CODE			
1	IDENT	Reserved						
2	TIME UNTIL POWER CYCLE						FAILURE INDICATION	WARNING INDICATION
3	REQUEST POWER OFF DURATION						FAILURE REQUESTED	WARNING REQUESTED

Field	Value
ELEMENT STATUS CODE	OK: Everything is Ok

3. Serial Command Line Interface Functions

The RS232 setting - baud rate: 115200 bps, data bits: 8, parity: none, stop bits: 1, flow control: none

3.1. How to get all revisions in AIC PCIe Gen4 Switch

(A) Switch firmware revision

```
cmd> rev
```

(B) Switch configuration revision

```
cmd> showmfg
```

3.2. How to configure serial number

(A) Get the current serial number

```
cmd> serialnumber
```

```
SerialNumber: 421-12021704510010
```

(B) Set the serial number with 421-12021704510010.

```
cmd>serialnumber 421-12021704510010
```

3.3. How to roll back the firmware

```
cmd>fwrb
```