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# Release Note for AIC SAS 12G EOBserver Expander

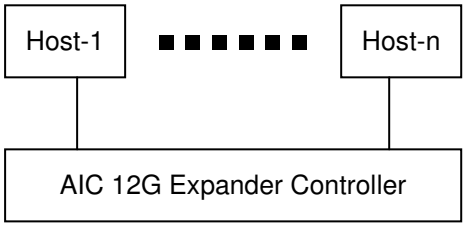
July 12, 2023

## Changelog

07/12/2023 (FW 1.12.55.1 + MFG 1.55.0.1) - Part Number (SEE-00125501_A01 + SEG-0055C001_A01)

1. Built with SDK 25
2. Initial revision

## 1. Support Multiple Host/Path Access




To have multiple host/path access support (the host number can be up to the number of wide ports on each AIC 12G Expander Controller), only the following drives are supported for shared access:

(A) SAS drive / Nearline SAS drive

(B) SATA drive with an interposer which provides SATA-to-SAS conversion

## 2. SES Inband Features

2.1. SES Pages

00h - List of supported diagnostic pages

01h - SES configuration

02h - SES enclosure control / SES enclosure status

05h – SES threshold out / SES threshold in

07h - SES element descriptor

0Ah - SES additional element

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

83h – Vendor specific canister number out / Vendor specific canister number in

2.2. SES Elements

02h - Power Supply

03h – Cooling (It depends on the jumper setting)

04h - Temperature Sensor

0Eh - Enclosure

12h – Voltage Sensor

17h - Array Device

2.3. Implementation on SES Pages

2.3.1. SES threshold out / SES threshold in

It includes only temperature sensor and voltage sensor elements.

2.3.1.1. SES threshold out

**Threshold control element format**

| BYTE/BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|
| 0 | REQUESTED HIGH CRITICAL THRESHOLD | | | | | | | |
| 1 | REQUESTED HIGH WARNING THRESHOLD | | | | | | | |
| 2 | REQUESTED LOW WARNING THRESHOLD | | | | | | | |
| 3 | REQUESTED LOW CRITICAL THRESHOLD | | | | | | | |

2.3.1.2. SES threshold in

**Threshold status element format**

| BYTE/BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|
| 0 | HIGH CRITICAL THRESHOLD | | | | | | | |
| 1 | HIGH WARNING THRESHOLD | | | | | | | |
| 2 | LOW WARNING THRESHOLD | | | | | | | |
| 3 | LOW CRITICAL THRESHOLD | | | | | | | |

2.3.2. Vendor specific canister number out / Vendor specific canister number in

The canister number length supported is 0 ~ 30 bytes.

2.3.2.1. Vendor specific canister number out

If the canister number length is set as '0', the 8 characters "0x20 0x20 0x20 0x20 0x20 0x20 0x20 0x20" is saved for the canister number (8 spaces in ASCII).

**Canister Number control format**

| BYTE/BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|
| 0~N | Canister Number | | | | | | | |

2.3.2.2. Vendor specific canister number in

The status in the following reports '1' for failure to get the canister number.

**Canister Number status format**

| BYTE/BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|
| 0 | Status (0: success, 1: failed) | | | | | | | |
| 1~N (if success) | Canister Number | | | | | | | |

2.4. Implementation on SES Elements

Only the fields highlighted in green are supported.

2.4.1. Power Supply Element

2.4.1.1. Power Supply 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 | Reserved | | | | | | | |
| 3 | Reserved | RQST FAIL | RQST ON | Reserved | | | | |

| Field | Value |
|---|---|
| RQST ON | Please refer to section "SES Element Control Functions" for details. |

2.4.1.2. Power Supply 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 | Reserved | | | | DC OVER VOLTAGE | DC UNDER VOLTAGE | DC OVER CURRENT | Reserved |
| 3 | HOT SWAP | FAIL | RQSTED ON | OFF | OVERTMP FAIL | TEMP WARN | AC FAIL | DC FAIL |

| Field | Value |
|---|---|
| ELEMENT STATUS CODE | OK |
| RQSTED ON | 1: On for Disk Power Supply<br>0: Off for Disk Power Supply |
| OFF | 1: Off for Disk Power Supply<br>0: On for Disk Power Supply |

2.4.2. Cooling Element

2.4.2.1. Cooling 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 | Reserved | | | | | | | |
| 3 | Reserved | RQST FAIL | RQST ON | Reserved | | REQUESTED SPEED CODE | | |

| Field | Value |
|---|---|
| RQST IDENT | Please refer to section “SES Element Control Functions” for details. |
| REQUESTED SPEED CODE | Please refer to section “SES Element Control Functions” for details. |

2.4.2.2. Cooling 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 | | | | ACTUAL FAN SPEED (MSB) |
| 2 | ACTUAL FAN SPEED (LSB) | | | | | |
| 3 | HOT SWAP | FAIL | RQSTED ON | OFF | Reserved | ACTUAL SPEED CODE |

| Field | Value |
|---|---|
| ELEMENT STATUS CODE | OK: Actual fan speed > 0<br>CRITICAL: The fan RPM can't be detected or equal to 0.<br>UNKNOWN: Failed to read the fan RPM |
| IDENT | Applicable only for Cooling element 0<br>0: Enable the smart fan function<br>1: Disable the smart fan function |
| ACTUAL FAN SPEED | Current fan RPM |
| FAIL | The fan RPM can't be detected or equal to 0. |
| ACTUAL SPEED CODE | Speed code level bases on current fan RPM. |

2.4.3. Temperature Sensor Element

2.4.3.1. 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 | | | | | | | |

2.4.3.2. 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<br>NON-CRITICAL: If either warning limit is exceeded<br>CRITICAL: If either failure limit is exceeded<br>UNKNOWN: Failed to read temperature |
| 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 |

2.4.4. Enclosure Element

2.4.4.1. 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 |

2.4.4.2. 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 |

2.4.5. Voltage Element

2.4.5.1. Voltage 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 | | | | | | | |

2.4.5.2. Voltage 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 | | WARN OVER | WARN UNDER | CRIT OVER | CRIT UNDER |
| 2 | VOLTAGE | | | | | | | |
| 3 | | | | | | | | |

| Field | Value |
|---|---|
| ELEMENT STATUS CODE | OK: Everything is Ok<br>NON-CRITICAL: If either warning limit is exceeded<br>CRITICAL: If either failure limit is exceeded |
| FAIL | A warning or failure condition is detected |
| VOLTAGE | Voltage reading |
| CRIT OVER | Voltage has exceeded the failure high threshold value |
| WARN OVER | Voltage has exceeded the warning high threshold value |
| CRIT UNDER | Voltage is below the failure low threshold value |
| WARN UNDER | Voltage is below the warning low threshold value |

2.4.6. Array Device Element

2.4.6.1. Array Device Control Element

| BYTE/BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|
| 0 | COMMON CONTROL | | | | | | | |
| | SELECT | PRDFAIL | DISABLE | RST SWAP | Reserved | | | |
| 1 | RQST OK | RQST RSVD DEVICE | RQST HOT SPARE | RQST CONS CHECK | RQST IN CRIT ARRAY | RQST IN FAILED ARRAY | RQST REBULD/ REMAP | RQST R/R ABORT |
| 2 | RQST ACTIVE | DO NOT REMOVE | Reserved | RQST MISSING | RQST INSERT | RQST REMOVE | RQST IDENT | Reserved |
| 3 | Reserved | | RQST FAULT | DEVICE OFF | ENABLE BYP A | ENABLE BYP B | Reserved | |

| Field | Value |
|---|---|
| PRDFAIL | Please refer to section “SES Element Control Functions” for details. |
| RQST OK | Please refer to section “SES Element Control Functions” for details. |
| RQST RSVD DEVICE | Please refer to section “SES Element Control Functions” for details. |
| RQST HOT SPARE | Please refer to section “SES Element Control Functions” for details. |
| RQST CONS CHECK | Please refer to section “SES Element Control Functions” for details. |
| RQST IN CRIT ARRAY | Please refer to section “SES Element Control Functions” for details. |
| RQST IN FAILED ARRAY | Please refer to section “SES Element Control Functions” for details. |
| RQST REBUILD/REMAP | Please refer to section “SES Element Control Functions” for details. |
| RQST R/R ABORT | Please refer to section “SES Element Control Functions” for details. |
| RQST ACTIVE | Please refer to section “SES Element Control Functions” for details. |
| DO NOT REMOVE | Please refer to section “SES Element Control Functions” for details. |
| RQST MISSING | Please refer to section “SES Element Control Functions” for details. |
| RQST INSERT | Please refer to section “SES Element Control Functions” for details. |

| | |
|---|---|
| RQST REMOVE | Please refer to section “SES Element Control Functions” for details. |
| RQST IDENT | Please refer to section “SES Element Control Functions” for details. |
| RQST FAULT | Please refer to section “SES Element Control Functions” for details. |
| DEVICE OFF | Please refer to section “SES Element Control Functions” for details. |

2.4.6.2. Array Device Status Element

| BYTE/BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|
| 0 | COMMON STATUS | | | | | | | |
| | Reserved | PRDFAIL | DISABLED | SWAP | ELEMENT STATUS CODE | | | |
| 1 | OK | RSVD DEVICE | HOT SPARE | CONS CHK | IN CRIT ARRAY | IN FAILED ARRAY | REBUILD/ REMAP | R/R ABORT |
| 2 | APP CLIENT BYPASSED A | DO NOT REMOVE | ENCLOSURE BYPASSED A | ENCLOSURE BYPASSED B | READY TO INSERT | RMV | IDENT | REPORT |
| 3 | APP CLIENT BYPASSED B | FAULT SENSED | FAULT REQSTD | DEVICE OFF | BYPASSED A | BYPASSED B | DEVICE BYPASSED A | DEVICE BYPASSED B |

| Field | Value |
|---|---|
| PRDFAIL | Set by the PRDFAIL on Array Device Control Element |
| ELEMENT STATUS CODE | OK: A drive is detected in the slot<br>NOT INSTALLED: No drive is installed in the slot |
| OK | Set by the RQST OK on Array Device Control Element |
| RSVD DEVICE | Set by the RQST RSVD DEVICE on Array Device Control Element |
| HOT SPARE | Set by the RQST HOT SPARE on Array Device Control Element |
| CONS CHK | Set by the RQST CONS CHECK on Array Device Control Element |
| IN CRIT ARRAY | Set by the RQST IN CRIT ARRAY on Array Device Control Element |
| IN FAILED ARRAY | Set by the RQST IN FAILED ARRAY on Array Device Control Element |
| REBUILD/REMAP | Set by the RQST REBUILD/REMAP on Array Device Control |

| | |
|---|---|
| | Element |
| R/R ABORT | Set by the RQST R/R ABORT on Array Device Control Element |
| DO NOT REMOVE | Set by the DO NOT REMOVE on Array Device Control Element |
| READY TO INSERT | Set by the RQST INSERT on Array Device Control Element |
| RMV | Set by the RQST REMOVE on Array Device Control Element |
| IDENT | Set by the RQST IDENT on Array Device Control Element |
| FAULT REQSTD | Set by the RQST FAULT on Array Device Control Element |
| DEVICE OFF | Set by the DEVICE OFF on Array Device Control Element |

2.5. SES Element Control Functions

2.5.1. LED indicators (blue and red) associated with an attached disk drive

**Array Device Slot control element**

| BYTE/BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|
| 0 | COMMON CONTROL | | | | | | | |
| | SELECT | PRDFAIL | DISABLE | RST SWAP | Reserved | | | |
| 1 | RQST OK | RQST RSVD DEVICE | RQST HOT SPARE | RQST CONS CHECK | RQST IN CRIT ARRAY | RQST IN FAILED ARRAY | RQST REBULD/ REMAP | RQST R/R ABORT |
| 2 | RQST ACTIVE | DO NOT REMOVE | Reserved | RQST MISSING | RQST INSERT | RQST REMOVE | RQST IDENT | Reserved |
| 3 | Reserved | | RQST FAULT | DEVICE OFF | ENABLE BYP A | ENABLE BYP B | Reserved | |

The default behavior for blue LED is "LED is on when the disk is not busy, and off when the disk is executing a command". When the "RQST IDENT" bit is set, the blue LED overwrites its default behavior with a slow blink while the red LED is off. The blue LED is set "Activity" for not overwriting its default behavior.

| Slot Control Bit | Blue LED | Red LED |
|---|---|---|
| RQST OK | Activity | OFF |
| RQST RSVD DEVICE | Activity | OFF |
| RQST HOT SPARE | Activity | OFF |
| RQST CONS CHECK | Activity | Fast blink |
| RQST IN CRIT ARRAY | Activity | Slow blink |
| RQST IN FAILED ARRAY | Activity | Slow blink |

| | | |
|---|---|---|
| RQST REBUILD/REMAP | Activity | Fast blink |
| RQST R/R ABORT | Activity | Slow blink |
| RQST ACTIVE | Activity | OFF |
| DO NOT REMOVE | Activity | OFF |
| RQST MISSING | ON | ON |
| RQST INSERT | Activity | Slow blink |
| RQST REMOVE | Activity | Slow blink |
| RQST IDENT | Slow blink | OFF |
| RQST FAULT | ON | ON |
| DEVICE OFF | OFF | OFF |
| PRDFAIL | Activity | Slow blink |

2.5.2. How to turn on/off the power of a drive slot

**Array Device Slot control element**

| BYTE/BIT | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|
| 0 | COMMON CONTROL | | | | | | | |
| | SELECT | PRDFAIL | DISABLE | RST SWAP | Reserved | | | |
| 1 | RQST OK | RQST RSVD DEVICE | RQST HOT SPARE | RQST CONS CHECK | RQST IN CRIT ARRAY | RQST IN FAILED ARRAY | RQST REBULD/ REMAP | RQST R/R ABORT |
| 2 | RQST ACTIVE | DO NOT REMOVE | Reserved | RQST MISSING | RQST INSERT | RQST REMOVE | RQST IDENT | Reserved |
| 3 | Reserved | | RQST FAULT | DEVICE OFF | ENABLE BYP A | ENABLE BYP B | Reserved | |

The "DEVICE OFF" for a drive slot is defined in the bit4, byte3 of the "Array Device Slot control element" in the SES specification. Set the bit to turn off a slot power, and vice versa. We use the software package "sg3_utils" on Linux for example, and have a SAS HBA and a cable to connect your host with the expander.

(A) Show the device for AIC Expander Controller

```
$ sg_map -i

/dev/sg2    AIC 12G      2U12 EOBserver          0c37
```

(B) Get the current state of a slot power. The "Device off=0" means the slot power is on.

```
$ sg_ses --page=2 /dev/sg2
```

Element 0 descriptor:

App client bypass B=0, Fault sensed=0, Fault reqstd=0, Device off=0

(C) Get the descriptor of a slot power

$ sg_ses --page=7 /dev/sg2

Element 0 descriptor: Disk001

(D) Turn off a slot power

$ sg_ses --descriptor=Disk001 --set=3:4:1 /dev/sg2

(E) Turn on a slot power

$ sg_ses --descriptor=Disk001 --clear=3:4:1 /dev/sg2

2.5.3. How to power off/on all disk drives manually

**Power Supply 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 | Reserved | | | | | | | |
| 3 | Reserved | RQST FAIL | RQST ON | Reserved | | | | |

The "RQST ON" for Power Supply is defined in the bit5, byte3 of the "Power Supply control element" in the SES specification. Clear the bit on Power Supply Element “DiskPowerSupply” to power off all disk drives. Set the bit on Power Supply Element “DiskPowerSupply” to power on all disk drives. We use the software package "sg3_utils" on Linux for example, and have a SAS HBA and a cable to connect your host with the expander.

(A) Show the device for AIC Expander Controller

$ sg_map -i

/dev/sg2  AIC 12G  2U12 EOBserver  0c37

(B) Power off all disk drives

$ sg_ses --descriptor=DiskPowerSupply --clear=3:5:1 /dev/sg2

(C) Power on all disk drives

$ sg_ses --descriptor=DiskPowerSupply --set=3:5:1 /dev/sg2

2.5.4. How to manually change PWM (fan speed) for all Cooling elements

**Cooling 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 | Reserved | | | | | | | |
| 3 | Reserved | RQST FAIL | RQST ON | Reserved | | REQUESTED SPEED CODE | | |

The "RQST IDENT" for Cooling is defined in the bit7, byte1 and the "REQUESTED SPEED CODE" is defined in the bit2 ~ 0, byte3 of the "Cooling control element" in the SES specification. Set "RQST IDENT" bit to disable the smart fan function, and then change PWM or fan speed for all Cooling elements by setting the "REQUESTED SPEED CODE" bits. Clear "RQST IDENT" bit to enable the smart fan function again. Please disable the smart fan function before changing PWM or fan speed. Only Cooling element 0 supports this feature. We use the software package "sg3_utils" on Linux for example, and have a SAS HBA and a cable to connect your host with the expander.

(A) Show the device for AIC Expander Controller

$ sg_map -i

/dev/sg2 AIC 12G 2U12 EOBserver 0c37

(B) Set "RQST IDENT" of Cooling element 0 to disable the smart fan function

$ sg_ses --descriptor=CoolingElement01 --set=1:7:1 /dev/sg2

(C) Set "REQUESTED SPEED CODE" of Cooling element 0 to change PWM or fan speed for all Cooling elements. Set "REQUESTED SPEED CODE"=7 (100% PWM) for example.

$ sg_ses --descriptor=CoolingElement01 --set 3:2:3=7 /dev/sg2

| REQUESTED SPEED CODE | PWM |
|---|---|
| 7 | 100% |
| 6 | 90% |

| | |
|---|---|
| 5 | 80% |
| 4 | 70% |
| 3 | 60% |
| 2 | 50% |
| 1 | 40% |
| 0 | Leave at current speed |

## 3. Serial Command Line Interface Functions

The RS232 setting - baud rate: 38400 bps, data bits: 8, parity: none, stop bits: 1, flow control: none

3.1. How to enable/disable T10 zoning

The default T10 zoning configuration is off.

(A) Check the current zoning state

cmd> phyzone state

Zoning is OFF

(B) Enable zoning

cmd> phyzone on

(C) Disable zoning

cmd> phyzone off

3.2. How to configure T10 zoning for PHY

After enabling T10 zoning, five predefined groups are Group1, Group8, Group9, Group10, and Group11. Each PHY should be in one of the five groups, and all PHYs in a wide port should be in the same group. Each PHY in Group1 can access any PHY in other groups, and vice versa. Each PHY in Group8 cannot access any PHY in Group9, and vice versa.

The command syntax is "phyzone phy_index group". The following example shows how to setup one drive accessed only by the first port and another drive accessed only by the second port.

The configuration for the example is

(A) PHY0 - PHY3 for the first wide port

(B) PHY4 - PHY7 for the second wide port

(C) PHY12 - PHY35 for drive

Step 1: Read the current group for PHY4

```
cmd> phyzone 4
Phy 4 for Zone Group 1
```

Step 2: Assign the second port (PHY4 - PHY7) for Group9

```
cmd> phyzone 4 9
cmd> phyzone 5 9
cmd> phyzone 6 9
cmd> phyzone 7 9
```

Step 3: Assign the first port (PHY0 - PHY3) for Group8

```
cmd> phyzone 0 8
cmd> phyzone 1 8
cmd> phyzone 2 8
cmd> phyzone 3 8
```

Step 4: Assign the drive on PHY12 to be accessed only by the first port instead of the second port

```
cmd> phyzone 12 8
```

Step 5: Assign the drive on PHY13 to be accessed only by the second port instead of the first port

```
cmd> phyzone 13 9
```

Step 6: Reset for taking effect with the new settings

```
cmd> reset
```

3.3. How to get all revisions in AIC SAS 12G Expander

(A) Expander firmware revision

```
cmd> rev
```

(B) Expander configuration revision

cmd> showmfg

(C) Sensors' report

cmd> sensor

3.4. How to configure temperature sensor

Four temperature settings in Celsius are T1, T2, warning threshold, and alarm (critical) threshold. The T1, T2 and alarm (critical) threshold are applied to the smart fan function.

(A) Get the current temperature settings

cmd> temperature

Temperature in Celsius (t1=20 C, t2=55 C, warning=50 C, alarm=55 C)

(B) Set temperature with new T1=18 C, T2=52 C, warning threshold=48 C, and alarm threshold=54 C. The new setting will take effect after reset.

cmd> temperature 18 52 48 54

cmd> reset

(C) We also take expander temperature into consideration, and the temperature parameters for expander are non-changeable. Expander temperature parameters: T1=40 C, T2=86 C (max 115*0.75), warning threshold=86 C, and alarm threshold=92 C. The smart fan function will use the highest PWM output which is calculated from backplane and expander temperature parameters.

3.5. How to configure enclosure address

(A) Get the current enclosure address

cmd> enclosure_addr

Enclosure Address: 0x500605B0000272BF

(B) Set the enclosure address with 0x500605B0000272BF. The new setting will take effect after reset.

cmd> enclosure_addr 500605B0000272BF

cmd> reset

3.6. How to configure standby timer for all disk drives

This feature is applicable for SAS/SATA drives. Standby timer is in units of minutes. Setting standby timer with 0 minute disables this feature.

(A) Get current standby timer

```
cmd> standby_timer
Standby Timer : 0 minutes
```

(B) Set the standby timer with 10 minutes. The new setting will take effect after reset.

```
cmd> standby_timer 10
cmd> reset
```

### 3.7. How to configure EDFB

The default EDFB configuration is off.

(A) Check the current configuration

```
cmd> edfb
EDFB is OFF
```

(B) Enable EDFB

```
cmd> edfb on
```

(C) Disable EDFB

```
cmd> edfb off
```

### 3.8. How to configure T10 zoning for a wide port

After enabling T10 zoning, five predefined groups are Group1, Group8, Group9, Group10, and Group11. Please enable T10 zoning before the following.

(A) Get the current zoning group of a wide port

```
cmd> zone_port 1
Port 01 for Zone Group 01
```

(B) Set the zoning group of a wide port

```
cmd> zone_port 1 8
Succeeded to set zone group for the port
```

3.9. How to configure T10 zoning for a slot

After enabling T10 zoning, five predefined groups are Group1, Group8, Group9, Group10, and Group11. Please enable T10 zoning before the following.

(A) Get the current zoning group of a slot

```
cmd> zone_slot 1
Slot 01 for Zone Group 01
```

(B) Set the zoning group of a slot

```
cmd> zone_slot 1 8
Succeeded to set zone group for the phy
```