



This Technical Advisory describes an issue which may or may not affect the customer's product

Intel Technical Advisory

TA-1131-01

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System throttling and System Event Log (SEL) events generated by the 2130W Power Supplies (Updated Root Cause and Corrective Action)

Affected Products

Product Name	Version	MM#
Intel® Server Chassis	H2312XXLR2	942352
Intel® Server Chassis	H2312XXLR3	954487
Intel® Server Chassis	H2216XXLR2	942353
Intel® Server Chassis	H2224XXLR2	943577
Intel® Server Chassis	H2224XXLR3	948907
Intel® Server Chassis	H2204XXLRE	957322
2130W AC Power Supply- Spare	FXX2130PCRPS	948196

Products impacted when connected to an affected product

Intel® Server Board	BBS7200AP	942367
Intel® Server Board	BBS7200APL	950090
Intel® Server Board	BBS2600BPB	948899
Intel® Server Board	BBS2600BPQ	948900
Intel® Server Board	BBS2600BPS	952609
Intel® Server Board	BBS2600KPR	943789
Intel® Server Board	BBS2600KPFR	943790
Intel® Server Board	BBS2600KPTR	948036
Intel® Server Board	BBS2600TPR	943944
Intel® Server Board	BBS2600TPTR	953032
Intel® Server Board	BBS2600TPFR	943947
Intel® Server Board	BBS2600TPNR	955259
Intel® Compute Module	HNS7200AP	942355
Intel® Compute Module	HNS7200APH	959390
Intel® Compute Module	HNS2600BPB	948924
Intel® Compute Module	HNS2600BPQ	948901
Intel® Compute Module	HNS2600BPS	952610
Intel® Compute Module	HNS2600BPB24	948903
Intel® Compute Module	HNS2600BPQ24	948904
Intel® Compute Module	HNS2600BPS24	952611

Intel® Compute Module	HNS2600TP24STR	953190
Intel® Compute Module	HNS2600KPR	943787
Intel® Compute Module	HNS2600KPFR	943788
Intel® Compute Module	HNS2600TPR	943948
Intel® Compute Module	HNS2600TPFR	943949
Intel® Compute Module	HNS2600TPNR	952260
Intel® Compute Module	HNS2600TP24R	943951
Intel® Compute Module	HNS2600TP24SR	945609
Intel® Compute Module	HNS2600TP24STR	953190

Description

Intel has received numerous reports from customers of unexpected and severe system CPU throttling on the identified affected products. The event is also coupled with a Power Supply Amber LED warning (1 Hz blink pattern) status generated by the event. A check of the System Event Log (SEL) shows a PSU Predictive Failure, an Over Temperature condition, and/or a SmART-CLST event. This anomaly occurs only in systems and chassis configured with the 2130W Power Supplies. All 2130W PSUs and all versions of 2130W PSU firmware are susceptible to this issue. Systems configured with other Power Supplies are unaffected by this issue.

Failure Details and Symptoms:

CPU Throttling

- CPU throttling may exceed 90%. The CPU frequency may drop as low as the 25-50 MHz range during the event.

System Event Log (SEL) Events. The following events may be seen in the System Event Log (SEL):

- TS:01/07/2018 05:31:30 SN:**SmART-CLST** Stat ST:OEM ED:State Asserted ET:Asserted EC:OK
- TS:01/07/2018 05:31:30 SN:PS2 Status ST:Power Supply ED:**Predictive Failure** ET:Asserted EC:Non-Critical
- TS:01/07/2018 05:31:30 SN:PS2 Status ST:Power Supply ED:**Predictive Failure- Over-Temperature** warning ET:Asserted EC:Non-Critical
- Over current events

PSU LED Warning

- One or both Power Supplies will exhibit an Amber LED warning (1 Hz blink pattern), indicating a non-fatal error.

Root Cause

The investigation has found a silicon related error in the in the 2130W Power Supply's I2C Microcontroller Unit (MCU), which is believed to be the root cause of the problem. The MCU of the non-targeted PSU is confused when a packet's payload that is sent to another PMBus slave address contains a value that matches the slave address of the non-targeted PSU. In this specific case, the non-targeted PSU will try to execute the remaining payload of the packet being sent through the PMbus.

It has been determined that the Compute Modules and Chassis are working as designed and do not contribute to the issue. In addition, the Over Temperature and Over Current events are false events generated by a time/date sensitive error in the MCU. Since the Over Temp and Over Current conditions are false events generated by the MCU error, there is no genuine system failure or stability issue.

Updated root cause: It was determined that when specific time-stamp commands are sent to the power supplies, the I2C state machine of the MCU sends incorrect address commands that modifies the values of the Over Temperature Warning Limit (OT_warn_limit). This in turn triggers the over temperature warning flag and SMB Alert, resulting in erroneous system throttling. An I2C ISR algorithm was implemented in PSU firmware version 33 that resolves this issue.

Workaround

The most effective workaround is a full AC power cycle for the units experiencing the issue (i.e., remove, pause, and then reconnect system power). The AC power cycle will reset all PSU sensors, clearing all errors.

The specific *Predictive Failure- Over-Temperature warning* can be cleared using these two IPMI commands:

Via Network if BMC is enabled for network access:

```
ipmitool -I lanplus -H {TargetIPAddress} -U{TargetBMCUSERID} -P{TargetBMCPassWord} raw 0x06  
0x52 0x0F 0xB0 0x00 0x51 0x71 0x00  
ipmitool -I lanplus -H {TargetIPAddress} -U{TargetBMCUSERID} -P{TargetBMCPassWord} raw 0x06  
0x52 0x0F 0xB2 0x00 0x51 0x71 0x00
```

Or on local system:

```
ipmitool raw 0x06 0x52 0x0F 0xB0 0x00 0x51 0x71 0x00  
ipmitool raw 0x06 0x52 0x0F 0xB2 0x00 0x51 0x71 0x00
```

Contact your Intel support representative if you need assistance with IPMI based workaround scripting.

Corrective Action

The updated PSU firmware (FW v33) that resolves the issue has been integrated and validated for all affected platforms.

The firmware packages containing the appropriate PSU FW package may be obtained at the following Intel Support locations:

For systems based on the Intel® Server Board S2600BP family, the platform firmware package is available here, and is "00.01.0013":

- SUP (EFI Shell) <https://downloadcenter.intel.com/download/27633>
- Intel® OFU (OS-level update) <https://downloadcenter.intel.com/download/27637>

For systems based on the Intel® Server Board S7200AP family, the platform firmware package is available here, and is "R01.03.0018":

- SUP (EFI Shell) <https://downloadcenter.intel.com/download/27644>
- Intel® OFU (OS-level update) <https://downloadcenter.intel.com/download/27645>

For systems based on the Intel® Server Board S2600TP family, the platform firmware package is available here, and is "R01.01.0024":

- SUP (EFI Shell) <https://downloadcenter.intel.com/download/27575>
- Intel® OFU (OS-level update) <https://downloadcenter.intel.com/download/27620>

For systems based on the Intel® Server Board S2600KP family, the platform firmware package is available here, and is "R01.01.0024":

- SUP (EFI Shell) <https://downloadcenter.intel.com/download/27574>
- Intel® OFU (OS-level update) <https://downloadcenter.intel.com/download/27619>

Recommended Customer Action

Intel recommends that customers impacted by this Technical Advisory implement upgrade to the latest firmware release for your specific platform as previously indicated. In the Corrective Actions section. Contact your Intel Support representative for details of the release and schedule.

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