



Intel[®] Server Platform Services Manageability Engine Firmware for Tylersburg-EP Product Line

Customer Release Notes

Release Production Update #3

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1 Introduction

These release notes are for the Production Update #3 release of the Intel® Server Platform Services Manageability Engine Firmware for Tylersburg-EP Product Line.

The product name is abbreviated to SPS in the remainder of this document.

1.1 SPS Application Revision Numbers

Table 1-1: Revision numbers of the SPS components for the Production Update #3.

Subproject (component)	Location	Revision
Intel® SPS ME Firmware	SPSOperational.bin	SPS_01.01.02.007.0
Intel® SPS ME Recovery Firmware	SPSRecovery.bin	SPS_01.01.02.007.0
Intel® Flash Image Tool for Server Platform Services only	Tools\FlashImageTool	SPS_01.01.02.007.0 based on Flash Image Tool 1.7.3.0
Intel® Flash Programming Tool	Tools\FlashProgrammingTool	version 5.0.0.1088
SPS ME Firmware configuration files	Config\	SPS_01.01.02.007.0
SPS Firmware Update Sample Application	Tools\SampleUpgradeTool\SampleUpgradeTool.zip	SPS_01.01.02.007.0

Table 1-2 lists the revision numbers visible on the console.

Table 1-2: Revision numbers visible on the console or over IPMI

Console/Component	Revision
ME SPS Firmware	Get Device Id Response 20 1C C4 2C xx 01 00 00 00 01 12 02 21 57 01 00 00 0B 13 00 70 01 xx
ME SPS Recovery Firmware	Get Device Id Response 20 1C C4 2C xx 01 00 00 00 81 12 02 21 57 01 00 00 0B 13 00 70 00 xx
FPT.exe and FPTw.exe	version 5.0.0.1088
FTOOL.exe	1.1.2.7 based on Flash Image Tool 1.7.3.0

2 SPS Package

Table 2-1 lists the package contents that need to be installed to be able to use the SPS firmware.

Note-1: All of this software needs Intel® compatible PC with Microsoft Windows XP* OS or DOS* OS installed depending on the specific tool requirements listed below.

Note-2: The release package contains three license files. License in the main directory is specified for Production Update #3 release firmware only the Sample Upgrade Tool package contains additional SDK license. For other tools there is dedicated license for internal use only.

Table 2-1: Software package

Num.	Package	Contents
1	ReleaseNotes.pdf	This file
2	367954_1_2.pdf	Intel ® Intelligent Power Technology Node Manager 1.5 External Interface Specification using IPMI Revision 1.2, Doc ID #367954
3	380896_1_2.pdf	Tylersburg-EP Server Platform Services Firmware Integration Guide Revision 1.2, Doc ID #380896
4	NodeManagerIPMITesting-SetupAndUsageGuide.pdf	Node Manager IPMI Testing Setup and Usage Guide

5	SPS_01.01.02.007.0_Production Update.zip	<p>This is a release package with Intel® SPS ME Firmware and Tools for TBG B0 production SKU and subsequent stepping of the silicon. This package will work also on TBG B0 SuperSKU engineering samples. Uncompress the package. The package will uncompress into SPS_01.01.02.007.0_Production Update\ directory.</p> <p>Package contents:</p> <ul style="list-style-type: none"> • Uncompressed documentation and license: TXT and PDF files in main directory. • Flash Programming Tool – Microsoft Windows* and DOS* tool: Flash Programming Tool for ICH attached SPI Flash. This tool is unpacked into the Tools\FlashProgrammingTool\ directory with dedicated license. Note: DOS* version of the tool requires DOS4GW.exe to work. This tool is not a part of the release package. • Intel® Flash Image Tool for Server Platform Services only – Microsoft Windows* tool: This is a tool to create SPI Flash image and to modify SPS firmware factory configuration. This tool is unpacked into the Tools\FlashImageTool\ directory with dedicated license. • Uncompressed SPS firmware binaries working on TBG B0 and subsequent steppings of the silicon: Files SPSRecovery.bin and SPSOperational.bin in the main directory. • Sample firmware configuration files for FIT in the Config\ directory: SPSPeciOnly_MX25L4.xml, SPSPeciOnly_MX25L4_Dual.xml, SPSPeciOnly_iS33.xml, SPS_iS33.xml, SPS_iS33_Dual.xml, SPS_M25p64_iS33_W25X64.xml, SPS_Uniform.xml and SPS_Uniform_Dual.xml. Refer to section 3.3 for description of the configuration files. • Sample Firmware Update Application in Tools\SampleUpgradeTool\SampleUpgradeTool.zip file. The file contains: <ul style="list-style-type: none"> ○ Source code files in C language ○ License files ○ Readme.txt file describing building procedure and functionality of the application ○ Microsoft Visual Studio* project files
6	IPMItool-scripts_SPS_01.01.02.007.0_ProductionUpdate.zip	Intel Node Manager IPMItool test scripts with user guide and dedicated license.

This release does not include NM 1.5 Demo Console, but the one provided in Tylersburg Production Update #2 release can be used with this release also.

3 New/Changed Features

3.1 New/Changed Features

The below list describes the new/changed functionality added in this SPS release in comparison to the **Production Update #2** release:

1. This release was validated with new flash part, Winbond W25Q64.
2. Firmware diagnostics were improved. HECI-2 Firmware Status register is also used for error reporting. Inspect this register together with HECI-1 Firmware Status when reporting issue to ME support.
3. Additional parameter has been added to Sample Upgrade Tool command line. Now you can provide the number of channel where ME is connected to BMC.
4. **This release contains fixes in the ME recovery code section. To update the recovery code, the entire ME region must be updated with new ME image, or the entire SPI flash with new flash image needs to be updated. However, please note that the Production Update #3 operational firmware is still compatible with the former (Production Update #2 / Production Update) recovery firmware if the ME recovery section of SPI flash cannot be updated.**

3.2 Limitations

The below list describes all the limitations for this SPS release:

1. This version of Node Manager manages the power range available for CPU power management, i.e. p-states and t-states. It cannot manage power consumption of other system components directly.
2. The code was tested in the below configuration:
 - Tylersburg IOH C2 stepping
 - Westmere CPU A0 stepping
 - Gainestown CPU D0 stepping
3. This release will not work on the Tylersburg A0-stepping silicon.
4. FPT.exe and FPTw.exe tools on non-uniform SPI Flash devices cannot upgrade just ME region solely if the ME region starts with offset not aligned to biggest erase block size. In that case only complete SPI Flash image can be written to Flash using FPT.
5. Node Manager tests were executed with:
 - Microsoft Windows Server 2003 R2 64-bit version.
 - Microsoft Windows Server 2008 32-bit/64-bit version.
 - Microsoft Windows Server 2008 R2 64-bit build 7100
 - Red Hat Enterprise Linux 5.3 Server Edition 64-bit.
 - SUSE Linux Enterprise Server 10 SP2 32-bit/64-bit
 - SUSE Linux Enterprise Server 11 64-bit

6. Full set of tests for PMBUS support was executed with PMBUS PSUs attached to SMLink - recommended PMBUS connectivity option. For Host SMBUS link connectivity make sure there is no address conflict of PMBUS PSU with other equipment on that line.
7. The tests on per-rail power readings were executed only with PMBUS simulator due to lack of support for per-rail measurements in existing PMBUS PSUs.
8. Tests were executed with Green City BIOS based on version Txx060.
9. During upgrade only CRC and additionally a beginning of the image is verified so the staging bit reported by **Online Update Get Status** IPMI command may return valid status even for the corrupted image. The full verification of image integrity is performed only on image load and in the recovery mode.
10. The Online Update Open Area IPMI command erases one 64 KB flash sector. The response will be sent after completing the operation and may take longer than 250ms. The actual response time depends on the type of flash part used. E.g. for Winbond W25X64 it may take be up to 1 second, and for Intel S33 it can be up to 4 seconds. Refer the flash part datasheet for Erase Sector Command timing information.
11. In extreme case SPS firmware reset to factory presets using IPMI OEM command Force ME Reset may take up to 20 seconds.
12. It is recommended to use correction time greater than 10 seconds when using action shutdown in NM policy.

3.3 Creation of SPI Flash image

To create the SPI Flash image without BIOS use:

```
Tools\FlashImageTool\ftool.exe /b <xml_file_path>
```

To create the SPI Flash image with BIOS image use:

```
Tools\FlashImageTool\ftool.exe /b /bios <bios_image_file_path> <xml_file_path>
```

To decompose complete SPI Flash image into separate regions run FTOOL.exe in the “window mode” (without option 'b') and open the binary SPI flash image <NAME>.bin. FTOOL.exe will automatically decompose the image into directory <NAME>/Decomp. This is useful if in the existing SPI flash image ME region should be replaced with a new content. Then the image can be created from decomposed parts and new ME image:

```
Tools\FlashImageTool\ftool.exe /b /bios "<NAME>/Decomp/BIOS Region.bin" <xml_file_path>
```

<xml_file_path> shall be replaced with the path to XML configuration file. The sample configuration files included in the package are:

- [Config\SPSPeciOnly_MX25L4.xml](#) – for MX25L Flash part series, containing only Flash descriptor and ME region with Peci-proxy enabled and Node Manager disabled. The configuration is for Single Image firmware update.
- [Config\SPSPeciOnly_MX25L4_Dual.xml](#) – for MX25L Flash part series, containing only Flash descriptor and ME region with Peci-proxy enabled and Node Manager disabled. The configuration is for Dual Image firmware update.
- [Config\SPSPeciOnly_iS33.xml](#) – for Intel S33 Flash part series, containing only Flash descriptor and

ME region with PECI-proxy enabled and Node Manager disabled. The configuration is for Single Image firmware update.

- [Config\SPS_iS33.xml](#) – for Intel S33 Flash part series, containing only Flash descriptor, PDR region and ME region with Node Manager enabled and PECI-proxy disabled. The configuration is for Single Image firmware update.
- [Config\SPS_iS33_Dual.xml](#) – for Intel S33 Flash part series, containing only Flash descriptor, PDR region and ME region with Node Manager enabled and PECI-proxy disabled. The configuration is for Dual Image firmware update.
- [Config\SPS_M25p64_iS33_W25X64.xml](#) – common for Intel S33 32Mb/64Mb, Numonyx M25P64, Winbond W25X64, Winbond W25Q64, containing only Flash descriptor, PDR region and ME region with Node Manager enabled and PECI-proxy disabled. The configuration is for Single Image firmware update.
- [Config\SPS_Uniform.xml](#) – for Atmel 26DF161 and SST 25VF016B Flash part series, containing only Flash descriptor and ME region with Node Manager enabled and PECI-proxy disabled. The configuration is for Single Image firmware update.
- [Config\SPS_Uniform_Dual.xml](#) – for Atmel 26DF161 and 25VF016B Flash part series, containing only Flash descriptor and ME region with Node Manager enabled and PECI-proxy disabled. The configuration is for Dual Image firmware update.

Notes:

1. If /b switch is not used, [FTOOL.exe](#) GUI will be presented and adjustments to XML can be made.
2. Always use XML from current kit and apply required changes. Flash Image Tool is not designed to accept configuration files from different kit version.
3. Any modifications to the binary files [SPSRecovery.bin](#) and [SPSOperational.bin](#) will make the files unusable.

3.4 Creation of SDR files

To build SDR files for XML file type:

```
Tools\FlashImageTool\ftool.exe /sdr <sdr_output_file> <xml_file_path>
```

<xml_file_path> shall be replaced with the path to XML configuration file. The sample configuration files included in the package are described in section 3.3.

<sdr_output_file> shall be replaced with the base name of the SDR files

Note that there are three additional, optional parameters that can be used when generating SDR:

/sdrch - channel number for discovery SDR, default 6

/sdrbase - start SDR records indexing at given base id, default 0

/sdrentinst - entity instance in management controller locator record, default 1

3.5 Documentation updates

1. Tylersburg I/O Hub (IOH) BIOS Specification Update Doc ID # 368193
 - DMI Completion Timeout is enabled by default with a value of 50ms. There is an additional

requirement for the BIOS to disable the DMI completion timeout within the first 48ms of execution by setting the DEVCTRL2: Bit4 to 1 on device #0, Function #0, offset B8h. This is required for systems where BIOS fetches instructions from SPI flash attached to ICH and may hang when ME starting in parallel will consume too much SPI bandwidth. The DMI Completion Timeout can be enabled later when BIOS executes mainly from system memory.

- Support for power measurements initiated by BIOS via HECI-1 removed from ME-BIOS interface specification defined in Intel Tylersburg I/O Hub (IOH) BIOS Specification Update Revision 0.64, Doc ID # 368193. This functionality is not supported in SPS firmware any more. Node Manager OEM IPMI commands shall be used for this purpose.
- Added request for restoring HECI-2 configuration in the BIOS on the resume path from S3.

4 Known Issues

'Disposition' field can be one or more of the following:

Under Investigation	The bug is being investigated.
Root Cause Identified	The root cause for the bug is identified.
Workaround Available	A temporary solution to the bug is provided until the bug is fixed.
As Designed	The issue reported is not a defect and the behavior will not be modified.
Closed no repro	The situation was not observed anymore and no further investigation is scheduled
Fixed	Already fixed

'O/R' field can be one or more of the following:

O	Operational code affected.
R	Recovery code affected.
N/A	Not applicable.

The table below presents problems and issues found during testing of this release.

Table 4-1: Known issues

Description	O/R	Disposition
Symptom: If Online Update is done using sliding window mechanism with window size 5 or greater upgrade may fail reporting 81h error. Root Cause: KCS driver in BMC firmware may sometimes duplicate data bytes. Workaround: Use maximum data size of the Write Area command, so that if additional byte is added the command will be refused by SPS firmware and retransmitted by the upgrade application.	N/A	Workaround Available
Symptom: Sometimes ME firmware cannot read correct value of ICH temperature. Root Cause: Probably BIOS problem as BIOS initializes the ICH sensor. Workaround: None.	O	Under Investigation
Symptom: Flash Image Tool (ftool.exe) fails to open an image if Chinese characters are used in file path. Root Cause: Unknown. Workaround: Do not use Chinese characters in file and directory names.	N/A	Workaround Available

Description	O/R	Disposition
Symptom: In a design where ME works in Always On power mode, and PECI Proxy functionality is enabled in ME configuration, when host reset with power cycle is triggered during the few seconds between CPU start and the moment when ME devices are enabled on PCI (Tylersburg errata 3319440), ME may start responding with completion code 89h (bus timeout) to all Send Raw PECI commands. Root Cause: Incorrect interaction with PECI controller. Workaround: Send Cold Reset command to ME.	O	Workaround Available
Symptom: If you enable scanning of MTT sensors, the sensors remain available even when host enters one of Sx states. Root Cause: Coding error. Workaround: Do not read these sensors when host is in one of Sx states.	O	Workaround Available
Symptom: Hibernation issues were observed in several operating systems. Some hang on entering hibernation, others on shutdown. Root Cause: Unknown, BIOS suspected. Workaround: Newer BIOS should be used.	N/A	Workaround Available
Symptom: Host system may fail to start at first power on if ME detects broken configuration partition and enforces cleanup and reset to defaults. Root Cause: Probably DMI timeout not disabled in BIOS startup sequence, Workaround: Restart the platform.	O	Workaround Available
Symptom: When running FPT.exe tool under DOS, the tool hangs just before exit. The image is written correctly to SPI Flash. Root Cause: The problem happens on platforms without legacy keyboard controller. FPT.exe uses DOS4GW. DOS4GW may crash without legacy keyboard controller. Workaround: Use the MS Windows version of the tool (FPTw.exe) under Windows XP or insert legacy keyboard controller card into the platform.	N/A	Workaround Available
Symptom: It was observed on one Green City CRB platform with Txx060 BIOS that Node Manager is not able to limit power consumption when Hyper-Threading (aka Simultaneous Multi Threading) is enabled. SCI interrupt is not delivered to OS. Root Cause: Probably BIOS problem. Workaround: Disable HT in BIOS setup.	N/A	Workaround Available

Description	O/R	Disposition
Symptom: If you enable DBS in MS Windows 2003 Server system (Start->Settings->Control Panel->Power Options is set to "Server Balanced Processor Power and Performance") then power limiting by NM is imprecise up to 16% below the limit. Root Cause: Unknown. Workaround: Disable DBS when using NM with MS Windows 2003 Server.	N/A	Under Investigation Workaround Available

5 Fixed Issues

The table below lists the issues detected in **Production Update #2** release that have been fixed in this SPS **Production Update #3** firmware version.

Table 5-1: Fixed issues

Description	O/R
<p>Symptom: If ME Watchdog Global Platform Reset Allowed is enabled for ME firmware using FIT, and some - at this moment hard to predict - circumstances would trigger such a reset, it is possible that ME will fail to send health event about the watchdog exception that caused the reset.</p> <p>Root Cause: ME does not resume sending the rest of exception traces from its internal log when it has sent first and was restarted.</p> <p>Workaround: None.</p>	O+R
<p>Symptom: If an NM policy is created with power limit less than 5% above the platform idle power it is possible that the policy, when activated, will keep limiting even though the load is removed and power consumption is below power limit.</p> <p>Root Cause: Coding error.</p> <p>Workaround: Use higher power limit.</p>	O
<p>Symptom: If you start Online Update session with sequence number FFh in Online Update Write Area command, the request with FFh sequence number would just be ignored and 0 returned in completion code.</p> <p>Root Cause: Coding error.</p> <p>Workaround: Start with sequence number 0 as requested in command description.</p>	O+R

Description	O/R
<p>Symptom: On system with wrong ME SPI layout where space for the second operational image is not allocated, but Dual Operational Image is enabled in the configuration, Online Update will not work and all Online Update IPMI commands will return D5h.</p> <p>Root Cause: No warning in the FTOOL about improper ME Region flash layout. Online Update in recovery code does not properly handle this incorrect SPI flash layout configuration.</p> <p>Workaround: Fix the ME region layout configuration in the FTOOL.</p>	O+R
<p>Symptom: After receiving SMBus frames of certain size and content ME may drop the next frame received. The frames that reproduce the issue are of data size 4, 12, 20 bytes, and with three last data bytes of value: - sum of first and third lower or equal to 32; - second byte is zero.</p> <p>Root Cause: Coding error.</p> <p>Workaround: Retry the frame that was dropped by ME.</p>	O+R
<p>Symptom: In Dual Image configuration, if ME is updated with operational code image corrupted in the first 3 KB, it may happen that ME will start in recovery mode instead of the returning to rollback image.</p> <p>Root Cause: Coding error.</p> <p>Workaround: None.</p>	O
<p>Symptom: If ME works in Always-On power mode, after host reset with power cycle ME may start responding with completion code 89h to all Send Raw PECI requests.</p> <p>Root Cause: Wrong interaction with PECI controller h/w.</p> <p>Workaround: Restart ME with Cold Reset IPMI command.</p>	O