Intel® Dynamic Platform and Thermal Framework (Intel® DPTF), Client Version 7.1

7.1.0.2103 Production Version for Windows* 8.1

Release Notes

August 2013

Contents

Tables

Revision History

Package Definition	Intel® Dynamic Platform and Thermal Framework (Intel® DPTF) Driver Revision	Release Date
7.0 Beta for Windows* 8.1	7.0.0.2026	May, 2013
7.1 Engineering Release for Windows* 8.1	7.1.0.2101	July, 2013
7.1 Production Version for Windows* 8.1	7.1.0.2103	August, 2013

1 Introduction

1.1 Supported Operating Systems

- Microsoft Windows* 8.1 x64 Edition
- Microsoft Windows* 8.1 x32 Edition
- Microsoft Windows* 8 x32 Edition
- Microsoft Windows* 8 x64 Edition
- Microsoft Windows* 7 x32 Edition
- Microsoft Windows* 7 x64 Edition

Basic Acceptance Tests (BAT) and Functional Tests (FT) was performed with Windows* Windows* 8.1 on Haswell U LPDDR3 and Haswell U DDR3L RVPs. Intel's internal validation team will continue Platform Functional tests.

Note: Microsoft Windows* XP is no longer supported with Intel® DPTF Client 7.0/7.1 driver.

1.2 Supported Hardware

- Haswell Platforms 4th generation Intel® Core™ processor C3/ C4/ D2 with config TDP support (BGA) stepping with Lynx Point Chipset B0 stepping samples.

Table 1. Haswell Processor SKU Table

Processor	cTDP[1]	LPM[1]	DPPM	DBPT
HSW H Processor (GT3) – 4th Gen Core	NO	NO	YES	YES
HSW H Processor (GT2) – 4th Gen Core	NO	NO	YES	YES
HSW M Processor 57W (GT2) – 4th Gen Core (XE)	YES	YES	YES	YES
HSW M Processor – 4th Gen Core	NO	NO	YES	YES
HSW M Processor – Pentium	*	*	*	*
HSW M Processor – Celeron	*	*	*	*
HSW U Processor – 4th Gen Core	YES	YES	YES	YES

HSW U Processor – Pentium	*	*	*	*
HSW U Processor – Celeron	*	*	*	*
HSW Y Processor – 4th Gen Core	YES	YES	YES	YES
HSW Y Processor – Pentium	*	*	*	*
HSW Y Processor – Celeron	*	*	*	*

Notes:

1. The cTDP/ LPM POR direction subject to change, please refer to EDS for latest update

* This DPTF release does not support Pentium and Celeron SKUs.

- Chief River Platforms with 3rd generation Intel® Core™ U-Processors and Y-Processor lines QS samples (with cTDP and Graphic support) with Intel® 7 Series/C216 Chipset Family QS samples.
- Huron River Platforms with 2nd generation Intel® Core™ U-Processors and Y-Processor lines D2 stepping with Intel® 6 Series/C200 Chipset Family B1 stepping.

Note: Intel® DPTF currently only supports Intel Mobile Platforms. Intel® DPTF does not support Desktop, All-in-One and Server platforms.

1.3 Supported Platform

Intel® DPTF Client 7.0/7.1 is for supported Core™ Platforms.

Please use DPTF 7.10 driver for Essential Platform.

Table 2. Platform Support

DPTF Client Driver Version	Core™ Platform (HSW)	Essential Platform
7.0	YES	-
7.1	YES	-
7.10	-	YES

1.4 Supported BIOS

- BIOS version 131.2 or newer for Haswell Platform (with Haswell U DDR3L and Haswell U LPDDR3 RVP) testing.

Note: Intel's internal validation team uses the latest BIOS based on the latest BKC.

- BIOS version 95.1 for Chief River platform testing.
- BIOS version 90 for Huron River platform testing.

1.5 Supported Firmware

- Full SKU PCH firmware.

1.6 Supported KSC

- KSC version 1.13 for Haswell platform (with Haswell U DDR3L and Haswell U LPDDR3 RVP).
- KSC version 1.07 for Chief River platform.
- KSC version 1.18 for Huron River platform.

1.7 Supported OS and Intel® Integrated Graphics Driver [IGD]

1.7.1 Supported Haswell Platform OS and Graphics Driver versions

Intel internal validation team used following versions of the Intel Integrated Graphics Driver.

- Windows* 8.1 – 64bit: 9.18.10.3246
- Windows*8.1 – 32 bit: 9.18.10.3246
- Windows* 8 – 64bit: 9.18.10.3224
- Windows* 8 – 32bit: 9.18.10.3224
- Windows* 7 – 64bit: 9.18.10.3224

- Windows* 7 – 32bit: 9.18.10.3224

1.7.2 Supported Chief River Platform OS and Graphics Driver versions

Intel internal validation team used following versions of the Intel Integrated Graphics Driver.

- Windows* 8.1 – 64bit: 9.18.10.3246
- Windows*8.1 – 32 bit: 9.18.10.3246
- Windows* 8 – 64bit: 9.18.10.3224
- Windows* 8 – 32bit: 9.18.10.3224
- Windows* 7 – 64bit: 9.18.10.3224
- Windows* 7 – 32bit: 9.18.10.3224

1.7.3 Supported Huron River Platform OS and Graphics Driver versions

Intel internal validation team used following versions of the Intel Integrated Graphics Driver.

- Windows* 8.1 – 64bit: 9.18.10.3246
- Windows*8.1 – 32 bit: 9.18.10.3246
- Windows* 8 – 64bit: 9.18.10.3224
- Windows* 8 – 32bit: 9.18.10.3224
- Windows* 7 – 64bit: 9.18.10.3224
- Windows* 7 – 32bit: 9.18.10.3224

1.8 Supported Collaterals

Please refer to the below mentioned supporting documents for the latest update on DPTF.

1.8.1 DPTF Collaterals:

- RS – Dynamic Platform and Thermal Framework (DPTF), Client Version 7.0 Shark Bay Platform PRD, Rev 0.5, Doc ID: 31199
- RS – Intel Dynamic Platform and Thermal Framework, Client Version 7.0 BIOS Write's Guide, Rev 1.0, Doc ID: 32630

- RS – Dynamic Platform and Thermal Framework (DPTF/DPPM), Client Version 7.0 Shark Bay Platform PRD, Rev 0.5, Doc ID: 31231
- Haswell Configurable TDP and Low Power Mode Implementation Guide, Rev 0.5, Doc ID: 490080
- RS – Intel Configurable TDP Product Requirements Document, Rev 0.8, Doc ID: 29922
- Intel® Dynamic Platform and Thermal Framework Client 7.0 Software Implementation Guide, Rev 0.4, Doc ID: 524476
- Intel® Dynamic Platform and Thermal Framework Client Version 7.0 OEM Testing Guide, Rev 0.8, Doc ID: 518803
- Intel® Dynamic Platform and Thermal Framework Client version 7.0 API Guide, Rev 1.0, Doc ID: 519875

1.8.2 Other Collaterals:

- Intel® 8 Series/C220 Series Chipset Family, Lynx Point-LP Platform Controller Hub (PCH), and Wellsburg Platform Controller Hub (PCH) BIOS Spec, Doc ID: 493816
- Lynx Point-LP Platform Controller Hub (PCH) External Design Specification (EDS), Doc ID: 503118
- 4th Generation Intel® Core™ Processor Family BIOS Write's Guide, Doc ID: 493770
- 4th Generation Intel® Core™ Processor (Haswell) System Agent BIOS Spec Doc ID: 492662
- RS – Intel Configurable TDP Product Requirements Document – Rev 0.8, Doc ID: 29922
- Mobile 3rd Generation Intel® Core™ Processor Family External Design Specification (EDS) – Volume 1 of 2, Doc ID: 473716
- Mobile 3rd Generation Intel® Core™ Processor Family External Design Specification (EDS) – Volume 2 of 2, Doc ID: 473770
- Intel® Ivy Bridge System Agent BIOS Specification, Doc ID: 490768
- Intel® Ivy Bridge Processor Family BIOS Writer's Guide, Doc ID: 490416
- Intel® 6 Series Chipset/Intel® C200 Series Chipset Platform Controller Hub (PCH) BIOS Specification, Doc ID: 441979
- Intel® 6 Series Chipset and Intel® C200 Series Chipset External Design Specification (EDS), Doc ID: 443554
- Intel® Thermal Analysis Tool Rev 4.3, Doc ID: 407834

- Thermal Analysis Tool Installation Guide, Doc ID: 355673

Contact your Intel representative for the latest revision.

2 Installation and Configuration Guide

2.1 Connected Standby BIOS Setup

Note: Following BIOS setup instructions are applicable if DPTF is tested for Connected Standby systems.

1. Reboot the system and enter BIOS setup screen.
2. Go to "Intel Advanced Menu"
3. Enter "ACPI Settings" page
    - Enable "Low Power S0 Idle Capability"
    - Enable "Native PCIe Enable"
    - Enable "Native ASPM"
4. Enter "RTD3 Setting"
    - Enable "RTD3 support"
5. Go to "Boot Maintenance Manager Menu"
6. Enter "Boot Configuration Menu"
    - Confirm "CSM Control" to "Always OFF"

2.2 Intel® DPTF 7.1 Driver Installation Guide (using Haswell RVP as an example)

Note: Following BIOS setup instructions are applicable for all Intel® Haswell RVP BIOS. Intel® DPTF team has verified with BIOS version 120 for the setup.

2.2.1 cTDP

1. Reboot the system and enter BIOS setup screen.
2. Go to "Intel Advanced Menu"
3. Enter "Power & Performance" page, then "CPU - Power Management Control" page
    - Make sure both "Intel® SpeedStep™" and "Turbo Mode" are enabled
    - Enter "View/Configure Turbo Options"
        - Enable "ACPI 5.0 CPPC Support"
            - Enable "ACPI 5.0 CPPC Platform SCI"
    - Enter "Config TDP Configurations" and set as desired
4. Enter "Thermal Configuration" page
    - Enter "CPU Thermal Configuration" page
        - Set "ACPI 3.0 T-States" flag (check the X-box) as desired
    - Enter "DPTF Configuration" page
        - Enable "DPTF"
        - Assure "Processor Thermal Device" is set to "SA Thermal Device"

        - Enable "ConfigTDP"
5. Run Setup.exe in Intel® DPTF 7.1 driver package to install DPTF 7.1 drivers

Note: cTDP configuration menu is only shown when a processor sample used supports the policy.

2.2.2 LPM

1. Reboot the system and enter BIOS setup screen.
2. Go to "Intel Advanced Menu"
3. Enter "Power & Performance" page, then "CPU - Power Management Control" page
    - Enter "View/Configure Turbo Options"
        - Enable "ACPI 5.0 CPPC Support"
            - Enable "ACPI 5.0 CPPC Platform SCI"
    - Make sure both "Intel SpeedStep" and "Turbo Mode" are enabled
4. Enter "Thermal Configuration" page
    - Enter "CPU Thermal Configuration" page
        - Set "ACPI 3.0 T-States" flag (check the X-box) as desired
    - Enter "DPTF Configuration" page
        - Enable "DPTF"
        - Assure "Processor Thermal Device" is set to "SA Thermal Device"
        - Enable "LPM"
        - Set "CLPM" as desired (default: Disabled)
5. Run Setup.exe in Intel® DPTF 7.1 driver package to install DPTF 7.1 drivers

Note: LPM configuration menu is only shown when a processor sample used supports the policy.

2.2.3 DPPM

1. Reboot the system and enter BIOS setup screen.
2. Go to "Intel Advanced Menu"
3. Enter "Power & Performance" page, then "CPU - Power Management Control" page
    - Enter "View/Configure Turbo Options"
        - Enable "ACPI 5.0 CPPC Support"
            - Enable "ACPI 5.0 CPPC Platform SCI"
    - Make sure both "Intel SpeedStep" and "Turbo Mode" are enabled
4. Enter "Memory Configuration" page.
    - Disable "2x Refresh Rate" (Only for Haswell U LPDDR3 RVP)
    - Enter "Memory Thermal Configuration" page
        - Enable "Memory Thermal Management"
        - Enable "PECI Injected Temperature"
        - Enable "EXTTS# via TS-on-DIMM"
        - Enter "Memory Power and Thermal Throttling" page
            - Disable "LPDDR Thermal Sensor" (Only for Haswell U LPDDR3 RVP)
            - Enter "Memory Thermal Reporting" page
                - Enable "Closed Loop Therm Manage"
            - Enter "Dram Power Meter"

        - Set "Use user provided power weights, scale factor, and channel power floor values" to Enabled (we will turn this back off after setting RAPL)

    - Enter "Memory RAPL"
        - Set RAPL Power Floor Ch0/Ch1 to 75
        - Enable RAPL PL 1 enable
        - Set RAPL PL 1 Power to 145
        - Set RAPL PL 1 WindowX to 3
        - Set RAPL PL 1 WindowY to 14
    - Re-enter "Dram Power Meter"
        - Set "Use user provided power weights" to Disabled

5. Enter "Thermal Configuration" page
    - Enter "CPU Thermal Configuration" page
        - Set "ACPI 3.0 T-States" flag (check the X-box) as desired
    - Enter "DPTF Configuration" page
        - Enable "DPTF"
        - Assure "Processor Thermal Device" is set to "SA Thermal Device"
        - Most everything will be pre-configured, so change settings as desired
            - Manually-enable "Display participant" device as desired.
            - Manually-enable "Power participant" device as desired.
        - Enter "Policy Configuration"
            - Enable "TMEM _TMP Object"
            - Enable/Disable "Active Policy/Passive Policy/Critical Policy/Cooling Mode Policy" as desired
6. Run Setup.exe in Intel® DPTF 7.1 driver package to install DPTF 7.1 drivers.

2.3 DPTF 7.1 Driver Installation Guide (using Chief River CRB as an example)

1. Reboot the system and enter BIOS setup screen.
2. Go to Advanced->Thermal Configuration screen.
3. Go to CPU Thermal Configuration-> Enable ACPI 3.0 T-States.
4. Go to DPTF Configuration screen.
    - Enable DPTF.
    - Enable DPPM if supported
    - Enable LPM if the system uses LPM
    - Set CLPM to Enable LPM.
    - Enable CTDP if the system uses CTDP
    - Make sure Processor Camarillo Device is MCP (SA) Camarillo Device (default).
    - Make sure PCH Camarillo Device is enabled (default).
5. Run Setup.exe in Intel® DPTF Client Version 7.1 driver package to install DPTF 7.1 drivers.

2.4 DPTF 7.1 Driver Installation Guide (using Huron River CRB as an example)

1. Go to Advanced->Thermal Configuration screen.
2. Go to CPU Thermal Configuration; enable ACPI 3.0 T-States.
3. Go to Platform Thermal Configuration, enable PCH Thermal Device.
4. Go to DPPM Configuration screen.
   a) Enable DPPM.
   b) Make sure Processor Camarillo Device is MCP Camarillo Device (default).
   c) Make sure PCH Camarillo Device is Enabled (default).

2.5 DPTF 7.1 Driver Silent Installation Guide

Intel® DPTF driver supports command line flags for the silent installation options.

1. For silent install with auto-reboot:
   - SETUP.EXE –b –s
2. For silent install without auto-reboot:
   - SETUP.EXE -s

Note: The system MUST be rebooted in order for all device updates to take effect.

2.6 Processor SKU Checking Feature

Processor SKU checking feature is removed from Production Candidate (PC) release of Intel® DPTF Client 7.0 with Haswell U-Processor support driver. For the list of processor SKUs that support each DPTF policy, please refer to the Table 1 in Section 1.2.

2.7 Behavioral Considerations

2.7.1 PL1 settings on Haswell Processors

DPTF driver sets PL1 values for supported processors for Low Power Mode (LPM). If OEMs setting the values other than default ones, they will need to override following Windows* Registry keys to a desired value when LPM is enabled on the system.

Registry Key:

StandardMode\PackagePowerLimit

Note: This value is used by LPM Standard Mode

AppSpecificMode\<App Specific Mode number>\PackagePowerLimit (LPM App Specific Mode)

Registry path:

HKLM\SYSTEM\CurrentControlSet\Enum\ACPI\INT3400\<string>\Device Parameters{B9455B06-7949-40C6-ABF2-363A70C8706C}

For more details, refer to Intel® DPTF Registry Setup Guide or contact your Intel representative.

3 Tools Support

Table 3. Tool Support

Feature	Description
DPTF Monitor Tool 2.0	A new DPTF Monitor tool is available. It's a vast improvement to the previous version in terms of user experience and functionalities such as real time graphing, record and playback, registry, system information reports. The new DPTF Monitor tool allows modification of trip points at run time. This DPTF Client 7.1 release supports both the DPTF Monitor 1.0 and DPTF 2.0 Tools. However, the DPTF Monitor Tool 2.0 is not compatible with older versions of the driver. Intel highly recommends the use of DPTF Monitor 1.0 for testing out DPTF 7.1.
Thermal Analysis Tool	This tool provides capabilities to analyze an OEM's thermal design. It also provides a plug-in that reports DPTF participant and policy trip points at run time.

4 Feature Set – New to this release

Table 4. New Features

Feature	Description
710.01	Support for _TMP in the Processor Participant is now removed. This is to prevent an issue that a policy trip point crossed event may not be correctly handled if _TMP is set for the participant. Intel has no plan to re-introduce the feature with DPTF Client 7.1 driver.

5 Issues – Fixed in this Release

Table 5. Fixed Issues

Reference No:	Description
5083196	Dptf *.sys file remaining after uninstalling DPTF driver
5083197	After uninstalling DPTF 7.0 drivers, Registry values are not changed in Power Option
5083789	BSOD Observed for MCP Participant after Critical Trip Point is crossed with Windows7 32bit OS

6 Issues – Known in this Release

Table 6. Known Issues

Ref ID	Issues	Description
700.01	Display brightness gets stuck at last value on lid close/open cycle on Windows* 8	The display brightness passive limiting will begin lowering brightness during a passive event. However, if the lid is closed (which blanks the display) during the passive limiting (as brightness is being changed from max to min limit) then once the lid is opened the actual brightness remains at the same level that it was before the lid was closed. The monitor will show that requested brightness is still limiting, but the actual/current brightness remains at the last value before lid close.
700.10	Memory throttling begins ahead of processor throttling completion	When skin sensor passive event is triggered, the memory power gets throttled before the processor has completed all its throttling.
700.11	First invocation of DptfPolicyLpmDll "-set" command does not result in LPM mode changing	The first time the DLL --set command is executed, the LPM mode of operation does not change.

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