Intel® SoC Watch for Windows* Release Notes

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Version 2.10

Intel Corporation

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Legal Information

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Version History

These are the main releases of Intel® SoC Watch:

Date	Revision	Description
November, 2017	2.4	First release that aligns all command line parameters and output formats across all supported operating systems.
December, 2017	2.4.2	Update release, includes support for Intel platforms code named Apollo Lake (new stepping) and corrected console message order when using delayed start option.
February, 2018	2.5	Includes support for Intel platform code named Gemini Lake and other fixes.
April, 2018	2.6	Enhancements include new hot key Alt-S, new --log option, modified metric groupings, and improved support in gfx metrics.
May, 2018	2.6.1	Update release.
August, 2018	2.7	Added average frequency report, new options (program-delay, disable-alts), new metrics (pkg-pwr), new group names, support for Intel platforms code named Whiskey Lake, Amber Lake, and Cherry Trail, fixed issues in ddr-bw, automation summary, and multiple pkg handling.
November, 2018	2.8	Added filter for acpi-dstate devices. Fixed error in ddr-bw reporting. Alt-S hotkey off by default.
January, 2019	2.9	Added trace file report grouping and informational messages.
March, 2019	2.10	Added histogram for CPU frequency and bug fixes.

Intended Audience

Use this document if you use Intel SoC Watch to analyze power consumption on a Windows* system.

Customer Support

For technical support, including answers to questions not addressed in this product, visit the technical support forum, FAQs, and other support information at: https://software.intel.com/en-us/intel-system-studio-support.

Introduction

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Intel® SoC Watch is the data collector for power-related data that helps identify issues on a platform that are preventing entry to power-saving states. The metrics it captures include system sleep states, CPU and GPU sleep states, processor frequencies, temperature data, device sleep states among others. The collected data can be correlated and visualized over time using the Intel® VTune™ Amplifier.

This document provides system requirements, installation instructions, issues and limitations, and legal information.

To learn more about this product, see:

- New features listed in the New in this Release section below
- Reference documentation listed in the Related Documentation section below
- Installation instructions can be found at: Installation Notes

New in This Release

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Release version 2.10 includes these new features:

- Enhanced `-f hw-cpu-pstate` feature reporting to include *Core P-state/Frequency Histogram* summary, which makes it easier to see residencies in turbo and throttled frequency states.
- This release (v2.10) is the last to maintain support for Windows* 8.1 OS.

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System Requirements

Supported Architectures and Terminology

Intel SoC Watch supports the following Intel microarchitecture or platform code names:

- Apollo Lake
- Sky Lake
- Kaby Lake
- Gemini Lake
- Coffee Lake
- Whiskey Lake
- Amber Lake

Minimum System Requirements

This tool can be run on the Windows* 8.1 OS and Windows* 10 OS, 64-bit operating systems, with administrator permissions.

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Where to Find the Release 4

Go to the Intel® System Studio website (https://software.intel.com/en-us/intel-system-studio) to get either an Evaluation (30-day trial release) license or a commercial license, and download the package from the Intel Registration Center (http://registrationcenter.intel.com/).

Installation Notes

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Intel SoC Watch for Windows* OS is installed as part of Intel System Studio when downloaded to a Windows host system.

Refer the I*ntel® SoC Watch for Windows* OS User's Guide* for additional instructions, including how to setup your environment to get complete symbol information in callstacks and how to install WDTF to allow automatic entry to Connected Standby.

Default Installation Folders

The default top-level installation folder for this product is:

```
C:\Program Files (x86)\Intel\SoCWatch
```

If you are installing on a system with a non-English language version of Windows OS, the name of the `Program Files` folder may be different. On Intel® 64 systems, the directory name is `Program Files (X86)` or the equivalent.

Installing on a Remote Target

You can install Intel SoC Watch on a remote Windows system. Detailed instructions are available from https://software.intel.com/en-us/energy-analysis-user-guide-preparing-a-target-windows-system-for-energy-analysis.

Changing, Updating, and Removing the Product

If you want to add or remove components from an installation, open the Control Panel, select the Add or Remove Programs applet, select Intel System Studio, and click **Change**. To remove the product, select Intel SoC Watch and click **Remove**.

When installing an updated version of Intel SoC Watch, any previously installed version will automatically be removed.

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Fixed Issues

Release version 2.10 has a fix for the below issues.

- Removed redundant word "Residency" in titles for feature `-f acpi-dstate`. Titles previously shown as "ACPI D-State Residency Summary: Residency (Percentage and Time)" are now simply "ACPI D-State Summary: Residency (Percentage and Time)."
- Resolved issue preventing use of drive letter in a pathname used in an argument on the Intel SoC Watch command line.
- Fixed error in `-f acpi-dstate` D3 Cold residency caused by unusual occurrence of a D3 Hot/Cold transition event occurring when the prior state was not D3. The problem was observed as time in D3Cold that should have been D2.
- The logical core count displayed in Intel® VTune™ Amplifier summary page for an imported Intel SoC Watch collection is now correct.

Known Issues

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This release contains the following known issues.

- On platforms with HyperV enabled, the sum of the CPU C-state idle residencies will not match CPU P-state idle residency time. The issue occurs because HyperV does not allow setting of a bit, resulting in incorrect core-level reporting of both C-state and P-states.
- Metrics report Unknown 0 and do not sum to total collection time when `-m` is not used and hibernation occurs. Metrics with a snapshot default collection mode, such as CPU C-state, will show the Unknown state with 0 time and the remaining states will not sum to the total collection duration if the system entered hibernation during the collection and the `-m` option was not specified. The snapshot metrics are only collected at the start and end of a collection by default, but finding hibernation time requires samples taken throughout the collection - including `-m` will cause continuous sampling to occur for all metrics. When hibernation occurs, a message reporting time spent in hibernation appears at the beginning of the summary report. The Unknown state is then included for all appropriate metrics and the time in hibernation is included in that state. Refer to the *Intel SoC Watch User's Guide* "Options Quick Reference" section to learn which metrics have a snapshot collection mode by default.
- Syntax errors in the command line may not report a visible error message. If a collection did not run and you are not seeing any error message, add option `-d 2` to your command line to get more information.
- Insufficient system resources error seen on occasion when collecting OS event trace metrics such as `acpi-dstate`. The system error "WARNING: Cannot enable provider in the trace file <etl filename>" has been reported when collecting metrics that enable event trace logging. This error prevents ETL logging from being started and is usually caused by a background process consuming system resources. Use Task Manager to find and remove such processes then try the collection again.
- Hyper-V and Virtualization-based Security (VBS) prevent some metrics from being collected. Intel SoC Watch detects when Hyper-V and Virtualization-based Security is enabled on the platform, reports a warning message on the console and disables metrics that are blocked by these settings. When Hyper-V and VBS are enabled `cpu-gpu-concurrency` cannot be collected.
- Total DDR bandwidth does not include EDRAM. On systems using EDRAM, the `ddr-bw` feature report may have a discrepancy between the total data read and writes and the total component requests. The Data Reads+Data Writes will be significantly higher than the total IA+GT+IO requests, because the EDRAM requests are not included.
- Collection on Windows* Server 2016 OS will result in failure to load the Intel SoC Watch driver if Secure Boot is enabled on the platform. The workaround is to disable Secure Boot. The problem on Windows 10 client OS was resolved.
- If a command window is closed (using either the X button or Alt-F4) while the socwatch process is running, or the Task Manager is used to kill the socwatch process, then the behavior of a subsequent run of Intel SoC Watch becomes unknown. The proper way to terminate Intel SoC Watch is using Ctrl-C. A collection driver may be left in an undefined state when Intel SoC Watch is abruptly terminated because there is no OS event to allow proper cleanup. This can cause the next Intel SoC Watch collection to result in anything from bad data to a system crash. If a driver is left running, it must be removed. You can reboot the system to clear a driver or use the following set of commands to check if the driver is running, stop it, and then delete it:`sc query socwatchdrv; sc stop socwatchdrv; sc delete socwatchdrv.`
- OS-based CPU P-state report does not support platforms with > 64 logical processors. The hardware-based P-state report is correct. The problem is in the OS event trace which provides state changes for only a partial set of logical processors when the platform is configured for more than 64 logical processors. When this situation occurs, a warning message is printed in the report indicating which processors have no OS P-state change events.
- Issues on Intel platforms code named Apollo Lake and Gemini Lake:

  - Memory bandwidth and memory self-refresh metrics not available. The following features are not supported: `ddr-bw`, `cpu-ddr-bw`, `cpu-ddr-mod0-bw`, `cpu-ddr-mod1-bw`, `disp-ddr-bw`, `isp-ddr-bw`, `gfx-ddr-bw`, `io-bw`, `all-approx-bw`, `dram-srr`.

Related Documentation

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The below documents are available with this release.

- Intel® SoC Watch for Windows* OS User's Guide
- Energy Analysis help: https://software.intel.com/en-us/energy-analysis-user-guide

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Release Content

- Intel® SoC Watch for Windows* OS User's Guide
- Intel® SoC Watch for Windows* OS Release Notes
- Intel® SoC Watch for Windows* OS executables

Acronyms and Terms

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The following acronyms and terms are used in this document (arranged in alphabetic order):

Acronym/Term	Description
SoC	System on Chip