



Intel® System Debugger 2020

Release Notes for Windows host*

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Version History

Date	Version	Major Change Summary
March, 2020	2020 Update 1	Added support for instruction tracing based on the Last Branch Record (LBR) hardware feature, documented a Python* script to dump the Interrupt descriptor table (IDT) from the System Debugger console, provided debugging support for Advanced Configuration and Power Interface (ACPI) Machine Language by Intel® Debug Extensions for WinDbg*, provided support for WinDbg* Preview.
December, 2020	2020 Initial Release	Initial release of the Intel® System Debugger 2020.

Intended Audience

Original Equipment Manufacturers (OEM), Original Design Manufacturers (ODM), IBVs, OS vendors, device manufacturers, System Integrators.

Customer Support

To submit an issue, ask a question, or participate in discussions, visit the [technical support forum](#). For additional support resources, go to the [Intel® System Studio Support](#) or the [main Support page](#).

Introduction

This document provides system requirements, issues, limitations, and legal information for all components of the Intel® System Debugger 2020 for Windows* OS host, which includes following tools:

- Intel® System Debugger
 - System Debug (new fully Eclipse* integrated debugger)
 - System Debug Legacy (legacy debugger that is provided in previous releases)
- Intel® System Debugger - System Trace
- Intel® Debug Extensions for WinDbg*

To learn more about this product, see the [Intel® System Debugger product page](#).

Additional Tools Version – 2020 Update 1

Tool	Version
OpenIPC	OpenIPC 1.2008.4464.100
Intel® DFX Abstraction Layer (Intel® DAL)	DAL 1.2007.1171.110

New in This Release – 2020 Update 1

Intel® System Debugger – System Debug

- Added a new breakpoint dialog, which enables setting execution breakpoints by address as well as platform breaks (for example, SMM Entry or Reset break).
- Provided support for instruction tracing based on the Last Branch Record (LBR) hardware feature.
- Added clipboard support for the content of the Platform Register Dictionary and Platform Register Watch views.
- Restricted the Reset button in the toolbar to "Warm Reset" and made it enabled independently of the thread selection. Now you can warm-reset the target from root CPU node or from a stack frame as well.
- Added a column for PE/ELF modules in the Instruction Trace view.
- Documented a Python* script to dump the Interrupt descriptor table (IDT) from the System Debugger console. Check the System Debug User and Reference Guide.

Intel® Debug Extensions for WinDbg*

- Implemented debugging support of Advanced Configuration and Power Interface (ACPI) Machine Language (AML) code. You can use it to check when an operating system interacts with BIOS in Windows* OS and when a hang occurs. For instructions, refer to the Debugging ACPI User Guide for Intel® Debug Extensions for WinDbg*.
- Introduced help commands. During the tool launch, a banner appears showing a link that you can use to access the tool help. The scratchPad with help commands is removed from the windows view.
- Provided support for WinDbg* Preview. You can now launch WinDbg* over Intel® DCI via `<install_dir>\iss_shell.bat` by executing the command `windbg_preview`.
- Enabled customization of WinDbg themes.

Unsupported or Discontinued Features

- The Android Trace feature of Intel® System Debugger - System Trace will be permanently removed from Intel® System Studio, beginning with the next release.

Supported Operating Systems

Intel® System Debugger 2020 for Windows* host supports the following operating systems:

- Microsoft Windows* 10
- Microsoft Windows* Server 2016
- Microsoft Windows* Server 2019.

Supported Platforms

Each Intel® System Debugger tool supports its own set of platforms and probes. The following probes are commonly used for connection:

- Intel® In-Target Probe (Intel® ITP) XDP3
- Intel® Silicon View Technology (Intel® SVT) Closed Chassis Adapter (CCA)
- Intel® Direct Connect Interface (Intel® DCI) Debug Class (DbC) cable.

See the table below for the combinations of platforms and probes supported by Intel® System Debugger 2020 (Update 1) for Windows* OS host.

	System Debug			System Trace		
	XDP3	CCA	DbC	XDP3	CCA	DbC
4th Gen Intel® Core™ Processor (Haswell)	XDP					
4th Gen Intel® Core™ U-Processor (Haswell ULT)	XDP					
5th Gen Intel® Core™ Processor (Broadwell)	XDP					
6th Gen Intel® Core™ Processor (Skylake) / 6th Gen Intel® Core™ Platform I/O (Sunrise Point PCH-LP)	XDP	CCA			CCA	
7th Gen Intel® Core™ Processor (Kaby Lake) / Intel® 200 Series Chipset (Kaby Lake PCH-H)	XDP	CCA	USB		CCA	USB
8th Gen Intel® Core™ Processor (Amber Lake-Y 2+2)	XDP	CCA			CCA	
8th Gen Intel® Core™ Processors (Coffee Lake-S) / Intel® H370 Chipset, Intel® H310 Chipset, Intel® B360 Chipset for Consumer (Cannon Lake PCH)	XDP	CCA	USB		CCA	USB
8th Gen Intel® Core™ Processor (Coffee Lake-S) / Intel® Z370 Series Chipset (Kaby Lake PCH-H)	XDP	CCA	USB		CCA	USB

	System Debug			System Trace		
	XDP3	CCA	DbC	XDP3	CCA	DbC
8th Gen Intel® Core™ Processor (Kaby Lake R) / 6th Gen Intel® Core™ Platform I/O (Sunrise Point PCH-LP)	XDP	CCA			USB	
8th Gen Intel® Core™ (Whiskey Lake U)	XDP	CCA	USB		CCA	USB
9th Gen Intel® Core™ Processor (Coffee Lake H) / Cannon Lake PCH-H	XDP	CCA	USB		CCA	USB
9th Gen Intel® Core™ Processor (Coffee Lake S Refresh) / Cannon Lake PCH-H	XDP	CCA	USB		CCA	USB
10th Gen Intel® Core™ Processor (Amber Lake Y 4+2) / Sunrise Point PCH-LP	XDP	CCA	USB		CCA	USB
10th Gen Intel® Core™ Processor (Comet Lake) / Comet Lake PCH-LP	XDP	CCA	USB		CCA	USB
10th Gen Intel® Core™ Processor (Ice Lake) / Ice Lake PCH-LP	XDP	CCA, CCA_2wire	USB		CCA, CCA_2wire	USB
Intel Atom® Processor (Anniedale / Moorefield)	XDP					
Intel Atom® Processor (Apollo Lake)			USB			USB
Intel Atom® Processor (Avoton)	XDP					
Intel Atom® Processor (Bay Trail / MinnowBoard MAX)	XDP					
Intel Atom® Processor (Cherry Trail)	XDP					
Intel Atom® Processor (Denverton)			USB			USB
Intel Atom® Processor (Tunnel Creek)	XDP					
Intel® Celeron® Processor (Whiskey Lake U)	XDP	CCA	USB		CCA	USB
Intel® Core™ X-series Processor (Basin Falls Refresh)	XDP	CCA	USB		CCA	USB

	System Debug			System Trace		
	XDP3	CCA	DbC	XDP3	CCA	DbC
Intel® Pentium® and Intel® Celeron® Processor (Braswell)	XDP					
Intel® Pentium® and Intel® Celeron® Processor (Coffee Lake S) / Cannon Lake PCH-H	XDP	CCA	USB		CCA	USB
Intel® Pentium® and Intel® Celeron® Processor (Kaby Lake R platform based)	XDP	CCA			CCA	
Intel® Pentium® Processor (Whiskey Lake U)	XDP	CCA	USB		CCA	USB
Intel® Pentium® Silver Processor or Intel® Celeron® Processor (Gemini Lake)			USB			USB
Intel® Xeon® Processor (Cascade Lake) / Lewisburg PCH	XDP	CCA	USB		CCA	USB
Intel® Xeon® Processor (Coffee Lake-S) / Cannon Lake PCH-H	XDP	CCA	USB		CCA	USB
Intel® Xeon® Processor (Grangeville)	XDP					
Intel® Xeon® Scalable Processor (Skylake-SP) / Intel® C620 Series Chipset (Lewisburg)	XDP	CCA, CCA_USB, USB			CCA, CCA_USB, USB	

Known Issues – 2020 Update 1

- **Installer returns an error “Intel® DAL failed to install with exit code (3)” when installing the same product multiple times or installing different variants of the same product on the same system.**
 - **Issue:** Intel® DAL component cannot be installed multiple times on the same system due to MSI packaging.
 - **Workaround:** If multiple variants of the product must be installed multiple times on the same system, customize the second installation and unselect Intel® DAL component or Intel® System Debugger component.
- **Warm reset does not work properly on Apollo Lake and Denverton platforms with OpenRC configuration.**
 - **Issue:** Warm reset on Apollo Lake and Denverton with OpenRC run control puts the target in an undefined state (cores cannot be released).
 - **Workaround:** Manually reset the target to regain control.
- **Connection status indicated by the Target Connection Assistant might be incorrect when Intel® DAL is used as an IPC provider.**
 - **Issue:** Target Connection Assistant relies on Intel® DAL to verify the connection status. However, Intel® DAL implementation does not provide all functionality to verify whether a target is connected. As a result, the Target Connection Assistant might indicate the connection incorrectly as connected.
 - **Workaround:** Use an alternative IPC provider or validate the configuration manually.
- **Disconnecting a probe crashes the target.**
 - **Issue:** Intel® SVT CCA and Intel® ITP XDP3 probes are supporting hot plug/unplug from a target, whereas for Intel® DCI DbC the connection is bidirectional. If a probe connection is lost, the debugger reports a Power Loss event.
 - **Workaround:** If the target was running, reconnect the probe (the disconnection has no effect on the running target). If the target was halted, reboot the target and restart the debugging session (the debug context is lost).
- **Platform security policy might inhibit debugger operation.**
 - **Issue:** In some platforms, the security policy might disable JTAG access to the CPU. This is intended to prevent reverse-engineering. In this case, the Intel® System Debugger will successfully connect to the target but will not be able to

discover any CPUs on the JTAG bus and will report that no CPU is available.

- **Workaround:** Ensure that that platform firmware has enabled access to the CPUs via JTAG. You can do it by flashing a special “debug” firmware into the target. In some cases, the CPU or the CPU module might physically disable JTAG access, especially in production or near-production versions. In this case, please work with the platform business unit to obtain a JTAG-enabled hardware.

Intel® System Debugger – System Debug

- **Breakpoint hits are not displayed in the System Debug Legacy console.**
 - **Issue:** Console messages in the System Debug Legacy do not show notifications after hitting software and hardware breakpoints, although you can see the breakpoint hits in the source code window.
 - **Workaround:** N/A
- **Reset break is not hit in System Debug Legacy with Comet Lake H (CML-H) and Coffee Lake S (CFL-S) platforms.**
 - **Issue:** After setting a reset break and resetting a target, reset break is not hit and the target and cores keep running.
 - **Workaround:** Use Intel® System Debugger – System Debug.
- **Cannot add map files compiled in a Linux* host.**
 - **Issue:** When adding map files that have been compiled in a Linux* host using Intel® System Debugger – System Debug, the debugger disconnects.
 - **Workaround:** Add the modules manually:
 1. Right-click the thread instance in the Debug view and select "Symbol Files". Alternatively, open the "Debug Configurations" dialog and select the required configuration or right-click the current debug configuration in the Debug view and select "Edit <debug_configuration>".
 2. In the "Symbol Files" tab, click Add and provide paths to the required modules. You can find paths to the modules and their offsets in the map file, which is a plain text file.
- **Target becomes unresponsive after the reset breakpoint is hit in System Debug Legacy on Apollo Lake and Gemini Lake platforms.**
 - **Issue:** On Apollo Lake and Gemini Lake platforms, a target becomes unresponsive in Intel® System Debugger – System Debug Legacy after reset breakpoint is hit.

- **Workaround:** Use Intel® System Debugger – System Debug (new System Debug).

Intel® System Debugger – System Trace

- **Various error messages referring to Interview_Decoder.dll or visa64.dll are displayed.**
 - **Issue:** If the host system has [IVI tools](#) installed, the tool erroneously tries to load visa64.dll from C:\Windows\System32 or Interview_Decoder.dll from <install_dir>\system_debugger_2020\system_trace\bin\.
 - **Workaround:** There are two possible workarounds:
 1. Temporarily remove C:\Windows\System32\visa64.dll or uninstall the IVI tools
 2. Check the information on the Dynamic-Link Library Search Order at <https://docs.microsoft.com/en-us/windows/desktop/dlls/dynamic-link-library-search-order> but be aware of the potential security implications.

Intel® Debug Extensions for WinDbg*

- **Compatibility issues of Intel® Debug Extensions for WinDbg* for Windows* 10 SDK.**
 - **Issue:** Windbg* over Intel® DCI plugin is currently not compatible for Windows* 10 SDK starting from version 1809 (10.0.17763).
 - **Workaround:** Install Windows* 10 SDK 1803 (10.0.17134) or lower versions.
- **Intel® Debug Extensions for WinDbg* console window launch from installer does not work.**
 - **Issue:** Intel® Debug Extensions for WinDbg* console window does not appear even if it was chosen in installer "Installation Complete" dialog.
 - **Workaround:** Launch Intel® Debug Extensions for WinDbg* via Desktop/Start Menu shortcut.

Change History

2020 Initial Release

- Started transition phase from Python* 2.7 to Python* 3. The transition to Python* 3 will be finalized by end of year 2019. Intel® System Debugger ships both Python* 2.7 and Python* 3.6 versions during the transition phase until 2020.
- Added support for the following platforms:
 - 10th Gen Intel® Core™ Processor (Ice Lake) / Ice Lake PCH-LP
 - 10th Gen Intel® Core™ Processor (Comet Lake) / Comet Lake PCH-LP
 - 10th Gen Intel® Core™ Processor (Amber Lake Y 4+2) / Sunrise Point PCH-LP
 - Intel® Xeon® Processor (Cascade Lake) / Lewisburg PCH.
- Introduced Target Indicator - a cross-platform tool that indicates the status of an Intel® DCI debug connection to a target platform.
- OpenIPC is updated to 1.1942.4128.100.

Intel® System Debugger – System Debug

- Added a new Eclipse*-integrated source-level debugger, providing, among others, reworked support for platform registers, improved support for the PCI configuration space, better debug information support, and a Python*-based scripting console.

Related Documentation

Offline Documentation

You can find offline documentation for all Intel® System Debugger components at

`<install_dir>\system_studio_2020\documentation_2020\en\debugger\system_studio_2020.`

For additional tools, refer to the following locations:

- Target Indicator:
`<install_dir>\system_studio_2020\documentation_2020\en\debugger\system_studio_2020\system_debugger\target_indicator`
- OpenIPC:
`<install_dir>\system_studio_2020\tools\openipc_<version>.`

Online Documentation

You can find documentation for all Intel® System Debugger components online at:

- System Debug
 - Get Started: <https://software.intel.com/en-us/get-started-with-system-debug>
 - User Guide: <https://software.intel.com/en-us/system-debug-user-guide>
- System Trace
 - Get Started: <https://software.intel.com/en-us/get-started-with-system-trace-windows>
 - System Trace User Guide: <https://software.intel.com/en-us/system-trace-user-guide>
 - TraceCLI User Guide: <https://software.intel.com/en-us/tracecli-user-guide>
- System Debug (Legacy)
 - Get Started: <https://software.intel.com/en-us/get-started-with-system-debug-legacy-windows>
 - User Guide: <https://software.intel.com/en-us/system-debug-legacy-user-guide>
 - Basic Debugging Tutorial: <https://software.intel.com/en-us/debugging-with-intel-system-debugger-legacy>
- Intel® Debug Extensions for WinDbg*
 - Get Started: <https://software.intel.com/en-us/get-started-debug-extensions->

windbg

- Intel® Processor Trace Support User Guide: <https://software.intel.com/en-us/debug-extensions-windbg-pt-user-guide>
- Microsoft* Hyper-V Support User Guide: <https://software.intel.com/en-us/debug-extensions-windbg-hyper-v-user-guide>

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