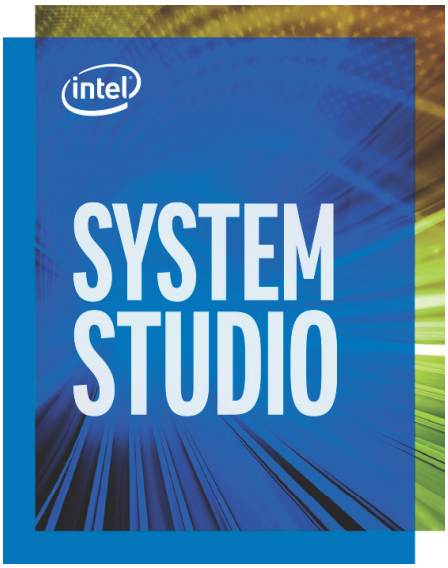
PRODUCT BRIEF

The Smart Way to Create Smart Code Based on Deep, System-Wide Insights

Intel® System Studio 2016

System and Embedded Development



Meeting System and Embedded Developers' Challenges

Smart, connected devices are growing in complexity—and are everywhere. Fifty billion connected devices are expected by 2020.[1] Intel® System Studio addresses the challenges facing system and embedded developers, who need tools that:

- **Enable and accelerate** performance-demanding use cases
- **Offer insight** into sources of excess power consumption
- **Quickly help** resolve defects in complex systems
- **Are comprehensive** and easy to use

Intel® System Studio 2016 meets all those needs, helping system and embedded developers deliver great products on Intel® architecture-based platforms. This comprehensive suite includes advanced tools and technologies to help speed delivery of energy-efficient, high-performance, smart, connected devices across wide-ranging system and embedded platforms.

Who Needs Intel System Studio?

- **Device manufacturers** looking for shorter system bring-up and validation cycles
- **System integrators** who need faster software stack integration and optimization
- **Embedded application developers** who want to efficiently deliver new capabilities

Key Benefits

- **Accelerate time to market.** Speed up development with fully supported tools that provide deep platform insight.
- **Boost power efficiency and performance.** System-wide analyzers, compilers, and libraries provide a smarter way to develop smart code and boost both power efficiency and performance.
- **Strengthen system reliability.** Quickly and easily enhance system stability using in-depth, system-wide debuggers and analyzers.
- **Worldwide, professional Intel® Premier Support** whenever it's needed.

What's New in Intel System Studio 2016

Enable and Optimize Compelling System and Application Usages

Highly optimized compilers and libraries, including Intel® C++ Compiler, Intel® Integrated Performance Primitives Library (Intel® IPP), and Intel® Math Kernel Library (Intel® MKL), help developers improve performance up to 4x.

Analyze Application Performance on Preemptive Real-Time Linux*

Since the performance analyzer supports real-time Linux* system profiling, developers can quickly and accurately pinpoint performance hotspots in preemptive Linux systems. Data collectors can be interrupted any time by high-priority tasks. Intel® VTune™ Amplifier continues to collect data through low overhead sampling. Enjoy concurrency, waits and locks analysis, plus context switch information. Find performance hot spots in system software and application code.

Analyze Application Performance in Virtualized Environments

The performance analyzer supports virtualized environment performance profiling. Observe and analyze the performance and behavior of embedded applications running on guest operating system instances. Performance optimize multiple operating systems and applications in a virtualized environment on a single platform to save on hardware costs.

Quickly Identify Software that's Wasting Power

The Energy Profiler supports Android*, Windows*, and now Linux to help extend the battery life of IoT, mobile, and embedded devices running Linux and optimize fanless systems thermals. Energy Profiler precisely shows the wake-ups from applications and system software that cause the most power consumption.

Quickly Isolate Complex System Issues

Comprehensive, system-wide hardware and software event tracing helps to efficiently pinpoint issues with time-stamped, correlated trace information and analyze complex interactions between software and hardware.

System-Wide, Closed-Chassis Debugging

JTAG*-based debug and trace over a standard USB connection adds flexibility and lowers costs, removing the need to access a JTAG port.

Intel® System Studio in Action

Speed Time to Market

5 Minutes Versus 8+ Hours

"IMCORP pioneers complex signal processing algorithms for power transmission cable diagnostics. Intel® VTune™ Amplifier, as part of Intel® System Studio, allowed us to find critical performance hotspots within 5 minutes that otherwise would take us more than 8 hours. Between Intel System Studio's compiler optimizations, Intel® Math Kernel Library's fully featured list of vector operations, and the easy-to-use Intel® Cilk™ Plus implementation, our code has reached its lowest execution time by 4x while maintaining a small footprint."

R&D Software Engineer
IMCORP

Boost Power Efficiency and Performance

3X Better Power Efficiency

"Intel System Studio drastically improved the user experience of our recently launched Android*-based tablet, Tolino Tab* 8" (optimized for eReading)—by a factor of 3x (200ms vs. 500-700ms)—which reduced the CPU workload and the resulting power consumption by at least the same factor."

Dirk Hofmann, Chief Product Owner
Deutsche Telekom

40% Performance Increase

"Intel System Studio helped us to optimize the Adaboost*-based algorithm through recompilation. We could achieve a performance gain up to 40%."

Guo Bin, Development Director
Hangzhou Hikvision Digital Technology Co.

Strengthen System Reliability

'Drastically Reduce' Engineering Efforts

"Intel® System Debugger, as part of Intel® System Studio, enabled us to improve sensitive, hardware-dependent code in our industrial automation system software. It helped us to drastically reduce engineering efforts when analyzing processor internal states and execution of time-critical paths in our software."

Dr. Henning Zabel
Beckhoff Automation

Figure 1. Intel System Studio helps develop smart, connected devices across wide-ranging system and embedded platforms.

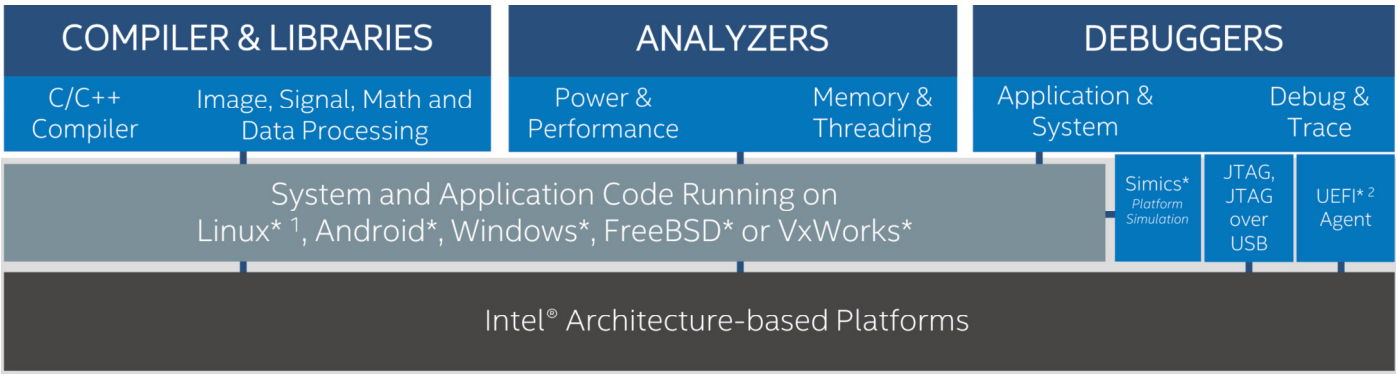


Figure 2. Compilers and libraries, analyzers, and debuggers to fit specific needs

Linux*, Embedded Linux, Wind River Linux*, Yocto Project*
UEFI: Unified Extensible Firmware Interface

Extended Insight into Windows* System for Enhanced Reliability

System debug and trace extensions for Microsoft* WinDbg* Kernel Debugger help simplify platform bring-up and Windows driver validation. Debug a completely halted Windows system, including drivers and interrupts, and isolate complex run-time issues faster with Intel® Processor Trace.

Effectively Debug Compute-Intensive Code Offloaded to Graphics Cores

Use simple compiler directives (e.g., #pragma) to mark compute-intensive code to cooperatively execute across processor and graphics cores. An extended debugger now supports debugging code running on the graphics cores in addition to the processor cores.

Support for the Latest Platforms

Get support for new Intel® processors and operating systems including:

- Intel® Atom™ x3, x5, and x7 processors (formerly code-named SoFIA and Cherry Trail)
- 6th generation Intel® Core™ processors (formerly code-named Skylake)
- Microsoft Windows 10
- FreeBSD*

Enhanced Developer Productivity

The enhanced out-of-the-box experience lets developers get started without actual target hardware using Wind River* Simics* platform simulation. It includes Eclipse* IDE for Improved tools integration, plus more samples for a quicker start and enhanced documentation.

Choose the Edition that Meets your Needs

- **Composer Edition:** Tools to build performance-optimized code
- **Professional Edition:** Everything in Composer Edition plus tools to analyze performance, power efficiency, and code correctness
- **Ultimate Edition:** Everything in the Professional Edition plus system-wide debug and trace for more robustness

All three editions are for Linux/Android or Microsoft Windows embedded targets. Support is also available for Wind River* VxWorks* and FreeBSD*. For all editions of Intel System Studio, Intel provides world-wide Intel Premier Support.

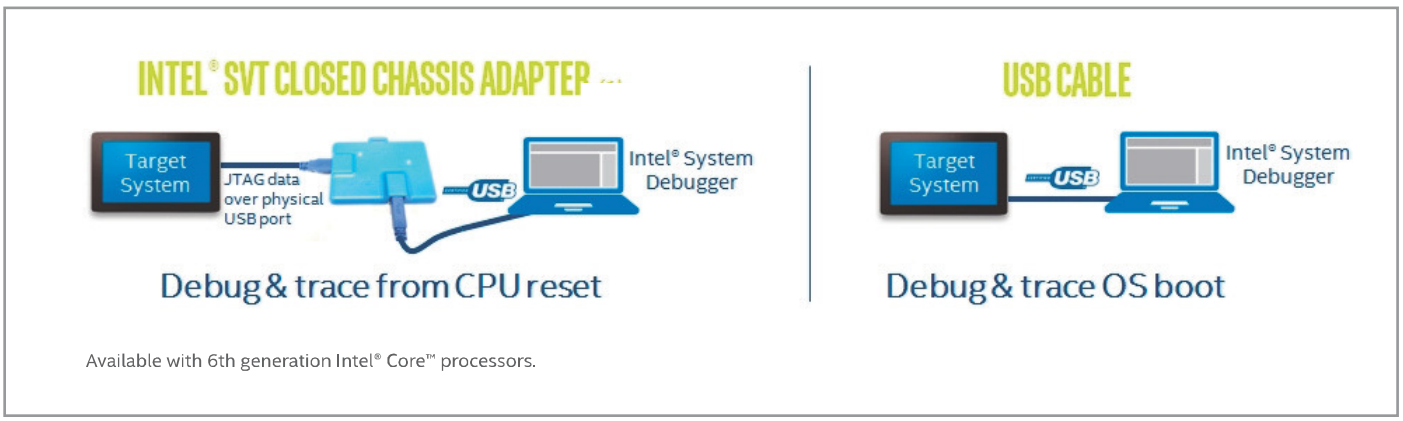


Figure 3. Isolate complex system issues with comprehensive, system-wide event tracing.

Category	Component	Linux* [1,2] Composer Edition	Linux* [1,2] Professional Edition	Linux* [1,2] Ultimate Edition	Android* [2] Composer Edition	Android* [2] Professional Edition	Android* [2] Ultimate Edition	Windows* (New) Composer Edition	Windows* (New) Professional Edition	Windows* (New) Ultimate Edition	VxWorks* [3] VxWorks* Edition	FreeBSD* (New) FreeBSD Edition
Host Operating Systems		Linux* Windows*			Linux* Windows*			Windows*			Linux* Windows*	Linux* FreeBSD*
Integrated Development Environment		Eclipse*, Workbench*			Eclipse*			Visual Studio*			Workbench*	Eclipse*
Compiler & Libraries	Intel® C++ Compiler	●	●	●	●	●	●	●	●	●	●	●
	Intel® Integrated Performance Primitives	●	●	●	●	●	●	●	●	●	●	
	Intel® Math Kernel Library	●	●	●				●	●	●		
	Intel® Threading Building Blocks	●	●	●	●	●	●	●	●	●		
System & Application Debuggers	Intel® System Debugger [4]			●			●			●	○ [7]	
	Intel® Debug Extensions for WinDbg* [4] (New)									●		
	Intel®-enhanced GDB* Application Debugger	●	●	●	●	●	●					
	Intel® Debugger for Heterogeneous Compute (New)	●	●	●	●	●	●					
Performance, Power & Correctness Analyzers	Intel® VTune™ Amplifier [6]		●	●		●	●		●	●		●
	Intel® Energy Profiler		●	●		●	●		●	●		
	Intel® Inspector		●	●					●	●		
	System Analyzer					●	●		●	●		
	Platform Analyzer [5]					●	●		●	●		
	Frame Analyzer [5]					●	●		●	●		

[1] Linux*, Embedded Linux, Wind River* Linux*, Yocto Project*
[2] Linux* and Android* target support available in a single product
[3] Available from Wind River* with VxWorks*
[4] Via Intel® ITP-XDP3 probe, OpenOCD*, Intel® SVT Closed Chassis Adapter* and EDKII* for UEFI*
[5] Available for Microsoft Windows* host
[6] Also available for OS X* host as a separate download
[7] Intel® System Debugger provides VxWorks* OS awareness - available with Ultimate edition

Figure 4. Intel System Studio editions, components, and operating systems

Deep, System-Wide Insight

Intel System Studio 2016 gives system and embedded developers expanded usability and capabilities to be more productive. Supporting the newest Intel platforms and operating systems, it helps build in better performance with expert compiler and library optimizations. It's easier to isolate complex defects with new debug and trace capabilites. And enhanced analyzers let developers improve both power efficiency and performance.

Learn more about Intel® System Studio 2016 or get started now:
intel.ly/system-studio

[1] IEEE Spectrum report, July 2013.

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