



Intel® Embedded Software
Development Tool Suite 2.0
for Intel® Atom™ processor
In-Depth

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Intel® Embedded Software Development Tool Suite 2.0 for Intel® Atom™ processor

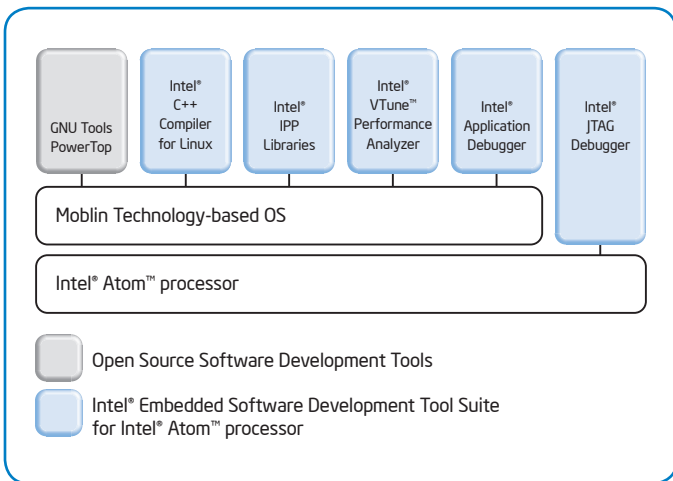
The Intel® Embedded Software Development Tool Suite for Intel® Atom™ processor is a complete tools solution set to address software performance requirements of Intel Atom processor-powered MIDs, Embedded, Netbook, and Consumer Electronic devices, and to enhance the productivity and experience of the system and application development process.

The Embedded Tool Suite covers the entire cycle of software development: coding, compiling, debugging, and analyzing performance. All included tools are Linux* hosted and compatible with GNU tools.

Features and Benefits

The Intel® Embedded Software Development Tool Suite for Intel Atom processor is a complete set of tools that covers the entire cycle of software development. It addresses the software performance requirements for Intel Atom processor-powered MID, embedded devices, Netbooks, and Consumer electronic devices and provides efficiency and productivity in the system and application software development process. The following figure shows the components of the Tool Suite.

Moblin Image Creator 2



Completeness

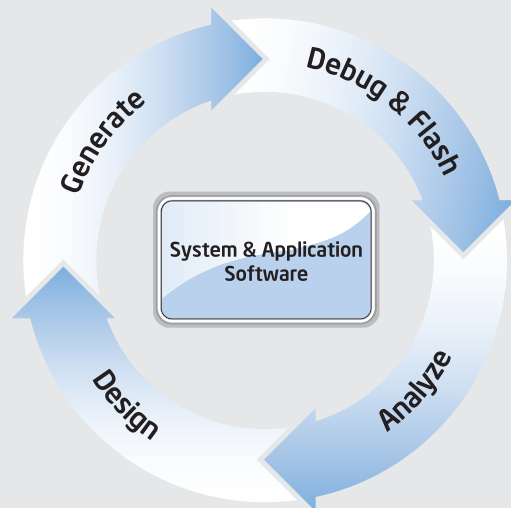
Use a set of software tools based on the latest tools technology for the entire software product development cycle (Design, Generate, Debug, and Analyze) without the need to research other tools components.

Intel® C++ Compiler

- Highly optimizing
- Full support for Intel® Atom™ processor
- GCC compatible

Intel® Integrated Performance Primitives Library

- Highly optimized multimedia functions
- Intel® Atom™ processor optimized



Intel® JTAG and Application Debuggers

- Intel® Atom™ processor and chipset support
- Kernel and low-level driver debugging
- Application debugging
- OS aware
- Built-in flash memory tool
- Execution trace support

Intel® VTune™ Analyzer

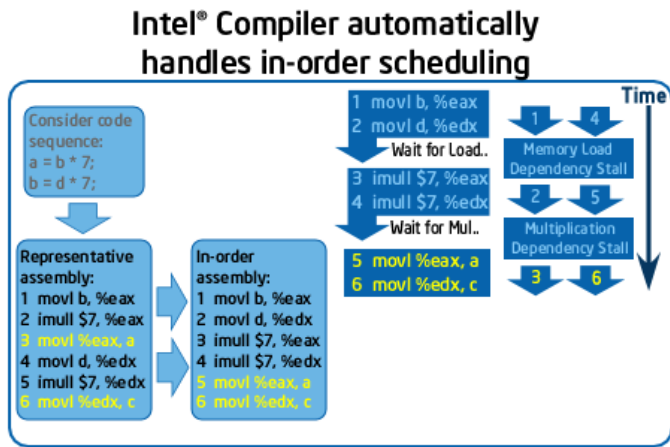
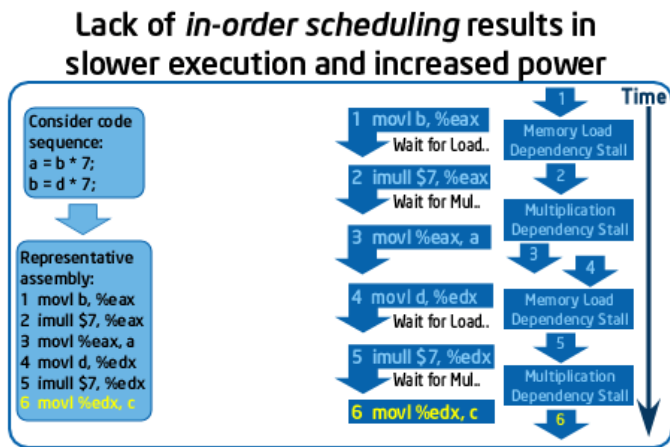
- Tune code actually running on device
- Performance bottleneck identification
- Tuning Assistant

Performance

New in-order scheduler and improvements in the compiler provide a significant performance advantage over GCC. Highly optimized Intel® Integrated Performance Primitives provide the same simple API as for IA-32, while being highly optimized for Intel® Atom™ processor at the same time. Intel® VTune™ Performance Analyzer helps to identify performance bottlenecks.

In-order Scheduler Compiler Feature

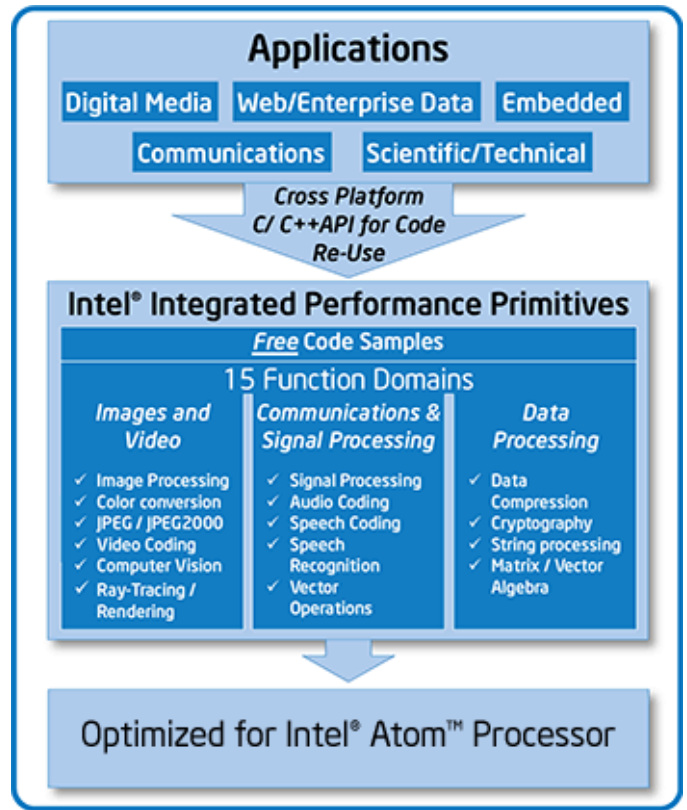
By minimizing dependency stalls due to low-power, IA-optimized instruction scheduling, the execution of routines can be sped up significantly.



The Intel Atom processor technology does not provide an integrated out-of-order scheduler that schedules instruction dispatch into the execution pipeline to take optimum advantage of the architecture and minimize dependency stalls. The Intel® C++ Compiler models the processor's instruction pipeline and execution flow, thus enabling it to produce code with the optimum instruction execution sequence for low-power IA.

Multimedia and Performance Libraries

With Intel® Integrated Performance Primitives (Intel® IPP), application developers can concentrate on feature implementation rather than optimization of application code. Intel® IPP provides performance-optimized building-block functions for key software applications such as: multimedia playback/recording, editing, image processing, audio/speech/signal processing and network data communications. Free code samples downloadable from the Intel website enhance the value of the Intel IPP functions by illustrating the implementation of multithreaded application blocks such as video, audio, and speech codecs.



Efficiency and Productivity

Intel provides two debug solutions for Intel Atom processor development:

- JTAG-based debug solution for kernel and low-level driver debugging
- Application debug solution for Moblin Technology based application debugging

Together, both debuggers for support all aspects of debugging, from low-level driver and kernel debugging up to high-level language C++ application debugging, with full execution trace support, and flash memory writer capabilities (only with JTAG hardware interface). Applications can be debugged natively on the host development environment as well as remotely via TCP/IP.

Intel® JTAG Debugger

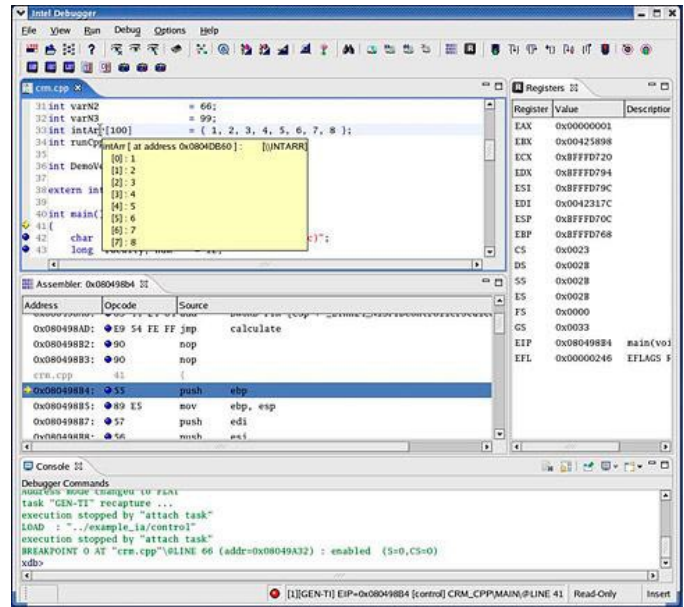
The Intel® JTAG Debugger for Intel Atom Processor is the recommended debug solution for hardware manufacturers, Embedded Developers, and Operating System Vendors, who need to deal with kernel debugging and low-level driver development. The JTAG debug solution is ideal for boot code and firmware debugging as well as OS kernel debugging while booting the OS. Through a JTAG interface the target hardware is connected to the debugger on the host system. The JTAG debugger allows, besides in-depth access of IA-specific features (execution trace support), also access to system-on-chip as well as chipset peripheral register content. This feature is unique and makes it valuable for driver development and debugging. The entire processor and peripheral register set is fully documented in the debugger solution. This makes development and real-time verification of your software against the underlying chipset convenient and readily available.

Supported JTAG devices:

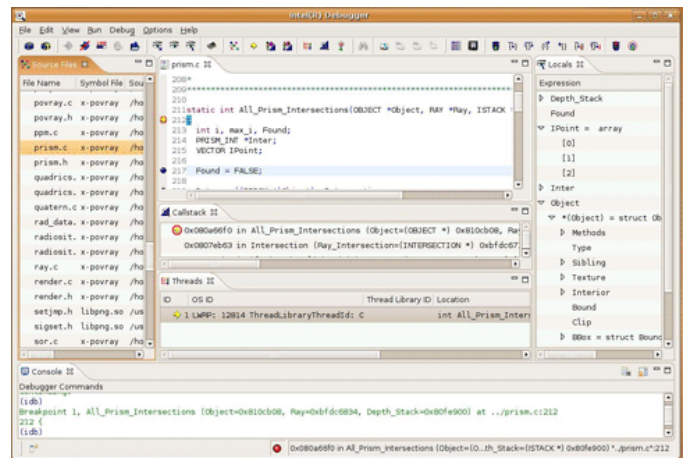
- Macraigor* JTAG interface support available in October 2009. Get hardware device through www.macraigor.com.
- Intel® XDP3 JTAG interface
 - Note This Intel-specific JTAG hardware interface is for enabling purposes only. OEMs and OSVs who have a CNDA with Intel in place can obtain JTAG hardware interfaces on a loaner basis by contacting MIDDevTools@intel.com.

Intel® Application Debugger

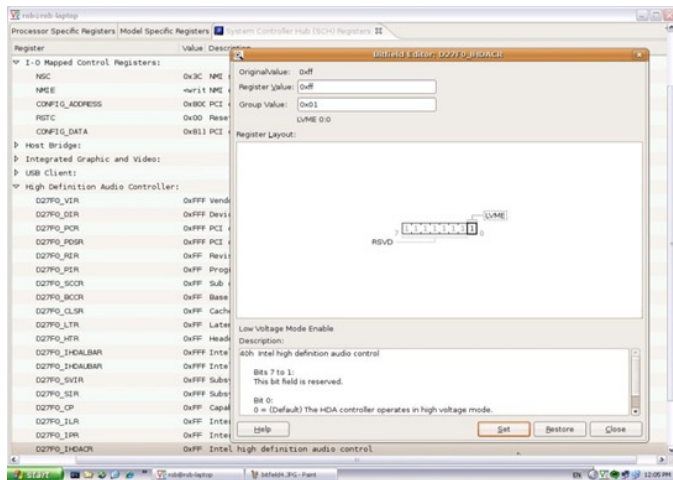
The Application Debugger supports native development and testing of Moblin technology-based applications within a KVM environment on the development host before they run on a real Intel Atom processor-powered device. Native testing as well as remote debugging of processes running on a virtual machine reduces time and simplifies the development process. The full GUI-driven application debugger supports execution trace support to look back to the history of an executed program, providing OS awareness and thread aware debugging.



The JTAG and Application Debuggers provide an Eclipse-based GUI running on Linux* host.

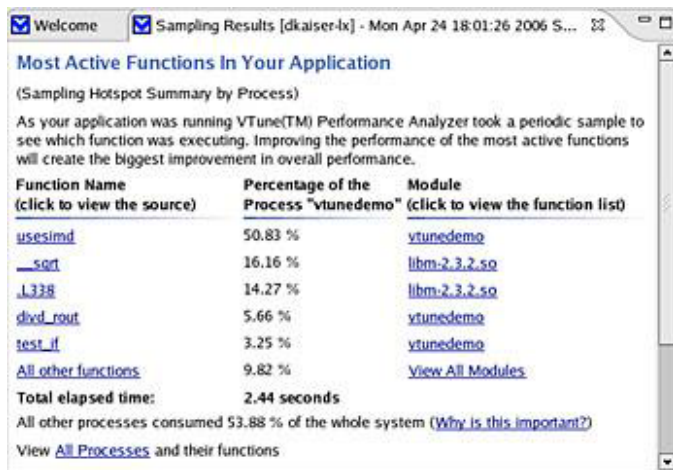


Both Debuggers provide full C/C++/ASM debugging, a callstack window for control of the application's callstack, and multithreaded debugging for applications using pthreads.

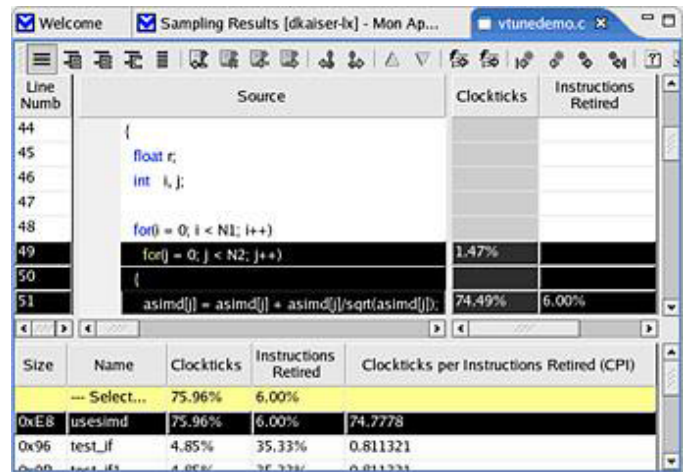


The JTAG debugger allows access to SoC/chipset peripheral register content, by simple mouse clicks. The entire documentation about the peripherals is part of the debugger.

Intel VTune Performance Analyzer makes it fast and easy to find performance bottlenecks with a list of the most active functions. Click on a function name to display the source and show the most time-consuming source statements. Furthermore, Event-Based Sampling support for Intel Atom processor enables you to determine the causes of execution stalls that impact performance.



Source and assembly views show you exactly which lines of code are taking the most time.



Moblin SDK* and Intel® Tools

The Intel® Embedded Software Development Tool Suite is a set of highly optimizing software development tools, with powerful debuggers for more efficient debug cycles. The tools are compatible with the GNU world and complement the standard open source GNU tools offering, which are part of the Moblin development environment.

Furthermore, the Tool Suite integrates into the Moblin Image Creator 2 (MIC2). Kickstart scripts tightly integrate the Intel® C++ Compiler and Intel® IPP into MIC2's jailroot environment. This allows for save and host environment pollution-free development, while taking advantage of the full performance of your development system at build time. Alternatively you can also install the Intel® C++ Compiler and the Intel® IPP into a Moblin 2 virtual image running under KVM*. Simply downloading a developer Moblin 2 image and installing Intel® Software Development Tool Suite components directly into it let you start even faster with the development of Moblin technology based system and application software.

Product Component Features and Benefits

Intel® C++ Compiler for Linux*

- Compatibility with GCC Compiler saves efforts in porting/reusing existing code.
- Up to 30% performance gain over GCC—helps to extend battery life of Intel Atom processor powered devices, because faster application completion and faster execution of performance-critical code will allow the battery-powered devices to revert to idle mode faster and thus decrease overall power consumption of the device.
- In-order scheduler for the use of Intel Atom processor—a hardware platform-specific optimization technique to obtain extra performance advantage.

- Multipass optimization techniques (Profile Guided Optimization, Interprocedural Optimizations) are some key compiler techniques to obtain an extra performance advantage and extend battery life.

Intel® Debuggers

- Full Eclipse RCP-based GUI helps to have better visibility of the application and system properties and thus have better control over the debugging process. Latest GUI technology enables developers to be more productive.
- Full Intel Atom processor support provides an in-depth view into Intel Atom processor technology. Provides easy access to most processor-specific features, including architectural registers, Intel® SSE3, etc. Execution Trace Support enhances the understanding of the flow of an executed program. It thus helps significantly with the isolation of memory leaks, data structure alignment, and execution flow issues. Displaying execution trace for system and application debugging enables more effective debug cycles.
- Linux OS Awareness* for full understanding of the system behavior at all times. Display all relevant kernel information, and debug the application in context with the OS.
- JTAG Debugger included in the Tool Suite. The JTAG Debugger supports direct hardware access through an Intel JTAG debugger interface, which enables developers to access Si-specific features even if there is no Operating System running on the target processor. The JTAG Debugger is recommended for Operating System Vendors (OSVs) and Device Manufacturers (OEMs). Furthermore, the JTAG solution supports accessing the peripheral registers of the chipset and SoC components. This is extremely helpful for low-level driver development, debugging, and validation. With a Bitfield editor and some mouse clicks, the content of peripheral registers can be modified on the fly. There is no recompilation required. The entire documentation of all peripheral registers is part of the JTAG debugging software solution.

Intel® Integrated Performance Primitives

- Intel® Integrated Performance Primitives (Intel® IPP) is an extensive library of highly optimized software functions covering 15 major domains of functionality for multimedia data processing and communications applications.
- Highly optimized for Intel Atom processor-powered devices running Moblin technology. Developers can concentrate on feature development rather than optimization.
- Cross-platform compatibility and code reuse. Just use the same set of APIs, now available for Intel Atom processor / Moblin Technology powered devices . Port your Linux PC-based application code with less effort to MIDs, netbooks, embedded, and consumer electronic devices.

VTune Performance Analyzer

- Analyzes applications without recompilation or linking.
- Tunes code actually running on a device. Takes the entire hardware and software system into account while tuning the application for performance.
- Identifies performance bottlenecks. VTune Analyzer brings you directly to the point where most CPU time is consumed.
- No recompile required. Unlike traditional instrumented profilers that make you recompile or modify your build script, just use your production executables.

Pricing

To purchase the Intel® Embedded Software Development Tool Suite for Intel® Atom™ processor please visit <http://software.intel.com/en-us/articles/intel-embedded-tool-suite-purchase/>.

Support

Every purchase of an Intel® Software Development Product includes a year of support services, which provide access to Intel® Premier Support and all product updates during that time. Intel Premier Support gives you online access to technical notes, application notes, and documentation

- Self help at <https://registrationcenter.intel.com/support/> and a user forum at <http://softwarecommunity.intel.com/isn/Community/en-US/forums/2497/ShowForum.aspx>

System Requirements

Host System:

- Ubuntu 9.04.x*
- Asianux 3*
- Fedora 10* and Fedora 11*

Target System:

- Support of all Intel® Atom™ processor variants (Zxx, Nxx series)
 - JTAG Debugger supports:
 - » Intel® Atom™ processor Z5xx
 - » SCH US15W
- Intel® Media Processor CE 3100
- Linux kernel 2.6.x*, Moblin 2.0* Netbooks, Moblin compliant OS

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Development Tool Suite for Intel® Atom™ processor
www.intel.com/software/products/compilers/flin

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