

Software and Development Tools

CodeWarrior Development Studio for StarCore v10.1

Overview

CodeWarrior Development Studio for StarCore, the latest in the CodeWarrior development tools portfolio, helps developers overcome the challenges of creating applications for complex, multicore DSPs by providing a wide array of tools.

CodeWarrior Development Studio for StarCore is based on the Eclipse platform, allowing developers to leverage the support of the Eclipse community. Within the Eclipse framework, build, debug, simulation and analysis tools are combined, unleashing the full potential of Freescale's high-performance DSPs.

Highlights

- Feature-rich, Eclipse-based IDE
- High-performance C/C++ compiler
- Multicore debugger with multicore run-control commands
- Extensive software analysis tools, including profiling and trace tools
- Royalty-free SmartDSP OS with extensive driver support
- Instruction set simulator (ISS) and performance accurate (PACC) simulators with both batch and IDE launch modes

Eclipse IDE

- Common IDE platform
- Open standard
 - Common framework
 - Leverages larger ecosystem
- Extensible
 - Eclipse-based tools enable extensions via plug-ins
- Ease of use
 - Common look and feel across Freescale Eclipse-based CodeWarrior platforms
 - Eclipse perspectives
 - Customizable window layout

Software Analysis

Freescale StarCore processors have extensive trace and debug hooks

- On-chip emulation: StarCore debug block
 - Tap/emulator control, trace, event counter, break/watch points
- Debug and profiling unit
 - Tracks every factor that impacts performance in the system
- Virtual trace buffer
 - Capture processor trace, messages and performance information to system memory without requiring an expensive external data collection tool

Software analysis component takes advantage of the following hooks

- Profiling, critical code analysis, call tree, trace points
- Trace viewer, code viewer, performance view, DPU analyzer
- Scripting
 - Post-process trace and performance data using scripts
- Register analyzer
- Trace on attach
- Offline trace importer

High-speed 6 Mbps data export of VTB trace or user data

- SmartDSP HEAT I/O mechanism over gigabit Ethernet
- Provides real-time trace

CodeWarrior Debugger

- Load each core independently with code and data
- Debug each core in its own window
- Synchronous run, stop and kill all
- Debug up to 24 cores simultaneously
- Multicore simulator included
- Multicore stationery available
- Multi-DSP stationery available (8144 AMC)

CodeWarrior Build Tools (Compiler, Assembler, Linker)

- High-performance compiler
 - Performs cutting-edge optimizations on control code
 - Basic C++ support
 - Special intrinsics to extract the maximum performance capabilities of the target architecture
 - Special porting intrinsics to easily adapt to StarCore architecture

Advanced Simulation

Supported Devices

- StarCore 3850 (with L1 Cache) single core instruction set simulator (ISS)
 - Purpose
 - Software design and debugging of single-core applications
 - Features
 - Functional accurate
 - Fast ~1.5 MIPs
 - Support sc3850 core, MMU, EPIC, OCE (partially)
 - Support cache coherence checking
- StarCore 3850 (with L1 Cache) performance accurate simulator (PACC)
 - Purpose
 - Code speed optimization, profiling, performance measurement of single-core applications
 - Features
 - Functional accurate + performance accurate (5% maximal clock inaccurate)
 - Supports clock performance of L1, L2 caches, M2, M3, DDR devices
 - Advanced profiling information
- MSC8156 ISS
 - Purpose
 - Development and debugging of multi-core applications
 - Features
 - 6 Titanium2 ISS
 - MAPLE-B simulator
 - QE simulator

Working Modes

Simulator may be run in the following modes:

- IDE mode: CodeWarrior debugger runs the simulator. User may run or break the simulator, read/write registers and memory or set breakpoints. This mode is more suitable for debugging applications.
- Batch mode: User runs the simulator from command line using runsim tool. This mode more suitable for running regression tests.
- Features
- OCE breakpoints and watchpoints
- Hybrid simulator
 - SC3850 platform simulator can run both in ISS and PACC modes and switch between them on the fly via GearShift

SmartDSP OS

- Optimized for multicore Freescale processors
 - Multi-tasking enables efficient program execution
- Compact
 - Lightweight kernel
 - Memory manager efficiently controls run-time memory allocation
- Real-time operation
 - Priority-based preemptible execution
- Extensive driver support
 - DMA, Ethernet, sRIO, MAPLE, PEX, TDM, I²C, SPI, UART
 - Buffered IO, synchronized IO, Character IO, and coprocessor buffer models with HAL support
- Integrated network stack
 - Includes TCP/IP stack with various high level protocols (e.g. SRTP, RTP, DHCP)
- Included with CodeWarrior tools as reference code
 - Royalty-free license for Freescale customers
 - Packaged drivers provide convenience and added value
- Ability to link with C++ Code

- Enabling technologies
 - SmartDSP HEAT—high-speed file I/O
 - Shell and eCLI—remote procedure call
 - Task awareness—fully integrated in IDE
 - Kernel awareness
 - Debug hooks
- Customizable
 - Kernel and driver source code is included with rights to modify

Recommended System Configuration

- 3 GHz Intel® Pentium® P4 processor (or equivalent AMD processor) or better. Dual-core processor preferable.
- Microsoft® Windows XP or Microsoft® Vista
- 1 GB free disk space

Note: 500 MB of free space is required on the OS drive, regardless of the free space available on the destination drive.

Supported Freescale Processors

- MSC8156
- MSC8154
- MSC8144 (CodeWarrior for StarCore 3.3.x is recommended)

Learn more: For more information CodeWarrior StarCore, visit freescale.com/codewarrior.