# DS-5 Development Studio 5

#### Overview

The ARM® Development Studio 5 (DS-5<sup>™</sup>) is the complete suite of software development tools for ARM processor-based ASICs and standard devices. DS-5 accelerates your software development by providing an easy-to-use, integrated, and validated toolchain.

#### Key Features and Benefits

- Support for all ARM processors.
- Integration with the industry-standard Eclipse IDE, which provides a large ecosystem of 3rd party plug-ins.
- Flexible C/C++ editor and project manager.
- Powerful C/C++ compilation tools.
- Debugger supports all phases of development from bootloader to kernel, and user space.
- Streamline Performance Analyzer provides system-wide profiling based on performance counters.
- Instant correlation of performance-bottlenecks (e.g. cache misses, interrupts) and software execution.
- Fast simulator for ARM software development on the host computer with typical speeds above 250 MHz.
- Support and maintenance contract for one year.

## DS-5 Debugger

The DS-5 Debugger brings together the convenience and productivity of integrated embedded development tools with the power and flexibility of open source tools for Linux and Android<sup>™</sup>.

The DS-5 debugger provides:

- Debug of code generated by ARM and GNU Compiler.
- Advanced Session Control and System Views control multiple simultaneous debug sessions, to one or more targets, from one debugger perspective.
- Run and stop mode debugging of single core and multicore devices.
- Linux kernel and user space debug, including context awareness, process, and threads.
- Non-intrusive instruction trace including summarized profile.
- Conditional and scripted breakpoints.

For expert Linux users, DS-5 includes the traditional GDB command line interface for detailed control of target interactions and flexibility with scripting advanced debugger functions.

## DSTREAM

The ARM DSTREAM<sup>™</sup> high performance debug and trace unit enables powerful software debug and optimization on any ARM processor-based hardware target.

DSTREAM enables the connection of DS-5 Debugger to ARM processor-based devices via JTAG or Serial-Wire Debug. It uses FPGA acceleration to deliver high download speeds and fast stepping through code on single and multi-processor devices and enables:

- Run control debug and trace unit supporting all ARM processors.
- USB 2.0 and Ethernet interface allows direct and remote connections from the host PC.
- Code download at speeds of up to 2500 KBytes per second.
- JTAG clocks of up to 60 MHz provide fast software upload over the existing debug port.
- 16-bit wide trace capture at 300 MHz DDR (600 Mbit/s per pin)
- Flexible trace clock positioning (relative to trace data).
- Large 4GB trace buffer enables long-term trace of fast targets.



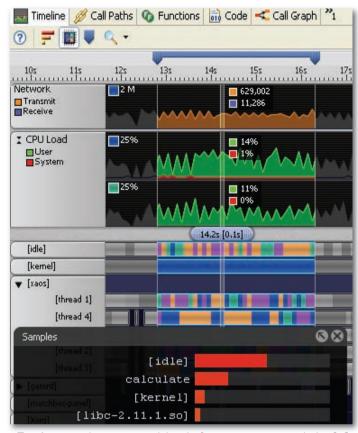
#### Streamline

Streamline is the Linux and Android performance analysis tool in DS-5. Through a small driver running on the target, Streamline captures the target's performance information and displays it in an easy to understand graphical interface. Streamline includes:

- Intuitive display of information ranging from system-wide performance counters to hot spots in the source code, making it easy for developers to identify performance bottlenecks, multithreading issues and general inefficient resource usage.
- Visualization tools to analyze per core performance metrics with threads and processes for optimal synchronization and concurrency of target's resources.
- Filtering capabilities to restrict the data set used by statistical reports over time and per process, thread or call path.
- Call paths view shows the processor time spent on each call tree. A flat report is generated for the selected call path, which enables you to focus the analysis of a process or thread.
- Code View highlights the hot spots within a function by displaying the processor time spent on each line of source code and on each disassembly instruction.
- Streamline Capture Options dialogue enables you to select the right balance between granularity and information detail, and intrusiveness.

🔜 Timeline	🥖 Call Paths	🚯 Fur	nctions 🐻 Co	ode < Call Grap	
? %	Σ 🛃 🖬				
Self Time	Total Time 🔫	Stack	Process/Thre	ad/Function Name	
0.00%	1.10%	0	🖻 [kernel]		
0.00%	0.78%	0	🖽 [gatord]		
0.00%	0.50%	0	🛱 [threads 3	]	
0.00%	0.10%	0	📄 🖨 [thread	4]	
0.07%	0.07%	?0	addsf3		
0.03%	0.03%	128	accumulate		
0.00%	0.10%	0	🕀 [thread 6]		
<					
Call Paths	1		Self Time	0 (0.00%)	
Path Time 🔹	Instances	Fund	tion Name 🔺	Location	
75.07%	6 5	addsf3		threads	
20,50%	6 5	accumulate		threads.c:109	
1.94%	<mark>6</mark> 3	[threads]		<anonymous></anonymous>	
1.39%	<mark>6</mark> 3	[libc-2.11.1.so]		<anonymous></anonymous>	

**Call paths view** shows the processor time spent on each call tree. A flat profiling report is generated for the selected call path, which enables you to focus the analysis on a process or thread.



**Timeline view** shows process and thread information over time, matched to SoC performance counters. This enables you to spot thread deadlocks and inefficiencies, as well as hot spots in time.

#### ARM C/C++ Compiler

The ARM Compiler in DS-5 Professional Edition is the only commercial compiler co-developed with the ARM processors and specifically designed to optimally support the ARM architecture. It is the industry standard C and C++ compiler for building applications targeting the ARM, Thumb®, Thumb-2, VFP, and NEON<sup>™</sup> instruction sets found in the newer Cortex<sup>™</sup> processor-based devices.

- ARM processors are designed to best execute code generated by the ARM Compiler.
- The ARM Compiler enables the new features in all the ARM processors.
- Supports building of Symbian OS, ARM Linux, and Android native applications and libraries, as well as bare-metal applications and all major RTOS.

#### www.arm.com/ds5

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