

Finding all the electronic components you need:

EDTN's Day Trader Challenge
Pick Stocks, Win prizes!**EE TIMES**
O N L I N Ewww.cmpnet.com

The Technology Network

User demands shake up CPU debug traditions

By Bernard Cole, EE Times

Feb 16, 1999 (8:58 AM)

URL: <http://www.eetimes.com/story/OEG19990216S0009>

Driven by higher levels of integration, system-on-a-chip designs, higher clock rates and more-complex architectures, momentum is building toward solutions to a number of hardware and software debug problems. To come up with a new debug interface standard, Nexus members — Motorola's John Hansen (left) and Ronald Stence — are questioning traditional debug methods

For example, in an effort to satisfy the requirements of embedded designers of high-integration applications in automobiles and industrial control, Motorola, Hitachi, Hewlett-Packard, Siemens and Bosch Etas have formed the Nexus Global Embedded Processor Debug Interface Standard Consortium to come up with a debug interface standard.

Alternatively, CPU vendors like Advanced Micro Devices, MIPS Technologies, NEC, Toshiba and LSI Logic are looking at developing extensions to the JTAG specification that support greater visibility into the internal workings of the new generation of highly integrated embedded processors and microcontrollers. And companies like Cygnus Solutions are looking at software debug alternatives that are less intrusive and disruptive but are extensions to existing debug methods.

Details on the new standard, proposals and technology demonstrations for extended debug support will be revealed at the Embedded Systems Conference in Chicago, March 2-4.

Ronald W. Stence, an applications engineer responsible for power-train-systems design and strategy at Motorola Semiconductor's Advanced Vehicle Systems Division (Austin, Texas), said the origin of the company's involvement in the Nexus effort began when his team, involved with developing Motorola's 32-bit single chip (MPC555) solution to auto transmission and vehicle control, realized that the proposed level of integration and the kinds of functions it performed, required rethinking traditional methods of hardware and software debug. "The original impetus came from the auto industry, who told us and a number of microprocessor companies that the way we were doing debug was not acceptable," he said. "It just did not solve their problems."

With most of the program and data storage on-chip, there was just no visibility into the chip with traditional logic analysis and debug tools, he said. Beyond this, there are three problems that users of such highly integrated devices face. The first, a hard real-time issue, as defined under Nexus, is any application that cannot be stopped for interrogation. If it is, the system operation is "broken." In the automobile, such interruptions could cause

damage to the engine or transmission.

A second problem, he said, relates to data-bound embedded applications like a laser printer or auto engine control in an automobile, where the data dictates the algorithm to be run, how the system operates and the functions it performs. The third problem involves instruction-bound applications, such as an Ethernet router, in which the application does not care about the data coming in but about the wrapper of instructions around it, with the latter determining its operation.

He sees efforts such as the MIPS vendors and AMD on the hardware side and Cygnus on the software side complementing Nexus' goal. "We want to define a set of constraints and standards within which any solution from any vendor will have to operate to provide valid data for debugging," he said.

Standard details and debug interface proposals from AMD and Cygnus will appear in the Embedded Systems section in the March 1 issue of EE Times.

EE TIMES
O N L I N E

www.cmpnet.com
The Technology Network

Copyright 1998 [CMP Media Inc.](http://www.cmpnet.com)