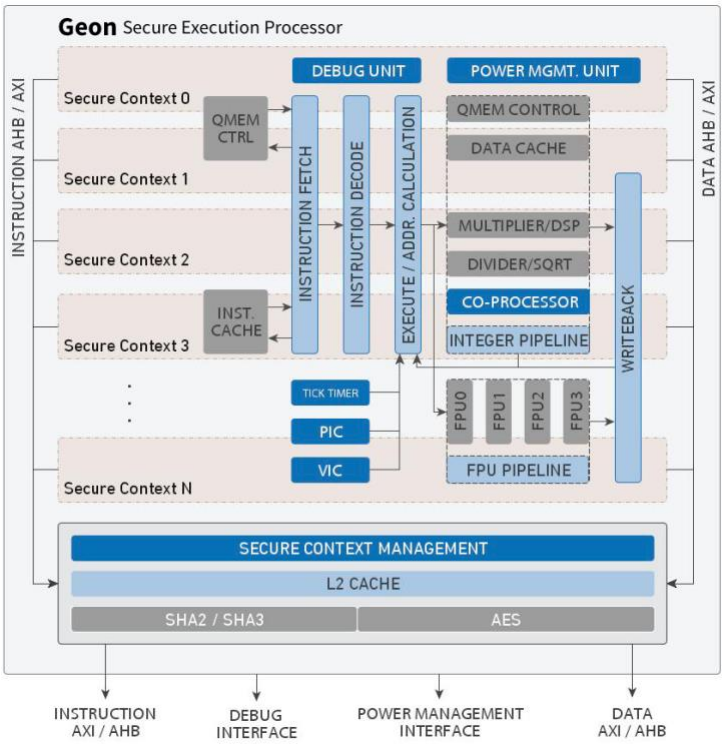
CAST NEWS

Geon Secure Execution Processor Brings Royalty-Free Protection to IoT Devices

IP core now available from CAST cryptographically protects critical code and data within a low-power, high-performance 32-bit processor

IoT DevCon, Santa Clara, CA — April 26, 2017 — Semiconductor intellectual property provider CAST, Inc. today announced the availability of an IP core that builds secure code execution into a 32-bit processor suitable for embedded systems and Internet of Things devices.

The **Geon™ Secure Execution Processor** uses two or more cryptographically separated *execution contexts* for a high degree of security during code execution and for data storage and transfer to and from the processor.



Firmware stored outside the processor is encrypted and thus safe, and Geon decrypts and checks that code and data only after it is transferred and isolated to a particular execution context within the processor. Geon isolates the multiple execution contexts from one another by assigning specific address space and execution units to each, and using a separate set of encryption keys per execution context for the code and data encryption. In this manner, even a complete breach of a software context in one execution context fails to compromise the data and code of the other contexts.

Unlike approaches employing a special secure or trusted mode of processor operation, Geon completely and securely separates each execution context 100% of the time. Any compromise to the confidentially or integrity of one Geon execution thread is separated from all the other

contexts by the authenticated encryption, and cannot spread to the rest of the system. Moreover, Geon's security methods are relatively low in complexity and add no significant software overhead, making Geon practical for use in even very small, deeply embedded systems.

"The Geon processor offers a different approach to system security that is both elegant in its design and unrelenting in its protection of sensitive data and code," said Nikos Zervas, chief operating officer of CAST. "Built-in security, excellent performance, small silicon area, and low-power operation make Geon extremely suitable for IoT nodes and similar devices, while Geon's royalty-free licensing is an extra bonus for these low-cost products."

Geon's 32-bit processing unit uses a five-stage pipeline and achieves up to 1.79 DMIPs/MHz (running at, for example, 450MHz on a 90nm process technology). It features separate instruction and data caches, supports tightly coupled internal memories, and has a Memory Management Unit supporting virtual memory. Thirty-two general purpose registers and several popular peripherals and interfaces are included, with more optionally available. Digital Signal Processing (DSP) extensions are available, and an inline coprocessor interface handles custom instructions.

Sourced from Beyond Semiconductor and a member of the 32-bit BA2x™ Processor Family, Geon benefits from the extreme code density of the BA2x ISA, and employs advanced power management to further lower CPU and memory subsystem power consumption.

The royalty-free Geon Secure Execution Processor is available now from CAST in RTL source code, complete with the BeyondStudio™ Eclipse-based IDE. A non-intrusive JTAG or serial debug package, ready-to-run reference design boards, pre-integrated platforms for AMBA bus based systems, and a variety of companion cores are also available.

To learn more about CAST and its line of IP cores and subsystems, call +1 201.391.8300, email info@cast-inc.com, or visit www.cast-inc.com. Learn more about Beyond Semiconductor by visiting www.beyondsemi.com.

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