Addressing the Business Dilemma for more Intelligent Embedded Systems

Business managers and software developers alike face increased challenges when building today’s intelligent embedded systems. They must successfully develop and deliver an increasingly complex, connected, and consolidated product, while meeting the escalating business demands of security, cost, performance, and tight time to market.

Complex and highly integrated SoCs are quickly becoming the common choice these days as demands increase for more performance, improved security, and reliable connectivity options – with less power. Many options have emerged to address these demands and one of the most effective is embedded virtualization. What was once the sole domain of desktop and server environments is now an accepted practice in the resource-constrained embedded systems. Mentor® Embedded Hypervisor allows developers to meet the design needs of a complex system, especially those systems requiring open source flexibility, real-time performance, or adherence to industry standards.

Virtualization by means of the Mentor Embedded Hypervisor, allows users to:

- Build safe and secure high-performance embedded devices
- Take advantage of HW virtualization with the latest multicore application processors
- Leverage a consistent set of tools to configure, build, debug, analyze, and tune the behavior of complex embedded systems

Whether building a system for industrial, medical, automotive or any other industry segment, Mentor Embedded Hypervisor helps development teams satisfy complex product requirements while meeting critical security, cost, and time-to-market business concerns.
Built Exclusively for Embedded Applications

Mentor Embedded Hypervisor is a small footprint type-1 hypervisor designed and built specifically for embedded applications. The high performance capability of the Mentor Embedded Hypervisor enables systems to boot quickly while minimizing the impact on guest operating system execution.

The framework of Mentor Embedded Hypervisor is extremely flexible, allowing it to run on single-core or multicore processor architectures supporting asymmetric multiprocessing (AMP), symmetric multiprocessing (SMP), or a combination of both. With dynamic scheduling of virtual machines, it allows for the load balancing of the payload and priority-based execution to support stringent realtime and performance constraints.

In addition, Mentor Embedded Hypervisor features a flexible device model that supports virtualized device access and direct device access for performance-critical applications and provides various mechanisms for inter-guest communications.

Secure by Design

Today’s devices are more connected than ever, which means issues around security are a paramount concern. Mentor Embedded Hypervisor addresses these security issues and challenges by enabling strong isolation and containment of guest operating environments. Functioning at the highest privilege level in a system, the hypervisor can enforce the partitioning of memory and devices to ensure that misbehaving applications, either unintentional or malicious, cannot disrupt or corrupt other areas of the system.

Mentor Embedded Hypervisor can be used with the ARM® TrustZone® system security architecture. For applications requiring hardware-based partitioning of resources such as memory, crypto blocks, and keyboard/screens ARM TrustZone creates a completely separate Secure World operating environment. Using TrustZone with Mentor Embedded Hypervisor effectively addresses a broad range of embedded device security requirements by extending the limitations of hardware-only system partitioning.

Improve your Return on Investment

Historically, systems used multiple processors to separate functionality while improving performance. Today, embedded virtualization can be used to maintain this necessary separation by allowing the previously separate and disparate functions to be consolidated onto a single compute platform. The benefits of consolidation include reduced bill of materials of the device or system which eliminates the need to purchase new tools for test and debug. And because virtualization uses the software already in operation, minimal time is needed to re-engineer or re-write the software – saving design teams and companies the costs typically associated with software and subsystem creation. Ultimately, this means lowering your development risk while improving time to market.

More about Mentor Embedded

The Mentor Graphics® Embedded Systems Division comprises the Mentor Embedded™ family of products and services, including embedded software IP, tools, and professional services to assist developers and silicon partners to optimize their products for design and cost efficiency.

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