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# Hypervisor

## Addressing intelligent embedded systems

**Benefits**

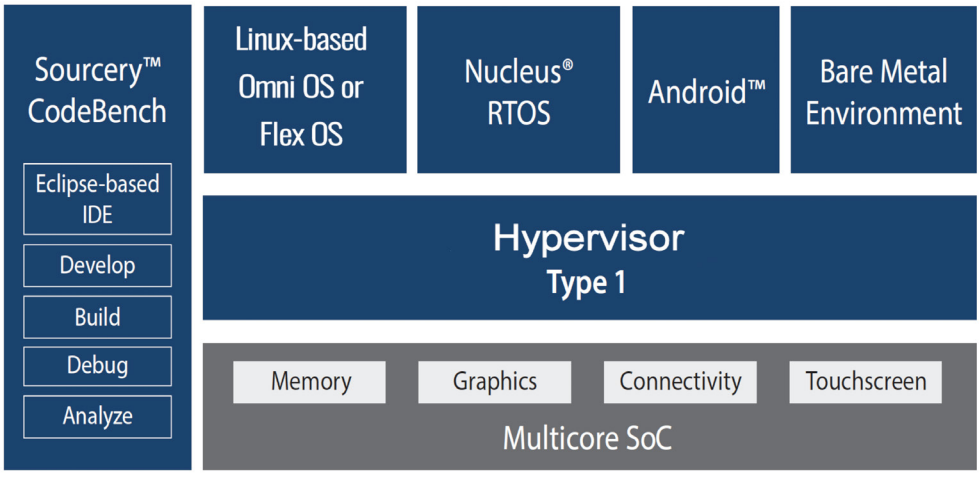
- Build highly reliable and high performing embedded systems
  Take advantage of the latest multicore processor architectures
- Enhance overall system capabilities of robustness
  Consolidate and isolate critical and non-critical functions
- Accelerate time-to-market
  Reuse code and extend system capabilities using a multicore processor to consolidate systems
- Maximize productivity
  Compatible with a complete and comprehensive set of development tools

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. 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 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




Hypervisor includes comprehensive support for leading multicore platforms along with support for guest operating systems in addition to tools and reference BSPs.

# Hypervisor

**Features**

- Built exclusively for embedded systems to take advantage of the latest multicore platforms
- Type-1 hypervisor with a small footprint to enhance separation and isolation of mixed-criticality applications
- Choice of guest operating systems including: Flex OS or Omni OS, Nucleus® RTOS, Android™, and Bare Metal Environment (BME)
- Includes Sourcery™ CodeBench and Sourcery™ Analyzer for a complete integrated design environment (IDE)
- Siemens Digital Industries Software Embedded Professional Services are available to assist from high-level architectural design to virtualizing the operating environ- ment and hardware

**Built exclusively for Embedded applications**

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

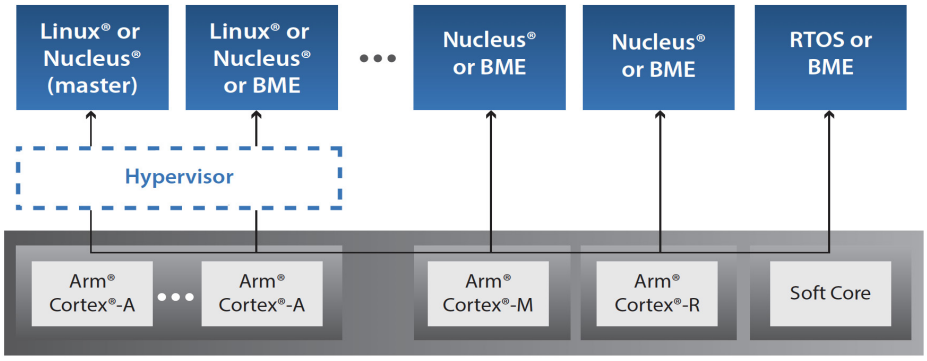
The framework of Hypervisor is extremely flexible, allowing it to run on single-core or multicore processor architectures supporting asymmetric multiprocessing (AMP), symmetric multiprocessing (SMP), or a combination of both. With dynamic scheduling of virtual machines, it allows for the load balancing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

In addition, 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. 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.

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 secure architectures with 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 Siemens Embedded**
The Siemens Digital Industries Software Embedded Division comprises the Siemens 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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