ACRN™

A Big Little Hypervisor for IoT Development

ACRN™ is a flexible, lightweight reference hypervisor, built with real-time and safety-criticality in mind, optimized to streamline embedded development through an open source platform.

Maybe the biggest news with ACRN hypervisor: it's small, around 25,000 lines of code. Complete with rich I/O mediators, ACRN is comprised of two main components: the hypervisor, and its device model.

Today's connected devices are increasingly expected to support a range of hardware resources, operating systems, and software tools/applications. Virtualization is key to meeting these broad needs. However, existing solutions don't offer the right size and flexibility for IoT. Data center hypervisor code is too big, doesn't offer safety-critical capabilities, and requires too much overhead for embedded development. Proprietary solutions are expensive and make it difficult to deliver long-term product support. Clearly there's need for a reference hypervisor that meets the unique needs of embedded development. ACRN is the answer.

ACRN aims to incorporate input from the open source and embedded developer communities and encourage collaboration and code contributions to the project. To learn more about the project please visit www.projectacrn.org and join the effort in providing the open source community a hypervsor that meets their embedded IoT development needs.

Join the Community

ACRN™ is an independent open source community producing code under the BSD license. Anyone is welcome to join and contribute code, documentation and use cases.

projectACRN.org

Connect with the Community

Join is on social media, email or Github for more collaboration.

🐦 @projectACRN	✉️ info@projectacrn.org	f @projectACRN
⌽ /projectacrn	☰ acrn-users@lists.projectacrn.org	💬 WeChat

ACRN

ACRN™ Features

Small Footprint

Optimized for resource constrained devices

Few lines of code for hypervisor: Approx. only 25,000 vs. <156,000 for datacenter-centric hypervisors

Built for Embedded IoT

Virtualization beyond the "basics"

Virtualization of Embedded IoT dev functions included

Rich set of I/O mediators to share devices across multiple VM's

Adaptability

Multi-OS support for guest operating systems like Linux and Android

Applicable across many use cases

Built with Real Time in Mind

Low latency

Enables faster boot time

Improves overall responsiveness with hardware communication

Safety Criticality

Safety critical workloads have priority

Isolates safety critical workloads

Project is built with safety critical workloads in mind

Truly Open Source

Scalable support

Significant R&D and development cost savings

Code transparency

SW development with industry leaders

Permissive Open Source BSD Licensing

ACRN

ACRN will have a Linux-based Service OS and will run guest operating systems (another Linux instance, an RTOS, Android™, or other operating system) simultaneously, providing a powerful software platform to build complex computing systems.

SAFETY/SECURITY CRITICAL DOMAIN

NON-SAFETY CRITICAL DOMAIN

Service OS (SOS)

VM1

VM2

VM3

Apps	Apps	Apps	Apps

Middleware & Frameworks

Device Model

Middleware & Frameworks

Middleware & Frameworks

Middleware & Frameworks

Linux | (RTOS)

Windows | Android

Linux | (RTOS)

Linux | (RTOS)

...

...

...

Kernel Mediators
...

IPU Mediation | GPU Mediation | Audio DSP Mediation

Graphics & Video | Computer Vision

Graphics & Video | Audio

Graphics & Video | Audio

Hypervisor

Bootloader

IPU | GPU | A. DSP

SoC

ACRN