

# embARC Open Software Platform

## Highlights

- ▶ Comprehensive suite of free and open-source software to accelerate development of ARC processor-based systems
- ▶ Includes port of FreeRTOS
- ▶ Supported by ARC MQX Real Time Operating System
- ▶ Packaged with common IoT protocol implementations, including MQTT, REST/HTTP, CoAP and LWM2M
- ▶ Support for ARC SecureShield™ technology for developing secure applications
- ▶ Supports mbedTLS SSL/TLS protocol stack for secure network communications
- ▶ Many examples including Amazon AWS IoT Smart Home demo
- ▶ Supported by free open-source GNU Toolchain and premium MetaWare Development Toolkit
- ▶ Dedicated website with downloads and documentation
- ▶ Supports ARC EM Starter Kit and ARC HS Development Kit

## Accelerating Development of ARC Processor-Based Embedded Systems

The use of 32-bit processors in embedded and deeply embedded applications continues to grow at a rapid rate. This includes applications for edge and gateway Internet of Things (IoT) devices, which span a broad range of products and market segments based on new and/or emerging standards that make writing or porting embedded software difficult.

### embARC.org

The [embARC.org](http://embARC.org) web site provides online access to a wide range of open source software and documentation for ARC processors. It provides access to downloads, documentation, and mailing lists for open source projects such as ARC Linux and the embARC Open Software Platform. It also includes links to free development tools and other resources for developing software on ARC processor-based systems. Users can also contribute to this open source software and provide suggestions on improving or adding to the existing open source projects.

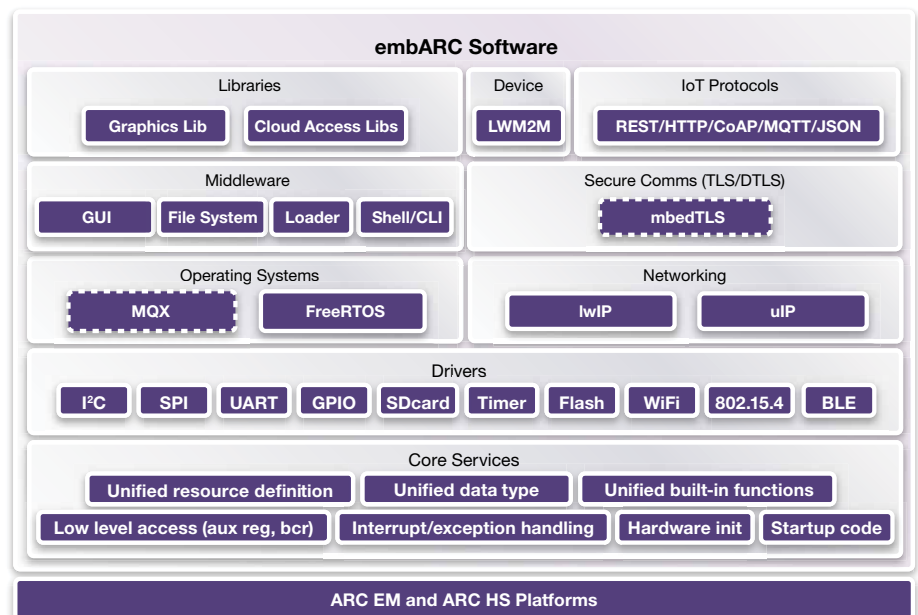


Figure 1. embARC Open Software Platform

## embARC Open Software Platform

The embARC Open Software Platform is an easily-accessible, highly-productive solution for the development of software for DesignWare® ARC® processor-based embedded systems and subsystems, especially those targeting the IoT and embedded systems. The comprehensive suite of free and open-source software available from the [embarc.org](http://embarc.org) website, including drivers, operating systems and middleware, enables code development to start sooner and complete faster. Downloads, documentation and other resources available on the website enable the sharing of information and expertise among the ARC-based development community.

The embARC software includes drivers, operating systems and middleware ported to the ARC EM and ARC HS processor families. Through the embARC OSP, developers can use a leading real-time operating system, FreeRTOS. FreeRTOS is a scalable, compact and reliable operating system that is popular among embedded software developers. Middleware available for use with FreeRTOS includes the TCP/IP stack lwIP, file system fatfs and MQTT, REST/HTTP, LWM2M and libcoap IoT protocols.

The embARC Open Software Platform provides support for and implementation of mbedTLS SSL/TLS secure communications protocol. SSL/TLS are cryptographic protocols designed to provide communication security over a computer network. The embARC Open Software Platform package includes documentation and scripts to download and build mbedTLS. It also includes the OpenThread protocol, an open-source implementation of the Thread networking protocol released by Nest Labs, Inc. The Thread specification is defined by the Thread Group, and describes an IPv6-based protocol designed to be reliable, secure and low-power for wireless device-to-device communications for digital home applications.

## Tools

Free software development tools built on the open-source GNU toolchain are available, giving developers a flexible software environment with an IDE, compiler, debugger and utilities that are familiar to embedded developers.

The embARC Open Software Platform is also supported by the commercially available DesignWare ARC MetaWare Development Toolkit, providing developers with the option to use a highly optimized toolchain for maximum code density and performance.

## ARC EM Processors

Synopsys' ARC processors are 32-bit CPUs that SoC designers can optimize for a wide range of uses, from deeply embedded to high-performance host applications in a variety of market segments. The ARC EM processor family is based on the scalable ARCV2 Instruction Set Architecture (ISA) and is optimized for performance efficiency (DMIPS/mW and DMIPS/mm<sup>2</sup>). The EM processors are highly-configurable and extensible, enabling designers to implement each core with the optimum combination of performance, code density, area and power consumption for the specific task or application.

## ARC HS Processors

The ARC HS family of 32-bit processors is based on the scalable ARCV2 ISA and is optimized to deliver maximum performance efficiency (DMIPS/mW and DMIPS/mm<sup>2</sup>) making it ideally suited for embedded applications with high-speed data and signal processing requirements. All HS processors are available in single-, dual- and quad-core configurations.