



The Mentor® Embedded IoT Framework (MEIF) is a multi-cloud solution that enables secure IoT architectures while reducing complexity and costs associated with device porting, scaling, and backend integration.

## Advancing the Internet of Things (IoT)

Manufacturers building smart IoT devices are coming to a harsh realization: implementing cloud backend capabilities to be fully functioning on the embedded device is hard work and costly. Moreover, if an implementation interoperates with unknown (or multiple) clouds and needs to scale across platforms, the architectural design and implementation work can become extraordinarily complex and expensive.

### A Secure and Flexible Multi-cloud Solution

The Mentor Embedded IoT Framework (MEIF) from Mentor, now a Siemens business, addresses these problems by integrating and extending the functionality offered by cloud backend providers to the embedded platform. It enables secure cloud connectivity, device management and monitoring, remote software updates, and remote device diagnostics and profiling. These capabilities are scalable from microcontrollers (MCUs) up to multicore application processors, and across processor architectures including Arm® and x86. Developers can use a variety of operating systems, including Mentor® Embedded Linux® and Nucleus® RTOS.

### Design a Long-term Solution to Reduce Cost and Risk

The MEIF design enables integration of cloud-vendor provided embedded SDKs alongside a well-defined set of MEIF device APIs which can be extended as needed. Through this framework approach, MEIF minimizes costs related to learning, implementation and porting of smart devices ranging from powerful gateways to smart sensors.

### Multi-cloud: Enables Public, Private, and Hybrid Cloud Topologies

The framework integrates with and complements the backend functions provided by major cloud vendors, such as Microsoft Azure, Amazon Web Services (AWS), Siemens MindSphere, and others. By integrating Eclipse IoT, the framework also supports on-premise or remote servers for device management and access.

## SOLUTION FEATURES:

- **Multi-cloud:** enables public, private and hybrid topologies. Supports Microsoft Azure, Amazon Web Services, Siemens MindSphere, Eclipse IoT, and more

- **Scalable:** across processor architectures (including Arm® and x86) and from multicore application processors to microcontrollers, with a consistent set of APIs, tools, and programming methods

- **Secure:** tool for signing and encrypting downloads; authentication and validation of the download on the smart device

- **Feature rich:** deep insights from the smart device with system health monitoring, diagnostics, and system profiling

## BENEFITS:

### Cloud ready

Pre-integrated with leading cloud solutions enables equipment to readily integrate with a variety of supported cloud environments

### Reduce cost and risk

Minimize learning curve and customization, while maximizing reuse of investments by leveraging a consistent and well-defined API that implements core functions and allows portability and scalability

### Flexibility

MEIF functions are supported in the cloud, on a network layer server, gateway edge devices, and end node devices

Highlights of the MEIF solution include:

### Platform Independent

MEIF is designed to be completely portable and scalable. By design, the framework can be leveraged across operating systems, across processor classes ranging from powerful multicore SoCs down to microcontroller-class processors, and across hardware architectures, including Arm® and x86. The benefits are clear: lower learning curves, simpler implementations, increased code reuse, reduced porting costs, and reduced testing.

### Framework Agent

The MEIF framework agent ties the cloud-vendor provided SDK hooks with the generic device management APIs, enabling a consistent set of APIs comprised of cloud SDK APIs and Mentor device management APIs. Applications utilizing these APIs can be ported and scaled across embedded platforms, while minimizing the re-writing and testing of code.

### Remote Diagnostics and Analysis

MEIF provides the means to remotely analyze the state and operation of the embedded platform. Leveraging proven Sourcery™ Analyzer technology, the instrumented system can generate time-series data, which can be accessed via the cloud and remotely analyzed for OS/ platform diagnostics, system health monitoring, and device profiling.

### System Health Monitoring

MEIF enables remote system health monitoring, which allows device vendors to understand operational aspects of the embedded device. By invoking commands from the back-end, data related to interrupt activity, watchdog daemons, or CPU/memory/network usage can be collected and presented on the backend for tracking and analysis.

### Comprehensive Security

Companies using MEIF along with other Mentor embedded platforms have everything they need to ensure a secure IoT solution. These platforms support comprehensive device security, securing data at rest, data in use, and data in motion. MEIF extends the security with a GUI-based utility to sign, encrypt, and package artifacts to be delivered to devices, enabling devices to validate and authenticate any downloaded packages (such as software updates or security patches) before installing.

### A Complete IoT Solution

The Mentor Embedded IoT Framework is an integral component of the company's industry-leading runtime platform solutions. Designed to be completely portable across operating systems, processors, and processor architectures, MEIF is initially available for both Mentor Embedded Linux and Mentor Nucleus RTOS, which have been designed into more than three billion devices.

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MGC 05-19 1034880-w