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Eurotech, Hitachi and Oracle together ensure successful and deterministic development and deployment of M2M solutions for a broad range of vertical markets.

Eurotech M2M Technical Building Blocks Focus on a Multi-Service Gateway Approach and Standards-Compliant Software Elements

Providing a competitive advantage to customers and partners by leveraging industry standards and years of experience in challenging machine-to-machine (M2M) projects

Overview

M2M projects present many challenges, even with hardware designed exactly to customer specifications. Success can be best assured when these three major conditions are met:

- Effective implementation of the customer's business logic on the device side

- Scalable and affordable methods for optimum device and data management

- Simple integration of distributed devices into different enterprise applications by effectively separating the producers and consumers of data

Eurotech assures a strong foundation for M2M applications by relying on leading industry partners (Oracle's Java Embedded Technologies, Hitachi SuperJ OSGi™ platform) to provide the technology basis for device, network, and service abstraction as well as efficient development.

That foundation, combined with Eurotech's long experience in delivering sophisticated M2M projects, coalesced into specifically designed M2M Multi-Service Gateways and a cloud-based M2M Integration Platform. These two pillars ensure successful and deterministic development and deployment of M2M solutions for a broad range of vertical markets.
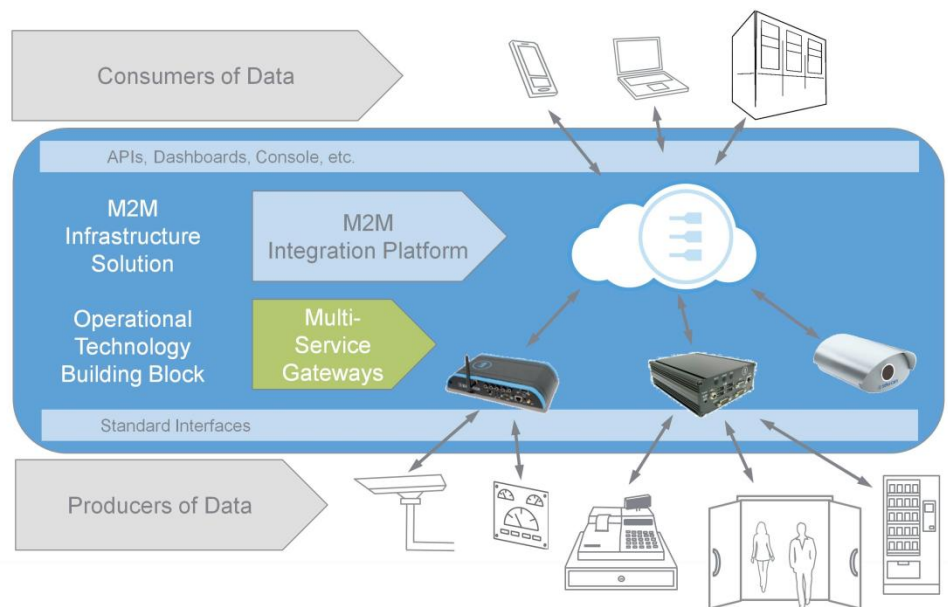
Eurotech's Everyware Software Framework (ESF)

Features & Benefits

- Efficient application development
- Programming resources availability
- 100% Java
- Cloud ready
- Modular, leveraging OSGi
- Maximum investment protection
- Device independent

Figure 1: Distributed Systems Architecture Overview.

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This approach provides Eurotech's partners with a competitive advantage by ensuring a dramatic reduction of time, cost and risk in M2M projects:

- Shorter time-to-market
- More deterministic development
- Lower barrier to entry
- Future-proof applications

Grow ROI

- **Extend Product Lifecycle** – In-field update and refresh enables ability to add new features for improved customer value
- **Competitive Advantage** – Standards-based systems allow focus on business value, reuse commodities from an existing ecosystem.
- **Innovation** – Fueled by largest pool of developer talent, millions of engineering students are experienced in Java development.
- **Increase Market Reach** – Partner in the world's largest developer ecosystem.

Helping Customers and Partners Focus on Their Core Competencies

Connected devices and M2M solutions enable companies to provide higher value through services, improving efficiency through data collection and 2-way customer feedback by utilizing connected devices. Regardless of whether they are end users or system integrators, it is all about providing enabling platforms, not just components!

The Multi-Service Gateway Approach

- Minimizes customer development risk by utilizing "off the shelf" purpose-built devices designed to meet vertical market value propositions

- Provides design flexibility by leveraging the Multi-Service Gateway approach to integrate and consolidate data streams and future-proof investments

- Reduces design complexity while introducing the Application Lifecycle Management approach

The benefits of IT-centric application development using ESF to implement business logic in smart edge devices / service gateways are:

- Simplifying application development for smart M2M Multi-Service Gateways with Everyware Software Framework (ESF), a Java/OSGi based application framework

- Optimizing portability across systems and hardware architectures

- Improving device management

- Native M2M platform integration (Everyware Cloud, MQTT)
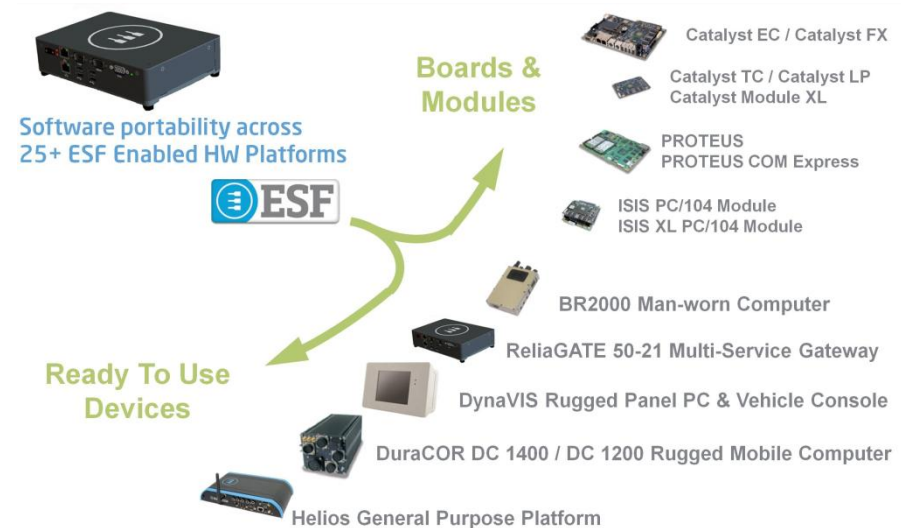
- Application management

Figure 2: Software portability ensures efficient development and investment protection across hardware platforms.

Oracle's Java Technologies

- Java provides the widest cross platform capability from the smallest microcontroller devices to high performing enterprise systems. By building your project strategy around Java you can tap into the existing 9 million developers currently building exciting applications.

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Reduce Cost

- **Portability** – Increase flexibility and roadmap planning by maximizing cross platform support through compliant standards, JCP (Java Community Process) and OSGi (Open Service Gateway Initiative)

- **Shorter Time to Market** – Reduce QA cycles and remove reinvention. Cost sharing business model supported by conformance testing (TCK).

- **Reduce Cost of Support** – Through remote updates and device management

- **Reduce Risk** – Most widely deployed secure, reliable development platform

- **Standards Based** – Java VM developed as an open standard and backed by Oracle. OSGI Framework developed by Hitachi backed by Oracle and Hitachi as part of the OSGI Alliance

- Oracle Java Embedded is ideal for application code development in any connected device, enabling a robust software infrastructure for service delivery platforms. Portability across devices is achieved through using a common set of Java APIs on multiple devices. This enables easy code development through software simulation before porting onto your embedded product and reducing time to market.

- Oracle Java SE Embedded is targeted at gateway devices, which typically use a Linux operating system, with various CPU versions available, including ARM and x86 instruction sets. The performance of the Java VM can improve the increasing number of multi-core systems through its thread aware application model.

Hitachi SuperJ Applications Ecosystem for the OSGi Service Platform

Hitachi's SuperJ Applications Ecosystem is a framework for the OSGi (Open Services Gateway Initiative) Service Platform. SuperJ facilitates the modularization of software components and applications and assures interoperability of applications and services over a variety of M2M devices.

Hitachi SuperJ is a fully-featured framework that enables the deployment of OSGi technology plus enhanced functionality on any Java enabled device or gateway. Benefits include:

- Modularity, through the separation of application logic/processes into modules

- The ability to deploy multiple versions of a module concurrently on a Multi-Service Gateway

- The ability to dynamically discover and use "services" provided by other modules in the system

- The ability to dynamically install, uninstall, start, stop and upgrade modules running on a Multi-Service Gateway

- The capability to abstract physical networking interfaces to complex software development by decoupling the network connection software from the application software
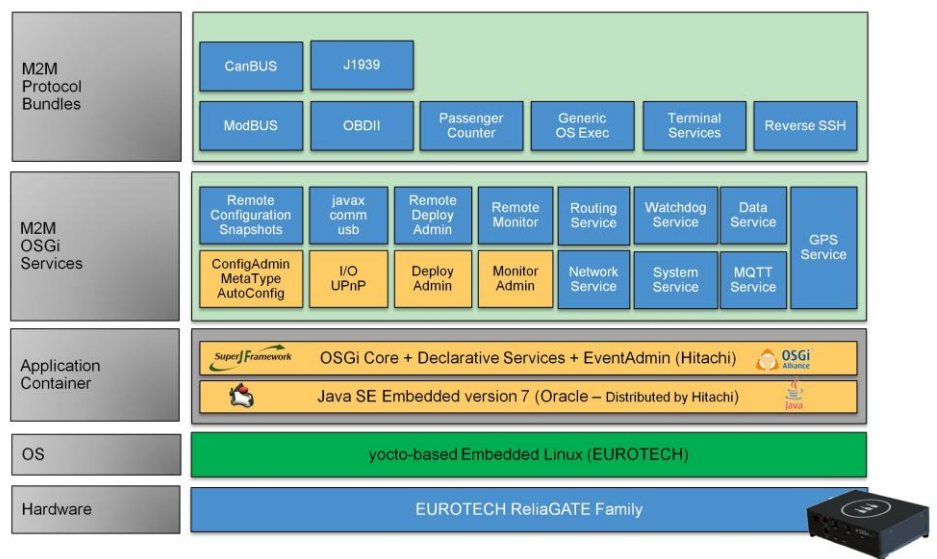

Figure 3: Software components using Java, OSGi, and ESF.

Eurotech M2M Technical Building Blocks Focus on a Multi-Service Gateway Approach and Standards-Compliant Software Elements

ESF Software Modules

- Foundation Layer turns the device into an internetworking device and an application gateway
- GUI for device management from any web browser
- Everyware Cloud Client, MQTT Client
- New and legacy protocol implementations for field busses, sensors, intelligent devices and communication options
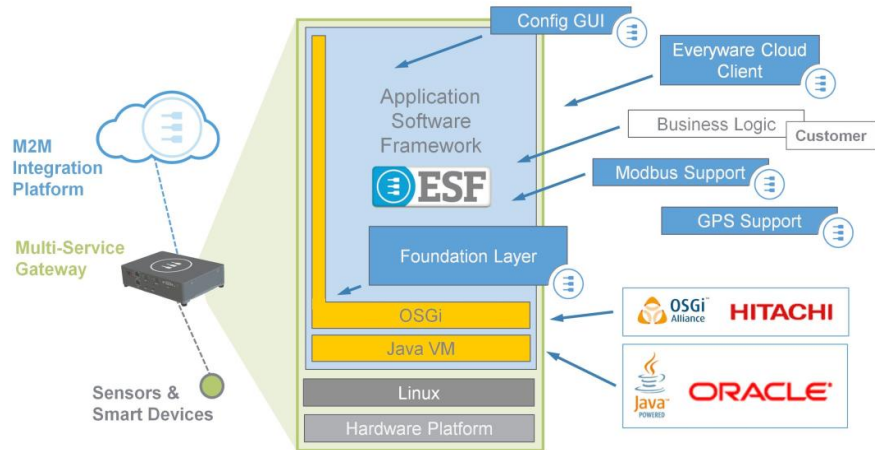

Figure 4: ESF Implementation Example.

ESF Features & Benefits Overview

- **Field Data Capture** – Features proven protocol components for data acquisition from in-field devices (ModBus, Jbus, PLCs, …)

- **Application Development** – Quickly develop hardware-abstracted and flexible embedded applications

- **Programming Resources Availability** – Tap into the exisitng community of 9 million Java developers by creating Java applications implementing customer's business logic simulated on PCs and deployed on devices in the field

- **100% Java** – Gain widest cross platform support through compliant Java-based abstraction APIs over I/O, network, serial, GPS, Bluetooth and other hardware components

- **Cloud Ready** – Built-in client for cloud-based M2M Integration Platform offering advanced data and device management services, simplifying the interaction with enterprise applications

- **Modular** – Oracle Java and Hitachi SuperJ Applications Ecosystem supports efficient M2M applications development, and dynamically adding, removing and changing of software modules (services).

- **Tools** – Advanced development tools based on the industry standard Eclipse platform

- **Device Independent** – ESF runs across device platforms resulting in portable applications and easy to re-use code

Conclusion

Together, Eurotech, Hitachi and Oracle ensure successful and deterministic development and deployment of M2M solutions for a broad range of vertical markets. By providing an enabling platform, ESF - a Java and OSGi based application framework, allows customers and partners to focus on their core competencies and provide higher value through services, improve efficiency, and reduce costs by utilizing connected devices.

CONTACT US

To learn more about Oracle's Java Embedded Technologies see www.oracle.com/goto/javaembedded. To learn more about Hitachi SuperJ Applications Ecosystem for the OSGi Service Platform see www.hitachi-cta.com/solutions/applications/m2mapps.html. To learn more about Eurotech see www.eurotech.com/esf.

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