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MIDDLEWARE

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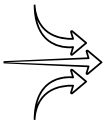
SIMPLIFY IoT IMPLEMENTATION WITH EUROTECH AND RED HAT

TECHNOLOGY OVERVIEW



Streamline machine-to-machine (M2M) distributed systems with Eurotech and Red Hat to:

- Reduce development time and risk with proven architectures, protocols, and technology.
- Dramatically reduce total cost of ownership (TCO) of distributed device infrastructures.
- Speed up implementation of innovative business models and processes.

INTRODUCTION

The Internet of Things (IoT) transforms business. Ordinary devices become smart devices, and smart devices are integrated into intelligent systems. Communication between devices and systems lets organizations harness the power of data to create actionable information.

Red Hat and Eurotech have collaborated to create a powerful open source infrastructure that lets devices connect and communicate to help complex IoT environments operate smoothly.

Eurotech, a leader in integrating human-to-machine (H2M) and machine-to-machine (M2M) interaction, offers the technology components to create distributed, intelligent systems of devices and sensors. Red Hat® technology connects those distributed systems to the IT infrastructure. Together, Eurotech and Red Hat provide a robust Internet of Things solution – from M2M interactions to enterprise applications – to seamlessly manage thousands to millions of devices.

AN EVOLVING ENVIRONMENT

M2M solutions traditionally consisted of black boxes, proprietary systems used for a single purpose with only one application. They contained only one type of device or sensor and needed only one predetermined connectivity method. Updates were tedious, often involving rewriting application software and, in some cases, changing the device hardware. Supporting and maintaining these environments can be difficult and expensive.

Black box M2M solutions are being replaced by more powerful, continually evolving Internet of Things solutions. The Internet of Things makes updating, maintaining, and supporting M2M environments more manageable and extends device data for use by more than one application or type of consumer.

Complexity resulting from multiple services occurring at the edge of the network, and often in multiple geographic locations, has created a need for powerful platforms and technologies with small footprints to assist with development, bridge the gap between operational technology and IT, and reduce time to market for IoT projects.

POWERFUL YET SIMPLE SOLUTIONS

Eurotech and Red Hat provide solutions that address the complexity of IoT implementations at all stages, including:

- Remote device management, access, and configuration.
- Data acquisition, collection and management.
- Communications infrastructure.
- Business application integration.

With Eurotech and Red Hat solutions, developers can smoothly unite operational M2M transactions with enterprise infrastructure.

Together, Eurotech and Red Hat provide a robust Internet of Things solution—from M2M to enterprise applications—to seamlessly manage thousands to millions of devices.

There are several areas where vulnerabilities can occur during IoT implementations that are addressed by Eurotech and Red Hat solutions:

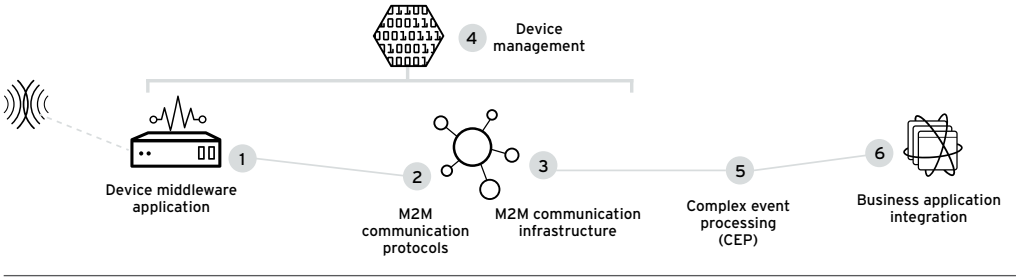


Figure 1: Potentially vulnerable areas during Internet of Things implementations

Device middleware and applications

Eurotech's Everyware Software Framework (ESF), an inclusive Java OSGi (Open Services Gateway Initiative) software framework, adds an abstraction layer between a device's hardware functions and software applications. Its industry-standard interfaces shorten custom development time and simplify coding, with software that can be easily ported between hardware platforms.

Red Hat and Eurotech have collaborated to integrate Kura, the open source version of ESF, with Apache Camel, the open source version of Red Hat JBoss® Fuse.

"When each and every product sold will be connected to its manufacturer, IoT will be as crucial to enterprises as ERP [enterprise resource planning] and CRM [customer relationship management] are now. That's why we believe in building IoT architectures on open industry standards."

ROBERTO SIAGRI
CEO, EUROTECH

M2M communication protocols and infrastructure

Eurotech's Everyware Cloud (EC) simplifies remote management of connected devices by using a single transport protocol, MQTT, over secure, reliable communications cloud services. Once devices are deployed, Eurotech's ESF connects to EC to let users connect, configure, and manage devices throughout their life cycles, from deployment to maintenance to retirement.

With Red Hat JBoss A-MQ, Eurotech's Everyware Cloud achieves reliable, high-performance messaging capabilities with real-time EC integration. The small footprint size and standards adherence of Red Hat JBoss A-MQ create the capability for nearly any device or sensor to be connected. Multiple protocols and languages are supported, including:

- Java Message Service (JMS) 1.1
- Transmission Control Protocol (TCP).
- Secure Sockets Layer (SSL).
- User Datagram Protocol (UDP).
- Simple (or Streaming) Text Oriented Message Protocol (STOMP).
- .NET Message Service (NMS).
- MQ Telemetry Transport (MQTT).
- Advanced Message Queuing Protocol (AMQP) 1.0.

Device management

Eurotech's Everyware Device Cloud (EDC) gathers live metrics from devices to help businesses make decisions based on data from the intelligence at the edge of the network—reducing the time, cost, and complexity of implementing, managing, and scaling their device networks.

RED HAT AND THE INTERNET OF THINGS

Red Hat's architecture for the Internet of Things is explained in the technology detail, "An intelligent systems solution for the Internet of Things", available at http://www.redhat.com/en/resources/intelligent-systems-solution-internet-things

With an EDC cloud-based architecture, users can instantly integrate business data into many data services, with:

- Customizable operational dashboards that show real-time device data.
- Trend-monitoring management reports.
- Integration with:
  - Enterprise services buses (ESBs) such as Red Hat JBoss Fuse.
  - Business intelligence platforms such as Pentaho.
  - Web application frameworks such as Liferay and WebRatio.
  - Red Hat Mobile Application Platform.
  - Customer-developed applications.
- Automatic notifications sent to designated recipients via SMS, email, Twitter, or automated phone calls.
- Mobile support to provide relevant data to specified users on the go.

Services for mobile support can be built using EDC Rest APIs with Red Hat Mobile Application Platform. EDC also uses the Red Hat JBoss A-MQ MQTT broker to communicate to enterprise applications via Red Hat JBoss Fuse.

Complex event processing (CEP)
Red Hat JBoss BRMS is a comprehensive platform for business rules management, business resource optimization, and complex event processing (CEP). Sophisticated decision logic can be incorporated into line-of-business applications, and underlying business rules can be quickly updated as market conditions change.

Using Red Hat JBoss BRMS, Eurotech deploys decision services across Everyware Cloud to associated remote devices and:

- Improve business agility.
- Make consistent, efficient decisions.
- Quickly build resource optimization solutions.
- Shorten development cycles for faster time to market.

Business application integration
As a lightweight, flexible ESB, Red Hat JBoss Fuse enables rapid integration across the enterprise, from the on-premise datacenter to the cloud. EDC integrates operational activities with enterprise applications, including Red Hat JBoss Data Virtualization and Red Hat JBoss Data Grid, by communicating through Red Hat JBoss Fuse.

EUROTECH AND EMBEDDED CONNECTED COMPUTING

The benefits of Eurotech's M2M 2.0 solutions are detailed in a Harbor Research whitepaper, "Eurotech Re-Invents Embedded Connected Computing for M2M 2.0", available at http://www.eurotech.com/en/library/white+papers

ENTERPRISE IoT WITH RED HAT AND EUROTECH

While many consumer IoT solutions can be constructed with a two-tier architecture of direct device-to-server communication and data exchange, enterprise implementations are typically more complex. A three-tier architecture (Figure 2)—consisting of a device tier, a control tier, and a datacenter tier—addresses the scale and time-critical nature of enterprise IoT deployments by adding a middle control tier. This control tier helps reduce datacenter traffic, decrease latency in response times, manage across disparate networks, and improve data flow.

Eurotech and Red Hat solutions provide value in each of the three tiers of an enterprise IoT architecture.

ABOUT EUROTECH

Eurotech's mission is to integrate state-of-the-art computing and communication technologies into innovative solutions to improve customers' competitiveness and their ability to cope with the amazing evolution of digital technologies. Visit Eurotech at www.eurotech.com.

ABOUT RED HAT

Red Hat is the world's leading provider of open source software solutions, using a community-powered approach to reliable and high-performing cloud, Linux, middleware, storage, and virtualization technologies. Red Hat also offers award-winning support, training, and consulting services. As a connective hub in a global network of enterprises, partners, and open source communities, Red Hat helps create relevant, innovative technologies that liberate resources for growth and prepare customers for the future of IT.

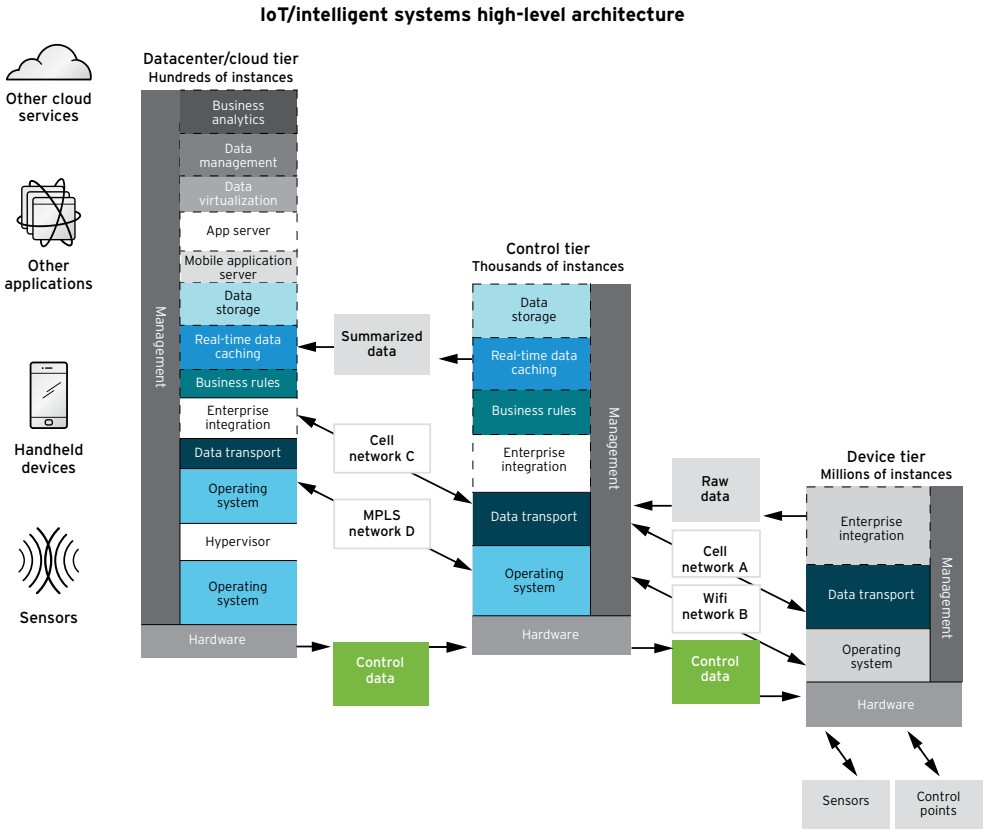


Figure 2: Enterprise Internet of Things implementations architecture

CONCLUSION

IoT solutions from Eurotech and Red Hat unite operations technology with IT to let devices that are part of an intelligent system communicate in new ways, transforming data into actionable information that leads to better business decisions. Based on open source standards, these innovative solutions help organizations reinvent M2M environments and keep up with the evolving IoT landscape to stay competitive.

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