



The business alchemy of the IoT

The medieval alchemists searched long and hard to find the Elixir of Life and turn base metals into gold. Our generation – and especially the M2M/IoT community – is now carrying out a similar transformation, turning silicon, copper, rare earth elements and the airy ether of the radio spectrum into new products, services, business models and profits.

M2M Now recently spoke with Roberto Siagri, CEO of Eurotech, about the role his company is playing in this transformation and what the future holds.

M2M Now: Roberto, can you give us an overview of Eurotech's approach to IoT, both in terms of its product portfolio and wider business strategy?

RS: We're one of the leading players in the embedded market. We offer a broad product portfolio including computer boards, purpose-built computer devices and high performance, embedded computing systems. This gives us a solid basis for our IoT/M2M solutions.

Purpose-built devices in particular are the building blocks for many industrial, commercial, transportation, medical and defense systems and applications - and have been our specialty for twenty years. Our broad range of M2M Multi-Service Gateways plays an important part too.

State of the art M2M solutions also require well-designed software and communication services to run on top of that hardware, so another important element that we offer involves software, tools and services. This gives our partners and customers a complete set of M2M technology building blocks. ►

It's all about making the IoT accessible and lowering the Total Cost of Ownership (TCO), dramatically lowering initial investment, reducing project risks in M2M/IoT and cutting time to market. We achieve this by providing a full 'IoT operating system' that gets companies connected quickly and simply and frees them up to concentrate on their applications. It's about dissecting - and encapsulating - the complexity of an end-to-end distributed system, from field devices to the cloud or enterprise application, with support that extends beyond just the development phase.

M2M Now: What are the basic elements that Eurotech offers and incorporates into its IoT offerings - and what specific business problems do your products address and resolve?

RS: As I said before, state of the art solutions require a well-designed stack of software and communication service layers and here we've simplified the IoT architecture by what you might call a 'divide and conquer' approach. Every dissected part has been encapsulated into a building block that then interacts with other building blocks through standard protocols and simple interfaces. ►



From the Gateway hardware layer up, Eurotech provides an application framework called the Everyware Software Framework (ESF) to increase flexibility and interchangeability. Based on Java and OSGi, ESF is one particularly important building block in the device software, speeding up the development of specific vertical applications or business logic. By abstracting the hardware it protects the customer's investment in software, while also allowing new services to be dynamically loaded onto our Multi-Service Gateway.

Above that, there's the communication layer that connects devices to the cloud or data center and is optimised for distributed and mobile systems. We're agnostic about the media the customer uses which could include cellular, satellite, WiFi, Ethernet or others - as long as they support TCP/IP. We can also provide SMS as an alternative for some applications.

On top of the communication layer lies our cloud-based IoT/M2M platform - Everyware Cloud - which integrates easily into existing enterprise IT infrastructures, offering simple access through standard APIs to real-time and historical data from devices. This IoT Integration Platform also offers device life-cycle features to ensure smooth deployment and management of devices in the field and is also available for deployment in a customer's own premises.

Finally, I'd like to highlight carrier certification issues - required in many markets for cellular-connected devices. For companies selling their products or services internationally, these certifications take time, effort and costs and are a major barrier. Our ReliaCELL product range therefore offers a very attractive, pre-certified modular solution.

In addition to these hardware and software solutions, we provide consulting services and a scalable pay-as-you-go model to facilitate our customers' adoption of IoT, minimising risk and simplifying IoT proofs of concept.

M2M Now: Eurotech has said that it takes an end-to-end holistic architectural approach to IoT. What does that mean for enterprises considering IoT deployment in the short term?

RS: This means that customers can stay focused on their businesses without having to become hardware, software, communications or infrastructure scalability experts.

Modularity and standard interfaces were the elements that made the x86 PC architecture so successful in the 1990s. By mastering IoT complexity in the same way and applying the divide and conquer strategy I mentioned earlier, we've isolated and simplified things through modular hardware and software building blocks. These can be easily coupled together or combined with third party building blocks, just like Lego. This concept applies from the Gateway through to the cloud management platform.

By turning a complex problem that required a lot of skills into a simple problem that customer can solve with readily available IT capabilities, they can prototype their IoT solutions rapidly and cost-effectively. We've transformed a distributed architecture of hundreds - or even hundreds of thousands - of devices to a simple client-server architecture.

M2M Now: What are the basic elements of M2M/IoT infrastructures and what should organisations do to prepare their environments for IoT migration, ensuring that they get it right the first time to minimise disruption?

RS: Our IoT architecture layers are:

- Field sensors and actuators at the edge
- Multi-Service Gateways - computers that locally aggregate field sensors and actuators
- ESF middleware installed on the gateways
- Communication networks - 2G/3G, LORA, SIGFOX, Satellite, PRN, etc
- Everyware Cloud - IoT/M2M Integration platform-as-a-service
- Apps developed on top of the platform accessing the distributed device infrastructure through the REST API

IoT infrastructures are a business overhead - just like CRM and ERP systems - and IoT complements CRM. With CRM you contact the product through the customer, but with IoT you contact the customer through the product. Combine the two together and you increase customer insight and business knowledge, improve maintenance and repair services, and can transition to new device-as-a-service business models.

Our building block strategy also dramatically minimises risk. Instead of increasing risk, IoT is actually a complementary tool that enhances an organisation's dexterity, agility and efficiency at many levels. In factories and logistics, IoT can increase efficiency and reduce opex, while in distribution and maintenance it will improve customer experience and increase sales. It also provides the flexibility required to bring business models and processes into the digital age.

M2M Now: Can you expand on Eurotech's Multi-Service Gateway concept and the IoT/M2M Integration Platform?

RS: This is where our Java and OSGi-based application framework - ESF - that I mentioned earlier comes in, abstracting the hardware to protect software investments. In smart-home applications, for example, rapid hardware obsolescence can jeopardise a business, so new services need to be easily deployed, loaded and activated at any time.

Another vital building block is the Everyware Cloud I also touched on. We've created a seamless interface between enterprise servers and in-field devices, allowing IT managers to program in-field devices using the same tools used to program servers. Via the Gateway, data can be processed at the edge, minimising data transfer to the cloud or data centers and improving reliability and real-time reactions.

This decouples the data producers and the data consumers, increasing the value of historic data produced. Opportunities for data fusion are also maximised, as well as the value of data analytics.

M2M Now: How can multiple, complex and changing services and tasks be performed in a smart edge device to help an organisation achieve tangible business results in real time?

RS: Take vending machine applications. Historically, these let us understand the number of goods stocked in machines and when to refill them. But vending machines today come with touch screens, electronic payment solutions, environmental sensors and video systems that can identify target customer groups. These now involve two-way communication and frequent updates with new software elements and features which, in turn, require M2M/IoT solutions that are more IT-centric in nature. It's no longer about simple telemetry.

These IT-centric solutions open new doors. Companies that traditionally implemented and integrated embedded devices relied on developers skilled in C++ and with a deep understanding of embedded systems. Programming business ►



logic in Java on embedded devices significantly lowers entry barriers, allowing more IT-centric system integrators to exploit purpose-built devices for specific vertical markets.

Question: IoT is all about connecting systems and devices and using embedded Big Data, analytics and business intelligence. But with so many “moving parts”, there’s a real fear for some that IoT may be too complex for them to tackle this early on. What’s Eurotech’s response to that?

RS: Yes, IoT will be the new Big Data generator, so its wider architectural implications must be appreciated. IoT implementations have to be future proof if they’re to capitalise on the data generated. One of the drivers for our IoT architecture has been the reuse and mash-up of data through a type of Enterprise Service Bus for machine interfaces which are easily connected to the most popular BI and analytic tools like Hadoop, Pentaho and Actuate. Another driver has been aimed at designing a modular architecture that reduces anxiety and uncertainty for “Roll Your Own” IoT implementations.

We’ve put a lot of investment into encapsulating industry-standard “moving parts” in easy-to-use building blocks. Encapsulating - and consequently hiding - the inherent complexity of distributed device solutions through this approach, based on open industry standards, gives customers the confidence to start exploring the benefits of IoT.

M2M Now: Security represents another huge challenge in an IoT environment. If everything’s connected, there’s potentially much more collateral damage in the event of a successful hack or penetration. What’s Eurotech’s IoT security strategy?

RS: Security in IoT projects involves more than just combining some perimeter defense solutions like white and black listings, firewalls and encrypted communications. While these are important, we believe that security is significantly improved by incorporating proper authentication methods; the use, storage and management of certificates; and, especially, an overall architecture and design that can eliminate many possible attack scenarios.

Eurotech’s IoT building blocks offer best-in-class authentication, security transport and software validation mechanisms, as well as anti-tampering features on the service Gateway. Cloud platforms also have to be validated and audited on an on-going basis by external security specialists.

M2M Now: Finally, what’s Eurotech’s prediction for how quickly mainstream businesses will transition to IoT?

RS: Today’s M2M technologies scale a lot better than before. They can now be deployed by customers who previously couldn’t have used embedded systems or appropriate communication technologies. Customers can now get valuable device data into their business applications at an affordable price, faster and better than ever before.

The holistic approach we have taken will speed up this business transition. While IoT for homes and buildings might require a new product class, this isn’t necessarily true for Industrial IoT, or for many legacy machines already in the field. IoT can be retrofitted just by adding a service Gateway, while the remaining elements simply consist of software components in the cloud.

A proper IoT implementation can be like an Elixir of Life for many companies – or, at least, a must-have tool. Global competition is based more and more on efficiency, customer experience and the revenues that come from new services. Who would turn down the offer of the IoT Elixir? ■