Eurotech's ruggedized compute at the edge and HPC experience combine in rich OT applications

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Often associated with IoT gateways, Eurotech has deep experience and an evolving presence in richer edge-computing operations and IoT platforms, combined with HPC projects. This combination has led to its high-performance embedded computing range used in applications like autonomous vehicle training and rail car monitoring.

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Introduction

Eurotech's long-standing experience in developing embedded and high-performance computing, and its place in the evolution and enablement of IoT, sits alongside its more well-known gateway technology. Eurotech worked closely with IBM in the development MQTT and its early open sourcing. MQTT was invented by Andy Stanford-Clark (now IBM EMEA CTO) and Arlen Nipper (who went on to become Eurotech CTO from 2006-2012).

The company maintains a strong contributing presence in other open source projects, such as Eclipse Kura (IoT edge framework for gateways) and Eclipse Kapua with Red Hat (IoT device management and data integration). It is also a specialist in HPC, designing and manufacturing supercomputers, which has led to its high-performance embedded computing (HPEC) product set, combining that R&D experience with its OT ruggedized products for IoT and edge computing.

451 TAKE

Eurotech is a well-established name that appears across IoT. Often, the company was categorized as a provider of IoT gateways, but that hides the complexity of its fit in the evolving IoT ecosystem. Its history in the invention and support of the MQTT protocol and its open source approach may not always get the focus they deserve. The company has extensive OT equipment and vertical niche customizations and IP, but is a forward-thinking open source-based company, and very IT-friendly. An advantage Eurotech has is leveraging its separate R&D work on supercomputing platforms (HPC). These, by their very nature, are niche, high-end engineering projects.

The IP from this has allowed Eurotech to develop its HPEC products at a time when the IoT and AI industries need much more computing power and function than is found in traditional embedded computing. Also, this is at a time when custom OT embedded computing is moving to a more general-purpose, IT-friendly and maintainable approach, since IT and OT converge in many use cases. This is something the company's PC/104 standards-based approach has addressed for some time. Eurotech must often be a partner in an ecosystem, and its specialist knowledge tends to make it appear to be a component of the larger provider's initiative. However, it clearly exerts a lot of influence on the development and future direction of high-end IoT applications.

Context

Eurotech cites over 28 years of experience in embedded, pervasive and distributed systems, pre-dating and now including IoT, along with specialist HPC build services. The company is headquartered in Amaro, Italy, with operations in North America, Japan and the rest of Europe where it has just over 300 employees: 47% in Japan, 38% in Europe, and the balance in the US. For 2019, it reported 46% of sales in Japan, 24% in Europe, 26% in the US and the remainder elsewhere in the world, with revenue of $111m, up from $87m in 2018.

Strategy

Eurotech has a multipronged approach covering a blend of hardware and software at the extremes of the stack. Its intellectual property, assets and services in building supercomputers, including managing power-consumption reduction and improving machine-cooling systems, saw it achieve the award for the most energy-efficient supercomputers in the world in 2013. Follow-on inventions and applications are helping it drive high-end compute power in datacenters and further to the edge in IoT. It is here that those developments meet its other focus area of embedded computing.

It recognized early on that traditional M2M systems relied on single-purpose devices, designed to run at the lowest cost per node possible; but that, in turn, made them hardware-specific and difficult to maintain. Eurotech, with its focus on embedded Java (a more portable language), spent time developing an IT-friendly software-defined system using open industry standards. This is at the intersection of IT and OT, where there is ongoing churn across almost all industry verticals, because the needs of OT – based on machinery and the physical world – must be addressed by an IT world whose experience tends more toward generic computing platforms on desktops, in datacenters and in the cloud.

Eurotech has positioned itself across both these silos in the areas of ruggedized and high-performance embedded computing and IoT software orchestration. It typically sits below any application layer, which is where it is able to partner with the likes of IBM, Red Hat, AWS, Microsoft and Hitachi as part of the overall ecosystem. Its core market focus is aimed at asset-intensive organizations with complex or high-value assets. Its vertical coverage is aimed at industrial and manufacturing, transportation (rolling stock, mining, agriculture), energy and utilities, and medical and life sciences, including the process industries. It also works in defense and security.

Products

Eurotech offers boards and modules, subsystems, networking and storage, intelligent sensors, IoT frameworks and HPEC. Boards and modules include single-board computers, such as its PC/104 family, across a range of ruggedized and low-power configurations. The first of these hit the market in 1987, and forms an open standard regulated by the PC/104 consortium since 1992. Its Everywhere Software Framework is a commercially supported version of Kura, and Everywhere Cloud is the commercial version of Kapua. The company is a founding and strategic member of the open source organization Eclipse IoT, alongside Bosch.IO and Red Hat.

The DynaCOR line is a Eurotech product focused on HPEC, providing high-performance and high-capacity compute with rugged certifications in specialist locations. Packages offer multiple liquid-cooled, high-end GPU options, nonvolatile memory express (NVMe) and (with no fan and no moving parts) can operate in any climate with no air conditioning requirements. The units install into a HPEC docking station, allowing swapping without having to deal with water pipes or cables.

A use case for such devices is in the training of highly complex AI models in the field. An example would be training fully autonomous vehicles, where local processing in the vehicle determines the models used in regular vehicles. The device must cope with the rigors of the physical movement of the car. The more extremely protected versions are onboard servers on rail or in challenging production environments. Other versions tolerate mild shock and temperature, such as those for 5G base stations.

Eurotech also produces more traditional edge gateways used across IoT for edge analytics and wrangling multiple IoT sensors. The three-tier model of sensor, gateway and cloud for IoT is not relevant in all use cases, and increasingly a distributed architecture is used more. Eurotech also offers an edge server, with APU/GPU acceleration for system-wide computations such as factory predictive maintenance.

Competition

Spanning IT and OT infrastructure provides competition from several directions: ADLINK for general IoT edge computing and gateways, embedded computing manufacturer Kontron (part of the S&T technology group) and Wireless Logic in M2M communications. Abaco Systems operates in the emerging HPEC area.

An ever-increasing move to the edge, especially in OT, is bringing potential competition from generalized IoT platform plays from AWS, Microsoft, Google and IBM, as well as industrial providers like Siemens. With the emergence of 5G, telcos are looking to provide management and communication, and subsequently orchestration, to complex IoT and M2M environments.

Edge, in all its flavors, is seeing significant startup activity, especially in industrial IoT, with IT-friendly OT-focused offerings such as those from Litmus Automation. We also documented the IoT impact on edge and core datacenters in our Market monitor report and in our report Edge and Fog: Where Are They Now?

SWOT Analysis

STRENGTHS	WEAKNESSES
The company has longevity of engagement in OT, but with an IT approach that is combined with strong and specific IP around performance compute that is now needed at the edge.	As a specialized partner in many projects, Eurotech has not always managed to communicate its influence across all of IoT.

OPPORTUNITIES	THREATS
The dawn of truly distributed and powerful compute as IoT and AI evolve is a sweet spot for Eurotech across all verticals.	While IoT platforms are difficult to differentiate, edge products often have significant differences and have a hardware and software component. The focus is on high-value assets, but the high-volume, low-value players may eat into that over time.