

# Shunting data

With its key expertise in supplying embedded electronics and computers, **Eurotech** provides platforms that are used throughout the rail industry

In September 2010 improved data was sought to justify rail infrastructure improvement spending by the UK Public Accounts Committee. Under the chair of Margaret Hodge, the fifth report, *Increasing Passenger Rail Capacity*, was recommended by the members of the committee.

'The department should require all new train carriages, whether procured by the department itself or by franchisees, to be fitted with automatic passenger counting equipment to show the numbers of people travelling on what trains and when. It should require franchisees to provide useful and verifiable data from that counting. It should also report back to the committee on progress to establish a computer system to capture, analyse and report on this data.'

There is little doubt that the rail industry is entering a transitional phase. Organisations are now paying greater attention to how technology can improve operational efficiencies and safety, while enhancing the customer experience both on board and at trackside locations such as stations. As this

trend continues, the key to obtaining these goals lies not simply in deploying point-in-time solutions that address a particular stakeholder's needs, but in interconnecting these systems and their data to drive new services, business models and revenue streams.

Eurotech is well placed to take advantage of this trend with a set of software components and rail-qualified hardware that together allow OEM's, systems integrators and end users to concentrate on the elements of a project that add real value to their proposition. The operator can use business logic as well as enterprise data analytics and dashboarding, without having to worry about the complexities of the enabling platform for data management, security, connectivity management and application enablement (device management).

## Eurotech

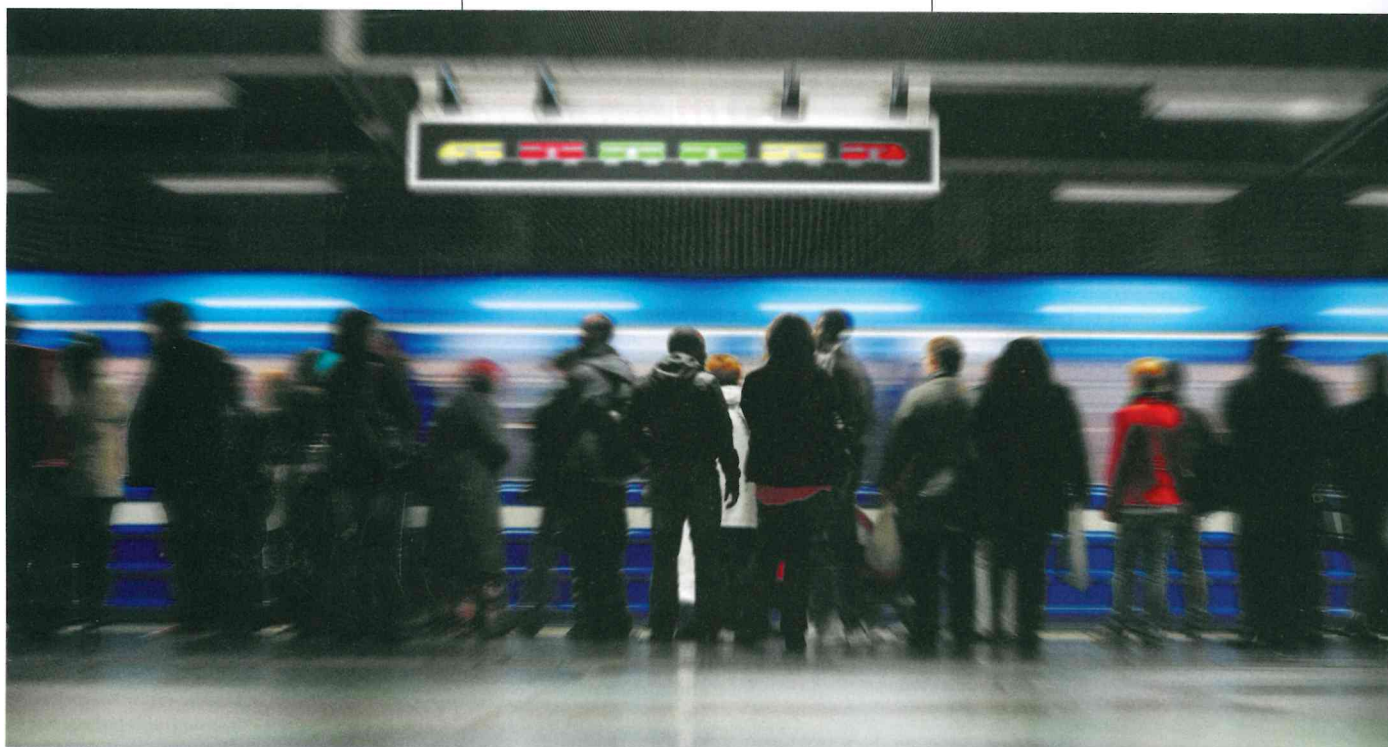
Eurotech is a global organisation with headquarters in Italy and has a core history in the supply of embedded electronics and computers to the rail, defence and industrial markets. The company started initially with single-



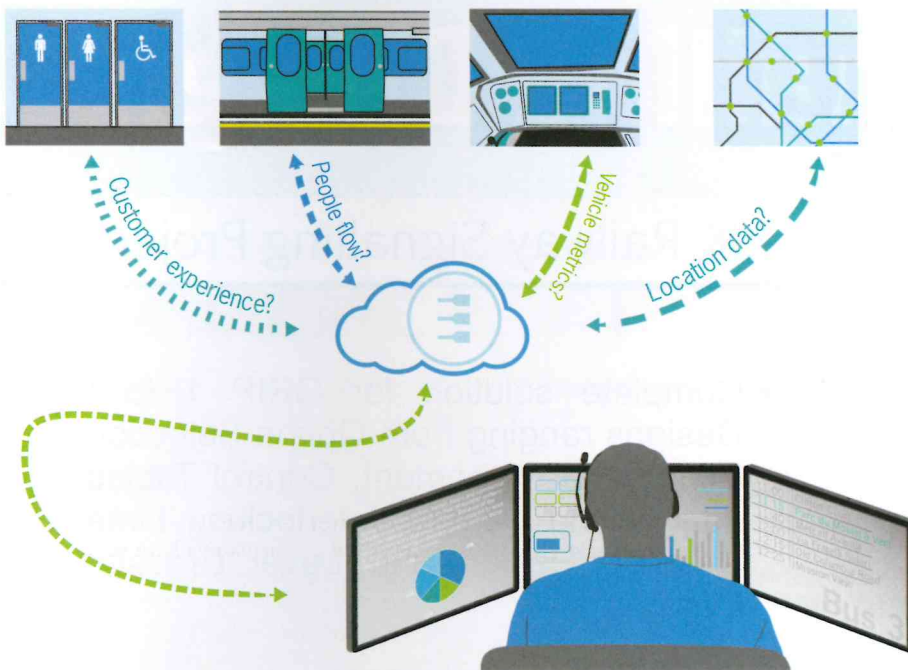
board computers but increasingly has progressed up the value chain to provide fully qualified, field-deployable platforms.

Its equipment lies at the heart of the products of major corporations and spans applications such as smartcard ticketing, positive train control, driver consoles, people and passenger counting, trackside monitoring, PIS (passenger information systems) and CCTV. Importantly however, a section of its business has specialised in protocol translation for many years, and has integrated legacy field devices into modern control and communication systems.

As part of this business, it has developed an architecture that addresses issues that include device and connectivity management, communications security and the sharing of data between multiple M2M (machine to machine) assets and enterprise systems. These, in fact, are all of the







key characteristics that are needed to assemble infrastructures for what has become known as the IoT (Internet of Things).

This architecture has evolved over the last 15 years from an internal toolkit into a comprehensive M2M integration platform. The EC (Everyware Cloud) is available to use with both Eurotech and third-party devices, significantly reducing the cost and risk of implementing new IoT-style systems.

EC has been developed to offer scalability and flexibility, allowing low volume proof-of-concept projects to grow into full implementations without the need for architectural changes. Due to its schemaless, noSQL database, data from new sources is automatically added as it is published, removing the need to restructure the database and define the interrelationships with each new sensor.

#### Opportunities in rail

The solution has wide potential applicability within the rail industry because it removes the requirement to build complex and expensive infrastructures that allow systems and devices to work collaboratively. With the EC, M2M integration platform, organisations can explore and exploit new relationships between passengers, staff, rolling stock, timetables and estates, coupled with ranges of pre-qualified, ready-to-use hardware platforms that can simply be deployed in rail edge applications.

#### Preventative maintenance

It is obvious that if the condition of an asset can be monitored then it is possible to spot trends or symptoms that indicate an impending failure, which allows the problem to be fixed without causing a

loss of service. The challenge to the rail industry is in the diversity of assets that need to be monitored, covering elements as diverse as points heaters, electricity supplies, wheel bearings, doors, and vacuum toilets.

This diversity has historically meant that either no monitoring system is available, or a system dedicated to monitoring one particular function is deployed, without any consideration of the wider use of the data it produces. For example, if data was consolidated about a particular supplier part, from multiple operators and different service conditions it would provide more reliable data that would aid both operators in the selection of components and the manufacturers in their process of continuous improvement.

#### Geocentric data

For a long time, the idea of modifying PIS 'infotainment' content in line with the current location of a train has been discussed and, in some cases, even implemented. The opportunities for geolocation data, when applied across the multiple systems in use on train and trackside, are even greater.

The industry is already discussing the use of passenger counting on trains with a real-time link to approaching stations so that users can queue in the most efficient position on the platform, but the potential stretches much wider. For example, knowing the number of incoming passengers could allow HVAC (heating, ventilation, and air conditioning) systems to be adjusted ahead of demand, or could feed into local taxi firms to improve waiting times for those waiting at taxi ranks.

Energy consumption coupled to track position can produce more efficient driving practices, while plotting the

position in which failures occur may yield valuable information on contributing or aggravating factors to the failure.

#### Static infrastructure

The benefits of adopting technology are not limited to the on-board environment. Adding asset monitoring to the property estates also produces benefits both in terms of efficiency savings and customer experience enhancement. Monitoring the number of people using washrooms allows maintenance regimes to be based upon usage rather than time. This in turn produces a better customer experience at times of heavy usage, avoiding unnecessary service visits in times of low demand that produce savings both in manpower and consumable use.

Monitoring entry to unmanned buildings is useful not only from a security standpoint but also from a manpower planning perspective. Environmental monitoring around public or large work sites provides a useful check for pollution control and also identifies potential revenue streams in terms of wider data reuse.

#### The real take home point

Applying solutions to any of the above problems, or the plethora of other challenges facing the rail industry, can produce business benefits – whether in terms of efficiency savings or new revenue streams. However, in many cases the economics don't stack up, due to the cost of the monitoring solution and infrastructure of a point-in-time solution. Leveraging the emerging technologies that will drive the IoT revolution will offer new ways to spread common infrastructure and middleware costs across a range of systems. Thereby bringing the average cost of all systems down, enabling the monitoring of assets that would otherwise be uneconomic with a dedicated system.

This cost benefit is multiplied when the ability to share data across systems is also factored in because it allows users to both investigate new dependencies between processes and start to apply optimisation across the whole ecosystem of customers, suppliers, logistics and regulation. Eurotech believes the adoption of architectures based upon M2M integration platforms like its own EC and smart, multiservice gateways – such as the rail-qualified DynaCOR 10-00 – is a fundamental precursor to the implementation of the systems that will release the full potential of the IoT vision within the regulatory framework of the rail industry.

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