

## **INDRA BRINGS THE NEW SMART AND SECURE IOT GENERATION TO THE RAILROAD SECTOR**

- **Indra is working on innovating wireless communication-based solutions to interconnect infrastructure and train devices with control centers and cloud platforms for the streamlined and straightforward deployment of new services using DevOps.**
- **These solutions will improve security and interoperability in critical areas such as level crossings, increase infrastructure capacity, determine and manage train configurations, and guarantee the monitoring of cars and loads, among other advantages.**
- **These new developments boost Indra's leading position in smart mobility and secure IoT technologies for the railroad sector, scarcely explored until now due to the dependence on infrastructure based on cables and strict security requirements.**

**Madrid, June 6 2018.-** Indra has started to develop and test new solutions designed to improve rail transport safety, efficiency, interoperability and service, as part of a new generation of smart, secure and reliable Internet of Things (IoT) systems.

The company is involved in the European R&D SCOTT project, working on developing new solutions and products based on secure, reliable and interoperable wireless communication technologies, to allow the different rail infrastructure elements and devices and those on board the trains to communicate with each other and with control centers and/or cloud platforms. The ultimate goal is to create new high value-added services. The project, co-funded by the Ministry of Energy, Tourism and Digital Agenda and the European Commission, also encourages the development and use of low-consumption and energy efficient devices.

Indra is leading the industrial cases, as well as the railroad domain and the related use cases. The company also contributes its IoT secure processing hardware platform for rail transport InVITALRAIL, which can integrate all kinds of on-board devices, as well as those already deployed in the infrastructure. The aim is to develop V2X (vehicle-to-everything) wireless communications, move toward a secure smart platform that integrates the data provided by the different monitoring and control elements (such as sensors and actuators) and, based on these, develop multiple innovative applications to deploy new railroad services, reducing the need for investment and operating costs. This also enhances interoperability with other means of transport.

### **Improvement of security, interoperability and efficiency**

Specifically, Indra will develop solutions to improve security in critical areas and monitoring and maintenance of rolling stock and infrastructure, using distributed wireless communications and semi-energy-autonomous networks, with devices powered exclusively through energy collectors, an area still in its infancy in the railroad domain.

These solutions will bring a viable and low-cost solution that is compatible with existing systems to railroad lines where there is no network infrastructure or that are difficult to access, eliminating potential security shortcomings in critical areas such as level crossings, road junctions or work areas without needing to use traditional cabling systems. They will also enable interoperability with connected and autonomous vehicles, for example, warning them that a train is approaching a junction, and they will help with rolling stock logistics, goods monitoring and other services.

Vehicle-vehicle (V2V) and vehicle-infrastructure (V2I/I2V) wireless communication and WSN (Wireless Sensor Networks) are some other technologies used in the project. Indra will develop new solutions designed to facilitate communication between trains and between these and the infrastructure, bringing an extra system to centralized security systems which can handle incidents in critical time more efficiently. These solutions will

reduce the necessary safety distance between trains and increase line capacity, and allow virtually coupled train formations instead of the current mechanical, electrical and pneumatic connections that involve high safety risks and time and staff costs.

Through the wireless link, trains can share information about their configuration, position, power, vehicle mass and length, and establish a control hierarchy so that a train can issue commands to the other virtual train convoys and communicate efficiently with its surroundings, making it easier to predict potential incidents along the layout. It will also allow the train convoy to be coupled without actually physically connecting them and provide an infrastructure for future train automation services.

Indra also defines and develops multimodal systems and services in the cloud to combine rail transport information, through the aforementioned autonomous wireless network, with information about connected vehicle traffic for use in terminals, stations etc. enhancing transport efficiency and passenger experience.

### **DevOps allows the devices and new services to be developed**

These new solutions are compatible with existing railroad infrastructures, allowing them to be adopted easily. In addition, to allow the IoT devices and associated services to be deployed, reducing time, cost and possible errors, Indra is working on using DevOps within the framework of the European R&D&i ENACT project, as part of the European H2020 innovation program.

DevOps is a set of software engineering tools and best practices that guarantee maximum quality and the ongoing development of complex systems, promoting agility, rapid innovation cycles and ease of use, due to being able to perform simulations ahead of actual deployment. This methodology has been widely adopted in the software industry, but as yet there is no full DevOps support for smart and reliable IoT systems.

Indra is leading the definition of requirements and use cases under the ENACT project, linking them to the business model. It will also use DevOps for a new service that uses IoT to monitor, control and manage the configuration and integrity of the Gulbene tourist train in Latvia.

Apart from this major contribution, Indra also brings its IoT secure processing hardware platform for rail transport InVITALRAIL, and the platform with IoT and big data capabilities from Indra's digital transformation unit, Minsait IoT SOFIA2, to the project.

### **Heading smart mobility in the railroad sector**

The developments under the SCOTT and ENACT projects reinforce Indra's leading position in smart mobility and as a pioneer in the inclusion of new smart and reliable IoT technologies in the railroad sector, scarcely explored until now due to strict security requirements and high growth potential. A large percentage of current railroad systems are based on wired solutions that can be replaced with modern and secure wireless solutions to allow significant financial and energy savings, as well as increasing safety, efficiency and interoperability.

As well as these projects, Indra actively participates in the main European innovation initiative in the railroad sector, Shift2Rail, of which its highest governing body is a member. The company is involved in the IP2 program, focused on developing advanced rail traffic control and management systems, in the IP4 program, which develops new ICT solutions and services that improve the passenger's experience and the appeal of the railroad by working on areas such as interoperability, ticketing, new payment methods and information systems, and in the IP5 program, which is aimed at moving toward more efficient, sustainable and competitive goods transport.

In addition to its solutions and experience in rail transport, Indra contributes to innovation in the sector with its digital capabilities and wide-ranging expertise in a number of industry sectors, supporting synergy generation and technology transfer between different fields, as well as driving more integrated and intermodal mobility management.

Commitment to innovation has allowed Indra to become one of the leading companies in the rail sector. Indra's cutting-edge technological solutions have placed it at the global forefront of the sector, having successfully



## Press release

deployed systems in different countries worldwide, including the USA, Australia, Mexico, Colombia, China, India and Malaysia.

### **About Indra**

Indra is one of the world's top technology and consulting and a technology partner for the key operations of its customers' businesses worldwide. It is a leading worldwide provider of proprietary solutions in niche areas in Transport and Defense Markets and the absolute leader in IT in Spain and Latin America. It offers a comprehensive range of proprietary solutions and cutting edge services with a high added value in technology based on a unique culture of reliability, flexibility and adaptability to the needs of its customers. Indra is a world leader in the development of end-to-end technology solutions in fields such as Defense and Security, Transport and Traffic, Energy and Industry, Telecommunications and Media, Financial Services, Electoral Processes, and Public Administrations and Healthcare. Minsait is Indra's digital transformation business unit. In 2017 Indra posted a revenue of €3,011m, employed 40,000 professionals, and had a local presence in 46 countries plus sales operations in more than 140 countries.