

How SNCF used the Eclipse Keyple SDK to facilitate MaaS and gain greater control of its ticketing offer



SNCF group, a leader in mass transit and the European champion of high-speed rail, is the operator of the second largest rail network in the world.

Its subsidiary, SNCF Voyageurs, enables both long-distance travel, in France and Europe, and everyday commuter mobility. It provides passengers with shared and door-to-door mobility solutions (MaaS) that meet passenger needs in terms of offer, cost, service quality and environmental protection.

To help achieve this, SNCF Voyageurs turned to Eclipse Keyple, a simple, universal and open tool for developers to effectively produce the next generation of innovative smart ticketing solutions...

THE SITUATION

The Ticketing Division of SNCF Voyageurs is the centre of ticketing expertise for the entire SNCF group; with 550,000 tickets sold every day, our ticketing offer is broad and diverse. Additionally, in France we collaborate with several long-standing partners: **RATP**, **OPTILE** and **IDFM**. Therefore our ticketing assets must meet all the needs and requirements expressed by multiple organising authorities.

France is also one of the world's leading tourist destinations and is as popular with international visitors as it is with French citizens. Attracting national and international visitors to travel by train and therefore reduce their ecological footprint is important and we need to ensure that we offer a range of ticketing solutions to meet each passenger's unique requirements.

THE CHALLENGE

SNCF Voyageurs ticketing systems must, first and foremost respond appropriately, reliably and securely to ticket control, validation and distribution needs, in order to ensure a functioning network.

Newer ticketing requirements, such as Mobility-as-a-Service (MaaS), offer seamless combined door-to-door travel, but to achieve this, SNCF needed to integrate MaaS solutions for all passengers and ensure interoperability between operators, regions and countries.

This was no easy task. It required the adoption and application of international standards, for MaaS and other innovations, so that SNCF adapted to growing diversity and competition in the industry.

“Being part of a community like Calypso Networks Association (CNA) makes facing these challenges easier. CNA brings together the brightest minds within the transport and mobility community to collaborate and enhance transport ticketing and by being involved, SNCF Voyageurs are actively participating in the drafting of standards documents that benefit us and passengers.”

Nicolas Generali,
Deputy Director of
Ticketing at SNCF

THE SOLUTION

Several years ago, SNCF began to develop BOX, its integrated, multi-platform ticketing solution. Its aim is to install BOX technology wherever possible, to standardise and homogenise the services provided to applications deployed in all types of control, validation and distribution equipment.

BOX technology has recently been upgraded to include Eclipse Keyple, the open-source software development kit (SDK) that CNA developed and donated to the ticketing community. As an open API, it helps give SNCF easy, low-cost access to advanced – and compliant – smart ticketing software. This gives SNCF complete freedom to evolve its back-end setup without needing all its developers to be ticketing experts.

WHAT IS ECLIPSE KEYPLE?

Keyple offers open and fully documented APIs, providing a framework that enables developers to design smart ticketing software for ticketing terminals that manage different transaction layers.

It ensures transport operators and authorities have easy and low-cost access to advanced, compliant smart ticketing software to help them evolve freely and implement their own software modifications without relying on their existing hardware provider.

From a technical point of view, Keyple exposes high-level APIs and provides an abstraction layer that frees it from the specificities of hardware. This is especially useful for connected devices such as readers, storage devices and secure elements (eSE, HCE, etc.). This abstraction layer is supported by plugins developed specifically for each type of hardware.

“As we use Calypso standards, the use of Eclipse Keyple for our BOX technology came about very logically and was a natural extension. It means that we can have a single generic software suite, regardless of equipment supplier, and no longer need to adapt our on-board software to the various sales, validation or control equipment used. It also enables us to ensure native compatibility with the latest developments to the Calypso standard.”

Laurent Poncin,
Ticketing Qualification and
Support Manager at SNCF

THE RESULT

At SNCF, Keyple was implemented by either its internal Connect&Tech subsidiary or its external CDS Billettique development teams. As the Keyple code is Open Source and published on the Eclipse Foundation website, both teams could use and access Keyple code to develop SNCF's technology.

“We found that Keyple is not at all complex to implement and the learning curve is fairly quick; it takes only a few weeks to achieve a good level of mastery. However certain technical issues, whether specific to ticketing or not, may need to be considered and require subsequent adaptations to user applications or Keyple itself. We encountered one or two small problems, which is normal for any tech project, but the overall integration of Keyple into several of our developments has not presented any major difficulties, and nothing put our projects at risk.”

Patrick Marion, Ticketing Project Manager at SNCF

Because Calypso technology is created by the transport community for the transport community, it stays relevant, innovative and constantly evolves in line with feedback expressed by customers and users. Keyple's highly responsive support team, with extensive expertise in the field, worked closely with SNCF to help ensure that delivery milestones were met and that the project was supported throughout its development.

SNCF has been using and promoting Calypso standards since its creation, as it provides a solution that can be adapted to the different needs and contexts of each region, enabling SNCF to achieve interoperability for ticketing at regional level.

Now, the flexibility and independence of Eclipse Keyple also gives SNCF more control of its ticketing system, rather than leaving it at the mercy of proprietary vendors, and further facilitates interoperability between different systems and equipment.

“We'd have no hesitation in recommending Eclipse Keyple and Calypso to other networks interested in enhancing their system to provide new ticketing services that improve the passenger experience and encourage more users away from private vehicles. Open ticketing standards and tools, particularly Calypso and Keyple, form a key pillar of our development strategy for the next five to ten years. We can confidently say today that without Keyple, it would've been very difficult for us to successfully modernize our ticketing system! This is especially important as we respond to increased competition from alternative forms of transport.”

Nicolas Generali,
Deputy Director
of Ticketing at SNCF

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- ▶ [Why CNA?](#)
- ▶ [Keyple eBook: “Blueprint for a Smarter Future”](#)
- ▶ [Eclipse Keyple Brochure](#)
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