Leading ticketing to open source
A challenge for Calypso
Calypso, an Open and Secure Contactless Ticketing Standard

Calypso deployment
125 cities & regions
25 countries
150 million transportation smart cards
490 000 readers

Challenges of providing a ticketing standard as open source
What is Calypso today?

1. A set of specifications describing a fast and secure off-line contactless transaction, between a portable object and a terminal

2. A guarantee of security and interoperability which relies on a total compliance with existing standards

3. A solution owned by users and managed by its users - not by manufacturers
Calypso products, fitting with Transportation Operators & Authorities needs

Calypso Applet
Triangle for Interoperability
HCE security specifications
Transport services are more and more open

Challenges of providing a ticketing standard as open source
What level of openness for Ticketing?

A question to be studied for the two main components of ticketing systems:

• Cards and portable objects (mobile phones, Java objects, wearables, ...)
• Terminals (validators, vending equipment, ...)

and with the complementary concern about guarantee of security
Openness at the level of cards and portable objects

Openness is achieved for cards and portable objects with the Calypso standard: a large choice of products and providers and a real competition.

<table>
<thead>
<tr>
<th>Supplier</th>
<th>Morpho</th>
<th>Gemalto</th>
<th>Any embedder (Oberthur, etc.)</th>
<th>Watchdata</th>
<th>Oberthur Technologies</th>
<th>ASK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product</td>
<td>Calypso MoneoPass</td>
<td>Celego Calypso G1</td>
<td>CDs3 by Innovatron</td>
<td>Calypso TimeCOS</td>
<td>cityGo Calypso</td>
<td>tanGo for Calypso</td>
</tr>
<tr>
<td>Revision</td>
<td>REV 2.4</td>
<td>REV 2.4/3.1/3.2</td>
<td>REV 2.4/3.1</td>
<td>REV 2.4/3.1</td>
<td>REV 2.4/3.1</td>
<td>REV 1/2.4/3.1/3.2</td>
</tr>
<tr>
<td>Chip</td>
<td>Atmel</td>
<td>Infineon</td>
<td></td>
<td>Samsung</td>
<td>STMicroelectronics</td>
<td></td>
</tr>
</tbody>
</table>

Challenges of providing a ticketing standard as open source

07/06/2017

7
And for Ticketing equipment?

- Terminal applications operating ticketing data (contracts, pricing, user profile) have to be implemented on top of a smartcard management layer.
- Today, implementing a ticketing solution often requires a big investment.
- Only few big transport networks have the control of their solution by requiring the support of specific API to terminal manufacturers, in order to manage themselves their ticketing application.
- But most of networks are linked to a ticketing integrator/manufacturer and evolutions may only be managed in a “purchase by agreement” manner, with a direct impact on the price.
How to facilitate new mobility & multiservice in this context?

How to integrate new mobility actors?
Car sharing, bike sharing, electrical scooter sharing ...

How to help the new mobility actors to be ready for global integration without being “killed” by complexity and security issues?

How these emerging actors can benefit of the highly secured Calypso transaction “as a service”, and consequently avoid to invest heavily in ticketing?

How Calypso could become the reference in the secured authentication field “Secure Element based”? 

Calypso Networks Association
Leading Ticketing to open source

• It is now time that Ticketing follows the way opened by Passenger Information!

• By opening up to new principles

• By facilitating its access to new actors

• And so facilitating integration of Public Transport ticketing with new mobility services, multiservice in the City

• But in respect of security and interoperability

• OPEN SOURCE is the way that Calypso intends to follow.
A Calypso SDK in order to become the reference in Secured Authentication

**Summer 2017**
First SDK Application
- Communicating with a Calypso SE & integrating readers
- Calypso Secured Identification

**Next Step**
A full ticketing tools kit
- Managing a Calypso portable object
- High level service API
The Calypso SDK: a reference library to facilitate the implementation of Calypso for the full range of terminals

To facilitate the implementation of Calypso for an as exhaustive as possible range of terminals:

• An open source library available both in Java & C++:
• Designed on a mutual Object-Oriented Model
• Compatible with any terminal architecture: mobile/embedded/server
• Interoperable with any smart card reader solution: standard/proprietary, local/remote
• Managing the advanced security features of Calypso
• But also able to manage non-Calypso smartcard solutions, for ticketing or payment.
A SDK answering to all needs

The SDK can be extended at any level: above the SE Proxy, at generic commands’ set layer, or higher, to add Calypso processing, or to manage other kinds of SE solutions.

A promise:
Ticketing processing implementations independent from the terminal architecture
CNA services
Assistance for Calypso SDK integrators
Consider to animate an Open Source community

Become a member of the Eclipse Foundation Smart Cities project

Support Transport Hackathon
Competition targeting innovative solutions in the field of mobility

- 260 members
- 360 projects
- 1400 active developers.
Thank you

Questions?