AGENDA

• Technical updates:
  • Calypso products range
  • Mobile ticketing
  • Card functional certification
  • Keyple and Terminal Certification
  • Open SAM

• Some Calypso key figures

• Membership fees 2024

• A few words about Calypso vs Open Payment

• 3 workshops to attend:

<table>
<thead>
<tr>
<th>Open SAM</th>
<th>ABT</th>
<th>Eclipse Keyple and Terminal certification</th>
</tr>
</thead>
</table>
Calypso
Networks Association

Technical updates
Product Range
Calypso Product Range

PRIME
LIGHT
basic
APPLET
HCE

Calypso Open Tech Day - November 2023
Latest News

Calypso® basic IS AVAILABLE!!

Certified Components*

infineon

RFID Certified products

nagels PARAGON ID

CONFIDEX infineon

* Functional & Security certification
Mobile Ticketing
Applet & HCE
Applet on Secure Elements

For eSE and Java Card

Java Card and GP compliant
- Similar to a Calypso Prime native card
- Generic
- Maintenance to follow GP and Java Card evolutions
- Adaptation to customer needs
- For mobiles and Java Cards

Free licence

For CNA Members
- Free licence
- Certification Prime
- 30 products certified since 2016
- 2 in 2023

Latest news

v 1.3.x versions last few years
- provides the features of Calypso Prime Regular

v 1.3.10 (01/2022)
- support of GlobalPlatform predictive challenge then regular publication of new features

v 2.0 in progress (January 2024)
- Prime Regular fully compliant with Calypso REV3.3 ed 2 spec
- Full support of Calypso Prime Extended & PKI modes
Calypso HCE

2016 to 2018 – Calypso HCE Specifications

2018 – Calypso HCE Guidelines

From 2021 – Calypso HCE SDK Certification Process
This process is a tool at the attention of the PTO which would like to have a formal insurance of an acceptable level of security of their Calypso HCE solution

Latest news

Calypso HCE v1.5 launched
• Reference specification is Calypso Prime Revision 3.3 Edition 2
• Support of PKI mode added
• Editorial evolutions

Calypso HCE functional certification process
• Postponed 2024
3

Card Functional Certification
Calypso Test Suite for Basic

Version 1.2.1

• First version validated
• Full compliant with the Calypso Basic 1.1 specification
• Bug correction

Released in November 2022
Calypso Test Suite for Light

Version 1.2.0

- Full compliant with the Calypso Light 1.2 specification
- Bug correction

Released in November 2022
Calypso Test Suite for Prime

Version 3.1.0

- Full compliant with the Calypso Prime Revision 3.3 Edition 2 specification
- For Calypso Prime Native & Calypso Prime Applet
- Allows certification with all or a subset of modes (PKI, Extended, Regular)

Released in November 2022

Version 3.2.0

- Improved test coverage
- Bug correction
- Will be applicable for all new certifications as soon as it is released

Expected in January 2024
Calypso Test Suite for HCE

Version 1.0.0

• Will be compliant with the new version 1.5 of Calypso HCE specification

Expected in 2024
4

Eclipse Keyple & Terminal certification
Terminal Requirements

**Reader Layer Requirements**
Requirements of the lowest level of the transaction related to the management of all types of cards and SAMs by a smartcard reader.

**Calypso Layer Requirements**
Specific requirements for the management of Calypso cards and SAMs in strict compliance with Calypso specifications.

**Ticketing Layer Requirements**
Requirements on the use of the Calypso high-level API.
Best practices to follow in a Calypso ticketing system.

The reference documents for developers of the different components of a Terminal.

A developer no longer needs to start from the card specifications to develop a Terminal.
Terminal certification steps

Since December 2020 – Terminal requirements and recommendations published

Since 1st September 2021 – Declarative procedure available

Expected 2024 – Terminal certification
Certification of the Reader based on the Reader Layer Requirements
Certification of the Calypso Library based on the Calypso Layer Requirements
Declarative Procedure

Not a certification.
Provides a guarantee that the vendor has read the documents concerning the terminal requirements and has undertaken to comply with them.

CNA sends to the vendor.
- A registration form
- An ICS (Implementation Conformance Statement) to complete
  - Product definition
  - Requirements declaration
    Check list with comments

Evaluation Committee reviews the ICS
- Analysis of discrepancies (m, M or C)
- Refining process with the Vendor

Registration on the CNA website
Guide for tenders available!

Call for tenders for cards, NFC mobile ticketing and terminals based on the Calypso standard

How to guarantee the complete opening of your ticketing system during a call for tenders

<table>
<thead>
<tr>
<th>Hardware/Software Type</th>
<th>Certification to be required</th>
<th>Registration letter to be required</th>
<th>Commitment letter to be required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware without Calypso library</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Hardware with Calypso library</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Equipment integrating the network's ticketing application</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Calypso library only</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Ticketing application only</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>
The target is a certification based on a technical evaluation made by an independent laboratory.

Next steps

- Development of test tools with the following principle: **Availability and ease of use**
  - Open-source software
  - Compatible with any type of terminal
  - Use of emulator and spy

Postponed in 2024

- Need for a terminal API evolution
  - Eclipse Keypop, new ECLIPSE open-source project

- Update test plans
new Eclipse open-source project to host Java & C++ code of the Terminal API defined by CNA

- Keypop code hosted by the Eclipse foundation but licensed under the “MIT license” → offers the widest licensing flexibility for any solution implementing Keypop interfaces

**first Keypop release November 2023** → major evolution of the terminal API to manage cryptographic processing through the use of extensions

- From the start - API extension for symmetric crypto based on the Calypso Legacy SAM (C1)

**Coming soon**

- API extension for asymmetric crypto to support “Calypso Prime PKI” (to perform dynamic card authentication without SAM)
- API extension for symmetric crypto based on the Calypso OpenSAM → use of the Calypso API for card transactions will be independent of the SAM solution

→ proposal of PKI extension for December 2023

**Keypop API ready for the coming Calypso Terminal Certification**
Eclipse **Keyple** - key strengths

Keyple, a set of libraries to operate Calypso processing in a ticketing terminal

- truly open-source
- strongly supported by terminal solutions
- really user-friendly for ticketing terminal developers
- highly interoperable with Calypso ticketing systems
- widest coverage of Calypso features
- rapidly & simply upgradeable and maintainable
Keyple Java – new features

Latest news

Calypso card processing

• Support of all features of Calypso Prime Regular & Prime Extended (including Calypso Basic, Light & HCE)
• prototype for Prime PKI scheduled for beginning 2024

Calypso legacy SAM processing

• Support of all SAM features involved in Calypso card transaction
• main SAM features for SAM management transaction (perso, settings, ceilings)

Calypso OpenSAM processing

• support for SAM functionalities involved in Calypso card transaction planned for the first quarter of 2024
OpenSAM
Calypso OpenSAM Status

<table>
<thead>
<tr>
<th>Card Transaction</th>
<th>Initialization &amp; Management</th>
<th>Certification</th>
</tr>
</thead>
</table>

Open for feedback!
Some Calypso key figures
Calypso and CNA health

Members evolution

Calypso cards shipped
Some key figures

- Active Technical Committees: 6
- Countries with Calypso deployment: 29
- Travel cards shipped in the last five years: 109m
- Certified products: 55
- Activated mobile solutions: 1.55m
- Estimated journeys delivered by Calypso each day: 33m+
- CNA approved cards*: 27

*Cards currently available and certified to Calypso and NF CEN TS 13709a
Alignment of membership fees
Evolution of membership fees

- The membership fees have not been increased since 2018.
- The bylaws of CNA precise at the article 6.4.2

  “The amount of the membership fee is determined each year by the board of directors [and notified to the Members and Adhering Members at the beginning of each fiscal year].”

  “In any event, the membership fee for Members with standard status may not exceed five thousand euros (EUR 5,000.00), subject to annual indexation, and the membership fee for Members with gold status may not exceed thirty thousand euros (EUR 30,000.00), subject to annual indexation”

- Consequently the Board members have validated the following membership fees for 2024 onwards
- Membership fee levels to be maintained for the next three years
## Membership fees 2024

<table>
<thead>
<tr>
<th>Member category</th>
<th>Present fee</th>
<th>Proposed fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transit authority, association</td>
<td>€300</td>
<td>€350</td>
</tr>
<tr>
<td>Transport or service operators with revenue of less than €1bn per year</td>
<td>€1,000</td>
<td>€1,200</td>
</tr>
<tr>
<td>Transport or service operators with revenue greater than €1bn per year</td>
<td>€3,000</td>
<td>€3,500</td>
</tr>
<tr>
<td>Manufacturers, integrators, and providers</td>
<td>€3,000</td>
<td>€3,500</td>
</tr>
<tr>
<td>Consulting companies and software providers with less than 10 employees</td>
<td>€600</td>
<td>€700</td>
</tr>
<tr>
<td>Consulting companies and software providers with 10-50 employees</td>
<td>€1,000</td>
<td>€1,200</td>
</tr>
<tr>
<td>Consulting companies and software providers with more than 50 employees</td>
<td>€3,000</td>
<td>€3,500</td>
</tr>
<tr>
<td>Gold member</td>
<td>€25,000</td>
<td>€28,000</td>
</tr>
</tbody>
</table>
A few words about Calypso vs Open Payment
And now ... the 3 workshops

- Open SAM
- ABT
- Eclipse Keyple & Terminal certification