

## Catalog of services provided by CNA for managers of ticketing system based on the Calypso license.

These services are addressed to the managers of ticketing systems based on the Calypso license, and not to the suppliers of equipment and solutions based on this license. They are mainly transport authorities and operators.

These services mainly concern the IT security and the quality of service of the ticketing systems, which is a major issue for these authorities and operators. The maintenance of a quality of service, in particular at the level of transactional performances, and of a level of security in adequacy with the expressed needs, is closely linked to the interaction between the software of the various equipments of the system and the transactional software kernel of terminal/customer support exchange, object of the Calypso license.

In order to meet the expectations of transport authorities and operators, CNA has set up exclusive services to improve the quality of service and to monitor and maintain the security of Calypso ticketing systems. These services are exclusive because they may require investigations and interventions in the transactional mechanisms of the Calypso licensed software.

## Description and pricing of Calypso software security services

### 1- Predictive, corrective and evolutive maintenance contract for Calypso security – Ref CNA/01

The security maintenance of a ticketing system based on the Calypso standard provided by CNA includes the following services performed on a lump sum basis under a maintenance contract:

- A technical and normative watch on the security of the ticketing information system based on Calypso

It is carried out on a continuous basis through various channels and sources, by collecting all information relating to security normative developments, recommendations or alerts from organizations such as ANSSI, and security incidents that have occurred in identical or similar areas on other networks. In this respect, the Security Club managed by CNA will provide a greater wealth of information. On this basis, CNA deduces the adaptations to be made to the Calypso security principles, implements them and makes its customer benefit from them.

- Monitoring, collection and analysis of data from the Calypso ticketing information system concerned

From tools allowing the monitoring and the collection of data produced by the ticketing system, CNA experts proceed to an analysis of these data, in order to detect weak signals potentially revealing a security breach or an intrusion attempt. This analysis implies taking into account the transactional mechanisms specific to Calypso, in order to correctly interpret the collected data.

## - Realization of evolutions and patches in the Calypso transaction

The analyses carried out previously may require an anticipatory or curative intervention, either in the Calypso software itself, or in the interfaces between the Calypso software and the ticketing system equipment software.

Depending on the case, either CNA issues requirements or recommendations to the manufacturers of the ticketing equipment software, in order to bring the corresponding corrections as a preventive or corrective measure, or CNA proceeds to the implementation of corrections or improvements in the Calypso software itself. CNA acts on behalf of the network operator to ensure the correct implementation of these patches by the manufacturers.

## Pricing for security maintenance of Calypso-based systems

The security maintenance service offered by CNA to transport networks with a ticketing system based on the Calypso license is subject to a maintenance contract whose pricing is linked to:

- The size of the network, which is determined by the number of annual transit trips provided by the network<sup>1</sup>.
- The level of service (SLA) chosen by the customer. The different levels of service available correspond to a commitment of means implemented by CNA, and not to a commitment of results.

CNA offers a basic maintenance service during normal business hours, Monday through Friday, from 9:00 a.m. to 5:00 p.m. The response time (handling of a request) is Day+1.

As an option 1, CNA offers a maintenance service from Monday to Friday, from 8am to 8pm. The response time (taking charge of a request) is Day+1.

In option 2, CNA offers a 4-hour response time.

Options 1 and 2 can be combined.

According to these two criteria (size and SLA), the pricing grid is as follows:

Network size	Basic	Option 1	Option 2
More than 3 billion trips per year	130 000 €	20 000 €	10 000 €
Between 1 and 3 billion trips per year	70 000 €	15 000 €	7 500 €
Between 200 million and 1 billion trips per year	30 000 €	10 000 €	5 000 €
Less than 200 million trips per year	15 000 €	7 500 €	5 000 €

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<sup>1</sup> According to the declaration made by the network concerned

These prices correspond to the annual maintenance prices. Invoicing is quarterly in arrears, at T0 (T0 being the start date of the service), T0 + 3 months, T0 + 6 months, T0 + 9 months.

## **2- Subscription to the Club " Security and Quality of Service of Ticketing Systems using the Calypso license» - Ref CNA/02**

In addition to the services and maintenance activities specifically dedicated to an operator or a transport authority within the framework of a contract, CNA offers an exclusive platform for the exchange and analysis of security and quality of service of ticketing systems based on the Calypso license. This platform allows the anticipation of security issues, compatibility between customer media and terminals, performance degradation, etc. occurring in a given network and context, in order to deduce anticipatory or corrective actions for other networks that have not yet been confronted with these problems. To benefit from this platform, operators and transport authorities must join the "Ticketing Systems using the Calypso license Security and Quality of Service Club".

The yearly subscription to this security and quality of service analysis platform for Calypso-based ticketing systems allows to benefit from the following services:

- Collection of all operating anomalies, security problems and frauds reported by member networks + monitoring.
- Analysis of anomalies and frauds, and proposal of short-term remedies (reaction measures) and longer-term remedies (prevention measures and permanent solutions).
- Organizing exchanges with the manufacturers concerned and all the authorities and transport operators.
- Realizing and/or managing preventive or remedial actions taken by manufacturers in response to the recommendations made by the Club's experts.

These analyses, as well as the implementation of the resulting modifications, may require access to protected elements of the technology or to the source code of the Calypso licensed software to which only CNA has access.

### Subscription fee for the Security and Quality of Service Club for Ticketing Information Systems based on Calypso

The fare charged depends on the size of the transport networks involved. The size of the network is determined by the number of annual public transit trips provided by the network<sup>2</sup> :

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|---|--------------|
| - More than 3 billion trips per year:               | 60 000 euros |
| - Between 1 and 3 billion trips per year:           | 50 000 euros |
| - Between 200 million and 1 billion trips per year: | 20 000 euros |
| - Less than 200 million trips per year:             | 10 000 euros |

These rates correspond to the subscription for one calendar year to the Calypso-based ticketing systems security and quality of service analysis instance.

In case the membership to the Club for year n starts after September 1st, the membership fee for year n amounts to 50% of the above rates.

The subscription is invoiced in one go in arrears.

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<sup>2</sup> According to the declaration made by the network concerned

## Training – Ref CNA/03

CNA provides a training program for Calypso license-based ticketing system managers, allowing them to acquire their own control over the main features of the Calypso software.

This very complete program goes from the generalities of contactless ticketing solutions to the specific elements of Calypso which are covered by the license, in particular the security principles, session/ratification mechanisms, cryptographies implemented, security keys management, description of Calypso operating system.

This program includes the following modules:

- Introduction to CNA and Calypso
- Best practices for open ticketing
- From the native card to the Java card
- Calypso specifications
- Calypso certification
- Calypso on NFC mobile
- Functional and technical principles of the Calypso session
- Calypso wearable application
- SAM and Security Keys in Calypso
- Secret and public key cryptography
- Additional Calypso Security Mechanisms

### Calypso Training Session Pricing

One half-day of training is required for two training modules. It is therefore necessary to count 5 half-days of training to cover the entire program.

The training can be dedicated to a group of up to ten trainees or be individual in the context of an inter-company training.

The rates are as follows:

- 2,200 euros for a half-day of dedicated training for a group of up to ten trainees, or 11,000 euros for all modules.
- 430 euros for a half-day of individual training as part of an inter-company training, i.e. 2,150 euros for all modules.

Invoicing is done at once in arrears.

## Other services provided by CNA

Calypso Networks Association has a team of international experts who have developed a deep knowledge of the system and have extensive operational experience in the transportation and mobility sector. The CNA team offers strategic support and expert guidance on best practices in the sector, in line with local, regional, national or global ticketing constraints.

CNA can provide other services for Calypso-based ticketing system managers.

These services include support and assistance in the implementation and deployment of ticketing systems using the Calypso license, or during major upgrades of these systems. These services do not require, a priori, access to the secret elements or source codes of the Calypso software and are therefore not exclusive to CNA.

However, the high level of expertise on Calypso of the consultants made available by CNA is a guarantee of quality services and optimum efficiency.

These services are provided in response to a specific request from a network and are subject to a dedicated quote, based on the following daily rates:

- Consultant: 750 €
- Experienced consultant: 1 050 €
- Senior consultant: 1 550 €