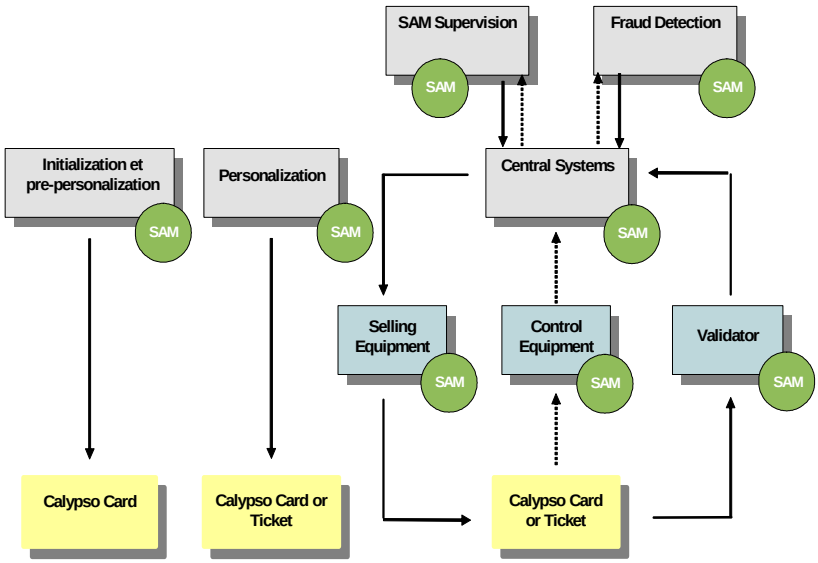
CLESS TICKETING & SECURITY

Ensuring the security of your CALYPSO* applications

Securing **contactless ticketing systems** requires using formal procedures which may be complex to manage.

Spirtech offers a complete range of services and products to help operators to start their projects and test their equipments.



THE SECURITY OF CALYPSO TICKETING SYSTEMS

Implementing a contactless ticketing system is done through the widespread use of **Calypso cards and tickets**.

These cards are used securely thanks to **Secure Application Modules** (SAM), which are themselves securely manufactured with other secure modules.

The security of a contactless ticketing system mainly relies upon using **secret keys** kept in the microprocessor cards and in the secure modules, acting as a safe box for these information.

These keys allow to **authenticate** the content of the cards and to **modify** it.

Terminals which communicate with a card at the various steps of its life cycle (manufacturing, initialization, personalization, normal use and end of life) and for the different normal uses (reloading, validation, control), must therefore possess a secure module enabling their specific rights toward the cards and tickets.

Products

- Secure Modules : *SAM S1*.
- Central security management tools : *SAM Supervisor, Fraud Detector*.
- Test tools and equipment analysis.

Services

- Security architecture specification (SAM and keys).
- Data model design.
- Key creation ceremony.
- SAM personalization.
- Tests of cards and terminals.
- Training, assistance, counseling.

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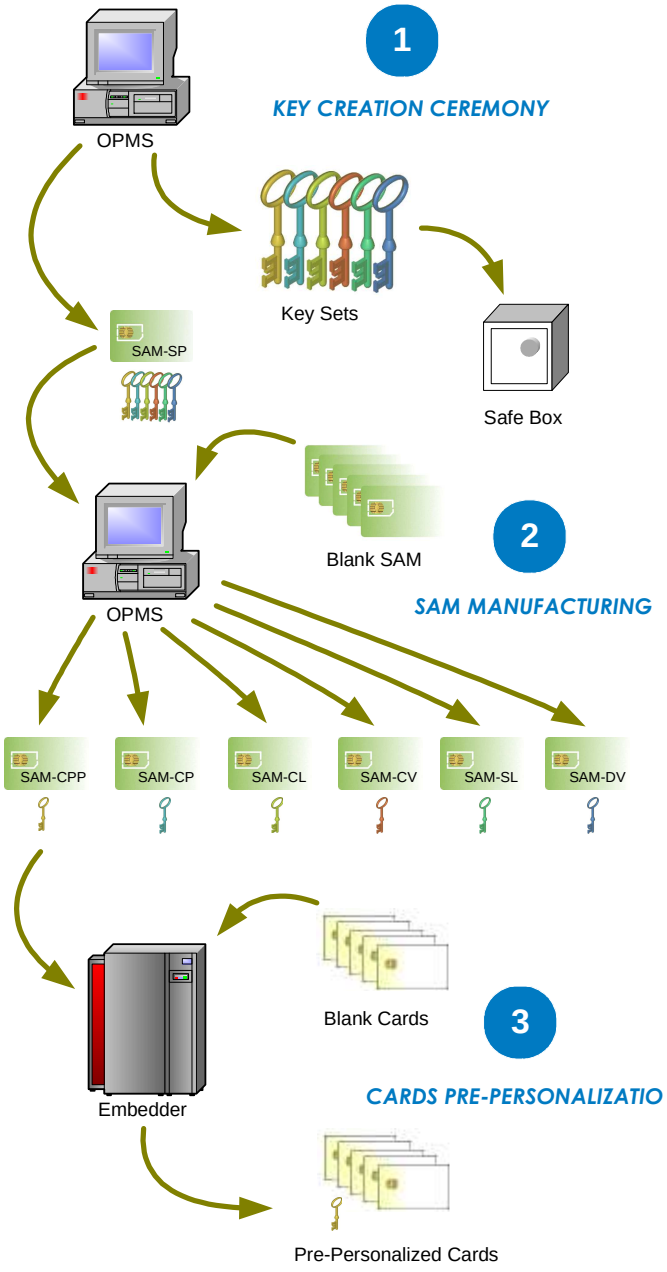
SPIRTECH Offer

Data Model

When implementing a contactless system, one of the first task is to define the coding of the ticketing data present in the Calypso cards and tickets.

This coding must be adapted to each network, usually on the basis of the EN1545 standard.

Spirtech offers counseling, technical assistance, training, and has developed validation tools to ensure the correct working of the equipments used for selling, validation and control.



Security: Keys and SAM

Using the Calypso security guidelines and specifications, the operator or regional authority must define the secret keys of the system, the storage rules in the SAM and the precise function of each type of SAM.

Spirtech offers a security architecture compliant with the Calypso specifications and may adapt it to specific requirements.

The transit networks must implement surveillance systems allowing to detect and analyze technological frauds, should they appear.

Spirtech proposes centralized security management tools.. The* SAM Supervisor *controls the secure modules and reloads the modules used for selling. The* Fraud Detector *observe the use of cards and tickets and generated alerts and reports in case of suspected fraud.

The Birth of a CALYPSO Card

❶ The **Key Creation Ceremony** has the following goals:

- Create the operational keys of the system and store them in a secure place.
- Ensure the confidentiality of the keys created during the ceremony.
- Create the master secure modules, SAM-SP, which contain all the keys of the system, and which will be used to manufacture the other SAMs.

Spirtech can organize the key ceremony under the control of the Regional Authority or of the operators.

❷ To **Manufacture the SAM** of the system, the SAM Personalization Tool uses the SAM-SP to securely introduce the keys into blank SAMs. Each SAM contains only the keys necessary to its operations.

If the operator wishes to manufacture itself the SAM, Spirtech may supply it with blank SAM and with the SAM Personalization Tool equipment and software. Alternatively, Spirtech may securely realize the key loading into the SAM, after having been entrsuted with teh SAM-SP of the system.

❸ The SAM-CPP contains all the keys necessary for the Calypso cards **Pre-personalization** (key loading). This operation is usually done by teh card manufacturer which then delivers the cards with the keys loaded.

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