SECURITY TARGET LITE CPS2TER APPLICATION ON ID-ONE COSMO V8.2

ISSUE: 1

DOCUMENT REVISION HISTORY			
Issue	**Date**	**Author**	**Purpose**
1.0	03/10/2019	IDEMIA	Initial version based on the full security target (FQR 110 9044, Ed 3)

IDEMIA

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1 Security Target introduction

1.1 ST Identification

Title	Security Target Lite CPS2ter Application on ID-One Cosmo v8.2
Reference	FQR 110 9201
Version	1
Date of Issue	03/10/2019
ITSEF	CEA-LETI
Certification Body	ANSSI
Author	IDEMIA
CC Version	3.1 Revision 5
Assurance Level	EAL4 augmented with ALC_DVS.2 and AVA_VAN.5
Protection Profiles	n/a

1.2 TOE Reference

The TOE is made up with the following components:

CPS2ter technical identification:

Name	CPS2ter Java Applet
Software identification (code SAAAAR)	0708312
Patch code identification (code SAAAAR)	093072

IAS ECC technical identification:

Name	IAS ECC Applet
Software identification (code SAAAAR)	077244
Certificates	ANSSI-CC-2019/33, ANSSI-CC-2019/34, ANSSI-CC-2019/35, ANSSI-CC-2019/36

Platform technical identification:

Name	ID-One Cosmo v8.2
Software identification (code SAAAAR)	091121
Certificate	ANSSI-CC-2019/28 [CR-PL]

IC identification:

Name:	NXP Secure Smart Card Controller P6022y VB* including IC Dedicated Software
Certificate	BSI-DSZ-CC-1059-2018 [IC-cert]

1.3 TOE Documentation

The TOE documentation is listed in the table below:

[AGD_PRE]	GIP-CPS on ID-One Cosmo v8.2 - AGD_PRE Pre-Personalization Guide, FQR 110 8975 Ed3. IDEMIA
[AGD_OPE]	GIP-CPS on ID-One Cosmo v8.2 - AGD_OPE Reference Guide, FQR 110 8976 Ed1. IDEMIA
[AGD_Platform]	ID-One Cosmo V8.2 Pre-Perso Guide, FQR 110 8875 Ed3. IDEMIA ID-One Cosmo v8.2 Reference Guide, FQR 110 8885 Ed3. IDEMIA ID-One Cosmo v8.2 Security Recommendations, FQR 110 8963 Ed4. IDEMIA

2 TOE DESCRIPTION

This part of the ST describes the TOE as an aid to the understanding of its security requirements and addresses the product type, the TOE scope, the intended usage and the general features of the TOE.

2.1 TOE OVERVIEW

2.1.1 TOE type & scope

The TOE is composed of the ID-One Cosmo v8.2 Java Card platform including an IAS ECC applet and a loaded applet also called CPS2ter, for secure storage of medical data and access to sensitive distant services. Therefore, the TOE is a smartcard providing the services of both IAS and CPS2ter on the same device. This intends to allow a smooth migration from the current technology of the “Agence des Systèmes d’Information Partagés de Santé” (ASIP Santé) known as CPS2ter to the future one called “CPS3” based on the “Identification, Authentification et Signature” standard (IAS). The CPS2ter application is an emulation in Java Card of the old native card executed besides and behind IAS considered as a front-end; if old APDUs dedicated to CPS2ter are detected they are automatically forwarded to CPS2ter by IAS for processing.

The Target of Evaluation (TOE) is defined by:

- an underlying Integrated Circuit (IC);
- the ID-One Cosmo v8.2 Java Card platform including Global Platform support;
- IAS ECC Applet running in contact and contactless;
- the CPS2ter Applet (with its patch code) running in contact mode only,

The product is closed, so that it is not possible to load any other applet after the point of delivery.

The Figure below gives a description of the TOE and its boundaries.

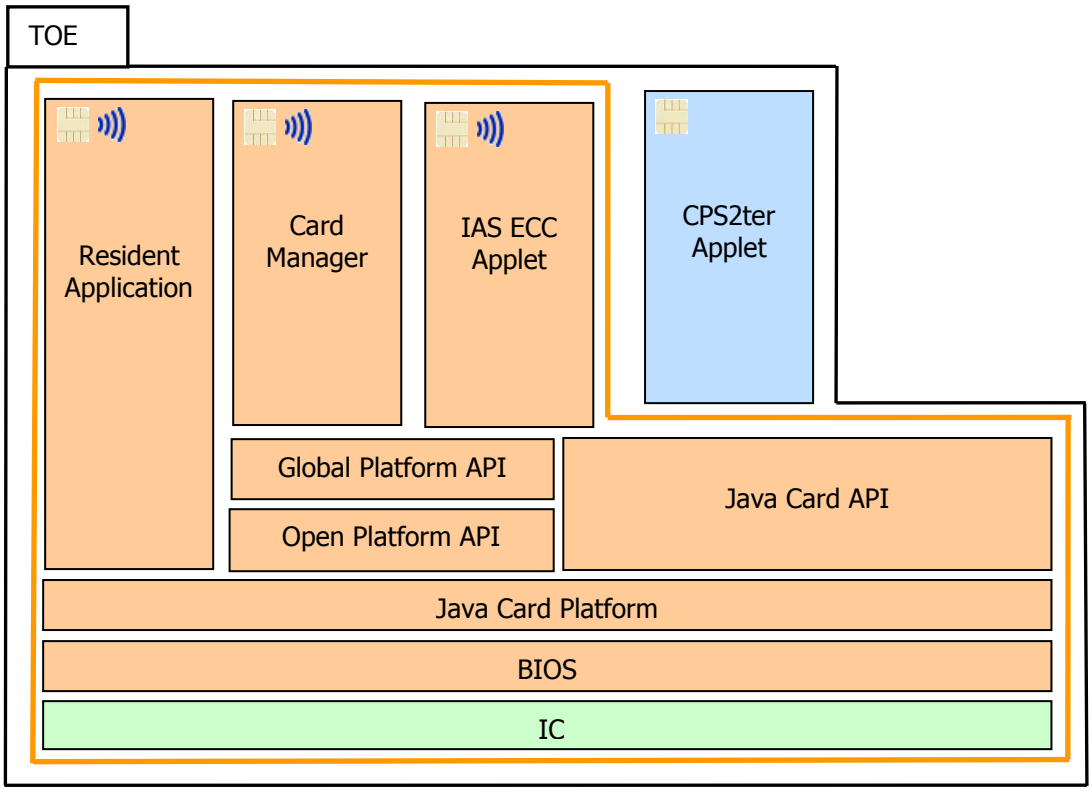


Figure 1 Smartcard architecture overview

2.1.2 Required non-TOE hardware/software/firmware

The TOE is an independent product and does not need any additional hardware/software/firmware to ensure its security.
In order to be powered up and to be able to communicate the TOE needs a card reader.

2.2 TOE DESCRIPTION

2.2.1 Global architecture

The purpose of the current Security Target is to specify and formalize security requirements of the CPS2ter application. Nevertheless, since it relies on both IAS and platform services, those entities are integrated in the current TOE.

For the enforcement of its security functionalities, CPS2ter relies on:

- the ID-One Cosmo v8.2 platform which provides a secure execution context and secures APIs, especially for key storage,
- the IAS shareable services for the management of PIN and the forwarding of APDUs.

The current CPS2ter application is considered as a bridge from old to new technology. Therefore one of the main objective is to migrate in a way users are unable to detect the evolution. That's why terminals will send all commands to IAS which will be responsible for forwarding if required to the correct application.
In the same way, managing PIN by IAS allows keeping PIN data when migrating to a full IAS infrastructure.

It is important to note that CPS2ter applet will be able to be addressed directly in "selectable mode" in order to ease the personalisation process.

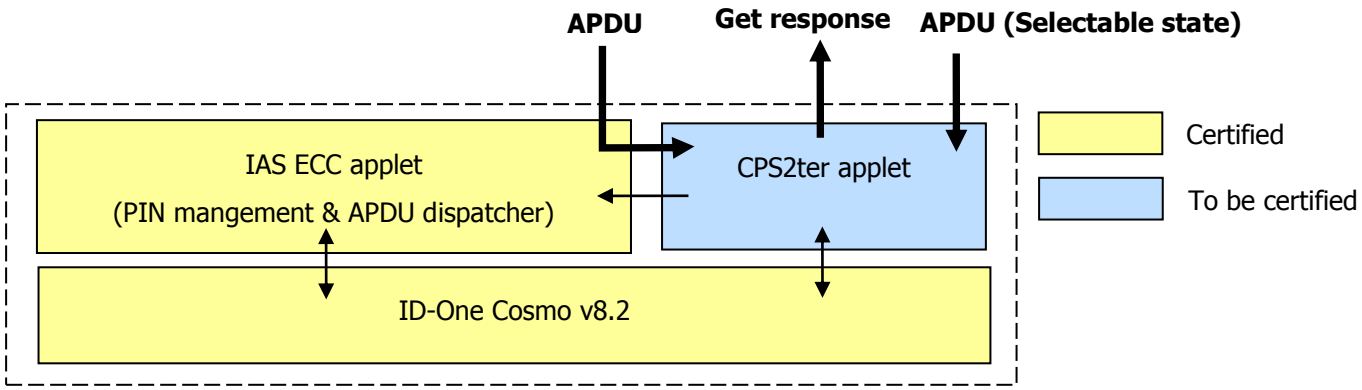


Figure 2 TOE functional architecture

2.2.2 Platform functions

The Operating System is based on Java Card technology [JCRE], [JCVM], [JCAPI] and Global Platform technology [GP]. His main responsibilities are:

- providing interface between the Integrated Circuit and the applet
- providing to the applet, basic services to access to memories and all needed cryptographic operations
- ensuring global management of the card (loading, installation and deletion of applets) and monitor the security of the card (data integrity and physical attacks counter-measures).

For details see [COSMO-ST].

2.2.3 IAS ECC functions

IAS ECC is conformant to [IAS] specifications and provides the following services via a shareable interface to other applets.

2.2.3.1 PIN management

The IAS ECC applet may be used as a SSO (single sign on). The user may validate its PIN through IAS ECC application and any other applet may rely on this PIN to decide to grant access or not to the user.
This functionality enables to give access to the global PINs (located within the root) the IAS ECC applet manages to any other applet without endangering the PINs' values.
Still, the IAS ECC enforces its security policy prior to granting access to the global PINs: the PIN verification, the PIN change, the PIN reset, the PIN reset and change are still protected with the same security policy, even when these operations are performed through shared interfaces.

2.2.3.2 APDU dispatcher feature

The IAS ECC applet may be used as an APDU dispatcher to another applet. When this feature is activated, the IAS ECC application behaves as if the two applets were selected at the same time:

- IAS ECC applet process all the APDU with the pair (CLA | INS) is knows ,
- IAS ECC applet transfers the APDU to CPS2ter when the pair (CLA | INS) is unknown. The APDU is totally processed by the target applet.

The two applets are coupled together in phase 5 (see 2.3.1) during personalisation.

For details on IAS ECC see [IAS ECC-ST].

2.2.4 CPS2ter functions

The TOE implements a secure storage device allowing to access to sensitive data about the user when correctly authenticated and authorized using the following services:

- Import of PINs and keys (protected by 3DES),
- Pin Authentication of the user: the TOE holds the reference CHVs that is used to verify the CHVs provided by the user,
- Export of user data,
- Random number generation,
- External authentication of distant entities for user data access (3DES based protocol),
- Protection of incoming commands using the PRO mode (protected by 3DES),
- Implementation of a trusted channel for personalisation (GP channel).

The trusted channel which can be used in personalisation (i.e. "Selectable" state of the applet) is no longer available in "Personalised" state. Symmetrically, access rights checking are not activated in "Selectable" state and operational starting from the transition to "Personalised" state.

Note: PIN secure management is enforced by the IAS shareable service.

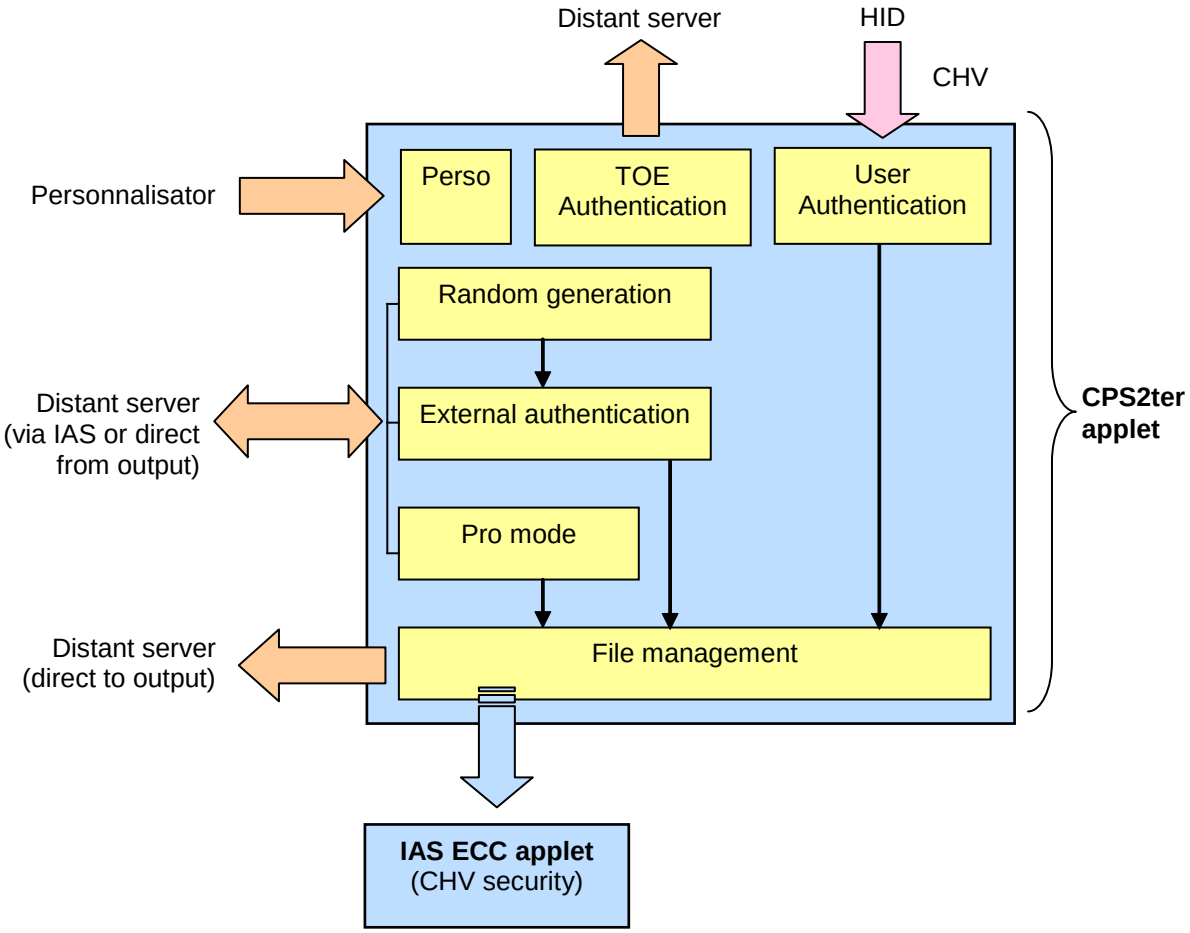


Figure 3 CPS2ter security features overview

For more information about CPS2ter security features see [SRS].

2.2.5 Out of scope features

Some features are put out of the evaluation scope and are therefore not part of the TSF. Here is the complete list of those functionalities:

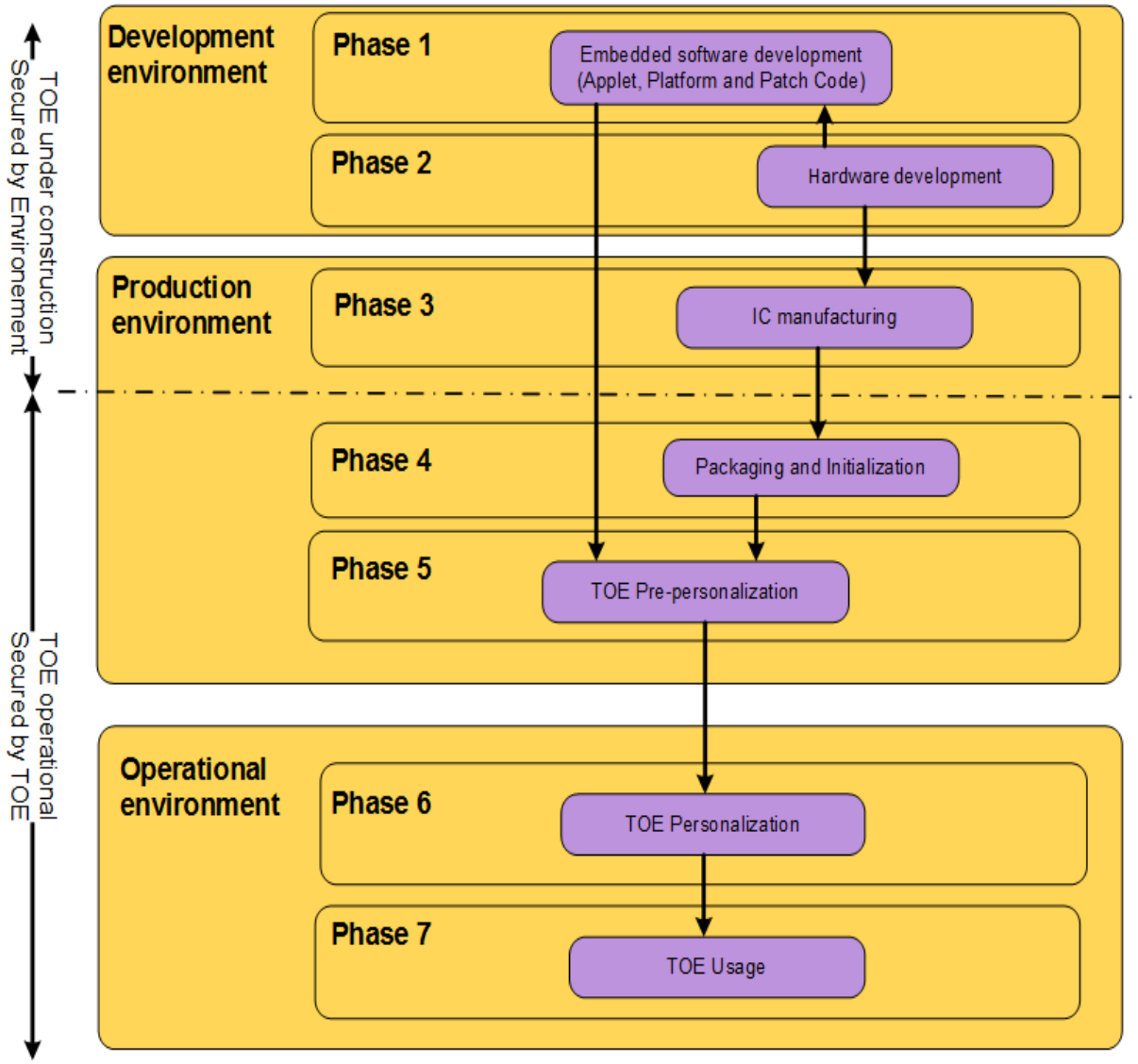
- Computation of signature using RSA (through command “Calcul Secret RSA”),
- Internal authentication using RSA (through command “Calcul Secret RSA”),
- Protection in integrity and proof of origin of exported Files data (through command “Read Binary Stamped”).

2.3 TOE product life cycle

2.3.1 Card life cycle

The Smart card product life cycle is split up into 7 phases[1] where evaluation scope (i.e. evaluation phases under the developer's responsibility) goes from phase 1 to phase 3.

The life cycle of the composite TOE may be depicted as follows:



[1] For details regarding phases see [COSMO-ST].

2.3.2 Description of the TOE environment

The TOE environment may be spitted into two different parts:

- The **Development environment**, in which the parts of TOE are designed and tested.
- The **Production environment**, in which the TOE is under construction. The security requirements of the Java Card platform are fulfilled and assurance levels are met.
- The **Operational environment**, in which the TOE is self protected and can be used as stated (personalized and used). Once personalized according to [AGD_PRE], the TOE is constructed: the security requirements of the TOE are fulfilled and the assurance levels are met.

2.3.2.1 Development environment

The development environment encompasses the environment in which the TOE is developed, i.e.

- the Java Card platform components;
- the Java Card applet and its patch code;
- the hardware.

2.3.2.1.1 Software development (phase 1)

This development environment of the Java Card applet, its patch code and the Java Card platform is enforced by **IDEMIA**.

The confidentiality and integrity of the cap files, the patch code and the Java Card platform is covered by the evaluation of the development premises of **IDEMIA**.

To ensure security, access to development tools and products elements (PC, card reader, documentation, source code…) is protected. The protection is based on measures for prevention and detection of unauthorized access. Two levels of protection are applied:

- Access control to **IDEMIA** offices and sensitive areas.
- Access to development data through the use of a secure computer system to design, implement and test software

At the end of this phase, the Java Card applet together with the Java Card platform are transferred to the IC manufacturer in order to be masked on silicium. The patch code is transferred to the Manufacturing Agent in order to be loaded during the pre-personnnalization of the Java Card platform (Phase 5).

At the end of this phase 1, the Java Card applet is protected in integrity and confidentiality.

This phase takes place in **IDEMIA** premises and is covered by ALC.

2.3.2.1.2 Hardware development (Phase 2)

In this phase, the underlying integrated circuit is developed.

This phase takes place at the NXP manufacturing site and is covered by ALC.

The confidentiality and integrity of the Java Card applet and Java Card platform is covered by the evaluation of the development premises of the silicium manufacturer.

2.3.2.2 Production environment

The production environment encompasses the environments in which the TOE is prepared.

It corresponds to the following steps:

- Software is engraved in the silicium to get the Java Card platform.
- The chip is mounted on a physical layout (card, USB token...)
- The Java Card platform is prepersonalized including patch code loading
- The Java Card platform is personalized
- The applet is instantiated

2.3.2.2.1 IC manufacturing (phase 3)

In this phase, the code of the Java Card platform and the Java Card applet are masked on the IC. This phase takes place at the NXP manufacturing site.

The confidentiality and integrity of the Java Card applet and Java Card platform is covered by the evaluation of the development premises of the silicium manufacturer.

At the end of phase 3, the Java Card platform and the TOE are self-protected: all its security functions are activated. The point of delivery of the TOE is the end of phase 3.

2.3.2.2.2 TOE packaging and initialization (phase 4)

This phase is performed by the Manufacturing Agent, which controls the TOE that is in charge of the packaging and initialization of the Java Card platform.

This phase spans the phase 4 of the Java Card platform life cycle and is covered by the platform preparative guidances [AGD_Platform].

All along this phase, the TOE is self-protected as it requires the authentication of the Manufacturing Agent prior to any operation.

2.3.2.2.3 TOE pre-personalization (phase 5)

The Java Card platform is under the control of the **Manufacturing Agent**.

During this phase, the Java Card platform is pre-personalized (including loading of the patch code) and personalized by the Manufacturing Agent. This subject shall be authenticated prior to any action on the Java Card platform.
The main operations performed by the **Manufacturing Agent** during this phase are the following:

- Configuration of the Java Card platform (ATR,..)
- Loading of the patch code
- Configuration and activation of the Card Manager
- Loading of the keys of the Card Manager
- Locking of the Java Card platform (to ban any applet loading)

This phase spans the phases 5, 6 and 7 of the Java Card platform and and is covered by the platform preparative and operational guidances [AGD_Platform].

At the end of this phase, the TOE is delivered together with its personalisation keys (keys of the Card Manager).

2.3.2.3 Operational environment

The operational environment encompasses the environments in which the TOE is constructed. It corresponds to the following steps:

- Personalization of the TOE
- Use of the TOE

2.3.2.3.1 TOE personalization (phase 6)

The TOE is under the control of the **Personalization Agent** in charge of personalizing the Applet. This subject shall be authenticated prior to any action on the Java Card platform.

This phase may not necessarily take place in a manufacturing site, but may be performed anywhere. The **Personalization Agent** is responsible for ensuring a sufficient level of security during this phase.

During this phase, the TOE is personalized as described in [AGD_PRE]

At the end of phase 6, the TOE is constructed

2.3.2.3.2 TOE Usage (phase 7)

The TOE can be used as described in [AGD_OPE]

2.3.3 Coverage of the different Life cycle state by the assurance components AGD & ALC

The following table indicates for each step of the life cycle, whether it is covered by ALC or AGD class:

Life cycle state	**Covered by**	**Site**
Phase 1	ALC (IDEMIA R&D)	Courbevoie and Pessac
Phase 2	ALC (IC)	IC certification [IC-cert]
Phase 3	ALC (IC)	IC certification [IC-cert]
TOE delivery		
Phase 4	AGD_PRE [PLT]	IDEMIA plant sites or another agent
Phase 5	AGD_PRE [PLT] AGD_OPE [PLT] [AGD_PRE]	IDEMIA plant sites or another agent
Phase 6	[AGD_PRE]	IDEMIA plant sites or another agent
Phase 7	[AGD_OPE]	N/A

2.3.4 Application life cycle

The application is a Java Card applet instantiated in phase 6. The lifecycle follows the standard defined in [COSMO-ST] §3.5 which is depicted by the following figure:

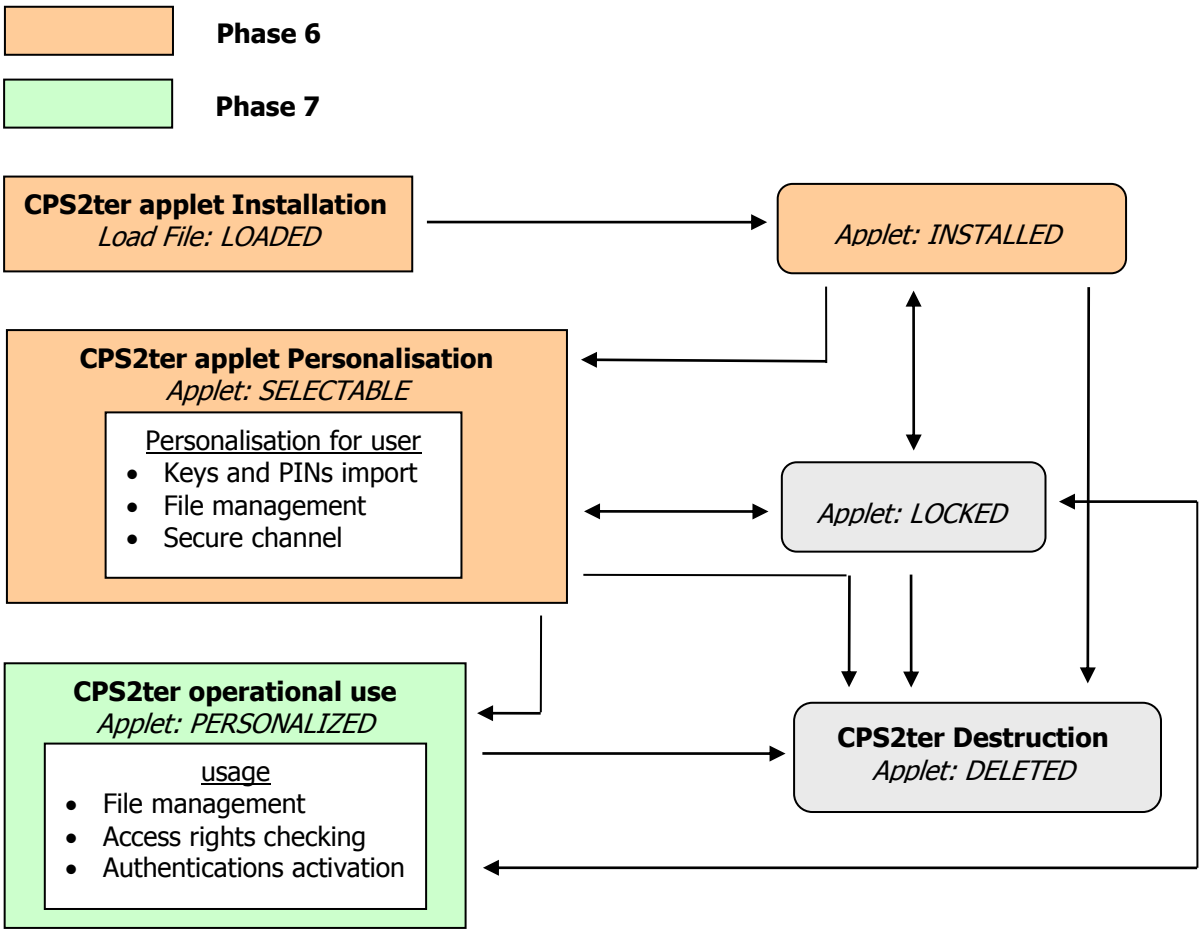


Figure 4 CPS2ter applet lifecycle

3 Conformance claims

3.1 Common Criteria conformance

This Security Target (ST) is CC Part 2 extended [CC-2], CC Part 3 conformant [CC-3] and written according to the Common Criteria version 3.1, revision 5, Part 1 [CC-1].

3.2 Package conformance

This ST is conformant to the EAL4 package as defined in [CC-3].

The EAL4 have been augmented with the following requirement to fulfil the smartcard standard:

Requirement	Name	Type
ALC_DVS.2	Sufficiency of security measures	Higher hierarchical component
AVA_VAN.5	Advanced methodical vulnerability analysis	Higher hierarchical component

3.3 Protection Profile conformance

No protection profile is claimed.

4 Security problem definition

4.1 Assets

PINs

Reference PINs used by the TOE to control access to sensitive data.

Protection: intergrity and confidentiality.

Application note:

In the following PINs are also refer as CHVs.

Keys

3DES keys used to compute both MAC required in PRO mode and cryptogram in external autentication.

Protection: intergrity and confidentiality.

Files data

File strucures used to store sensitive user data.

Protection: integrity.

Application note:

PINs and keys are not included in this asset.

TryCounters

The PIN try counters manage the number of PIN wrong enters. When it reaches the defined maximum number (PIN Try Counter limit) of wrong enters, the PIN verification mechanism is blocked.

Protection: integrity.

ACs

Access conditions associated to a file specifying which security mechanisms have to be performed in order to grant access. There are 4 types of mechanisms available:

- External authentication (see SF External Authentication),
- Pro mode (see SF Pro mode),
- CHV1 (see SF cardholder authentication),
- CHV2 (see SF cardholder authentication).

All combinations can be used.

Protection: integrity.

TOE

The target of Evaluation is a smart card allowing to store sensitive data and access distant services. It provides security mechanisms to prevent illegal usage and access.

4.2 Users / Subjects

S.User

S.User is the cardholder who wants to access to distant services. He authorizes access of its data to a distant server by providing the PIN associated to the file where those data are stored.

S.DistantServer

S.DistantServer is an electronic device providing services based on data stored in the card of S.User. For accessing those data it can be required to perform:

- an external authentication of the S.DistantServer,
- communicating using protected commands,
- a S.User authentication for getting user autorisation.

S.Personnaliser

S.Personnalizer is in charge of writing initial user data, PINs and Keys during personnalisation phase. He uses a secure channel in order to communication with the card.

S.APDU

S.APDU acts on behalf of the cardholder or the distant server by processing the APDUs they send.

4.3 Threats

T.Keys_Disclosure

Unauthorised knowledge of the secret keys.

Assets threatened: Keys.

Application note:

An attacker discloses the value of a key stored in the TOE in order, for instance, to illegitimately perform External authentication or commands in Pro mode and therfore executing unauthorised operations on file.

T.Keys_Corruption

Unauthorised modification of stored keys: an attacker modifies the value of a secret key and associated attributes stored in the TOE in order to input a known key.

Assets threatened: Keys.

T.Files_Corruption

Unauthorised modification of files data: an attacker modifies the content of a user file in the TOE in order to modify to write fake data in the card.

Assets threatened: Files data.

Application note:

This can be, for instance, modifying the name and role of the cardholder which would be stored in the TOE. Therefore, distant server will retrieve afterward incorrect data from the TOE and would be able to decide to allow cardholder to access services which should not be available to him.

T.ACs_Corruption

Unauthorised modification of Access conditions: an attacker modifies the AC of a file present in the TOE in order to set values that would allow him to access to the file.

Assets threatened: AC.

T.PTC_Corruption

Unauthorised modification of stored PIN try counters: an attacker modifies the value of a PIN try counter stored in the TOE in order to change the limitation of the number of failing PIN required and finally to retrieve the associated PIN.

Assets threatened: TryCounters, PINs.

T.CHV_Disclosure

Unauthorised knowledge of a PIN.

Assets threatened: PINs.

Application note:

An attacker discloses the value of a PIN stored in the TOE in order, for instance, to illegitimately authenticate himself subsequently as the cardholder in order to perform a file operation requiring a CHV authentication.

T.CHV_Corruption

Unauthorised modification of PINs: an attacker modifies the value of a PIN stored in the TOE in order to input a known PIN.

Assets threatened: PINs.

T.Replay

Replay of commands.

Data are accessed without required authentications by replaying a correct sequence of operations leading to the intended operation.

Assets threatened: PINs, Keys, Files data, AC.

T.User_Usurpation

An attacker is unduly granted the rights of the user to perform unauthorised operations on his/her behalf.

Assets threatened: Files data, Keys, AC, PINs.

Application note:

Operations that can be performed on behalf of the user are those that are specified to be protected by a CHV1 or CHV2 authentication in the AC of the file.

T.DistantServer_Usurpation

An attacker is unduly granted the rights of the distant server to perform unauthorised operations on his/her behalf.

Assets threatened: Files data, Keys, AC, PINs.

T.TOE_Usurpation

An attacker unduly authentifies itself to a third party as a genuine TOE in order to access restricted services.

Assets threatened: TOE.

T.Tearing

The attacker may force the TOE into a non stable state by stopping or disrupting the execution of the commands.

Assets threatened: Files data, Keys, AC, TryCounters, PINs.

Application note:

An attack path is tearing the TOE out of the reader while a command is processed, breaking the execution flow and possibly switching the assets to uncorrect values.

4.4 Organisational Security Policies

P.Crypto

Cryptographic (mathematical) functions used must be trusted to ensure integrity and confidentiality. Therefore, those cryptographic functions are expected to resist practical attacks. A practical attack is an attack that may occur during card lifespan or embedded key lifetime, and that can be led by an organisation with high expertise and computational resources. To that end:

- Secure parameters: cryptographic functions shall use security parameters (key lengths, usage conditions...) strong enough to resist practical attacks,
- Secure implementation: the implementation of cryptographic functions inside the TOE, including key storage, shall resist practical attacks.

P.CHV_management

CHV tranfers to the TOE are supposed be performed in an appropriate secure environment in usage phase.

This environment should be local and able to enforce integrity and confidentiality between the CHV device and the TOE.

Application note:

The CHV device is usually a PIN pad and its associated terminal but can also be a standard PC.

4.5 Assumptions

A.Usage

The developper should communicate to the user the rules dealing with the use of the TOE. Especially it must inform the user that:

- he must keep its TOE the same way he does for a highly valuable assets,
- he must not divulgate his PINs to anyone.

The user should enforce these rules.

A.Perso

The personnaliser is a trusted entity enforcing rules and recommandations specified in the personnalisation guide.

5 Security Objectives

5.1 Security Objectives for the TOE

O.CHV

The TSF shall ensure authentication of the user to the TOE for operations which require it.

O.Authentication

The TSF shall ensure authentication of the distant server before processing operations which require such an authentication.

O.TOE_Usurpation

The TSF shall authentify itself to be able to prove its own genuinity.

O.Export

Confidential data must not be exported.

O.Import

The TSF shall ensure that commands comming from the distant server are genuine.

O.Confidentiality_Protection

The TSF shall provide the means to avoid unauthorised disclosure of data that must be protected in confidentiality: PINs and keys.

O.Integrity_Protection

The TSF shall provide the means to avoid unauthorised modification of data that must be protected in integrity: PINs, keys, File data, TryCounters and AC.

O.replay_Protection

The TSF shall ensure that replayed commands are detected and rejected.

Application note:

"replayed commands" refered to commands previously transmitted to the TOE and re-sended without any modification. This could allow to access sensitive data without any authorisation nor any knowledege of secrets contains in the TOE.

O.Access_Control

The TOE security functionalities shall ensure that sensitive assets are only accessed by authorised users.

O.Crypto

Cryptographic functions of the TOE shall resist practical attacks led by organisations with high expertise and high computational resources.

O.Tamper

The TSF shall prevent physical tampering of its security critical parts.

O.Operate

The TSF shall ensure the continued correct operation of its security functionalities especially in case of abnormal process of commands such as interruption during processing.

5.2 Security objectives for the Operational Environment

OE.Usage

It must be enforced that the developper must communicate to the user the rules dealing with the use of the TOE.

Especially it must inform the user that:

- he must keep its TOE the same way he does for a highly valuable assets,
- he must not divulgate his PINs to anyone.

The user shall enforce these rules.

OE.Perso

The personnaliser must be a trusted entity enforcing rules and recommandations specified in the personnalisation guide.

OE.CHV_Management

CHV tranfers to the TOE must be performed in an appropriate secure environment in usage phase.

This environment should be local and must enforce integrity and confidentiality between the CHV device and the TOE.

6 Extended requirements

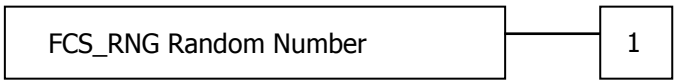
6.1 Extended family FCS_RNG - Random Number Generation

A physical random number generator (RNG) produces the random number by a noise source based on physical random processes. A non-physical true RNG uses a noise source based on non-physical random processes like human interaction (key strokes, mouse movement). A deterministic RNG uses a random seed to produce a pseudorandom output. A hybrid RNG combines the principles of physical and deterministic RNGs.

Family behavior:

This family defines quality requirements for the generation of random numbers which are intended to be used for cryptographic purposes.

Component leveling:



FCS_ RNG.1 Random Number Generation has two constituents:

- FCS_RNG.1.1 Random number generator type
- FCS_RNG.1.2 Random number quality

Management:

There are no management activities foreseen

Audit:

There are no actions defined to be auditable

FCS_RNG.1 *Random Number Generation*

Hierarchical to: No other components.
Dependencies: No dependencies. Definition

FCS_RNG.1.1 The TSF shall provide a [selection: physical, non-physical true, deterministic hybrid] random number generator that implements: [assignment: list of security capabilities].

FCS_RNG.1.2 The TSF shall provide random numbers that meet [assignment: a defined quality metric].

7 Security Functional Requirements

7.1 Security Functional Requirements

7.1.1 Attributes

FIA_ATD.1/Attributes User attribute definition

FIA_ATD.1.1/Attributes The TSF shall maintain the following list of security attributes belonging to individual users:

- **CHVx status which defines if the cardholder is authenticated with the PIN x,**
- **ExternalAuth_k which defines if the distant server is authenticated with an external authentication and the key k**.

7.1.2 CHV

There can be several authentications of the cardhloder to the TOE. they all use the mecanism of PIN verfication referred in the following as Cardholder verification or CHV.

Actually, each DF can be associated to a different CHV but keys can only be associated to CHV1:

- if a key required CHV1 authentication, the cardholder must perform an authentication with CHV1 in order to use the key,
- if a file required a CHVx authentication in its AC for the received command, the cardholder must perform an authentication with CHVx in order to acces the file (this open the CHVx session).

Remark:

On the card, only one type of CHV can be used; either CHV1 or CHV2.

FIA_UAU.1/CHV Timing of authentication

FIA_UAU.1.1/CHV The TSF shall allow

- **identifying the user by means of FIA_UID.1/CHV (as CHVx for targeting the CHVx authentification),**
- **unblocking CHVx,**
- **any operation on file whose CHVx flag (in AC) is set to false,**
- **any operation which uses a key whose CHV1 flag is set to false,**
- **any operation requiring the CHVy authentication if the user is currently authenticated as CHVy**

on behalf of the user to be performed before the user is authenticated.

FIA_UAU.1.2/CHV The TSF shall require each user to be successfully authenticated before allowing any other TSF-mediated actions on behalf of that user.

Refinement:

This requirement considers the CHVx authentication of the cardholder.

CHVx authentication is performed using the adequate CHVx file defined as follow: *Adequate* (CHVx,current_DF)=

- if a CHVx file F exist in current_DF then return current_DF
- else return *Adequate* (CHVx,father_DF))

Application note:

CHVx authentication is a PIN based authentication.

FIA_UID.1/CHV Timing of identification

FIA_UID.1.1/CHV The TSF shall allow

- **unblocking CHVx,**
- **any operation on file whose CHVx flag (in AC) is set to false,**
- **any operation which uses a key whose CHV1 flag is set to false,**
- **any operation requiring the CHVy authentication if the user is currently authenticated as CHVy**

on behalf of the user to be performed before the user is identified.

FIA_UID.1.2/CHV The TSF shall require each user to be successfully identified before allowing any other TSF-mediated actions on behalf of that user.

Refinement:

This requirement considers the CHVx identification of the cardholder.

FIA_AFL.1/CHV Authentication failure handling

FIA_AFL.1.1/CHV The TSF shall detect when **an administrator configurable positive integer within range [1,15]** unsuccessful authentication attempts occur related to **CHVx authentication**.

FIA_AFL.1.2/CHV When the defined number of unsuccessful authentication attempts has been **met**, the TSF shall **block the PIN associated to the adequate CHVx file**.

Refinement:

blocking is a temporary operation that can be cancelled by the associated unblock PIN.

Application note:

The "associated unblock PIN" referred to the PUK linked to the specified CHVx. It is definitely blocked after a defined number of fail attempt.

FIA_USB.1/CHV User-subject binding

FIA_USB.1.1/CHV The TSF shall associate the following user security attributes with subjects acting on the behalf of that user: **CHVx status**.

FIA_USB.1.2/CHV The TSF shall enforce the following rules on the initial association of user security attributes with subjects acting on the behalf of users:

- **CHVx status is set to true**.

FIA_USB.1.3/CHV The TSF shall enforce the following rules governing changes to the user security attributes associated with subjects acting on the behalf of users:

- **CHVx status cannot be modified except by the TOE during the authentication with another CHV,**
- **CHVx status is reset to false**
  - **if an other file is selected with a different adequate file,**
  - **if the file related to CHVx is deactivated or deleted,**
  - **at each application startup**.

7.1.3 External authentication

FIA_UAU.1/ExtAuth Timing of authentication

FIA_UAU.1.1/ExtAuth The TSF shall allow

- **identifying the distant server by means of FIA_UID.1/ExtAuth,**
- **any operation on file whose External Authentication flag (in AC) is set to false,**
- **any operation requiring the ExternalAuth_k authentication if the user is currently authenticated using an ExternalAuth_k**

on behalf of the user to be performed before the user is authenticated.

FIA_UAU.1.2/ExtAuth The TSF shall require each user to be successfully authenticated before allowing any other TSF-mediated actions on behalf of that user.

Refinement:

This requirement considers the external authentication of the distant server.

External authentication is performed using the adequate file defined as follow:

Adequate (KeyFileType,current_DF)=

- if a KeyfileType F exist in current_DF then return current_DF
- else return *Adequate* (KeyFileType,father_DF))

with KeyFileType(File) = AppFile if File is transparent else GesFile

Application note:

ExternalAuth_k referred to the external authentication using the key k. The only method to be used is the external authentication with 3DES. The other method by direct compare must not be activated in the key AC field.

The above requirement uses the following terms:

- "transparent file" which refers to an application file storing "files data" senstive assets,

- "AppFile" which refers to the type of 3DES key files used for transparent files access,
- "GesFile" which refers to the type of 3DES key files used for management files access (i.e. operations on DF and key files).

FIA_UID.1/ExtAuth Timing of identification

FIA_UID.1.1/ExtAuth The TSF shall allow

- o **any operation on file whose External Authentication flag (in AC) is set to false,**

on behalf of the user to be performed before the user is identified.

FIA_UID.1.2/ExtAuth The TSF shall require each user to be successfully identified before allowing any other TSF-mediated actions on behalf of that user.

Refinement:

This requirement considers the identification of the distant server by means of the external authentication.

FIA_AFL.1/ExtAuth Authentication failure handling

FIA_AFL.1.1/ExtAuth The TSF shall detect when **an administrator configurable positive integer within range [0,15]** unsuccessful authentication attempts occur related to **external authentication or Pro mode verification with a defined key k**.

FIA_AFL.1.2/ExtAuth When the defined number of unsuccessful authentication attempts has been **met**, the TSF shall **block the associated key k**.

Refinement:

The try counter is the one associated to the key.

Application note:

External authentication and Pro mode can use the same application key file. Therefore the try counter of a key can be decreased either by a failed External Authentication or a failed Pro mode verification.

FIA_USB.1/ExtAuth User-subject binding

FIA_USB.1.1/ExtAuth The TSF shall associate the following user security attributes with subjects acting on the behalf of that user: **ExternalAuth_k status**.

FIA_USB.1.2/ExtAuth The TSF shall enforce the following rules on the initial association of user security attributes with subjects acting on the behalf of users:

- o **ExternalAuth_k status is set to true**.

FIA_USB.1.3/ExtAuth The TSF shall enforce the following rules governing changes to the user security attributes associated with subjects acting on the behalf of users:

- **ExternalAuth_k status cannot be modified except by the TOE during the external authentication with another key k',**
- **ExternalAuth_k status reset to false**
  - **if an other file is selected with a different adequate file,**
  - **if the file related to ExternalAuth_k is deleted,**
  - **at each application startup**.

7.1.4 Internal Authentication

FDP_DAU.1/InitAuth Basic Data Authentication

FDP_DAU.1.1/InitAuth The TSF shall provide a capability to generate evidence that can be used as a guarantee of the validity of **the TOE**.

FDP_DAU.1.2/InitAuth The TSF shall provide **any external entities** with the ability to verify evidence of the validity of the indicated information.

7.1.5 Exchanges

FDP_ETC.1/Export Export of user data without security attributes

FDP_ETC.1.1/Export The TSF shall enforce the **AC policy** when exporting user data, controlled under the SFP(s), outside of the TOE.

FDP_ETC.1.2/Export The TSF shall export the user data without the user data's associated security attributes

Refinement:

Only those data can be exported outside the TOE:

- files AC using the SELECT APDU,
- try counters using the SELECT APDU,
- random values using ASK RANDOM APDU,
- data contained in transparent files using READ BINARY APDU.

FDP_ITC.1/Import Import of user data without security attributes

FDP_ITC.1.1/Import The TSF shall enforce the **AC policy** when importing user data, controlled under the SFP, from outside of the TOE.

FDP_ITC.1.2/Import The TSF shall ignore any security attributes associated with the user data when imported from outside the TOE.

FDP_ITC.1.3/Import The TSF shall enforce the following rules when importing user data controlled under the SFP from outside the TOE:

- **the import of the first Load key file must be performed using the Key Exchange key (Kek) of the Card Manager to dechiper key data**.

FMT_SMF.1/Selectable Specification of Management Functions

FMT_SMF.1.1/Selectable The TSF shall be capable of performing the following management functions:

- **switch the internal state of the applet from SELECTABLE to PERSONNALIZED and deactivate in the same time the possibility of going back to the SELECTABLE state when Set Data APDU is received**.

7.1.6 File secure management

FDP_SDI.2/IntegrityControl Stored data integrity monitoring and action

FDP_SDI.2.1/IntegrityControl The TSF shall monitor user data stored in containers controlled by the TSF for **corruption** on all objects, based on the following attributes:

- **file header,**
- **key secure container parameters,**
- **PIN secure container parameters**.

FDP_SDI.2.2/IntegrityControl Upon detection of a data integrity error, the TSF shall **kill the card**.

FDP_ACC.1/AccessControl Subset access control

FDP_ACC.1.1/AccessControl The TSF shall enforce the **AC policy** on

- **Subject: S.APDU,**
- **Objects: Ob.File,**
- **Operations: Op.Read, Op.Dir, Op.Update, Op.ChangeAC, Op.Delete, Op.Write, Op.Create, Op.LoadKeyFile**.

Application note:

The object Ob.File refer to all files handled by the TOE: Master File (MF), Directory File (DF) and Elementary File (EF). All these files are organized within a File System compliant to [7816-4]. It represents the hierarchy between all the files. See [IAS ECC-ST] for more details. Operations (prefixed with "Op") are described in the following table.

Operation	Description
Op.Read	read data in the current EF.
Op.Dir	list all files and/or directories registred under the current directory (a DF or the MF).
Op.Update	update a part of the whole content of the current selected EF.
Op.ChangeAC	change the AC of the adequate file.
Op.Delete	delete a file (DF or EF) from the current directory (a DF or the MF).
Op.Write	write binary data into the content of the selected EF.
Op.Create	create a new file under the current directory (a DF or the MF).
Op.LoadKeyFile	Initialize or secure update of Key File.

FDP_ACF.1/AccessControl Security attribute based access control

FDP_ACF.1.1/AccessControl The TSF shall enforce the **AC policy** to objects based on the following:

- **Subjects (attributes): S.APDU (APDU.CHV1, APDU.CHV2, APDU.ExternalAuth_k),**
- **Objects (attributes): Ob.File (File.AC)**.

Refinement:

The attribute AC is divided into 4 sub-attributes defining the access rights for the a category of command.

FDP_ACF.1.2/AccessControl The TSF shall enforce the following rules to determine if an operation among controlled subjects and controlled objects is allowed:

Subject	Operation(Object)	Rule*
S.APDU	**Op.Read(File)**	***CheckAC(S.APDU,AC)* where AC = File.AC.groupe1**
S.APDU	**Op.Dir(File)**	***CheckAC(S.APDU,AC)* where AC = File.AC.groupe1**
S.APDU	**Op.Update(File)**	***CheckAC(S.APDU,AC)* where AC = File.AC.groupe2**
S.APDU	**Op.ChangeAC(File)**	***CheckAC(S.APDU,AC)* where AC = File.AC.groupe3**
S.APDU	**Op.Delete(File)**	***CheckAC(S.APDU,AC)* where AC = File.AC.groupe3**
S.APDU	**Op.Write(File)**	***CheckAC(S.APDU,AC)* where AC = File.AC.groupe3**
S.APDU	**Op.Create(File)**	***CheckAC(S.APDU,AC)* where AC = File.AC.groupe4**
S.APDU	**LoadKeyFile(File)**	***CheckAC(S.APDU,AC)* where AC = File.AC.groupe4**

*** *CheckAC* must be true to authorize operation.**

Here is the definition as a boolean expression of *CheckAC(S.APDU,AC)* governing file access:

***CheckAC(S.APDU,AC): boolean* =**

- ***AppletState=SELECTABLE* -> true, *or***
- ***AC.condition* = "ALWAYS" -> true, *and***
- ***AC.condition* = "CHV1 or CHV1/AUTH or CHV1/PRO" -> S.APDU.CHV1, *and***
- ***AC.condition* = "CHV2 or CHV2/AUTH or CHV2/PRO" -> S.APDU.CHV2, *and***
- ***AC.condition* ="AUTH or CHV1/AUTH or CHV2/AUTH" -> S.APDU.ExternalAuth_k where k = AC.keyIndex, *and***
- ***AC.condition* = "PRO or CHV1/PRO or CHV2/PRO" -> S.APDU provides a correct certificate with k = AC.keyIndex, *and***
- ***AC.condition* = "NEVER" -> false**

FDP_ACF.1.3/AccessControl The TSF shall explicitly authorise access of subjects to objects based on the following additional rules: **none**.

FDP_ACF.1.4/AccessControl The TSF shall explicitly deny access of subjects to objects based on the

- **Op.Read(Ob.File) is forbidden if Ob.File is a key file or CHV file,**
- **Op.Update(Ob.File) is forbidden if Ob.File is a key file,**
- **Op.Write(Ob.File) is forbidden if Ob.File is a key file or CHV file,**
- **Op.ChangeAC(Ob.File,AC_new) is forbidden if AC_new < File.AC.**

See below the lattice corresponding to the set of ACs and the order relation "<":

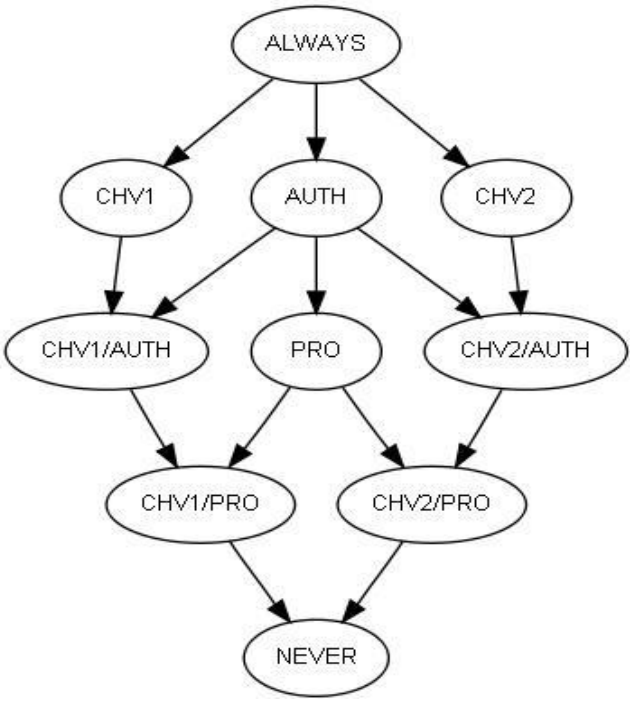


Figure 5 ACs lattice

Application note:

The subject S.APDU acts on behalf of the cardholder or the distant server by processing the APDUs they send. These are processed in a state defined by the previous CHV and External authentications performed and referred as the attributes APDU.CHVx and APDU.External_Auth_k.

FDP_ACF.1.4 got the highest priority; requirements elements 3, 2 and 1 are applied in this order. Consequently, for instance, ACs cannot be changed to a lower security level even if current ACs are enforced.

Keys used are always contained in the Adquate file as specified in FIA_UAU.1/ExtAuth.

A group is defined as the ACs of a set of operations (activated by related APDUs):

- groups 1 is composed of Op.Read and Op.Dir,
- groups 2 is composed of Op.Update,
- groups 3 is composed of Op.ChangeAC, Op.Delete and Op.Write,
- groups 4 is composed of Op.Create and Op.LoadKeyFile.

Details are provided in [SRS] §2.4, §3.1 and §4.3.4.

7.1.7 Transactions protection

FDP_UIT.1/Exchanges Data exchange integrity

FDP_UIT.1.1/Exchanges The TSF shall enforce the **AC policy** to be able to **receive** user data in a manner protected from **replay, modification, deletion and insertion** errors.

FDP_UIT.1.2/Exchanges The TSF shall be able to determine on receipt of user data, whether **modification, deletion, insertion and replay** has occurred.

Refinement:

Replay and integrity protection is only enforced for:

- external authentication,
- all APDUs using Pro mode,
- all APDUs sent in SELECTABLE state and embedding a sensitive asset.

Application note:

Key used is the one contained in the adequate file (see FIA_UAU.1/ExtAuth).

FDP_UCT.1/LoadKey Basic data exchange confidentiality

FDP_UCT.1.1/LoadKey The TSF shall enforce the **AC policy** to **receive** user data in a manner protected from unauthorised disclosure.

Refinement:

Confidentiality is only to ensure for key loading.

Application note:

Key used is the one contained in the adequate file (see FIA_UAU.1/ExtAuth).

FTP_ITC.1/Selectable Inter-TSF trusted channel

FTP_ITC.1.1/Selectable The TSF shall provide a communication channel between itself and another trusted IT product that is logically distinct from other communication channels and provides assured identification of its end points and protection of the channel data from modification or disclosure.

FTP_ITC.1.2/Selectable The TSF shall permit **another trusted IT product** to initiate communication via the trusted channel.

FTP_ITC.1.3/Selectable The TSF shall initiate communication via the trusted channel for **performing all operations specified in FDP_ACF.1/AccessControl**.

Application note:

This secure channel is mandatory in SELECTABLE state for commands which support it.

7.1.8 Cryptography

FCS_COP.1/TDES Cryptographic operation

FCS_COP.1.1/TDES The TSF shall perform **encryption and decryption** in accordance with a specified cryptographic algorithm

- **3DES in CBC mode for Pro mode and data cipher,**

and cryptographic key sizes **128 bits (only 112 bits are used)** that meet the following:

- **[FIPS 46-3],**
- **[FIPS 81]**.

Application note:

ANSI X3.92 is the internatial standard specifying 3DES. FIPS 46-3 is the equivalent standard issued by the USA.

ISO 10116 is the internatial standard specifying CBC mode of 3DES. FIPS 81 is the equivalent standard issued by the USA.

FCS_RNG.1/Random Random number generation

FCS_RNG.1.1/Random The TSF shall provide a **hybrid** random number generator that implements: **none**.

FCS_RNG.1.2/Random The TSF shall provide random numbers that meet **[NIST SP 800-90].**

FCS_CKM.4/Destruction Cryptographic key destruction

FCS_CKM.4.1/Destruction The TSF shall destroy cryptographic keys in accordance with a specified cryptographic key destruction method **which ensures that any access to a cleared key throw an exception as specified by the method clearKey() of the underlying platform** that meets the following: **[JCAPI]**.

7.1.9 TOE protection

FPT_PHP.3 Resistance to physical attack

FPT_PHP.3.1 The TSF shall resist **changing operational conditions every times: the frequency of the external clock, power supply, and temperature** to the **chip elements** by responding automatically such that the SFRs are always enforced.

Application note:

This requirement is connected to the FPT_PHP.3 requirements of the platform. It detects physical attacks and reacts to these attacks by resetting the card or raising an exception. In these two cases, IC notifies the attack to the software.

FPT_FLS.1 Failure with preservation of secure state

FPT_FLS.1.1 The TSF shall preserve a secure state when the following types of failures occur:

- **tearing**.

7.2 Security Assurance Requirements

The security assurance requirement level is EAL4 augmented with AVA_VAN.5 and ALC_DVS.2. All these SARs are defined in [CC-3].

8 TOE Summary Specification

8.1 TOE Summary Specification

Cardholder authentication

This security feature allows the cardholder (or user) to authenticate himself to the card using a PIN based method.

For each file, Access Conditions can requires a user PIN authentication either with the CHV1 (first PIN) or CHV2 (second PIN). Depending on the directory in which this file is located those to CHV can differ. To grant access to the considered file, the TOE will check that CHV authenticationr required has been performed.

Each CHV is associated to a PUK which allows to unlock it when the maximum tries authorized has been met.

Pro mode

This security feature integrates a cryptogram to each incoming commands to check their authenticity. The following steps summarize it:

- sending of a random value to the distant server,
- Computing of a MAC in CBC mode with a key k on this random value and data bytes of the command,
- checking of this MAC by the TOE with the key required by the file (see below),
- Pro mode condition succeed.

For each file, Access Conditions can requires such a feature to grant access to the considered file. Depending on the directory in which this file is located and the key index specified in ACs, the key used to compute cryptogram will differ.

External Authentication

This security feature implements a protocol to ensure authentication of the distant server. The following steps summarize it:

- sending of a random value to the distant server,
- Computing of a MAC in CBC mode with a key k on this random value,
- checking of this MAC by the TOE with the key required by the file (see below),
- External Authentication succeed: all files requiring an External Authentication with this key k can be accessed.

For each file, Access Conditions can requires such a feature to grant access to the considered file. Depending on the directory in which this file is located and the key index specified in ACs, the key used to compute cryptogram will differ.

Internal Authentication

This security feature implements a protocol to ensure authentication of the TOE to adistant entity. The following steps summarize it:

- sending of a random value from the distant server,
- Computing of a MAC in CBC mode with a key k on this random value,
- checking of the cryptogram by the distant server in order to validate the genuinity of the TOE.

Random generation

This security feature allows to generate random based on both chip hardware random and sotfware post-processing. Those randoms are exported by the TOE to the distant server in order to be included in the cryptograms it send. This feature provide protection against replay of previously send commands.

Access Control

This security feature checks that access conditions specified in the AC of file are always enforced when accessing the file. Here are the main points checked for an incoming command of type T and ensured by the TOE:

- what are the AC required by this file for T?,
- If Cardholder verification is required (CHV1 or CHV2), has it been performed?,
- If External Authentication is required, has it been performed? With the correct key?
- If Pro Mode is required, is cryptogram presents in the command? With the correct key?
- If an AC modification in required, does the new one more restrictive than the old one? Those checks are mandatory to grant access to the file.

Access control also checks that confidential data are not exported outside the TOE.

Secure personnalisation

This secure feature allows to create a secure channel between the TOE and the personnalizer in order to perform operations on the TOE during phase 6 of the lifecycle. This secure channel is provided by card manager of the TOE an ensure authentication of the end-points, integrity, confidentiality and replay protection depending on the level requested during the initialisation of the channel.

In phase 6 (personnalisation) or Selectable state of the CPS2ter applet, this channel is the main feature protecting data transfers.

9 Rationales

9.1 Security objectives / Security Problem Definition

9.1.1 Threats

T.Keys_Disclosure To counter the threat, the TOE shall:

- ensure the confidentiality of keys imported and stored (O.Confidentiality_Protection),
- control access to keys to the only authorized users (O.Access_Control),
- Forbid export of confidential data (O.Export),
- enforce physical protection to avoid bypassing security mechanisms (O.Tamper).

T.Keys_Corruption To counter the threat, the TOE shall:

- ensure integrity of keys imported and stored (O.Integrity_Protection),
- control access to keys to the only authorized users (O.Access_Control),
- verify authenticity of imported data (O.Import),
- enforce physical protection to avoid bypassing security mechanisms (O.Tamper).

T.Files_Corruption To counter the threat, the TOE shall:

- ensure integrity of files imported and stored (O.Integrity_Protection),
- control access to files to the only authorized users (O.Access_Control),
- verify authenticity of imported data (O.Import),
- enforce physical protection to avoid bypassing security mechanisms (O.Tamper).

T.ACs_Corruption To counter the threat, the TOE shall:

- ensure integrity of ACs imported and stored (O.Integrity_Protection),
- control access to ACs to the only authorized users (O.Access_Control),
- verify authenticity of imported data (O.Import),
- enforce physical protection to avoid bypassing security mechanisms (O.Tamper).

T.PTC_Corruption To counter the threat, the TOE shall:

- ensure integrity of PTC stored (O.Integrity_Protection),
- Forbid access to PTC; no entity but the TSF can manage this asset (O.Access_Control),
- enforce physical protection to avoid bypassing security mechanisms (O.Tamper).

T.CHV_Disclosure To counter the threat, the TOE shall:

- ensure the confidentiality of CHV stored (O.Confidentiality_Protection),
- control access to CHV to the only authorized users (O.Access_Control),
- Forbid export of confidential data (O.Export),
- enforce physical protection to avoid bypassing security mechanisms (O.Tamper).

To counter the threat the environment must also:

- ensure the confidentiality of CHV imported (OE.CHV_Management).

T.CHV_Corruption To counter the threat, the TOE shall:

- ensure integrity of CHV stored (O.Integrity_Protection),
- control access to CHV to the only authorized users (O.Access_Control),
- verify authenticity of imported data (O.Import),
- enforce physical protection to avoid bypassing security mechanisms (O.Tamper).

To counter the threat the environment must also:

- ensure the confidentiality of CHV imported (OE.CHV_Management).

T.Replay To counter the threat, the TOE shall:

- ensure that all replayed commands are detected and rejected (O.replay_Protection).

T.User_Usurpation To counter the threat, the TOE shall:

- enforce authentication of the user to the TOE before performing operations requiring it (O.CHV),
- enforce physical protection to avoid bypassing security mechanisms (O.Tamper).

T.DistantServer_Usurpation To counter the threat, the TOE shall:

- enforce authentication of the distant server to the TOE before performing operations requiring it (O.Authentication),
- enforce physical protection to avoid bypassing security mechanisms (O.Tamper).

T.TOE_Usurpation To counter the threat, the TOE shall:

- enforce authentication of the TOE to any third party in order to prove its own genuinity (O.TOE_Usurpation),
- enforce physical protection to avoid bypassing security mechanisms (O.Tamper).

T.Tearing To counter the threat, the TOE shall:

- ensure the continued correct operation of its security functionalities especially in case of abnormal process of commands such as interruption during processing (O.Operate).

9.1.2 Organisational Security Policies

P.Crypto This OSP is directly enforced by the objectives O.Crypto.

P.CHV_management This OSP is directly enforced by the objectives for the environment OE.CHV_Management.

9.1.3 Assumptions

A.Usage This assumption is completely upheld by the objectives for the environment OE.Usage.

A.Perso This assumption is completely upheld by the objectives for the environment OE.Perso.

9.1.4 SPD and Security Objectives

Threats	Security Objectives	Rationale
T.Keys_Disclosure	O.Access_Control, O.Confidentiality_Protection, O.Export, O.Tamper	Section 9.1.1
T.Keys_Corruption	O.Access_Control, O.Integrity_Protection, O.Import, O.Tamper	Section 9.1.1
T.Files_Corruption	O.Access_Control, O.Integrity_Protection, O.Import, O.Tamper	Section 9.1.1
T.ACs_Corruption	O.Access_Control, O.Integrity_Protection, O.Import, O.Tamper	Section 9.1.1
T.PTC_Corruption	O.Integrity_Protection, O.Tamper, O.Access_Control	Section 9.1.1
T.CHV_Disclosure	O.Access_Control, O.Confidentiality_Protection, O.Export, O.Tamper, OE.CHV_Management	Section 9.1.1
T.CHV_Corruption	O.Access_Control, O.Integrity_Protection, O.Tamper, O.Import, OE.CHV_Management	Section 9.1.1
T.Replay	O.replay_Protection	Section 9.1.1
T.User_Usurpation	O.CHV, O.Tamper	Section 9.1.1
T.DistantServer_Usurpation	O.Authentication, O.Tamper	Section 9.1.1
T.TOE_Usurpation	O.TOE_Usurpation, O.Tamper	Section 6.1.1
T.Tearing	O.Operate	Section 9.1.1

Tableau 1 Threats and Security Objectives - Coverage

Security Objectives	Threats
O.CHV	T.User_Usurpation
O.Authentication	T.DistantServer_Usurpation
O.TOE_Usurpation	T.TOE_Usurpation
O.Export	T.Keys_Disclosure, T.CHV_Disclosure
O.Import	T.Keys_Corruption, T.Files_Corruption, T.ACs_Corruption, T.CHV_Corruption
O.Confidentiality_Protection	T.Keys_Disclosure, T.CHV_Disclosure
O.Integrity_Protection	T.Keys_Corruption, T.Files_Corruption, T.ACs_Corruption, T.PTC_Corruption, T.CHV_Corruption
O.replay_Protection	T.Replay
O.Access_Control	T.Keys_Disclosure, T.Keys_Corruption, T.Files_Corruption, T.ACs_Corruption, T.PTC_Corruption, T.CHV_Disclosure, T.CHV_Corruption
O.Crypto	
O.Tamper	T.Keys_Disclosure, T.Keys_Corruption, T.Files_Corruption, T.ACs_Corruption, T.PTC_Corruption, T.CHV_Disclosure, T.CHV_Corruption, T.User_Usurpation, T.DistantServer_Usurpation, T.TOE_Usurpation
O.Operate	T.Tearing
OE.Usage	
OE.Perso	
OE.CHV_Management	T.CHV_Disclosure, T.CHV_Corruption

Tableau 2 Security Objectives and Threats - Coverage

Organisational Security Policies	Security Objectives	Rationale
P.Crypto	O.Crypto	Section 9.1.2
P.CHV_management	OE.CHV_Management	Section 9.1.2

Tableau 3 OSPs and Security Objectives - Coverage

Security Objectives	Organisational Security Policies
O.CHV	
O.Authentication	
O.TOE_Usurpation	
O.Export	
O.Import	
O.Confidentiality_Protection	
O.Integrity_Protection	
O.replay_Protection	
O.Access_Control	
O.Crypto	P.Crypto
O.Tamper	
O.Operate	
OE.Usage	
OE.Perso	
OE.CHV_Management	P.CHV_management

Tableau 4 Security Objectives and OSPs - Coverage

Assumptions	Security objectives for the Operational Environment	Rationale
A.Usage	OE.Usage	Section 9.1.3
A.Perso	OE.Perso	Section 9.1.3

Tableau 5 Assumptions and Security Objectives for the Operational Environment - Coverage

Security objectives for the Operational Environment	Assumptions
OE.Usage	A.Usage
OE.Perso	A.Perso
OE.CHV_Management	

Tableau 6 Security Objectives for the Operational Environment and Assumptions - Coverage

9.2 Security requirements / security objectives

9.2.1 Objectives

9.2.1.1 Security Objectives for the TOE

O.CHV This objective is covered by:

- FIA_UID.1/CHV and FIA_UAU.1/CHV which requires identification and PIN authentication of the user,
- FIA_AFL.1/CHV which controls the number of fail attempt and therefore prevent against illicit authentications,
- FIA_USB.1/CHV which specifies rules concerning set and reset of CHV authentication status,

- FIA_ATD.1/Attributes which defines the CHV authentication status used in the access control,
- FDP_ACF.1/AccessControl which requires CHV authentication when ACs of the accessed file require it.

O.Authentication This objective is covered by:

- FIA_UID.1/ExtAuth and FIA_UAU.1/ExtAuth which requires identification and authentication of the distant server,
- FIA_AFL.1/ExtAuth which control the number of fail attempt and therefore prevent against illicit authentications,
- FIA_USB.1/ExtAuth which specifies rules concerning set and reset of external authentication status,
- FIA_ATD.1/Attributes which defines the external authentication status used in the access control,
- FDP_ACF.1/AccessControl which requires external authentication when ACs of the accessed file require it,
- FCS_COP.1/TDES which ensure cryptographic computations are performed using 3DES approved standard,
- FCS_RNG.1/Random which ensures the same cryptogram will not be used twice.

O.TOE_Usurpation This objective is covered by:

- FDP_DAU.1/InitAuth which ensures the computation of a proof of authenticity of the TOE and provides third parties means to verify it,
- FCS_COP.1/TDES which ensure cryptographic computations are performed using 3DES approved standard.

O.Export This objective is covered by:

- FDP_ACF.1/AccessControl which forbids reading confidential data,
- FDP_ETC.1/Export which restricts export to not confidential data.

O.Import This objective is covered by:

- FDP_ITC.1/Import and FDP_ACF.1/AccessControl which ensures access control to ensure genuinity of commands are applied when importing them,
- FDP_UIT.1/Exchanges which ensures first that exchanges are always protected in integrity and second that entity sending the commands know the secret keys which is a proof of genuinity,
- FTP_ITC.1/Selectable which provides a secure channel enforcing authentication of end points,
- FCS_COP.1/TDES which ensure cryptographic computations are performed using 3DES approved standard,
- FMT_SMF.1/Selectable which switches application phase to personnalised and activates ACs; secure channel is therefore no more useful.

O.Confidentiality_Protection This objective is covered by:

- FDP_ACF.1/AccessControl which forbids reading confidential data,
- FDP_UCT.1/LoadKey which protects key loading in confidentiality,
- FTP_ITC.1/Selectable which provides a secure channel protecting data exchanged in confidentiality,

- FMT_SMF.1/Selectable which switches application phase to personnalised and activates ACs; secure channel is therefore no more useful,
- FCS_COP.1/TDES which ensure cryptographic computations are performed using 3DES approved standard,
- FCS_CKM.4/Destruction which ensures keys are properly destroyed to ensure confidentiality,
- FPT_PHP.3 which ensures protection against physical attacks.

O.Integrity_Protection This objective is covered by:

- FDP_ACF.1/AccessControl which specifies entities authorized to perform modification of sensitive data,
- FDP_UIT.1/Exchanges which protects External authentication and APDUs using Pro mode in integrity,
- FTP_ITC.1/Selectable which provides a secure channel protecting data exchanged in integrity,
- FMT_SMF.1/Selectable which switches application phase to personnalised and activates ACs; secure channel is therefore no more useful,
- FCS_COP.1/TDES which ensure cryptographic computations are performed using 3DES approved standard,
- FDP_SDI.2/IntegrityControl which ensures integrity of stored senstive data,
- FPT_PHP.3 which ensure protection against physical tampering.

O.replay_Protection This objective is covered by:

- FDP_UIT.1/Exchanges which protects External authentication and APDUs using Pro mode against replay attacks,
- FTP_ITC.1/Selectable which provide a secure channel protecting against replay attacks,
- FMT_SMF.1/Selectable which switches application phase to personnalised and activates ACs; secure channel is therefore no more useful,
- FCS_COP.1/TDES which ensure cryptographic computations are performed using 3DES approved standard,
- FCS_RNG.1/Random which ensures the same cryptogram can not be used twice.

O.Access_Control This objective is covered by:

- FDP_ACC.1/AccessControl and FDP_ACF.1/AccessControl which specifies the rules to access data stored in files based on authentication performed,
- FIA_UAU.1/CHV which authentifies users using a CHV,
- FIA_UAU.1/ExtAuth which authentifies users using a cryptogram.

O.Crypto This objective is covered by:

- FCS_COP.1/TDES which ensure cryptographic computations are performed using 3DES approved standard,
- FCS_RNG.1/Random which ensure the generation of random values of high quality without any bias,
- FPT_PHP.3 which ensures that physical attacks are not practical on the implementation.

O.Tamper This objective is covered by:

- FPT_PHP.3 which ensures physical tampering protection and avoid security mechanisms to be bypassed.

O.Operate This objective is covered by:

- FPT_FLS.1 which ensures protection against tearing that could disturb correct operation of security functionnalities.

9.2.2 Rationale tables of Security Objectives and SFRs

Security Objectives	Security Functional Requirements	Rationale
O.CHV	FIA_ATD.1/Attributes, FIA_UAU.1/CHV, FIA_UID.1/CHV, FIA_AFL.1/CHV, FIA_USB.1/CHV, FDP_ACF.1/AccessControl	Section 9.2.1.1
O.Authentication	FIA_ATD.1/Attributes, FIA_UAU.1/ExtAuth, FIA_UID.1/ExtAuth, FIA_AFL.1/ExtAuth, FIA_USB.1/ExtAuth, FDP_ACF.1/AccessControl, FCS_COP.1/TDES, FCS_RNG.1/Random	Section 9.2.1.1
O.TOE_Usurpation	FDP_DAU.1/InitAuth, FCS_COP.1/TDES	Section 9.2.1.1
O.Export	FDP_ETC.1/Export, FDP_ACF.1/AccessControl	Section 9.2.1.1
O.Import	FDP_ITC.1/Import, FDP_UIT.1/Exchanges, FTP_ITC.1/Selectable, FDP_ACF.1/AccessControl, FMT_SMF.1/Selectable, FCS_COP.1/TDES	Section 9.2.1.1
O.Confidentiality_Protection	FDP_ACF.1/AccessControl, FDP_UCT.1/LoadKey, FCS_CKM.4/Destruction, FTP_ITC.1/Selectable, FPT_PHP.3, FMT_SMF.1/Selectable, FCS_COP.1/TDES	Section 9.2.1.1
O.Integrity_Protection	FDP_SDI.2/IntegrityControl, FDP_UIT.1/Exchanges, FTP_ITC.1/Selectable, FPT_PHP.3, FDP_ACF.1/AccessControl, FMT_SMF.1/Selectable, FCS_COP.1/TDES	Section 9.2.1.1
O.replay_Protection	FDP_UIT.1/Exchanges, FTP_ITC.1/Selectable, FMT_SMF.1/Selectable, FCS_COP.1/TDES, FCS_RNG.1/Random	Section 9.2.1.1
O.Access_Control	FDP_ACC.1/AccessControl, FDP_ACF.1/AccessControl, FIA_UAU.1/CHV, FIA_UAU.1/ExtAuth	Section 6.2.1
O.Crypto	FCS_COP.1/TDES, FCS_RNG.1/Random, FPT_PHP.3	Section 9.2.1.1
O.Tamper	FPT_PHP.3	Section 9.2.1.1
O.Operate	FPT_FLS.1	Section 9.2.1.1

Tableau 7 Security Objectives and SFRs - Coverage

Security Functional Requirements	Security Objectives
FIA_ATD.1/Attributes	O.CHV, O.Authentication
FIA_UAU.1/CHV	O.CHV, O.Access_Control
FIA_UID.1/CHV	O.CHV
FIA_AFL.1/CHV	O.CHV
FIA_USB.1/CHV	O.CHV
FIA_UAU.1/ExtAuth	O.Authentication, O.Access_Control
FIA_UID.1/ExtAuth	O.Authentication
FIA_AFL.1/ExtAuth	O.Authentication
FIA_USB.1/ExtAuth	O.Authentication
FDP_DAU.1/InitAuth	O.TOE_Usurpation
FDP_ETC.1/Export	O.Export
FDP_ITC.1/Import	O.Import
FMT_SMF.1/Selectable	O.Import, O.Confidentiality_Protection, O.Integrity_Protection, O.replay_Protection
FDP_SDI.2/IntegrityControl	O.Integrity_Protection
FDP_ACC.1/AccessControl	O.Access_Control
FDP_ACF.1/AccessControl	O.CHV, O.Authentication, O.Export, O.Import, O.Confidentiality_Protection, O.Integrity_Protection, O.Access_Control
FDP_UIT.1/Exchanges	O.Import, O.Integrity_Protection, O.replay_Protection
FDP_UCT.1/LoadKey	O.Confidentiality_Protection
FTP_ITC.1/Selectable	O.Import, O.Confidentiality_Protection, O.Integrity_Protection, O.replay_Protection
FCS_COP.1/TDES	O.Authentication, O.TOE_Usurpation, O.Import, O.Confidentiality_Protection, O.Integrity_Protection, O.replay_Protection, O.Crypto
FCS_RNG.1/Random	O.Authentication, O.replay_Protection, O.Crypto
FCS_CKM.4/Destruction	O.Confidentiality_Protection
FPT_PHP.3	O.Confidentiality_Protection, O.Integrity_Protection, O.Crypto, O.Tamper
FPT_FLS.1	O.Operate

Tableau 8 SFRs and Security Objectives

9.3 Dependencies

9.3.1 SFRs dependencies

Requirements	CC Dependencies	Satisfied Dependencies
FIA_ATD.1/Attributes	No dependencies	
FIA_UAU.1/CHV	(FIA_UID.1)	FIA_UID.1/CHV
FIA_UID.1/CHV	No dependencies	
FIA_AFL.1/CHV	(FIA_UAU.1)	FIA_UAU.1/CHV
FIA_USB.1/CHV	(FIA_ATD.1)	FIA_ATD.1/Attributes
FIA_UAU.1/ExtAuth	(FIA_UID.1)	FIA_UID.1/ExtAuth
FIA_UID.1/ExtAuth	No dependencies	
FIA_AFL.1/ExtAuth	(FIA_UAU.1)	FIA_UAU.1/ExtAuth
FIA_USB.1/ExtAuth	(FIA_ATD.1)	FIA_ATD.1/Attributes
FDP_DAU.1/InitAuth	No dependencies	
FDP_ETC.1/Export	(FDP_ACC.1 or FDP_IFC.1)	FDP_ACC.1/AccessControl
FDP_ITC.1/Import	(FDP_ACC.1 or FDP_IFC.1) and (FMT_MSA.3)	FDP_ACC.1/AccessControl
FMT_SMF.1/Selectable	No dependencies	
FDP_SDI.2/IntegrityControl	No dependencies	
FDP_ACC.1/AccessControl	(FDP_ACF.1)	FDP_ACF.1/AccessControl
FDP_ACF.1/AccessControl	(FDP_ACC.1) and (FMT_MSA.3)	FDP_ACC.1/AccessControl
FDP_UIT.1/Exchanges	(FDP_ACC.1 or FDP_IFC.1) and (FTP_ITC.1 or FTP_TRP.1)	FDP_ACC.1/AccessControl
FDP_UCT.1/LoadKey	(FDP_ACC.1 or FDP_IFC.1) and (FTP_ITC.1 or FTP_TRP.1)	FDP_ACC.1/AccessControl
FTP_ITC.1/Selectable	No dependencies	
FCS_COP.1/TDES	(FCS_CKM.1 or FDP_ITC.1 or FDP_ITC.2) and (FCS_CKM.4)	FDP_ITC.1/Import, FCS_CKM.4/Destruction
FCS_RNG.1/Random	No dependencies	
FCS_CKM.4/Destruction	(FCS_CKM.1 or FDP_ITC.1 or FDP_ITC.2)	FDP_ITC.1/Import
FPT_PHP.3	No dependencies	
FPT_FLS.1	No dependencies	

Tableau 9 SFRs dependencies

9.3.1.1 Rationale for the exclusion of dependencies

The dependency FMT_MSA.3 of FDP_ITC.1/Import is unsupported. Initial values of attributes and conditions to perform modifications are still specified in FIA_USB.1 requirements. Therefore, this dependency is irrelevant.

The dependency FMT_MSA.3 of FDP_ACF.1/AccessControl is unsupported. Initial values of attributes and conditions to perform modifications are still specified in FIA_USB.1 requirements. Therefore, this dependency is irrelevant.

The dependency FTP_ITC.1 or FTP_TRP.1 of FDP_UIT.1/Exchanges is unsupported. In Selectable state this dependency is enforced by FTP_ITC.1/Selectable. In Personalised

state data are protected directly by cipherment and adding cryptogram without using a Secure Channel In this case the dependency is therefore not useful.

The dependency FTP_ITC.1 or FTP_TRP.1 of FDP_UCT.1/LoadKey is unsupported. In Selectable state this dependency is enforced by FTP_ITC.1/Selectable. In Personalised state data are protected directly by cipherment and adding cryptogram without using a Secure Channel In this case the dependency is therefore not useful.

9.3.2 SARs dependencies

Requirements	CC Dependencies	Satisfied Dependencies
ADV_ARC.1	(ADV_FSP.1) and (ADV_TDS.1)	ADV_FSP.4, ADV_TDS.3
ADV_FSP.4	(ADV_TDS.1)	ADV_TDS.3
ADV_IMP.1	(ADV_TDS.3) and (ALC_TAT.1)	ADV_TDS.3, ALC_TAT.1
ADV_TDS.3	(ADV_FSP.4)	ADV_FSP.4
AGD_OPE.1	(ADV_FSP.1)	ADV_FSP.4
AGD_PRE.1	No Dependencies	
ALC_CMC.4	(ALC_CMS.1) and (ALC_DVS.1) and (ALC_LCD.1)	ALC_CMS.4, ALC_DVS.2, ALC_LCD.1
ALC_CMS.4	No Dependencies	
ALC_DEL.1	No Dependencies	
ALC_DVS.2	No Dependencies	
ALC_LCD.1	No Dependencies	
ALC_TAT.1	(ADV_IMP.1)	ADV_IMP.1
ASE_CCL.1	(ASE_ECD.1) and (ASE_INT.1) and (ASE_REQ.1)	ASE_ECD.1, ASE_INT.1, ASE_REQ.2
ASE_ECD.1	No Dependencies	
ASE_INT.1	No Dependencies	
ASE_OBJ.2	(ASE_SPD.1)	ASE_SPD.1
ASE_REQ.2	(ASE_ECD.1) and (ASE_OBJ.2)	ASE_ECD.1, ASE_OBJ.2
ASE_SPD.1	No Dependencies	
ASE_TSS.1	(ADV_FSP.1) and (ASE_INT.1) and (ASE_REQ.1)	ADV_FSP.4, ASE_INT.1, ASE_REQ.2
ATE_COV.2	(ADV_FSP.2) and (ATE_FUN.1)	ADV_FSP.4, ATE_FUN.1
ATE_DPT.1	(ADV_ARC.1) and (ADV_TDS.2) and (ATE_FUN.1)	ADV_ARC.1, ADV_TDS.3, ATE_FUN.1
ATE_FUN.1	(ATE_COV.1)	ATE_COV.2
ATE_IND.2	(ADV_FSP.2) and (AGD_OPE.1) and (AGD_PRE.1) and (ATE_COV.1) and (ATE_FUN.1)	ADV_FSP.4, AGD_OPE.1, AGD_PRE.1, ATE_COV.2, ATE_FUN.1
AVA_VAN.5	(ADV_ARC.1) and (ADV_FSP.4) and (ADV_IMP.1) and (ADV_TDS.3) and (AGD_OPE.1) and (AGD_PRE.1) and (ATE_DPT.1)	ADV_ARC.1, ADV_FSP.4, ADV_IMP.1, ADV_TDS.3, AGD_OPE.1, AGD_PRE.1, ATE_DPT.1

Tableau 10 SARs dependencies

9.4 SFRs / TSS

Security Functional Requirements	TOE Summary Specification
FIA_ATD.1/Attributes	Cardholder authentication, External Authentication, Access Control
FIA_UAU.1/CHV	Cardholder authentication
FIA_UID.1/CHV	Cardholder authentication
FIA_AFL.1/CHV	Cardholder authentication
FIA_USB.1/CHV	Cardholder authentication
FIA_UAU.1/ExtAuth	External Authentication
FIA_UID.1/ExtAuth	External Authentication
FIA_AFL.1/ExtAuth	External Authentication
FIA_USB.1/ExtAuth	External Authentication
FDP_DAU.1/InitAuth	Internal Authentication
FDP_ETC.1/Export	Access Control
FDP_ITC.1/Import	Access Control
FMT_SMF.1/Selectable	Secure personnalisation
FDP_SDI.2/IntegrityControl	Access Control
FDP_ACC.1/AccessControl	Pro mode, External Authentication, Access Control
FDP_ACF.1/AccessControl	Pro mode, External Authentication, Access Control
FDP_UIT.1/Exchanges	Pro mode, External Authentication, Access Control, Secure personnalisation
FDP_UCT.1/LoadKey	Access Control
FTP_ITC.1/Selectable	Secure personnalisation
FCS_COP.1/TDES	Pro mode, External Authentication, Internal Authentication
FCS_RNG.1/Random	Random generation
FCS_CKM.4/Destruction	Pro mode, External Authentication, Internal Authentication
FPT_PHP.3	Cardholder authentication, Pro mode, External Authentication, Internal Authentication, Random generation, Access Control, Secure personnalisation
FPT_FLS.1	Cardholder authentication, Pro mode, External Authentication, Internal Authentication, Random generation, Access Control, Secure personnalisation

Tableau 11 SFRs and TSS - Coverage

TOE Summary Specification	Security Functional Requirements
Cardholder authentication	FIA_ATD.1/Attributes, FIA_UAU.1/CHV, FIA_UID.1/CHV, FIA_AFL.1/CHV, FIA_USB.1/CHV, FPT_PHP.3, FPT_FLS.1
Pro mode	FDP_ACC.1/AccessControl, FDP_ACF.1/AccessControl, FDP_UIT.1/Exchanges, FCS_COP.1/TDES, FCS_CKM.4/Destruction, FPT_PHP.3, FPT_FLS.1
External Authentication	FIA_ATD.1/Attributes, FIA_UAU.1/ExtAuth, FIA_UID.1/ExtAuth, FIA_AFL.1/ExtAuth, FIA_USB.1/ExtAuth, FDP_ACC.1/AccessControl, FDP_ACF.1/AccessControl, FDP_UIT.1/Exchanges, FCS_COP.1/TDES, FCS_CKM.4/Destruction, FPT_PHP.3, FPT_FLS.1
Internal Authentication	FDP_DAU.1/InitAuth, FCS_COP.1/TDES, FCS_CKM.4/Destruction, FPT_PHP.3, FPT_FLS.1
Random generation	FCS_RNG.1/Random, FPT_PHP.3, FPT_FLS.1
Access Control	FIA_ATD.1/Attributes, FDP_ETC.1/Export, FDP_ITC.1/Import, FDP_SDI.2/IntegrityControl, FDP_ACC.1/AccessControl, FDP_ACF.1/AccessControl, FDP_UIT.1/Exchanges, FDP_UCT.1/LoadKey, FPT_PHP.3, FPT_FLS.1
Secure personnalisation	FMT_SMF.1/Selectable, FDP_UIT.1/Exchanges, FTP_ITC.1/Selectable, FPT_PHP.3, FPT_FLS.1

Tableau 12 TSS and SFRs - Coverage

9.5 EAL rationale

EAL4 allows a developer to attain a reasonably high assurance level without the need for highly specialized processes and practices. It is considered to be the highest level that could be applied to an existing product line without undue expense and complexity. As such, EAL4 is appropriate for commercial products that can be applied to moderate to high security functions. The TOE described in this security target is just such a product.

9.6 EAL augmentations rationale

9.6.1 AVA_VAN.5 Advanced methodical vulnerability analysis

Due to the definition of the TOE, it must be shown to be highly resistant to penetration attacks. This assurance requirement is achieved by the AVA_VAN.5 component.

Advanced methodical vulnerability analysis is based on highly detailed technical information. The attacker is assumed to be thoroughly familiar with the specific implementation of the TOE. The attacker is presumed to have a high level of technical sophistication. AVA_VAN.5 has dependencies with ADV_ARC.1 "Security architecture description", ADV_FSP.2 "Security-enforcing functional specification", ADV_IMP.1 "Implementation representation of the TSF", ADV_TDS.3 "Basic modular design", AGD_PRE.1 "Preparative procedures" and AGD_OPE.1 "Operational user Guidance".

All these dependencies are satisfied by EAL4.

9.6.2 ALC_DVS.2 Sufficiency of security measures

Development security is concerned with physical, procedural, personnel and other technical measures that may be used in the development environment to protect the TOE. This assurance component is a higher hierarchical component to EAL4 (only ALC_DVS.1). Due to the nature of the TOE, there is a need for any justification of the sufficiency of these procedures to protect the confidentiality and integrity of the TOE.

ALC_DVS.2 has no dependencies.

10 Glossary

DF	Dedicated File
EF	Elementary File
MF	Master File
CHV	Card Holder Verification
CHVx methods	CHV number 1 (CHV1) or CHV number 2 (CHV2) – Authentication
CHVx/AUTH	Stands for the requirement of both CHVx and AUTH authentications
CHVx/Pro	Stands for the requirement of both CHVx and Pro mode authentications
PRO	Authentication method by symmetric signature of data
AUTH	Authentication method by external authentication
ALWAYS	Means that the access to a file is always granted
NEVER	Means that the access to a file is always denied
IAS	Identification, Authentication and Signature
ECC	Electronic Citizen Card
ASIP Santé	Agence des Systèmes d'Information Partagés de Santé
IC	Integrated Circuit
BIOS	Basic Input/Output System
API	Application programming interface
CPS2ter	name of the old "ASIP santé" smartcard and its current emulation
PIN	Personal Identification Number
APDU	Application Protocol Data Unit
CLA	Class parameter in the [ISO 7816-4] APDU format
INS	Instruction parameter in the [ISO 7816-4] APDU format
HID	Human Interface Device
SF	Security Functionality
AC	Access Condition
PTC	PIN Try Counter
PC	Personal Computer
3DES	Triple Data Encryption Standard
PUK	PIN Unlock Key (note that it is just a regular PIN with a specific unlocking purpose)
GP	Global Platform

11 References

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