
TÜBİTAK BİLGEM

National Research Center of Electronics and Cryptography

# Common Criteria Protection Profile for Application Firmware of Secure Smartcard Reader for National Electronic Identity Verification System

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| Prepared by | eID Applications Unit |

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# 1 PP INTRODUCTION

## 1.1 PP REFERENCE

Title: Protection Profile for Application Firmware of Secure Smartcard Reader for National Electronic Identity Verification System

CC Version: 3.1 (Revision 4)

Assurance Level: EAL4+ with ALC_DVS.2 augmentation

Version Number: v2.5

Keywords: Electronic Identity, Smartcard Reader, Identity Verification, Electronic Identity Card, Secure Smartcard Reader, Biometric Authentication

## 1.2 TOE OVERVIEW

The TOE is the Secure Smartcard Reader (SSR) Application Firmware running on SSR Device. The SSR is the identity verification terminal for the National eID Verification System (eIT.DVS). As the application firmware of the SSR, the TOE performs identity verification of Service Requester and Service Attendee according to the eIDVS, securely communicating with the other system components and as a result of the identity verification, produces an Identity Verification Assertion (IVA) signed by the Secure Access Module (SAM) inside the SRR. The root certificates used for the identification & authentication purposes are also covered by the TOE

### 1.2.1 MAJOR SECURITY FEATURES OF A TOE

The following security mechanisms are primarily mediated in the TOE:

- Identification and Authentication,
  - Cardholder verification by using PIN and biometrics (fingerprint, finger vein, or palm vein data).
  - Authentication of eID Card by the TOE,
  - Authentication of Role Holder by eID Card and by the TOE,
  - Authentication of SAM by the TOE and by eID Card,
  - Authentication of the TOE by SAM and by Card Holder (Service Requester and Service Attendee) and by external entities (e.g. EPP, EBS, Role Holder, etc.),
- Secure Communication between the TOE and

- SAM
- eID Card
- Role Holder
- other trusted IT Components

- Security Management,
- Self-Protection,
- Audit.

Among the certificates used in the National eID Verification System, certificates of the root CA, device management CA and eID management CA are included in the TOE.

### 1.2.2 TYPES OF SSR DEVICES

This Protection Profile supports TOE on three different operational environments. Operation environment is the SSR Hardware and SSR User Environment including the other parties that SSR communicates to the SSR Application Firmware.

Properties of the three operational environments are compared in Table 1.

**Table 1. Comparison of SSR types**

| | **Type I** | **Type II** | **Type III** |
|---|---|---|---|
| **User Interface of SSR Device** | · Pinpad,<br>· Display,<br>· One smartcard slot,<br>· Biometric sensor (internal, external or does not exist)<br>· External pinpad (optional) | · Pinpad,<br>· Display,<br>· Two smartcard slots,<br>· Biometric sensor (internal, external or does not exist)<br>· External pinpad (optional) | · Pinpad,<br>· Display,<br>· One or two smartcard slots,<br>· Biometric sensor (internal, external or does not exist)<br>· External pinpad (optional) |
| **Service Provider Client Application (SPCA)** | Running on PC | Running on PC | Included in the TOE |
| **SSR Access Server (SAS)** | N/A | Optional | N/A |
| **Communication Environment of SSR** | · SSR communicates to Service Provider Client Application (SPCA) through USB Interface. SPCA | · SSR communicates to Service Provider Client Application through USB interface or communicates to SAS | · SSR directly communicates to IVPS / APS/ OCSPS through wireless |

| | | | |
|---|---|---|---|
| | communicates to Identity Verification Policy Server (IVPS) / Application Server (APS)/ Online Certificate Status Protocol Server (OCSPS). | through Ethernet interface. SPCA or SAS communicates to IVPS / APS/ OCSPS. | interface. |
| **Service Attendee Support** | N/A | Yes | Optional |
| **Secure Upgrade** | Yes | Yes | Yes |
| **Optional Online/Offline Mode** | · Offline Certificate Validation using Certificate Revocation List when the OCSP Server isn't reached | · Offline Certificate Validation using Certificate Revocation List when the OCSP Server isn't reached | · Offline Certificate Validation using Certificate Revocation List when the OCSP Server isn't reached<br>· Storing Identity Verification Assertions when the connection is failed |

There are two offline use cases: (i) offline revocation list control and (ii) offline IVA generation & storage. In first use case, only the certificate status control is performed offline, other identity verification steps are performed online. As it is explained in Table 1, this use case could be included in all three types of SSR Devices when OCSPS could not be reached. On the other hand, the second use case is an option only for SSR Type III Devices. If the SSR type III Device has the offline IVA generation and storage mode, the IVA can be generated and stored within the SSR when the SSR can not reach to the APS. The confidentiality and the integrity of the IVAs shall be assured during storage.

### 1.2.3 NON TOE HARDWARE/ SOFTWARE/ FIRMWARE

#### 1.2.3.1 Typical Software/ Firmware Environment of TOE

| |
|---|
| File System and Software Libraries |
| Embedded Operating System Kernel |
| Smartcard Reader IC Firmware |

**Figure 1. Typical Software/Firmware Environment of TOE**

In a typical software environment, the TOE runs at the top of an embedded operating system, its file-system and software libraries. It communicates to a smartcard reader IC firmware within the device. Other possible applications that could run on the SSR Device are not defined in this protection profile.

### 1.2.3.2 Hardware Environment of TOE (SSR Hardware)

The TOE is stored in a non-volatile memory location in the SSR Hardware as an encrypted binary file. During power-up, the encrypted TOE is decrypted before its execution. A Typical SSR Hardware environment of TOE is shown in Figure 2.

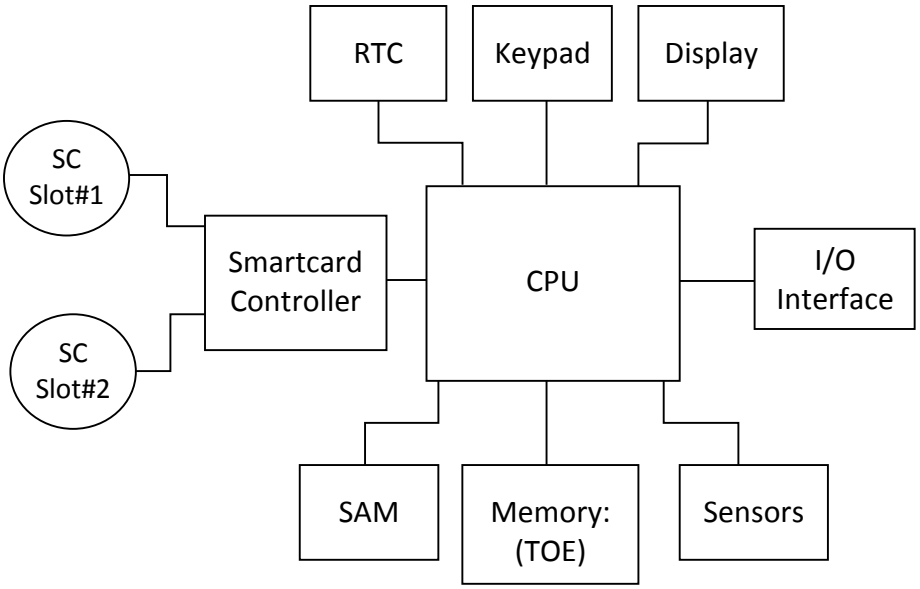



**Figure 2. Typical SSR Hardware**

Minimum SSR Hardware includes:

- I/O interfaces
- User interfaces (keypad, display, optional biometric sensor),
- CPU,
- Memory components,
- At least one smart card slot,
- Secure Access Module (SAM),
- Real Time Clock (RTC),
- Physical and logical security barriers (shields, tamper switches etc.).

Some hardware components such as biometric sensor, Ethernet port or second smartcard slot are optional depending on the SSR type. There are three possible SSR device types that TOE can be deployed. These types are defined in Section 1.2.4.

#### 1.2.3.3 Optional Hardware

SSR Devices may be developed to operate together with additional hardware components which are Internal Biometric Sensor, External Biometric Sensor (EBS) and External PIN PAD (EPP). Biometric verification feature is optional for SSR Devices. Both internal and external biometric sensors are accepted for biometric verification. . In addition, an External PIN PAD could be supplied with the SSR Hardware as an addition to the on board PIN PAD so as to give ease of use to the user. However, when external biometric sensors or external PIN PADs are applicable, the TOE shall authenticate the external device and protect the confidentiality of the communication between the TOE and the external device.

### 1.2.4 ACTORS AND EXTERNAL SYSTEMS

**Actors:** Service Requester, Service Attendee

**External Systems:** Service Provider Client Application(SPCA, Identity Verification Policy Server (IVPS), Application Server (APS), SSR Access Server (SAS), Identity Verification Server (IVS), Electronic Identity Card of National Republic (eID Card), Service Requester (SR), Service Attendee (SA), Online Certificate Status Protocol (OCSP) Server, Identity Faker, Illegitimate eID Card, SSR Access Server, PC, SAM, External Biometric Sensor (if applicable), External Pinpad (if applicable).

### 1.2.5 OPERATIONAL ENVIRONMENTS OF SSR

User environments and usage scenarios are explained for the three types of TOE Environment.

### 1.2.5.1 Operational Environment for SSR Type I

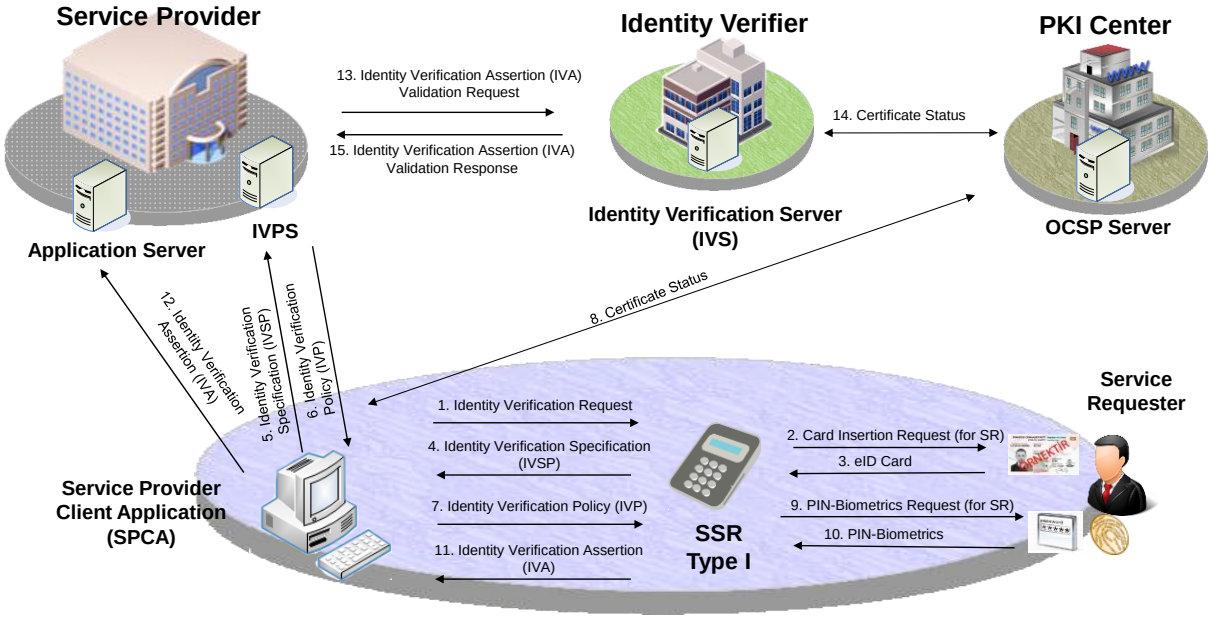



**Figure 3. User Environment of Type I**

The following scenario explains how Type I devices perform Identity Verification Operation in the environment shown in Figure 3. Operation is initiated by the Service Provider Client Application (SPCA) which is installed on a personal computer (PC).

First, SPCA sends an Identity Verification Request to TOE. Once the TOE receives this request, it asks the SR to insert his/her eID card into the smartcard slot. After the eID card is inserted, the TOE sets up a secure messaging session with the eID card. Having read the cardholder‘s personal message from the eID card, the TOE displays it on the screen for the SR’s approval. If the displayed message is approved by the SR, an Identity Verification Specification (IVSP), is generated by the TOE, and sent to SPCA. Next, SPCA connects to the Identity Verification Policy Server (IVPS) and gets the Identity Verification Policy (IVP) for the SR specified in the IVSP. After that, SPCA sends the IVP to the TOE. Since the policy is signed by the IVPS, the TOE checks the signature to make sure it comes from a legitimate IVPS and hasn't been modified. The IVP defines the Identity Verification Method (IVM) for the SR and the organizational policies defined in TS 13584. If an IVPS doesn’t exist, the SPCA defines the IVM itself. Otherwise, the TOE uses the predefined default IVM which has the highest security level. During identity verification, the Identity Verification Certificate within the eID Card is not only verified offline by the TOE, but also validated online with the help of the Online Certificate Status Protocol (OCSP) Server. If the online certificate validation cannot be achieved due to technical problems, there are two options to continue the operation: (i) the TOE validates the eID Card of the Service Requester using the Certificate Revocation List downloaded on the SSR Device. In this case,

the information that “OCSP check could not be achieved" shall be included in the IVA. (ii) The TOE does not validate the eID Card of the Service Requester. In this case, the information that “OCSP check and Revocation List control could not be achieved” shall be included in the IVA. In addition to certificate verification and validation, according to the IVM, if requested, biometric verification of the SR is done by the TOE using fingerprint, fingervein or palmvein data. At the end of the authentication, an Identity Verification Assertion (IVA) is generated by the TOE. Since the IVA is signed by the SAM, it assures origin of identity, time and place. The TOE sends the IVA to the SPCA and finally, the SPCA forwards the IVA to the IVS, where it's further validated and kept as the evidence for the operation. Until the IVA is validated by the IVS, the Identification and Authentication of SR is regarded as incomplete.

### 1.2.5.2 Operational Environment for SSR Type II

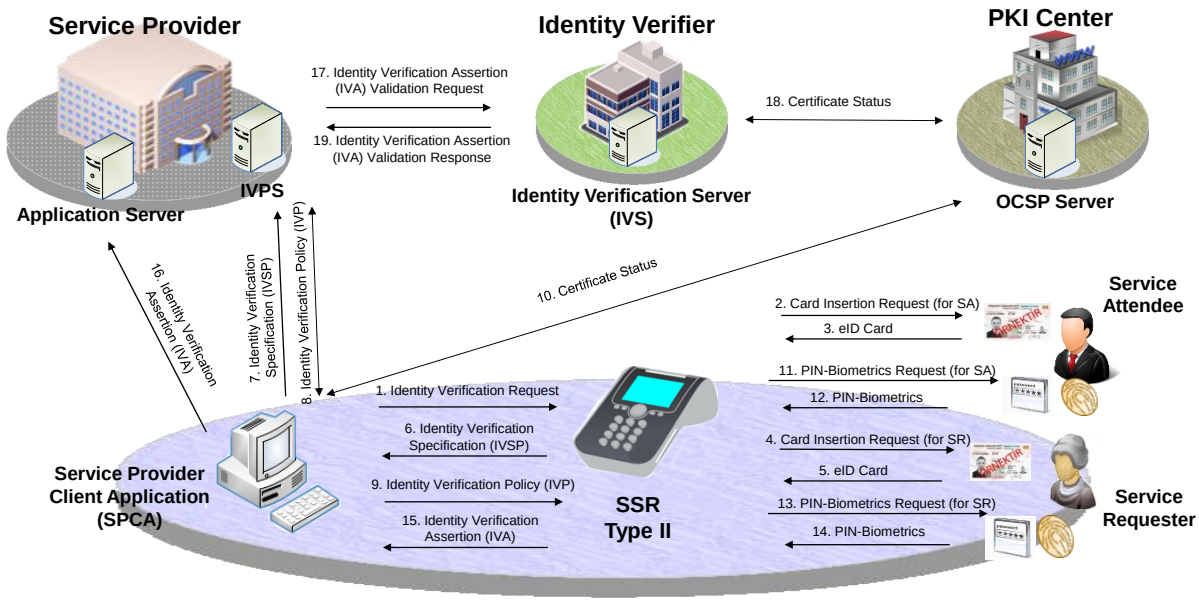



**Figure 4. User Environment of Type II (without SAS)**

User environments for Type II devices are given in Figure 4 and Figure 5. As seen, two smartcard slots are required for Type II devices. The second smartcard slot is needed for Service Attendee support. Operation is initiated by the SPCA. If SSR Access Server (SAS) exists as shown in Figure 5, the SPCA communicates to the TOE through the SAS via Ethernet interface, otherwise, it communicates to the TOE via USB interface.

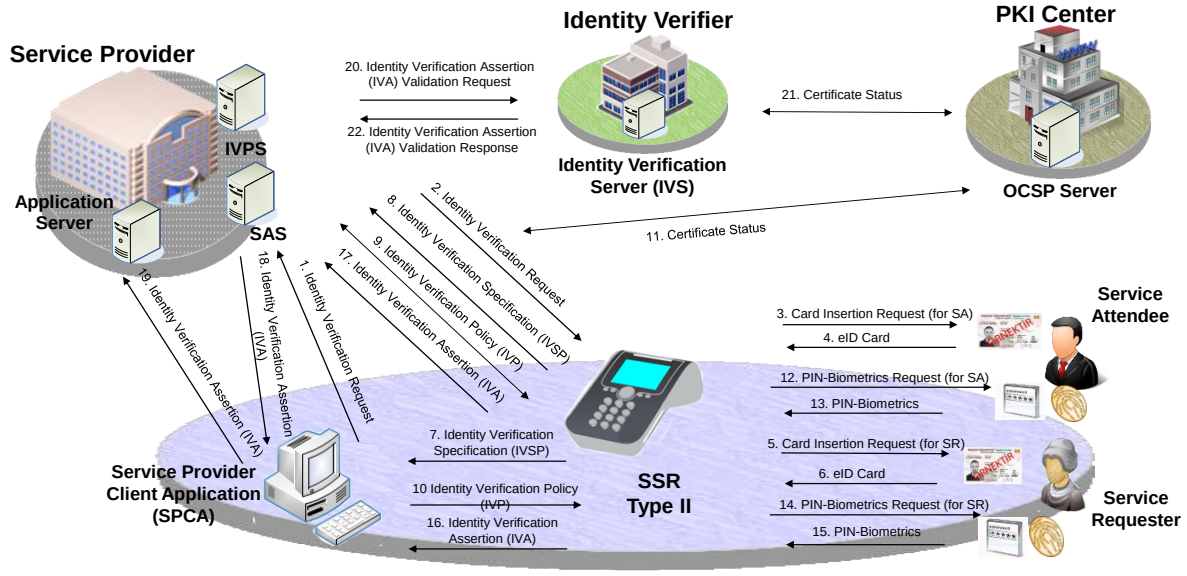



**Figure 5. User Environment of Type II (with SAS)**

In this scenario, the procedures are similar to the scenario for Type I SRR devices. However, in addition to Identification and Authentication of SR, Type II SRR devices also support Identification and Authentication of Service Attendee (SA) thanks to the second smartcard slot. At the end of the Identification and Authentication of SR and SA, an Identity Verification Assertion (IVA) is generated by the TOE. This time the IVA includes Service Attendee information as well. The TOE sends the IVA to the SPCA. Finally, SPCA forwards the IVA to IVS, which validates it and keeps it as an evidence for the operation. Until the IVA is validated by the IVS, the Identification and Authentication of SR and SA is regarded as incomplete.

### 1.2.5.3 Operational Environment for SSR Type III

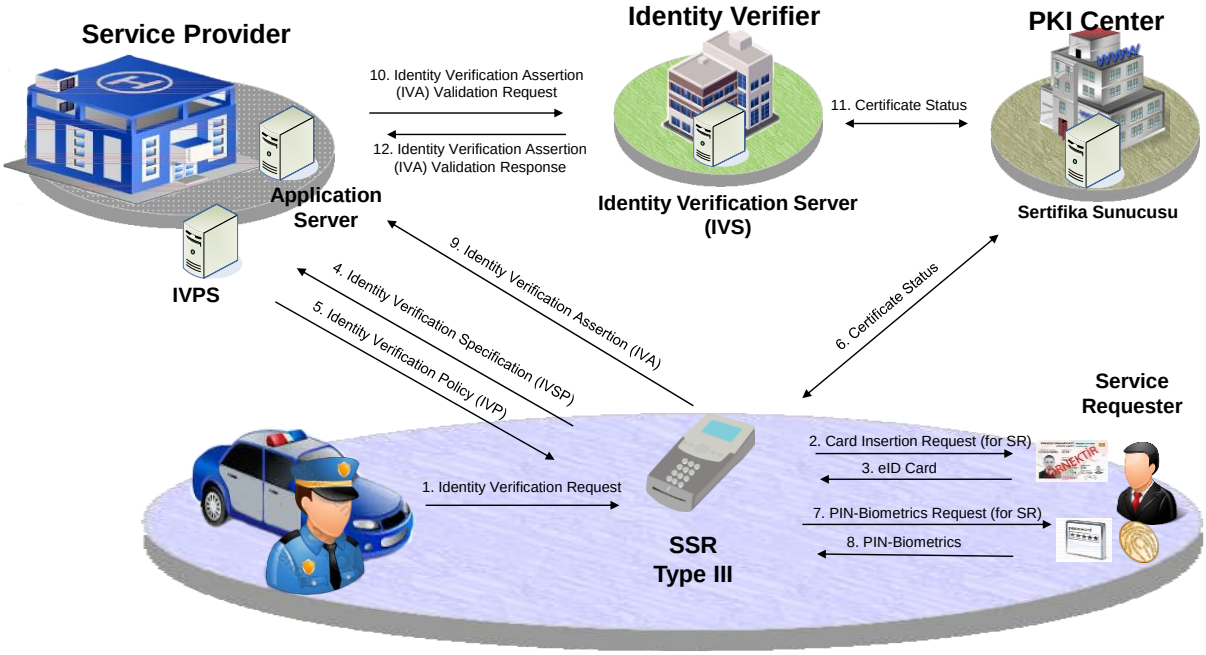



**Figure 6. User Environment of Type III**

User environment for Type III devices is given in Figure 6. Type III device is intended for mobile use. As seen, the environment doesn't require a PC. The TOE performs the functions of SPCA itself. It directly communicates to OSPCS, Application Server and IVPS. Type III devices may have one or two smartcard slots depending on usage. In the scenario, the procedures are similar to the scenario for Type I and Type II devices. However, the TOE itself initiates the Identification and Authentication Operation. In addition, offline usage scenarios are defined for mobile SSR Device. In case OCSP Server is not reached, (i)TOE validates the eID Card of the Service Requester from the Revocation List downloaded on the SSR Device and puts the information that OCSP could not be achieved into the IVA. (ii)TOE does not validate the eID Card and puts the information that OCSP and Revocation List control could not be achieved in the IVA. This scenario is the same as the Type I and Type II Devices. However, the revocation list shall be downloaded onto the mobile SSR since SSR Device could run totally offline for maximum offline working time duration. In addition, if the connection with the APS is failed, IVAs could be stored in the SSR Device securely until the device becomes online again. The maximum offline working time is defined by the authorized foundations. Stored IVAs stored be transmitted to APS securely before this time.

## 1.2.6 TOE LIFE CYCLE

The TOE shall support:

- Initialization & Configuration

- Operation Phases

After production, the TOE is in Initialization & Configuration Phase. In the Initialization & Configuration Phase, the TOE and all other SSR firmware including operating system and file system are installed to the SSR Device by Initialization agent in a secure environment. After the initialization and the configuration, the TOE switches to the Operation Phase and doesn't go back to the Initialization & Configuration Phase again except tampering of the SSR. Tampering event is the only condition to set the TOE back to the Initialization & Configuration Phase. If a tampering event is detected, cryptographic data (keys, SAM Pin, etc.) within the SSR are deleted and the TOE becomes out of service; all TOE software including operating system, file system and other firmware need to be re-installed and it has to be initialized and configured by authorized personnel.

In addition, SSR and the TOE have close relations with the SAM in the SSR. Therefore SAM life cycle and SAM processes related to the TOE and the SSR are given briefly in the following subsections.

#### 1.2.6.1 Obtaining SAM to Produce an SSR

SAM cards and test SAM Cards are supplied by Authorized SAM Provider (ASP). Detailed information about obtaining the SAM cards are provided by ASP.

During development of SSR, the TOE manufacturer configures the prototype SSR device with test-SAM cards and then applies to an accredited CC Laboratory and the CC Scheme for CC certification. In addition, the manufacturer applies to an accredited laboratory and the Turkish Standardization Institution (TSE) for TS 13582 - TS 13585 conformance certification. Unless the SSR is certified according to this PP and TS 13582, TS 13583, TS13584, TS 13585 Turkish Standards, the manufacturer is not given production SAM cards by ASP.

In some cases, an External Biometric Sensor (EBS) and/or an External PIN Pad could be supplied separately with the SSR. In these cases, the TOE authenticates and securely communicates to the EBS and/or the EPP as defined in TS 13584[3]. EBS or EPP Developers acquires test- EBS SAM cards or test-EPP SAM cards from ASP for testing their EBS or EPP.

After the test and certification processes are completed successfully, EBS, EPP and SSR Developers apply for actual SAM cards.

# 2 CONFORMANCE CLAIMS

## 2.1 CC CONFORMANCE CLAIM

This PP/ST claims conformance to

- Common Criteria for Information Technology Security Evaluation, Part 1: Introduction and General Model; CCMB-2012-09-001 Version 3.1 Revision 4, September 2012, (CC Part 1)
- Common Criteria for Information Technology Security Evaluation, Part 2: Security Functional Components; CCMB--2012-09-002 Version 3.1 Revision 4, September 2012, (CC Part 2)
- Common Criteria for Information Technology Security Evaluation, Part 3: Security Assurance Requirements; CCMB--2012-09-003 Version 3.1 Revision 4, September 2012, (CC Part 3)

as follows

  - Part 2 extended
  - Part 3 conformant
- The Common Methodology for Information Technology Security Evaluation, Evaluation Methodology; CCMB--2012-09-004 Version 3.1 Revision 4, September 2012, [CEM] has to be taken into account.

## 2.2 PP CLAIM

This PP does not claim conformance to any other Protection Profiles.

## 2.3 PACKAGE CLAIM

This PP is conforming to assurance package EAL4 augmented with ALC_DVS.2 defined in CC part 3 (CC Part 3).

## 2.4 CONFORMANCE RATIONALE

Since this PP is not claiming conformance to any other protection profile, no rationale is necessary here.

## 2.5 CONFORMANCE STATEMENT

This PP requires demonstrable conformance of any ST or PP, which claims conformance to this PP. It is required that conformance statement includes the Configuration Type of the TOE.

# 3 SECURITY PROBLEM DEFINITION

This part of the PP defines the security problem that is to be addressed by the TOE. It consists of Assets, Subjects and External Entities, Organizational Security Policies, Threats and Assumptions.

## 3.1 FACTORS EFFECTING THE SECURITY PROBLEM DEFINITION

Operational Environments for three SSR Types and interaction between the SSR device and external system components are defined in Section 1.2.5. Optional external/ internal hardware components of SSR Device are defined in Section 1.2.3.3. These two sections together define the possible alternatives for the TOE operational environments. Operational environment of the TOE and optional offline use cases of the TOE, given in Table 1, are the factors effecting the security problem definition.

Each factor bring about additional security needs. Therefore, in this PP document, Security Problem Definition, Security Objectives and Security Functional Requirements are designed to cover all the possible alternatives. ST writer should chose the appropriate ones in the ST document according to SSR Type**,** Operational environment, external/ internal optional hardware components and covered offline use cases.

## 3.2 ASSETS

The Secure Smart Card Reader (SSR) and the TOE is a part of eID Verification System. TOE carries out identification and authentication operations and accesses (reads out and performs management operations of) eID Card on behalf of authorized entities (Role Holder) who has privileges on the eID Card. TOE shall securely forward the user data read out from the eID Card; however, TOE does not store any user data.

The TOE defined in this PP (the Application Firmware of the SSR) does not possess any user data.

**Table 2. Primary and Secondary Assets**

| **Primary Assets: User Data** | | **Definition** | **Protected against loss of** |
|---|---|---|---|
| 1. | PIN and Biometry data. | PIN and Biometry data of Service Requester and Service Attendee. | Integrity and confidentiality |
| 2. | SAM-PIN | Used to authenticate the TOE to the SAM | Integrity and confidentiality |

| | | | |
|---|---|---|---|
| 3. | Identity Verification Assertion (IVA) | Generated as the evidence of the identity verification operation. | Privacy, integrity and authenticity |
| **Secondary Assets: Security Services** | | **Definition** | **Protected against loss of** |
| 4. | Identification and Authentication of Service Requester and Service Attendee | Personal Identity Verification is performed by this service. | Correct operation |
| 5. | Identification and Authentication of third party trusted IT Components | Identity Verification of third party IT Components are performed by this service. These components are Application Server (APS), SSR Access Server (SAS), External Biometric Sensor (EBS), External PIN PAD (EPP) and SAM | Correct operation |
| 6. | Access eID Card on behalf of Role Holder | Secure messaging session between the TOE and the Role Holder is setup. The TOE accesses the eID card on behalf of the Role Holder. Data transfer between the TOE and the Role Holder is managed in a secure manner using the secure messaging session. | Correct operation |
| **Secondary Assets: TSF Data** | | **Definition** | **Protected against loss of** |
| 7. | Device Tracking Number of SSR | A number specific to each TOE that is written during initialization of TOE. Stored in the memory of the SSR. | Integrity |

| | | | |
|---|---|---|---|
| 8. | Secure Messaging and Role Card Verifiable Certificates of SAM (in CVC Fomat) | Secure Messaging Certificate is used for Secure Messaging between the TOE and eID Card; Role Card Verifiable Certificate is used for Role Authentication of the SSR. These certificates are given by Device Management Certificate Authority and imported from SAM to the SSR Device and updated by the TOE before the expiry date. | Correctness |
| 9. | Current Time | The time defined by OCSP server. TOE uses this time for ID verification assertion. | Integrity |
| 10. | Audit Data | Audit Data | Integrity |

## 3.3 SUBJECTS AND EXTERNAL ENTITIES

Table 3. gives the legitimate and the malicious actors and external entities. The legitimate ones are given in the left column and the malicious ones are given in the right column of Table 3.

**Table 3. Legitimate and malicious actors and external systems**

| **Legitimate subjects and entities** | **Malicious subjects and entities** |
|---|---|
| **Service Provider Environment** | |
| Service Provider Client Application | See **Note 1** |
| Identity Verification Policy Server | Illegitimate Identity Verification Policy Server |
| Application Server | Illegitimate Application Server |
| SSR Access Server | Illegitimate SSR Access Server |
| Identity Verification Server | See **Note 2** |
| **Identity Verification Environment** | |
| eID Card | Illegitimate eID Card |

| | |
|---|---|
| Service Requester (SR) | Identity Faker (not real Service Requester) |
| Service Attendee (SA): validates photo of the card holder and has rights to proceed the operation even if the biometric verification fails | SA Masquerader (attacker acting as if Service Attendee) |
| SAM | Illegitimate SAM |
| External Biometric Sensor | Illegitimate External Biometric Sensor |
| External Pin Pad | Illegitimate External Pin Pad |
| Secure Smartcard Reader (SSR) hardware. | Illegitimate SSR hardware (manipulated and/or probed) |
| Role Holder | Illegitimate Role Holder (Malicious) |
| **The Proxy Entities** | |
| PC (on which the SPCA runs) | See **Note 3.** |
| **Other Activities** | |
| Initialization agent | - |
| Manufacturer service operator | Illegitimate service operator |
| **Attacker** | |
| | Attacker (also covers the Identity Faker, SA Masquerader, Illegitimate Role Holder) |

**Note 1:** It is assumed that no illegitimate Service Provider Client Application (SPCA) exists within the current context.

**Note 2:** No illegitimate Identity Verification Server (IVS) exists within the current context. The reason the IVS is taken into the scope this PP, is its required ability to distinguish the IVAs created by the TOE with the IVAs created by illegitimate TOEs.

**Note 3:** It is assumed that (1) the PC is free of any malicious software and (2) the environment between the USB Interface Software and the TOE is secure. So no illegitimate USB Interface Software and illegitimate PC are defined within the system.

**Note 4:** Within the current system context, the role holder has privileges on the eID Card. The attacker will try to exploit these privileges to gain benefits.

**Note 5:** Initialization agent is assumed to pose no threat because the environment is secure and personal acts responsively.

**Note 6:** The attacker is the threat agent who tries to violate the security of the eID Verification System. Note that the attacker here is assumed to possess at most *enhanced-basic attack potential* (which means that the TOE to be tested against AVA_VAN.3).

## 3.4 RELEVANCE OF EXTERNAL ENTITIES TO THE TOE ON DIFFERENT SSR TYPES

Some of the entities defined in the Subsection 3.3 are valid for all the three types of SSR Device, however, some entities are irrelevant for one or two types of the SSR Device. Table 4 shows the relevance of these entities for three types of SSR Device.

**Table 4. Legitimate Entities vs SSR Types**

| Entity | Applies to |
|---|---|
| Service Provide Client Application | Applies to Type I and Type II. |
| Identity Verification Policy Server | Applies to all |
| Application Server | Applies to all (but only TOE on SSR Type III has direct contact) |
| SSR Access Server | Applies to Type II |
| Identity Verification Server | Applies to all |
| eID Card | Applies to all |
| Service Requester | Applies to all |
| Service Attendee | Applies to Type II and Type III |
| Online Certificate Status Protocol Server | Applies to all |
| PC | Applies to Type I and Type II |
| Security Access Module | Applies to all |
| SSR Hardware | Applies to all |
| External Biometric Sensor | Applies to configurations with External Biometric Sensor |
| External Pinpad | Applies to configurations with External Pin Pad |

## 3.5 THREATS

The threats that could be met by the TOE and its environment are given in Table 5.

**Table 5. Threats**

| Threat | Definition |
|---|---|

| | |
|---|---|
| T.Counterfeit_eIDC | An attacker (Identity Faker) may present a counterfeit eID Card (form of illegitimate eID Card) to the TOE for faking his or her identity. This action is also regarded as damaging the correct operation of the Identification and Authentication of the Service Requester and the Service Attendee. |
| T.Revoked_eIDC | An attacker (Identity Faker) may present a revoked eID Card (form of illegitimate eID Card) to the TOE for faking his or her identity. This action is also regarded as damaging the correct operation of the Identification and Authentication of the Service Requester and the Service Attendee. |
| T.Stolen_eIDC | An attacker (Identity Faker) may present a stolen (not an illegitimate eID Card) to the TOE for faking his or her identity. This action is also regarded as damaging the correct operation of the Identification and Authentication of the Service Requester and the Service Attendee. |
| T.IVA_Fraud | An attacker may create a fraudulent Identity Verification Assertion IVA (totally fake, build from scratch, or modified from a legitimate IVA). |
| T.IVA_Eavesdropping | The attacker may obtain Identity Verification Assertion by monitoring the communication line between Identity Verification Server and the Application Server or the communication line between Application Server and the Connected part (Service Provider Client Application for Type I, SPCA and SAS for Type II and TOE for Type III). |
| T.IVA_Confidentiality_Integrity [valid only for offline mode of TOE on SSR Type III] | An attacker may steal or change the IVAs stored in the SSR Type III memory area during the offline operation of the SSR Type III. |
| T.Repudiation | The Service Requester (or the Service Attendee) may repudiate the Identification Verification Assertion. |
| T.Fake_TOE_to_SR | An attacker may prepare a fake SSR Hardware and introduce it to the Service Requesters (and/or Service Attendee). This way, the attacker may collect the Identity Verification Card-PIN and Biometric Information. |
| T.Fake_TOE_to_External_Entities | An attacker may introduce himself/herself as legitimate TOE to the external entities: eID Card, External Biometric Sensor, External PIN Pad. Thus obtain the PIN and biometric information of the Service Requester (or the Service Attendee) and gain access to eID Card on behalf of the Role Holder. |

| | |
|---|---|
| T.SA_Masquerader | An attacker may act as if he/she is a legitimate service attendee and perform the photo verification and thus damage the Identification and Authentication Service of the Service Requester. |
| T.SA_Abuse_of_Session | An attacker may abuse the service attendee's authentication session. Thus the attacker can validate the photo and/or accept negative result of biometric verification in an unauthorized way. This action therefore is regarded as damaging the correct operation of the Identification and Authentication of the Service Requester and the Service Attendee. |
| T.Fake_Policy | An attacker may send a fraudulent policy to manage the authentication process in an unauthorized manner. This action is also regarded as damaging the correct operation of the Identification and Authentication of the SA and the SR. |
| T.Fake_OCSP_Response | An attacker may mimic a legitimate Online Certificate Status Protocol Server (OCSPS) or manipulate the TSF Data transmitted by OCSPS. This action is also regarded as damaging the correct operation of the Identification and Authentication of the SA and the SR. |
| T.RH_Comm | An attacker may access or modify the eID Card contents through eavesdropping and manipulating the communication between the Role Holder and eID Card. |
| T.RH_Session_Hijack | An attacker may access or modify the eID Card contents through hijacking the authentication session between the eID Card and the Role Holder. |
| T.Illegitimate_EBS | An attacker may change the outcome of biometric verification[1] or steal or modify the transmitted biometric template, thus collect biometric information from the Cardholders or damage the correct operation of the Identification and Authentication of Service Requester or Service Attendee by using an illegitimate biometric sensor. |
| T.EBS_Comm | An attacker may change the outcome of biometric verification; steal or modify the transmitted biometric template, thus collect biometric information from the Cardholders or damage the correct operation of the Identification and Authentication of Service Requester or |

1 If biometric verification is implemented on the sensor then biometric verification result is subject of the attack otherwise biometric template is subject of the attack.

| | |
|---|---|
| | Service Attendee through (1) eavesdropping and modifying the communication; (2) hijacking or replaying the authentication session between the TOE and the EBB. |
| T.Illegitimate_EPP | An attacker may change the outcome of PIN verification or steal or modify the transmitted PIN, thus collect PIN information from the Cardholders or damage the correct operation of the Identification and Authentication or Service Requester of Service Attendee by using an illegitimate external PIN-PAD. |
| T.EPP_Comm | An attacker may steal or modify the transmitted PIN, thus collect PIN information from the Cardholders or damage the correct operation of the Identification and Authentication of Service Requester or Service Attendee through (1) eavesdropping and modifying the communication; (2) hijacking or replaying the authentication session between SSR and EPP. |
| T.eIDC_Comm | An attacker may access or modify the eID Card contents, steal the PIN and biometric information, block the PIN and biometric verification through (1) eavesdropping and modifying the communication; (2) hijacking or replaying the authentication session between the TOE and eID Card. |
| T.Illegitimate_SAS | An attacker may use illegitimate SSR Access Server (SAS) to undermine security policies. This action is also regarded as damaging the correct operation of the Identification and Authentication of third party IT Components for TOE on SSR Type II. |
| T.Illegitimate_APS | An attacker may use illegitimate Application Server (APS) to undermine security policies. This action is also regarded as damaging the correct operation of the Identification and Authentication of third party IT Components for TOE on SSR Type III. |
| T.DTN_Change | An attacker may change the Device Tracking Number of the TOE through physically gaining access to the memories. This also damage the correctness of the IVA generated by the TOE. |
| T.SAM-PIN_Theft | An attacker may read or change the SAM-PIN of the TOE during normal operation by physically accessing the SAM PIN memory area or while TOE is entering the SAM PIN, i. e. sending the SAM PIN to the SAM. |

| | |
|---|---|
| T.Audit_Data_Compromise | An attacker may change or delete the audit data by physically accessing the audit memory area. |
| T.TOE_Manipulation | An attacker may manipulate the operation or probe the internals of the SSR. SAM PIN could be obtained by probing the internals of the SSR, or DTN or Audit data could be manipulated. In addition, a counterfeit Identity Verification Assertion could be created. |
| T.Fake_SAM | An attacker may issue a fake SAM to obtain the SAM-PIN. |
| T.Stolen_SAM | An attacker may steal a SAM and use it to build an illegitimate SSR. |
| T.Revoked_SAM | An attacker may use a Revoked SAM to build an illegitimate SSR. |

## 3.6 ORGANIZATIONAL SECURITY POLICIES

The OSPs are given in Table 6.

**Table 6. Organizational security policies**

| Policy | Policy Category and Definition |
|---|---|
| P.IVM_Management | The TOE shall apply the identity verification methods defined by the IVPS. Otherwise if IVPS is not present, identity verification methods defined by the SPCA shall be applied. In absence of those, the TOE shall apply the default policy which has the highest security level |
| P.TOE_Upgrade | The TOE will have mechanisms for secure field upgrade. |
| P.Re-Authentication | Authentication of third party IT components will be renewed after 24 hours. |
| P.Terminal_Cert_Update | Terminal Certificate will be renewed within a period defined in TS 13584 [3]. Client application (for TOE on SSR type I or II), SSR Access Server (for TOE on Type II with SAS) or Application Server (for TOE on SSR Type III) shall update the Secure Messaging and Role Card Verifiable Certificates of SAM one day before the expiration day. |
| P.Time_Update | The time shall be updated using the real time that is received only from trusted entities. |
| P.Offline_Operation | In case SSR Device cannot reach to OCSP Server, downloading the |

| | |
|---|---|
| | Revocation List onto the SSR Device and checking the certificate revocation status of the Service Requester (and the Service Attendee if applicable) from this list is allowed. The revocation list shall be up to date. When the certificate revocation check is carried out without OCSP Server, the information regarding that OCSP check could not be realized shall be put in the IVA. If the OCSP Server is not reached and there is no downloaded revocation list, then the information that OCSP check and revocation list control could not be realized shall be put in the IVA. In this case, only the certificate status control is performed offline, other identity verification steps shall be performed online. Unless IVA is validated at IVS and revocation check is completed, Identity Verification is not regarded as completed.<br>Additionally, in cases when the SSR Type III (mobile SSR) cannot reach to Application Server, TOE on SSR Type III is allowed to operate offline for at most maximum offline working time which is defined by the authorized foundation. IVAs shall be stored on the SSR Device securely and transmitted to APS before this time. |
| P.DPM | The TOE shall support Initialization & Configuration and Operation lifecycle phases. The phase change shall be from Initialization & Configuration Phase to Operation Phase except tamper event detection case. If a tamper event is detected, TOE shall be out of service and require re-initialization. This shall be the only condition to go back to Initialization & Configuration Phase.<br>DTN and SAM PIN shall be written to the SSR Device during Initialization & Configuration Phase. |

## 3.7 ASSUMPTIONS

The assumptions for the operational environment are given in Table 7.

**Table 7. Assumptions**

| | |
|---|---|
| A.SPCA | It is assumed that Service Provider Client Application is a trusted third party and its communication with SSR occurs in a secure environment via USB interface. However, for SSR Type II with SAS, there is no direct connection between the SSR and |

| | |
|---|---|
| | the SPCA, SPCA communicates to the SAS through Ethernet interface.<br>When the Service Provider Client Application determines the identity verification method, it is assumed that the Service Provider Client Application selects the appropriate method.<br>In addition, integrity and the confidentiality of the private data transferred from SSR Device to the Client Application is preserved by the foundation sustaining the Client Application |
| A.IVPS | It is assumed that the IVPS prepares and sends the policy correctly. |
| A.EBS-EPP | It is assumed that legitimate External Biometric Sensor (EBS) and legitimate External Pin Pad (EPP) work correctly. |
| A.PC | It is assumed that the PC executing the Client Application is malicious code free and located in secure environment. In addition, the confidentiality of the private data that might be written into the IVA by the Application Owner as Application Specific Data is preserved by the Application Owner. |
| A.APS-IVPS | It is assumed that the Application Server and the Identity Verification Policy Server are malicious code free and located in secure environment. |
| A.Management_Environment | It is assumed that the environments, where initialization and configuration are performed, are secure. And the personal that hold initialization and configuration roles act responsively. |
| A.SAM_ PIN_Environment | It is assumed that the PIN value of the SAM in the SSR is defined in the SSR in secure environment. |

## 3.8 RELEVANCE OF THREATS, OSPS AND ASSUMPTIONS TO THE TOE ON DIFFERENT SSR TYPES

Threats, OCPs and assumptions defined in the Security Problem Definition are matched with the three types of the SSR Device in Table 8.

**Table 8. Relevance of Threats, OSPs and Assumptions to the three TOE types**

| Security Problem Definition | Applies to |
|---|---|
| T.Revoked_eIDC | Applies to all |
| T.Stolen_eIDC | Applies to all |
| T.IVA_Fraud | Applies to all |
| T.IVA_Eavesdropping | Applies to all |
| T.IVA_Confidentiality_Integrity | Applies to TOE on SSR Type III with offline mode feature |
| T.Repudiation | Applies to all |
| T.Fake_TOE_to_SR | Applies to all |
| T.Fake_TOE_to_External_Entities | Applies to all |
| T.SA_Masquerader | Applies to TOE on SSR Type II and Type III |
| T.SA_Abuse_of_Session | Applies to TOE on SSR Type II and Type III |
| T.Fake_Policy | Applies to all |
| T.Fake_OCSP_Response | Applies to all |
| T.RH_Comm | Applies to all |
| T.RH_Session_Hijack | Applies to all |
| T.Illegitimate_EBS | Applies to TOE on SSR with External Biometric Sensor |
| T.EBS_Comm | Applies to TOE on SSR with External Biometric Sensor |
| T.Illegitimate_EPP | Applies to TOE on SSR with External Pin Pad |
| T.EPP_Comm | Applies to TOE on SSR with External Pin Pad |
| T.eIDC_Comm | Applies to all |
| T.Illegitimate_SAS | Applies to TOE on SSR Type II |
| T.Illegitimate_APS | Applies to TOE on SSR Type III |
| T.DTN_Change | Applies to all |
| T.SAM-PIN_Theft | Applies to all |
| T.Audit_Data_Compromise | Applies to all |
| T.TOE_Manipulation | Applies to all |
| T.Fake_SAM | Applies to all |
| T.Stolen_SAM | Applies to all |

| | |
|---|---|
| T.Revoked_SAM | Applies to all |
| P.TOE_Update | Applies to all |
| P.Re-Authentication | Applies to all |
| P.Terminal_Cert_Update | Applies to all |
| P.Time_Update | Applies to all |
| P.Offline_Operation | Applies to TOE on SSR Type I, Type II and Type III but differently. |
| A.SPCA | Applies to all |
| A.IVPS | Applies to all |
| A.EBS-EPP | Applies to TOE on SSR with EBS and/or EPP |
| A.PC | Applies to all |
| A.APS-IVPS | Applies to all |
| A.Management_Environment | Applies to all |
| A.SAM_ PIN_Environment | Applies to all |

# 4 SECURITY OBJECTIVES

In this section part-wise solutions are given against the security problem defined in Part 3.

## 4.1 SECURITY OBJECTIVES FOR THE TOE

Security Objectives for the TOE are given in Table 9.

**Table 9.** Security Objectives of the TOE

| Objective | Definition |
|---|---|
| OT.IVM_Management | The TOE shall apply the identity verification methods defined by the IVPS. Otherwise if IVPS is not present, identity verification methods defined by the SPCA shall be applied. In absence of those, the TOE shall apply the default policy which has the highest security level. |
| OT.Security_Failure | When a tampering event is detected or SAM - PIN authentication failure occurs the TOE shall delete all user and/or security related data and enter out of service mode becoming unusable until reinstallation and re-initialization of the TOE. |
| OT. eIDC_Authentication | The TOE shall support the Card Authentication mechanism defined in TS 13584 [3].<br>When OCSP Server is not reached, certificate revocation status control of the Service Requester and the Service Attendee could be done using the Revocation List downloaded to SSR Device. The revocation list shall be up to date.<br>If the certificate status control of Service Requester or the Service Attendee is carried out without OCSP Server, the information that OCSP check could not be realized shall be put in the IVA. If the OCSP Server is not reached and the Revocation List does not exist within the SRR, then the information that OCSP check |

| | |
|---|---|
| | and Revocation List check could not be realized shall be put in the IVA. |
| OT.PIN_Verification | The TOE shall support PIN Verification mechanism defined in TS 13584 [3] for Identification and Authentication of Service Requester and Service Attendee. |
| OT.Photo_Verification | The TOE shall support Photo Verification defined in TS 13584 [3] for Identification and Authentication of Service Requester. |
| OT.Biometric_Verification | The TOE shall support Biometric Verification defined in TS 13584 [3] for Identification and Authentication of Service Requester and Service Attendee if applicable. |
| OT.IVA_Confidentiality_Authentication | The created Identity Verification Assertion shall be electronically signed by the TOE (using SAM). If the TOE is on SSR Type III, IVA shall be sent through a secure channel to the IVS. Otherwise the secure channel is founded in between SPCA and IVS.<br>If the created IVA in the TOE on SSR Type III cannot be transmitted due to connection problems, this IVA shall be stored in the SSR Device in encrypted form. Integrity of the stored IVAs shall be also protected. The keys for encryption/decryption and integrity control are generated by the SAM and transferred to the TOE via secure messaging. .<br>The stored IVAs shall be transmitted to the APS (after being decrypted) as soon as possible and not later than the maximum offline working time. |
| OT.PM_Verification | The eID Card lets the TOE to access Personal Message of the service requester after the secure messaging session defined in TS 13584 [3] is established between the TOE and the eID Card. The TOE shall |

| | |
|---|---|
| | display the Personal Message to the Service Requester, so that, the Service Requester verifies the authenticity of the TOE and the SSR, since only legitimate TOE can access to the Personal Message. |
| OT.SA_Identity_Verification | The TOE shall support Identification and Authentication of Service Attendee as defined in TS 13585 [4]. |
| OT.Session_Ending | The TOE shall end the authentication session of the Service Attendee whenever the session expires and/or the eID Card of the Service Attendee is taken out. In addition TOE shall re-authenticate each authenticated third party IT product after 24 hours. (SAS for TOE on SSR Type II (if applicable) , APS for TOE on SSR Type III, EPP if applicable, EBS if applicable) |
| OT.Identity_Verification Policy_Authentication | The TOE shall verify that the source of received Identity Verification Policy is a legitimate IVPS. |
| OT.OCSP_Query_Verify | The TOE shall verify that the source of received information is a legitimate OCSPS. |
| OT.APS_DA | Mutual authentication between the TOE on SSR Type III and the APS shall be setup before TOE's doing any action. |
| OT.SAS_DA | Mutual authentication between the TOE on SSR Type II and the SAS (if applicable) shall be setup before TOE's doing any action. |
| OT.APS_SC | The TOE on SSR Device Type III shall communicate to APS securely via SSL-TLS as defined in TS 13584 [3]. |
| OT.SAS_SC | The TOE on SSR Device Type II shall communicate to SAS (if applicable) securely via SSL-TLS as defined in TS 13584 [3]. |

| | |
|---|---|
| OT.RH_DA<br>[Role Holder Device Authentication] | Mutual authentication between the TOE and Role Holder shall be setup as defined in TS 13584 [3] before TOE's doing any action. |
| OT.RH_SC<br>Secure Communication with Role Holder | The communication between the TOE and the Role Holder shall be secured by AES-256 CBC and AES-256 CMAC algorithms, mutual authentication mechanisms and key exchange method defined in TS 13584 [3]. |
| OT.RH_Session_Ending | The TOE shall end the role holder authentication session of eID Card when the secure communication between the TOE and Role Holder ends. |
| OT.EBS_DA | The TOE shall support mutual authentication with the External Biometric Sensor as defined in TS 13584 [3]. |
| OT.EBS_SC | The TOE shall ensure the confidentiality, integrity and authenticity of the communication going between the TOE and the External Biometric Sensor as defined in TS 13584 [3].. |
| OT.EPP_DA<br>[External PIN-PAD Device Authentication] | The TOE shall support mutual authentication with the External PIN-PAD defined in SSR Standard TS 13584 [3]. |
| OT.EPP_SC | The TOE shall ensure the confidentiality, integrity and authenticity of the communication going between the TOE and External PIN-PAD as defined in TS 13584 [3].. |
| OT.SM_eID Card<br>[Secure Messaging between TOE and eID Card] | The TOE shall ensure the confidentiality, integrity and authenticity of the communication going between the TOE and the eID Card. |
| OT.TOE_Upgrade | The TOE shall accept only the Upgrade Package associated with the corresponding SSR SAM. The upgrade operation shall only be enabled by the following roles: |

| | |
|---|---|
| | (i) Manufacturer Service Operator for manual upgrade operation,<br>(ii) The following third party IT components for online upgrade operation:<br>• SPCA for TOE on SSR Type I,<br>• SPCA or SAS for TOE on SSR Type II,<br>• APS for SSR Type III.<br>TOE shall verify that the source of received upgrade package is a legitimate software publisher and TOE shall have a mechanism to decrypt the received TOE upgrade package as defined in TS TS 13584 [3]. |
| OT.DPM<br>[Device Phase Management] | The TOE shall support Initialization & Configuration and Operation lifecycle phases. The phase change shall be from Initialization & Configuration to Operation. The TOE shall not be switched to the Initialization & Configuration Phase from the Operation Phase unless a tamper event is detected and the TOE becomes out of service. |
| OT.SAM-PIN_Mgmt | The TOE shall have a management function to write the SAM-PIN to the SSR Device. The SAM PIN shall be written only by the initialization agent during Initialization & Configuration phase. |
| OT.DTN_Mgmt | The TOE shall have a management function to write the Device Tracking Number to the TOE. The DTN shall be written only by the initialization agent during Initialization & Configuration phase.. |
| OT.Time_Mgmt | The TOE shall have a management function to set the real time that is received only from the OCSP Server. |
| OT.SM_ TOE_and_SAM<br>[Secure Messaging between TOE and SAM] | The TOE shall protect the confidentiality, integrity and the authenticity of the communication between the TOE and the SAM. |
| OT.SAM-PIN_Sec | The TOE shall protect the confidentiality and integrity of the SAM-PIN during storage and operation regardless of device power state with the help of the |

| | |
|---|---|
| | SSR hardware. |
| OT.DTN_Integrity | The TOE shall protect the integrity of the Device Tracking Number. |
| OT.Audit_Data_Integrity | The TOE shall protect the integrity of the audit data. |
| OT.RIP<br>[Residual Information Protection] | PIN, Biometry data, other user data and TSF data shall be copied to only volatile memory under electronic mesh cover and deleted in a secure way right after the end of the usage. |
| OT.Auth_SAM_by_TOE [Authentication of SAM by TOE] | The TOE shall authenticate the SAM before doing any operation. |
| OT.Cert_Update | At each Identity Verification Operation, the TOE shall control the validity of the Secure Messaging and Role Card Verifiable Certificates of the SAM.<br>If the expiration date of these certificate(s) are closer than one day, TOE shall request updated certificates from the SPCA (for TOE on SSR type I or II without SAS), the SSR Access Server (for TOE on Type II with SAS) or the Application Server (for TOE on SSR Type III) and update the certificates. |

## 4.2 SECURITY OBJECTIVES FOR THE OPERATIONAL ENVIRONMENT

Security objectives for the SSR Hardware and the User Environment of the SSR.

**Table 10. Security Objectives for the Operational Environment**

| Objective | Definition |
|---|---|
| OE.SPCA | Service Provider Client Application shall be developed and used by trusted parties thus accepted as a trusted third party IT product. In addition the communication between SPCA and the SSR shall occur in secure environment.<br>For the cases when the SPCA determines the identity verification method, the SPCA shall select the appropriate method.<br>SPCA shall encrypt the Identity Verification Assertion before sending it to the Application Server (APS). |

| | |
|---|---|
| OE.IVPS | The IVPS shall:<br>• prepare and send the correct policy,<br>• protect the integrity and the authenticity of the policy (it shall sign the policy using its signing certificate),<br>• protect the confidentiality of the private key of its signing certificate. |
| OE.eID Card | The eID Card shall have the following properties:<br>• support PIN verification,<br>• prevent usage of IVC Certificate Private key prior to PIN verification,<br>• store the cardholder's digital photo,<br>• store the cardholder's biometric data (fingerprint, fingervein and palmvein),<br>• support terminal authentication as defined in TS 13584 [3],<br>• store the cardholder's personal message(shall not let any subject access to the personal message prior to terminal authentication),<br>• support role holder authentication as defined in TS 13584 [3],<br>• support secure messaging as defined in TS 13584 [3],<br>• protect the integrity and confidentiality of the user data and TSF data. |
| OE.SAM | The SAM shall<br>• store security credentials for eID Card Authentication,<br>• support signing the IVA,<br>• store security credentials for External Device Authentication to authenticate External Biometric Sensor and External Pin Pad,<br>• support Secure Messaging key generation mechanisms for the communication between the TOE and the following entities: (1) eID Card, (2) Role Holder, (3) External Biometric Sensor, (4) External Pin Pad as defined in TS 13584 [3], |

| | |
|---|---|
| | • store the private key (Key Encryption Key) to decrypt the TOE Upgrade package as defined in TS 13584 [3],<br>• support SAM-PIN verification mechanism to authenticate the TOE,<br>• require SAM-PIN verification to allow the TOE to use its services,<br>• support Secure Messaging with the TOE as defined in TS 13584 [3],<br>• support authentication of itself to the TOE,<br>• offer Random Number Generation,<br>• have minimum EAL4+ (AVA_VAN.5) Common Criteria Certificate. |
| OE.Service_Requester | The Service Requester shall:<br>• Protect his/her PIN,<br>• Not enter his/her PIN, or give his/her biometric data prior to personal message verification,<br>• Immediately, inform his/her stolen or lost eID Card. |
| OE.Service_Attendee | The Service Attendee shall:<br>• protect his or her PIN,<br>• not enter his/her PIN, or give his/her biometric data prior to personal message verification,<br>• immediately inform the stolen or lost eID Card,<br>• act responsively during photo verification,<br>• not leave the TOE unattended while his/her identity is verified (shall remove his/her eID Card whenever he/she leaves the environment). |
| OE.OCSPS | The OCSPS shall:<br>• operate correctly,<br>• sign the OCSP answer ,<br>• protect the confidentiality of the signing key. |
| OE.IVS | The IVS shall have the following properties: |

| | |
|---|---|
| | • Supports the verification of the authenticity of the IVA with the Authentication Reference Data (Public Key of IVA Signing Certificate's integrity is protected) |
| OE.SSR_Platform | The SSR platform shall not have vulnerabilities exploitable by attackers possessing Enhanced-Basic attack potential for the below mentioned security features:<br>• including minimum hardware configuration to provide correct operation of the TOE,<br>• possessing tamper-detection and response mechanisms that cause the SSR to become immediately out of service and result in the automatic and immediate erasure of SAM PIN and cryptographic keys stored in tamper protected area, such that it becomes infeasible to recover these sensitive data.<br>• being designed and implemented in a secure manner such that<br>  • hardware components are chosen to prevent probing (they shall be BGA);<br>  • it protects the unencrypted data and address busses carrying the user data and TSF data so that they are not directly reachable;<br>• including a Real Time Clock (RTC) Unit with at most 20 seconds fault within 24 hours,<br>• providing hardware based protection mechanisms to ensure the integrity and confidentiality of the TOE during storage, instantiation and operation. |
| OE.EBS | The EBS shall:<br>• support Secure Communication between the EBS and the TOE as defined in TS 13584 [3],<br>• support Terminal Authentication as defined in TS 13584 [3],<br>• protect security credentials within the EBS.<br>• display the personal message of the Service Requester prior |

| | |
|---|---|
| | to requesting biyometric input |
| OE.EPP | The EPP shall:<br>• support Secure Communication between the EPP and theTOE as defined in TS 13584 [3],<br>• support Terminal Authentication as defined in TS 13584 [3],<br>• protect security credentials within the EPP,<br>• display the personal message of the Service Requester prior to PIN |
| OE.Role_Holder | The role holder shall:<br>• act responsively<br>• have the appropriate role certificate and its Private Key for Role Holder Authentication<br>• support Secure Communication between the Role Holder and the TOE as defined in TS 13584 [3]. |
| OE.PC | The PC that executes the SPCA shall be malicious code free and be located in secure environment. |
| OE.Security_Management | The security management environment shall be secure and unauthorized personnel shall not access to the TOE.<br>The security management roles shall act responsively, |
| OE.SAS | The SAS will support Secure Communication with the TOE on SSR Type II.<br><br>SAS shall encrypt the Identity Verification Assertion before sending it to the SPCA. |
| OE.Terminal_Cert_Directory | SPCA (for TOE on SSR type I or II without SAS), SSR Access Server (for TOE on Type II with SAS) or Application Server (for TOE on SSR Type III) shall get the updated Secure Messaging and Role Card Verifiable Certificates of the SAM in periods defined in TS 13585 [4] and forward them to the TOE. |
| OE.PKI | The issuer of the eID Card shall establish a public key infrastructure for the authentication mechanisms of eID Card Authentication, External Biometric Sensor Authentication, External Pin Pad |

| | |
|---|---|
| | Authentication, Role Holder Device Authentication, OCSP Response Verification, Identity Verification Policy Verification, and the TOE Upgrade Package Verification. |
| OE.CM [Credential Management] | All credentials, certificates, authentication reference data, shall be securely created and distributed to the relevant entities.<br>If Revocation List is used for certificate verification, this Revocation List shall be up to date. |
| OE.APS | The Application server (APS) shall support Secure Communication with the TOE on SSR Type III and with client application for SSR Type I and SSR Type II without SAS.<br>For the cases when the APS determines the identity verification method, the APS shall select the appropriate method.<br>APS shall encrypt the Identity Verification Assertion before sending it to the IVS (if IVA received is decrypted in the APS). |
| OE.SSR_Initialization_Environment | The initialization environment of the SSR Device where SAM PIN is defined to the SSR shall be physically secure. |

## 4.3 APPLICATION OF SECURITY OBJECTIVES TO THE TOE ON DIFFERENT SSR TYPES

Application of Objectives to the TOE on different SSR Types are given in Table 11.

**Table 11. Application of Objectives to the TOE on different SSR Types**

| Objective | Applies to |
|---|---|
| OT.IVM_Management | Applies to all |
| OT.Security_Failure | Applies to all |
| OT.eIDC_Authentication | Applies to all |
| OT.PIN_Verification | Applies to all |
| OT.Photo_Verification | Applies to the Type II and Type III configurations |
| OT.Biometric_Verification | Applies to configurations with external/internal Biometric Sensor |
| OT.IVA_Confidentiality_Authentication | Applies to TOE on SSR Type I, Type II and Type III differently. |
| OT.PM_Verification | Applies to all |
| OT.SA_Identity_Verification | Applies to the Type II and Type III configurations |
| OT.Session_Ending | Applies to all |
| OT.Identity_Verification Policy_Authentication | Applies to all |
| OT.OCSP_Query_Verify | Applies to all |
| OT.APS_DA | Applies to TOE on SSR Type III. |
| OT.SAS_DA | Applies to TOE on SSR Type II with SAS. |
| OT.APS_SC | Applies to TOE on SSR Type III. |

| | |
|---|---|
| OT.SAS_SC | Applies to TOE on SSR Type II with SAS. |
| OT.RH_DA<br>[Role Holder Device Authentication] | Applies to all |
| OT.RH_SC [Secure Communication with Role Holder] | Applies to all |
| OT.RH_Session_Ending | Applies to all |
| OT.EBS_DA | Applies to the configuration with EBS |
| OT.EBS_SC | Applies to the configuration with EBS |
| OT.EPP_DA<br>[External PIN-PAD Device Authentication] | Applies to the configuration with EPP |
| OT.EPP_SC | Applies to the configuration with EPP |
| OT.SM_eID Card | Applies to all |
| OT.TOE_Upgrade | Applies to all |
| OT.DPM | Applies to all |
| OT.SAM-PIN_Mgmt | Applies to all |
| OT.DTN_Mgmt | Applies to all |
| OT.Time_Mgmt | Applies to all |
| OT.SM_TOE_and_SAM<br>[Security between TOE and SAM] | Applies to all |
| OT.SAM-PIN_Sec | Applies to all |
| OT.DTN_Integrity | Applies to all |
| OT.Audit_Data_Integrity | Applies to all |
| OT.RIP [Residual Information Protection] | Applies to all |
| | Applies to all |

| | |
|---|---|
| OT.Auth_SAM_by_TOE [Authentication of SAM by TOE] | Applies to all |

Application of Environment Objectives to the different SSR Types and User Environments of different SSR Types are given in Table 12.

**Table 12. Application of Environment Objectives to the different SSR Types and User Environments of different SSR Types**

| Environment Objective | Applies to |
|---|---|
| OE.SPCA | Applies to Type I and Type II |
| OE.IVPS | Applies to all |
| OE.eID Card | Applies to all |
| OE.SAM | Applies to all |
| OE.Service_Requester | Applies to all |
| OE.Service_Attender | Applies to the Type II and Type III |
| OE.OCSPS | Applies to all |
| OE.IVS | Applies to all |
| OE.SSR_Platform | Applies to all |
| OE.EBS | Applies to the configuration with EBS |
| OE.EPP | Applies to the configuration with EPP |
| OE.Role_Holder | Applies to all |
| OE.PC | Applies to all |
| OE.Security_Management | Applies to all |
| OE.SAS | Applies to TOE on SSR Type II with SAS |
| OE.Terminal_Cert_Directory | Applies to all |
| OE.PKI | Applies to all |
| OE.CM [Credential Management] | Applies to all |

| | |
|---|---|
| OE.APS | Applies to all |
| OE.SSR_Initialization_Environment | Applies to all |

## 4.4 COVERAGE OF THREATS, OSPS AND ASSUMPTIONS BY THE SECURITY OBJECTIVES

Table 13, Table 14, Table 15 and Table 16 give the coverage of threats, OSPs and assumptions by the security objectives. Table 13 gives the coverage of threats and OSPs by the common TOE security objectives of the TOE on all three types of SSR devices and EPP, EBS configurations and optional offline mode features. Table 14 gives the coverage of threats, OSPs and assumptions by the common environmental security objectives of the TOE on all three types of SSR devices and EPP, EBS configurations and optional offline mode features. Due to different SSR types and presence of EPP, biometric sensor and optional offline mode features, additions to the rationale given in Table 15 and Table 16.

**Table 13. Security Objectives Rationale Table for TOE on Either SSR Type I,II,II without Biometric Sensor and External Pin Pad**

| | OT.IVM_Management | OT.Security_Failure | OT. eIDC _Authentication | OT.PIN_Verification | OT.IVA_Confidentiality_Authentication | OT.PM_Verification | OT.Session_Ending | OT.Identity_Verification_Policy_Autjentication | OT.OCSP_Query_Verify | OT.RH_DA | OT.RH_SC | OT.RH_Session_Ending | OT.SM_eID Card | OT.TOE_Upgrade | OT. DPM | OT.SAM-PIN_Mgmt | OT.DTN_Mgmt | OT.Time_Mgmt | OT.SM_TOE_and_SAM | OT.SAM-PIN_Sec | OT.DTN_Integrity | OT.Audit_Data_Integrity | OT.RIP | OT.Auth_SAM_by_TOE | OT.Cert_Update |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **T.Counterfeit_eIDC** | ✓ | | ✓ | | | | | | | | | | ✓ | | | | | | | | | | | | |
| **T.Revoked_eIDC** | ✓ | | | | | | | | | | | | | | | | | | | | | | | | |
| **T.Stolen_eIDC** | | | | ✓ | | | | | | | | | | | | | | | | | | | | | |
| **T.IVA_Fraud** | | | | | ✓ | | | | | | | | | | | | | | | | | | | | |
| **T.IVA_Eavesdropping** | | | | | ✓ | | | | | | | | | | | | | | | | | | | | |
| **T.IVA_Confidentiality_Integrity** | | | | | ✓ | | | | | | | | | | | | | | ✓ | | | | | | |
| **T.Repudiation** | | | | ✓ | | | | | | | | | | | | | | | | | | | | | |
| **T.Fake_TOE_to_SR** | | | | | | ✓ | | | | | | | | | | | | | | | | | | | |

| | OT.IVM_Management | OT.Security_Failure | OT. eIDC _Authentication | OT.PIN_Verification | OT.IVA _Confidentiality_ Authentication | OT.PM_Verification | OT.Session_Ending | OT.Identity_Verification_Policy_Autjentication | OT.OCSP_Query_Verify | OT.RH_DA | OT.RH_SC | OT.RH_Session_Ending | OT.SM_eID Card | OT.TOE_Upgrade | OT. DPM | OT.SAM-PIN_Mgmt | OT.DTN_Mgmt | OT.Time_Mgmt | OT.SM_TOE_and_SAM | OT.SAM-PIN_Sec | OT.DTN_Integrity | OT.Audit_Data_Integrity | OT.RIP | OT.Auth_SAM_by_TOE | OT.Cert_Update |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **T.Fake_TOE_to_External_Entities** | | | | | | | | | | ✓ | | | ✓ | | | | | | | | | | | | |
| **T.Fake_Policy** | | | | | | | | ✓ | | | | | | | | | | | | | | | | | |
| **T.Fake_OCSP_Response** | | | | | | | | | ✓ | | | | | | | | | | | | | | | | |
| **T.RH_Comm** | | | | | | | | | | | ✓ | | | | | | | | | | | | | | |
| **T.RH_Session_Hijack** | | | | | | | | | | ✓ | | ✓ | | | | | | | | | | | | | |
| **T.eIDC_Comm** | | | | | | | | | | | | | ✓ | | | | | | | | | | | | |
| **T.DTN_Change** | | | | | | | | | | | | | | | | | ✓ | | | | | | | | |
| **T.SAM-PIN_Theft** | | ✓ | | | | | | | | | | | | | | | | | ✓ | ✓ | | | | | |
| **T.Audit_Data_Compromise** | | ✓ | | | | | | | | | | | | | | | | | | | | ✓ | | | |
| **T.TOE_Manipulation** | | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| **T.Fake_SAM** | | | | | | | | | | | | | | | | | | | | | | | | ✓ | |
| **T.Stolen_SAM** | | | | | | | | | | | | | | | | ✓ | | | ✓ | ✓ | | | | ✓ | |
| **T.Revoked_SAM** | | | | | | | | | | | | | | | | | | | | | | | | ✓ | |
| **P.IVM_Management** | ✓ | | | | | | | | | | | | | | | | | | | | | | | | |
| **P.TOE_Upgrade** | | | | | | | | | | | | | | ✓ | | | | | | | | | | | |
| **P.Terminal_Cert_Update** | | | | | | | | | | | | | | | | | | | | | | | | | ✓ |
| **P.Re-Authentication** | | | | | | | ✓ | | | | | | | | | | | | | | | | | | |

| | OT.IVM_Management | OT.Security_Failure | OT. eIDC _Authentication | OT.PIN_Verification | OT.IVA _Confidentiality_ Authentication | OT.PM_Verification | OT.Session_Ending | OT.Identity_Verification_Policy_Autjentication | OT.OCSP_Query_Verify | OT.RH_DA | OT.RH_SC | OT.RH_Session_Ending | OT.SM_eID Card | OT.TOE_Upgrade | OT. DPM | OT.SAM-PIN_Mgmt | OT.DTN_Mgmt | OT.Time_Mgmt | OT.SM_TOE_and_SAM | OT.SAM-PIN_Sec | OT.DTN_Integrity | OT.Audit_Data_Integrity | OT.RIP | OT.Auth_SAM_by_TOE | OT.Cert_Update |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **P.Time_Update** | | | | | | | | | | | | | | | | | | ✓ | | | | | | | |
| **P.Offline_Operation** | | | ✓ | | ✓ | | | | | | | | | | | | | | | | | | | | |
| **P.DPM** | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | | | | | | | | |

**Table 14. Environmental Security Objectives Rationale Table for TOE on Either SSR Type I,II,II without External Biometric Sensor and External Pin Pad**

| | OE.SPCA | OE.IVPS | OE.eID Card | OE.SAM | OE.Service_Attendee | OE.Service_Requester | OE.OCSP | OE.IVS | OE.SSR_Platform | OE.Role_Holder | OE.PC | OE.Security_Management | OE.SAS | OE.Terminal_Cert_Directory | OE.PKI | OE.CM | OE.APS | OE.SSR_Initialization_Environment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **T.Counterfeit_eID Card** | | | ✓ | ✓ | | | | | | | | | | | ✓ | ✓ | | |
| **T.Revoked_eID Card** | | | ✓ | | | | ✓ | | | | | | | | ✓ | ✓ | | |
| **T.Stolen_eID Card** | | | ✓ | | ✓ | ✓ | | | ✓ | | | | | | | | | |
| **T.IVA_Fraud** | | | | ✓ | | | | ✓ | | | | | | | ✓ | ✓ | | |
| **T.IVA_Eavesdropping** | ✓ | | | | | | | ✓ | | | ✓ | | ✓ | | | | ✓ | |
| **T.IVA_Confidentiality_Integrity** | | | | ✓ | | | | | | | | | | | | | | |
| **T.Repudiation** | | | ✓ | | | ✓ | | | | | | | | | ✓ | ✓ | | |
| **T.Fake_TOE_to_SR** | | | ✓ | ✓ | | ✓ | | | | | | | | | ✓ | ✓ | | |
| **T.Fake_TOE_to_External_Entities** | | | ✓ | ✓ | | | | | | | | | | | ✓ | ✓ | | |
| **T.Fake_Policy** | | ✓ | | | | | | | | | | | | | ✓ | ✓ | | |
| **T.Fake_OCSP_Response** | | | | | | | ✓ | | | | | | | | ✓ | ✓ | | |
| **T.RH_Comm** | | | | ✓ | | | | | | ✓ | | | | | | | | |
| **T.RH_Session_Hijack** | | | ✓ | ✓ | | | | | | ✓ | | | | | ✓ | ✓ | | |
| **T.eIDC_Comm** | | | ✓ | ✓ | | | | | | | | | | | | | | |
| **T.DTN_Change** | | | | | | | | | ✓ | | | | | | | | | |

| | OE.SPCA | OE.IVPS | OE.eID Card | OE.SAM | OE.Service_Attendee | OE.Service_Requester | OE.OCSP | OE.IVS | OE.SSR_Platform | OE.Role_Holder | OE.PC | OE.Security_Management | OE.SAS | OE.Terminal_Cert_Directory | OE.PKI | OE.CM | OE.APS | OE.SSR_Initialization_Environment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **T.SAM-PIN_Theft** | | | | | | | | | ✓ | | | | | | | | | |
| **T.Audit_Data_Compromise** | | | | | | | | | ✓ | | | | | | | | | |
| **T.TOE_Manipulation** | | | | | | | | | ✓ | | | | | | | | | |
| **T.Fake_SAM** | | | | ✓ | | | | | | | | | | | ✓ | ✓ | | |
| **T.Stolen_SAM** | | | | ✓ | | | | | | | | | | | | ✓ | | |
| **T.Revoked_SAM** | | | | ✓ | | | ✓ | | | | | | | | | | | |
| **P.TOE_Upgrade** | ✓ | | | ✓ | | | | | | | | | ✓ | | | | ✓ | |
| **P.Terminal_Cert_Update** | | | | | | | | | | | | | | ✓ | | ✓ | | |
| **P.Offline_Operation** | | | | | | | | | | | | | | | | ✓ | | |
| **A.SPCA** | ✓ | | | | | | | | | | | | | | | | | |
| **A.IVPS** | | ✓ | | | | | | | | | | | | | | | | |
| **A.EBS-EPP** | | | | | | | | | | | | | | | | | | |
| **A.PC** | | | | | | | | | | | ✓ | | | | | | | |
| **A.APS** | | | | | | | | | | | | | | | | | ✓ | |
| **A.Management_Environment** | | | | | | | | | | | | ✓ | | | | | | |
| **A.SAM_ PIN_Environment** | | | | | | | | | | | | | | | | | | ✓ |

TOE on SSR Type II and TOE on SSR Type III adds the Photo Verification mechanism and Service Attendee and Security Service Provider entities. In addition, TOE on SSR Type II adds the SSR Access Server (SAS) related objectives and TOe on SSR Type III adds the Application Server (APS) related objectives. The additions for the coverage of the threats, OCPs and assumptions ( that are not valid for Type I) is given in Table 15.

**Table 15. Additions to Security Objective Rationale due to differences of SSR Type II, III from SSR Type I**

| | OT.Photo_Verification | OE.Service_Attendee | OT.SA_Identity_Verification | OT.Session_Ending | OT.SAS_DA | OT.SAS_SC | OT.APS_DA | OT.APS_SC | OE.APS | OE.SAS | OE.PKI | OE.CM | OE.SAM | OE.eID_Card |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **T.Illegitimate_SAS (SSR Type II)** | | | | | ✓ | | | | | ✓ | | | | |
| **T.Illegitimate_APS (SSR Type III)** | | | | | | | ✓ | | ✓ | | | | | |
| **T.IVA_Eavesdropping** | | | | | | ✓ | | ✓ | | | | | | |
| **T.Fake_TOE_to_External_Entities** | | | | | ✓ | | ✓ | | | | | | | |
| **T.Stolen_eIDC** | ✓ | ✓ | | | | | | | | | | | | |
| **T.SA_Masquerader** | | ✓ | ✓ | | | | | | | | ✓ | ✓ | ✓ | |
| **T.SA_Abuse_of_Session** | | ✓ | | ✓ | | | | | | | | | | |

For all three types of SSR Device, External Biometric sensor or External PIN Pad could be connected. For the TOE on SSR device connected with an EBS or EPP, the additional threats, OSPs and assumptions are given in **Table 16**.

**Table 16. Additions to Security Objective Rationale for TOE on SSR with External/Internal Biometric Sensor and/or EPP**

| | OT.Biometric_Verification | OT.EPP_DA | OT.EPP_SC | OE.EPP | OE.PKI | OE.CM | OT.EBS_DA | OT.EBS_SC | OE.SAM | OE.EBS |
|---|---|---|---|---|---|---|---|---|---|---|
| **T.Stolen_eIDC** | ✓ | | | | | | | | | |
| **T.Fake_TOE_to_External_Entities** | | ✓ | | ✓ | | | ✓ | | | ✓ |
| **T.Repudiation** | ✓ | | | | | | | | | |
| **T.Illegitimate_EPP** | | ✓ | | ✓ | ✓ | ✓ | | | ✓ | |
| **T.EPP_Comm** | | | ✓ | ✓ | | | | | ✓ | |
| **T.Illegitimate_EBS** | | | | | ✓ | ✓ | ✓ | | ✓ | ✓ |
| **T.EBS_Comm** | | | | | | | | ✓ | ✓ | ✓ |
| **A.EBS-EPP** | | | | ✓ | | | | | | ✓ |

## 4.5 SECURITY OBJECTIVES RATIONALE

**T.Counterfeit_eID Card:** The security objectives OT.eIDC_Authentication and OT.SM_eID Card protect the eID Card against counterfeiting by authentication of the eID Card and Secure Messaging with the card. These mechanisms brings about some requirements on eID card, which is addressed by OE.eID and the support of SAM, which is addressed by OE.SAM. The authentication mechanism requires the public key infrastructure and the secure credential management. The public key infrastructure is addressed by OE.PKI; the security of credential management is addressed by OE.CM.

Security Objectives: OT.eIDC_Authentication, OT.SM_eID Card, OT.IVM_Management, OE.eID Card, OE.SAM, OE.PKI, OE.CM

**T.Stolen_eID Card:** The justification of this threat changes according to the configuration of the TOE.

| | **Without Biometric Sensor (internal or external) and EPP** | **With Biometric Sensor and EPP** |
|---|---|---|
| **TOE on SSR Type I** | OT.PIN_Verification,<br>OE.Service_Requester,<br>OE.eID Card,<br>OE.SSR_Platform. | OT.PIN_Verification,<br>OT.Biometric_Verification<br>OE.Service_Requester,<br>OE.eID Card,<br>OE.SSR_Platform. |
| **Type II and III** | OT. PIN_Verification,<br>OT.Photo_Verification,<br>OE.Service_Requester,<br>OE.Service_Attendee,<br>OE.eID Card,<br>OE.SSR_Platform. | OT.PIN_Verification,<br>OT.Photo_Verification,<br>OT.Biometric_Verification<br>OE.Service_Requester,<br>OE.Service_Attendee,<br>OE.eID Card,<br>OE.SSR_Platform. |

At minimum PIN Verification mechanism verifies if the person presenting the card is legitimate owner of the eID Card or an attacker trying to masquerade the identity of legitimate card holder (OT.PIN_Verification adresses the features in the TOE for this operation, OE.eID_Card adresses the eID Card requirements for this operaiton, and OE.Service_Requester addresses the Service Requester requirements for this operaiton). Photo Verification and Biometric Verification strengthens the resistance against the T.Stolen_eID Card. (OT.Biometric_Verification for biometric verification;

OT.Photo_Verification and OE.Service_Attendee for photo verification). In addition to this the SSR Platform shall prevent the attacker to steal the PIN or the biometric data of the user.

Security Objectives: OT.PIN_Verification, OT.Photo_Verification and OT.Biometric_Verification, OE.eID Card, OE.Service_Requester, OE.Service_Attendee, OE.SSR_Platform.

**T.Revoked_eID Card:** Authentication methods required by OT.IVM_Management prevent the revocation attack on the eID Card. OT.IVM_Management and OE.OCSPS cover the threat.

Security Objectives: OT.IVM_Management, OE.OCSPS, OE.eID Card, OE.PKI, OE.CM.

**T.IVA_Fraud:** OT.IVA_Confidentiality_Authentication allows the IVS to verify the IVA and identify the SSR that created the IVA. Hence, if an illegitimate IVA is created by an attacker, the IVS can detect it. The signing of IVA is performed by the SAM. Therefore, the OT.IVA_Confidentiality_Authentication, OE.SAM and OE.IVS cover the current threat together with OE.PKI and OE.CM which also cover the required PKI and the secure creation and distribution of the credentials and authentication reference data respectively.

Security Objectives: OT.IVA_Confidentiality_Authentication, OE.SAM, OE.IVS, OE.PKI, OE.CM

**T.IVA_Eavesdropping:** OT.IVA_Confidentiality_Authentication requires the secure communication of IVS and the TOE on SSR Type III. OT.SAS_SC, OT.APS_SC requires the secure communication of the TOE with SAS and APS for SSR Type II and Type III correspondingly. In addition for TOE on SSR Type I and Type II, OE.SPCA requires secure transfer of the IVA to APS by SPCA whereas OE.APS requires secure transfer of the IVA to IVS by APS. Similarly, for SSR Type II with SAS, OE.SAS requires secure transfer of the IVA to SPCA by SAS. Hence, T.IVA_Eavesdropping is covered by OT.IVA_Confidentiality_Authentication, OE.IVS, OE.APS, OE.SAS and OE.SPCA.

Security Objectives: OT.IVA_Confidentiality_Authentication, OT.SAS_SC, OT.APS_SC, OE.APS, OE.SAS, OE.SPCA, OE.IVS, OE.PC.

**T.IVA_Confidentiality_Integrity:** OT.IVA_Confidentiality_Authentication addresses the secure storage of the IVAs in SSR Type III. The encryption keys are generated by SAM thus OE.SAM addresses the secure storage of this encryption keys. These keys shall be transferred to the TOE via the secure messaging which is addressed by OT.SM_TOE_and_SAM

Security Objectives: OT.IVA_Confidentiality_Authentication, OT.SM_TOE_and_SAM, OE.SAM,

**T.Repudiation:** PIN Verification or Biometric Verification mechanisms ensure that Service Requester and eID Card had joined to the Identification Process. OE.CM covers the secure creation and distribution of the credentials and authentication reference data. Thus OT.PIN_Verification, OT.Biometric_Verification, OE.Service_Requester, OE.eID Card, OE.PKI, and OE.CM cover the T.Repudiation.

Security Objectives: OT.PIN_Verification, OT.Biometric_Verification, OE.Service_Requester, OE.eID Card, OE.PKI and OE.CM

**T.Fake_TOE_to_SR**: OT.PM_Verification allows the Service Requester identifying a legitimate SSR. OE.Service_Requester protects the service requester from entering his or her PIN and interacting with the biometric sensor without Personal Message Verification. OE.eID Card prevents the fake SSR accessing the Personal Message and OE.SAM provides the TOE the ability of proving its identity to the eID Card. Finally OE.PKI and OE.CM cover the required PKI and the secure creation and distribution of the credentials and authentication reference data.

Security Objectives: OT.PM_Verification, OE.eID Card, OE.Service_Requester, OE.SAM, OE.PKI, OE.CM

**T.Fake_TOE_to_External_Entities:** Authentication objectives for eID Card, Role Holder, SAS, APS, EBS, EPP are OT.SM_eIDCard, OT.RH_DA, OT.SAS_DA, OT.APS_DA, OT.EBS_DA, OT.EPP_DA correspondingly require TOE to prove its identity before doing any action. SAM card in the SSR Device is used to prove identity of the TOE to the external entities. OE.PKI and OE.CM cover the required PKI and the secure creation and distribution of the credentials and authentication reference data. Thus OE.SAM covers the threat with OE.eID Card, OE.EBS (depends on the configuration), and OE.EPP (depends on the configuration).

Security Objectives: OT.SM_eIDCard, OT.RH_DA, OT.SAS_DA, OT.APS_DA, OT.EBS_DA, OT.EPP_DA, OE.SAM, OE.eID Card, OE.EBS (depends on the configuration), OE.EPP (depends on the configuration), OE.PKI, OE.CM.

**T.SA_Masquerader:** OT.SA_Identity_Verification addresses the verification of Service Attendee's identity. Service Attendee's identity verification is similar to the identity verification of Service Requester. OE.eID Card, OE.SAM and the OE.Service_Attender address the necessary contributions of the eID Card, SAM and Service Attendee to the mechanisms covered in Service Attendee identity verification. Finally OE.PKI and OE.CM cover the required PKI and the secure creation and distribution of the credentials and authentication reference data.

Security Objectives:OT.SA_Identity_Verification, OE.eID Card, OE.SAM OE.Service_Attendee, OE.PKI, OE.CM

**T.SA_Abuse_of_Session:** OT.Session_Ending addresses the termination of authentication session of Service Attendee whenever the session expires or the Service Attendee removes the eID Card. OE.Service_Attendee states that the Service Attendee shall not leave his or her eID Card when he or she leaves the SRR environment.

Security Objectives: OT.Session_Ending, OE.Service_Attendee

**T.Fake_Policy:** OT.Identity_Verification_Policy_Authentication addresses verifying the integrity and origin of Identity Verification Policy and OE.IVPS states that Identity Verification Policy shall be signed

electronically by the IVPS. OE.PKI and OE.CM cover the required PKI and the secure creation and distribution of the credentials and authentication reference data.

Security Objectives: OT.Identity Verification Policy_Authentication, OE.IVPS, OE.PKI, OE.CM

**T.Fake_OCSP_Response:** OT.OCSP_Query_Auth addresses verifying the integrity and the origin of the OCSP response. OE.OCSPS states that OCSP response shall be signed by the OCSPS. OE.PKI and OE.CM cover the required PKI mechanism and the secure creation and distribution of the credentials and authentication reference data.

Security Objectives: OT.OCSP_Query_Verify, OE.OCSPS, OE.PKI, OE.CM

**T.RH_Comm:** The OT.RH_SC, OE.SAM and OE.Role_Holder together agree on the secure communication keys. OT.RH_SC and OE.Role_Holder addresses the secure communication between the Role Holder and the TOE.

Security Objectives: OT.RH_SC, OE.SAM, OE.Role_Holder

**T.RH_Session_Hijack:** OT.RH_DA [Role Holder Device Authentication], OE.SAM and OE.Role_Holder provides mutual authentication of the TOE and the Role Holder.. OT.RH_Session_Ending resets the authentication status of Role Holder in eID Card when the secure communication session is terminated. This prevents the attacker to abuse the authentication status present in the eID Card. OE.eID Card helps the OT.RH_Session_Ending by providing an authentication reset mechanism to the TOE. Finally OE.PKI and OE.CM cover the required PKI mechanism and the secure creation and distribution of the credentials and authentication reference data.

Security Objectives:OT.RH_DA [Role Holder Device Authentication], OT.RH_Session_Ending, OE.Role_Holder, OE.SAM, OE.eID Card, OE.PKI, OE.CM.

**T.Illegitimate_EBS:** OT.EBS_DA addresses the authentication of EBS by SAM. OE.PKI and OE.CM cover the required PKI echanism and the secure creation and distribution of the credentials and authentication reference data. So the threat is covered OT.EBS_DA, OE.SAM, OE.EBS, OE.PKI and OE.CM.

Security Objectives: OT.EBS_DA, OE.SAM, OE.EBS, OE.PKI, OE.CM

**T.EBS_Comm:** OT.EBS_SC and OE.EBS addresses secure communication between the TOE and the EBS. The OE.SAM and OE.EBS contribute to the key agreement protocol between the TOE and the EBS.

Security Objectives: OT.EBS_SC, OE.SAM, OE.EBS

**T.Illegitimate_EPP:** OT.EPP_DA, OE.EPP and OE.SAM addresses the authentication of EPP by SAM. OE.PKI and OE.CM cover the required PKI mechanism and the secure creation and distribution of the credentials and authentication reference data. So the threat is covered by OT.EPP_DA, OE.SAM, OE.EPP, OE.PKI, and OE.CM.

Security Objectives: OT.EPP_DA, OE.SAM, OE.EPP, OE.PKI, OE.CM

**T.EPP_Comm:** OT.SC_EPP, OE.EPP and OE.SAM address the secure communication between the TOE and the EPP therefore cover the threat.

Security Objectives:OT.SC_EPP, OE.EPP, OE.SAM

**T.eIDC_Comm:** OT.SM_eID Card and OE.eID Card create the cryptographic keys and perform secure communication. OE.SAM supports the cryptographic key agreement between the TOE and the eID Card. Hence the threat is covered by OT.SM_eID Card, OE.eID Card and OE.SAM.

Security Objectives: OT.SM_eID Card, OE.eID Card and OE.SAM.

**T.Illegitimate_SAS:** This threat is covered by OT.SAS_DA which guarantee the authentication of the SAS before any other action and OE.SAS which ensures that the SAS has the ability to be authenticated by the TOE.

Security Objectives: OT.SAS_DA, OE.SAS.

**T.Illegitimate_APS:** This threat is covered by OT.APS_DA which guarantee the authentication of the APS before any other action and OE.APS which ensures that the APS has the ability to be authenticated by the TOE.

Security Objectives: : OT.APS_DA, OE.APS.

**T.DTN_Change:** OT.DTN_Mgmt and OE.SSR_Platform addresses the protection against unauthorized modification to the DTN.

Security Objectives:OT.DTN_Mgmt, OE.SSR_ Platform.

**T.SAM-PIN_Theft:** OT.Security_Failure, OT.SM_TOE_and_SAM, OE.SSR_ Platform and OT.SAM-PIN_Sec address the protection of SAM-PIN against theft and unauthorized change.

Security Objective: OT.Security_Failure, OT.SAM-PIN_Mgmt, OT.SAM-PIN_Sec, OE.SSR_ Platform.

**T.Audit_Data_Compromise:** OT.Security_Failure, OT.Audit_Data_Integrity and OE.SSR_ Platform covers the protection of audit data from unauthorized change.

Security Objective: OT.Security_Failure, OT.Audit_Data_Integrity, OE.SSR_ Platform.

**T.TOE_Manipulation:** OT.Security_Failure addresses protection of the TOE against physical tampering together with OE.SSR_Platform. OT.SM_TOE_and_SAM [Secure Messaging between TOE and SAM], addresses the protection of communication between the SAM and the TOE. OT.SAM-PIN_Sec protects the SAM-PIN against probing, OT.DTN_Integrity protects the DTN from manipulation, and the OT.Audit_Data_Integrity protects the audit data from manipulation. OT.RIP provides protection against probing attacks and de-allocates any resources when they are no longer needed.

Security Objectives: OT.SM_TOE_and_SAM [Security between TOE and SAM], OT.SAM-PIN_Sec, OT.DTN_Integrity, OT.Audit_Data_Integrity, OT.RIP [Residual Information Protection], OE.SSR_Platform

**T.Fake_SAM:** OT.Auth_SAM_by_TOE addresses the authentication of SAM by TOE. OE.SAM provides the TOE for the capability to authenticate itself. Finally OE.PKI and OE.CM cover the required PKI mechanism and the secure creation and distribution of the credentials and authentication reference data. Thus OT.Auth_SAM_by_TOE, OE.SAM, OE.PKI, and OE.CM cover the threat.

Security Objectives:OT.Auth_SAM_by_TOE [Authentication of SAM by TOE], OE.SAM, OE.PKI, OE.CM

**T.Stolen_SAM:** OT.Auth_SAM_by_TOE addresses the authentication of SAM by TOE and OE.SAM requires the SAM-PIN verification before allowing the SSR (the legitimate or the fake) access its services. OT.SAM-PIN_Secand OT.SM_TOE_and_SAM requires the SAM PIN security during operation of the SSR Device. The OE.CM protects the SAM-PIN during generation and writing to the SAM and the TOE.

Security Objectives: OT.Auth_SAM_by_TOE, OT.SAM-PIN_Sec, OT.SAM-PIN_Mgmt, OT.SM_TOE_and_SAM, OE.SAM and OE.CM.

**T.Revoked_SAM:** Authentication of SAM by TOE mechanism also involves the revocation query. The OT.Auth_SAM_by_TOE, OE.SAM, OE.OCSP cover the threat.

Security Objectives: OT.Auth_SAM_by_TOE, OE.SAM, OE.OCSPS.

**P.IVM_Management:** OT. IVM_Management matches the requirement.

Security Objective: OT. IVM_Management

**P.TOE_Upgrade:** OT.TOE_Upgrade covers the policy together with OE.SPCA, OE.SAM, OE.SAS and OE.APS since the upgrade package could be installed onto the SSR via SPCA, SAS or APS and SAM stores the certificates to validate the upgrade package.

Security Objectives: OT.TOE_Upgrade, OE.SPCA, OE.SAM, OE.SAS, OE.APS.

**P.Re-Authentication:** OT.Session_Ending requires necessary re-authentications for each authentication session.

Security Objectives: OT.Session_Ending

**P.Terminal_Cert_Update:** OT.Cert_Update**,** OE.Terminal_Cert_Directory and OE.CM matches the policy. OE.Terminal_Cert_Directory requires the related server to obtain the updated certificates and OT.Cert_Update covers the update of the certificates by the TOE.

Security Objectives: OT.Cert_Update**,** OE.Terminal_Cert_Directory and OE.CM.

**P.Time_Update:** OT.Time_Mgmt matches the time update requirement.

Security Objective:OT.Time_Mgmt

**P.Offline_Operation:** OT. eIDC _Authentication defines the offline certificate verification together with OE.CM. OT.IVA _Confidentiality_and_Authentication mathes the offline identity verification with TOE on SSR Type III.

Security Objectives: OT. eIDC _Authentication, OE.CM and OT.IVA _Confidentiality_ Authentication.

**P.DPM:** OT.DPM addresses the phase management policy of the P.DPM. DTN and PIN writing policy is addressed by OT.DTN_Mgmt and OT.SAM-PIN_Mgmt objectives correspondingly.

Security Objectives: OT.DPM, OT.DTN_Mgmt and OT.SAM-PIN_mgmt

**A.SPCA:** The security objective OE.SPCA covers the assumption.

Security Objective: OE.SPCA

**A.IVPS:** The security objective OE.IVPS covers the assumption.

Security Objective: OE.IVPS

**A.EBS-EPP:** OE.EBS and OE.EPP covers the assumption.

Security Objective: OE.EBS, OE.EPP

**A.PC:**OE.PC covers the assumption

Security Objective: OE.PC

**A.APS:** The security objective OE.APS covers the assumption.

Security Objective: OE.APS

**A.Management_Environment:** OE.Security_Management covers the assumption.

Security Objective: OE.Security_Management

**A.SAM_ PIN_Environment:** OE.SSR_Initialization_Environment covers the assumption.

Security Objective: OE.SSR_Initialization_Environment

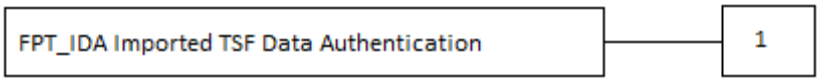
# 5 EXTENDED COMPONENTS DEFINITION

## 5.1 FPT_IDA IMPORTED TSF DATA AUTHENTICATION

**Family Behavior:**

This family requires that the TOE has the ability to verify that the defined imported TSF Data originates from the stated external entity.

**Component Leveling:**




### 5.1.1 FPT_IDA.1 IMPORTED TSF DATA AUTHENTICATION

**Management:** FPT_IDA.1

The following actions could be considered for the management functions in FMT:

- Management of authentication data by an administrator.

**Audit:** FPT_IDA.1

The following actions should be auditable if FAU_GEN Security audit data generation is included in the PP/ST:

- Minimal: The final decision on authentication;

**FPT_IDA.1 Imported TSF Data Authentication**

Hierarchical to: No other components

Dependencies: No dependencies

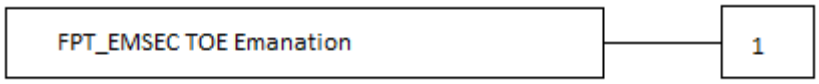
| | |
|---|---|
| FPT_IDA.1.1 | The TSF shall verify that the [assignment: list of TSF Data] originates from [assignment: list of external entities] using [assignment: list of authentication mechanisms]. |

## 5.2 FPT_EMSEC TOE EMANATION

**Family Behavior:**

This family is defined to prevent attacks against secret data stored in and used by the TOE where the attack is based on external observable physical phenomena of the TOE. The examples to these attacks are Differential Power Analysis, Simple Power Analysis and Timing Attacks.

**Component Leveling:**




### 5.2.1 FPT_EMSEC.1 TOE EMANATION

**Management:** FPT_EMSEC:1

There are no management activities foreseen

**Audit:** FPT_EMSEC.1

**FPT_EMSEC.1 TOE Emanation**

Hierarchical to: No other components

Dependencies: No dependencies

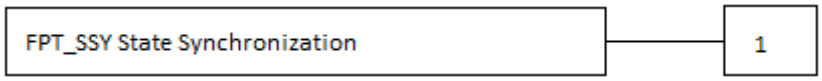
| | |
|---|---|
| FPT_EMSEC.1.1 | The TOE shall not emit [assignment: types of emissions] in excess of [assignment: specified limits] enabling access to [assignment: list of types of TSF data] and [assignment: list of types of user data]. |

## 5.3 FPT_SSY STATE SYNCHRONIZATION

**Family Behavior:**

This family requires that the TOE has ability to synchronize its internal state with another trusted external entity.

**Component Leveling:**




### 5.3.1 FPT_SSY.1 STATE SYNCHRONIZATION

**Management:** FPT_SSY.1

The following actions could be considered for the management functions in FMT:

- Management of conditions where state synchronization is mandatory, not necessary if it fails, or not required

**Audit:** FPT_SSY.1

The following actions should be auditable if FAU_GEN Security audit data generation is included in the PP/ST:

- Minimal: Result of synchronization: success or failure

**FPT_SSY.1 State Synchronization**

Hierarchical to: No other components

Dependencies: No dependencies

| | |
|---|---|
| FPT_SSY.1.1 | The TSF shall check [assignment: status of the user security attributes] from the [assignment: the external entities] in times: [assignment: defined periods]. |

# 6 SECURITY REQUIREMENTS

## 6.1 SECURITY FUNCTIONAL REQUIREMENTS

This part of the PP defines the detailed security requirements that shall be satisfied by the TOE. The statement of TOE security requirements shall define the functional and assurance security requirements that the TOE needs to satisfy in order to meet the security objectives for the TOE. The CC allows several operations to be performed on functional requirements; refinement, selection, assignment, and iteration are defined in Section 8.1 of Common Criteria Part1 [17]. The following operations are used in the PP.

The **refinement** operation is used to add detail to a requirement, and thus further restricts a requirement. Refinements of security requirements are denoted in such a way that added words are in **bold text** and removed are ~~crossed out~~.

The **selection** operation is used to select one or more options provided by the CC instating a requirement. Selections having been made are denoted as underlined text.

The **assignment** operation is used to assign a specific value to an unspecified parameter, such as the length of a password. Assignments are denoted by *italicized* text.

The **iteration** operation is used when a component is repeated with varying operations. Iteration is denoted by showing a slash "/", and the iteration indicator after the component identifier.

### 6.1.1 CLASS FAU: SECURITY AUDIT

#### 6.1.1.1 FAU_GEN.1 - Audit data generation

Hierarchical to: No other components.

Dependencies: [FPT_STM.1 Reliable time stamps] **fulfilled** by FPT_STM.1

| | |
|---|---|
| FAU_GEN.1.1 | The TSF shall be able to generate an audit record of the following auditable events:<br>a) Start-up and shutdown of the audit functions;<br>b) All auditable events for the minimal[2] level of audit; and<br>c) *Insertion and removal of eID Card and SAM, Service requester authentication, service attendee authentication, start and end of secure messaging, card authentication, received data integrity failure, role holder* |

2[selection, choose one of: minimum, basic, detailed, not specified]

| | |
|---|---|
| | *authentication, external biometric sensor authentication, external pin pad authentication, SAM authentication, SAM-PIN verification failure, TOE update, IVP verification, OCSP answer verification, Switching to offline mode (for TOE on SSR Type III), SAS authentication and tampering of the SSR*[3]. |
| FAU_GEN.1.2 | The TSF shall record within each audit record at least the following information:<br>a) Date and time of the event, ~~type of event,~~ subject identity (if applicable), and the outcome (success or failure) of the event; and<br>b) *For each audit event type, based on the auditable event definitions of the functional components included in the PP/ST, reason of the failure (if applicable)*[4]. |

Configuration Note:

Refinement for TOE on SSR Type I: Exclude the service attendee authentication process.

### 6.1.1.2 FAU_ARP.1 - Security alarms

Hierarchical to: No other components.

Dependencies: [FAU_SAA.1 Potential violation analysis] **fulfilled** by FAU_SAA.1

| | |
|---|---|
| FAU_ARP.1.1 | The TSF shall take *the action of entering Out of Service Mode and delete SAM PIN and Cryptographic Keys used for storage security*[5] upon detection of a potential security violation. |

**Application Note 1:** The instantiation "Cryptographic Keys used for storage security" matches the IVA Confidentiality and Integrity Keys for TOE on SSR Type III with offline working feature.

### 6.1.1.3 FAU_STG.1 - Protected audit trail storage

Hierarchical to: No other components.

Dependencies: [FAU_GEN.1 Audit data generation] **fulfilled** by FAU_GEN.1

| | |
|---|---|
| FAU_STG.1.1 | The TSF shall protect the stored audit records in the audit trail from unauthorized deletion.. |

3[assignment: other specifically defined auditable events]
4[assignment: other audit relevant information]
5[assignment: list of actions]

| | |
|---|---|
| FAU_STG.1.2 | The TSF shall be able to detect[6] unauthorized modifications to the stored audit records in the audit trail. |

#### 6.1.1.4 FAU_STG.4 - Prevention of audit data loss

Hierarchical to: FAU_STG.3 Action in case of possible audit data loss.

Dependencies: [FAU_STG.1 Protected audit data storage] **fulfilled** by FAU_STG.1

| | |
|---|---|
| FAU_STG.4.1 | The TSF shall overwrite the oldest stored audit records[7] and *none*[8] if the audit trail is full. |

#### 6.1.1.5 FAU_SAA.1 - Potential violation analysis

Hierarchical to: No other components.

Dependencies: [FAU_GEN.1 Audit data generation] **fulfilled** by FAU_GEN.1

| | |
|---|---|
| FAU_SAA.1.1 | The TSF shall be able to apply a set of rules in monitoring the audited events and based upon these rules indicate a potential violation of the enforcement of the SFRs. |
| FAU_SAA.1.2 | The TSF shall enforce the following rules for monitoring audited events:<br>a) *Tampering of the SSR*[9] known to indicate a potential security violation;<br>b)*none*[10]. |

### 6.1.2 CLASS FCS: CRYPTOGRAPHIC SUPPORT

#### 6.1.2.1 FCS_CKM.1/SM - Cryptographic key generation for secure messaging with eID, SA, EBS, EPP and Role Holder

Hierarchical to: No other components.

Dependencies: [FCS_CKM.2 Cryptographic key distribution, or FCS_COP.1 Cryptographic operation] **fulfilled** by FCS_COP.1/AES-CBC and FCS_COP.1/AES-CMAC

[FCS_CKM.4 Cryptographic key destruction] **fulfilled** by FCS_CKM.4

| | |
|---|---|
| FCS_CKM.1.1 | The TSF shall generate cryptographic keys in accordance with a specified |

6 [selection, choose one of: prevent, detect]
7 [selection, choose one of: "ignore audited events", "prevent audited events, except those taken by the authorised user with special rights", "overwrite the oldest stored audit records"]
8 [assignment: other actions to be taken in case of audit storage failure]
9[assignment: subset of defined auditable events]
10[assignment: any other rules].

| | |
|---|---|
| | cryptographic key generation algorithm *Encryption and CMAC Key Generation Algorithm for Secure Messaging*[11] and specified cryptographic key sizes *256 bits*[12] that meet the following: *TS 13584 [3]*[13]. |

**Application Note 2:** Above mentioned Secure Messaging are founded between TOE and eID; TOE and SAM; TOE and EBS (if applicable); TOE and EPP (if applicable); TOE and Role Holder.

#### 6.1.2.2 FCS_CKM.1/SM_TLS - Cryptographic key generation for secure messaging with Identity Verification Server, Application Server and SSR Access Server

Hierarchical to: No other components.

Dependencies: [FCS_CKM.2 Cryptographic key distribution, or FCS_COP.1 Cryptographic operation] **fulfilled** by FCS_COP.1/AES-CBC and FCS_COP.1/AES-CMAC

[FCS_CKM.4 Cryptographic key destruction] **fulfilled** by FCS_CKM.4

| | |
|---|---|
| FCS_CKM.1.1 | The TSF shall generate cryptographic keys in accordance with a specified cryptographic key generation algorithm *TLS v1.2 or above* [14] and specified cryptographic key sizes *256 Bits*[15] that meet the following: *RFC 5246*[16]. |

**Application Note 3:** TLS Key Generation is performed between TOE and APS for TOE on SSR Type III; between TOE and SAS for TOE on SSR Type II.

#### 6.1.2.3 FCS_CKM.1/IVA_Keys - Cryptographic key generation for IVA Confidentiality and Integrity

Hierarchical to: No other components.

Dependencies: [FCS_CKM.2 Cryptographic key distribution, or FCS_COP.1 Cryptographic operation] **fulfilled** by FCS_COP.1/AES-CBC and FCS_COP.1/AES-CMAC

[FCS_CKM.4 Cryptographic key destruction] **fulfilled** by FCS_CKM.4

| | |
|---|---|
| FCS_CKM.1.1 | The TSF shall generate cryptographic keys in accordance with a specified cryptographic key generation algorithm *True Random Number Generation*[17] |

11[assignment: cryptographic key generation algorithm]
12[assignment: cryptographic key sizes]
13[assignment: list of standards]
14[assignment: cryptographic key generation algorithm]
15[assignment: cryptographic key sizes]
16[assignment: list of standards]
17[assignment: cryptographic key generation algorithm]

| | |
|---|---|
| | and specified cryptographic key sizes *256 bits*[18] that meet the following: *none*[19]. |

**Application Note 4:** True Random Numbers should be generated by the SAM. Since the communication between the TOE and the SAM is secure, these keys are securely transferred to the TOE and stored in the tamper proof area.

**Refinement:** Keys above refers to IVA Encryption/Decryption key used in AES CBC algorithm and the IVA Integrity key used in AES CMAC algorithm. These keys are used to Encrypt/Decrypt the stored IVAs on SSR Type III.

**Application Note 5:** FCS_CKM.1/IVA_Keys defined above should be included in the ST if only the TOE is on SSR Type III and includes the optional offline IVA Generation and Storage use case.

#### 6.1.2.4 FCS_CKM.4 - Cryptographic key destruction

Hierarchical to: No other components.

Dependencies: [FDP_ITC.1 Import of user data without security attributes, or FDP_ITC.2 Import of user data with security attributes, or FCS_CKM.1 Cryptographic key generation] **fulfilled** by FCS_CKM.1/SM, FCS_CKM.1/IVA_Keys and FCS_CKM.1/SM_TLS

| | |
|---|---|
| FCS_CKM.4.1 | The TSF shall destroy cryptographic keys in accordance with a specified cryptographic key destruction method [assignment: cryptographic key destruction method][20] that meets the following: [assignment: list of standards][21]. |

**Application Note 6:** The dependency of FCS_CKM.4 is satisfied by the FCS_CKM.1/SM, FCS_CKM.1/IVA_Keys and FCS_CKM.1/SM_TLS. Note here that the coverage of these SFRs differs according to SSR Type and whether EBS, EPP and offline modes are included. Therefore, FCS_CKM.4 is required only for the covered SSR Configuration just as it is for FCS_CKM.1.

**Application Note 7:** FCS_CKM.4 determines the key destruction method for the secure messaging keys, secure storage keys and the Upgrade Package key (the decrypted key). In case there are different key destruction algorithms for different keys (e.g. secure messaging with SAM and secure messaging with role owner), each different key destruction method shall be given in the ST as a different iteration.

18[assignment: cryptographic key sizes]
19[assignment: list of standards]
20[assignment: cryptographic key destruction method]
21[assignment: list of standards]

### 6.1.2.5 FCS_COP.1/SHA-256 - Cryptographic operation SHA 256

Hierarchical to: No other components.

Dependencies: [FDP_ITC.1 Import of user data without security attributes, or FDP_ITC.2 Import of user data with security attributes, or FCS_CKM.1 Cryptographic key generation] **not fulfilled** but justified.

[FCS_CKM.4 Cryptographic key destruction] **not fulfilled** but justified.

Justification: A hash function does not use a key so there is neither need to create nor need to destroy.

| | |
|---|---|
| FCS_COP.1.1 | The TSF shall perform *hash value calculation*[22] in accordance with a specified cryptographic algorithm *SHA-256 [5]*[23] and cryptographic key sizes *none*[24] that meet the following: *FIPS 180-4*[25]. |

### 6.1.2.6 FCS_COP.1/AES-CBC - Cryptographic AES CBC operation

Hierarchical to: No other components.

Dependencies: [FDP_ITC.1 Import of user data without security attributes, or FDP_ITC.2 Import of user data with security attributes, or FCS_CKM.1 Cryptographic key generation] **fulfilled** by FCS_CKM.1/SM, FCS_CKM.1/IVA_Keys, FCS_CKM.1/SM_TLS

[FCS_CKM.4 Cryptographic key destruction] **fulfilled** by FCS_CKM.4

Justification: The first dependency is not satisfied for the decryption requirement for the TOE Upgrade package. The encrypted keys of the TOE Upgrade package are installed onto the TOE together with the Upgrade Package. The Key Decryption Keys for these keys are stored in the SAM. Therefore encrypted keys are decrypted in the SAM using the Key Decryption Keys and used in the TOE.

| | |
|---|---|
| FCS_COP.1.1 | The TSF shall perform *encryption and decryption*[26] in accordance with a specified cryptographic algorithm *AES-256 CBC Mode*[27] and cryptographic key sizes *256 bits*[28] that meet the following: *FIPS 197 (for AES) [6], NIST* |

22[assignment: list of cryptographic operations]
23[assignment: cryptographic algorithm]
24[assignment: cryptographic key sizes]
25[assignment: list of standards]
26[assignment: list of cryptographic operations]
27[assignment: cryptographic algorithm]
28[assignment: cryptographic key sizes]

| | |
|---|---|
| | *Recommendation for Block Cipher Modes of Operations (for CBC mode)[ 7]*[29]. |

### 6.1.2.7 FCS_COP.1/AES-CMAC - Cryptographic CMAC operation

Hierarchical to: No other components.

Dependencies: [FDP_ITC.1 Import of user data without security attributes, or FDP_ITC.2 Import of user data with security attributes, or FCS_CKM.1 Cryptographic key generation] **fulfilled** by FCS_CKM.1/SM, FCS_CKM.1/IVA_Keys, FCS_CKM.1/SM_TLS .

[FCS_CKM.4 Cryptographic key destruction] **fulfilled** by FCS_CKM.4.

| | |
|---|---|
| FCS_COP.1.1 | The TSF shall perform *message authentication*[30] in accordance with a specified cryptographic algorithm *AES-CMAC*[31] and cryptographic key sizes *256 bits*[32] that meet the following: *FIPS 197 (for AES) [6], RFC 4493 (for CMAC operation) [9]*[33]. |

### 6.1.2.8 FCS_COP.1/RSA - Cryptographic RSA encryption operation

Hierarchical to: No other components.

Dependencies: [FDP_ITC.1 Import of user data without security attributes, or FDP_ITC.2 Import of user data with security attributes, or FCS_CKM.1 Cryptographic key generation] **not fulfilled** but justified.

[FCS_CKM.4 Cryptographic key destruction] **fulfilled** by FCS_CKM.4

Justification: RSA encryption operation is performed during the key agreement between the SAM and the TOE. Certificate of the secure messaging between the TOE and the SAM is stored in the SAM. This certificate contains the public RSA key needed for this RSA encryption operation and is read by the TOE before key agreement process starts.

| | |
|---|---|
| FCS_COP.1.1 | The TSF shall perform *encryption*[34] in accordance with a specified cryptographic algorithm *RSA OAEP*[35] and cryptographic key sizes *2048*[36] |

29[assignment: list of standards]
30[assignment: list of cryptographic operations]
31[assignment: cryptographic algorithm]
32[assignment: cryptographic key sizes]
33[assignment: list of standards]
34 [assignment: list of standards]
35 [assignment: cryptographic algorithm]
36 [ assignment: cryptographic key sizes]

| | |
|---|---|
| | that meet the following: *TS 13584 [3],* and *RSA Cryptography Standard [10]*[37]. |

### 6.1.2.9 FCS_COP.1/Sign_Ver - Cryptographic signature verification operation

Hierarchical to: No other components.

Dependencies: [FDP_ITC.1 Import of user data without security attributes, or FDP_ITC.2 Import of user data with security attributes, or FCS_CKM.1 Cryptographic key generation] **not fulfilled** but justified.

[FCS_CKM.4 Cryptographic key destruction] **not fulfilled** but justified.

Justification: The public key needed to perform the cryptographic operation is written to the card via FMT_MTD.1/Ver_Cert. So neither key creation nor import operation is necessary within the SFR. Also the public key used in the operation does not have confidentiality requirements so FCS_CKM.4 is also not required here.

| | |
|---|---|
| FCS_COP.1.1 | The TSF shall perform *Signature Verification by Cryptographic Validation and Certificate Validation*[38] in accordance with a specified cryptographic algorithm *RSA, PKCS#1 v2.1 with PSS padding method*[39] and cryptographic key sizes *2048*[40] that meet the following: *ETSI TS 102 853[12] and TS 13584 [3]*[41]. |

**Application Note 8:** This signature verification shall be done for the following signature verification operations:

- verification of Identity Verification Certificate (eID Card Certificate),
- verification of the OCSP Answer signature,
- verification of the Signature of the Identity Verification Policy sent by the Identity Verification Policy Server (IVPS) and,
- verification of the Secure Access Module (SAM) certificate,
- verification of upgrade package signature.

Other required signature verification operations required according to the additions to TOE shall be added in the ST.

37 [assignment: list of standards]
38[assignment: list of cryptographic operations]
39[assignment: cryptographic algorithm]
40[assignment: cryptographic key sizes]
41[assignment: list of standards]

### 6.1.3 CLASS FIA: IDENTIFICATION AND AUTHENTICATION

#### 6.1.3.1 FIA_AFL.1 Authentication failure handling

Hierarchical to: No other components.

Dependencies: [FIA_UAU.1 Timing of authentication] fulfilled by FIA_UAU.2 which is hierarchic to FIA_UAU.1

| | |
|---|---|
| FIA_AFL.1.1 | The TSF shall detect when *number of Biometric Verification Failure (defined in TS 13584 [3]) times*[42] unsuccessful authentication attempts occur related to *Biometric Verification*[43]. |
| FIA_AFL.1.2 | When the defined number of unsuccessful authentication attempts has been met[44], the TSF shall not allow *further biometric verification*[45]. |

Application Note 9: Unsuccessful biometric verification number is written into the eID Card by the TOE and updated each time the counter is changed.

#### 6.1.3.2 FIA_UID.2 User Identification before any action

Hierarchical to: No other components.

Dependencies: No dependencies

| | |
|---|---|
| FIA_UID.2.1 | The TSF shall require each user to be successfully identified before allowing any other TSF-mediated actions on behalf of that user. |

**Refinement:** User above refers to Role Holder, Secure Access Module, External PIN Pad (if applicable), External Biometric Sensor (if applicable) and eID Card. In addition, for TOE on SSR Type II user also refers to SAS, for TOE on SSR Type III user also refers to APS.

#### 6.1.3.3 FIA_UAU.2 User authentication before any action

Hierarchical to: FIA_UAU.1.

Dependencies: [FIA_UID.1 Timing of identification] fulfilled by FIA_UID.2 which is hierarchic to FIA_UID.1

| | |
|---|---|
| FIA_UAU.2.1 | The TSF shall require each user to be successfully authenticated before allowing any other TSF-mediated actions on behalf of |

42[selection: [assignment: positive integer number], an administrator configurable positive integer within[assignment: range of acceptable values]]
43[assignment: list of authentication events]
44[selection: met, surpassed]
45[assignment: list of actions]

| | |
|---|---|
| | that user. |

**Refinement:** User above refers to Role Holder, Secure Access Module, External PIN Pad (if applicable), External Biometric Sensor (if applicable) and eID Card. In addition, for TOE on SSR Type II user also refers to SAS, for TOE on SSR Type III user also refers to APS.

#### 6.1.3.4 FIA_UAU.5 Multiple authentication mechanisms

Hierarchical to: No other components.

Dependencies: No dependencies.

| | |
|---|---|
| FIA_UAU.5.1 | The TSF shall provide *the following authentication mechanisms:*<br>• *Service Attendee authentication ,*<br>• *Service Requester authentication,*<br>• *eID Card authentication,*<br>• *SAM authentication,*<br>• *Role Holder Device authentication,*<br>• *SAS authentication for TOE on SSR Type II,*<br>• *APS authentication for TOE on SSR Type III,*<br>• *external PIN Pad authentication (if applicable),*<br>• *external biometric sensor authentication (if applicable)*[46]<br>to support user authentication. |
| FIA_UAU.5.2 | The TSF shall authenticate any user's claimed identity according to the following rules:<br>• *Service requester authentication is done by methods defined in TS 13585 [4]. Verification method is determined by the Identity Verification Policy Server (IVPS) or the Client Application. For the cases when there is no IVPS and Client Application does not determine the method, default method shall be used which is the combination of certificate verification, PIN authentication, photo verification (if applicable) and biometric verification (if applicable) as defined in TS 13585 [4].*<br>• *Service Attendee authentication is done by methods defined in TS TS 13585 [4]. Verification method is determined by the Identity Verification Policy Server (IVPS) or the Client Application. For the cases* |

46[assignment: list of multiple authentication mechanisms]

| | |
|---|---|
| | *when there is no IVPS and Client Application does not determine the method, default method shall be used which is the combination of certificate verification, PIN authentication and biometric verification (if applciable) as defined in TS 13585 [4].*<br>• *eID Card, SAM, Role Holder, external PIN Pad and external biometric sensor authentications are done by certificate verification.*<br>• *APS and SAS authentication are done by SSL/ TLS certificate authentication. SAS verification is a mutual authentication started by the TOE. APS verification is a one way server authentication* [47]. |

**Refinement:** User above refers to Secure Access Module, External PIN Pad, External Biometric Sensor, Service Requester, Service Attendee, eID Card. In addition, for TOE on SSR Type II user also refers to SAS, for TOE on SSR Type III user also refers to IVPS and APS.

**Refinement for TOE on SSR Type I:** Exclude the Photo Verification and Service Attendee Authentication.

**Refinement for TOE on SSR with no external biometric sensor:** Exclude the external biometric sensor authentication.

**Refinement for TOE on SSR with no external PIN Pad:** Exclude the external PIN Pad authentication.

**Application Note 10:** Certificates stored in the SAM are used for the SSL/ TLS client authentication.

**Application Note 11:** eID Card is the smart card with the National eID Application. Card holder (either Service Requester or the Service Attendee) is the person who possesses the eID Card. The authentication of the eID Card and the Card Holder are handled separately because the former is to validate that the card is not counterfeit, not forged or notrevoked and the latter is to validate that the card is not stolen. However, due to the authentication policy, in some cases Service Attendee and Service Requester authentication consist of certificate verification. In this case one refers to the other.

#### 6.1.3.5 FIA_UAU.6 - Re-authenticating

Hierarchical to: No other components.

Dependencies: No dependencies.

| | |
|---|---|
| FIA_UAU.6.1 | The TSF shall re-authenticate the user under the conditions given below. When 4 hours is exceeded after Service Attendee authentication, this |

47[assignment: rules describing how the multiple authentication mechanisms provide authentication]

| | |
|---|---|
| | authentication process is repeated.<br>• In each authentication request for Service Requester, Service Requester is re-authenticated even if the card is not removed.<br>• *After 24 hours are exceeded the following sessions' keys are renewed:*<br>  • *SAM authentication,*<br>  • *Role Holder Device authentication,*<br>  • *APS authentication for TOE on SSR Type III,*<br>  • *SAS authentication for TOE on SSR Type II*<br>  • *external PIN Pad authentication (if applicable),*<br>  • *external biometric sensor authentication (if applicable)*[48]. |

**Refinement for TOE on SSR Type I:** Exclude the Photo Verification and Service Attendee Authentication

**Refinement:** User above refers to Service Attendee, Service Requester, SAM, Role Holder, APS for TOE on SSR Type III, SAS for TOE on SSR Type II, EPP (if applicable) or EBS (if applicable) according to the context.

#### 6.1.3.6 FIA_UAU.7 Protected authentication feedback

Hierarchical to: No other components.

Dependencies: [FIA_UAU.1 Timing of authentication] fulfilled by FIA_UAU.2 which is hierarchical to FIA_UAU.1.

| | |
|---|---|
| FIA_UAU.7.1 | The TSF shall provide<br>• *a dummy character for each entered PIN entry for authentication by PIN*<br>• *a dummy fingerprint representation for authentication by biometry on the SSR screen* [49] to the ~~user~~ **Service Requester or Service Attendee** while the authentication is in progress. |

48[assignment: list of conditions under which re-authentication is required]
49[assignment: list of feedback]

### 6.1.4 CLASS FCO: COMMUNICATION

#### 6.1.4.1 FCO_NRO.2 Enforced proof of origin for Identity Verification Assertion

Hierarchical to: Selective proof of origin.

Dependencies: [FIA_UID.1 Timing of identification] fulfilled by FIA_UID.1

| | |
|---|---|
| FCO_NRO.2.1 | The TSF shall enforce the generation of evidence of origin for transmitted *Identity Verification Assertion Data*[50] at all times. |
| FCO_NRO.2.2 | The TSF shall be able to relate the *identity of origin*[51] of the originator of the information, and the *Identity Verification Assertion Data*[52] of the information to which the evidence applies. |
| FCO_NRO.2.3 | The TSF shall provide a capability to verify the evidence of origin of information to *Identity Verification Server*[53] given *immediately in online mode, within a 72 hours period in offline mode for TOE on SSR Type III*[54]. |

**Refinement:** Evidence above shall be the signature of the SAM card. Before sending the Identity Verification Assertion (IVA) to the Identity Verification Server (IVS), TOE shall ensure that the Identity Verification Assertion Data is signed by the SAM Signature Certificate as defined in TS 13584 [3].

**Application Note 12:** - IVS verifies the IVA. This is why the assignment is instantiated as *"Identity Verification Server"*. However, TOE on SSR Type I and Type II gives the IVA to SPCA and SPCA sends the IVA to APS. TOE on SSR Type III directly sends the IVA to APS. In all cases APS sends the IVA to IVS.

### 6.1.5 CLASS FMT: SECURITY MANAGEMENT

#### 6.1.5.1 FMT_MOF.1 /Verify- Management of security functions behavior - verify

Hierarchical to: No other components.

Dependencies: [FMT_SMR.1 Security roles] **fulfilled** by FMT_SMR.1

[FMT_SMF.1 Specification of Management Functions] **fulfilled** by FMT_SMF.1

| | |
|---|---|
| FMT_MOF.1.1 | The TSF shall restrict the ability to determine the behavior of[55] the function *Identity Verification Operation*[56] to the *Identity Verification Policy Server or* |

50 [assignment: list of information types]
51 [assignment: list of attributes]
52 [assignment: list of information fields]
53 [assignment: list of third parties]]
54 [assignment: limitations on the evidence of receipt]

| | |
|---|---|
| | *Client Application*[57]. |

**Application Note 13** A default Identity Verification Method shall be defined in the TOE during production for the cases when this method is not determined by IVPS or Client Application.

### 6.1.5.2 FMT_MOF.1 /Upgrade-Management of security functions behavior - upgrade

Hierarchical to: No other components.

Dependencies: [FMT_SMR.1 Security roles] **fulfilled** by FMT_SMR.1

[FMT_SMF.1 Specification of Management Functions] **fulfilled** by FMT_SMF.1

| | |
|---|---|
| FMT_MOF.1.1 | The TSF shall restrict the ability to enable[58] the function *TOE Upgrade*[59] to *Client Application for TOE on Type I and Type II, Application Server for TOE on Type III and Manufacturer service operator*[60]. |

**Refinement:** TOE Upgrade above shall be allowed only for the higher versions and the Upgrade Package shall be associated with the SAM in the corresponding SSR.

### 6.1.5.3 FMT_MTD.1/SAM-PIN Management of TSF data

Hierarchical to: No other components.

Dependencies: [FMT_SMR.1 Security roles] fulfilled by FMT_SMR.1

[FMT_SMF.1 Specification of Management Functions] fulfilled by FMT_SMF.1

| | |
|---|---|
| FMT_MTD.1.1 | The TSF shall restrict the ability to *write*[61] the *SAM-PIN*[62] to *Initialization Agent*[63]. |

### 6.1.5.4 FMT_MTD.1/DTN Management of TSF data - Device Tracking Number

Hierarchical to: No other components.

Dependencies: FMT_SMR.1 Security roles **fulfilled** by FMT_SMR.1

FMT_SMF.1 Specification of Management Functions **fulfilled** by FMT_SMF.1

| | |
|---|---|
| FMT_MTD.1.1 | The TSF shall restrict the ability to *write*[64] the *Device Tracking Number*[65] to |

55[selection: determine the behaviour of, disable, enable, modify the behaviour of]
56[assignment: list of functions]
57[assignment: the authorised identified roles]
58[selection: determine the behaviour of, disable, enable, modify the behaviour of]
59[assignment: list of functions]
60[assignment: the authorised identified roles]
61[selection: change_default, query, modify, delete, clear, [assignment: other operations]]
62[assignment: list of TSF data]
63[assignment: the authorised identified roles]

| | |
|---|---|
| | *Initialization Agent*[66]. |

### 6.1.5.5 FMT_MTD.1/Time Management of TSF data -Time

Hierarchical to: No other components.

Dependencies: FMT_SMR.1 Security roles **fulfilled** by FMT_SMR.1

FMT_SMF.1 Specification of Management Functions **fulfilled** by FMT_SMF.1

| | |
|---|---|
| FMT_MTD.1.1 | The TSF shall restrict the ability to *update*[67] the *Time*[68] to *OCSP server*[69]. |

**Application Note 14:** TOE gets the time information from OCSP Server and stores this time information on the SSR real time Clock (RTC). Upon use of time information in TSF functions, RTC provides time information.

### 6.1.5.6 FMT_SMF.1 Specification of Management Functions

Hierarchical to: No other components.

Dependencies: No dependencies.

| | |
|---|---|
| FMT_SMF.1.1 | The TSF shall be capable of performing the following management functions:<br>• TOE initialization (including SAM PIN and DTN initialization),<br>• TOE upgrade,<br>• time and date setting,<br>• audit generation,<br>• identity verification method determination [70]. |

### 6.1.5.7 FMT_SMR.1 Security roles

Hierarchical to: No other components.

Dependencies: FIA_UID.1 Timing of identification **fulfilled** by FIA_UID.2 which is hierarchic to FIA_UID.1

| | |
|---|---|
| FMT_SMR.1.1 | The TSF shall maintain the roles |

64[selection: change_default, query, modify, delete, clear, [assignment: other operations]]
65[assignment: list of TSF data]
66[assignment: the authorised identified roles]
67[selection: change_default, query, modify, delete, clear, [assignment: other operations]]
68[assignment: list of TSF data]
69[assignment: the authorised identified roles]
70[assignment: list of management functions to be provided by the TSF]

| | |
|---|---|
| | • *Initialization Agent,*<br>• *SSR Access Server for TOE on SSR Type II,*<br>• *Client Application for TOE on Type I and Type II,*<br>• *Application Server for TOE on Type III,*<br>• *Identity Verification Policy Server,*<br>• *OCSP Server,*<br>• *Manufacturer service operator*<br>• *Software Publisher*[71]. |
| FMT_SMR.1.2 | The TSF shall be able to associate users with roles. |

### 6.1.6 CLASS FPT: PROTECTION OF THE TSF

#### 6.1.6.1 FPT_STM.1 Reliable Time Stamps

Hierarchical to: No other components

Dependencies: No dependencies

| | |
|---|---|
| FPT_STM.1.1 | The TSF shall be able to provide reliable time stamps. |

**Refinement:** Reliable time stamp shall be provided from the OCSP server and stored in a real time clock on SSR Device.

#### 6.1.6.2 FPT_IDA.1/CVC – Imported TSF Data Authentication - Card Verifiable Certificate s

Hierarchical to: No other components

Dependencies: No dependencies

| | |
|---|---|
| FPT_IDA.1.1 | The TSF shall verify that the *Secure Messaging Card Verifiable Certificates and Role Card Verifiable Certificates*[72] originates from *Card Publisher*[73] using *CVC Authentication Mechanism defined in TS 13584 [3]*[74]. |

71[assignment: the authorized identified roles]
72[assignment: list of TSF Data]
73[assignment: list of external entities]
74[assignment: list of authentication mechanisms].

### 6.1.6.3 FPT_IDA.1/IVP - Imported TSF Data Authentication - Identity Verification Policy

Hierarchical to: No other components

Dependencies: No dependencies

| | |
|---|---|
| FPT_IDA.1.1 | The TSF shall verify that the *Identity Verification Policy*[75] originates from *Identity Verification Policy Server*[76] using *IVP authentication mechanism defined in TS 13584 [3]*[77]. |

### 6.1.6.4 FPT_IDA.1/OCSP Imported TSF Data Authentication - OCSP

Hierarchical to: No other components

Dependencies: No dependencies

| | |
|---|---|
| FPT_IDA.1.1 | The TSF shall verify that the *OCSP Response*[78] originates from legitimate *OCSP Server*[79] using *OCSP Response Verification Mechanism defined TS 13584 [3]*[80]. |

**Application Note 15:** For offline Revocation Status Control from the Revocation List downloaded onto the SSR Device this verification mechanism is still valid.

### 6.1.6.5 FPT_IDA.1/TOE_Upgrade - Imported TSF Data Authentication - TOE Upgrade Package

Hierarchical to: No other components

Dependencies: No dependencies

| | |
|---|---|
| FPT_IDA.1.1 | The TSF shall verify that the *TOE upgrade package*[81] originates from *legitimate Software Publisher*[82] using *TOE Upgrade Authentication mechanism defined in TS 13584 [3]*[83]. |

75[assignment: list of TSF Data]
76[assignment: list of external entities]
77[assignment: list of authentication mechanisms].
78[assignment: list of TSF Data]
79[assignment: list of external entities]
80[assignment: list of authentication mechanisms].
81[assignment: list of TSF Data]
82[assignment: list of external entities]
83[assignment: list of authentication mechanisms].

### 6.1.6.6 FPT_SSY.1/Cert State Synchronization -Secure Messaging and Role CVC

Hierarchical to: No other components

Dependencies: No dependencies

| | |
|---|---|
| FPT_SSY.1.1 | The TSF shall check *the validity of the Secure Messaging and Role Card Certificates of the SAM* [84] **and request updated certificates** from the:<br>• *SPCA for TOE on SSR Type I and Type II with no SAS*<br>• *SAS for TOE on SSR Type II with SAS*<br>• *APS for TOE on SSR Type III*[85]<br>in times*: at each Identity Verification Operation*[86]. |

### 6.1.6.7 FPT_SSY.1/SAM State Synchronization -SAM

Hierarchical to: No other components

Dependencies: No dependencies

| | |
|---|---|
| FPT_SSY.1.1 | The TSF shall check *SAM Card Certificate revocation status*[87] from the *OCSP Server*[88] in times*: immediately after opening of the SSR*[89]. |

### 6.1.6.8 FPT_SSY.1/IVC State Synchronization -IVC

Hierarchical to: No other components

Dependencies: No dependencies

| | |
|---|---|
| FPT_SSY.1.1 | The TSF shall check *Identity Verification Certificate revocation status*[90] from the *OCSP Server or SSR Platform on which up-to-date Revocation List is present*[91] in times: *during Identity Verification Operation.* |

**Application Note 16:** The instantiation of the assignment operation with "SSR Platform on which up-to-date Revocation List is present " should be included in the ST only if the TOE has the capability of offline Revocation Control, i.e. downloads the revocation list onto SSR device and do offline revocation controls. If a new update is present for the revocation list but the OSCP is not reached, in

84[assignment: security attributes]
85[assignment: the external entities]
86 [assignment: defined periods]
87[assignment: security attributes]
88[assignment: the external entities]
89 [assignment: defined periods]
90[assignment: security attributes]
91[assignment: the external entities]

this case the foundation giving the service is responsible for defining the time for using old revocation list

### 6.1.6.9 FPT_SSY.1/RH_Auth_Status State Synchronization Role Holder Authentication Status

Hierarchical to: No other components

Dependencies: No dependencies

| | |
|---|---|
| FPT_SSY.1.1 | The TSF shall check *Role Holder authentication status in eID Card*[92] from the *eID Card*[93] in times: *after the secure communication between Role Holder and the TSF is terminated*[94]. |

**Application Note 17:** The TSF shall reset the authentication status of the Role Holder in eID Card after the secure communication between Role Holder and the TSF is terminated as defined in TS 13584 [3]

### 6.1.6.10 FPT_TST.1 TSF testing

Hierarchical to: No other components.

Dependencies: No dependencies.

| | |
|---|---|
| FPT_TST.1.1 | The TSF shall run a suite of self tests during initial start-up[95] to demonstrate the correct operation of the TSF[96]. |
| ~~FPT_TST.1.2~~ | ~~The TSF shall provide authorized users with the capability to verify the integrity of [selection: [assignment: parts of TSF data], TSF data~~[97]~~.~~ |
| ~~FPT_TST.1.3~~ | ~~The TSF shall provide authorized users with the capability to verify the integrity of [selection: [assignment: parts of TSF], TSF]~~. |

92[assignment: security attributes]
93[assignment: the external entities]
94 [assignment: defined periods]
95[selection: during initial start-up, periodically during normal operation, at the request of the authorised user,at the conditions[assignment: conditions under which self-test should occur]]
96[selection: [assignment: parts of TSF], the TSF].
97 [selection: [assignment: parts of TSF data], TSF data]

#### 6.1.6.11 FPT_EMSEC.1 TOE Emanation

Hierarchical to: No other components

Dependencies: No dependencies

| | |
|---|---|
| FPT_EMSEC.1.1 | The TOE shall not emit *power consumption, electromagnetic emanation or timing information*[98] in excess of *non useful information*[99] enabling access to *secret keys of symmetric cryptographic operations, private keys of asymmetric cryptographic operations, biometric verification counter*[100] and *SAM PIN*[101]. |

#### 6.1.6.12 FPT_FLS.1 Failure with preservation of secure state

Hierarchical to: No other components.

Dependencies: No dependencies.

| | |
|---|---|
| FPT_FLS.1.1 | The TSF shall preserve a secure state when the following types of failures occur: *a tampering event is detected, identification and authentication services for SAM are disturbed*[102]. |

### 6.1.7 CLASS FDP: USER DATA PROTECTION

#### 6.1.7.1 FDP_SDI.2 Stored data integrity monitoring and action

Hierarchical to: Stored data integrity monitoring.

Dependencies: No dependencies.

| | |
|---|---|
| FDP_SDI.2.1 | The TSF shall monitor user data stored in containers controlled by the TSF for *any integrity error*[103] on ~~all objects~~ **encrypted IVAs stored during offline operation on SSR Type III**, based on the following attributes: *AES-CMAC value of the stored encrypted IVAs shall be checked before they are transmitted to the APS*[104]. |

98 [assignment: types of emissions]
99 [assignment: specified limits]
100 [assignment: list of types of TSF data]
101 [assignment: list of types of user data]
102 assignment: list of types of failures in the TSF
103 [assignment: integrity errors]
104 [assignment: user data attributes]

| | |
|---|---|
| FDP_SDI.2.2 | Upon detection of a data integrity error, the TSF shall *give an error message to the APS indicating the integrity fault and do not continue offline Identity Verification Operation*[105]. |

**Application Note 18:** FDP_SDI.2 defined above should be included in the ST if only the TOE is on SSR Type III and includes the optional offline IVA Generation and Storage use case.

### 6.1.7.2 FDP_IFC.1 Subset Information Flow Control

Hierarchical to: No other components

Dependencies: FDP_IFF.1 Simple security attributes fulfilled by FDP_IFF.1

| | |
|---|---|
| FDP_IFC.1.1 | The TSF shall enforce the *Information Flow Control Policy*[106] on :<br>*Subjects:*<br>*SPCA (subject of TOE on SSR Type I and SSR Type II), SAS (subject for TOE on SSR Type II with SAS), APS (subject for TOE on SSR Type III), OCSP Server for TOE on SSR Type III, IVPS for SSR Type III.*<br>*Information:*<br>*TOE Upgrade Package, IVA, IVM, OCSP response, SAM Secure Messaging CVC and SAM Role CVC*<br>*Operations:*<br>*Write (installed to the TOE), read (sent by the TOE)*[107]. |

### 6.1.7.3 FDP_IFF.1 Simple Security Attributes

Hierarchical to: No other components

Dependencies: FDP_IFC.1 Subset information flow control fulfilled by FDP_IFC.1

FMT_MSA.3 Static attribute initialisation not fulfilled but justified

Justification: The initial value for IVM is defined in the TOE during manufacturing. For other information under Information Flow Control Policy, initial value is not required, nor meaningful.

| | |
|---|---|
| FDP_IFF.1.1 | The TSF shall enforce the *Information Flow Control Policy* [108] based on the following types of subject and information security attributes: *Subjects:* |

105 [assignment: action to be taken]
106 [assignment: information flow control SFP]
107 [assignment: list of subjects, information, and operations that cause controlled information to flow to and from controlled subjects covered by the SFP]
108 [assignment: *information flow control SFP*]

| | |
|---|---|
| | *SPCA (subject of TOE on SSR Type I and SSR Type II), SAS (subject for TOE on SSR Type II with SAS), APS (subject for TOE on SSR Type III), OCSP Server for TOE on SSR Type III, IVPS for SSR Type III.*<br>*Information:*<br>*TOE Upgrade Package, IVA, IVM, OCSP response, SAM Secure Messaging CVC and SAM Role CVC*<br>*Attributes:*<br>*Software Publisher Signature for TOE Upgrade Package , SAM Signature for IVA, IVP Signature for IVM, OCSP signature for OCSP response, eID management CA Signature correspondingly* [109]. |
| FDP_IFF.1.2 | The TSF shall permit an information flow between a controlled subject and controlled information via a controlled operation if the following rules hold*: IVA is sent only if communication channel with corresponding SPCA, SAS or APS is established as defined in this PP and other information under the control of Information Flow Control Policy are accepted and written if signature verification is completed successfully*[110]*.* |
| FDP_IFF.1.3 | The TSF shall enforce the *none* [111]. |
| FDP_IFF.1.4 | The TSF shall explicitly authorise an information flow based on the following rules: *none*[112]. |
| FDP_IFF.1.5 | The TSF shall explicitly deny an information flow based on the following rules: *none* [113]. |

#### 6.1.7.4 FDP_ITC.1 Import of user data without security attributes

Hierarchical to: No other components

Dependencies: [FDP_ACC.1 Subset access control, or
FDP_IFC.1 Subset information flow control] fulfilled by FDP_IFC.1
FMT_MSA.3 Static attribute initialisation not fulfilled but justified

Justification: The initial value for IVM is defined in the TOE during manufacturing. For other information under Information Flow Control Policy, initial value is not required, nor meaningful.

---

[109] [assignment: *list of subjects and information controlled under the indicated SFP, and for each, the security attributes*]
[110] [assignment: *for each operation, the security attribute-based relationship that must hold between subject and information security attributes*]
[111] [assignment: *additional information flow control SFP rules*]
[112] [assignment: *rules, based on security attributes, that explicitly authorise information flows*]
113 [assignment: rules, based on security attributes, that explicitly deny information flows]

| | |
|---|---|
| FDP_ITC.1.1 | The TSF shall enforce the *Information Flow Control Policy*[114] when importing user data, controlled under the SFP, from outside of the TOE |
| FDP_ITC.1.2 | The TSF shall ignore any security attributes associated with the user data when imported from outside the TOE. |
| FDP_ITC.1.3 | The TSF shall enforce the following rules when importing user data controlled under the SFP from outside the TOE: *none*[115] |

### 6.1.7.5 FDP_ETC.2 Export of User Data with Security Attributes

Hierarchical to: No other components

Dependencies: [FDP_ACC.1 Subset access control, or
FDP_IFC.1 Subset information flow control] fulfilled by FDP_IFC.1

| | |
|---|---|
| FDP_ETC.1.1 | The TSF shall enforce the *Information Flow Control Policy*[116] when exporting user data, controlled under the SFP(s), outside of the TOE. |
| FDP_ETC.1.2 | The TSF shall export the user data with the user data's associated security attributes |
| FDP_ETC.1.3 | The TSF shall ensure that the security attributes, when exported outside the TOE, are unambiguously associated with the exported user data. |
| FDP_ETC.1.4 | The TSF shall enforce the following rules when user data is exported from the TOE: *none*[117]. |

### 6.1.7.6 FDP_RIP.1 Subset residual information protection

Hierarchical to: No other components.

Dependencies: No dependencies.

| | |
|---|---|
| FDP_RIP.1.1 | The TSF shall ensure that any previous information content of a resource is made unavailable upon the deallocation of the resource from[118] the following objects *cryptographic credentials, IVA data fields, PIN, photo and biometric information*[119]. |

114 [assignment: access control SFP(s) and/or information flow control SFP(s)]
115 [assignment: additional importation control rules]
116 [assignment: access control SFP(s) and/or information flow control SFP(s)]
117 [assignment: additional exportation control rules]
118 [selection: allocation of the resource to, deallocation of the resource from]
119 [assignment: list of objects]

### 6.1.8 CLASS FTP: TRUSTED PATH/CHANNELS

#### 6.1.8.1 FTP_ITC.1 Inter-TSF trusted channel

Hierarchical to: No other components.

Dependencies: No dependencies.

| | |
|---|---|
| FTP_ITC.1.1 | The TSF shall provide a communication channel between itself and ~~another trusted IT product~~ **each one of the following trusted products: Role Holder Device, External Biometric Sensor (if applicable), External Pin Pad (if applicable), eID Card, SSR SAM, SAS for TOE on SSR Type II (with SAS) and APS for TOE on SSR Type III** that is logically distinct from other communication channels and provides assured identification of its endpoints and protection of the channel data from modification or disclosure. |
| FTP_ITC.1.2 | The TSF shall permit the TSF[120] to initiate communication via the trusted channel. |
| FTP_ITC.1.3 | The TSF shall initiate communication via the trusted channel for *all functions*[121]. |

**Refinement:** The role holder certificate used to construct the trusted channel shall be kept in the HSM device. External Biometric Sensor and the external Pin Pad shall include a Secure Access Module. Trusted paths with SSR Access Server and Application Server are founded using SSL-TLS using SSL- TLS certificates.

## 6.2 APPLICATION OF SFRS TO TOE ON DIFFERENT SSR TYPES AND BIOMETRIC SENSOR / EPP CONFIGURATIONS

The application of the SFRs to the TOEs on different SSR types and biometric sensor and EPP configurations and whether the device will run in offline mode or not are stated in Section 6.1 as Application Notes right after the corresponding SFRs. The relevant SFR corresponding to the Type of the SSR and other configurations should be chosen by the ST writer.

120[selection: the TSF, another trusted IT product]
121[assignment: list of functions for which a trusted channel is required]

## 6.3 SECURITY ASSURANCE REQUIREMENTS

For the evaluation of the TOE and its development and operating environment are those taken from the Evaluation Assurance Level (EAL4) and augmented by taking the following component: ALC_DVS.2.

## 6.4 SECURITY REQUIREMENTS RATIONALE

### 6.4.1 SECURITY FUNCTIONAL REQUIREMENTS RATIONALE

**OT.IVM_Management:** FIA_UAU.5 selects the rules for authentication of Service Requester and Service Attendee. FMT_MOF.1/Verify restricts the use of the management function to the security role: Identity Verification Policy Server and SPCA. FMT_SMF.1 and FMT_SMR.1 determines the management functions and roles.

SFRs: FIA_UAU.5, FMT_MOF.1/Verify, FMT_SMF.1 and FMT_SMR.1.

**OT.Security_Failure:** This objective is covered by FPT_FLS. 1, FAU GEN.1 and FAU_SAA.1 which requires preserving the secure state, auditing and taking the action of entering out of service mode respectively upon detection of a security failure.

SFRs: FPT_FLS.1, FAU GEN.1 and FAU_SAA.1.

**OT.eIDC_Authentication:** Card authentication mechanism is covered by the FIA_UAU.5, FIA_UID.2 and FIA_UAU.2. FPT_SSY/IVC addresses that the eID Card certificate is not expired. Generation of audit data when failure of authentication happens is provided by FAU.GEN.1.

SFR: FIA_UAU.5, FAU_GEN.1, FIA_UID.2, FPT_SSY/IVC and FIA_UAU.2.

**OT.PIN_Verification:** Identity Verification Certificate PIN verification is covered by the FIA_UAU.5, FIA_UAU.2 and FIA_UID.2 and protection of PIN during entry is addressed by the FIA_UAU.7. Generation of audit data when failure of authentication happens is provided by FAU.GEN.1.

SFRs: FIA_UAU.2, FIA_UID.2, FIA_UAU.5, FIA_UAU.7 and FAU_GEN.1

**OT.Photo_Verification: Authentication needs for** Photo verification is covered by the FIA_UAU.5, FIA_UAU.2 and FIA_UID.2.. Generation of audit data when failure of authentication happens is provided by FAU.GEN.1.

SFRs: FIA_UAU.5, FAU_GEN.1, FIA_UAU.2 and FIA_UID.2.

**OT.Biometric_Verification:** Biometric verification is covered by the FIA_UAU.5. Generation of audit data when failure of authentication happens is provided by FAU.GEN.1. Authentication failure handling of biometric verification is handled by FIA_AFL.1. Protection of biometry data during entry is addressed by the FIA_UAU.7.

SFRs: FIA_UAU.5, FIA_AFL.1, FAU_GEN.1 and FIA_UAU.7.

**OT.IVA_Confidentiality_Authentication:** FAU_GEN.1 requires auditing the created IVAs. The FCO_NRO.2 guaranties the authentication of the IVA. The hash value of the IVA is created and signed in SAM. This requirement is covered by FCS_COP.1/SHA-256. IVA is directly sent to APS in TOE on SSR Type III. Thus confidentiality of the IVA during transmission is covered by FCS_CKM.1/SM-TLS, FCS_CKM.1/SM_TLS,FCS_CKM.4 and FTP_ITC.1.

The cryptographic requirement for IVA integrity and confidentiality for the TOE on SSR Type III in the offline mode is guaranteed by FDP_SDI.2, FDP_RIP, FCS_COP.1/AES-CBC and FCS_COP.1/AES-CMAC together with FPT_EMSEC.1 which guaranties the protection against Side Channel Attacks. The generation and destruction of the encryption/decryption and integrity keys are addressed by FCS_CKM.1/IVA_Keys and FCS_CKM.4. These keys are generated by SAM and stored in the tamper proof area. The confidentiality of this key is guaranteed by FCS_CKM.1/SM, FCS_CKM.4 and FPT_ITC.1 during transmission from SAM to TOE and by FAU_ARP.1 during storage. The stored IVA integrity for TOE on SSR Type III in offline mode is addressed by FDP_SDI.2.

SFRs: FCS_COP.1/AES-CBC, FCS_COP.1/AES-CMAC, FPT_EMSEC.1, FAU_GEN.1, FAU_ARP.1 FCO_NRO.2, FCS_COP.1/SHA-256, FCS_CKM.1/SM, FCS_CKM.1/IVA_Keys, FCS_CKM.1/SM-TLS, FCS_CKM.4, FPT_ITC.1, FDP_SDI.2 , FDP_RIP.1

**OT.PM_Verification:** Since only the legitimate TOE could found secure messaging with eID Card and read personnal message FCS_CKM.1/SM, FCS_CKM.4, FCS_COP.1/AES-CBC and FCS_COP.1/AES-CMAC covers the OT.PM_Verification with FAU_GEN.1 which audits the confirmation of the personnal message

SFR: FAU_GEN.1, FCS_CKM.1/SM, FCS_COP.1/AES-CBC, FCS_COP.1/AES-CMAC and FCS_CKM.4.

**OT.SA_Identity_Verification:** FIA_UID.2, FIA_UAU.2 and FIA_UAU.5 covers the identity verification of Service Attendee and FAU_GEN.1 requires the auditing of the authentication.

SFR: FIA_UID.2, FIA_UAU.2, FIA_UAU.5 and FAU_GEN.1

**OT.Session_Ending:** FIA_UAU.6 and FAU_GEN.1 covers the objective.

SFRs: FIA_UAU.6, FAU_GEN.1.

**OT.ID_Verification_Policy_Authentication:** FPT_IDA.1/IVP covers the objective and the Identity Verification Policy Authentication mechanism addressed in the FPT_IDA.1/IVP requires the cryptographic support of FCS_COP.1/ Sign_Ver. FAU_GEN.1 audits the authentication.

SFRs:FPT_IDA.1/IVP, FCS_COP.1/ Sign_Ver and FAU_GEN.1.

**OT.OCSP_Query_Verify:**FPT_IDA.1/OCSP covers the objective and the OCSP Query Response Verification Mechanism addressed in the FPT_IDA.1/OCSP requires the cryptographic support of FCS_COP.1/ Sign_Ver. FAU_GEN.1 audits the authentication.

SFRs:FPT_IDA.1/OCSP, FCS_COP.1/ Sign_Ver and FAU_GEN.1.

**OT.RH_DA [Role Holder Device Authentication]:** FIA_UAU.5 and FPT_IDA.1/CVC covers the authentication of role holder and role holder CVC certificate. This requires the cryptographic support of FCS_COP.1/ Sign_Ver. FAU_GEN.1 audits the authentication.

SFR: FIA_UAU.5, FPT_IDA.1/CVC, FCS_COP.1/ Sign_Ver and FAU_GEN.1.

**OT.RH_SC [Secure Communication with Role Holder]:** FTP_ITC.1 covers the secure communication between the Role Holder and the TOE. FCS_CKM.1/SM, FCS_CKM.4, FCS_COP.1/AES-CBC, FCS_COP.1/AES-CMAC give the necessary cryptographic support for the secure communication and FPT_EMSEC.1 guarantees the protection of cryptographic keys against SCA.

SFRs: FTP_ITC.1, FCS_CKM.1/SM, FCS_CKM.4, FCS_COP.1/AES-CBC, FCS_COP.1/AES-CMAC, FPT_EMSEC.1.

**OT.RH_Session_Ending:** FPT_SSY.1/RH_Auth_Status covers the objective.

SFR: FPT_SSY.1/RH_Auth_Status

**OT.EBS_DA:** FIA_UID.2, FIA_UAU.2 and FIA_UAU.5 covers the identity verification of EBS, FPT_SSY/IVC addresses that the EBS SAM certificate is not expired and FAU_GEN.1 requires the auditing of the authentication.

SFR: FIA_UID.2, FIA_UAU.2, FIA_UAU.5, FPT_SSY/IVC and FAU_GEN.1

**OT.EBS_SC:** FTP_ITC.1 covers the secure communication between the EBS and the TOE. FCS_CKM.1/SM, FCS_CKM.4 FCS_COP.1/AES-256, FCS_COP.1/AES-CMAC give the necessary cryptographic support for the secure communication and FPT_EMSEC.1 guarantees the protection of cryptographic keys against SCA.

SFRs: FTP_ITC.1, FCS_CKM.1/SM, FCS_CKM.4, FCS_COP.1/AES-CBC, FCS_COP.1/AES-CMAC, FPT_EMSEC.1.

**OT.EPP_DA[External PIN-PAD Device Authentication]:** FIA_UID.2, FIA_UAU.2 and FIA_UAU.5 covers the identity verification of EPP, FPT_SSY/IVC addresses that the EPP SAM certificate is not expired and FAU_GEN.1 requires the auditing of the authentication.

SFR: FIA_UID.2, FIA_UAU.2, FIA_UAU.5, FPT_SSY/IVC and FAU_GEN.1

**OT.EPP_SC:** FTP_ITC.1 covers the secure communication between the EPP and the TOE. FCS_CKM.1/SM, FCS_CKM.4 FCS_COP.1/AES-CBC, FCS_COP.1/AES-CMAC give the necessary cryptographic support for the secure communication and FPT_EMSEC.1 guarantees the protection of cryptographic keys against SCA.

SFRs: FTP_ITC.1, FCS_CKM.1/SM, FCS_CKM.4, FCS_COP.1/AES-CBC, FCS_COP.1/AES-CMAC, FPT_EMSEC.1.

**OT.SM_eID Card:** FTP_ITC.1 and FPT_IDA.1/CVC covers the secure communication between the eID Card and the TOE. FCS_CKM.1/SM, FCS_CKM.4 FCS_COP.1/AES-CBC, FCS_COP.1/AES-CMAC give the

necessary cryptographic support for the secure communication and FPT_EMSEC.1 guarantees the protection of cryptographic keys against SCA.

SFRs: FTP_ITC.1, FPT_IDA.1/CVC , FCS_CKM.1/SM, FCS_CKM.4, FCS_COP.1/AES-CBC, FCS_COP.1/AES-CMAC, FPT_EMSEC.1

**OT:DPM:** FMT_SMF and FMT_SMR covers the phase management functions and roles thus covers the objective.

SFRs: FMT_SMF.1 and FMT_SMR.1.

**OT.TOE_Upgrade:** The management function and roles of TOE upgrade is addressed by FMT_SMF.1 and FMT_SMR.1. Unauthorized TOE Update is protected by FMT_MOF.1/Upgrade_Management and FPT_IDA.1/TOE_Upgrade. The authentication before the upgrade is guarantied by the FIA_UAU.2 and FIA_UID.2. Required cryptographic support is covered by FCS_COP.1/SHA-256, FCS_COP.1/AES-CBC and FCS_COP.1/Sign_Ver. Audit generation is needed thus FAU_GEN.1 is covered.

SFRs: FAU_GEN.1, FMT_SMF.1, FMT_SMR.1, FMT_MOF.1/Upgrade_Management, FPT_IDA.1/TOE_Upgrade, FCS_COP.1/SHA-256, FCS_COP.1/AES-CBC, FCS_COP.1/Sign_Ver FIA_UAU.2 and FIA_UID.2.

**OT.SAM-PIN_Mgmt:** The management function of writing the SAM-PIN is addressed by FMT_SMF.1; and protection of SAM-PIN from unauthorized access is provided by FMT_MTD.1/SAM-PIN. FMT_SMR.1 addresses the security role Initialization Agent who is allowed to write the SAM-PIN.

SFRs: FMT_MTD.1/SAM-PIN, FMT_SMF.1, FMT_SMR.1

**OT.DTN_Mgmt:** The device tracking number can only written by the configuration agent; this requirement is covered by FMT_MTD.1/DTN. Relevant management function and role are covered by FMT_SMF.1 and FMT_SMR.1. Authentication of the role before DTN writing is covered by FIA_UAU.2 and FIA_UID.2.

SFRs: FMT_MTD.1/DTN, FMT_SMF.1, FMT_SMR.1, FIA_UAU.2 and FIA_UID.2.

**OT.Time_Mgmt:** Time data may only be updated by the security role(s) defined by the ST writer. This is addressed by FMT_MTD.1/Time. Security role and management function regarding the writing the Default Method is given in the SFRs: FMT_SMR.1 and FMT_SMF.1. Authentication of the role before time update is covered by FIA_UAU.2 and FIA_UID.2.

SFRs: FMT_MTD.1/Time, FMT_SMF.1, FMT_SMR.1, FIA_UAU.2 and FIA_UID.2.

**OT.SM_TOE_and_SAM [Security between TOE and SAM]:** FTP_ITC.1 covers the secure communication between the TOE and the SAM. The necessary cryptographic support is given by FCS_CKM.1/SM, FCS_CKM.4, FCS_COP.1/RSA, FCS_COP.1/AES-CBC, and FCS_COP.1/AES-CMAC and FPT_EMSEC.1 guarantees the protection of cryptographic keys against SCA.

SFRs: FTP_ITC.1, FCS_CKM.1/SM, FCS_CKM.4, FCS_COP.1/RSA, FCS_COP.1/AES-CBC, FCS_COP.1/AES-CMAC, FPT_EMSEC.1.

**OT.SAM-PIN_Sec:** The security of the SAM-PIN is satisfied by the deletion of the SAM PIN upon detection of a tamper event. This objective is covered by FPT_FLS.1, FAU GEN.1 and FAU_ARP.1

SFRs: FPT_FLS.1, FAU GEN.1 and FAU_ARP.1.

**OT.DTN_Integrity:** The objective OT.DTN_Integrity is provided by FPT_TST.1 and FPT_FLS.1.

SFR: FPT_TST.1 and FPT_FLS.1.

**OT.Audit_Data_Integrity:** FAU_STG1 and FAU_STG.4 covers the audit integrity

SFR: FAU_STG1 and FAU_STG.4

**OT.RIP [Residual Information Protection]:** The SFR FDP_RIP.1 provides the protection aimed by OT.RIP.

SFR: FDP_RIP.1

**OT.Auth_SAM_by_TOE [Authentication of SAM by TOE]:** FIA_UAU.5 addresses the authentication of SAM by the TOE. FPT_SSY.1/SAM addresses the revocation status control.

SFRs: FIA_UAU.5, FPT_SSY.1/SAM.

**OT.SAS_DA:** FIA_UID.2, FIA_UAU.2 and FIA_UAU.5 covers the objective of device authentication of SAS with FAU_GEN.1

SFRs: FIA_UID.2, FIA_UAU.2, FIA_UAU.5, FAU_GEN.1

**OT.SAS_SC**: FCS_CKM.1/SM_TLS, FCS_COP.1/AES-CBC, FCS_COP.1/SHA-256 and FTP_ITC.1 covers the objective

SFRs: FCS_CKM.1/SM_TLS and FTP_ITC.1

**OT.APS_DA:** FIA_UID.2, FIA_UAU.2 FIA_UAU.6, and FIA_UAU.5 covers the objective of device authentication of SAS with FAU_GEN.1

SFRs: FIA_UID.2, FIA_UAU.2, FIA_UAU.5, FAU_GEN.1

**OT.APS_SC:** FCS_CKM.1/SM_TLS, FCS_COP.1/AES-CBC, FCS_COP.1/SHA-256 and FTP_ITC.1 covers the objective.

SFRs: FCS_CKM.1/SM_TLS and FTP_ITC.1

**OT.Cert_Update:** FPT_SSY.1/Cert covers the objective.

SFRs: FPT_SSY.1/Cert

### 6.4.2 SECURITY FUNCTIONAL REQUIREMENTS RATIONALE TABLES

The coverage of objectives by the SFRs are given in Table17, Table18 and Table19**.**

Table17 given below includes the objectives that are valid for TOE on all of the three SSR Types where external PIN Pad and External/Internal Biometric Sensor is not present.

**Table17. SFR Rationale Table for TOE on SSR Type I without Biometric Sensor and External PIN Pad**

| SFR s | OT.IVM_Management | OT.Security_Failure | OT.eIDC_Authentication | OT.PIN_Verification | OT.IVA_Confidentiality_Authentication | OT.PM_Verification | OT.ID_Verification Policy_Authentication | OT.OCSP_Query_Verify | OT.RH_DA | OT.RH_SC | OT.RH_Session_Ending | OT.SM_eID Card | OT.DPM | OT.TOE_Upgrade | OT.SAM-PIN_Mgmt | OT.DTN_Mgmt | OT.Time_Mgmt | OT.SM_ TOE_and_SAM | OT.SAM-PIN_Sec | OT.DTN_Integrity | OT.Audit_Data_Integrity | OT.RIP | OT.Auth_SAM_by_TOE | OT.Cert_Update |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **FAU_GEN.1** | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | ✓ | | | | | ✓ | | | | | |
| **FAU_ARP.1** | | | | | ✓ | | | | | | | | | | | | | | ✓ | | | | | |
| **FAU_STG.1** | | | | | | | | | | | | | | | | | | | | | ✓ | | | |
| **FAU_STG.4** | | | | | | | | | | | | | | | | | | | | | ✓ | | | |
| **FAU_SAA.1** | | ✓ | | | | | | | | | | | | | | | | | | | | | | |
| **FCS_CKM.1/SM** | | | | | ✓ | ✓ | | | | ✓ | | ✓ | | | | | | ✓ | | | | | | |
| **FCS_CKM.1/SM_TLS** | | | | | ✓ | | | | | | | | | | | | | | | | | | | |
| **FCS_CKM.1/IVA_Keys** | | | | | ✓ | | | | | | | | | | | | | | | | | | | |
| **FCS_CKM.4** | | | | | ✓ | ✓ | | | | ✓ | | ✓ | | | | | | ✓ | | | | | | |

| SFR s | OT.IVM_Management | OT.Security_Failure | OT.eIDC_Authentication | OT.PIN_Verification | OT.IVA_Confidentiality_Authentication | OT.PM_Verification | OT.ID_Verification Policy_Authentication | OT.OCSP_Query_Verify | OT.RH_DA | OT.RH_SC | OT.RH_Session_Ending | OT.SM_eID Card | OT.DPM | OT.TOE_Upgrade | OT.SAM-PIN_Mgmt | OT.DTN_Mgmt | OT.Time_Mgmt | OT.SM_ TOE_and_SAM | OT.SAM-PIN_Sec | OT.DTN_Integrity | OT.Audit_Data_Integrity | OT.RIP | OT.Auth_SAM_by_TOE | OT.Cert_Update |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **FCS_COP.1/SHA-256** | | | | | ✓ | | | | | | | | | ✓ | | | | | | | | | | |
| **FCS_COP.1/AES-CBC** | | | | | ✓ | ✓ | | | | ✓ | | ✓ | | ✓ | | | | ✓ | | | | | | |
| **FCS_COP.1/AES-CMAC** | | | | | ✓ | ✓ | | | | ✓ | | ✓ | | | | | | ✓ | | | | | | |
| **FCS_COP.1/RSA** | | | | | | | | | | | | | | | | | | ✓ | | | | | | |
| **FCS_COP.1/ Sign_Ver** | | | | | | | ✓ | ✓ | ✓ | | | | | ✓ | | | | | | | | | | |
| **FIA_UID.2** | | | ✓ | ✓ | | | | | | | | | | ✓ | | ✓ | ✓ | | | | | | | |
| **FIA_UAU.2** | | | ✓ | ✓ | | | | | | | | | | ✓ | | ✓ | ✓ | | | | | | | |
| **FIA_UAU.5** | ✓ | | ✓ | ✓ | | | | | ✓ | | | | | | | | | | | | | | ✓ | |
| **FIA_UAU.7** | | | | ✓ | | | | | | | | | | | | | | | | | | | | |
| **FCO_NRO.2** | | | | | ✓ | | | | | | | | | | | | | | | | | | | |
| **FMT_MOF.1/Verify** | ✓ | | | | | | | | | | | | | | | | | | | | | | | |
| **FMT_MOF.1/Upgrade_Management** | | | | | | | | | | | | | | ✓ | | | | | | | | | | |
| **FMT_MTD.1/SAM-PIN** | | | | | | | | | | | | | | | ✓ | | | | | | | | | |
| **FMT_MTD.1/DTN** | | | | | | | | | | | | | | | | ✓ | | | | | | | | |
| **FMT_MTD.1/Time** | | | | | | | | | | | | | | | | | ✓ | | | | | | | |

| SFR s | OT.IVM_Management | OT.Security_Failure | OT.eIDC_Authentication | OT.PIN_Verification | OT.IVA_Confidentiality_Authentication | OT.PM_Verification | OT.ID_Verification Policy_Authentication | OT.OCSP_Query_Verify | OT.RH_DA | OT.RH_SC | OT.RH_Session_Ending | OT.SM_eID Card | OT.DPM | OT.TOE_Upgrade | OT.SAM-PIN_Mgmt | OT.DTN_Mgmt | OT.Time_Mgmt | OT.SM_ TOE_and_SAM | OT.SAM-PIN_Sec | OT.DTN_Integrity | OT.Audit_Data_Integrity | OT.RIP | OT.Auth_SAM_by_TOE | OT.Cert_Update |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **FMT_SMF.1** | ✓ | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| **FMT_SMR.1** | ✓ | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| **FPT_STM.1** | | | | | | | | | | | | | | | | | | | | | | | | |
| **FPT_IDA.1/CVC** | | | | | | | | | ✓ | | | ✓ | | | | | | | | | | | | |
| **FPT_IDA.1/IVP** | | | | | | | ✓ | | | | | | | | | | | | | | | | | |
| **FPT_IDA.1/OCSP** | | | | | | | | ✓ | | | | | | | | | | | | | | | | |
| **FPT_IDA.1/TOE_Upgrade** | | | | | | | | | | | | | | ✓ | | | | | | | | | | |
| **FPT_EMSEC.1** | | | | | ✓ | | | | | ✓ | | ✓ | | | | | | ✓ | | | | | | |
| **FPT_SSY.1/IVC** | | | ✓ | | | | | | | | | | | | | | | | | | | | | |
| **FPT_SSY.1/SAM** | | | | | | | | | | | | | | | | | | | | | | | ✓ | |
| **FPT_SSY.1/RH_Auth_Status** | | | | | | | | | | | ✓ | | | | | | | | | | | | | |
| **FPT_TST.1** | | | | | | | | | | | | | | | | | | | | ✓ | | | | |
| **FDP_SDI.2** | | | | | ✓ | | | | | | | | | | | | | | | | | | | |
| **FDP_RIP.1** | | | | | ✓ | | | | | | | | | | | | | | | | | ✓ | | |
| **FPT_FLS.1** | | ✓ | | | | | | | | | | | | | | | | | ✓ | ✓ | | | | |
| **FTP_ITC.1** | | | | | ✓ | | | | | ✓ | | ✓ | | | | | | ✓ | | | | | | |

| SFR s | OT.IVM_Management | OT.Security_Failure | OT.eIDC_Authentication | OT.PIN_Verification | OT.IVA_Confidentiality_Authentication | OT.PM_Verification | OT.ID_Verification Policy_Authentication | OT.OCSP_Query_Verify | OT.RH_DA | OT.RH_SC | OT.RH_Session_Ending | OT.SM_eID Card | OT.DPM | OT.TOE_Upgrade | OT.SAM-PIN_Mgmt | OT.DTN_Mgmt | OT.Time_Mgmt | OT.SM_ TOE_and_SAM | OT.SAM-PIN_Sec | OT.DTN_Integrity | OT.Audit_Data_Integrity | OT.RIP | OT.Auth_SAM_by_TOE | OT.Cert_Update |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FPT_SSY.1/Cert | | | | | | | | | | | | | | | | | | | | | | | | ✓ |

Table18 gives the SFR Rational for additional objectives of TOE on SSR Type II and SSR Type III.

**Table18: SFR Rationale for additional objectives of TOE on SSR Type II and SSR Type III**

| | OT.Photo_Verification | OT.SA_Identity_Verification | OT.Session_Ending | OT.SAS_DA | OT.SAS_SC | OT.APS_DA | OT.APS_SC |
|---|---|---|---|---|---|---|---|
| **FAU_GEN.1** | ✓ | ✓ | ✓ | ✓ | | ✓ | |
| **FCS_CKM.1/SM_TLS** | | | | | ✓ | | ✓ |
| **FCS_COP.1/SHA-256** | | | | | ✓ | | ✓ |
| **FCS_COP.1/AES-CBC** | | | | | ✓ | | ✓ |
| **FIA_UID.2** | ✓ | ✓ | | ✓ | | ✓ | |
| **FIA_UAU.2** | ✓ | ✓ | | ✓ | | ✓ | |
| **FIA_UAU.5** | ✓ | ✓ | | ✓ | | ✓ | |
| **FIA_UAU.6** | | | ✓ | | | ✓ | |
| **FTP_ITC.1** | | | | | ✓ | | ✓ |

Table19 gives the SFR Rational for additional objectives of TOE on SSR with biometric sensor and/pr external PIN PAD.

**Table19: SFR rationale additions for TOE on SSR with External/Internal Biometric Sensor and/or EPP**

| | OT.Biometric_ Verification | OT.EPP_DA | OT.EPP_SC | OT.EBS_DA | OT.EBS_SC | OT.Session_Ending |
|---|---|---|---|---|---|---|
| **FAU_GEN.1** | ✓ | ✓ | | ✓ | | |
| **FIA_AFL.1** | ✓ | | | | | |
| **FIA_UID.2** | | ✓ | | ✓ | | |
| **FIA_UAU.2** | | ✓ | | ✓ | | |
| **FIA_UAU.5** | ✓ | ✓ | | ✓ | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **FIA_UAU.6** | | | | | | ✓ |
| **FIA_UAU.7** | ✓ | | | | | |
| **FCS_CKM.1/SM** | | | ✓ | | ✓ | |
| **FCS_CKM.4** | | | ✓ | | ✓ | |
| **FCS_COP.1/AES-CBC** | | | ✓ | | ✓ | |
| **FCS_COP.1/AES-CMAC** | | | ✓ | | ✓ | |
| **FPT_EMSEC.1** | | | ✓ | | ✓ | |
| **FPT_SSY.1/IVC** | | ✓ | | ✓ | | |
| **FTP_ITC.1** | | | ✓ | | ✓ | |

### 6.4.3 SECURITY ASSURANCE REQUIREMENTS RATIONALE

EAL4 is chosen to permit a developer to gain maximum assurance from positive security engineering based on good commercial development practices which, though rigorous, do not require substantial specialist knowledge, skills, and other resources. EAL4 is the highest level at which it is likely to be economically feasible to retrofit to an existing product line.

EAL4 is applicable in those circumstances where developers or users require a moderate to high level of independently assured security in conventional commodity TOEs and are prepared to incur additional security-specific engineering costs.

The selection of the component ALC_DVS.2 provides a higher assurance of the security of the TOE's development and manufacturing especially for the secure handling of the TOE's material.

The component ALC_DVS.2 augmented to EAL4 has no dependencies to other security requirements.

# 7 GLOSSARY AND ACRONYMS

## 7.1 GLOSSARY

Service Provider Environment:

**SCPA (Service Provider Client Application):** The external system that requests the identity verification. The SCPA may directly state the method that will be used in the identity verification process or may state the method will be declared by the IVPS. And as a final option the SCPA may state that the default method stored in the TOE should be used in the identity verification process.

**IVPS (Identity Verification Policy Server):**The external system that prepares the Identity Verification Policy (Identity Verification Policy) and sends it to the TOE. The TOE performs the identity verification method defined in the policy.

**IVS (Identity Verification Server):** The external entity that validates the IVAs created by the TOE.

Identity Verification Environment:

**eID Card (Electronic Identity Card):** The national identity card used by service requester for claiming and proving his or her identity. eID Card is issued by or on behalf of General Directorate of Civil Registration and Nationality – Ministry of the Interior.

**SR (Service Requester):** Service requester is the person who claims and proves his or her identity. The service requester claim starts with presenting eID Card to the SSR. The TOE, the SAM and the Service Attendee[122] together verify the claim interacting with the Service Requester and the eID Card[123].

**SA (Service Attendee):** Service Attendee is the person who attends the identity verification process and approves if the photo displayed by the SSR belongs to the service requester. Service Attendee is also subject to prove his or her identity one of the methods.

**OCSPS (Online Certificate Status Protocol Server):** The server that keeps the revocation status of the IVCs. The OCSPS responds to the OCSP queries with the revocation status of the queried IVC.

Malicious Actors and Malicious External Systems:

**Identity Faker:** The attacker who tries to masquerade his or her identity with someone else's identity.

**Illegitimate eID Card:** An identity faker may use three types of illegitimate eID Card: a counterfeit eID Card, a forged eID Card and a revoked eID Card.

122The Service Attendee's presence and role depends on the Configuration of the TOE and the selected identity verification method.

123 PIN Verification involves interaction of Service Requester with eIDC.

The Proxy Entities:

**PC (Personal Computer):** The computer the UIS or NIS is running on.

SSR Environment:

**SAM (Secure Access Module):** The SAM is the secure element of the SSR. The critical security functionality of the SSR is performed by the SAM. Since the TOE is the application software of the SSR, the SAM is an external element. The TOE accesses the SAM services through PIN verification.

**The SSR Platform:**The SAM and the SSR Environment are the non-TOE hardware, software and firmware that the TOE needs to function. The SSR environment at minimum consists of USB Interface, the smart card interfaces, graphic display, Service Requester interface, real time clock, execution environment and file system. Optionally depending on the configuration, the TOE may have Service Attendee interface, biometric sensor, Ethernet interface and interfaces for EBS and EPP. The SSR environment should also include security features to protect itself from tampering.

**EBS[124] (External Biometric Sensor):** Optional external entity connected to the TOE. Depending on the sensor type, it sends the biometric template or biometric verification result to the TOE.

**EPP[125] (External PIN-PAD):**Optional external entity connected to the TOE.The EPP is present only for TOE of Configuration Type III. External PIN_PAD offers convenience to the Service Requester. When external PIN-PAD is available, the Service Requester inserts his or her eID Card and enters IVC-PIN to external PIN-PAD.

## 7.2 ACRONYMS

**APS:** Application Server

**CRL:** Certificate Revocation List

**CVC:** Card Verifiable Certificate

**DA:** Device Authentication

**DTN:** Device Tracking Number

**EBS:** External Biometric Sensor

**eID:** Electronic Identity

**EPP:** External pin Pad

**eIDMS:** Electronic Identity Management System

**eID Card:** Electronic Identity Card of National Republic

**eIDVS:** Electronic Identity Verification System

124EBS presence depends on the SSR configuration.
125EPP presence depends on the SSR configuration.

**eSign:** Electronic Signature

**IV:** Identity Verification

**IVA:** Identity Verification Assertion

**IVC:** Identity Verification Certificate

**Identity Verification Policy:** Identity Verification Policy

**IVPS:** Identity Verification Policy Server

**IVR:** Identity Verification Request

**IVS:** Identity Verification Server

**IVSP:** Identity Verification Specification

**OCSPS:** Online Certificate Status Protocol Server

**SAM:** Security Access Module

**SAS:** SSR Access Server

**SPCA:** Service Provider Client Application

**SPSA:** Service Provider Server Application

**SSR:** Card Acceptance Device

**TA:** Terminal Authentication

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