

**E-Bio KEC - Secure Smartcard Readers Firmware**

**v1.1**

**Security Target**

Version No: v1.6

**VERSION HISTORY**

|  |  |  |
| --- | --- | --- |
| Version No | Reason for Change | Release Date |
| 0.1 | First Draft | 14.11.2016 |
| 1.0 | Updated on revisions from evaluation facility | 03.01.2017 |
| 1.1 | Updated on revisions from evaluation facility | 26.05.2017 |
| 1.2 | Updated according to version 2.8 of Protection Profile | 05.10.2017 |
| 1.3 | Updated on revisions from evaluation facility | 10.01.2018 |
| 1.4 | Updated on revisions from evaluation facility | 17.01.2019 |
| 1.5 | Updated on revisions from evaluation facility | 28.01.2019 |
| 1.6 | Updated on revisions from evaluation facility | 22.02.2019 |

**APPROVALS**

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# ST Introduction

## Security Target & TOE Reference

**ST Title:** E-Bio KEC - Secure Smartcard Readers Firmware v1.1 - Security Target

**ST Reference:** v1.6

**TOE Identification:** E-Bio KEC - Secure Smartcard Readers Firmware v1.1

**CC Conformance:** Common Criteria for Information Technology Security Evaluation, Version 3.1 (Revision 5)

**PP Conformance:** Protection Profile for Application Firmware of Secure Smartcard Reader (SSR) for Electronic Identity Verification System, SSR\_PP\_2.8

**Assurance Level:** EAL4+ with ALC\_DVS.2 augmentation

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

## 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 eID Verification System (eIDVS) defined by TS13584. 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 TOE also covers the root certificates used for the identification & authentication purposes.

### 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 ,
* 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 eID Verification System, certificates of the root CA, device management CA and eID management CA are included in the TOE.

TOE is the application firmware which is loaded into the embedded flash memory of E-Bio KEC. E-Bio KEC one of the terminal devices designed for eID Verification System. It provides personal identity verification and digital signature operations for smartcard based services over electronic media. E-Bio KEC will mainly used in public institutions like hospitals, pharmacies and banks.

### Types of SSR Devices

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

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

Table 1. Comparison of SSR types

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Type I** | **Type II** | **Type III** |
| **User Interface of SSR Device** | * Pinpad, * Display, * One smartcard slot, * Biometric sensor (internal, external or does not exist) * External pinpad (optional) | * Pinpad, * Display, * Two smartcard slots, * Biometric sensor (internal, external or does not exist) * External pinpad (optional) | * Pinpad, * Display, * One or two smartcard slots, * Biometric sensor (internal, external or does not exist) * 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 communicates to Identity Verification Policy Server (IVPS) / Application Server (APS)/ Online Certificate Status Protocol Server (OCSPS). | * SSR communicates to Service Provider Client Application through USB interface or communicates to SAS through Ethernet interface. SPCA or SAS communicates to IVPS / APS/ OCSPS. | * SSR directly communicates to IVPS/ APS/ OCSPS through wireless interface. |
| **Service Attendee Support** | N/A | Yes | Optional |
| **Secure Upgrade** | Yes | Yes | Yes |
| **Revocation Status Control** | Three options:   1. Online OCSP query 2. Offline Revocation List Control 3. No control | Three options:   1. Online OCSP query 2. Offline Revocation List Control   (3) No control | Two options:   1. Online OCSP query   Offline Revocation List Control |
| **Optional Online/Offline Mode** | Works Online | Works Online | Storing Identity Verification Assertions when the connection is failed |

Offline mode is a valid 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 cannot reach to the APS. The confidentiality of the IVAs shall be assured during storage. Integrity concern of the IVAs does not exist since the IVAs are already electronically signed by the SAM.

### Non TOE Hardware/ Software/ Firmware

#### Software/ Firmware Environment of TOE

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

Figure 1. Software/Firmware Environment of TOE

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.

#### 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.

SSR Hardware environments of TOE for three different types are stated in Figure 2, Figure 3 and Figure 4.

Hardware environment of TOE consists of the following components:

* Communication interfaces (Ethernet & USB for Type I & Type II, Wireless interface for Type III)
* Memory (RAM)
* RTC (Real Time Clock)
* I / O Interface
* CPU
* Physical and Logical Security Barriers : Tamper Switch
* Smartcard Controller (for communication with e-ID card(s) & SAM). SlotX refers to slot number which is used for communication with e-ID card. Type I uses 1 slot, Type II uses 2 slots, Type III uses 1 slot or two slots for e-ID communication.
* User interfaces module which controls keypad / virtual keypad, biometric sensors and display.

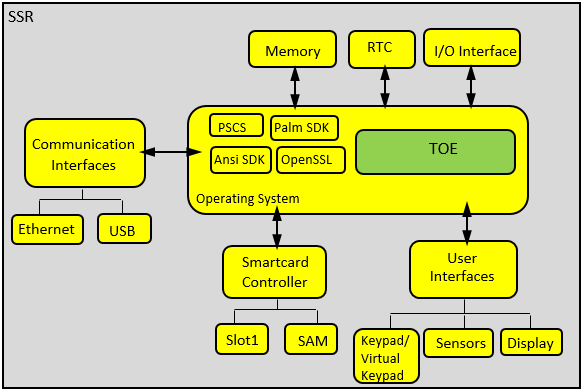


Figure 2. Hardware Environment of TOE – Type 1

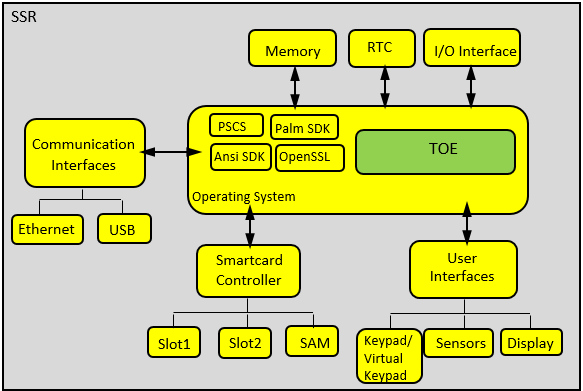


Figure 3. Hardware Environment of TOE – Type 2

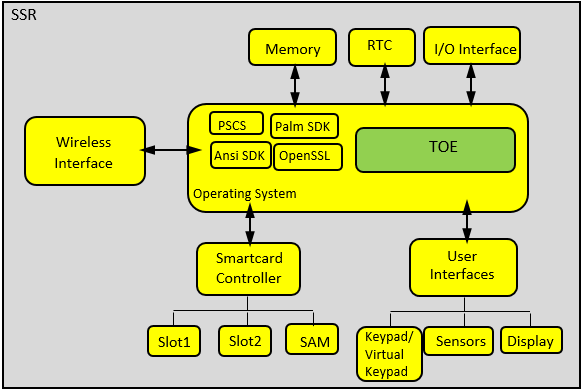


Figure 4. Hardware Environment of TOE – Type 3

### 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 (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 , External Pinpad .

### 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 and integrity of the communication between the TOE and the external device.

### Operational envıronments of of ssr

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

#### Operational Environment for SSR Type I



a.User Environment of Type I

The following scenario explains how Type I devices perform Identity Verification Operation in the environment shown in the figure above (a). 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 SR approves the displayed message, an Identity Verification Specification 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 that 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 checked online with the help of the Online Certificate Status Protocol (OCSP) Server. If the online certificate check cannot be achieved due to technical problems, there are two options to continue the operation: (i) the TOE checks 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 check 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, PIN verification and 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.

#### Operational Environment for SSR Type II



b.User Environment of Type II (without SAS)

User environments for Type II devices are given in figure above(b) and below(c). As seen, two smartcard slots are required for Type II devices. The second smartcard slot is needed for Service Attendee support. The SPCA initiates the operation. 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.



c.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.

#### Operational Environment for SSR Type III



d.User Environment of Type III

User environment for Type III devices is given in figure above(d). 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, TOE checks 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. 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 should be transmitted to APS securely before this time.

## TOE Description

### TOE Life Cycle

The TOE supports the following phases:

* 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 within the SSR are deleted and the TOE becomes out of service; TOE and the other 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.

### TOE Physical Scope

TOE Physical Scope consists of the following:

-TOE Installed SSR Device that is explained in 1.2.3.2 with the system requierements:

**Processing Unit:** Arm Cortex A9 1.2 Ghz processing unit support NEON/VFP

**Memory:** 4 Gb Nand Flash Memory and 512 DDR SDRAM

Real Time Controller

Security Access Module (SAM), placed into the SIM card slot

**Display:** 320X480 resolution TFT-LCD

**Keypad:** 18 keys keypad/virtual keypad

**Connections:**

* Micro USB port for PC connection
* 10/100 Mbit Ethernet port for network connection
* Wifi Module
* GSM Module
* USB device connection for biometric sensor

**Power Supply:** +9V power supply input

**Battery:** 7.4V 2500mAh

**-**User manual (pdf)

TOE is delivered on site as a firmware installed on a SSR Device ,that is explained above, and delivered by a courier of ETB.

Delivered version of TOE is the evaluated version in this ST and there is no need for extra configuration for security features. Other configurations related to customer will be done in the site by an official ETB staff.

### TOE Logical Scope

The primary security features of the TOE are:

* **Security audit:** TOE Security Functionality generates an audit record of the auditable events which will be explained in this ST.   
  Audit logs for the following events are provided:
  + 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 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 (for TOE on SSR Type II)
  + Tamper event detection
* **Cryptographic Support:** Cryptographic support involves Cryptographic key generation, Encryption/Decryption, Cryptographic key destruction provided by the TOE.

Cyrptographic operations are involved during the following functionalities:

* + Secure Messaging are founded between TOE and eID; TOE and SAM; TOE and Role Holder
  + 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
  + To Encrypt/Decrypt the stored IVAs on SSR Type III
  + Service Attendee authentication
  + Service Requester authentication
  + eID Card authentication
  + SAM authentication
  + Role Holder Device authentication
  + SAS authentication for TOE on SSR Type II
  + APS authentication for TOE on SSR Type III
* **Identification and Authentication:**  This feature contains that the users must be identified and authenticated before any action which related to security on the TOE. User roles are defined on system.Authentication failure handling, user identification and athentication, Multiple authentication mechanism for different users, reauthenticating, protected authentication feedback are supplied by the TOE. Identification and authentication functionalities for the followings are provided by the TOE:
  + Service Attendee identification & authentication
  + Service Requester identification & authentication
  + eID Card identification & authentication
  + SAM identification & authentication
  + Role Holder Device identification & authentication
  + SAS identification & authentication for TOE on SSR Type II
  + APS identification & authentication for TOE on SSR Type III
* **Communication :** This feature contains communication methods between the TOE and other devices which the TOE can communicate. Following communications channels are provided by the TOE:
  + Communication between TOE and eID
  + Communication between TOE and SAM
  + Communication between TOE and Role Holder
  + Communication between TOE and SPCA (on SSR Type I – Type II without SAS)
  + Communication between TOE and SAS (on SSR Type II with SAS)
  + Communication between TOE and APS (on SSR Type III)
  + Communication between TOE and IVS (on SSR Type III)
  + Communication between TOE and IVPS (on SSR Type III)
  + Communication between TOE and OCSP (on SSR Type III)
* **Security Management:** This feature contains managing security functions and data for diffirent situations. Security roles, rules and conditions are identified and management is supplied according to roles,rules and conditions and only authorized people access the TOE.
* **Protection of the TSF:** The TOE protects the TOE Security Functions and TSF data. This feature contains protection of cryptographic keys, digital signiture protection/verification, data authentication, SAM-PIN, cryptographic credentials, IVA data fields, software integrity self-test and other TSF data protection. Temper protection is also suppoerted by the TOE.
* **User Data Protection:** This feature incloses monitoring user data stored in containers controlled by the TSF for any integrity error. Critical data in terms of keys, user passwords is used by the TOE and it is protected against losing and stealing. Integrity checking method, subset flow control rules, security attributes are provided by the TOE.
* **Trusted Path/Channels:** This feature involves cryptographic communication protocols between itself and defined trusted products. Trusted channels supported by the TOE are the followings:
  + Trusted path/channel between TOE and eID
  + Trusted path/channel between TOE and SAM
  + Trusted path/channel between TOE and Role Holder
  + Trusted path/channel between TOE and SPCA (on SSR Type I – Type II without SAS)
  + Trusted path/channel between TOE and SAS (on SSR Type II with SAS)
  + Trusted path/channel between TOE and APS (on SSR Type III)
  + Trusted path/channel between TOE and IVS (on SSR Type III)
  + Trusted path/channel between TOE and IVPS (on SSR Type III)
  + Trusted path/channel between TOE and OCSP (on SSR Type III)

### obtaınıng 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 is 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.

# Conformance Claims

## CC Conformance Claim

This ST claims conformance to

* Common Criteria for Information Technology Security Evaluation, Part 1: Introduction and General Model; CCMB-2017-04-001 Version 3.1 Revision 5, April 2017, (CC Part 1)
* Common Criteria for Information Technology Security Evaluation, Part 2: Security Functional Components; CCMB--2017-04-002 Version 3.1 Revision 5, April 2017, (CC Part 2)
* Common Criteria for Information Technology Security Evaluation, Part 3: Security Assurance Requirements; CCMB--2017-04-003 Version 3.1 Revision 5, April 2017, (CC Part 3)

as follows

* Part 2 extended
* Part 3 conformant
* The Common Methodology for Information Technology Security Evaluation, Evaluation Methodology; CCMB--2017-04-004 Version 3.1 Revision 5, April 2017, [CEM] has to be taken into account.

## PP Claim

This ST claims conformance to

* Protection Profile for Application Firmware of Secure Smartcard Reader (SSR) for Electronic Identity Verification System, SSR\_PP\_2.8

## Package Claim

This ST is conforming to assurance package EAL4 augmented with ALC\_DVS.2 defined in CC part 3 (CC Part 3).

## Conformance Rationale

This ST claims strict conformance to Conformance Rationale of

* Protection Profile for Application Firmware of Secure Smartcard Reader (SSR) for Electronic Identity Verification System, SSR\_PP\_2.8 for Type I, Type II and Type III configurations.

Configuration specific properties are clearly stated by comparison tables or descriptions.

# Security Problem Definition

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

## Introductıon

Operational Environments for three SSR Types and interaction between the SSR device and external system components are defined in Section 1.2.6. Optional external/ internal hardware components of SSR Device are defined in Section 1.2.5. 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 brings about additional security needs. Therefore, in this ST document, Security Problem Definition, Security Objectives and Security Functional Requirements are designed to cover all the possible alternatives.

## 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 ST (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** |
|  | PIN and Biometry data. | | PIN and Biometry data of Service Requester and Service Attendee. | Integrity and confidentiality |
|  | SAM-PIN | | Used to authenticate the TOE to the SAM | Integrity and confidentiality |
|  | Identity Verification Assertion (IVA) | | Generated as the evidence of the identity verification operation. | Privacy, and authenticity |
| **Secondary Assets: Security Services** | | | **Definition** | **Protected against loss of** |
|  | | Identification and Authentication of Service Requester and Service Attendee | Personal Identity Verification is performed by this service. | Correct operation |
|  | | 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 |
|  | | |  | | --- | | 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 |
| **Secondary Assets: TSF Data** | | | **Definition** | **Protected against loss of** |
|  | 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 |
|  | Secure Messaging and Role Card Verifiable Certificates of SAM (in CVC Format) | | 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 |
|  | Current Time | | The time defined by OCSP server. TOE uses this time for ID verification assertion. | Integrity |
|  | Audit Data | | Audit Data | Integrity |

## 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 ST, 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).

## 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 |

## 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  (valid for Type II and Type III TOE) | The attacker may obtain Identity Verification Assertion by monitoring the communication line between type III TOE and the Application Server or the communication line between SAS and type II TOE. |
| T.IVA\_Confidentiality[valid only for offline mode of TOE on SSR Type III] | An attacker may steal 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 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]](#footnote-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 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 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 read, change or delete the audit data. |
| 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 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. |

## 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 and remote 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 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.Revocation\_Control | 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. |
| 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.  DTN and SAM PIN shall be written to the SSR Device during Initialization & Configuration Phase. |
| P.Tamper\_Response | The SSR platform will be able to detect any tampering attempts and will notify the TOE. The TOE will respond to this notification by securely deleting the SAM-PIN and getting into Initialization & Configuration phase. |

## 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.  When the Service Provider Client Application determines the identity verification method, it is assumed that the Service Provider Client Application selects the appropriate method.  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. |
| A.SSR\_Platform | The SSR platform supports the security functionality of the TOE and does not undermine the security properties of it. The SSR platform does not provide any opportunities to the attacker to manipulate or bypass the security functionality of the TOE.  The TSF architecture is resistant against attacks that can be performed by attackers possessing Enhanced-Basic attack potential (AVA\_VAN.3), it is assumed that SSR Platform does not offer any attack interface to the attacker with enhanced basic attack potential to break the TSF architecture.  SSR Platform will store the TOE encrypted during nonoperation times. SSR Platform will decrypt and authenticate the TOE during starting up the TOE. |

**Application Note:** The SSR Platform consists of the physical enclosure, physical hardware, security elements, operating system and other dedicated software. A.SSR\_Platform enables that Security Objectives of the TOE and the SSR Platform together are resistant to the attackers possessing Enhanced Basic Attack Potential.

## 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.Counterfeit\_eIDC | Applies to all |
| T.Revoked\_eIDC | Applies to all |
| T.Stolen\_eIDC | Applies to all |
| T.IVA\_Fraud | Applies to all |
| T.IVA\_Eavesdropping | Applies to TOE on SSR Type III |
| T.IVA\_Confidentiality | 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.IVM\_Management | Applies to all |
| P.TOE\_Upgrade | 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 III |
| P.Revocation\_Control | Applies to TOE on SSR Type I, Type II and Type III but differently. |
| P.DPM | Applies to all |
| P.Tamper\_Response | Applies to all |
| 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 |
| A.SSR\_Platform | Applies to all |

# Security Objectives

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

## 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[[2]](#footnote-2). |
| OT.eIDC\_Authentication | The TOE shall support the Card Authentication mechanism defined in TS 13584 [3].  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.  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 |
| OT.IVA\_ Signing | The created Identity Verification Assertion shall be electronically signed by the TOE (using SAM).  Otherwise the secure channel is founded in  between SPCA and IVS. |
| OT.IVA\_Privacy  (valid for Type III) | 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. The keys for encryption/decryption are generated by the SAM and transferred to the TOE via secure messaging. 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, APS for TOE on SSR Type III, EPP , EBS) |
| 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 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 securely via SSL-TLS as defined in TS 13584 [3]. |
| OT.RH\_DA  [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  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  [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  [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 have TOE update security management function. 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,  (ii) The following third party IT components for online upgrade operation:   * SPCA for TOE on SSR Type I, * SPCA or SAS for TOE on SSR Type II, * APS for SSR Type III.   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 13584 [3]. |
| OT.DPM  [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  [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 platform. |
| OT.DTN\_Integrity | The TOE shall protect the integrity of the Device Tracking Number. |
| OT.Audit\_Data\_ Protection | The TOE shall control access to the audit data and shall not allow attackers to read, change or delete. |
| OT.RIP  [Residual Information Protection] | PIN, Biometry data, other user data and TSF data shall be copied to only volatile memory and be 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.  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. |

## 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.  For the cases when the SPCA determines the identity verification method, the SPCA shall select the appropriate method.  SPCA shall encrypt the Identity Verification Assertion before sending it to the Application Server (APS). |
| OE.IVPS | The IVPS shall:   * prepare and send the correct policy, * protect the integrity and the authenticity of the policy (it shall sign the policy using its signing certificate), * protect the confidentiality of the private key of its signing certificate. |
| OE.eID Card | The eID Card shall have the following properties:   * support PIN verification, * prevent usage of IVC Certificate Private key prior to PIN verification, * store the cardholder’s digital photo, * store the cardholder’s biometric data (fingerprint, fingervein and palmvein), * support terminal authentication as defined in TS 13584 [3], * store the cardholder’s personal message(shall not let any subject access to the personal message prior to terminal authentication), * support role holder authentication as defined in TS 13584 [3], * support secure messaging as defined in TS 13584 [3], * protect the integrity and confidentiality of the user data and TSF data. |
| OE.SAM | The SAM shall   * store security credentials for eID Card Authentication, * support signing the IVA, * store security credentials for External Device Authentication to authenticate External Biometric Sensor and External Pin Pad, * 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], * support SAM-PIN verification mechanism to authenticate the TOE, * require SAM-PIN verification to allow the TOE to use its services, * support Secure Messaging with the TOE as defined in TS 13584 [3], * support authentication of itself to the TOE, * offer Random Number Generation, * have minimum EAL4+ (AVA\_VAN.5) Common Criteria Certificate. |
| OE.Service\_Requester | The Service Requester shall:   * Protect his/her PIN, * Not enter his/her PIN, or give his/her biometric data prior to personal message verification, * Immediately, inform his/her stolen or lost eID Card. |
| OE.Service\_Attendee | The Service Attendee shall:   * protect his or her PIN, * not enter his/her PIN, or give his/her biometric data prior to personal message verification, * immediately inform the stolen or lost eID Card, * act responsively during photo verification, * 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:   * operate correctly, * sign the OCSP answer , * 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 will support the security functionality of the TOE and does not undermine the security properties of it. The SSR platform does not provide any opportunities to the attacker, who is possessing enhanced basic attack potential, to manipulate or bypass the security functionality of the TOE.  The TSF architecture will be resistant against attacks that can be performed by attackers possessing Enhanced-Basic attack potential (AVA\_VAN.3), SSR Platform will not offer any attack interface to the attacker with enhanced basic attack potential to break the TSF  architecture.  SSR Platform will store the TOE encrypted during nonoperation times. SSR Platform will decrypt and authenticate the TOE during starting up the TOE.  SSR Platform will have tamper detection mechanism and notify the TOE upon detection of a tamper event. SSR Platform will enable the TOE to securely delete the SAM-PIN and cryptographic keys when deleted SAM-PIN and cryptographic keys will be unrecoverable.  SSR Platform will provide correct operation of the TOE.  SSR platform will include a Real Time Clock (RTC) Unit with at most 20 seconds fault within 24 hours. |
| OE.EBS | The EBS shall:   * will perform biometric verification correctly * support Secure Communication between the EBS and the TOE as defined in TS 13584 [3], * support Terminal Authentication as defined in TS 13584 [3], * protect security credentials within the EBS. * display the personal message of the Service Requester prior to requesting biometric input |
| OE.EPP | The EPP shall:   * support Secure Communication between the EPP and the TOE as defined in TS 13584 [3], * support Terminal Authentication as defined in TS 13584 [3], * protect security credentials within the EPP, * display the personal message of the Service Requester prior to PIN * protect the confidentiality of the PIN |
| OE.Role\_Holder | The role holder shall:   * act responsively * have the appropriate role certificate and its Private Key for Role Holder Authentication * protect the private key used within Role Holder Authentication * 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.  The security management roles shall act responsively, |
| OE.SAS | The SAS will support Secure Communication with the TOE on SSR Type II.  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.  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.  For the cases when the APS determines the identity verification method, the APS shall select the appropriate method.  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. |

## 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\_ Signing | Applies to all |
| OT.IVA\_Privacy | Applies to TOE on SSR Type II and III |
| OT.PM\_Verification | Applies to all |
| OT.SA\_Identity\_Verification | Applies to the Type II and Type III configurations |
| OT.Session\_Ending | Applies to the Type II and Type III configurations |
| 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  [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  [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  [Security between TOE and SAM] | Applies to all |
| OT.SAM-PIN\_Sec | Applies to all |
| OT.DTN\_Integrity | Applies to all |
| OT.Audit\_Data\_ Protection | Applies to all |
| OT.RIP [Residual Information Protection] | Applies to all |
| OT.Cert\_Update | 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\_Attendee | 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 |

## 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\_Signing** | **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\_Protection** | **OT.RIP** | **OT.Auth\_SAM\_by\_TOE** | **OT.Cert\_Update** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T.Counterfeit\_eIDC** | ✓ |  | ✓ |  |  |  |  |  |  |  |  |  | ✓ |  |  |  |  |  |  |  |  |  |  |  |  |
| **T.Revoked\_eIDC** | ✓ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **T.Stolen\_eIDC** |  |  |  | ✓ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **T.IVA\_Fraud** |  |  |  |  | ✓ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **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** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ |  |  |  |  |  |  |  |  |
| **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** |  |  |  |  |  |  | ✓ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **P.Time\_Update** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ |  |  |  |  |  |  |  |
| **P.Revocation\_Control** |  |  | ✓ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **P.DPM** |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ | ✓ | ✓ |  |  |  |  |  |  |  |  |
| **P.Tamper\_Response** |  |  | ✓ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

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\_eIDC** |  |  | ✓ | ✓ |  |  |  |  |  |  |  |  |  |  | ✓ | ✓ |  |  |
| **T.Revoked\_eIDC** |  |  | ✓ |  |  |  | ✓ |  |  |  |  |  |  |  | ✓ | ✓ |  |  |
| **T.Stolen\_eIDC** |  |  | ✓ |  | ✓ | ✓ |  |  | ✓ |  |  |  |  |  |  |  |  |  |
| **T.IVA\_Fraud** |  |  |  | ✓ |  |  |  | ✓ |  |  |  |  |  |  | ✓ | ✓ |  |  |
| **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** |  |  |  |  |  |  |  |  | ✓ |  |  |  |  |  |  |  |  |  |
| **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.Revocation\_Control** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ |  |  |
| **P.Tamper\_Response** |  |  |  |  |  |  |  |  | ✓ |  |  |  |  |  |  |  |  |  |
| **A.SPCA** | ✓ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **A.IVPS** |  | ✓ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **A.EBS-EPP** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **A.PC** |  |  |  |  |  |  |  |  |  |  | ✓ |  |  |  |  |  |  |  |
| **A.APS** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ |  |
| **A.Management\_Environment** |  |  |  |  |  |  |  |  |  |  |  | ✓ |  |  |  |  |  |  |
| **A.SAM\_ PIN\_Environment** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ |
| **A.SSR\_Platform** |  |  |  |  |  |  |  |  | ✓ |  |  |  |  |  |  |  |  |  |

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** |  |  |  | ✓ |  |  |  |  |  | ✓ |

**Table 17. Additions to Security Objective Rationale for TOE on SSR Type III**

|  |  |  |
| --- | --- | --- |
|  | **OT.IVA\_Privacy** | **OE.SAM** |
| **P.Offline\_Operation** |  |  |
| **T.IVA\_Confidentiality** |  |  |

## Security Objectives Rationale

**T.Counterfeit\_eIDC:** 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\_eIDC:** The justification of this threat changes according to the configuration of the TOE.

**Table 18. Justification According to The Configuration of TOE**

|  |  |  |
| --- | --- | --- |
|  | **Without Biometric Sensor (internal or external) and EPP** | **With Biometric Sensor and EPP** |
| **TOE on SSR Type I** | OT.PIN\_Verification,  OE.Service\_Requester,  OE.eID Card,  OE.SSR\_Platform. | OT.PIN\_Verification, OT.Biometric\_Verification  OE.Service\_Requester,  OE.eID Card,  OE.SSR\_Platform. |
| **Type II and III** | OT. PIN\_Verification,  OT.Photo\_Verification,  OE.Service\_Requester,  OE.Service\_Attendee,  OE.eID Card,  OE.SSR\_Platform. | OT.PIN\_Verification, OT.Photo\_Verification,  OT.Biometric\_Verification,  OE.Service\_Requester, OE.Service\_Attendee,  OE.eID Card,  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\_eIDC:** 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\_ Signing 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\_ Signing, 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\_ Signing, OE.SAM, OE.IVS, OE.PKI, OE.CM

**T.IVA\_Eavesdropping:**

OT.APS\_SC and OE.APS require the secure communication of the TOE with SAS and APS for SSR for Type III.OT.SAS\_SC, and OE.SAS require the secure communication of the TOE with SAS and APS for SSR Type II. Secure communication prevents the attacker to obtain IVA by monitoring the communication.

Hence, T.IVA\_Eavesdropping is covered by, OT.SAS\_SC, OT.APS\_SC, OE.APS and OE.SAS

Security Objectives: OT.APS\_SC, OE.APS, OT.SAS\_SC, OE.SAS

**T.IVA\_Confidentiality:** OT.IVA\_Privacy 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\_Privacy, 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\_Attendee 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.EPP\_SC, OE.EPP and OE.SAM address the secure communication between the TOE and the EPP therefore cover the threat.

Security Objectives:OT.EPP\_SC, 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 address 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\_Protection and OE.SSR\_ Platform covers the protection of audit data from unauthorized change.

Security Objective: OT.Security\_Failure, OT.Audit\_Data\_Protection, 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\_Protection 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\_Protection, 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.IVA\_Privacy matches the offline identity verification with TOE on SSR Type III.

Security Objective: OT.IVA \_Privacy

**P.Revocation\_Control:** OT.eIDC\_Authentication defines the offline certificate verification together with OE.CM

Security Objectives: OT.eIDC \_Authentication, OE.CM

**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

**P.Tamper\_Response:** OT.Security\_Failure and OE.SSR\_Platform realize the tamper response together.

Security Objectives: OT.Security\_Failure, OE.SSR\_Platform

**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-IVPS:** 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

**A.SSR\_Platform:** OE.SSR\_Platform covers the assumption totally. Security Objective: OE.SSR\_Platform

# Extended Components Definition

## 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:**



### 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 this ST:

* Minimum: The final decision on authentication;

**FPT\_IDA.1 Imported TSF Data Authentication**

Hierarchical to: No other components

Dependencies: No dependencies

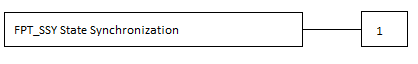
|  |  |
| --- | --- |
| FPT\_IDA.1.1 | The TSF shall verify that the [assignment: list of TSF Data] originates from [assignment: list of external entities] using [assignment: list of authentication mechanisms]. |

## 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:**



### 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 this ST:

* Minimum: 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]. |

# Security Requirements

## Security Functional Requirements

This part 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 this ST.

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.

### Class FAU: Security Audit

#### 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:   1. Start-up and shutdown of the audit functions; 2. All auditable events for the minimum[[3]](#footnote-3) level of audit; and 3. *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 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[[4]](#footnote-4)*. |
| FAU\_GEN.1.2 | The TSF shall record within each audit record at least the following information:   1. Date and time of the event, ~~type of event,~~ subject identity (if applicable), and the outcome (success or failure) of the event; and 2. *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)[[5]](#footnote-5)*. |

Configuration Note:

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

#### 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[[6]](#footnote-6)* upon detection of a potential security violation. |

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

#### FAU\_SAR.1 - Audit review

Hierarchical to: No other components.

Dependencies: FAU\_GEN.1 Audit data generation

|  |  |
| --- | --- |
| FAU\_SAR.1.1 | The TSF shall provide [administrator user][[7]](#footnote-7) with the capability to read [all auditable events][[8]](#footnote-8) from the audit records. |
| FAU\_SAR.1.2 | The TSF shall provide the audit records in a manner suitable for the user to interpret the information. |

#### 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. |
| FAU\_STG.1.2 | The TSF shall be able to detect[[9]](#footnote-9) unauthorized modifications to the stored audit records in the audit trail. |

#### 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[[10]](#footnote-10) and *none*[[11]](#footnote-11) if the audit trail is full. |

#### 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:  a) *Tampering of the SSR*[[12]](#footnote-12) known to indicate a potential security violation;  b) *none*[[13]](#footnote-13). |

### Class FCS: Cryptographic Support

#### 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 cryptographic key generation algorithm *Encryption and CMAC Key Generation Algorithm for Secure Messaging*[[14]](#footnote-14) and specified cryptographic key sizes *256 bits*[[15]](#footnote-15) that meet the following: *TS 13584* *[*3*]*[[16]](#footnote-16). |

Application Note 2: Above mentioned Secure Messaging are founded between TOE and eID; TOE and SAM; TOE and Role Holder.

#### 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* [[17]](#footnote-17) and specified cryptographic key sizes *256 Bits*[[18]](#footnote-18) that meet the following: *RFC 5246*[[19]](#footnote-19). |

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.

#### FCS\_CKM.1/IVA\_Keys - Cryptographic key generation for IVA Confidentiality

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*[[20]](#footnote-20) and specified cryptographic key sizes *256 bits*[[21]](#footnote-21) that meet the following: *none*[[22]](#footnote-22). |

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.

#### 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 [*by changing keys with zero and releasing related pointers from the application area*][[23]](#footnote-23) that meets the following: [*none*][[24]](#footnote-24). |

Application Note 5: 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 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 6:** 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 this ST as a different iteration.

#### 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*[[25]](#footnote-25) in accordance with a specified cryptographic algorithm *SHA-256 [*5*]*[[26]](#footnote-26) and cryptographic key sizes *none*[[27]](#footnote-27) that meet the following: *FIPS 180-4*[[28]](#footnote-28). |

#### 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*[[29]](#footnote-29) in accordance with a specified cryptographic algorithm *AES-256 CBC Mode*[[30]](#footnote-30) and cryptographic key sizes *256 bits*[[31]](#footnote-31) that meet the following: *FIPS 197 (for AES) [*6*], NIST Recommendation for Block Cipher Modes of Operations (for CBC mode)[* 7*]*[[32]](#footnote-32). |

#### 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*[[33]](#footnote-33) in accordance with a specified cryptographic algorithm *AES-CMAC*[[34]](#footnote-34) and cryptographic key sizes *256 bits*[[35]](#footnote-35) that meet the following: *FIPS 197 (for AES) [*6*], RFC 4493 (for CMAC operation) [*9*]*[[36]](#footnote-36). |

#### 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[[37]](#footnote-37)* in accordance with a specified cryptographic algorithm *RSA OAEP [[38]](#footnote-38)* and cryptographic key sizes *2048[[39]](#footnote-39)* that meet the following: *TS 13584 [*3*],* and *RSA Cryptography Standard [10][[40]](#footnote-40)*. |

#### 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 imported to the TOE via FPT\_IDA.1/X509. 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*[[41]](#footnote-41) in accordance with a specified cryptographic algorithm *RSA, PKCS#1 v2.1 with PSS padding method* [[42]](#footnote-42) and cryptographic key sizes *2048*[[43]](#footnote-43) that meet the following: *ETSI TS 102 853[12] and TS 13584 [*3*]*[[44]](#footnote-44). |

**Application Note 7:**  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 this ST.

### Class FIA: Identification and Authentication

#### 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 *limit of Biometric Verification Failure (defined in TS 13584 [*3*]) times*[[45]](#footnote-45) unsuccessful authentication attempts occur related to *Biometric Verification*[[46]](#footnote-46). |
| FIA\_AFL.1.2 | When the defined number of unsuccessful authentication attempts has been met[[47]](#footnote-47), the TSF shall not allow *further biometric verification*[[48]](#footnote-48). |

**Application Note 8:** Unsuccessful biometric verification number is written into the eID Card by the TOE and updated each time the counter is changed.

#### 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 External Biometric Sensor 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.

#### 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 that user. |

**Refinement:** User above refers to Role Holder, Secure Access Module, External PIN Pad External Biometric Sensor 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.

#### 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:*   * *Service Attendee authentication ,* * *Service Requester authentication,* * *eID Card authentication,* * *SAM authentication,* * *Role Holder Device authentication,* * *SAS authentication for TOE on SSR Type II,* * *APS authentication for TOE on SSR Type III,* * *external PIN Pad authentication ,* * *external biometric sensor authentication)*[[49]](#footnote-49)   to support user authentication. |
| FIA\_UAU.5.2 | The TSF shall authenticate any user's claimed identity according to the following rules:   * *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 and biometric verification as defined in TS 13585 [*4*].* * *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 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*].* * *eID Card, SAM, Role Holder, external PIN Pad and external biometric sensor authentications are done by certificate verification.* * *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*[[50]](#footnote-50). |

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

**Application Note 10:**  eID Card is the smart card with the 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 not revoked 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.

#### 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 authentication process is repeated.   * In each authentication request for Service Requester, Service Requester is re-authenticated even if the card is not removed.   *After 24 hours are exceeded the following sessions' keys are renewed:*   * + *SAM authentication,*   + *Role Holder Device authentication,*   + *APS authentication for TOE on SSR Type III,*   + *SAS authentication for TOE on SSR Type II*   + *external PIN Pad authentication ,*   + *external biometric sensor authentication ,*[[51]](#footnote-51)*.* |

**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 according to the context.

#### 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   * *a dummy character for each entered PIN entry for authentication by PIN* * *a dummy fingerprint representation for authentication by biometry*   *on the SSR screen* [[52]](#footnote-52) to the ~~user~~ **Service Requester or Service Attendee** while the authentication is in progress. |

### Class FCO: Communication

#### 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*[[53]](#footnote-53) at all times. |
| FCO\_NRO.2.2 | The TSF shall be able to relate the *identity of origin*[[54]](#footnote-54) of the originator of the information, and the *Identity Verification Assertion Data*[[55]](#footnote-55) 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*[[56]](#footnote-56) given *immediately in online mode, within a 24 hours period in offline mode for TOE on SSR Type III*[[57]](#footnote-57). |

**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 11:** - 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.

### Class FMT: Security Management

#### 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[[58]](#footnote-58) the function *Identity Verification Operation*[[59]](#footnote-59) to the *Identity Verification Policy Server or Client Application*[[60]](#footnote-60). |

Application Note 12 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.

#### 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[[61]](#footnote-61) the function *TOE Upgrade*[[62]](#footnote-62) to *Client Application for TOE on Type I and Type II, Application Server for TOE on Type III and Manufacturer service operator*[[63]](#footnote-63). |

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.

#### 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*[[64]](#footnote-64) the *SAM-PIN*[[65]](#footnote-65) to *Initialization Agent*[[66]](#footnote-66). |

#### 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*[[67]](#footnote-67) the *Device Tracking Number*[[68]](#footnote-68) to *Initialization Agent*[[69]](#footnote-69). |

#### 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*[[70]](#footnote-70) the *Time*[[71]](#footnote-71) to *OCSP server*[[72]](#footnote-72). |

##### Application Note 13: 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.

#### 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:   * *TOE initialization (including SAM PIN and DTN initialization),* * *TOE upgrade,* * *time and date setting,* * *audit generation,* * *identity verification method determination*[[73]](#footnote-73). |

#### 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   * *Initialization Agent,* * *SSR Access Server for TOE on SSR Type II,* * *Client Application for TOE on Type I and Type II,* * *Application Server for TOE on Type III,* * *Identity Verification Policy Server,* * *OCSP Server,* * *Manufacturer service operator* * *Software Publisher* [[74]](#footnote-74). |
| FMT\_SMR.1.2 | The TSF shall be able to associate users with roles. |

### Class FPT: Protection of the TSF

#### 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.

#### 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*[[75]](#footnote-75) originates from *Card Publisher*[[76]](#footnote-76) using *CVC Authentication Mechanism defined in TS 13584 [*3*]*[[77]](#footnote-77). |

#### FPT\_IDA.1/X509 - Imported TSF Data Authentication - X509 Certificates

Hierarchical to: No other components

Dependencies: No dependencies

|  |  |
| --- | --- |
| FPT\_IDA.1.1 | The TSF shall verify that the *Identity Verification Certificate, Identity Verification Policy Server Certificate, OCSP Server Certificate, Software Publisher Certificate[[78]](#footnote-78)* originates from *Card Publisher and Device Manager[[79]](#footnote-79)* using *X509 Certificate Authentication Mechanism defined in TS 13584 [*[3](#_bookmark88)*][[80]](#footnote-80)*. |

#### 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*[[81]](#footnote-81) originates from *Identity Verification Policy Server*[[82]](#footnote-82) using *IVP authentication mechanism defined in TS 13584 [*3*]*[[83]](#footnote-83). |

#### 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*[[84]](#footnote-84) originates from legitimate *OCSP Server*[[85]](#footnote-85) using *OCSP Response Verification Mechanism defined TS 13584 [*3*]*[[86]](#footnote-86). |

##### Application Note 14: For offline Revocation Status Control from the Revocation List downloaded onto the SSR Device this verification mechanism is still valid.

#### 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*[[87]](#footnote-87) originates from *legitimate Software Publisher*[[88]](#footnote-88) using *TOE Upgrade Authentication mechanism defined in TS 13584 [*3*]*[[89]](#footnote-89). |

#### 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* [[90]](#footnote-90) **and request updated certificates** from the:   * *SPCA for TOE on SSR Type I and Type II with no SAS* * *SAS for TOE on SSR Type II with SAS* * *APS for TOE on SSR Type III*[[91]](#footnote-91)   in times*: at each Identity Verification Operation[[92]](#footnote-92)*. |

#### 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*[[93]](#footnote-93) from the *OCSP Server*[[94]](#footnote-94)in times*: immediately after opening of the SSR[[95]](#footnote-95)*. |

#### 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*[[96]](#footnote-96) from the *OCSP Server or SSR Platform on which up-to-date Revocation List is present*[[97]](#footnote-97)in times: *during Identity Verification Operation.* |

#### 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* [[98]](#footnote-98) from the *eID Card*[[99]](#footnote-99) in times: *after the secure communication between Role Holder and the TSF is terminated[[100]](#footnote-100)*. |

**Application Note 16:** 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]

#### 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[[101]](#footnote-101) to demonstrate the correct operation of the TSF[[102]](#footnote-102). |
| ~~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[[103]](#footnote-103).~~ |
| ~~FPT\_TST.1.3~~ | ~~The TSF shall provide authorized users with the capability to verify the integrity of [selection: [assignment: parts of TSF], TSF]~~. |

#### 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*[[104]](#footnote-104). |

### Class FDP: User Data Protection

#### 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*[[105]](#footnote-105)on :  *Subjects:*  *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.*  *Information:*  *TOE Upgrade Package, IVA, IVM, OCSP response, SAM Secure Messaging CVC and SAM Role CVC*  *Operations:*  *Write (installed to the TOE), read (sent by the TOE)*[[106]](#footnote-106). |

#### 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 initialization 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* [[107]](#footnote-107)based on the following types of subject and information security attributes: *Subjects:*  *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.*  *Information:*  *TOE Upgrade Package, IVA, IVM, OCSP response, SAM Secure Messaging CVC and SAM Role CVC*  *Attributes:*  *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* [[108]](#footnote-108). |
| 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 ST and other information under the control of Information Flow Control Policy are accepted and written if signature verification is completed successfully*[[109]](#footnote-109)*.* |
| FDP\_IFF.1.3 | The TSF shall enforce the *none[[110]](#footnote-110)*. |
| FDP\_IFF.1.4 | The TSF shall explicitly authorize an information flow based on the following rules: *none*[[111]](#footnote-111). |
| FDP\_IFF.1.5 | The TSF shall explicitly deny an information flow based on the following rules: *none*[[112]](#footnote-112). |

#### 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.2.1 | The TSF shall enforce the *Information Flow Control Policy*[[113]](#footnote-113) when exporting user data, controlled under the SFP(s), outside of the TOE. |
| FDP\_ETC.2.2 | The TSF shall export the user data with the user data's associated security attributes |
| FDP\_ETC.2.3 | The TSF shall ensure that the security attributes, when exported outside the TOE, are unambiguously associated with the exported user data. |
| FDP\_ETC.2.4 | The TSF shall enforce the following rules when user data is exported from the TOE: *none*[[114]](#footnote-114). |

#### FDP\_RIP.1 Subset residual information protection

Hierarchical to: No other components.

Dependencies: No dependencies.

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| --- | --- |
| 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[[115]](#footnote-115) the following objects *cryptographic credentials, IVA data fields, PIN, photo and biometric information*[[116]](#footnote-116). |

### Class FTP: Trusted Path/Channels

#### 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, 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[[117]](#footnote-117) to initiate communication via the trusted channel. |
| FTP\_ITC.1.3 | The TSF shall initiate communication via the trusted channel for *all functions*[[118]](#footnote-118). |

**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.

## 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.

## 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.

## Security Requirements Rationale

### 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. FCS\_COP.1/Sign\_Ver verifies the authenticity of the certificate and FPT\_IDA.1/X509 verifies the authenticity of the certificate. 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, FCS\_COP.1/Sign\_Ver, FPT\_IDA.1/X509, 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\_Signing:** 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.

SFRs: FCO\_NRO.2, FCS\_COP.1/SHA-256

**OT.IVA\_Privacy:** 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.4 and FTP\_ITC.1.

The cryptographic requirement for IVA confidentiality for the TOE on SSR Type III in the offline mode is guaranteed by FDP\_RIP, FCS\_COP.1/AES-CBC and FCS\_COP.1/AES-CMAC. The generation and destruction of the encryption/decryption 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\_ETC.2, FDP\_IFC.1 and FDP\_IFF.1 define *Information Flow Control Policy* to sign IVA by SAM before sending it to IVS.

SFRs: FCS\_COP.1/AES-CBC, FCS\_COP.1/AES-CMAC, FAU\_GEN.1, FAU\_ARP.1, 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\_RIP.1, FDP\_ETC.2, FDP\_IFC.1 and FDP\_IFF.1.

**OT.PM\_Verification:** Since only the legitimate TOE could found secure messaging with eID Card and read personal 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 personal 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:** FDP\_ETC.2, FDP\_IFC.1 and FDP\_IFF.1 define *Information Flow Control Policy* for verifying the signature of the Identity Verification Policy sent by the IVPS. FPT\_IDA.1/IVP covers the authentication of policy and FPT\_IDA.1/X509 covers the authentication of the certificate of the policy server. The Identity Verification Policy Authentication mechanism addressed in the FPT\_IDA.1/IVP and FPT\_IDA.1/X509 require the cryptographic support of FCS\_COP.1/ Sign\_Ver. FAU\_GEN.1 audits the authentication.

SFRs: FDP\_ETC.2, FDP\_IFC.1, FDP\_IFF.1, FPT\_IDA.1/IVP, FPT\_IDA.1/X509, FCS\_COP.1/ Sign\_Ver and FAU\_GEN.1.

**OT.OCSP\_Query\_Verify:** FDP\_ETC.2, FDP\_IFC.1 and FDP\_IFF.1 define *Information Flow Control Policy* for verifying the signature of the OCSP Query Response sent by the OCSPS. FPT\_IDA.1/OCSP covers the authentication of query response and FPT\_IDA.1/X509 covers the authentication of the certificate of the OCSP server. 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: FDP\_ETC.2, FDP\_IFC.1, FDP\_IFF.1 FPT\_IDA.1/OCSP,FPT\_IDA.1/X509, 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.

SFRs: FTP\_ITC.1, FCS\_CKM.1/SM, FCS\_CKM.4, FCS\_COP.1/AES-CBC, FCS\_COP.1/AES-CMAC.

**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.

SFRs: FTP\_ITC.1, FCS\_CKM.1/SM, FCS\_CKM.4, FCS\_COP.1/AES-CBC, FCS\_COP.1/AES-CMAC.

**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.

SFRs: FTP\_ITC.1, FCS\_CKM.1/SM, FCS\_CKM.4, FCS\_COP.1/AES-CBC, FCS\_COP.1/AES-CMAC.

**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.

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

**OT.DPM:** FMT\_SMF and FMT\_SMR cover 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. FPT\_IDA.1/X509 covers the authentication of the certificate of the software publisher server. FDP\_ETC.2, FDP\_IFC.1 and FDP\_IFF.1 define *Information Flow Control Policy* for verifying the signature of the Upgrade Package sent by the Software Publisher. The authentication before the upgrade is guaranteed 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, FPT\_IDA.1/X509, FCS\_COP.1/SHA-256, FCS\_COP.1/AES-CBC, FCS\_COP.1/Sign\_Ver FIA\_UAU.2 and FIA\_UID.2, FDP\_IFC.1, FDP\_IFF.1, FDP\_ETC.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. Providing the real time for IVA data and audit data is fulfilled by FPT\_STM.1.

SFRs: FMT\_MTD.1/Time, FMT\_SMF.1, FMT\_SMR.1, FIA\_UAU.2, FIA\_UID.2 and FPT\_STM.1.

**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.

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

**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\_Protection :** FAU\_STG1, FAU\_SAR.1 and FAU\_STG.4 covers the audit data protection.

SFR: FAU**\_**STG1, FAU\_SAR.1 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:** Validity of certificates needs to be checked by the TOE. This is covered by FPT\_SSY.1/Cert. During certificate update, the integrity and authenticity of the new certificates replacing the old certificates are ensured. For this, FDP\_ETC.2, FDP\_IFC.1 and FDP\_IFF.1 define *Information Flow Control Policy* for verifying *eID management CA signature*.

SFRs: FPT\_SSY.1/Cert, FDP\_ETC.2, FDP\_IFC.1, and FDP\_IFF.1

### Security Functional Requirements Rationale Tables

The coverage of objectives by the SFRs are given in Table19, Table20 and Table21**.**

Table19 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.

**Table 19. 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\_Signing** | **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\_Protection** | **OT.RIP** | **OT.Auth\_SAM\_by\_TOE** | **OT.Cert\_Update** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **FAU\_GEN.1** |  | ✓ | ✓ | ✓ |  | ✓ | ✓ | ✓ | ✓ |  |  |  |  | ✓ |  |  |  |  | ✓ |  |  |  |  |  |
| **FAU\_ARP.1** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ |  |  |  |  |  |
| **FAU\_SAR.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** |  |  |  |  |  | ✓ |  |  |  | ✓ |  | ✓ |  |  |  |  |  | ✓ |  |  |  |  |  |  |
| **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** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ |  |  |  |  |  |  |  |
| **FMT\_SMF.1** | ✓ |  |  |  |  |  |  |  |  |  |  |  | ✓ | ✓ | ✓ | ✓ | ✓ |  |  |  |  |  |  |  |
| **FMT\_SMR.1** | ✓ |  |  |  |  |  |  |  |  |  |  |  | ✓ | ✓ | ✓ | ✓ | ✓ |  |  |  |  |  |  |  |
| **FPT\_STM.1** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ |  |  |  |  |  |  |  |
| **FPT\_IDA.1/CVC** |  |  |  |  |  |  |  |  | ✓ |  |  | ✓ |  |  |  |  |  |  |  |  |  |  |  |  |
| **FPT\_IDA.1/X509** |  |  |  |  |  |  | ✓ | ✓ |  |  |  |  |  | ✓ |  |  |  |  |  |  |  |  |  |  |
| **FPT\_IDA.1/IVP** |  |  |  |  |  |  | ✓ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **FPT\_IDA.1/OCSP** |  |  |  |  |  |  |  | ✓ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **FPT\_IDA.1/TOE\_Upgrade** |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ |  |  |  |  |  |  |  |  |  |  |
| **FPT\_SSY.1/IVC** |  |  | ✓ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **FPT\_SSY.1/SAM** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ |  |
| **FPT\_SSY.1/RH\_Auth\_Status** |  |  |  |  |  |  |  |  |  |  | ✓ |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **FPT\_TST.1** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ |  |  |  |  |
| **FDP\_RIP.1** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ |  |  |
| **FPT\_FLS.1** |  | ✓ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ | ✓ |  |  |  |  |
| **FTP\_ITC.1** |  |  |  |  |  |  |  |  |  | ✓ |  | ✓ |  |  |  |  |  | ✓ |  |  |  |  |  |  |
| **FPT\_SSY.1/Cert** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ✓ |
| **FDP\_ETC.2** |  |  |  |  |  |  | ✓ | ✓ |  |  |  |  |  | ✓ |  |  |  |  |  |  |  |  |  | ✓ |
| **FDP\_IFC.1** |  |  |  |  |  |  | ✓ | ✓ |  |  |  |  |  | ✓ |  |  |  |  |  |  |  |  |  | ✓ |
| **FDP\_IFF.1** |  |  |  |  |  |  | ✓ | ✓ |  |  |  |  |  | ✓ |  |  |  |  |  |  |  |  |  | ✓ |

Table20 gives the SFR Rational for additional objectives of TOE on SSR Type II and SSR Type III.

Table 20. 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** |  |  |  |  | ✓ |  | ✓ |

Table21 gives the SFR Rational for additional objectives of TOE on SSR with biometric sensor and/or external PIN PAD.

Table 21. 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\_SSY.1/IVC** |  | ✓ |  | ✓ |  |  |
| **FTP\_ITC.1** |  |  | ✓ |  | ✓ |  |

Table 22. SFR Rationale for additional objectives of TOE on SSR Type III

|  |  |
| --- | --- |
| **SFR s** | **OT.IVA\_Privacy** |
| **FAU\_GEN.1** |  |
| **FAU\_ARP.1** |  |
| **FCS\_CKM.1/SM** |  |
| **FCS\_CKM.1/SM\_TLS** |  |
| **FCS\_CKM.1/IVA\_Keys** |  |
| **FCS\_CKM.4** |  |
| **FCS\_COP.1/AES-CBC** |  |
| **FCS\_COP.1/AES-CMAC** |  |
| **FDP\_RIP.1** |  |
| **FTP\_ITC.1** |  |
| **FDP\_ETC.2** |  |
| **FDP\_IFC.1** |  |
| **FDP\_IFF.1** |  |

### 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.

# TOE Summary Specification

## TOE Security Functions

### Security Audit

TOE Security Functionality generates an audit record of the auditable events which are explained in this ST.   
Audit logs for the following events are provided:

* 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 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 (for TOE on SSR Type II)
* Tamper event detection
* External biometric sensor authentication
* External pin pad authentication

For each audit event; date and time of the event, subject identity (if applicable), and the outcome (success or failure) of the event; and for each audit event type, based on the auditable event definitions of the functional components included in the, reason of the failure (if applicable) are stored. Audit trail is protected from unauthorized deletion.

TOE is able to detect unauthorized modifications to the stored audit records in the audit trail. TOE overwrites the oldest stored audit records if the audit trail is full.

TOE provides the capability to read from the audit records in a manner suitable for the user to interpret the information.

TOE is able to enter Out of Service Mode and delete SAM PIN and Cryptographic Keys used for storage security upon detection of a potential security violation.

Functional Requirement Satisfied: FAU\_ARP.1, FAU\_GEN.1, FAU\_SAR.1, FAU\_STG.1, FAU\_STG.4, FAU\_SAA.1

### Cryptographic Support

Cryptographic support involves Cryptographic key generation, Encryption/Decryption, Cryptographic key destruction provided by the TOE.

Cyrptographic operations are involved during the following functionalities:

* Secure Messaging are founded between TOE and eID; TOE and SAM; TOE and Role Holder
* 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
* To Encrypt/Decrypt the stored IVAs on SSR Type III
* Service Attendee authentication
* Service Requester authentication
* eID Card authentication
* SAM authentication
* Role Holder Device authentication
* SAS authentication for TOE on SSR Type II
* APS authentication for TOE on SSR Type III

The TSF generates cryptographic keys in accordance with a specified cryptographic key generation algorithm Encryption and CMAC Key Generation Algorithm for Secure Messaging with eID, SA and Role Holder and specified cryptographic key sizes 256 bits that meet the TS 13584.

The TSF generates cryptographic keys in accordance with a specified cryptographic key generation algorithm TLS v1.2 or above for secure messaging with Identity Verification Server, Application Server and SSR Access Server and specified cryptographic key sizes 256 Bits that meet the RFC 5246.

The TSF generates cryptographic keys in accordance with a specified cryptographic key generation for IVA Confidentiality and Integrity True Random Number Generation algorithm.

The TSF performs hash value calculation in accordance with a specified cryptographic algorithm SHA-256 that meet the FIPS 180-4.

The TSF performs encryption and decryption in accordance with a specified cryptographic algorithm AES-256 CBC Mode and cryptographic key sizes 256 bits that meet the following: FIPS 197 (for AES), NIST Recommendation for Block Cipher Modes of Operations (for CBC mode) for secure messaging between the TOE and eID card, TOE and SAM, TOE and Role Holder.

The TSF performs message authentication in accordance with a specified cryptographic algorithm AES-CMAC and cryptographic key sizes 256 bits that meet the FIPS 197 (for AES), RFC 4493 (for CMAC operation) for secure messaging between the TOE and eID card, TOE and SAM, TOE and Role Holder.

The TSF performs encryption in accordance with a specified cryptographic algorithm RSA OAEP and cryptographic key sizes 2048 that meet the TS 13584 [3], and RSA Cryptography Standard for secure messaging between the TOE and eID card, TOE and SAM, TOE and Role Holder.

The TSF performs Signature Verification by Cryptographic Validation and Certificate Validation in accordance with a specified cryptographic algorithm RSA, PKCS#1 v2.1 with PSS padding method and cryptographic key sizes 2048 that meet the ETSI TS 102 853[12] and TS 13584 for 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.

The TSF destroys cryptographic keys related to secure messaging with eID, SA, EBS, EPP and role holder, IVA confidentiality and secure messaging with Identity Verification Server, Application Server and SSR Access Server by changing keys with zero and releasing related pointers from the application area.

Functional Requirement Satisfied: FCS\_CKM.1/SM, FCS\_CKM.1/SM\_TLS, FCS\_CKM.1/IVA\_Keys, FCS\_CKM.4, FCS\_COP.1/SHA-256, FCS\_COP.1/AES-CBC, FCS\_COP.1/AES-CMAC, FCS\_COP.1/RSA, FCS\_COP.1/Sign\_Ver

### Identification and Authentication

**Identification and Authentication:**  This feature contains that the users must be identified and authenticated before any action which related to security on the TOE. User roles are defined on system. Authentication failure handling, user identification and authentication, multiple authentication mechanism for different users, reauthenticating, and protected authentication feedback are supplied by the TOE. Identification and authentication functionalities for the followings are provided by the TOE:

* Service Attendee identification & authentication
* Service Requester identification & authentication
* eID Card identification & authentication
* SAM identification & authentication
* Role Holder Device identification & authentication
* SAS identification & authentication for TOE on SSR Type II
* APS identification & authentication for TOE on SSR Type III

The TSF detects when limit of Biometric Verification Failure (defined in TS 13584 [3]) times unsuccessful authentication attempts occur related to Biometric Verification. When the defined number of unsuccessful authentication attempts has been met, the TSF does not allow further biometric verification.

The TSF requires each user to be successfully identified and authenticated before allowing any other TSF-mediated actions on behalf of that user.

Service requester and service attendee 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 (Or configurable default method when it is not determined by IVPS or the Client Application).

eID Card, SAM, Role Holder authentications are done by certificate verification.

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.

TSF is able to reauthenticate the users for certain conditions for each user type.

TSF provides a dummy character for each entered PIN entry for authentication by PIN and a dummy fingerprint representation for authentication by biometry on the SSR screen to the Service Requester or Service Attendee while the authentication is in progress.

Functional Requirement Satisfied: FIA\_AFL.1, FIA\_UID.2, FIA\_UAU.2, FIA\_UAU.5, FIA\_UAU.6, FIA\_UAU.7

### Communication

This feature contains communication methods between the TOE and other devices which the TOE can communicate. Following communications channels are provided by the TOE:

* Communication between TOE and eID
* Communication between TOE and SAM
* Communication between TOE and Role Holder
* Communication between TOE and SPCA (on SSR Type I – Type II without SAS)
* Communication between TOE and SAS (on SSR Type II with SAS)
* Communication between TOE and APS (on SSR Type III)
* Communication between TOE and IVS (on SSR Type III)
* Communication between TOE and IVPS (on SSR Type III)
* Communication between TOE and OCSP (on SSR Type III)

The TSF enforces the generation of evidence of origin for transmitted Identity Verification Assertion Data at all times.

The TSF is able to relate the identity of origin of the originator of the information, and the Identity Verification Assertion Data of the information to which the evidence applies.

The TSF provides a capability to verify the evidence of origin of information to Identity Verification Server given immediately in online mode, within a 24 hours period in offline mode for TOE on SSR Type III.

Functional Requirement Satisfied: FCO\_NRO.2

### Security Management

This feature contains managing security functions and data for different situations. Security roles, rules and conditions are identified and management is supplied according to roles, rules and conditions and only authorized people access the TOE.

The TSF restricts the ability to determine the behavior of the function Identity Verification Operation to the Identity Verification Policy Server or Client Application.

TOE upgrade function is only enabled to Client Application for TOE on Type I and Type II, Application Server for TOE on Type III and Manufacturer service operator.

SAM-PIN and Device Tracking number only can be written by Initialization Agent.

TOE time can only be updated by OCSP server.

The TSF maintains the roles: Initialization Agent, SSR Access Server for TOE on SSR Type II, Client Application for TOE on Type I and Type II, Application Server for TOE on Type III, Identity Verification Policy Server, OCSP Server, Manufacturer service operator and Software Publisher and associates corresponding users with these roles.

Functional Requirement Satisfied: FMT\_MOF.1 /Verify, FMT\_MOF.1 /Upgrade\_Management, FMT\_MTD.1/SAM-PIN, FMT\_MTD.1/DTN, FMT\_MTD.1/Time, FMT\_SMF.1, FMT\_SMR.1

### Protection of the TSF

The TOE protects the TOE Security Functions and TSF data. This feature contains protection of cryptographic keys, digital signature protection/verification, data authentication, SAM-PIN, cryptographic credentials, IVA data fields, software integrity self-test and other TSF data protection. Temper protection is also supported by the TOE.

The TSF is able to provide reliable time stamps that are actually provided from the OCSP ser and stored in a real time clock on SSR Device.

The TSF verifies that:

* Secure Messaging Card Verifiable Certificates and Role Card Verifiable Certificates originates from Card Publisher using CVC Authentication Mechanism
* Identity Verification Policy originates from Identity Verification Policy Server using IVP authentication mechanism
* OCSP Response originates from legitimate OCSP Server using OCSP Response Verification Mechanism
* TOE upgrade package originates from legitimate Software Publisher using TOE Upgrade Authentication mechanism

defined in TS 13584[3].

The TSF checks the validity of the Secure Messaging and Role Card Certificates of the SAM and request updated certificates from the: SPCA for TOE on SSR Type I and Type II with no SAS,

SAS for TOE on SSR Type II with SAS, and APS for TOE on SSR Type III at each Identity Verification Operation.

The TSF checks SAM Card Certificate revocation status from the OCSP Server immediately after opening of the SSR.

The TSF checks Identity Verification Certificate revocation status from the OCSP Server or SSR Platform on which up-to-date Revocation List is present during Identity Verification Operation.

The TSF checks Role Holder authentication status in eID Card from the eID Card after the secure communication between Role Holder and the TSF is terminated.

The TSF shall run a suite of self-tests during initial start-up to demonstrate the correct operation of the TSF.

The TSF shall preserve a secure state when any tampering event is detected, identification and authentication services for SAM are disturbed.

Functional Requirement Satisfied: FPT\_STM.1, FPT\_IDA.1/CVC, FPT\_IDA.1/X509, FPT\_IDA.1/IVP, FPT\_IDA.1/OCSP, FPT\_IDA.1/TOE\_Upgrade, FPT\_SSY.1/Cert, FPT\_SSY.1/SAM, FPT\_SSY.1/IVC, FPT\_SSY.1/RH\_Auth\_Status, FPT\_TST.1, FPT\_FLS.1, FAU\_ARP.1

### User Data Protection

This feature encloses monitoring user data stored in containers controlled by the TSF for any integrity error. Critical data in terms of keys, user passwords is used by the TOE and it is protected against losing and stealing. Integrity checking method, subset flow control rules, security attributes are provided by the TOE.

The TSF monitors user data stored in containers controlled by the TSF for any integrity error 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.

Upon detection of a data integrity error, the TSF gives an error message to the APS indicating the integrity fault and do not continue offline Identity Verification Operation.

The TSF enforces the Information Flow Control Policy on 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 over TOE Upgrade Package, IVA, IVM, OCSP response, SAM Secure Messaging, CVC and SAM Role CVC during write (installed to the TOE) and read (sent by the TOE) operations.

The TSF shall enforce the Information Flow Control Policy based on 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 over TOE Upgrade Package, IVA, IVM, OCSP response, SAM Secure Messaging CVC and SAM Role CVC for attributes 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.

The TSF enforces the Information Flow Control Policy and ignores any security attributes associated with the user data; when importing and exporting user data, controlled under the SFP, from outside of the TOE.

The TSF ensures that any previous information content of a resource is made unavailable upon the deallocation of the resource from the cryptographic credentials, IVA data fields, PIN, photo and biometric information.

Functional Requirement Satisfied: FDP\_IFC.1, FDP\_IFF.1, FDP\_ETC.2, FDP\_RIP.1

### Trusted Path/Channels

This feature involves trusted communication protocols between itself and defined trusted products. Trusted channels supported by the TOE are the followings:

* Trusted path/channel between TOE and eID
* Trusted path/channel between TOE and SAM
* Trusted path/channel between TOE and Role Holder
* Trusted path/channel between TOE and SPCA (on SSR Type I – Type II without SAS)
* Trusted path/channel between TOE and SAS (on SSR Type II with SAS)
* Trusted path/channel between TOE and APS (on SSR Type III)
* Trusted path/channel between TOE and IVS (on SSR Type III)
* Trusted path/channel between TOE and IVPS (on SSR Type III)
* Trusted path/channel between TOE and OCSP (on SSR Type III)

The TSF initiates communication via the trusted channel for all functions.

Functional Requirement Satisfied: FTP\_ITC.1

# 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

**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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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. [↑](#footnote-ref-1)
2. Note: The SSR Platform will notify the TOE and the TOE will respond this notification by deleting the SAM-PIN and other security related data, going to initialization and configuration phase. [↑](#footnote-ref-2)
3. 3[selection, choose one of: minimum, basic, detailed, not specified] [↑](#footnote-ref-3)
4. [assignment: other specifically defined auditable events] [↑](#footnote-ref-4)
5. [assignment: other audit relevant information] [↑](#footnote-ref-5)
6. [assignment: list of actions] [↑](#footnote-ref-6)
7. [assignment: authorized users] [↑](#footnote-ref-7)
8. [assignment: list of audit information] [↑](#footnote-ref-8)
9. [selection, choose one of: prevent, detect] [↑](#footnote-ref-9)
10. [selection, choose one of: “ignore audited events”, “prevent audited events, except those taken by the authorized user with special rights”, “overwrite the oldest stored audit records”] [↑](#footnote-ref-10)
11. [assignment: other actions to be taken in case of audit storage failure] [↑](#footnote-ref-11)
12. [assignment: subset of defined auditable events] [↑](#footnote-ref-12)
13. [assignment: any other rules]. [↑](#footnote-ref-13)
14. [assignment: cryptographic key generation algorithm] [↑](#footnote-ref-14)
15. [assignment: cryptographic key sizes] [↑](#footnote-ref-15)
16. [assignment: list of standards] [↑](#footnote-ref-16)
17. [assignment: cryptographic key generation algorithm] [↑](#footnote-ref-17)
18. [assignment: cryptographic key sizes] [↑](#footnote-ref-18)
19. [assignment: list of standards] [↑](#footnote-ref-19)
20. [assignment: cryptographic key generation algorithm] [↑](#footnote-ref-20)
21. [assignment: cryptographic key sizes] [↑](#footnote-ref-21)
22. [assignment: list of standards] [↑](#footnote-ref-22)
23. [assignment: cryptographic key destruction method] [↑](#footnote-ref-23)
24. [assignment: list of standards] [↑](#footnote-ref-24)
25. [assignment: list of cryptographic operations] [↑](#footnote-ref-25)
26. [assignment: cryptographic algorithm] [↑](#footnote-ref-26)
27. [assignment: cryptographic key sizes] [↑](#footnote-ref-27)
28. [assignment: list of standards] [↑](#footnote-ref-28)
29. [assignment: list of cryptographic operations] [↑](#footnote-ref-29)
30. [assignment: cryptographic algorithm] [↑](#footnote-ref-30)
31. [assignment: cryptographic key sizes] [↑](#footnote-ref-31)
32. [assignment: list of standards] [↑](#footnote-ref-32)
33. [assignment: list of cryptographic operations] [↑](#footnote-ref-33)
34. [assignment: cryptographic algorithm] [↑](#footnote-ref-34)
35. [assignment: cryptographic key sizes] [↑](#footnote-ref-35)
36. [assignment: list of standards] [↑](#footnote-ref-36)
37. [assignment: list of standards] [↑](#footnote-ref-37)
38. [assignment: cryptographic algorithm] [↑](#footnote-ref-38)
39. [ assignment: cryptographic key sizes] [↑](#footnote-ref-39)
40. [assignment: list of standards] [↑](#footnote-ref-40)
41. [assignment: list of cryptographic operations] [↑](#footnote-ref-41)
42. [assignment: cryptographic algorithm] [↑](#footnote-ref-42)
43. [assignment: cryptographic key sizes] [↑](#footnote-ref-43)
44. [assignment: list of standards] [↑](#footnote-ref-44)
45. [selection: [assignment: positive integer number], an administrator configurable positive integer within[assignment: range of acceptable values]] [↑](#footnote-ref-45)
46. [assignment: list of authentication events] [↑](#footnote-ref-46)
47. [selection: met, surpassed] [↑](#footnote-ref-47)
48. [assignment: list of actions] [↑](#footnote-ref-48)
49. [assignment: list of multiple authentication mechanisms] [↑](#footnote-ref-49)
50. [assignment: rules describing how the multiple authentication mechanisms provide authentication] [↑](#footnote-ref-50)
51. [assignment: list of conditions under which re-authentication is required] [↑](#footnote-ref-51)
52. [assignment: list of feedback] [↑](#footnote-ref-52)
53. [assignment: list of information types] [↑](#footnote-ref-53)
54. [assignment: list of attributes] [↑](#footnote-ref-54)
55. [assignment: list of information fields] [↑](#footnote-ref-55)
56. [assignment: list of third parties]] [↑](#footnote-ref-56)
57. [assignment: limitations on the evidence of receipt] [↑](#footnote-ref-57)
58. [selection: determine the behavior of, disable, enable, modify the behavior of] [↑](#footnote-ref-58)
59. [assignment: list of functions] [↑](#footnote-ref-59)
60. [assignment: the authorized identified roles] [↑](#footnote-ref-60)
61. [selection: determine the behavior of, disable, enable, modify the behavior of] [↑](#footnote-ref-61)
62. [assignment: list of functions] [↑](#footnote-ref-62)
63. [assignment: the authorized identified roles] [↑](#footnote-ref-63)
64. [selection: change\_default, query, modify, delete, clear, [assignment: other operations]] [↑](#footnote-ref-64)
65. [assignment: list of TSF data] [↑](#footnote-ref-65)
66. [assignment: the authorized identified roles] [↑](#footnote-ref-66)
67. [selection: change\_default, query, modify, delete, clear, [assignment: other operations]] [↑](#footnote-ref-67)
68. [assignment: list of TSF data] [↑](#footnote-ref-68)
69. [assignment: the authorized identified roles] [↑](#footnote-ref-69)
70. [selection: change\_default, query, modify, delete, clear, [assignment: other operations]] [↑](#footnote-ref-70)
71. [assignment: list of TSF data] [↑](#footnote-ref-71)
72. [assignment: the authorized identified roles] [↑](#footnote-ref-72)
73. [assignment: list of management functions to be provided by the TSF] [↑](#footnote-ref-73)
74. [assignment: the authorized identified roles] [↑](#footnote-ref-74)
75. [assignment: list of TSF Data] [↑](#footnote-ref-75)
76. [assignment: list of external entities] [↑](#footnote-ref-76)
77. [assignment: list of authentication mechanisms]. [↑](#footnote-ref-77)
78. [assignment: list of TSF Data] [↑](#footnote-ref-78)
79. [assignment: list of external entities] [↑](#footnote-ref-79)
80. [assignment: list of authentication mechanisms]. [↑](#footnote-ref-80)
81. [assignment: list of TSF Data] [↑](#footnote-ref-81)
82. [assignment: list of external entities] [↑](#footnote-ref-82)
83. [assignment: list of authentication mechanisms]. [↑](#footnote-ref-83)
84. [assignment: list of TSF Data] [↑](#footnote-ref-84)
85. [assignment: list of external entities] [↑](#footnote-ref-85)
86. [assignment: list of authentication mechanisms]. [↑](#footnote-ref-86)
87. [assignment: list of TSF Data] [↑](#footnote-ref-87)
88. [assignment: list of external entities] [↑](#footnote-ref-88)
89. [assignment: list of authentication mechanisms]. [↑](#footnote-ref-89)
90. [assignment: security attributes] [↑](#footnote-ref-90)
91. [assignment: the external entities] [↑](#footnote-ref-91)
92. [assignment: defined periods] [↑](#footnote-ref-92)
93. [assignment: security attributes] [↑](#footnote-ref-93)
94. [assignment: the external entities] [↑](#footnote-ref-94)
95. [assignment: defined periods] [↑](#footnote-ref-95)
96. [assignment: security attributes] [↑](#footnote-ref-96)
97. [assignment: the external entities] [↑](#footnote-ref-97)
98. [assignment: security attributes] [↑](#footnote-ref-98)
99. [assignment: the external entities] [↑](#footnote-ref-99)
100. [assignment: defined periods] [↑](#footnote-ref-100)
101. [selection: during initial start-up, periodically during normal operation, at the request of the authorized user, at the conditions[assignment: conditions under which self-test should occur]] [↑](#footnote-ref-101)
102. [selection: [assignment: parts of TSF], the TSF]. [↑](#footnote-ref-102)
103. [selection: [assignment: parts of TSF data], TSF data] [↑](#footnote-ref-103)
104. assignment: list of types of failures in the TSF [↑](#footnote-ref-104)
105. [assignment: information flow control SFP] [↑](#footnote-ref-105)
106. [assignment: list of subjects, information, and operations that cause controlled information to flow to and from controlled subjects covered by the SFP] [↑](#footnote-ref-106)
107. [assignment: *information flow control SFP*] [↑](#footnote-ref-107)
108. [assignment: *list of subjects and information controlled under the indicated SFP, and for each, the security attributes*] [↑](#footnote-ref-108)
109. [assignment: *for each operation, the security attribute-based relationship that must hold between subject and information security attributes*] [↑](#footnote-ref-109)
110. [assignment: *additional information flow control SFP rules*] [↑](#footnote-ref-110)
111. [assignment: *rules, based on security attributes, that explicitly authorize information flows*] [↑](#footnote-ref-111)
112. [assignment: rules, based on security attributes, that explicitly deny information flows] [↑](#footnote-ref-112)
113. [assignment: access control SFP(s) and/or information flow control SFP(s)] [↑](#footnote-ref-113)
114. [assignment: additional exportation control rules] [↑](#footnote-ref-114)
115. [selection: allocation of the resource to, deallocation of the resource from] [↑](#footnote-ref-115)
116. [assignment: list of objects] [↑](#footnote-ref-116)
117. [selection: the TSF, another trusted IT product] [↑](#footnote-ref-117)
118. [assignment: list of functions for which a trusted channel is required] [↑](#footnote-ref-118)