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# Sanitized Security Target for Kaspersky Endpoint Security for Windows

# Document History

| Date | Version | Editor | Change |
|---|---|---|---|
| August2014 | 0.86 | Oleg Andrianov | Document creation – first description |
| September 2014 | 0.87 | Alexander Testov | Security Functions revised |
| February 2015 | 0.88 | Alexander Testov | Due to evaluator comments |
| February 2015 | 0.89 | Alexander Testov | Scope extended with anti-virus functionality, GUI |
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| October 2015 | 0.91 | Oleg Andrianov | |
| March 2016 | 0.92 | Alexander Testov | Changes oriented to correct the issues reported; changed the TOE name. |
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| October 2016 | 0.95 | Alexander Testov | Updated the TSS. |
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| June 2017 | 0.97 | Oleg Andrianov | Corrected following ORs. |
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| August 2017 | 0.99 | Oleg Andrianov | Refined security problem definition |
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| July 2018 | 1.05 | Oleg Andrianov | Updated as part of Maintenance process |
| July 2018 | 1.06 | Oleg Andrianov | ST Sanitation- changes to document name and p. 7.1.5 |

# Table of Contents

# Terminology

This Security Target refers to the terms and definitions of Section 4 of Part 1 of the Common Criteria (CC) [CCp1]. Additionally, the following terms and acronyms, most of them specific to Kaspersky Endpoint Security products, shall be defined.

| Term | Definition |
|---|---|
| AES | Advanced Encryption Standard |
| BIOS | Basic Input/Output System |
| ECB | Electronic Code Book |
| EFI | Extensible Firmware Interface |
| EME | Encoding Method Encryption |
| ESP | EFI System Partition |
| FDE | Full Disk Encryption |
| HMAC | Keyed-Hash Message Authentication Code |
| KES | Kaspersky Endpoint Security |
| KSC | Kaspersky Security Center |
| MBR | Master Boot Record |
| OAEP | Optimal Asymmetric Encryption Padding |
| PBKDF | Password-Based Key Derivation Function |
| RSA | Rivest, Shamir und Adleman algorithm |
| SHA | Secure Hash Algorithm |
| TLS | Transport Layer Security |
| Token | Secure device (smart card/Integrated Circuit Card) able to perform RSA encryption with private key |
| UEFI | Unified Extensible Firmware Interface |
| XTS | Xor-encrypt-xor-based tweaked-codebook mode with ciphertext stealing |
| Virus | While technically virus is only one type of malware—specifically replicating file infector—for historic purposes, this term is often used to describe malware in general. So in this document phrases as “Scan for Viruses” should be understood as “Scan for Malware”, etc. |
| Malware | Software which is specifically designed to disrupt, damage, or gain unauthorized access to a computer system and disrupt of information confidentiality, integrity and availability. |
| Known virus | By known viruses is understood list of malware known to Kaspersky lab, specifically those included in the list included in [UGDAA]. |

The referenced documents are listed in Chapter 8. The text does not refer to the document sources because it is always clear which reference is meant.

# 1 ST Introduction

## 1.1 ST Reference

| | |
|---|---|
| Title: | Security Target for<br>**Kaspersky Endpoint Security for Windows** |
| Sponsor: | Kaspersky Lab UK Ltd. |
| Author(s): | Oleg Andrianov, Kaspersky Lab |
| | Alexander Testov, Kaspersky Lab |
| ST Version: | 1.06 |
| Date: | 06-Jul-18 |
| CC Version: | Version 3.1, Revision 5 |
| Assurance Level: | EAL2+, EAL2 augmented with ALC_FLR.1 |
| Keywords: | Full Disk Encryption, Anti-Virus protection, Application Startup Control, Device Control, Web Control |

## 1.2 TOE Reference

The target of evaluation (TOE) in this ST is the **Kaspersky Endpoint Security for Windows (version 11.0.0.6499 AES256)** developed by Kaspersky Lab.

## 1.3 TOE Overview

### 1.3.1 TOE Definition and Operational Usage

The TOE is the **Kaspersky Endpoint Security for Windows**. It is a software product, which provides the encryption of device data (user data, operation system data), anti-virus and access control functionality. Together with the Kaspersky Security Center (KSC) which is used for management functions both parts build a security suite for protection of personal computer systems (work stations, laptops and other devices) using Windows as operating system.

**Kaspersky Endpoint Security (KES)**

Kaspersky Endpoint Security for Windows combines world-class anti-malware with application startup control, device access control, and web access control, plus data encryption in a single application.

Full Disk Encryption as part of Kaspersky Endpoint Security for Windows functionality helps to protect valuable business data from accidental loss due to lost or stolen devices. Kaspersky understands that data loss can result in devastating consequences. Kaspersky Endpoint Security for Windows Encryption functionality provides a strong encryption algorithm integrated in the endpoint protection suite that can be easily managed with a centralised management console.

Kaspersky Endpoint Security consists of components, each of which is responsible for protection against a particular type of threat. They can be organised into three groups covering main product functionality:

1. Anti-Virus protection:
    - File system protection
    - Network protection and traffic scanning
    - Proactive Defense
2. Control:
    - Application Startup Control
    - Device Access Control
    - Web Access Control
3. Encryption:

- Full Disk Encryption
- Removable Device Encryption (not a part of evaluation)
- File Level Encryption (not a part of evaluation)

4. Management of all above.

The overview of the physical architecture is given on the following picture (Fig.1).

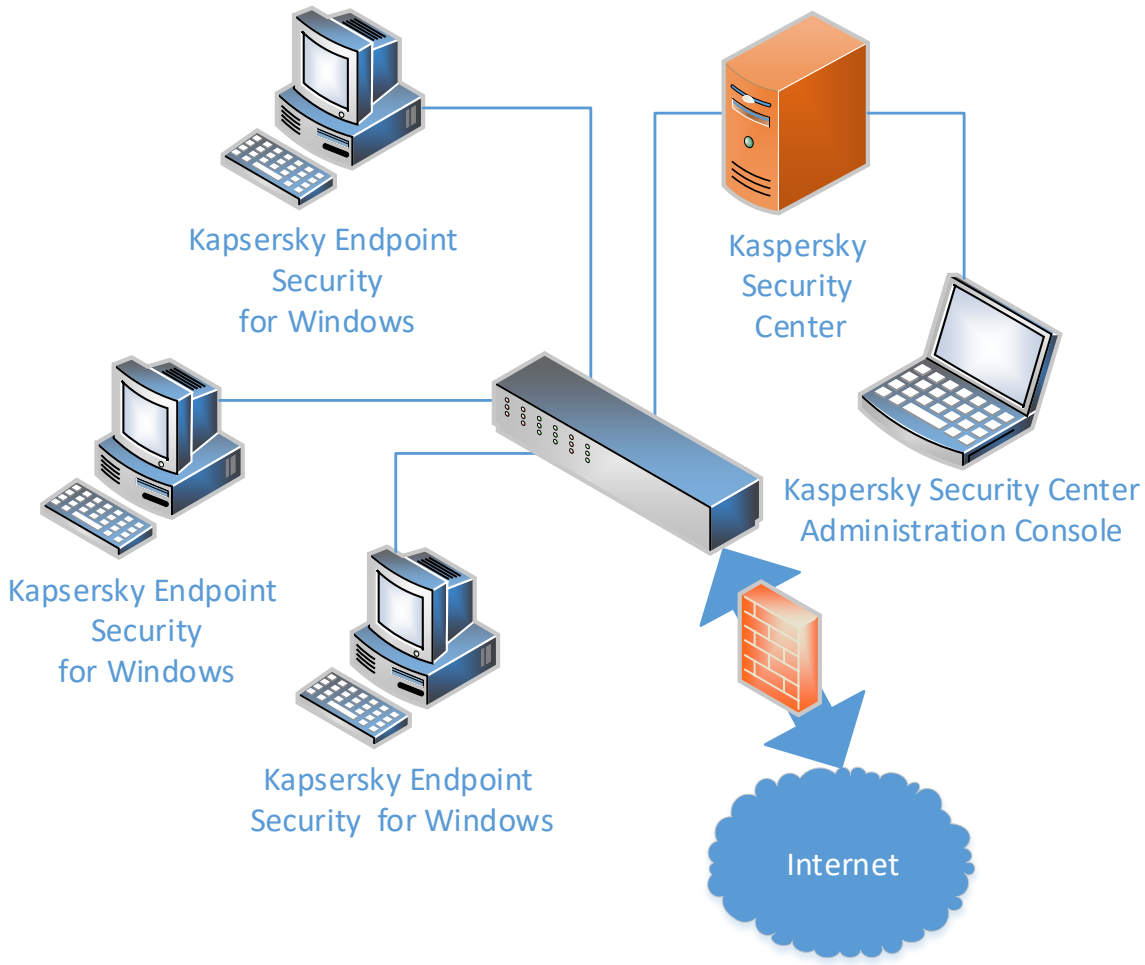



Fig.1 Physical architecture

### 1.3.2 Required Non-TOE hardware/software/firmware

**Hardware**

The TOE has to run on devices (usually personal computer systems) with the following minimum requirements:

Processor: Intel Core i3 Duo 3.10GHz or equivalent

RAM: 2GB of free RAM or more

HDD: 2GB of available hard disk space

Network connection peripherals

**Software**

The Full Disk Encryption of Kaspersky Endpoint Security under this evaluation is provided for the following operating systems:

- Microsoft Windows 10 Professional x86 / x64;
- Microsoft Windows 10 Enterprise x86 / x64;
- Microsoft Windows 8.1 Enterprise x86 / x64;
- Microsoft Windows 8.1 Pro x86 / x64;
- Microsoft Windows 8 Pro x86 / x64;
- Microsoft Windows 8 Enterprise x86 / x64;
- Microsoft Windows 7 Professional x86 / x64 SP1;
- Microsoft Windows 7 Enterprise x86 / x64 SP1;

Kaspersky Endpoint Security – Full Disk Encryption works with the following file systems under Windows: FAT, FAT32, and NTFS4.

Additional requirements for Full Disk Encryption Functionality:

- Different drives for the loader and the operating system are not supported.
- Basic disk partitions are supported. Dynamic disk partitions are not supported.
- At least 2 % of contiguous free disk space shall be available on the disk for encryption.

**Kaspersky Security Center (KSC) – Not a part of the TOE**

Every feature within Kaspersky Endpoint Security for Windows can be set up and managed via Kaspersky Security Center – centralised management console.

Kaspersky Security Center has been developed with the sole purpose of making it easier and quicker to configure, run and manage your IT security and systems – across a complex IT environment. It provides a single, unified management console that can control all of the Kaspersky security and systems management technology.

Kaspersky Security Center enables the installation, configuration and management of Kaspersky's endpoint security technologies

Kaspersky Security Center allows administrators to create various policies that will enable necessary protection functionality, set parameters, schedules and notifications for all protection components. Single-policy management allows creation of encryption, anti-malware, device control, application startup control and other endpoint security settings within a single policy:

- Scan for viruses – on demand or by chosen schedule
- Manage updates of anti-virus databases
- Manage cloud-assisted protection from the Kaspersky Security Network (KSN)
- Configure and manage Kaspersky's advanced firewall and Host-based Intrusion Prevention System
- Set your Application Startup Control policies
- Manage access privileges for devices that users attach to network – according to the type of device, the bus or the device's individual serial number
- Monitor and control web access and privileges – including segmentation of user groups
- Centrally manage all encryption settings and policies to encrypt data on:
    - Hard disks – file / folder encryption or full disk encryption
    - Removable devices – file / folder or full disk encryption

Kaspersky Security Center consists of server component that stores, process and issue data, and administration console, that can be connected.

For the indicated Windows operating systems, the TOE is compatible with all application software released for these Windows operating systems. If application software is not using the respective Application Programming Interface of the Windows OS for disk access, it will not be able to interpret the encrypted data reading directly from disk. Such software may also write plain text data directly onto a protected device. Then this data could not be protected by the TOE against unauthorised disclosure.

However, such software is not used, except for special hard disk operations such as repair and copy functions. It is not recommended to use such software for hard disk operations together with the TOE.

The device, which is secured by the TOE as a part of Kaspersky Endpoint Security, must have a network connection to an administration server. This is usually the Kaspersky Security Center, which stores and manages the security policies and administration/configuration data for each KES. The connection between the device and the KSC server is possible using a web server interface. The server provides a web server socket, where the client connects to. The data exchanged in this connection must be secured. Usually the TOE environment provides a Secure Socket Layer (SSL) resp. Transport Layer Security (TLS) for this purpose.

### 1.3.3 Product physical / logical features and functionality not included in TOE scope

The Kaspersky Endpoint Security for Windows provides other features that are out of the scope of evaluation, therefore there is no assurance level associated with this features and functionality.

Those features are the following:

- Removable Device Encryption functionality
- File Level Encryption functionality
- Detection of malware that are not included in the list of known malware
- Firewall functionality
- Network Attack blocker functionality
- Web Control rules based on website categorization (“By content category”).
- Application startup control rule based on application categorization (“KL Category” rule condition).
- Protection of shared folders against remote encryption as part of the Behavior Detection component.
- Cloud mode for Threat Protection.
- Anti-Bridging feature in Device Control.
- Management through Simplified interface mode.

## 1.4 TOE Description

This section addresses the physical and logical components of the TOE that are included in the evaluation.

### 1.4.1 TOE Physical Scope

The Target of Evaluation (TOE) consists of

1) The program code of the Kaspersky Endpoint Security for Windows Kaspersky. The program code is delivered as binary installation package: *kes_win_11.0.0.6499_en_aes256.exe* with SHA256 checksum:
0F9B3FD649348B2915C483B44D43F479C6EDA46569958B0AFA3A546E2AAAB255
The following parts of the installed programs implement the security functionality of the TOE:
   a) Pre-boot agent for establishing secure access to protected hard drive
   b) Main TOE service managing settings and operations
   c) Drivers for disk access and operations.
2) the User Manual for administering and maintaining Kaspersky Endpoint Security ”Kaspersky Endpoint Security for Windows. User Manual. Version 1.05”, distributed as PDF file with SHA256 checksum C3C6FC047B4F4EC6FC6A66EE9DCF0E989B1A55E6FFE3CFFA40F853C07851D107.
3) the Addendum that references User Manual and TOE architectural evidences ”Kaspersky Endpoint Security for Windows. User Manual. Addendum A. Version 1.05”, distributed

as PDF file with SHA256 checksum 08D65F08833E0C30D8BB64FB804AEDB70C064F813A65E9DFCE23A027AB7660D5.

4) the Guide for preparing for installation and installing Kaspersky Endpoint ”Preparative Procedures for Kaspersky Endpoint Security for Windows”. Version 1.05” distributed as PDF file with SHA256 checksum 0146A2762E9CCE84962905CFA2D2684DB10C00CB7309BAF7DB9013BD968D7636.

The delivery of the TOE is secured in a manner that any user is able to determine the authenticity of the software package received. The delivery package, including the TOE and associated documentation is downloaded from Kaspersky Lab website.

All binary executable files of TOE, including installation package are digitally signed with a Code Signing Certificate with timestamp. This enables customers to verify the origin, integrity and authenticity of the TOE. The installation guide delivered together with the product explains how to securely install and configure product in order to bring it to the evaluated state. Also, the hash sums of the TOE binary files are provided to the customers to confirm that the received TOE files are the expected ones.

### 1.4.2 TOE Logical Scope

**Cryptographic Functionality**

The TOE generates cryptographic keys in accordance with a specified cryptographic key generation algorithm and specified cryptographic key sizes that meet the specified standards.

The TOE destroys cryptographic keys in accordance with a specified cryptographic key destruction method.

The TOE performs cryptographic operations in accordance with a specified cryptographic algorithm and cryptographic key sizes that meet the specified standards.

**Access control policies**

The TOE enforces the policies over FDE access control, application startup control, device access control, and web access control using securely configurable rules.

The TOE enforces the FDE access control policy restricting access to data on HDD for unauthorized users, using full disk encryption methods.

The TOE enforces the application startup control policy to ensure only authorized applications can be launched on protected device. Authorization is granted based on defined access rules.

The TOE enforces the device access control policy to ensure only authorized removable devices can be used on protected device and device access is granted based on defined access rules.

The TOE enforces the web access control policy to ensure internet access to web sites is granted based on defined access rules.

**Anti-Virus protection**

The TOE is able to perform real-time, scheduled, and on-demand scans for viruses based upon known signatures.

The TOE performs scheduled scans at the time and frequency configured by the authorised administrator. Upon detection of a malware, the TOE takes the action specified by the authorised administrator and generates an audit event that might identify the affected object, the malware (name or type) that was detected, and the action taken by the TOE. The TOE also sends an alarm email to the administrator (if specified) when a malware is detected.

**Security Management**

The TOE maintains the roles of KLUser and KLAdmin and is able to associate particular users with them.

The TOE restricts the ability to modify implemented access policies’ security attributes to the authorised administrator only.

The TOE enforces access control policies providing permissive default values for policies' security attributes, except for FDE access policy, which has restrictive ones.

The TOE allows the authorised administrator to specify alternative initial values to override the default values when an object or information is created.

The TOE is capable of performing the management functions on its anti-virus functionality and access controls.

**Identification and authentication**

The TOE requires users to be successfully identified and authenticated before allowing access to its functions.

### 1.4.3 TOE Development Environment

TOE is developed using established development procedures and processes.

Configuration management, code access control is managed by MS Team Foundation System, set of automated tests, both quality and functional, are performed on each build during development process.

Build process is automated as well.

Physical security is maintained in development facility in Moscow, together with relevant personnel screening and education, preventing unauthorised code influence.

Code quality is maintained via code standards, education, regular code reviews. Programming languages and tools are chosen for maximum development efficiency.

Flaw remediation and vulnerability handling are well documented and supported by relevant processes.

### 1.4.4 Evaluated configuration

Evaluated configuration is of TOE deployed on:

- PC with intel core i3 duo 3.10GHz or equivalent with 4GB RAM or more, running Windows 10 enterprise 64 bits

PC with intel core i3 duo 3.10GHz or equivalent with 8GB ram or more, running Windows 2016 standard 64 bits and KSC 10.4.343 should be used for centralized management.

Computers should be connected to LAN.

# 2 Conformance Claims

## 2.1 CC Conformance Claim

This Security Target and the TOE claim conformance to part 2 and part 3 of CC Version 3.1, Revision 5:

- CC part 2 extended (CCMB-2017-04-002),
- CC part 3 conformant (CCMB-2017-04-003).

## 2.2 PP Claim

This Security Target does not claim conformance to a Protection Profile.

## 2.3 Package Claim

This Security Target claims conformance to EAL2 augmented with ALC_FLR.1.

## 2.4 Conformance Rationale

As this Security Target does not claim conformance to a Protection Profile a conformance claim rationale is not necessary.

# 3 Security Problem Definition

## 3.1 Assets

Assets protected by the TOE include two types:

1. User data on the computer.
2. TOE data.

| Name | Short description | Description | Type |
|---|---|---|---|
| ASS.KEYS | Cryptographic Keys | Cryptographic keys used for FDE functionality. | TOE Data |
| ASS.TOE_DATA | TOE Settings, binary files, data in memory, and AV bases. | TOE settings, including secure configuration and system-specific settings that are stored in files and registry, TOE binaries, TOE process in memory and data file containing antimalware records and signatures. | TOE Data |
| ASS.USER_FILE | User files | User files containing user data that can be compromised. | User Data |

## 3.2 Threats to Security

The threats are defined by an adverse action performed by a threat agent on an asset.

Agents may be attackers that are unauthorised users, processes or external entities, for example:

- Persons, who obtain unauthorised physical access to protected device (i.e. stole laptop)
- Hackers (with substantial expertise, standard equipment, and being paid to do so) who is trying to compromise confidentiality and integrity of confidential data by disrupting TOE functionality.

The TOE addresses the following threats:

| Name | Description |
|---|---|
| T.ACCESS_DD | Device data access<br>An attacker with physical access to the switched off device attempts to access any data stored on the encrypted device.<br>**Endangered asset: ASS.USER_FILE (confidentiality, integrity)** |
| T.ACCESS_CD | Configuration data access<br>An attacker attempts to change the TOE security configuration while the device secured by the TOE is switched on (and both the device and the TOE are running). The aim of the manipulation is to get access to data or key in the next steps. The manipulation could be a change of TSF (authentication procedures, key derivation, etc.) or change of TSF data (local user password, policy, etc.)<br>**Endangered asset: ASS.KEYS (confidentiality, integrity), ASS.TOE_DATA (confidentiality, integrity)** |
| T.ACCESS_KD | Cryptographic keys data access<br>An attacker can try to obtain cryptographic keys in plain text or unencrypted key material, which allows keys derivation.<br>**Endangered asset: ASS.KEYS (confidentiality, integrity)** |

| Name | Description |
|---|---|
| T.KEY_DISCLOSURE | Key disclosure<br>An attacker discloses a cryptographic key as a result of a brute force attack or key guessing due to key generation weakness in the TOE.<br>**Endangered asset: ASS.KEYS (confidentiality)** |

## 3.3 Organizational Security Policies

The following table describes the organizational security policies relevant to the operation of the TOE.

| Name | Description |
|---|---|
| P.ACCESS_DV | Use of removable devices should be controlled. Administrators should be able to restrict usage of removable devices on protected machines or certain types of operation. |
| P.LAUNCH | Launch of applications and scripts should be restricted. Administrators shall be able to maintain and enforce a list of permitted or forbidden applications. |
| P.WEBACC | Web access from protected machines have to be controlled or restricted based on web resource properties or data type. |
| P.VIRUS | Files and objects on protected machines have to be checked for known viruses (malware). |

## 3.4 Assumptions

The following assumptions are made to guarantee the TOE's security:

| **Name** | **Description** |
|---|---|
| A.PROTECT_ACCESS | Attacker access protection<br>The device secured by the TOE should not fall under temporary and undetected physical control of an attacker when the device is booted.<br>It is assumed that potential attackers do not have physical or logical access to the device secured by the TOE before and during the TOE installation. |
| A.AUTHORISED_USER | Correct behaviour of authorised users<br>It is assumed that authorised users handle the device secured by the TOE and the TOE itself with the necessary care and diligence.<br>Authorised are not trying to actively compromise the security of the device secured by the TOE and the TOE itself, and are instructed not to leave a device secured by the TOE while it is switched on and running. |
| A.SECURE_SERVER | Secure environment of the KSC server<br>It is assumed that KSC is installed and configured to enable administration of TOE. |

| | |
|---|---|
| | It is assumed that the KSC server is operating in a secure environment with strong physical and logical access restrictions. The secure environment provides the needed quality, integrity and confidentiality of the relevant cryptographic material and keys stored on the KSC server. Furthermore, the security environment provides a secure channel for connection between the device on which TOE is installed and running and the KSC. |
| A.SECURE_OPER | TOE secure operation<br>It is assumed, that non-trusted software (especially with ability to perform direct access to the hard disk or kernel mode operations) is not placed on the device and cannot be executed. |
| A.PROTECT_PASSWD | Password protection<br>It is assumed that all authorised individuals (users, administrators) protect their passwords and/or PINs for Token to avoid its disclosure. It is furthermore assumed that the corresponding security measures sufficiently protect against password eavesdropping and recording using software tools or additional hardware devices. For the configuration that allows the usage of Token as an authentication device, the assumption means a secure handling of Token too. |
| A.TRUST_ADMIN | Trusted administration<br>It is assumed that administrators responsible for the device and KSC server administration can be trusted and perform all tasks regarding the TOE security correctly and with due diligence. |

# 4 Security Objectives

The security objectives are a high-level statement of the intended response to the security problem. These objectives indicate how the security problem, as characterised in the “TOE Security Environment” section, is to be addressed.

## 4.1 Security Objectives for the TOE

The following security objectives are defined for the TOE:

| Name | Description |
|---|---|
| O.ACCESS_DV | Device access control<br>The TOE will provide mechanisms to authorise users to access devices specified by TOE. User authorization is based on access rights configured by the authorised users of the TOE and the binding of external attributes to subjects recognised by the TSF. |
| O.LAUNCH | Application startup control<br>The TOE will provide mechanisms to authorise launch of applications and PowerShell scripts or loading of DLLs and drivers. User authorization is based on access rights configured by the authorised users of the TOE and the binding of external attributes to subjects recognised by the TSF. |
| O.WEBACC | Web access control<br>The TOE will provide mechanisms to authorise users to access web sites specified by TOE once the user has been authenticated. User authorization is based on access rights configured by the authorised users of the TOE and the binding of external attributes to subjects recognised by the TSF. |
| O.SECURE_DATA | Secure data<br>The TOE must provide a functionality to prohibit the access to the device data (user data and operating system data) and cryptographic keys from an unauthorised individual who has physical access to the switched off device. Protection is ensured by a TSF that encrypts the data. Authorised individuals can access the device data after positive authentication (with password or Token usage) and data encryption. The cryptographic mechanisms of the TOE must ensure that an unauthorised individual cannot disclosure a cryptographic key by means of brute force attack or to guess a key due to key generation weakness in the TOE. The TOE has to use strong cryptographic algorithms based on keys with appropriate key length that are resistant against brute force attack. For key generation the TOE uses random numbers from random number generator providing unpredictable results. |
| O.SECURE_MANAGEMENT | Secure management<br>The TOE must provide mechanisms to ensure that only authorised users are able to log in and configure the TOE, and provide protections for logged-in administrators. Authorised users can perform TOE management after successful authentication (for example, password check). |
| O.VIRUS | Anti-Virus<br>The TOE must provide mechanisms to detect and take action against known viruses (malware) introduced to the protected computer via network traffic or removable media. |

## 4.2 Security Objectives for the Operational Environment

The following security objectives are defined for the TOE Operational Environment:

| Name | Description |
|---|---|
| OE.PROTECT_ACCESS | Attacker access protection<br>The device secured by the TOE should not fall under temporary and undetected physical control of an attacker when the device is booted. Potential attacker must not have physical or logical access to the device secured by the TOE before and during the TOE installation. Appropriate physical security measures and physical security policies have to be in place. |
| OE.AUTHORISED_USER | Correct behaviour of authorised users<br>Authorised users shall not actively compromise the security of the device secured by the TOE and the TOE itself and should be instructed not to leave a device secured by the TOE while it is switched on and running. |
| OE.SECURE_SERVER | Secure environment of the KSC server.<br>KSC have to be installed and configured to enable administration of TOE.<br>The KSC server shall be located in a trusted environment that provides strong physical and logical access restrictions. The interaction of integrated security measures in the KSC server environment ensures the needed quality, integrity and confidentiality of the relevant cryptographic material and keys stored on the server.<br>The TOE and the KSC server communicate using a secure SSL connection that is provided by the environment. The NetAgent of the KES has to be used. The NetAgent SSL connection has to be configured to provide a strong server authentication together with strong encryption and integrity protection of all transmitted data. |
| OE.SECURE_OPER | TOE secure operation<br>Non-trusted software (especially with ability to perform direct access to the hard disk) is not installed and will not be installed on the device secured by the TOE. The users are instructed not to install or use utility programs like partition managers or disk copy programs. |
| OE.PROTECT_PASSWD | Password protection<br>All authorised individuals (users, administrators) protect their passwords and/or PINs for Token to avoid disclosure. They are instructed to keep their password secret and not to write down their password, neither manually nor electronically. Unauthorised individuals shall not get the password of an authorised individual. The corresponding security measures sufficiently protect against password/PIN eaves dropping and recording using software tools or additional hardware devices. In particular, the devices and the environment shall be protected against installing any software programs or hardware devices, which enable capturing user password inputs on the keyboard. |
| OE.TRUST_ADMIN | Trusted administration<br>The administrators responsible for the device and KSC server administration have to be trustworthy. They perform all tasks correctly regarding the TOE security. |

## 4.3 Security Objective Rationale

The following table lists all objectives for the TOE and the Operational Environment to show which objectives are necessary to counter a threat or satisfy an assumption or organizational security policies relevant to the operation of the TOE. The table also shows that no objective exists which does not trace back to a threat, policy or assumption.

| Objective / Threat, Assumption | O.ACCESS_DV | O.LAUNCH | O.WEBACC | O.VIRUS | O.SECURE_DATA | O.SECURE_MANAGEMENT | OE.PROTECT_ACCESS | OE.AUTHORISED_USER | OE.SECURE_SERVER | OE.SECURE_OPER | OE.PROTECT_PASSWD | OE.TRUST_ADMIN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T.ACCESS_DD | | | | | X | | | | | | | |
| P.ACCESS_DV | X | | | | | | | | | | | |
| T.ACCESS_CD | | X | | X | | X | X | X | X | X | | X |
| T.ACCESS_KD | | | | | X | | X | X | X | | | |
| T.KEY_DISCLOSURE | | | | | X | | | | | | | |
| P.LAUNCH | | X | | | | | | | | | | |
| P.WEBACC | | | X | | | | | | | | | |
| P.VIRUS | | X | | X | | | | | | | | |
| A.PROTECT_ACCESS | | | | | | | X | | | | | |
| A.AUTHORISED_USER | | | | | | | | X | | | | |
| A.SECURE_SERVER | | | | | | | | | X | | | |
| A.SECURE_OPER | | | | | | | | | | X | | |
| A.PROTECT_PASSWD | | | | | | | | | | | X | |
| A.TRUST_ADMIN | | | | | | | | | | | | X |

The following table shows why the chosen objectives are sufficient to counter a threat or satisfy an assumption.

| Threat, Policy Assumption | Objectives |
|---|---|
| T.ACCESS_DD | O.SECURE_DATA prevents that unauthorised individuals get access to device data and keys stored on the hard disk after the device has been switched off. This security objective exactly counters the threat |

| Threat, Policy Assumption | Objectives |
|---|---|
| | T.ACCESS_DD. |
| P.ACCESS_DV | O.ACCESS_DV prevents that authorised individual use devices that they are not authorised to access.<br>This security objective fulfil the security policy P.ACCESS_DV |
| T.ACCESS_CD | O.SECURE_MANAGEMENT prevents that unauthorised individuals are able to perform local management operations on the TOE and get access to configuration data and passwords.<br>O.LAUNCH prevents that unauthorised individuals or processes execute applications or scripts or load DLLs or drivers that can be used to tamper TOE and TOE configuration.<br>O.VIRUS prevents execution of malware that can be used to tamper TOE and TOE configuration.<br>OE.PROTECT_ACCESS prevents that unauthorised individuals have undetected physical access to the device secured by the TOE that can be used to tamper device to coerce authorised users credentials.<br>OE.AUTHORISED_USER guarantees that authorised users are instructed not to install any software which could modify the TOE programs and configuration data (TSF and TSF data), not to use any software manipulating the hard disk directly and not to leave the device in the time in which the device and the TOE are running.<br>OE.TRUST_ADMIN and OE.SECURE_SERVER guarantee that only authorised individuals provide configuration data for the TOE on the KSC server that is placed in the secure environment.<br>OE.SECURE_OPER guarantees that non-trusted software (especially with ability to perform direct access to the hard disk) is not installed and will not be installed on the device secured by the TOE. |
| T.ACCESS_KD | O.SECURE_DATA prevents that unauthorised individuals get access to device data and keys stored on the hard disk after the device has been switched off.<br>OE.PROTECT_ACCESS prevents that unauthorised individuals TOE should not fall under temporary and undetected physical control of an attacker when the device is booted, where attacker can perform attack on key data in memory.<br>OE.AUTHORISED_USER guarantees that authorised users are instructed not to install any software which could modify the TOE programs and configuration data (TSF and TSF data), not to use any software manipulating the hard disk directly and not to leave the device secured by the TOE in the time in which the device and the TOE are running.<br>OE.SECURE_SERVER guarantees that the TOE and the KSC server communicate using a secure SSL connection that ensures the confidentiality and integrity of all transmitted data. |
| T.KEY_DISCLOSURE | O.SECURE_DATA ensures that strong cryptographic algorithms based on keys with appropriate key length is in use to prevent the disclosure of cryptographic keys by means of brute force attack. Random number generator that provides unpredictable results is used for key generation. This security objective exactly counters threat T.KEY_DISCLOSURE. |
| P.LAUNCH | O.LAUNCH prevents that individuals or processes execute applications or scripts or load DLLs or drivers that are not authorised for use in |

| Threat, Policy Assumption | Objectives |
|---|---|
| | certain operating environment. This security objective exactly fulfils the security policy P.LAUNCH. |
| P.WEBACC | O.WEBACC control web access from protected machine and prevents that an authorised individual connects to certain internet hosts that are restricted by a organizational policy.<br>This security objective exactly fulfil the security policy P.WEBACC |
| P.VIRUS | O.VIRUS makes sure applications and files on a protected machines or removable devices are checked for known malware signatures to implement this organization policy.<br>O.LAUNCH provides access control policies that can be used to prevent launching unknown malicious code, which has not been identified by O.VIRUS. |
| A.PROTECT_ACCESS | OE.PROTECT_ACCESS The device secured by the TOE should not fall under temporary and undetected physical control of an attacker when the device is booted. Potential attacker must not have physical or logical access to the device secured by the TOE before and during the TOE installation. Appropriate physical security measures and physical security policies have to be in place.<br>This security objective exactly covers the assumption A.PROTECT_ACCESS. |
| A.AUTHORISED_USER | OE.AUTHORISED_USER guarantees that do not leave the device secured by the TOE in the time in which the device and the TOE are running, and are not trying to bypass actively compromise the device and TOE. This security objective exactly covers the assumption A.AUTHORISED_USER. |
| A.SECURE_SERVER | OE.SECURE_SERVER ensures that the KSC server is located in a trusted environment with required security measures that provides the needed quality, integrity and confidentiality of the relevant cryptographic material and keys stored on the server. OE.SECURE_SERVER guarantees that the TOE and the KSC server communicate using a secure SSL connection that ensures the confidentiality and integrity of all transmitted data. This security objective exactly covers the assumption A.SECURE_SERVER. |
| A.SECURE_OPER | OE.SECURE_OPER guarantees that non-trusted software (especially with ability to perform direct access to the hard disk) is not installed and will not be installed on the device secured by the TOE. This security objective exactly covers the assumption A.SECURE_OPER. |
| A.PROTECT_PASSWD | OE.PROTECT_PASSWD ensures that all authorised individuals (users, administrators) protect their passwords and PINS for Token to avoid disclosure. The corresponding security measures sufficiently protect against password eavesdropping and recording by use of software tools or additional hardware devices. This security objective exactly covers the assumption A.PROTECT_PASSWD. |
| A.TRUST_ADMIN | OE.TRUST_ADMIN guarantees that administrators responsible for the device and KSC server administration are trustworthy and perform all tasks correctly regarding the TOE security. This security objective exactly covers the assumption A.TRUST_ADMIN. |

# 5 Extended Components Definition

This section defines extended security functionality that is not a part of CC.

## 5.1 Definition of the Class FAV - Anti-Virus

The FAV: Anti-Virus class is composed of three families: Anti-Virus Actions (FAV_ACT), Anti-Virus Alerts (FAV_ALR) and Anti-Virus Scanning (FAV_SCN).

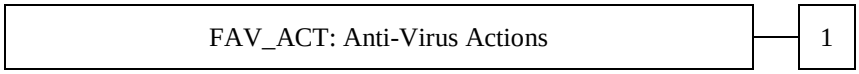
Anti-Virus Actions (FAV_ACT) family addresses the aspects of actions taken on detected viruses, while the Anti-Virus Alerts (FAV_ALR) family is concerned with the correspondent informing about virus detection, and Anti-Virus Scanning (FAV_SCN) family addresses the scanning process.

### 5.1.1 FAV_ACT Anti-Virus Actions

**Family Behaviour**

This family defines requirements for actions to be taken on virus detection.

**Component levelling**




FAV_ACT.1 requires that the TOE take actions against viruses once they detected and defines such actions.

**Management**: FAV_ACT.1

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

a) Configuration of parameters of actions.

**Audit**: There are no actions defined to be auditable.

FAV_ACT.1 Anti-Virus Actions

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

FAV_ACT.1.1 Upon detection of a virus, the TSF shall perform the action(s) specified by [assignment: *authorized users*]. Actions are configurable for each type of scan and consist of:

a) Disinfect,

b) Delete the file,

c) [selection: [assignment: *list of other actions*], *no other actions*].

### 5.1.2 FAV_ALR Anti-Virus Alerts

**Family Behaviour**

This family defines requirements for delivering security alerts to the users.

**Component levelling**

| | |
|---|---|
| FAV_ALR: Anti-Virus Alerts | 1 |

FAV_ALR.1 Anti-Virus Alerts defines alerting requirements to ensure the users are aware that a virus was detected.

**Management**: FAV_ALR.1

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

a) Configuration of parameters of alerts.

**Audit**: There are no actions defined to be auditable.

| | |
|---|---|
| FAV_ALR.1 | Anti-Virus Alerts<br>Hierarchical to: No other components.<br>Dependencies: No dependencies. |
| FAV_ALR.1.1 | The TSF shall be able to generate an audit event indicating detection of a virus. The event shall identify the object, the virus that was detected, and the action taken by the TOE. |
| FAV_ALR.1.2 | The TSF shall send an alarm to [assignment: *alarm destination*] when a virus is detected. |

### 5.1.3 FAV_SCN Anti-Virus Scanning

**Family Behaviour**

This family defines requirements for scanning for viruses.

**Component levelling**

| | |
|---|---|
| FAV_SCN: Anti-Virus Scanning | 1 |

FAV_SCN.1 Anti-Virus Scanning requires that the TOE scans for viruses and defines parameters of scanning.

**Management**: FAV_SCN.1

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

a) Configuration of parameters of scanning.

**Audit**: There are no actions defined to be auditable.

| | |
|---|---|
| FAV_SCN.1 | Anti-Virus Scanning |

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

FAV_SCN.1.1 The TSF shall perform real-time, scheduled, and on-demand scans for viruses based upon known signatures.

FAV_SCN.1.2 The TSF shall perform scheduled scans at the time and frequency configured by [assignment: *authorised identified users*].

# 6 Security Requirements

This ST claims to be CC Part 2 extended, see previous section. No extended Security Assurance Requirements are defined and used, as this ST claims to be CC Part 3 conformant.

The notation, formatting and conventions used in this section are consistent with those used in Version 3.1 of the Common Criteria (CC). The CC allows several operations to be performed on functional requirements; refinement, selection, assignment and iteration are defined in Section 8.1 of Part 1 of the CC:

- Refinements are indicated by **bold** text and ~~strikethrough~~
- Selections are enclosed in [square brackets]
- Assignments are enclosed in [square brackets and underlined]
- Iterations are numbered in sequence as appropriate

## 6.1 Security Functional Requirements

Following SFRs are defined for the TOE:

| SFR | SFR name |
|---|---|
| FCS_CKM.1(1) | Cryptographic key generation (DEK/MK) |
| FCS_CKM.1(2) | Cryptographic key generation (User key) |
| FCS_CKM.4 | Cryptographic key destruction |
| FCS_COP.1(1) | Cryptographic operation (Data Encryption/Decryption) |
| FCS_COP.1(2) | Cryptographic operation (Key Encryption/Decryption) |
| FCS_COP.1(3) | Cryptographic operation (HMAC calculation) |
| FCS_COP.1(4) | Cryptographic operation (RSA Key Encryption) |
| FDP_ACC.1(1) | Subset access control (FDE) |
| FDP_ACC.1(2) | Subset access control (ASC) |
| FDP_ACC.1(3) | Subset access control (DAC) |
| FDP_IFC.1 | Subset information flow control (WAC) |
| FDP_ACF.1(1) | Security attribute based access control (FDE) |
| FDP_ACF.1(2) | Security attribute based access control (ASC) |
| FDP_ACF.1(3) | Security attribute based access control (DAC) |
| FDP_IFF.1 | Simple security attributes (WAC) |
| FIA_UAU.2 | User authentication before any action |
| FIA_UID.2 | User identification before any action |
| FMT_MSA.1(1) | Management of security attributes (FDE) |
| FMT_MSA.1(2) | Management of security attributes (ASC) |
| FMT_MSA.1(3) | Management of security attributes (DAC) |
| FMT_MSA.1(4) | Management of security attributes (WAC) |
| FMT_MSA.3(1) | Static attribute initialisation (FDE) |

| | |
|---|---|
| FMT_MSA.3(2) | Static attribute initialisation (ASC) |
| FMT_MSA.3(3) | Static attribute initialisation (DAC) |
| FMT_MSA.3(4) | Static attribute initialisation (WAC) |
| FMT_MTD.1 | Management of TSF data |
| FMT_SMF.1 | Specification of management functions |
| FMT_SMR.1 | Security roles |
| FAV_ACT.1 | Anti-virus actions |
| FAV_ALR.1 | Anti-virus alerts |
| FAV_SCN.1 | Anti-virus scanning |

### 6.1.1 Class FCS: Cryptographic Support

#### *6.1.1.1 FCS_CKM.1(1) Cryptographic key generation (DEK/MK)*

FCS_CKM.1(1).1 The TSF shall generate cryptographic keys in accordance with a specified cryptographic key generation algorithm [key generation using a deterministic random number generator][1] and specified cryptographic key sizes [256 bit][2] that meet the following: [Hash_DRBG according to NIST SP 800-90A with SHA-256][3].

*Application note 1*: For the XTS-AES-256 the TSF generates two AES keys, each 256 bit long in accordance with the mentioned algorithm.

#### *6.1.1.2 FCS_CKM.1(2) Cryptographic key generation (User key)*

FCS_CKM.1(2).1 The TSF shall generate cryptographic keys in accordance with a specified cryptographic key generation algorithm [Password-Based Key Derivation Function 2 (PBKDF2) with HMAC-SHA256, 10.000 iteration value, 256 bit salt and password as input][4] and specified cryptographic key sizes [256 bit][5] that meet the following: [SP 800-132 Option 2a,][6].

#### *6.1.1.3 FCS_CKM.4 Cryptographic key destruction*

FCS_CKM.4.1 The TSF shall destroy cryptographic keys in accordance with a specified cryptographic key destruction method [overwriting with zeroes][7] that meets the following: [none][8].

#### *6.1.1.4 FCS_COP.1(1) Cryptographic operation (Data Encryption/Decryption)*

FCS_COP.1(1).1 The TSF shall perform [symmetric encryption/decryption of device block data][9] in accordance with a specified cryptographic algorithm [XTS-AES-256][10] and

[1] [assignment: *cryptographic key generation algorithm*]
[2] [assignment: *cryptographic key sizes]*
[3] [assignment: *list of standards*]
[4] [assignment: *cryptographic key generation algorithm*]
[5] [assignment: *cryptographic key sizes]*
[6] [assignment: *list of standards*]
[7] [assignment: *cryptographic key destruction method*]
[8] [assignment: *list of standards*]

cryptographic key sizes [256 bit][11] that meet the following: [NIST SP 800-38E,FIPS-197][12].

*Application note 2*: The TSF uses two AES keys, each 256 bit long in accordance with the mentioned algorithm and standard.

#### *6.1.1.5 FCS_COP.1(2) Cryptographic operation (Key Encryption/Decryption)*

FCS_COP.1(2).1 The TSF shall perform [symmetric encryption/decryption of data (key)][13] in accordance with a specified cryptographic algorithm [AES-256-ECB][14] and cryptographic key sizes [256 bit][15] that meet the following: [FIPS-197, NIST SP 800-38A][16].

#### *6.1.1.6 FCS_COP.1(3) Cryptographic operation (HMAC calculation)*

FCS_COP.1(3).1 The TSF shall perform [Keyed-Hash Message Authentication Code calculation][17] in accordance with a specified cryptographic algorithm [HMAC-SHA256][18] and cryptographic key sizes [256 bit][19] that meet the following: [FIPS 180-4, and FIPS-198-1][20].

*Application note 3*: The TSF uses the AES keys (Master Key) for HMAC-SHA256 calculation.

#### *6.1.1.7 FCS_COP.1(4) Cryptographic operation (RSA Key Encryption)*

FCS_COP.1(4).1 The TSF shall perform [asymmetric data encryption of data (key)][21] in accordance with a specified cryptographic algorithm [RSA-EME-OAEP][22] and cryptographic key sizes [2048 bit][23] that meet the following: [PKCS#1, v2.2][24].

### 6.1.2 Class FDP: User Data Protection

#### *6.1.2.1 FDP_ACC.1(1) Subset access control (FDE)*

FDP_ACC.1(1).1 The TSF shall enforce the [FDE Access Control SFP][25] on [Subjects (Authorised Users), Objects (Device data / DEK), Operations (transparently decrypt device data using DEK)][26].

---

[9] [assignment: *list of cryptographic operations*]
[10] [assignment: *cryptographic algorithm*]
[11] [assignment: *cryptographic key sizes]*
[12] [assignment: *list of standards*]
[13] [assignment: *list of cryptographic operations*]
[14] [assignment: *cryptographic algorithm*]
[15] [assignment: *cryptographic key sizes]*
[16] [assignment: *list of standards*]
[17] [assignment: *list of cryptographic operations*]
[18] [assignment: *cryptographic algorithm*]
[19] [assignment: *cryptographic key sizes]*
[20] [assignment: *list of standards*]
[21] [assignment: *list of cryptographic operations*]
[22] [assignment: *cryptographic algorithm*]
[23] [assignment: *cryptographic key sizes]*
[24] [assignment: *list of standards*]
[25] [assignment: *access control SFP*]
[26] [assignment: *list of subjects, objects, and operations among subjects and objects covered by the SFP*]

#### 6.1.2.2 FDP_ACC.1(2) Subset access control (ASC)

FDP_ACC.1(2).1 The TSF shall enforce the [Application Startup Control SFP][27] on [Subjects (Authorised Users), Objects (Executable binaries and Scripts), Operations (execute)][28].

*Application note 4*: Here and further in this class SFRs: Among Authorised Users can be: Users, Groups, or Built-in security principals (including the operating system process). Not to be mixed up with the security roles of KLUser and KLAdmin (FMT_SMR.1). While all Users are KLUsers, this SFP can also be applied to other system entities.

*Application note 5*: Here and further in this class SFRs: by 'Executable binaries' are meant Applications, dynamic link libraries (DLL modules), and system drivers. By Scripts are meant JavaScripts, VBscripts, Windows Registry files (.reg), Windows Command scripts (.cmd), Batch Command Files (.bat), PowerShell Scripts.

*Application note 6*: Here and further in this class SFRs: by 'Execution' is understood application launch, loading of DLL modules or drivers, execution of Scripts through supported execution methods. Execution of scripts from running interpretation is not covered.

#### 6.1.2.3 FDP_ACC.1(3) Subset access control (DAC)

FDP_ACC.1(3).1 The TSF shall enforce the [Device Access Control SFP][29] on [Subjects (Authorised Users), Objects (Device data), Operations (read, write)][30].

#### 6.1.2.4 FDP_IFC.1 Subset information flow control (WAC)

FDP_IFC.1.1 The TSF shall enforce the [Web Access Control SFP][31] on [Subjects (Authorised Users), Information (web content through HTTP), Operations (get, post)][32].

#### 6.1.2.5 FDP_ACF.1(1) Security attribute based access control (FDE)

FDP_ACF.1(1).1 The TSF shall enforce the [FDE Access Control SFP][33] to objects based on the following: [Subjects (Authorised Users), Objects (device data / DEK), Subject attributes (password); Object attributes: (IDs of disks covered by SFP)][34].

FDP_ACF.1(1).2 The TSF shall enforce the following rules to determine if an operation among controlled subjects and controlled objects is allowed: [If the checks (Password Key derivation with PBKDF2, User Key decryption with Password Key, Master Key decryption with User Key, HMAC-SHA256 calculation with Master Key, HMAC-SHA256 has to match the stored user verification value) transparent decryption is performed][35].

FDP_ACF.1(1).3 The TSF shall explicitly authorise access of subjects to objects based on the following additional rules: [if disk ID is not among IDs of disks covered by policy][36].

---

[27] [assignment: *access control SFP*]
[28] [assignment: *list of subjects, objects, and operations among subjects and objects covered by the SFP*]
[29] [assignment: *access control SFP*]
[30] [assignment: *list of subjects, objects, and operations among subjects and objects covered by the SFP*]
[31] [assignment: *information flow control SFP*]
[32] [assignment: *list of subjects, information, and operations that cause controlled information to flow to and from controlled subjects covered by the SFP*]
[33] [assignment: *access control SFP*]
[34] [assignment: *list of subjects and objects controlled under the indicated SFP, and for each, the SFP-relevant security attributes, or named groups of SFP-relevant security attributes*]
[35] [assignment: *rules governing access among controlled subjects and controlled objects using controlled operations on controlled objects*]
[36] [assignment: *rules, based on security attributes, that explicitly authorise access of subjects to objects*]

FDP_ACF.1(1).4 The TSF shall explicitly deny access of subjects to objects based on the following additional rules: [no additional rules][37].

#### *6.1.2.6 FDP_ACF.1(2) Security attribute based access control (ASC)*

FDP_ACF.1(2).1 The TSF shall enforce the [Application Startup Control SFP][38] to objects based on the following: [Subjects (Authorised Users), Objects (Executable binaries and scripts), Subject attributes (Authorized users IDs) and Object's attributes as defined in a table below][39].

| Object | Object attributes group | Object Attributes | Attribute description |
|---|---|---|---|
| Executable binaries and scripts | Properties | File hash code | Sha256 hash value of object. |
| | | Path to file | System path to object, including wildcards. |
| | | Condition by file drive | Object is being located on removable drive. |
| | Certificate *(Properties of Authenticode signature on the object if exists)* | Issuer | Issuer field in certificate, used to sign object. |
| | | Subject | Subject field in certificate, used to sign object. |
| | | Thumbprint | Thumbprint field in certificate, used to sign object. |
| | Metadata *(Fields in object properties section, if exists)* | File name | Field in file properties section. |
| | | File Version | Field in file properties section (with logical operations). |
| | | Application name | Field in file properties section. |
| | | Application version | Field in file properties section (with logical operations). |
| | | Vendor | Field in file properties section. |

FDP_ACF.1(2).2 The TSF shall enforce the following rules to determine if an operation among controlled subjects and controlled objects is allowed: [when an Authorised user is trying to execute application or script or to load DLLs or drivers the active user identity and object attributes are compared to applicable rules in active policy which applies to application. The outcome of these rule decisions is one of the following states: startup is allowed, startup is blocked][40].

FDP_ACF.1(2).3 The TSF shall explicitly authorise access of subjects to objects based on the following additional rules: [if Application Startup Control mode is set to "Black List" all objects not matching attributes in policy are allowed to execute or object is part of the TOE or application startup control functionality is disabled][41].

[37] [assignment: *rules, based on security attributes, that explicitly deny access of subjects to objects*]
[38] [assignment: *access control SFP*]
[39] [assignment: *list of subjects and objects controlled under the indicated SFP, and for each, the SFP-relevant security attributes, or named groups of SFP-relevant security attributes*]
[40] [assignment: *rules governing access among controlled subjects and controlled objects using controlled operations on controlled objects*]
[41] [assignment: *rules, based on security attributes, that explicitly authorise access of subjects to objects*]

FDP_ACF.1(2).4 The TSF shall explicitly deny access of subjects to objects based on the following additional rules: [if Application Startup Control mode is set to "White List" all objects not matching attributes in policy are blocked from execution][42].

#### *6.1.2.7 FDP_ACF.1(3) Security attribute based access control (DAC)*

FDP_ACF.1(3).1 The TSF shall enforce the [Device Access Control SFP][43] to objects based on the following: [Subjects (Authorised Users), Objects (removable media), Subjects attributes(Authorised Users IDs, assigned access schedule), Object attributes (target device type, device bus, device properties)][44].

FDP_ACF.1(3).2 The TSF shall enforce the following rules to determine if an operation among controlled subjects and controlled objects is allowed: [operations are checked against the set of rules containing device type, device bus, device properties, Authorised User ID and access schedule for this user. The outcome of this is two states: access allowed or access blocked][45].

FDP_ACF.1(3).3 The TSF shall explicitly authorise access of subjects to objects based on the following additional rules: [when this control is disabled ][46].

FDP_ACF.1(3).4 The TSF shall explicitly deny access to objects based on the following additional rules: [if there are conflicting rules both blocking and allowing to the object][47].

#### *6.1.2.8 FDP_IFF.1 Simple security attributes (WAC)*

FDP_IFF.1.1 The TSF shall enforce the [Web Access Control SFP][48] based on the following types of subject and information security attributes: [Subjects (Authorised Users), Information (web content through HTTP), Subject attributes (Authorised User ID) and Information security attributes (Web address, Content type, Time of operation)][49].

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: [SFP rules do not contain any attributes matching transmitted information][50].

FDP_IFF.1.3 The TSF shall enforce the [warning alerts for user if action Warn is defined in rules, that matches transmitted information, subject and operation time and has higher priority than other matching rules][51].

FDP_IFF.1.4 The TSF shall explicitly authorise an information flow based on the following rules: [if action Allow is defined in rules, that matches transmitted information, subject and operation time and has higher priority than other matching rules][52].

FDP_IFF.1.5 The TSF shall explicitly deny an information flow based on the following rules: [if action Block is defined in rules, that matches transmitted information, subject and operation time and has higher priority than other matching rules][53].

---

[42] [assignment: *rules, based on security attributes, that explicitly deny access of subjects to objects*]
[43] [assignment: *access control SFP*]
[44] [assignment: *list of subjects and objects controlled under the indicated SFP, and for each, the SFP-relevant security attributes, or named groups of SFP-relevant security attributes*]
[45] [assignment: *rules governing access among controlled subjects and controlled objects using controlled operations on controlled objects*]
[46] [assignment: *rules, based on security attributes, that explicitly authorise access of subjects to objects*]
[47] [assignment: *rules, based on security attributes, that explicitly deny access of subjects to objects*]
[48] [assignment: *information flow control SFP*]
[49] [assignment: *list of subjects and information controlled under the indicated SFP, and for each, the security attributes*]
[50] [assignment: *for each operation, the security attribute-based relationship that must hold between subject and information security attributes*]
[51] [assignment: *additional information flow control SFP rules*]
[52] [assignment: *rules, based on security attributes, that explicitly authorise information flows*]
[53] [assignment: *rules, based on security attributes, that explicitly deny information flows*]

### 6.1.3 Class FIA: Identification and Authentication

#### *6.1.3.1 FIA_UAU.2 User authentication before any action*

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.

#### *6.1.3.2 FIA_UID.2 User identification before any action*

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.

### 6.1.4 Class FMT: Security Management

#### *6.1.4.1 FMT_MSA.1(1) Management of security attributes (FDE)*

FMT_MSA.1(1).1 The TSF shall enforce the [FDE Access Control SFP][54] to restrict the ability to [modify][55] the security attributes [IDs of disks covered by SFP][56] to [KLAdmin][57].

#### *6.1.4.2 FMT_MSA.1(2) Management of security attributes (ASC)*

FMT_MSA.1(2).1 The TSF shall enforce the [Application Startup Control SFP][58] to restrict the ability to [modify, delete][59] the security attributes [Subject attributes and Object attributes as defined in 6.1.2.6][60] to [KLAdmin][61].

#### *6.1.4.3 FMT_MSA.1(3) Management of security attributes (DAC)*

FMT_MSA.1(3).1 The TSF shall enforce the [Device Access Control SFP][62] to restrict the ability to [modify][63] the security attributes [target device type, device bus, device properties][64] to [KLAdmin][65].

#### *6.1.4.4 FMT_MSA.1(4) Management of security attributes (WAC)*

FMT_MSA.1(4).1 The TSF shall enforce the [Web Access Control SFP][66] to restrict the ability to [modify, delete][67] the security attributes [Subject attributes and Object attributes as defined in 6.1.2.8][68] to [KLAdmin][69].

---

[54] [assignment: *access control SFP(s), information flow control SFP(s)*]
[55] [selection: *change_default, query, modify, delete, [assignment: other operations]*]
[56] [assignment: *list of security attributes*]
[57] [assignment: *the authorised identified roles*]
[58] [assignment: *access control SFP(s), information flow control SFP(s)*]
[59] [selection: *change_default, query, modify, delete, [assignment: other operations]*]
[60] [assignment: *list of security attributes*]
[61] [assignment: *the authorised identified roles*]
[62] [assignment: *access control SFP(s), information flow control SFP(s)*]
[63] [selection: *change_default, query, modify, delete, [assignment: other operations]*]
[64] [assignment: *list of security attributes*]
[65] [assignment: *the authorised identified roles*]
[66] [assignment: *access control SFP(s), information flow control SFP(s)*]
[67] [selection: *change_default, query, modify, delete, [assignment: other operations]*]
[68] [assignment: *list of security attributes*]
[69] [assignment: *the authorised identified roles*]

#### *6.1.4.5 FMT_MSA.3(1) Static attribute initialisation (FDE)*

FMT_MSA.3(1).1 The TSF shall enforce the [FDE Access Control SFP][70] to provide [restrictive][71] default values for security attributes that are used to enforce the SFP.

FMT_MSA.3(1).2 The TSF shall allow the [KLAdmin][72] to specify alternative initial values to override the default values when an object or information is created.

*Application note 7*: For the first device data encryption, user accounts with pre-defined passwords have to be available. User accounts with pre-defined passwords are either generated by the TOE in accordance with the administration data (TSF data) received from the administration server or received by the TOE with these administration data (TSF data). The FDE Access Control SFP regulates the authorization for device data decryption, which is possible only with the Data Encryption Key (DEK) and only by authenticated user with valid password. The password is not valid for device data access if the user did not changed the pre-defined password or the administration data (TSF data) received from the administration server pointed a password changing necessity out. If the user has not changed the password, the access to the DEK and device data is forbidden. The successful authentication with such a password allows password changing only.

#### *6.1.4.6 FMT_MSA.3(2) Static attribute initialisation (ASC)*

FMT_MSA.3(2).1 The TSF shall enforce the [Application Startup control SFP][73] to provide [permissive][74] default values for security attributes that are used to enforce the SFP.

FMT_MSA.3(2).2 The TSF shall allow the [KLAdmin][75] to specify alternative initial values to override the default values when an object or information is created.

#### *6.1.4.7 FMT_MSA.3(3) Static attribute initialisation (DAC)*

FMT_MSA.3(3).1 The TSF shall enforce the [Device Access Control SFP][76] to provide [permissive][77] default values for security attributes that are used to enforce the SFP.

FMT_MSA.3(3).2 The TSF shall allow the [KLAdmin][78] to specify alternative initial values to override the default values when an object or information is created.

#### *6.1.4.8 FMT_MSA.3(4) Static attribute initialisation (WAC)*

FMT_MSA.3(4).1 The TSF shall enforce the [Web Access Control SFP][79] to provide [permissive][80] default values for security attributes that are used to enforce the SFP.

FMT_MSA.3(4).2 The TSF shall allow the [KLAdmin][81] to specify alternative initial values to override the default values when an object or information is created.

#### *6.1.4.9 FMT_MTD.1 Management of TSF data*

FMT_MTD.1.1 The TSF shall restrict the ability to [modify, change default][82] the [TSF data listed in a table below][83] to [roles listed in a table below][84].

---

[70] [assignment: *access control SFP(s), information flow control SFP(s)*]
[71] [selection, choose one of: *restrictive, permissive, [assignment: other property]*]
[72] [assignment: *the authorised identified roles*]
[73] [assignment: *access control SFP(s), information flow control SFP(s)*]
[74] [selection, choose one of: *restrictive, permissive, [assignment: other property]*]
[75] [assignment: *the authorised identified roles*]
[76] [assignment: *access control SFP(s), information flow control SFP(s)*]
[77] [selection, choose one of: *restrictive, permissive, [assignment: other property]*]
[78] [assignment: *the authorised identified roles*]
[79] [assignment: *access control SFP(s), information flow control SFP(s)*]
[80] [selection, choose one of: *restrictive, permissive, [assignment: other property]*]
[81] [assignment: *the authorised identified roles*]
[82] [selection: *change_default, query, modify, delete, clear, [assignment: other operations]*]
[83] [assignment: *list of TSF data*]
[84] [assignment: *the authorised identified roles*]

| SFR | TSF | TSF data | Authorised User |
|---|---|---|---|
| **FMT_SMR.1** | SF_MGNT | Password | KLUser, KLAdmin |
| **FAV_ACT.1** | SF_AVP | Default actions to be taken | KLAdmin |
| **FAV_ALR.1** | SF_AVP | Audit log size, notification settings | KLAdmin |
| **FAV_SCN.1** | SF_AVP | Types of scan, scan schedule, scan exclusions | KLAdmin |

#### *6.1.4.10 FMT_SMF.1 Specification of Management Functions*

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

Managing the FDE Access Control SFP attributes used to make explicit access or denial based decisions,

Managing the Application Startup Control SFP attributes used to make explicit access or denial based decisions,

Managing the Device Access Control SFP attributes used to make explicit access or denial based decisions,

Managing the Web Access Control SFP attributes used to make explicit access based decisions,

Managing TSF data, as defined in FMT_MTD.1

Managing of the authentication data by an administrator or by the user associated with this data][85].

#### *6.1.4.11 FMT_SMR.1 Security roles*

FMT_SMR.1.1 The TSF shall maintain the roles [KLUser, KLAdmin][86][87].

FMT_SMR.1.2 The TSF shall be able to associate users with roles.

### 6.1.5 Class FAV: Anti-Virus (Explicitly Stated)

#### *6.1.5.1 FAV_ACT.1 Anti-Virus Actions*

FAV_ACT.1.1 Upon detection of a virus, the TSF shall perform the action(s) specified by [KLAdmin]. Actions are administratively configurable for each type of scan and consist of:

a) Disinfect,

b) Delete the file,

c) [Block,

d) Ignore][88]

*Application note 8*: Depending on malware and object type, some actions may not be applicable. The TOE should attempt alternative action or inform authorised users about the action failure.

[85] [assignment: *list of management functions to be provided by the TSF*]
[86] KLUser and KLAdmin roles are referred to as User and Administrator respectively in [UGD].
[87] [assignment: *the authorised identified roles*]
[88] [selection: [*assignment: list of other actions*], *no other actions*]

#### *6.1.5.2 FAV_ALR.1 Anti-Virus Alerts*

FAV_ALR.1.1 The TSF shall be able to generate an audit event indicating detection of a malware. The event shall identify the object, the virus that was detected, and the action taken by the TOE.

FAV_ALR.1.2 The TSF shall send an alarm [to the specified email][89] when a virus is detected.

#### *6.1.5.3 FAV_SCN.1 Anti-Virus Scanning*

FAV_SCN.1.1 The TSF shall perform real-time, scheduled, and on-demand scans for viruses based upon known signatures.

FAV_SCN.1.2 The TSF shall perform scheduled scans at the time and frequency configured by [KLAdmin].

[89] [assignment: *alarm destination*]

## 6.2 Security Assurance Requirements

The TOE conforms to all security assurance requirements in EAL2 as defined in CC part 3 augmented with ALC_FLR.1. The following table lists all SARs. A **bold** typeface is used to indicate that ALC_FLR.1 is an augmentation to EAL2.

| Assurance Class | Assurance Components |
|---|---|
| ADV | ADV_ARC.1, ADV_FSP.2, ADV_TDS.1 |
| AGD | AGD_OPE.1, AGD_PRE.1 |
| ALC | ALC_CMC.2, ALC_CMS.2, ALC_DEL.1, **ALC_FLR.1** |
| ASE | ASE_CCL.1, ASE_ECD.1, ASE_INT.1, ASE_OBJ.2, ASE_REQ.2, ASE_SPD.1, ASE_TSS.1 |
| ATE | ATE_COV.1, ATE_FUN.1, ATE_IND.2 |
| AVA | AVA_VAN.2 |

## 6.3 Security Functional Requirements Rationale

The following table maps security objectives to security functional requirements, showing that each security objective is covered by at least one security functional requirement and that no security functional requirement exists that is not needed by any security objective.

| Objective / Requirement | O.SECURE_DATA | O.LAUNCH | O.ACCESS_DV | O.VIRUS | O.WEBACC | O.SECURE_MANAGEMENT |
|---|---|---|---|---|---|---|
| **FCS_CKM.1(1)** | X | | | | | |
| **FCS_CKM.1(2)** | X | | | | | X |
| **FCS_CKM.4** | X | | | | | |
| **FCS_COP.1(1)** | X | | | | | |
| **FCS_COP.1(2)** | X | | | | | |
| **FCS_COP.1(3)** | X | | | | | X |
| **FCS_COP.1(4)** | X | | | | | |
| **FDP_ACC.1(1)** | X | | | | | |
| **FDP_ACC.1(2)** | | X | | | | |

| Objective / Requirement | O.SECURE_DATA | O.LAUNCH | O.ACCESS_DV | O.VIRUS | O.WEBACC | O.SECURE_MANAGEMENT |
|---|---|---|---|---|---|---|
| **FDP_ACC.1(3)** | | | X | | | |
| **FDP_IFC.1** | | | | | X | |
| **FDP_ACF.1(1)** | X | | | | | |
| **FDP_ACF.1(2)** | | X | | | | |
| **FDP_ACF.1(3)** | | | X | | | |
| **FDP_IFF.1** | | | | | X | |
| **FIA_UAU.2** | X | | | | | X |
| **FIA_UID.2** | X | | | | | X |
| **FMT_MSA.1(1)** | | | | | | X |
| **FMT_MSA.1(2)** | | | | | | X |
| **FMT_MSA.1(3)** | | | | | | X |
| **FMT_MSA.1(4)** | | | | | | X |
| **FMT_MSA.3(1)** | | | | | | X |
| **FMT_MSA.3(2)** | | | | | | X |
| **FMT_MSA.3(3)** | | | | | | X |
| **FMT_MSA.3(4)** | | | | | | X |
| **FMT_MTD.1** | | X | X | X | X | X |
| **FMT_SMF.1** | | | | | | X |
| **FMT_SMR.1** | X | | | | | X |
| **FAV_ACT.1** | | | | X | | |
| **FAV_ALR.1** | | | | X | | |
| **FAV_SCN.1** | | | | X | | |

The following table shows what the individual security functional requirements contribute to the objective and that the requirements are sufficient to satisfy the objective.

| Objective | Requirements |
|---|---|

| Objective | Requirements |
|---|---|
| O.SECURE_DATA | User authentication and data encryption ensure the device data protection in case of a physical access to the device.<br>FDP_ACC.1(1) and FDP_ACF.1 define the rules and conditions for the data and cryptographic key access.<br>FCS_COP.1(1) describes the data encryption/decryption with the keys generated as defined in FCS_CKM.1(1).<br>FCS_COP.1(2) defines the key encryption/decryption with the keys generated as defined in FCS_CKM.1(1).<br>FCS_COP.1(3) defines the HMAC calculation needed for authentication verification.<br>FCS_COP.1(4) defines the key encryption using RSA with 2048-bit key. The SFR support the authentication with Token usage.<br>FCS_CKM.1(1) requires key generation using a deterministic random number generator.<br>FCS_CKM.1(2) describes key generation using defined Password-Based Key Derivation Function.<br>FCS_CKM.4 ensures that keys are destroyed in a safe way.<br>FIA_UAU.2 requires user authentication before allowing any other TSF-mediated actions.<br>FIA_UID.2 requires user identification before allowing any other TSF-mediated actions.<br>FMT_SMR.1 allows to associate users with the security role of authenticated user. |
| O.LAUNCH | FMT_MTD.1 allows the authenticated user to change settings.<br>FDP_ACC.1(2) and FDP_ACF.1(2) define attributes and rules to be used when providing application startup control functionality. |
| O.ACCESS_DV | FMT_MTD.1 allows the authenticated user to change settings.<br>FDP_ACC.1(3) and FDP_ACF.1(3) define attributes and rules to be used when providing device access control functionality. |
| O.WEBACC | FMT_MTD.1 allows the authenticated user to change settings.<br>FDP_IFC.1 and FDP_IFF.1 define attributes and rules to be used when providing web access control functionality. |
| O.VIRUS | FAV_SCN.1 defines anti-virus scanning used to detect viruses.<br>FAV_ACT.1 defines actions that the TOE is attempting on detected virus.<br>FAV_ALR.1 defines alerts and audit events generated to inform the TOE users of detected viruses.<br>FMT_MTD.1 allows the authenticated user to change settings. |
| O.SECURE_MANAGEMENT | TOE management operations have to be forbidden for unauthorised individuals to protect the TSF and TSF data.<br>FCS_COP.1(3) defines the HMAC calculation needed for authentication verification.<br>FCS_CKM.1(2) describes key generation using defined Password-Based Key Derivation Function.<br>FIA_UAU.2 requires user authentication before allowing any other TSF-mediated actions.<br>FIA_UID.2 requires user identification before allowing any other TSF-mediated actions. |

| Objective | Requirements |
|---|---|
| | FMT_SMR.1 allows to associate users with the security role of authenticated user.<br>FMT_MSA.1(1) and FMT_MTD.1 restrict the password modification possibility to authenticated administrator.<br>FMT_MSA.1(2) and FMT_MTD.1 restrict the possibility of application metadata and properties modification to authenticated administrator.<br>FMT_MSA.1(3) and FMT_MTD.1 restrict the target device type, device bus, device properties modification possibility to authenticated administrator.<br>FMT_MSA.1(4) and FMT_MTD.1 restrict the web site address and content modification possibility to authenticated administrator.<br>FMT_MSA.3(1) specifies the initial encrypted disk(s) setting by administrator via administration server or authenticated administrator.<br>FMT_MSA.3(2) specifies the initial application metadata and properties setting by administrator via administration server or authenticated administrator.<br>FMT_MSA.3(3) specifies the initial target device type, device bus, device properties setting by administrator via administration server or authenticated administrator.<br>FMT_MSA.3(4) specifies the initial web site address and content setting by administrator via administration server or authenticated administrator.<br>FMT_MTD.1 allows the authenticated user or administrator to change the password and TSF data.<br>FMT_SMF.1 describes the security functions can be used to ensure the secure operation of the TOE. |

### 6.3.1 Security Functional Requirements Dependencies

The table lists the dependencies for each Security Functional Requirement (SFR) and shows by which SFRs they are met.

| SFR | Required Dependencies | Met/fulfilled by |
|---|---|---|
| **FCS_CKM.1(1)** | [FCS_CKM.2 or FCS_COP.1]<br>FCS_CKM.4 | FCS_COP.1(1) and FCS_COP.1(2)<br>FCS_CKM.4 |
| **FCS_CKM.1(2)** | [FCS_CKM.2 or FCS_COP.1]<br>FCS_CKM.4 | FCS_COP.1(3)<br>FCS_CKM.4 |
| **FCS_CKM.4** | [FDP_ITC.1 or FDP_ITC.2 or FCS_CKM.1] | FCS_CKM.1(1) and FCS_CKM.1(2) |
| **FCS_COP.1(1)** | [FDP_ITC.1 or FDP_ITC.2 or FCS_CKM.1],<br>FCS_CKM.4 | FCS_CKM.1(1)<br>FCS_CKM.4 |
| **FCS_COP.1(2)** | [FDP_ITC.1 or FDP_ITC.2 or FCS_CKM.1],<br>FCS_CKM.4 | FCS_CKM.1(1)<br>FCS_CKM.4 |
| **FCS_COP.1(3)** | [FDP_ITC.1 or FDP_ITC.2 or FCS_CKM.1],<br>FCS_CKM.4 | FCS_CKM.1(2)<br>FCS_CKM.4 |
| **FCS_COP.1(4)** | [FDP_ITC.1 or FDP_ITC.2 or FCS_CKM.1], | The dependency refers to the question, how the TOE gets the cryptographic keys for the cryptographic operation. This is fulfilled during the TOE |

| SFR | Required Dependencies | Met/fulfilled by |
|---|---|---|
| | FCS_CKM.4 | initialization. Pre-generated Key is obtained from token<br>FCS_CKM.4 |
| **FDP_ACC.1(1)** | FDP_ACF.1 | FDP_ACF.1(1) |
| **FDP_ACC.1(2)** | FDP_ACF.1 | FDP_ACF.1(2) |
| **FDP_ACC.1(3)** | FDP_ACF.1 | FDP_ACF.1(3) |
| **FDP_IFC.1** | FDP_IFF.1 | FDP_IFF.1 |
| **FDP_ACF.1(1)** | FDP_ACC.1<br>FMT_MSA.3 | FDP_ACC.1(1)<br>FMT_MSA.3(1) |
| **FDP_ACF.1(2)** | FDP_ACC.1<br>FMT_MSA.3 | FDP_ACC.1(2)<br>FMT_MSA.3(2) |
| **FDP_ACF.1(3)** | FDP_ACC.1<br>FMT_MSA.3 | FDP_ACC.1(3)<br>FMT_MSA.3(3) |
| **FDP_IFF.1** | FDP_IFC.1<br>FMT_MSA.3 | FDP_IFC.1<br>FMT_MSA.3(4) |
| **FIA_UAU.2** | FIA_UID.1 | FIA_UID.2 hierarchical to FIA_UID.1 |
| **FIA_UID.2** | none | none |
| **FMT_MSA.1(1)** | [FDP_ACC.1 or FDP_IFC.1]<br>FMT_SMR.1<br>FMT_SMF.1 | FDP_ACC.1(1)<br>FMT_SMR.1<br>FMT_SMF.1 |
| **FMT_MSA.1(2)** | [FDP_ACC.1 or FDP_IFC.1]<br>FMT_SMR.1<br>FMT_SMF.1 | FDP_ACC.1(2)<br>FMT_SMR.1<br>FMT_SMF.1 |
| **FMT_MSA.1(3)** | [FDP_ACC.1 or FDP_IFC.1]<br>FMT_SMR.1<br>FMT_SMF.1 | FDP_ACC.1(3)<br>FMT_SMR.1<br>FMT_SMF.1 |
| **FMT_MSA.1(4)** | [FDP_ACC.1 or FDP_IFC.1]<br>FMT_SMR.1<br>FMT_SMF.1 | FDP_IFC.1<br>FMT_SMR.1<br>FMT_SMF.1 |
| **FMT_MSA.3(1)** | FMT_MSA.1<br>FMT_SMR.1 | FMT_MSA.1(1)<br>FMT_SMR.1 |
| **FMT_MSA.3(2)** | FMT_MSA.1<br>FMT_SMR.1 | FMT_MSA.1(2)<br>FMT_SMR.1 |
| **FMT_MSA.3(3)** | FMT_MSA.1<br>FMT_SMR.1 | FMT_MSA.1(3)<br>FMT_SMR.1 |

| SFR | Required Dependencies | Met/fulfilled by |
|---|---|---|
| **FMT_MSA.3(4)** | FMT_MSA.1<br>FMT_SMR.1 | FMT_MSA.1(4)<br>FMT_SMR.1 |
| **FMT_MTD.1** | FMT_SMR.1<br>FMT_SMF.1 | FMT_SMR.1<br>FMT_SMF.1 |
| **FMT_SMF.1** | none | none |
| **FMT_SMR.1** | FIA_UID.1 | FIA_UID.2 hierarchical to FIA_UID.1 |
| **FAV_ACT.1** | none | none |
| **FAV_ALR.1** | none | none |
| **FAV_SCN.1** | none | none |

## 6.4 Security Assurance Requirements Rationale

EAL2 has been chosen to establish a sufficient level of confidence in the security offered by the TOE. It has been augmented with ALC_FLR.1 to ensure that customers can report flaws and that those flaws can be corrected according to flaw remediation procedures.

Since ALC_FLR.1 does not have dependencies and EAL2 satisfies its own dependencies, EAL2 augmented with ALC_FLR.1 is consistent with regard to its dependencies.

# 7 TOE Summary Specification

This section contains description of how the TOE meets all the SFRs.

The following table helps associate SFR with relevant description.

| SFR | SFR name | TOE Security Function |
|---|---|---|
| **FCS_CKM.1(1)** | Cryptographic key generation (DEK/MK) | SF_FDE |
| **FCS_CKM.1(2)** | Cryptographic key generation (User key) | SF_FDE |
| **FCS_CKM.4** | Cryptographic key destruction | SF_FDE |
| **FCS_COP.1(1)** | Cryptographic operation (Data Encryption/Decryption) | SF_FDE |
| **FCS_COP.1(2)** | Cryptographic operation (Key Encryption/Decryption) | SF_FDE |
| **FCS_COP.1(3)** | Cryptographic operation (HMAC calculation) | SF_FDE |
| **FCS_COP.1(4)** | Cryptographic operation (RSA Key Encryption) | SF_FDE |
| **FDP_ACC.1(1)** | Subset access control (FDE) | SF_FDE |
| **FDP_ACC.1(2)** | Subset access control (ASC) | SF_ASC |
| **FDP_ACC.1(3)** | Subset access control (DAC) | SF_DAC |
| **FDP_IFC.1** | Subset information flow control (WAC) | SF_WAC |
| **FDP_ACF.1(1)** | Security attribute based access control (FDE) | SF_FDE |
| **FDP_ACF.1(2)** | Security attribute based access control (ASC) | SF_ASC |
| **FDP_ACF.1(3)** | Security attribute based access control (DAC) | SF_DAC |
| **FDP_IFF.1** | Simple security attributes (WAC) | SF_WAC |
| **FIA_UAU.2** | User authentication before any action | SF_IA |
| **FIA_UID.2** | User identification before any action | SF_IA |
| **FMT_MSA.1(1)** | Management of security attributes (FDE) | SF_MGNT |
| **FMT_MSA.1(2)** | Management of security attributes (ASC) | SF_MGNT |
| **FMT_MSA.1(3)** | Management of security attributes (DAC) | SF_MGNT |
| **FMT_MSA.1(4)** | Management of security attributes (WAC) | SF_MGNT |
| **FMT_MSA.3(1)** | Static attribute initialisation (FDE) | SF_MGNT |
| **FMT_MSA.3(2)** | Static attribute initialisation (ASC) | SF_MGNT |
| **FMT_MSA.3(3)** | Static attribute initialisation (DAC) | SF_MGNT |
| **FMT_MSA.3(4)** | Static attribute initialisation (WAC) | SF_MGNT |
| **FMT_MTD.1** | Management of TSF data | SF_MGNT |
| **FMT_SMF.1** | Specification of management functions | SF_MGNT |
| **FMT_SMR.1** | Security roles | SF_MGNT |

| | | |
|---|---|---|
| **FAV_ACT.1** | Anti-virus actions | SF_AVP |
| **FAV_ALR.1** | Anti-virus alerts | SF_AVP |
| **FAV_SCN.1** | Anti-virus scanning | SF_AVP |

## 7.1 Full Disk Encryption Functionality (SF_FDE)

### 7.1.1 Cryptographic key generation (DEK/MK)

During installation of the TOE and initial encryption of the devices data (initialisation), a deterministic random number generator is used for the generation of the needed AES cryptographic keys. This applies to the following keys:

- Data Encryption Key (DEK),
- Master Key (MK).

DEK and MK are generated during the TOE initialisation and if the keys have to be changed.

Keys are generated by TOE crypto library using Hash_DRBG algorithm according to NIST SP 800-90A with SHA-256.

For the XTS-AES-256 the TSF generates two AES keys, each 256 bit long in accordance with the mentioned algorithm.

**SFRs that are met: FCS_CKM.1(1).**

### 7.1.2 Cryptographic key generation (User key)

During installation of the TOE and initial encryption of the devices data (initialisation), a deterministic random number generator is used for the generation of the needed AES cryptographic keys (User Keys).

User Keys are generated during the TOE installation in accordance with the available accounts and if the keys have to be changed.

Keys are generated by TOE crypto library by Password-Based Key Derivation Function 2 (PBKDF2) with HMAC-SHA256, 10.000 iteration value, 256 bit salt and password as input as required by NIST SP 800-132, Option 2a.This key is later used during user authentication with username/password method.

**SFRs that are met: FCS_CKM.1(2).**

### 7.1.3 Cryptographic key destruction

Following recommended practice the TOE overwrites cryptographic keys in memory with zeroes when it no longer needs them.

**SFRs that are met: FCS_CKM.4.**

### 7.1.4 Cryptographic operations

Cryptographic operations are done by TOE crypto library is way required be relevant standard, mentioned in each SFR iteration.

Cryptographic operation (Data Encryption/Decryption) is providing symmetric encryption/decryption of data using XTS-AES-256 algorithm for disk data during disk I/O operations.

Cryptographic operation (Key Encryption/Decryption) is used to encrypt/decrypt encryption keys stored on HDD during user authentication and creation of new users.

Cryptographic operation (HMAC calculation) is used during boot process to verify user credentials.

Cryptographic operation (RSA Key Encryption) is used by TOE for user authentication using Tokens instead of username/password combination on new user creation stage. RSA public key is obtained from Token and used to encrypt key for future authentication use.

**SFRs that are met: FCS_COP.1(1), FCS_COP.1(2), FCS_COP.1(3), FCS_COP.1(4)**

### 7.1.5 Full Disk Encryption Security Function

The TOE aims to protect user data on a disk drive from unauthorised access through “stolen laptop” scenario. This means that user data protection relies not on OS mechanisms, that can be bypassed if physical access to disk is obtained, but on strong encryption and user authentication data.

So user (and system) data exists on a hard drive only in fully encrypted state, and successful decryption possible only with valid user authentication data (username/password or Token/Pin pairs).

To achieve this the TOE relies on cryptographic functionality described above.

This function performs the user authentication after power on before the operating system is booted. The function is implemented in a special Pre-Boot Authentication (PBA) software module that is running in UEFI/BIOS environment. After successful user authentication, the control is granted to the operation system loader.

The function supports two kinds of user authentications depending on the corresponding configurations: based on the username/password and with help of the Token (PIN).

[PRAGRAPH TEXT WAS REMOVED DURING ST SANITATION]

If the authentication failed, the next attempt is possible as long as the defined attempt amount was not reached; otherwise the authentication function is blocked for the user.

After successful authentication, the function decrypts the user policy data with the Master Key and evaluates the policy. If the management tasks (password changing) have to be performed, the function starts the corresponding management function.

[PRAGRAPH TEXT WAS REMOVED DURING ST SANITATION]

For read operation OS makes read request from file system driver to physical disk driver, the TOE relays this request. Physical disk driver reads relevant part of the disk and transmits the data to a TOE driver, the TOE then decrypts it using DEK and MK from memory and then passes decrypted data to file system driver for OS usage.

For write operation, OS passes plaintext data to file system driver for write operations, the TOE intercepts this requests, encrypts this data and passed encrypted data to physical disk driver to perform physical operation.

Thus the TOE makes sure there is no unencrypted data on a disk drive at any given moment.

**SFRs that are met: FDP_ACC.1(1), FDP_ACF.1(1).**

## 7.2 Application Startup Control (SF_ASC)

Application startup control functionality of the TOE is based on filter driver interception mechanisms, where the TOE intercepts all processes being started in OS on a kernel level. When OS or application executes new application (process), the TOE scans the application being run, (or script being executed) to get process properties and metadata.

This can be application hash sum, path, application properties, application`s digital signature parameters, application category (out of scope of evalutation), active user.

This metadata then are compared to active Application Startup control policy (set of rules).

Based on rules parameters (permissive or non-permissive), subject that executes the application, and conditions defined the TOE makes decision whether to allow execution, or prevent it. That decision is enforced via driver to system kernel, preventing unauthorised operations.

**SFRs that are met: FDP_ACC.1(2), FDP_ACF.1(2).**

## 7.3 Device Access Control (SF_DAC)

Device control functionality of the TOE is based on filter driver interception mechanisms, where the TOE intercepts all file data operations in OS on a kernel level.

When OS initiates a data transmission to or from the attached device, the TOE collects operation properties and metadata.

This can be type of device, the bus or the device's individual serial number, type of operations (read or write), active user, operation time.

This metadata then are compared to active device control policy (set of rules).

Based on rules parameters (permissive or non-permissive), subject that executes the operation, and conditions defined in the rules, the TOE makes decision whether to allow operation, or prevent it.

That decision is enforced via driver to system kernel, preventing unauthorised execution.

**SFRs that are met: FDP_ACC.1(3), FDP_ACF.1(3).**

## 7.4 Web Access Control (SF_WAC)

Web control functionality of the TOE is based on filter driver interception mechanisms, where TOE intercepts all data operations in OS on a kernel level.

When OS initiates a data transmission to or from the network, the TOE collects operation properties and metadata.

This can be type of target address, operation time, active user.

This metadata then are compared to active web control policy (set of rules).

Based on rules parameters (permissive or non-permissive), subject that executes the operation, and conditions defined in the rules, the TOE makes decision whether to allow operation, or prevent it.

That decision is enforced via driver to system kernel, preventing unauthorised access to resources.

The TOE has the following 4 control options for each rule:

- Any content. All web traffic is blocked or permitted. (URL server name mask can be attached to this rule).
- By content categories. URLs accessed are checked against base of known categorized web sites. URLs are then blocked if URL category matches the one selected in the rule. Content categories are described in User Manual (this rule type is out of scope of evaluation).
- By type of data. When object is being downloaded from network its source URL is matched against known groups of file extensions.
- By content categories and types of data. Two above mentioned checks together (this rule type is out of scope of evaluation).

Multiple rules can be defined with relative priority, they will be applied based on their priority.

**SFRs that are met: FDP_IFC.1, FDP_IFF.1.**

## 7.5 Identification and authentication (SF_IA)

TOE performs user identification and authentication during pre-boot. User credentials are verified against stored values (as described in details section 7.1.5) and disk decryption operations are available to authenticated users.

When user tries to perform operations that require KLAdmin role authorization additional authentication dialogue is shown via GUI or command line interface and additional authentication is performed when user issues command or tries to save changed settings TOE.

TOE checks provided credentials against stored values (calculates hash values for provided credentials and compares it with stored values) before accepting changes/commands, that require authentication.

Hash values are calculated using SHA256 algorithms with salt to provide protection against recovery using rainbow tables.

When KLAdmin uses KSC to manage TOE authentication is performed on program API level by checking for valid digital signature of program module that relays the management commands to TOE.

**SFRs that are met: FIA_UAU.2, FIA_UID.2**

## 7.6 Security management (SF_MGNT)

### 7.6.1 Security Roles

Specifics of this TOE is that it provides services to all users in the environment. Thus the TOE has two distinct roles: KLUsers and KLAdmin.

Users are associated with KLUser role when they perform authentication during pre-boot (see section 7.5 above)

Users are associated with KLAdmin Role when they provide valid credentials (user name and password) when prompted by the TOE when action that is restricted to KLAdmin role is initiated, like modification of policies' security attributes, TFS data, authentication data. This commands will not be accepted until user provides valid credentials for KLAdmin role.

This is not related to OS user authorisation and rights. All actions done through KSC management interface are considered to be from KLAdmin.

KLUser and KLAdmin roles are referred to as User and Administrator respectively in [UGD].

**SFRs that are met: FMT_SMR.1.**

### 7.6.2 Management of policies security attributes, TSF data and authentication data

The TOE operates based on rules, access policies and other TOE data, such as KLAdmin password, encryption keys, task settings, default actions and values for Access Control Policies.

All TOE policies and rules are stored in Windows registry file and are read by TOE when necessary.

KLAdmin can manage the TOE by using relevant interfaces – via GUI, command prompt or using Kaspersky Security Center (not part of the TOE). When KLAdmin tries to change data or apply new policies, authorisation is required (see section 7.5).

Please note that FDE Access Control SFP can be managed only through Kaspersky Security Center (not part of TOE).

KLAdmin can set default values for TOE Access control SFPs policies and change them from permissive to restrictive mode (recommended after all necessary control policies are defined).

After TOE accepts new settings and policies, stored TOE data are modified accordingly by the TOE. The TOE data are being protected by the TOE from modification by all other subjects, except the TOE itself.

Encryption Keys are stored separately in a special section of drive in encrypted form, those are being modified by the TOE automatically, when User change password, or new users are being added to the system.

KLAdmin can modify certain authentication data (KLUsers passwords for pre-boot authentication, KLAdmin password for management functions).

Users with KLUser role can change their passwords for pre-boot authentication during pre-boot.

**SFRs that are met: FMT_MSA.1(1), FMT_MSA.1(2) FMT_MSA.1(3), FMT_MSA.1(4), FMT_MSA.3(1), FMT_MSA.3(2) FMT_MSA.3(3), FMT_MSA.3(4), FMT_MTD.1, FMT_SMF.1.**

## 7.7 Anti-Virus protection (SF_AVP)

### 7.7.1 Anti-Virus Scanning

Anti-virus functionality protects system from malicious software using wide range of technics, including real-time file access monitor, on-demand on on-schedule scans of system critical areas. Incoming network objects (including mail and web objects) are also scanned. It employs signature-based, heuristic and behaviouristic methods of detection of malicious object, and remediation functionality.

TOE provides real-time protection and scheduled and on-demand scans of certain areas as configured by KLAdmin (see FMT_MTD.1) or triggered by KLUser.

**Real-time protection** functionality is based on filter driver mechanism, the TOE intercepts all data operations in OS on a kernel level.

When the TOE detects a file access operation, it intercepts that and passes file object to AV engine for scanning.

For network interaction – all data transmitted via network channels are also being passed to AV engine.

For executed process all actions initiated by process are passed to AV engine to be matched to existing patterns of malicious behaviour.

**For scheduled or on-demand scan** the TOE also uses its drivers to ensure reliable access to objects on disk or in memory. Areas and objects to be scanned are determined by scan task properties. The TOE reads relevant objects and passes them to AV engine for scanning.

**For all these scan types** AV engine conducts a set of detection routines on the file, including unpacking, emulation, static detection and set of heuristic procedures providing a detection verdict and proposed actions.

**SFRs that are met: FAV_SCN.1.**

### 7.7.2 Anti-Virus Actions

When AV engine provides verdict, the TOE compares received verdict with scan settings that define possible exclusions, and actions to be taken on detected objects.

The TOE can be configured to take action as described in table below.

| Action | Description |
|---|---|
| **Disinfect** | This action can be applied only for files that were infected by infector-type viruses and malicious code can be removed, and this removal procedure is available to TOE.<br>It must be noted that this full recovery of infected object is not guaranteed. |
| **Delete** | The TOE deletes detected object. |

| Action | Description |
|---|---|
| **Block** | The TOE does not attempt operation on the file but blocks system access to object. So file execution or file read operation will fail. |
| **Ignore** | It detected object matches the exclusion settings configured by KLAdmin no action is taken with detected object. |

TOE attempt sequence of actions as configured:

- to disinfect object, then delete if disinfection fails;
- to disinfect, then block if disinfection fails.

**SFRs that are met: FAV_ACT.1.**

### 7.7.3 Anti-Virus Alerts

When a malicious object is detected and processed, the TOE generates relevant audit records, also pop-up notifications or e-mail alerts can be configured.

Alerts can be obtained through all management interfaces, that are accessible to Administrators and Users – GUI, command-line interface or through Kaspersky Security Center administration console (KSC itself is not a part of the TOE).

Such alerts identify detected objects, detection verdict, and actions taken by the TOE.

**SFRs that are met: FAV_ALR.1.**

# 8 References

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