



T-Systems PKI - Certificate Practice Statement (CPS)

T-Systems International GmbH, Telekom Security

Certificate Practice Statement (CPS) of the T-Systems Trust Center Public Key Infrastructure

Version 8.0

Date 15.05.2018

Status Released

public



Imprint

Issuer

T-Systems International GmbH
Telekom Security
Trust Center & ID-Solutions
Untere Industriestraße 20, 57250 Netphen, Deutschland

Filename

File number

Title

T-Systems-PKI-CPS-EN-v8.0-
20180515.docx

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Abstract

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Version history

| Version | Date | Author | Changes |
|---------|------------|-----------|---|
| 8.0 | 15.05.2018 | T-Systems | Initial version after splitting CP & CPS document and changing the document structure conform to RFC 3647. A new version history has been started as older document versions base on a different document structure. |
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1 Introduction

1.1 Overview

The T-Systems Trust Center Public Key Infrastructure (PKI) is operated in the T-Systems Trust Center by the T-Systems International GmbH Group unit within Deutsche Telekom AG. The T-Systems Trust Center maintains a number of different certification authorities under different root certification authorities (root CAs).

This document is the certification practice statement (CPS) for all certification authorities operated within the T-Systems PKI. It is based on the international standard for certificate policies (RFC 3647 Internet X.509 Public Key Infrastructure Certificate Policy and Certification Practices Framework) of the Internet Engineering Task Force (IETF).

The T-Systems Trust Center additionally guarantees that all certification authorities within the T-Systems PKI meet and comply with all requirements and regulations of the current published version of the [CAB-BR] (<http://www.cabforum.org/documents.html>). In the event that this document and the [CAB-BR] contradict one another, the regulations in the [CAB-BR] have priority.

1.2 Document name and identification

| | |
|-------------------|---|
| Name: | Certificate Practice Statement for the T-Systems Trust Center Public Key Infrastructure |
| Version: | 8.0 |
| Date | 15.05.2018 |
| Object identifier | 1.3.6.1.4.1.7879.13.39 |

1.3 PKI participants

1.3.1 Certification authorities (CA)

In addition to operating certification authorities for proprietary internal products and services, the T-Systems Trust Center issues CA certificates for certification authorities of other operators, which are operated under the following root certification authorities (root CAs):

- **Deutsche Telekom root CA 2**
Key: RSA 2048, SHA-1
Serial#: 26
Thumbprint: 85:a4:08:c0:9c:19:3e:5d:51:58:7d:cd:d6:13:30:fd:8c:de:37:bf
Valid until: 10. July 2019
- **T-TeleSec GlobalRoot Class 2**
Key: RSA 2048, SHA-256
Serial#: 01
Thumbprint: 59:0d:2d:7d:88:4f:40:2e:61:7e:a5:62:32:17:65:cf:17:d8:94:e9
Valid until: 2. October 2033
- **T-TeleSec GlobalRoot Class 3**
Key: RSA 2048, SHA-1
Serial#: 01
Thumbprint: 55:a6:72:3e:cb:f2:ec:cd:c3:23:74:70:19:9d:2a:be:11:e3:81:d1
Valid until: 2. October 2033
- **TeleSec GlobalRoot Class 1 G2**
Key: ECDSA_P384, sha384ECDSA

Serial#: 3e:12:94:c2:bf:53:1c:ba

Thumbprint: d6:29:07:eb:4a:14:5e:56:4b:73:02:43:1d:4b:30:9f:bb:f7:ee:09

Valid until: 23. February 2041

- **TeleSec GlobalRoot Class 2 G2**

Key: ECDSA_P384, sha384ECDSA

Serial#: 00:a8:0a:76:8d:f7:b2:75:37

Thumbprint: bc:b9:2e:ec:7f:9a:ec:cb:2f:89:d9:d2:fd:21:f1:24:0e:3c:df:de

Valid until: 23. February 2041

- **TeleSec GlobalRoot Class 3 G2**

Key: ECDSA_P384, sha384ECDSA

Serial#: 2c:87:1d:8e:a0:07:19:fe

Thumbprint: 6f:54:32:b1:58:07:a8:ec:b6:75:dd:27:c1:be:af:22:92:8a:c1:4d

Valid until: 23. February 2041

The root CA certificates are self-signed by the T-Systems Trust Center and are published by T-Systems. The publication makes it possible to fully check the validity of all certificates issued in this hierarchy. Only certificates from directly subordinate certification authorities (sub-CAs) are issued. End entity certificates (subscriber certificates) are not issued. Regulations regarding subscriber certificates are described in separate CPS of additional T-Systems certificate solutions.

1.3.2 Registration authorities (RA)

Registrations and all related activities for the root CAs listed in this CPS are processed by a central internal registration authority of T-Systems. No further external or internal registration authorities (RA) are consulted.

1.3.3 Subscribers

Root CA subscribers are exclusively directly subordinate certification authorities. No end-entity certificates are issued.

The subscriber

- applies for the certificate (represented by an authorized natural person)
- is authenticated by the responsible CA as part of the registration process
- is identified by the certificate, i.e., it is confirmed that the public key contained in the certificate belongs to the subscriber
- owns the private key that belongs to the public key in the certificate

1.3.4 Relying parties

Relying parties are legal entities or organizational units that trust in the integrity and quality of an issued subscriber certificate.

1.3.5 Other participants

Not applicable.

1.4 Certificate usage

1.4.1 Appropriate certificate uses

See CP, Section 1.4.1.

1.4.2 Prohibited certificate uses

See CP, Section 1.4.2.

1.5 Policy administration

1.5.1 Organization administering the document

This document (CPS) is published by T-Systems International GmbH, Telekom Security, Trust Center & ID-Security.

1.5.2 Contact person

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1.5.3 Person determining CPS suitability for the policy

This document (CPS) remains valid as long as it is not revoked by the publisher (see Section 1.5.1). It is updated when required (but at least once a year) and is then assigned a new ascending version number (see also Sections 9.12.1 and 9.12.2).

1.5.4 CPS approval procedures

The publisher named in Section 1.5.1 is responsible for this document (CPS). The approval is given by the Change Advisory Board.

This CPS undergoes an annual review, regardless of any other amendments. The department named in Section 1.5.1 is responsible for carrying out or coordinating the review.

The annual review must be noted in the change history of the CPS. This shall also apply even if no changes are made to contents.

1.6 Definitions and acronyms

1.6.1 List of acronyms

| | |
|------------|---------------------------|
| ARL | Authority Revocation List |
| BR | Baseline Requirements |
| CA | Certification Authority |

| | |
|-------|---|
| CARL | Certification Authority Revocation List (same as ARL) |
| CMP | Certificate Management Protocol |
| CN | Common Name |
| CP | Certificate Policy |
| CPS | Certification Practice Statement |
| CRL | Certificate Revocation List |
| DK | Dual Key |
| DN | Distinguished Name |
| EDP | Electronic Data Processing |
| eIDAS | Electronic Identification and Signature |
| ERP | Enterprise Resource Planning |
| ETSI | European Telecommunications Standards Institute |
| FQDN | Fully Qualified Domain Name |
| GRP | Identifies a group, function, or role certificate |
| HSM | Hardware Security Module |
| HTTP | Hypertext Transfer Protocol |
| HTTPS | Hypertext Transfer Protocol Secure |
| IDS | Intrusion Detection System |
| IETF | Internet Engineering Task Force |
| IPS | Intrusion-Prevention-System |
| IPSec | Internet Protocol Security |
| ISMS | Information Security Management System |
| ISO | International Organization for Standardization |
| IV | Individual Validation |
| LDAP | Lightweight Directory Access Protocol |
| n.a. | not available |
| NCP | "Normalized" Certificate Policy |
| NIC | Network information center |
| OCSP | Online Certificate Status Protocol |
| OID | Object Identifier |
| opt. | optional |
| OV | Organization Validated |
| OVCP | "Organizational Validation" Certificate Policy |
| PIN | Personal Identification Number |
| PKI | Public key infrastructure |
| PKIX | Public Key Infrastructure X.509 |
| PN | Stands for pseudonym |
| PSE | Personal Security Environment |
| PTC | Publicly trusted certificate |

| | |
|--------|---|
| RA | Registration Authority |
| RFC | Request for Comments |
| RSA | Rivest Shamir Adleman |
| S/MIME | Secure Multipurpose Internet Mail Extension |
| SCEP | Simple Certificate Enrollment Protocol |
| SD | Service Description |
| SigG | German Digital Signature Act (<i>Signaturgesetz</i>) |
| SigV | German Digital Signature Regulation (<i>Signaturverordnung</i>) |
| SK | Single Key |
| SLA | Service Level Agreement |
| SOAP | Simple Object Access Protocol |
| SSL | Secure Socket Layer |
| TK | Triple Key |
| TLS | Transport Layer Security |
| UPN | User Principal Name |
| URL | Uniform Resource Locator |
| UTC | Universal Time Coordinated |
| XML | Extensible Markup Language |

Table 1 - List of acronyms

1.6.2 Glossary

| Term | Explanation |
|--|--|
| Affiliate | For example, a company, partnership, joint venture, corporation, (capital) company, association, foundation, or other organization (legal person) that supervises, is supervised by, or is controlled together with another organization (legal person), facility, department, governmental unit, or unit that is directly subordinate to a governmental authority. |
| Application for a certificate with increased risk | An application for which the CA provides an additional check with regards to internal criteria and databases that the CA runs. This can concern names that are subject to a high risk about phishing or other fraudulent use, names that are contained in previously rejected certificate applications or revoked certificates, names that are on the MillerSmiles phishing list, or the Google Safe Browsing list or names that the CA identifies based on its own risk-minimization criteria. |
| Applicant | The natural or legal person who applies for a certificate (or requests its renewal). Once the certificate has been issued, the applicant is referred to as the subscriber. In the case of certificates issued for devices, the applicant is the organization that controls or operates the device listed on the certificate, even if the device sends the actual certification application. |
| Applicant's representative | If different from the applicant, a natural person or payer, an employee of the applicant, or an authorized representative who has the express authority to represent the applicant: (i) who signs, submits, or approves an application for a certificate in the name of the applicant and/or (ii) signs and submits a subscriber agreement in the name of the applicant and/or (iii) acknowledges and agrees to the certificate's terms of use in the name of the applicant if the applicant is an affiliated company (affiliate) of the certification authority (CA). |
| Application software provider | A provider of Internet browser software or other application software on the relying side that displays or uses certificates and contains root certificates. |
| Authentication | Checking an identity based on claimed characteristics. |

| Term | Explanation |
|---|---|
| Authority revocation list (ARL) | List showing digital certificates that have been revoked by certification authorities (except root CA). Before a digital certificate of a certification authority is used, the ARL should be used to check whether the certificate may still be used. |
| Delegated third party | A natural or legal person who is not identical to the certification authority (CA) but is authorized by this authority to support the certificate management process by performing tasks to fulfill one or more requirements. This may be an external registration authority or an internal enterprise registration authority. |
| Authorization document | The documentation that proves an applicant is authorized to apply for one or more certificates for a certain natural person, group of persons or functions, legal person, or device. This may also be a document from the certification authority regarding communication with the person or organization in question. |
| | |
| Bulk | Function of a CA with which the sub-registration authority can generate soft PSEs in bulk. |
| Central repository | An online database that contains public PKI documents (e.g., certificate policy, certificate practice statement, CA certificates), as well as additional information, either in the form of a CRL or an OCSP response. |
| Central registration model | Following successful registration, the sub-registration authority requests the certificate on the sub-registration authority website (using a web form or in bulk) and directly receives this certificate or the key material for the end entity (except in the case of a registration authority certificate). |
| Certificate | An electronic document that uses a digital signature to bind a public key to an identity (e.g., person, device). |
| Certificate administration process | Processes, practices, and procedures relating to the use of keys, software, and hardware that the certification authority (CA) uses to check certificate data, issue certificates, maintain a central data repository, and revoke certificates. |
| Certificate application | A request made in electronic or written form that contains data regarding an applicant. |
| Certification authority (CA) | An organization that is responsible for generating, issuing, revoking and managing certificates. This term is used for both root certification authorities (root CA) and subordinate certification authorities (sub-CA). |
| Certificate data | Certificate applications and associated data (obtained from the applicant or elsewhere) that is in the possession of the certification authority (CA), is subject to monitoring by the CA or that the CA has access to. |
| Certificate Management Protocol (CMP) | The Certificate Management Protocol is a protocol developed by the IETF to manage X.509 certificates within a public key infrastructure (PKI). |
| Certificate policy (CP) | Defines the guidelines for generating and managing certificates of a certain type. A set of rules that specifies the options for using a named certificate in a certain community (parties involved in PKIs) and/or a PKI implementation with common security requirements. |
| Certificate problem report | Complaints due to suspicion that the key is at risk, certificate misuse, or with regard to other types of fraudulent behavior, risk, misuse, or incorrect behavior in connection with certificates. |
| Certification practice statement (CPS) | Explanations for operating a certification authority. In particular, the CPS implements the provisions and policies of the CP of a certification authority. One of several documents that provide general and specific framework conditions. This contains, in particular, a description of the procedure the certification authority (CA) follows for issuing, managing, revoking, and renewing certificates. |
| Certificate revocation list (CRL) | A regularly updated, time-stamped list of revoked certificates that is generated and signed digitally by the issuing certification authority (CA). The authority revocation list (ARL) is a special certificate revocation list (CRL), as it contains only sub-CA certificates. |
| Certificate signing request (CSR) [TC] | A certificate request that is created electronically by a device (e.g., server) and signed using the private key, which contains the public key and the certificate data in coded form. The syntax is described by the standard PKCS#11. |
| Chip card | Plastic card with an integrated computer chip. Telephone cards are an example of these. If the computer chip is able to perform calculations, it is also called a smartcard. Smartcards can also be used for cryptographic applications. |

| Term | Explanation |
|---|---|
| Compromise | A private key is compromised if it is made known to unauthorized persons or can be used by them. A compromise could occur through a criminal attack, for example. |
| Country | Either a member of the United Nations or a geographical region that at least two member states of the UNO recognize as a sovereign state. |
| Cryptography | Science dealing with the encryption of data and related issues (such as digital signatures). |
| Device | Component such as a router, server, gateway, or application that supports certificate-based functions but cannot request certificates itself or can do so only to a limited extent. Frequently, certificates are requested via an authorized person (e.g., administrator) and installed on the component. |
| Device certificate | X.509 V3 certificate that contains either a host name, an IP address, or an e-mail address in the commonName field (CN) of the subscriber's distinguishedName (subject) and/or in at least one subjectAltName extension. |
| Digital signature | A checksum created with a special mathematical procedure. Guarantees the authenticity of the signatory and the integrity of the data. |
| Directory service | Data repository for calling up certificates and certificate validation information (revocation list). |
| Distinguished name | Format with which distinguished names can be specified in accordance with the X.500 standard. A digital certificate must contain a DN. |
| Domain authorization document | The documentation that the domain name registrar, a registered domain owner (domain name registrant), or the person or organization that is listed as the registered domain owner in WHOIS (including all private, anonymous, or proxy registration services) provides and that proves the applicant's authorization to request a certificate for a particular domain name space. This may also be a document from the certification authority regarding communication with the person or organization in question. |
| Domain name | The name that is given to a node in the Domain Name System (DNS). |
| Dual key certificate | Variant in which separate key pairs are used for encryption and signing. This means the user has two corresponding certificates. |
| End entity | Also see Subscriber. The term end entity is largely used in the X.509 environment. |
| End-entity certificate | A certificate that does not use the "certification authority" basic constraint and therefore cannot sign certificates itself. |
| ETSI certification | Check and confirmation for certification authorities by an independent expert to ensure that the PKI is operated in accordance with the "ETSI TS 102 042" ETSI criteria. The aim of ETSI audits is to strengthen demand-side trust in electronic business transactions. |
| External registration authority | An employee (staff member) or representative of a company that is not affiliated with the certification authority (CA) (non-affiliate) that approves certificates for third parties. These roles (trusted roles) are performed, for example, by the tenant's master and sub-registration authority or authorized representative. |
| Fully qualified domain name (FQDN) | Correct and complete domain name, i.e., a chain of all labels for a path in the domain name space (for further information see RFC 2181). |
| Hardware security module (HSM) | Hardware to generate and store private keys securely. |
| Hash value | In this context, a fixed length cryptographic checksum (the correct name is cryptographic hash value). It should be as unlikely as possible to calculate the entry from the hash value or to find several possible inputs for the same hash value (hash value is used as a synonym for fingerprint). In most cases a hash value is signed instead of a complete digital document. |
| Identification | The process of providing the identity of a subject or object (e.g., user, device) to a system. The identification is part of the validation. |
| Interface | An interface is part of a system that is used for communication (input and output). |

| Term | Explanation |
|--|--|
| Internal registration authority | An employee (staff member) or representative of a CA who checks the "domain" specified by the PKI tenant and provides it for the certificate application. This role (trusted role) is performed, for example, by the T-Systems Trust Center operator. |
| Internal server name | A server name (which may or may not contain a registered domain name) that cannot be dissolved with the public Domain Name System (DNS). |
| Issuer distinguished name (issuer DN) | Format with which distinguished names can be specified in accordance with the X.500 and LDAP standards. The issuer DN describes the CA issuing the certificate in a unique way. |
| Issuing certification authority (CA) | The certification authority (CA) that issued a specific certificate. This could be a root certification authority (root CA) or a subordinate certification authority (sub-CA). |
| Key backup | Mechanism for backing up keys. In order to be able to restore encrypted e-mails in the event of key loss, we recommend backing up the key material of the encryption key. Key backup is also used as a synonym for key archiving. |
| Key compromise | A private key is considered to be compromised if its value is shared with an unauthorized person, an unauthorized person has access to it, or there is a practical method that an unauthorized person could use to find out its value. |
| Key owner | A natural person authorized by the delegated third party who is responsible for the proper use (distribution, use and, if necessary, revocation) of the key pair and certificate that was issued for a group of persons or functions, legal person, or device. |
| Key pair | The private key and its corresponding public key. |
| Key recovery | Mechanism for recovering keys. This can be necessary if users lose their key (such as through a damaged file). |
| Latency period | Period of time between an action and the occurrence of a delayed reaction (delay period). With latency periods, the action occurs unnoticed and is only discovered through the reaction. |
| Lightweight Directory Access Protocol (LDAP) | Protocol for querying directories. This has displaced the significantly more complicated Directory Access Protocol (DAP) in many areas. LDAP offers more options than HTTP and FTP (such as setting up a context that can be maintained using several queries). LDAP is used in particular to query digital certificates and revocation lists within public key infrastructures. |
| LDAP server | Server that saves information that can be called up via LDAP. |
| Legal person | A company, group, partnership, sole trader, trust, government authority, or legal entity with legal standing within the legal system of a country. |
| Local registration model | The user requests the certificate via the user website or by sending an e-mail request, or the device uses its SCEP interface to request the certificate. This request is processed by the sub-registrar (approval, rejection, or postponement (resubmission)). |
| Mail security | Security functions such as digital signature and encryption that support standard mail applications. |
| Management system for information security (ISMS) | The management system for information security (ISMS) represents a set of procedures and rules within a company that serve to define, manage, monitor, maintain, and continually improve information security over the long term. The term is used in the ISO/IEC 27002 standard; ISO/IEC 27001 defines an ISMS. |
| Master domain | Independent administrative area that has a distinguished name and is set up exclusively for a delegated third party. The delegated third party can approve and manage certificates within the tenant. The tenant is managed using the master registration authority certificate. Further information is available under: Tenant. |
| Master registration authority | Natural person (trusted role) who manages the master domain. |

| Term | Explanation |
|---|--|
| Multitenancy | In information technology (IT), multitenancy refers to the property of software or a server to map multiple, fully separated tenants on one installation. The respective tenants (e.g., legal units or companies) are unable to view the data, user administration, or similar of the other parties/tenants. |
| Object identifier (OID) | A unique, alphanumeric, or numeric identifier that is registered for a specific object or object class of the International Standards Organization (ISO) under the appropriate standard. |
| Online Certificate Status Protocol (OCSP) [BR] | A protocol for online certificate validation with the help of which the application software on the relying side can determine the status of an identified certificate. Also see OCSP responder. |
| OCSP responder | An online server that is subordinate to the certification authority (CA) and is connected to its central repository to process certificate applications. Also see Online Certificate Status Protocol (OCSP). |
| Period of validity | The period from the issue date (not before) until the expiry date (not after). |
| Permitted Internet domains | A domain name that consists of the top-level domain and further sub-domains and is added to the tenant's PKI configuration (master domain) as a "permitted Internet domain" following a successful check by the internal registration authority. |
| Permitted public data source | An authentication document or a data source (e.g., identity database, commercial register) that is used to check subject identity data, that is generally recognized by commercial companies and authorities (public administration) as reliable and that a third party created for a different purpose other than the issuing of certificates by the applicant. |
| Person authorized to revoke | A person who is authorized by the subscriber or key owner to revoke a certificate for a group of persons or functions, legal person, or device. Authorization is via the certificate revocation password. |
| Personal Identification Number (PIN) | Secret code used at cash machines, for example. |
| Personal security environment (PSE) | All security-relevant information such as the private key is saved in the personal security environment. The PSE can be available as an encrypted file or on a smartcard and is protected by a password or a PIN. |
| Policy | Guidelines or explanations that determine the security level for creating and using certificates. There is a difference between certificate policy (CP) and certification practice statement (CPS). |
| Power of attorney | Power of attorney is understood to be a power of representation founded on a legal transaction. The power of attorney is established through unilateral declarations of intent that the principal must communicate to the agent of the power of attorney. |
| Private key | They key from a key pair that the key owner keeps secret and uses to create digital signatures and/or decrypt electronic data and files that were encrypted using the corresponding public key. |
| Public device certificate | A device certificate that a sub-CA issues in the CA hierarchy below a root certificate. |
| Public key | The key from a key pair that the owner of the corresponding private key is permitted to make publicly available and that the relying side uses to verify digital signatures that were created using the owner's private key and/or to encrypt messages that can only be decrypted using the owner's corresponding private key. |
| Public key infrastructure | Hardware, software, persons, procedures, rules, guidelines, and obligations that enable certificates and keys to be generated, issued, managed, and used reliably based on the public key cryptography. |
| Public Infrastructure Key (PKIX) | IETF standard that standardizes all relevant parts of a PKI. |

| Term | Explanation |
|--|---|
| Public Key Service (PKS) | Service of the T-Systems Trust Center for issuing and administrating certificates that comply with the German Digital Signature Act. |
| Qualified auditor | A natural or legal person who meets the specified criteria. |
| Registration authority (RA) | A legal person who is responsible for identifying and authenticating certificate subjects. However, this is not a CA and therefore does not sign or issue certificates. An RA can provide support when requesting or denying a certificate or in both cases. When "RA" is used as an adjective to describe a role or function, this does not necessarily refer to an independent authority. It can, however, be part of the CA. |
| Registration authority of a company (enterprise RA) | An employee (staff member) or representative of an organization who is not affiliated with the certification authority (CA) (non-affiliate) that approves certificates for third parties. These roles (trusted roles) can be performed, for example, by the tenant's master and sub-registration authority or authorized representative. |
| Registered domain name | A domain name that is registered with a domain name registration authority (registrar). |
| Registration model | A distinction is made between the central registration model (see there) and the local registration model (see there). |
| Relying parties | A natural or legal person who relies on a valid certificate. A provider of software is not a relying party if the software this provider sells merely contains information on a certificate. |
| Revocation authority | An employee (staff member) or representative of an organization who performs certificate revocations. |
| Rivest Shamir Adleman (RSA) | Procedure for encryption, for digital signature and for the secure transmission of keys that is named after the three cryptographers Rivest, Shamir, and Adleman. |
| Root CA | See Root certification authority. |
| Root certification authority (root CA) | The highest level certification authority whose root certificate is distributed by application software providers and who issues the subordinate CA certificates (sub-certificates). |
| Root certification authority certificate (root certificate) | The self-signed certificate that the root certification authority (root CA) issues for self-identification. In addition, this certificate helps with the validation of issued sub-certificates. |
| Secure Multipurpose Internet Mail Extension (S/MIME) | Secure Multipurpose Internet Mail Extension. Extension of the MIME e-mail format, which describes additions for cryptographic services that guarantee the authenticity, integrity, and confidentiality of messages. |
| Secure Socket Layer (SSL) | Crypto protocol for ensuring end-to-end connections on the Internet. This has now been superseded by the newer TLS process. Can be used instead of the more complex IPSec in many cases. |
| Service desk | The service desk is an organizational unit within a company that serves as the tenant or delegated third party's central contact point for all service and support requests and that conveys these within the company in accordance with the agreed business processes. |
| Simple Certificate Enrollment Protocol (SCEP) | Simple Certificate Enrollment Protocol. Protocol for ordering and loading certificates in IPSec devices. |
| Simple Object Access Protocol (SOAP) | Simple Object Access Protocol: SOAP provides a simple mechanism for exchanging structured information between applications in a decentralized, distributed environment. |
| Single key certificate | Variant in which the same key pair is used for encryption and signing. This means the user has one certificate. |
| Smartcard | A special plastic card with an integrated computer chip that can also be used for cryptographic applications. |
| Software PSE (soft PSE) | An encrypted file for saving the certificate and the corresponding private and public keys. |
| Sub-domain | Hierarchically subordinated sub-section of the master domain that is managed by a sub-registration authority. |
| Subject | The natural person, device, system, unit, or legal person that is named as the subject in a certificate. The subject is either the subscriber or a device that is under the subscriber's control or is operated by this person. |
| Subject Alternative Name | Additional fields in a certificate. The fields can be used to enter additional names of the subscriber and are a standard extension of the X509 standard. |

| Term | Explanation |
|---|--|
| Subject distinguished name (subject DN) | Format with which distinguished names can be specified in accordance with the X.500 and LDAP standards. The subject DN uniquely specifies a person or device. |
| Subject identity data | Data that identifies the subject of the certificate. Subject identity data does not contain a domain name that is listed in the subjectAltName extension or the subject commonName field. |
| Subordinate certification authority (sub-CA) | A certification authority whose certificate is signed by a root certification authority (root CA) or another subordinate certification authority (sub-CA). |
| Sub-registration authority | Natural person (trusted role) who manages the sub-domain. |
| Subscriber agreement | An agreement between the certification authority (CA) and the applicant/subscriber that specifies the rights and obligations of the parties. |
| Suspension | In connection with the PKI, suspension means a provisional or temporary revocation. The certificate initially appears in the certificate revocation list, but can be re-activated by the sub-registration authority. |
| Transport layer security (TLS) | Crypto protocol for ensuring end-to-end connections on the Internet. |
| Tenant | The tenant is a separate, logically self-contained unit with its own legal, organization, and data management within the system. The tenant thus structures the use of the system. The master domains are known as tenants. Within the master domains, there are further subdivisions in the form of areas of responsibility (also known as sub-domains). |
| Terms of use | Provisions regarding safekeeping and permitted usage of an issued certificate in accordance with the specified requirements if the applicant/subscriber is an affiliated company of the certification authority (CA), for example. |
| Triple key certificate | Variant in which separate key pairs are used for encryption and signing and Microsoft smartcard logon. This means the user has three corresponding certificates. |
| Trusted certificate | A certificate that is trusted due to the fact that its corresponding root certificate represents a trust anchor in widely distributed application software. |
| T-Systems Advisory Board | A board within T-Systems that decides on PKI functions. |
| Unregistered domain name | A domain name that is not a registered domain name. |
| Valid certificate | A certificate that passes the validation procedure described in RFC 5280. |
| Validation | Evidence of the reproducibility of a result from a described procedure under defined conditions. The more precisely a procedure is described and the fewer unknown influencing factors there are, the more certain it is that corresponding results will be produced. A description of the goal and method is required for a validation. In this context, valid means that the method leads to the result in a repeatable manner. In the context of a PKI, there is a validation process in the following places: notification and verification of an identity (e.g., natural person, device) against the certificate application. Algorithm to check a certificate for its validity period, issuing certification authorities, and certificate status (valid, revoked). |
| Validation specialist | Someone who performs the data validation tasks in accordance with the requirements in question. In the context of the Trust Centers these are the following role owners: Trust Center operator, master registrar, sub-registrar |
| Wildcard certificate | A certificate that has an asterisk (*) in the left-most position of a fully qualified domain name of the subject contained in the certificate. |
| X.509 | Standard, whose most important element is a format for digital certificates. Certificates of version X.509v3 are supported in all common public key infrastructures. |

Table 2 - Glossary

1.6.3 References

| Shortname | Reference |
|----------------|---|
| [BDSG] | Datenschutzgesetz, Bundesgesetzblatt I 2003 S.66 (Data Protection Act, Federal Law Gazette I 2003 p.66) |
| [CAB-BR] | Version of the "Baseline Requirements for the Issuance and Management of Publicly-Trusted Certificates" document published by CA/Browser Forum at http://www.cabforum.org/documents.html valid at the time |
| [EU-RL] | Directive of the European Parliament and of the Council on a Community framework for electronic signatures, 1999/93/EC, EU, 1999 |
| [PKCS] | RSA Security Inc., RSA Laboratories "Public Key Cryptography Standards," http://www.rsasecurity.com/rsalabs |
| [PKIX] | RFCs and specifications by the Public Key Infrastructure (X.509) IETF working group |
| [RFC3647] | Internet X.509 Public Key Infrastructure Certificate Policy and Certification Practices Framework, Network Working Group, IETF, 2003 |
| [SigG] | Law on general conditions for digital signatures and for the amendment of additional provisions (Gesetz über Rahmenbedingungen für elektronische Signaturen und zur Änderung von weiteren Vorschriften), Federal Law Gazette (Bundesgesetzblatt) I 2001, p. 876 |
| [SigV] | Digital signature regulation (Verordnung zur elektronischen Signatur), BGBl (German Civil Code). I p. 3074, November 21, 2001 |
| [TSYSROOTSIGN] | T-Systems Root Signing Service Specification |
| [X.509] | Information technology - Open Systems Interconnection - The Directory:authentication framework, Version 3, ITU, 1997 |

Table 3 - References

2 Publication and repository responsibilities

2.1 Repositories

A distinction is made between the following information services within the PKI:

- OCSP
- ARL or CARL
- CP and CPS
- Other

2.2 Publication of certification information

T-Systems makes ARL and OCSP information available 24/7.

2.2.1 OCSP

The status of a certificate can be queried via the Online Certificate Status Protocol (OCSP). For this purpose, the certificate status is made publicly accessible via a defined interface.

2.2.2 CRL

The T-Systems Trust Center provides the PKI certificate users on the Internet with a publicly available CRL.

2.2.3 CP and CPS

The Trust Center's website can be reached at <http://www.telesec.de/pki/index.html>. The CP and the CPS are published at <https://www.telesec.de/de/trust-center>.

2.2.4 Other information

The T-Systems Trust Center also provides the certificate users of the PKI with the following information on the website:

- Root CA certificate and its fingerprint (SHA1 and/or SHA256)
- Information about the change of a Root-CA or Sub-CA certificate
- Information on a compromise, a suspected compromise, or the revocation of a root CA or sub-CA certificate

2.3 Time or frequency of publication

In case of a revocation the revocation information of root-CA and sub-CA certificates are updated (CRL, OCSP responder). CP, CPS and other informationen material are published at <https://www.telesec.de>.

2.3.1 OCSP

Before using the certificates, the information is available for OCSP requests.

2.3.2 ARL/CARL update

See Section 4.9.7

2.3.3 CP and CPS

This document and the associated CP are reviewed at least once a year.

If there are relevant changes regarding requirements, explanations, measures or procedures, the CP/CPS will be updated in a timely manner.

2.4 Access controls on repositories

The repositories are publicly available for read-only access. There are no further restrictions.

Write access to all information listed in Section 2.2 is only used by authorized employees or systems of the T-Systems Trust Center.

3 Identification and authentication

3.1 Naming

A distinguished name (DN) is a unique, global name for directory objects in accordance with the X.500 standard. Distinguished names allow people and systems to be clearly distinguished worldwide. The DN ensures that a digital certificate is never issued with the same name for different people.

3.1.1 Types of names

The naming conventions for the "SubjectDistinguishedName" (subject DN) and "IssuerDistinguishedName" (issuer DN) are defined in accordance with the X.501 standard and include fields with the following attributes:

- Country (C)
- Organization (O)
- Organizational Unit (OU)
- State or Province (S)
- Locality (L)
- Common Name (CN)
- E-mail Address (E)
- Subject Alternative Name (SAN)

3.1.2 Need for names to be meaningful

The name in the "SubjectDistinguishedName" (CN) and "SubjectAlternativeName" (SAN) clearly identifies the subscriber. Permissible abbreviations of the name entered in the commercial register, for example, are also used.

3.1.3 Anonymity or pseudonymity of subscribers

No anonymized or pseudonymized certificate data is used.

3.1.4 Rules for interpreting various name forms

No rules.

3.1.5 Uniqueness of names

The requirements of the corresponding chapter in the CP are fulfilled.

3.1.6 Recognition, authentication, and role of trademarks

The requirements of the corresponding chapter in the CP are fulfilled.

3.2 Initial identity validation

Not applicable.

3.2.1 Method to prove possession of private key

Not applicable.

3.2.2 Authentication of organization identity

The requirements of the corresponding chapter in the CP are fulfilled.

3.2.2.1 Identity

See CP, Section 3.2.2.

3.2.2.2 DBA/trade name

See CP, Section 3.2.2.

3.2.2.3 Verification of country

See CP, Section 3.2.2.

3.2.2.4 Validation of domain authorization or control

Not applicable.

3.2.2.5 Authentication for an IP address

Not applicable.

3.2.2.6 Wildcard domain validation

Not applicable

3.2.2.7 Wildcard domain validation

See CP, Section 3.2.2.

3.2.2.8 CAA records

Not applicable.

3.2.3 Authentication of individual identity

The requirements of the corresponding chapter in the CP are fulfilled.

3.2.4 Non-verified subscriber information

None of the root and sub CA certificates issued by T-Systems contain non-verified subject information.

3.2.5 Validation of authority

The requirements of the corresponding chapter in the CP are fulfilled.

3.2.6 Criteria for interoperoperation

The requirements of the corresponding chapter in the CP are fulfilled.

3.3 Identification and authentication for re-key requests

3.3.1 Identification and authentication for routine re-key

Not applicable.

3.3.2 Identification and authentication for re-key after revocation

Not applicable.

3.4 Identification and authentication for revocation request

The T-Systems Trust Center offers subscribers a central revocation service so that the internal certificate can be revoked in the event of loss or suspicion of misuse. A revocation is authenticated by entering the basic data (name, company, call-back number, e-mail address). The revocation request is authorized by providing the revocation password.

Persons and institutions authorized for revocation may request a certificate to be revoked by e-mail or telephone. In case of revocation, the certificate is added to a revocation list and is reported as revoked for OCSP requests.

4 Certificate life-cycle operational requirements

4.1 Certificate application

The issuance of Root-CA, Sub-CA, and service certificates (e.g. OCSP) is subject to special processes and controls due to their criticality. In the following they are described in more detail:

4.1.1 Who can submit a certificate application?

Applications may only be submitted by an authorized representative of the respective applicant organization. The certificates are issued exclusively to legal persons.

4.1.2 Enrollment process and responsibilities

The application procedure is as follows, depending on the certificate:

Root-CA

- Management request
- Involvement of the ETSI inspection and certification authority
- Review of the request by the operator
- Release for certification by the operator
- Check of hardware
- Key pair generation
- Self-signed certificate generation
- Approval of the ETSI inspection and certification authority
- Storage and subsequent archiving of the documentation

Sub-CA/cross

- Conclusion of contract with third parties or request from management
- Creation of the certificate application
- Creation of the keys and attachment of the request incl. public key
- Review of the request by the operator
- Monitoring of key delivery
- Release for certification by the operator
- Issue and delivery of the certificate
- Storage and subsequent archiving of the documentation

Service certificates

- Creation of the certificate application
- Creation of the keys and attachment of the request incl. public key
- Review of the request by the operator
- Check of key delivery
- Release for certification by the operator
- Issue and delivery of certificates
- Storage and subsequent archiving of the documentation

4.2 Certificate application processing

4.2.1 Performing identification and authentication functions

Identification and authentication is part of the registration process and include at least the following steps:

- Signed contract is in place when a certificate is applied for by a third party

- Completed, current order form, digital or in paper format. The application form must be signed electronically or in writing by an authorized representative of the customer
- Check of the certificate application for authorization of the signatory. Also check of completeness and verification of signature
- For a Sub-CA the service specific CPS must be available
- If necessary, submission of further documents, e.g., documents of the inspection and certification authority on successful certification in accordance with the required standards or partial confirmation and subsequent delivery of the certificate
- Check and release of the service specific CPS
- Proof of ownership of the private key in accordance with Section 3.2.1 and review of the request

All process steps are documented and signed by the processor.

4.2.2 Approval or rejection of certificate applications

A certificate application is authorized and prepared for processing only if the review was successful.

If the application is rejected, the subscriber will be notified in an appropriate manner, stating reasons, and measures will be agreed with the customer to remedy the defects and continue the process.

4.2.3 Time to process certificate applications

Processing of the certificate application starts within a suitable period following receipt of the application. There are no provisions for the processing time of an application if no processing time has been specified in an individual agreement.

4.3 Certificate issuance

4.3.1 CA actions during certificate issuance

An approval step is the precondition to produce certificates by the Root-CA. A CAA check is not performed for certificates of the Root-CA. The operator responsible documents the process steps and loads the request onto a mobile data storage. Production takes place exclusively in line with the dual-control principle, which means that two role owners are then able to produce the desired certificate.

The inspection or certification authority e.g. ETSI is involved as a witness when new root certificates are produced. A customer representative can also participate as guest.

4.3.2 Notification to subscriber by the CA of issuance of certificate

The subscriber is informed after production and receives the certificate for verification.

4.4 Certificate acceptance

A produced certificate is send to the subscriber before publication, to proof the correctness of the content and coding.

4.4.1 Conduct constituting certificate acceptance

The applicant must send an acceptance confirmation to the T-Systems Trust Center within 7 days.

4.4.2 Publication of the certificate by the CA

The Root-CA and Sub-CA certificates are published on the Trust Center website <http://www.telesec.de> after acceptance.

4.4.3 Notification of certificate issuance by the CA to other entities

There is no explicit notification of further instances. After the production of a new Sub-CA certificate, the certificate is added to the CCADB certificate database <https://www.ccadb.org>

4.5 Key pair and certificate usage

The Root-CA only issues certificates for itself, for subordinate CAs, and service certificates.

4.5.1 Subscriber private key and certificate usage

The certificates issued according to this CPS are only issued for the application in certification authorities.

4.5.2 Relying party public key and certificate usage

Relying parties may only use certificates of the Root-CA if

- compatible software is used for the standards and validity models deployed
- before using a certificate, its validity is checked in accordance with the applied validity model
- the certificate is used exclusively for authorized and legal purposes

4.6 Certificate renewal

The renewal of Root-CA/Sub-CA certificates or service certificates is not supported.

4.6.1 Circumstance for certificate renewal

No certificate renewal supported.

4.6.2 Who may request renewal

No certificate renewal supported.

4.6.3 Processing certificate renewal requests

No certificate renewal supported.

4.6.4 Notification of new certificate issuance to subscriber

No certificate renewal supported planned.

4.6.5 Conduct constituting acceptance of a renewal certificate

No certificate renewal supported.

4.6.6 Publication of the renewal certificate by the CA

No certificate renewal supported.

4.6.7 Notification of certificate issuance by the CA to other entities

No certificate renewal supported.

4.7 Certificate re-key

The generation of Root-CA/Sub-CA certificates or service certificates is not subject to re-keying.

4.7.1 Circumstance for certificate re-key

No re-key supported.

4.7.2 Who may request certification of a new public key

No re-key supported.

4.7.3 Processing certificate re-keying requests

No re-key supported.

4.7.4 Notification of new certificate issuance to subscriber

No re-key supported.

4.7.5 Conduct constituting acceptance of a re-keyed certificate

No re-key supported.

4.7.6 Publication of the re-keyed certificate by the CA

No re-key supported.

4.8 Certificate modification

Are there changes of certificate data during the validity of the certificate, these changes need to be documented.

If the certificate should be modified, a new certificate request/order will be necessary.

4.8.1 Circumstance for certificate modification

No changes to certificate data planned.

4.8.2 Who may request certificate modification

No changes to certificate data supported.

4.8.3 Processing certificate modification requests

No changes to certificate data supported.

4.8.4 Notification of new certificate issuance to subscriber

No changes to certificate data supported.

4.8.5 Conduct constituting acceptance of a re-keyed certificate

No changes to certificate data supported.

4.8.6 Publication of the re-keyed certificate by the CA

No changes to certificate data supported.

4.9 Certificate revocation and suspension

The revocation of certificates created by the Root-CA is particularly critical and must usually be carried out with the participation of the accredited certification authority.

4.9.1 Circumstances for revocation

Circumstances for revocation are:

- It becomes known that the private key has been lost (e.g., loss or theft)
- The private key has been or is suspected to have been compromised
- Considerable payment default beyond the payment periods agreed in the contract
- The information in the certificate (except for non-verified information) is no longer correct so that revocation is mandatory
- There is a case of misuse or the suspicion of misuse of the certificate by the subscriber or other persons authorized to use the key
- The certificate is used or handled in conflict with the contractual agreements or violate the certificate policy or certification practice statement (CP/CPS)
- The certified key or the algorithms used with it no longer meet current requirements
- It comes to light that an essential requirement for issuing the certificate has neither been fulfilled nor had its fulfillment waived
- The certification authority ceases operations
- Legal requirements or court judgments
- The subscriber is no longer authorized to use the certificate

4.9.2 Who can request revocation

If the CA or the certificate subscriber learns of information which are a mandatory cause for revocation, a request for revocation needs to be generated. The revocation must be executed by the CA itself, after consultation with the certificate subscriber, or due to a request of the certificate subscriber.

A revocation which has no origin in the mandatory reasons for revocation, has to be initiated by the certificate subscriber or other authorized persons. Since the subscriber is usually a legal person, proof of the power of attorney must be provided.

4.9.3 Procedure for revocation request

Persons authorized for revocation may request a certificate to be revoked by signed e-mail or in writing. Due to the criticality, contact should be made by telephone beforehand.

If the conditions for the revocation are met, the revocation is carried out and the revoked certificate is included in the revocation information. The revocation information is provided in a format that complies with the standard (ARL).

The person or institution authorized will be notified that the revocation has been carried out.

4.9.4 Revocation request grace period

The CA or the certificate holder needs to initiate a revocation request immediately after detecting a reason for revocation.

4.9.5 Time within which CA must process the revocation request

The revocation requests are forwarded to the contacts specified in the contract or the internal persons responsible. Due to the criticality the management or the accredited certification authority are involved into this process.

If the revocation is confirmed, the revocation is carried out immediately and the revocation list is created and published.

4.9.6 Revocation checking requirement for relying parties

Revocation information for the issued certificates of the Root-CA is provided in a standard form (ARL) in the DER format and can therefore be checked using applications that comply with the standard. In addition, the revocation status may be checked via an OCSP request.

4.9.7 CRL issuance frequency (if applicable)

The revocation information of the Root-CA is updated every six months in a standardized form (ARL) and provided. Any revocation of a certificate that is relevant for the list within these six months triggers a new ARL to be created at that time.

Due to the application of cross certificates, an ARL is being issued at least every 31 days,

4.9.8 Maximum latency for CRLs (if applicable)

The revocation lists are made available in the directory device within an economically reasonable period after they have been generated. The latency of the ARL is maximum five (5) days.

4.9.9 On-line revocation/status checking availability

T-Systems runs an OCSP-responder to verify the validity of issued Root-CA and Sub-CA certificates. OCSP responses are valid for five (5) days. The OCSP database will be updated after a certificate revocation during a max. timeframe of five (5) days.

Both the revocations lists and OSCP service are provided on a 24/7 basis. Online information (OCSP) about the certificate status are available at <http://ocsp.telesec.de/ocspr>.

4.9.10 On-line revocation checking requirements

Trusting third parties must be able to check the revocation status of a certificate to gather enough information about the trustworthiness and validity of a certificate. The OCSP service (OCSP Responder) is available for requesting up-to-date status information (see Section 4.9.9).

4.9.11 Other forms of revocation advertisements available

No other forms of communication are used at present.

4.9.12 Special requirements re key compromise

If a private key is compromised, the relevant certificate must be revoked as promptly as possible. There are no further regulations.

4.9.13 Circumstances for suspension

A suspension (revocation reason „on-hold“) for a certification authority are not being offered.

4.9.14 Who can request suspension

Suspension is not supported.

4.9.15 Procedure for suspension request

Suspension is not supported.

4.9.16 Limits on suspension period

Suspension is not supported.

4.10 Certificate status services

An online status information service is available (see Section 4.9.9).

4.10.1 Operational characteristics

No additional characteristics (see Section 4.9)

4.10.2 Service availability

The status information service is available on a 24/7 basis.

4.10.3 Optional features

No optional features are available.

4.11 End of subscription

If a contractual relationship is terminated by the subscriber, the certificate is revoked.

4.12 Key escrow and recovery

For certification authorities run by the T-Systems Trust Center, encrypted key pairs are stored on an approved hardware security module (HSM) in a secure environment. Key escrow at third parties is not implemented.

4.12.1 Key escrow and recovery policy and practices

Not supported.

4.12.2 Session key encapsulation and recovery policy and practices

Not supported.

5 Facility, management, and operational controls

The Root-CAs considered in this CPS are housed within a data center in a specially protected area, the so-called Trust Center, and are operated by trusted and expert personnel. All processes for requesting and generating certificates are defined in detail. All security measures are documented in a security plan (not publicly available).

5.1 Physical controls

This section describes the infrastructural measures.

5.1.1 Site location and construction

The Root-CAs are operated in the Trust Center within a data center, which consists of two fully redundant halves. Two self-sufficient energy wings (power supply, climate, water) are available with a building management system, emergency power generators, and an administration wing. Depending on customer requirements, it is possible to implement a staggered failover plan with defined security levels in the Trust Center.

The establishment and operation of the Trust Center bases on the regulations of the German Federal Office for Information Security (Bundesamt für Sicherheit in der Informationstechnik) (BSI) and the German Insurances Association (GDV), DIN norms about fire and smoke protection and other mitigations. The Trust Center is accepted by GDV in terms of security technology.

The technical measures are supplemented by organizational elements that include the handling of security-relevant techniques and regulations regarding access to security zones for employees and third parties (visitors, external staff and cleaning staff), delivery of materials (hardware, accessories, resources) and tidiness at the work station as well as in computer rooms.

5.1.2 Physical access

The data center is divided into different security zones. The physical access regulations are implemented and logged with an access control system. In addition, the Trust Center area has its own access regulations. General access is via turnstiles. Access for guests is only granted in exceptional cases after examination and approval. Access authorizations are checked regularly. All authorizations and accesses are logged.

5.1.3 Power and air conditioning

The suction intakes for outside air are arranged in such a manner that pollutants such as dust or dirt as well as corrosive, poisonous or highly flammable gases cannot enter. The systems are operated using a very low proportion of outside air. The necessary intakes for fresh air are access protected. Filters are installed to protect against air pollution resulting from floating particles. The fresh air intake is continuously checked for aggressive gases. In case of an emergency (e.g. fire in the environment) the outside air supply mechanism will be closed with the help of a ventilation flap.

To protect against power supply failure, an independent alternating current supply is installed in accordance with VDE regulations. It provides protection against variations in voltage, short-term bridging that is free of interruptions as well as long-term bridging with two separate stationary emergency generators with a performance corresponding to the full load of the data center.

5.1.4 Water exposures

The Trust Center is situated in a protected area, i.e., it is not situated close to any body of water or in low-lying areas (danger of flooding).

5.1.5 Brandschutz

The applicable fire regulations (e.g., DIN 4102, requirements of the local fire department, regulations regarding fire resistance, VDE-compliant electrical installation) are complied with. All fire resistant doors include automatic closing mechanisms. As agreed with the fire department, water will only be used to put out fires in extreme emergencies.

Since there are no offices for personnel on site, the entire buildings are fitted with CO₂ extinguishing systems.

Fire sections are secured with the help of fire-resistant building components. Passages through fire protection walls are equipped with self-closing fire doors.

In areas with double floors as well as suspended ceilings the fire protection walls go right through to the ceilings/floors of the story.

Early fire detection systems (suction systems) are installed in all system and system operator rooms, archives, UPS rooms, and other selected rooms. The supply and exhaust air of the air conditioning units in the individual rooms is monitored. The additional rooms are equipped with fire detectors.

5.1.6 Media storage

Data media containing production software and data, audit, archive, or backup information, are stored in rooms with appropriate physical and logical access controls which offer protection against accident damage (e.g., water, fire, and electromagnetic damage).

5.1.7 Waste disposal

Confidential documents and materials are physically destroyed before being disposed of. Prior to their disposal, data media containing confidential information must be treated in such a way that this data cannot be extracted or restored. Prior to their disposal, cryptographic devices are physically destroyed according to the manufacturer's guidelines. Other waste is disposed of in accordance with T-Systems' regular disposal guidelines.

5.1.8 Off-site backup

T-Systems regularly runs backups of critical system data, audit log data or other confidential information. The backup copies are kept in a different room from the original data.

5.2 Procedural controls

5.2.1 Trusted roles

All persons working for the Root-CAs are listed as trusted roles. These are operators, system administrators, internal auditors, and responsible persons for the operation service. The high requirements for this role transfer apply to all persons.

5.2.2 Number of persons required per task

The operational maintenance of the certification authority and the directory service (administration, backup, restoration) is carried out by knowledgeable and trusted staff.

Work on highly sensitive components (e.g., key generation system, HSM) is governed by special internal control procedures and carried out by at least two members of staff in trusted roles in a secure environment and in accordance with the dual-control principle.

5.2.3 Identification and authentication for each role

T-Systems employees who are classed as trustworthy and who carry out trustworthy activities are subject to a T-Systems internal security check (see Section 5.3.2).

T-Systems ensures that employees have achieved a trusted status and the department has given its approval before these employees:

- receive access tokens and access to facilities,
- Receive authorization to access IT systems
- Are permitted to carry out certain tasks in connection with these systems

5.2.4 Roles requiring separation of duties

The following roles require a separation of duties and are therefore assumed by different employees:

- Backup and recovery of databases and HSMs,
- Key life-cycle management of Sub-CA and Root-CA certificates.

5.3 Personnel controls

5.3.1 Qualifications, experience, and clearance requirements

Employees wishing to work as trusted persons are required by T-Systems to prove that they have the qualifications and experience necessary to fulfill their prospective work obligations in a competent and satisfactory manner, see also Section 5.3.2.

5.3.2 Background check procedures

Before an employee starts work in a trusted role, T-Systems runs a security check which includes the following:

- Checking and confirming the previous work relationships
- Checking employment references
- Confirming the highest or most relevant educational/vocational qualification
- Certificate of good conduct in accordance with § 30 of the German Federal Central Criminal Register Act (*Bundeszentralregistergesetz – BZRG*)

Sofern die in diesem Abschnitt festgelegten Anforderungen nicht erfüllt werden können, macht T-Systems ersatzweise Gebrauch von einer gesetzlich zulässigen Ermittlungsmethode, die im Wesentlichen die gleichen Informationen liefert.

Results of a security check which could lead to a candidate for a trusted person being rejected can include

- false statements by the candidate or the trusted person
- particularly negative or unreliable employment references
- certain previous convictions.

Reports containing such information are evaluated by HR employees or security personnel. They are determining the next steps. Further proceedings may involve measures that can even lead to candidates for trusted positions having their employment offer withdrawn or to trusted persons being dismissed.

The application of information gathered during a background check for executing aforementioned measures underlies legal regulations.

T-Systems must be provided with a certificate of good conduct at regular intervals, but no later than after three (3) years, or a new check will be performed.

5.3.3 Training requirements

The staff at T-Systems undergo the training measures required to fulfill their work obligations in a competent and satisfactory manner. T-Systems stores records about training measures.

The training programs at T-Systems are tailored towards the individual work areas and include, for example:

- Advanced PKI knowledge including key management:
- Procedures in accordance with ITIL
- Data protection,
- Security and operational guidelines and processes of T-Systems,
- Use and operation of the hardware and software in use
- Reporting and handling of faults and compromises
- Procedures for disaster recovery and business continuity
- Requirements of the CA Browser Forum
- Requirements of the browser manufacturers, e.g., Mozilla Root Program

5.3.4 Retraining frequency and requirements

T-Systems personnel receive refresher and training courses to the required extent and at the required intervals. In particular, training is provided in further development of the root programs of the browser manufacturers and the CA/Browser Forum.

5.3.5 Job rotation frequency and sequence

If there are employee changes, care is taken to ensure that no risks arise from the change.

5.3.6 Sanctions for unauthorized actions

T-Systems reserves the right to punish unauthorized activities or other violations of this CPS and the procedural and work instructions resulting therefrom and to take appropriate disciplinary measures. The disciplinary measures may include measures up to a dismissal based on the number and severity of unauthorized activities.

5.3.7 Independent contractor requirements

T-Systems reserves the right to name / apply independent contractors or consultants for trustworthy positions. These persons underly the same functional or security criteria as T-Systems employees.

The above group of people who have not yet concluded or successfully completed the security screening described in Section 5.3.2 will only be granted access to T-Systems' secure facilities provided they are always accompanied by trusted persons and are closely supervised.

5.3.8 Documentation supplied to personnel

To enable employees to properly fulfill their work obligations, T-Systems provides its employees with all the aids and documents they need for this (training documents, procedural instructions).

5.4 Audit logging procedures

5.4.1 Types of events recorded

Generally, all log data entries contain at least the date and time of the entry, a reference to the person or system that generated the entry, and a description of the event.

CA key pairs and CA systems

For the life-cycle management of CA key pairs or CA systems, the T-Systems Trust Center logs at least the following events for:

- a) generation, destruction, storage, backup, recovery, and archiving of the key pair or parts of the key pair
- b) events in the life-cycle management of cryptographic devices (e.g., HSM) and the CA software used

CA certificates

For the life-cycle management of CA certificates, the T-Systems Trust Center logs at least the following events for:

- initial request and revocation of certificates
- request for renewal with and without a change of key (renewal and re-key)
- all activities relating to the verification of information
- the event, as well as the date/time and phone number of phone calls relating to the verification and the name of the contact person
- acceptance or rejection of certificate applications
- issue of a certificate
- generation of revocation lists and OCSP entries

Other security-related events

In addition, the T-Systems Trust Center logs all security-relevant events for operation of the infrastructure. This includes at least the following events:

- successful and unsuccessful attempts to access the PKI systems
- actions performed on and by PKI systems and other systems that are relevant for security
- changes to the security profile
- system crashes, hardware failures, and other anomalies
- firewall and router activities
- entering and exiting of Trust Center facilities

5.4.2 Frequency of processing log

The audit logs/logging files are continuously examined for important events relevant to security and operations. Furthermore, T-Systems checks its audit logs/logging files for suspicious and unusual activities resulting from irregularities and faults.

Measures taken in response to the analysis of audit logs/logging files are also being logged.

5.4.3 Retention period for audit log

Audit logs/logging files are archived after processing for seven (7) years.

5.4.4 Protection of audit log

Audit logs/logging files are protected against unauthorized access.

5.4.5 Audit log backup procedures

An audit log backup is done if needed.

5.4.6 Audit collection system (internal vs. external)

Applications create and log audit data. Manually generated audit data is recorded by T-Systems employees.

5.4.7 Notification to event-causing subject

Events recorded by the audit monitoring system are assessed and passed on to the Trust Center staff responsible. High priority events are immediately passed on to the Trust Center staff, including outside of regular working hours.

5.4.8 Vulnerability assessments

The Trust Center administrators are regularly informed about weaknesses found in software products. After analyzing the information, the vulnerability is assessed and counter-measures are determined which are then immediately implemented.

5.5 Records archival

5.5.1 Types of records archived

T-Systems archives the following data:

- Hard copy of application documents
- All audit/event logging files recorded

5.5.2 Retention period for archive

The following records and storage periods are stipulated:

- Order documents, in particular information regarding certificate applications, their validation, and the certificates resulting from this and revocations executed are retained for a minimum of ten (10) years after the certificate expires
- Audit- and event log data are stored for seven (7) years

5.5.3 Protection of archive

T-Systems ensures that only authorized and trusted persons are given access to archives. Archive data is protected against unauthorized read access, changes, deletions, or other forms of tampering.

5.5.4 Archive backup procedures

An incremental backup of the electronic archives is carried out on a daily basis.

5.5.5 Requirements for time-stamping of records

Data such as certificates, certificate revocation lists, OSCP responses, and logging files are given information on the date and time. The time source is the receive signal of the DCF 77, from which the UTC is derived.

5.5.6 Archive collection system (internal or external)

T-Systems only uses internal archiving systems.

5.5.7 Procedures to obtain and verify archive information

Only authorized and trusted personnel receive access to archives and archive data. When archive data is restored, its authenticity is verified.

5.6 Key changeover

Within the period of validity, a key change or certificate change may be required if the

- key material is compromised
- cryptographic algorithm needs to be changed
- key size needs to be changed
- certificate content is changed

The generation of new keys and certificates is documented and monitored in accordance with the rules of the key generation ceremony. New certificates and their fingerprints are published (see Section 2.3).

Certificates can only be renewed within the period of validity of the Root-CA higher up in the hierarchy. Expired or revoked certificates remain available for validation on a website.

In case of a key changeover of Root-CA or Sub-CA the generation of new keys and certificates has to be documented and to be monitored according to the requirements of the security concept. Sub-CA New certificates and their fingerprints must be published (see Section 2.2).

5.7 Compromise and disaster recovery Sub-CA

If private keys of a Root-CA or Sub-CA are compromised, this must be communicated without delay (see Section 2.2). Sub-CA certificates must then be revoked without delay and the corresponding ARL must be published immediately. The generation of new keys and certificates must be documented and monitored according to the stipulations of the related security plan. New certificates and their fingerprints must be published (see Section 2.2).

5.7.1 Incident and compromise handling procedures

Incidents are submitted via the contacts defined in Section 1.5.2 and processed in the context of service management.

5.7.2 Computing resources, software, and/or data are corrupted

If the IT components, software, and/or data are damaged, the incident is immediately investigated and reported to the T-Systems security department. The event entails a corresponding escalation, incident investigation, incident response, and finally incident resolution. Disaster recovery is carried out depending on the incident classification.

5.7.3 Entity private key compromise procedures

If it becomes known that the private key of a CA is compromised, the incident is immediately investigated, assessed and the necessary steps taken.

End entities are informed that the relevant websites may be compromised (see Section 2.3). If necessary, the certificate(s) must be immediately revoked and the corresponding certification authority revocation list (ARL) must be generated and published.

5.7.4 Business continuity capabilities after a disaster

T-Systems has developed, implemented, and tested an emergency plan for data center operation in order to alleviate the effects of catastrophes of all kinds (natural catastrophes or catastrophes of human origin) and to restore the availability of critical business processes as quickly as possible. This also includes all Trust Center processes, components, systems, and services. This plan is reviewed at least once a year, tested, and updated accordingly, so as to be able to respond in a targeted and structured manner in the case of a disaster.

The emergency plan contains at least the following information:

- The necessary criteria for activating the plan
- Possible emergency measures (depending on the situation)
- Fallback procedures
- Restart procedure
- Procedure for regular maintenance, updating, and further development
- Awareness-raising measures
- Training requirements for the affected personnel
- The responsibilities of the individuals (role description and assignment)
- Recovery time objective (RTO)
- Regular execution of the emergency plans for test purposes
- A procedure for maintenance or timely restoration of business activities following an interruption or failure of critical business processes
- An obligation to back up or keep critical cryptographic devices and information at a different location
- Specification of the maximum tolerable downtime (MTD) and corresponding restoration times
- Frequency at which backups are created of critical business information and the software used including its configuration
- Physical distance between the backup locations or facilities and the main office or the Trust Center data center
- Procedure for securing the business premises and facilities as well as possible following a disaster (emergency operation) until secured normal operation in line with the requirements is restored

As part of a compliance audit (see Section 8), the auditor is authorized to view the details of the emergency plan.

5.8 CR or RA termination

Termination of operations may only be invoked by the T-Systems Board of Management.

If one or all T-Systems Root-CAs (see Section 1.3.1) have to cease operating, a cessation plan will be developed. Economically reasonable efforts (or efforts promised in the individual agreements) will be made to notify in advance any subordinate authorities affected by these terminations of operations.

A termination plan may include the following regulations:

- Continuity of revocation service
- Revocation of issued CA certificates
- Any transition regulations required for a successor CA
- Reimbursement of costs depending on the content of existing individual agreements
- Retention of the documentation and archives of the CA

If operations (the revocation service, in particular) are not taken over by another certification authority, all certificates issued will be revoked.

6 Technical security controls

The T-Systems Trust Center is housed in a specially protected building and operated by expert staff. All processes for requesting and generating certificates of the certification authorities operated there are defined in detail. All technical security measures are documented in a security plan (not publicly available).

The following statements describe technical measures and apply to the root CA certificates operated by the T-Systems Trust Center.

6.1 Generation and installation of key pairs

6.1.1 Key pair generation

All key pairs for root CA certificates are generated in a protected environment and created and stored on a security-checked hardware component (FIPS 140-2/ level 3 evaluated).

Implementation of the dual-control principle is enforced when generating the key. The generation of CA keys is documented in accordance with [EN 319 411].

6.1.2 Private key delivery to subscriber

It is not planned to deliver private keys to subscribers.

6.1.3 Public key delivery to certificate issuer

Public keys of a sub-CA to be certified are transmitted to the T-Systems Trust Center for certificate generation in the form of a signed PKCS#10 request.

6.1.4 CA public key delivery to relying parties

The public keys of the T-Systems root CAs can be obtained both from the "ldap.telesec.de" LDAP server and from the T-Systems Trust Center websites (the corresponding fingerprints are also published there) (see also Section 2).

6.1.5 Key sizes

The key size of the T-Systems root CA certificates is at least 2048 bits when using an RSA key and 384 bits when using an ECC key.

The key size of sub-CA certificates is least 2048 bits for RSA keys and 256 bits for ECC keys.

6.1.6 Public key parameter generation and quality checking

Public keys are generated in accordance with the stipulations of [CAB-BR].

The keys included in requests for sub CAs are checked in accordance with the the relevant section of the stipulations of [CAB-BR].

6.1.7 Key usage purposes (as per X.509 v3 key usage field)

Private root CA keys are used exclusively to sign sub-CA certificates, OCSP certificates, and revocation lists.

6.2 Private key protection and cryptographic module engineering controls

T-Systems has implemented physical, organizational, and procedural mechanisms to ensure the security of CA keys.

In the case of root CA and sub-CA certificates, the private keys are generated and stored on a hardware security module that has been security-checked. Keys can be backed up using high-quality multi-person backup techniques. The security plan regulates the details.

6.2.1 Cryptographic module standards and controls

The private keys of the root CAs are stored on a security-checked hardware security module (FIPS 140-2/level 3 evaluated).

Throughout the entire life-cycle, the modules are protected against unauthorized tampering by technical and organizational measures.

6.2.2 Private key (n out of m) multi-person control

T-Systems has implemented technical, organizational, and procedural mechanisms that require the participation of several trusted and trained persons of the T-Systems Trust Center to be able to carry out confidential cryptographic CA operations. The usage of the private key is protected by a divided authentication process. Every person involved in the process has secrets that only enable certain activities in their entirety.

6.2.3 Private key escrow

The storage of private keys with trustees outside T-Systems is not permitted.

6.2.4 Private key backup

T-Systems creates backup copies of the key material of the root CA certificates for restoration and disaster recovery purposes. These keys are stored in encrypted form within cryptographic hardware modules (HSM) and associated key storage devices.

The recovery of private keys is protected by a divided authentication process (trusted path authentication with key). Every person involved in the process has secrets that only enable activities in their entirety.

6.2.5 Private key archival

Root CA keys are destroyed when they reach the end of their validity periods. Keys are not archived.

The provisions of the deletion plan are implemented.

6.2.6 Private key transfer into or from a cryptographic module

T-Systems generates root CA keys on cryptographic hardware modules (HSM). Copies of these keys are made for recovery and emergency purposes (see Sections 6.2.4 and 6.2.5). In this case the transfer between both modules takes place in encrypted form.

All work steps can only be performed and documented by authorized individuals and in accordance with the dual-control principle.

6.2.7 Private key storage on cryptographic module

T-Systems stores root CA keys in secure form on approved and FIPS 140-2 level 3 evaluated cryptographic hardware security modules (HSM).

6.2.8 Method of activating private key

6.2.8.1 Private key activation on cryptographic modules

The root CA keys are activated in a log by multiple persons (one person of roles TC-PV and RFK each).

TC-PV and RFK protect the activation data against loss, theft, modification, disclosure, and unauthorized use.

6.2.8.2 Private sub-CA key activation on cryptographic modules

Private keys of sub-CA certificates are only available to the respective service.

6.2.8.3 End entity keys

Private keys of end entities are not available.

6.2.9 Method of deactivating private key

The private CA keys are deactivated by terminating the connection between HSM and the application. The deactivation is logged after actions (generation of keys, signing of revocation lists) have been completed.

6.2.10 Method of destroying private key

Root CA keys are destroyed by deletion in the HSM and all backup tokens. The deletion is carried out and documented by multiple persons (two persons with different roles). Further use of the private key is therefore no longer possible.

6.2.11 Cryptographic module rating

The rating is based on the specified methods. FIPS 140-2/level 3 evaluated components are monitored for validity in accordance with NIST.

6.3 Other aspects of key pair management

6.3.1 Public key archival

Public keys are archived in the form of the certificates generated.

Certificates are backed up and archived as part of the regular T-Systems backup measures. Other procedures are defined in the individual agreements.

6.3.2 Certificate operational periods and key pair usage periods

Root CA keys and root CA certificates are valid for a maximum period of 25 years.

OCSP certificates are valid for a maximum period of one (1) year.

6.4 Activation data

6.4.1 Activation data generation and installation

During generation and installation, the specifications of the CP were adhered to.

The activation data of the root CA keys is requested by the HSM. When assigning passwords, the dual-control principle is enforced by dividing the password into two halves. Each half is set by a person with the TC-PV and RFK role, respectively. In addition, activation requires the use of two different PED keys that are accessed separately by persons with the TC-PV and RFK roles.

6.4.2 Activation data protection

The persons involved (trusted roles) store their activation data protected from view in safes provided for this purpose.

6.4.3 Other aspects of activation data

6.4.3.1 Transfer of activation data

Activation data is transferred personally.

6.4.3.2 Destruction of activation data

As soon as the activation data is no longer required, it is securely deleted, shredded, or destroyed in specially marked containers for secure file disposal.

6.5 Computer security controls

6.5.1 Specific computer security technical requirements

T-Systems ensures that the required systems are backed up in accordance with the security plan, depending on the protection requirements.

The root CA is operated offline, i.e., with no network connection.

6.5.2 Computer security rating

As part of the security plan, different threat analyses are carried out to test the effectiveness of all measures implemented.

The rating will be reviewed after each incident, but not later than once a year.

6.6 Life cycle technical controls

6.6.1 System development controls

No provisions.

6.6.2 Security management controls

T-Systems has implemented mechanisms and/or guidelines to be able to control and monitor the configuration of its CA systems. The integrity is manually verified prior to installation.

6.6.3 Life cycle security controls

The equipment used is operated in accordance with the manufacturer's instructions. Before the start of operation, it is thoroughly checked and are only used if there is no doubt that it has not been tampered with.

By sealing the hardware and carrying out software checks, any tampering or attempted tampering can be detected with every action or audit.

6.7 Network security controls

The following network security measures are implemented:

- **Directory services and OCSP responder**
 - The directory services and OCSP responders accessible from the Internet are separated from the internal networks by firewalls.
 - Vulnerability scans are performed at regular intervals. Further details are described in Section 5.4.8.
- **Security-critical components**
 - The security-critical components and systems (e.g., CA, DB, Signer, HSM) are only wired directly in the rack and completely isolated from the network.

6.8 Time-stamping

The time source is manually synchronized on the offline system.

7 Certificate, CRL, and OCSP profiles

7.1 Certificate profile

The root CA certificates are structured in accordance with the X.509 standard. The name attributes for both subscribers and issuers are documented in the X.501 standard.

Certificate profiles for CA and subscriber certificates are defined in detail in the CPS of the respective certification authority.

The serial numbers are generated using a cryptographically secure random number generator. They are greater than zero and have at least 64 bit entropy.

7.1.1 Version number(s)

Root CA certificates are issued in accordance with the international X.509 standard (version 3).

7.1.2 Certificate extensions

7.1.2.1 Certificate extensions for root CA certificates

The certificate extensions of the root CA and sub-CA certificates comply with the CP requirements.

7.1.3 Algorithm object identifiers

The following signature algorithms are used in root CA certificates:

- SHA256 RSA (OID 1.2.840.113549.1.1.11)
- SHA384 ECDSA (OID 1.2.840.10045.4.3.3)

7.1.4 Name forms

The name forms of root CAs are compliant with the CP.

7.1.5 Name constraints

The name constraints of root CA are compliant with the CP.

7.1.6 Certificate policy object identifier

7.1.6.1 Root CA certificates

The included root CA certificates do not contain certificate policies.

7.1.6.2 Sub-CA certificates

The certificate policies for underlying sub-CA certificates are defined in the CPS of the respective services.

7.1.7 Usage of Policy Constraints extension

No use of the policy constraints extension for the root CA certificates.

7.1.8 Policy qualifiers syntax and semantics

No use of the policy qualifiers for the root CA certificates.

7.1.9 Processing semantics for the critical Certificate Policies extension

No use of the certificate Policies extension for the root CA certificates.

7.2 CRL profile

The revocation lists issued by T-Systems meet the following requirements:

- **[RFC 5280]** Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile
- **[X.509]** Information technology - Open Systems Interconnection - The Directory: Public-key and attribute certificate frameworks, Recommendation X.509 (08/05), Recommendation X.509 (2005) Corrigendum 1 (01/07)

7.2.1 Version number(s)

T-Systems supports certificate revocation lists in the X.509 Version 2 format in accordance with RFC 5280.

7.2.2 CRL and CRL entry extensions

7.2.2.1 "Authority Key Identifier" extension

The revocation lists contain the "Authority Key Identifier" extension. The criticality of this extension is set to "non-critical."

7.2.2.2 "Revocation list number" extension

The revocation lists contain the "revocation list number" extension as a sequential serial number of the revocation list. The criticality of this extension is set to "non-critical."

7.3 OCSP profile

7.3.1 Version number(s)

OCSP V1 is used in accordance with [RFC 6960].

7.3.2 OCSP extensions

No OCSP extensions are used.

8 Compliance audit and other assessments

The root CAs are certified conform to the policies ETSI TS 102 042 (since June 2018 ETSI EN 319 411-1). This is reviewed on an annual basis. The compliance audit of the root CAs is scheduled in context of the sub-CAs certification process. The assignment is indicated on the <http://www.telesec.de/de/trust-center> website under the published certificates.

Since no tasks of the root CA are performed by third parties, no regulations and checks at third parties are necessary.

8.1 Frequency or circumstances of assessment

In accordance with the requirements, a certification audit and an internal audit take place at least once a year.

8.2 Identity / qualification of assessor

For the determination of ETSI compliance, an accredited inspection authority is commissioned for the audit and an accredited certification authority for certification. Internal audits are carried out by the trusted role of "internal auditor," who is appropriately qualified (CISA and/or Lead Auditor ISO 27001).

8.3 Assessor's relationship to assessed entity

The ETSI compliance audit is carried out in accordance with ISO/IEC 17021 and meets the requirements for the auditor's relationship with the inspecting authority stated therein. With regards to the internal auditor, a role exclusion applies to all other roles of the unit to be audited.

8.4 Topics covered by assessment

The audit covers the complete scope of the ETSI EN 319 411-1 standard. According to ETSI EN 319 411-1 Section 4.4, this includes the complete CA operation including the components registration service, certificate generation service, dissemination service, revocation management service, revocation status service, and subject device provision service.

8.5 Actions taken as a result of deficiency

If defects or faults are detected during an audit by the accredited inspection authority, these are evaluated and, depending on the evaluation, immediate measures must be initiated or within certain deadlines. The Head of Trust Center decides relevant measures in cooperation with the inspection authority. The Head of the Trust Center, represented by the IT security officer, is responsible for updating and implementing the action plan.

8.6 Communication of results

The certification documents will be communicated by the accredited inspection authority to the management of the T-Systems CAs and will be published on the website of the T-Systems Trust Center: <https://www.telesec.de/de/trust-center>

The audit reports of the inspection authority on which the certification is based are not published. The requirements and the result of the audit are published in an annex to the certification document.

9 Other business and legal matters

9.1 Fees

Fees are determined in the relevant General Terms and Conditions (AGB) of the certification authorities.

9.1.1 Certificate issuance or renewal fees

T-Systems is entitled to charge for issuing, renewing, and managing certificates. Prices are governed by the certification authority's General Terms and Conditions (AGB) applicable to the relevant service or by individual agreement.

9.1.2 Certificate access fees

T-Systems does not charge for access to certificates in the directory service.

9.1.3 Revocation or status information access fees

T-Systems does not charge for access to revocation or status information for the relevant parts that fall under the scope of this document.

9.1.4 Fees for other services

T-Systems does not charge for access to this document and the associated simple viewing.

Any other usage, e.g., reproduction, amendment, or production of a derived document is subject to prior written consent of the authority (Sections 1.5.1, 9.5) that holds the copyright.

The use of this document is also free of charge if it serves as a further applicable contractual document for the contractual relationship between the customer and T-Systems.

9.1.5 Refund policy

T-Systems reimburses charges in accordance with the legal regulations under German law. Detailed provisions can be found in the General Terms and Conditions (AGB).

9.2 Financial responsibility

Financial responsibilities are determined in the relevant General Terms and Conditions (AGB) of the certification authorities or in individual agreements.

9.2.1 Insurance coverage

T-Systems has business liability insurance and D&O liability insurance cover. It is guaranteed that the requirements regarding insurance cover are fulfilled.

9.2.2 Other assets

Not applicable.

9.2.3 Insurance or warranty coverage for end-entities

Not applicable.

9.3 Confidentiality of business information

Data of legal persons and organizations as subscribers is recorded and verified to an extent as is required for issuing the sub-CA certificates and to guarantee that these certificates can be trusted.

Personal information is protected in accordance with the German Federal Data Protection Act (*Bundesdatenschutzgesetz*). Personal data is only made available to third parties if this becomes necessary as a result of legal requirements.

9.3.1 Scope of confidential information

Confidential information is any information from parties involved in PKIs (see Sections 1.3.2 and 1.3.3), which is not covered by Section 9.3.2.

9.3.2 Information not within the scope of confidential information

Non-confidential information is any implicit and explicit information that is included in issued certificates, revocation lists, and status information or can be derived from these.

9.3.3 Responsibility to protect confidential information

T-Systems, as PKI service provider, is responsible for the protection of confidential information and compliance with data protection provisions.

9.4 Privacy of personal information

Personal data of certificate holders is recorded and verified to an extent as is required for issuing the subscriber certificates and to guarantee that these certificates can be trusted.

As part of the data review, only the identity of the subscriber is determined but not his trustworthiness, credit rating, or credit worthiness.

Personal information is protected in accordance with the Federal Data Protection Act and § 14 of the German Digital Signature Act (*Signaturgesetz*). Personal data is only made available to third parties if this becomes necessary as a result of legal requirements.

9.4.1 Privacy plan

T-Systems adheres to the requirements of the privacy plan for T-Systems PKI. Excerpts from the privacy plan can be provided upon request.

9.4.2 Information treated as private

The same regulations as in Section 9.3.1 apply to personal data.

9.4.3 Information not deemed private

The same regulations as in Section 9.3.2 apply to personal data.

9.4.4 Responsibility to protect private information

The same regulations as in Section 9.3.3 apply to personal data.

9.4.5 Notice and consent to use private information

The certificate applicant consents to the use of personal data by a CA or RA insofar as it is necessary for service provision purposes. Furthermore, all data may be published that is not treated as confidential in accordance with Section 9.4.3.

9.4.6 Disclosure pursuant to judicial or administrative process

The obligation not to disclose confidential information or personal data does not apply if disclosure of such information/data has been ordered by force of law or by a court ruling or an administrative authority, or serves to implement legal judgments. As soon as there is reason to institute legal or official proceedings, which could lead to confidential or private information being disclosed, the contracting party involved in the proceedings will inform the other contracting party about this, taking into account the legal provisions.

9.4.7 Other information disclosure circumstances

No stipulations.

9.5 Intellectual property rights

This document is protected by copyright. It is not permitted to use the texts or diagrams or extracts thereof without the written consent of T-Systems. Intellectual property rights to the certificates and the ARL remain with T-Systems. The rights of use to the certificates issued are set out in individual agreements with the corresponding certification authorities.

9.6 Representations and warranties

9.6.1 CA representations and warranties

T-Systems commits to the following:

- That certificates do not include any false statements that are known to or originate from the registration authorities that approve the certificate application or issue the certificate
- That the certificates do not contain any errors made by the staff of the registration authorities that approve the certificate application or issue the certificate and which can be attributed to improper or careless certificate issuance and management
- That all certificates comply with the requirements of this document
- That the revocation functions and the use of the CA database (directory service, OCSP responder) fulfill all the essential requirements of the applicable CP/CPS

Furthermore, the T-Systems Trust Center guarantees that, at the time a SSL/TLS certificate is issued:

1. A defined procedure is in place to ensure that the applicant has the right to use the domains and/or IP addresses named in the certificate. Alternatively, that he has a relevant power of attorney that was issued by a person or an organization that has the right to this use
2. The procedure described under 1) is followed and
3. The procedure described under 1) is specified in detail in this CP/CPS
4. A defined procedure is followed to ensure that the subscriber (subject) named in the certificate has approved the issuing of the certificate and that the applicant's representative is authorized to make the request

5. The procedure described under 4) is followed and
6. The procedure described under 4) is specified in detail in this CP/CPS
7. A defined procedure is followed to check that, with the exception of the OU field, all the information contained in the certificate is correct in the subject DN
8. The procedure described under 7) is followed and
9. The procedure described under 7) is specified in detail in this CP/CPS
10. A defined procedure is followed to minimize the probability that the OU field of the subject DN contains misleading information
11. The procedure described under 10) is followed and
12. The procedure described under 10) is specified in detail in this CP/CPS

In addition, the T-Systems Trust Center guarantees that, in the event that the SSL/TLS certificate to be issued contains information regarding the subscriber's identity:

13. A defined procedure to check the provided identity is followed, which meets the requirements of the version of the [BR], Sections 9.2.4 and 11.2, valid at the time the certificate is issued
14. The procedure described under 13) is followed and
15. The procedure described under 13) is specified in detail in this CP/CPS

The T-Systems Trust Center additionally guarantees that:

16. If the subscriber is a group company (affiliate), the applicant's representative must accept the "General Terms of Use" before issuing a certificate
17. If the subscriber is not a group company (affiliate), the applicant agrees the "General Terms and Conditions" with T-Systems in a legally enforceable form
18. It operates a publicly accessible directory that contains status information regarding all certificates that have not expired (valid or revoked). This directory is available around the clock, 365 days a year
19. The issued certificates will be revoked in the event of all reasons listed in the [CAB-BR]

9.6.2 RA representations and warranties

All registration authorities commit to the following:

- Not to include any essentially false statements in certificates that are known to or originate from the registration authorities that approve the certificate application or issue the certificate
- That the certificates do not contain any errors made by the staff of the registration authorities that approve the certificate application or issue the certificate and which can be attributed to improper or careless certificate issuance and management
- To bear the legal consequences arising from the non-fulfillment of the obligations described.
- That all certificates fulfill the essential requirements of this document

9.6.3 Subscriber representations and warranties

No stipulations.

9.6.4 Relying party representations and warranties

Relying parties must have sufficient information and knowledge to be able to evaluate the handling of certificates and their validation. The relying party is responsible for its own decisions regarding whether the information provided is reliable and trustworthy.

9.6.5 Representations and warranties of other participants

No stipulations.

9.7 Disclaimers of warranties

The disclaimer of warranties is regulated in the applicable General Terms and Conditions (AGB).

9.8 Limitations of liability

The certification authority will have unlimited liability for damage arising out of injury to life, limb, or health, and damage resulting from willful breaches of obligations. Apart from that, liability for damage resulting from a breach of obligations due to negligence will be governed by the General Terms and Conditions (AGB) or by individual agreement.

9.9 Indemnities

Compensation is regulated in the applicable General Terms and Conditions (AGB).

9.10 Term and termination

9.10.1 Term

This document becomes effective upon publication on the T-Systems website. Changes also take effect when they are published on public websites (see Section 2.3).

9.10.2 Termination

This document remains in effect in the latest version until it is replaced by a new version.

9.10.3 Effect of termination and survival

When the Telekom PKI service ends, all users remain bound by the regulations contained in the CP/CPS until the last certificate issued expires or is revoked.

9.11 Individual notices and communications with participants

Unless otherwise contractually agreed, the up-to-date contact details (address, e-mail, etc.) for individual messages will be given to the certification authority.

9.12 Amendments

In order to respond to changing market requirements, security requirements and legislation, etc., T-Systems reserves the right to amend or adjust this document.

9.12.1 Procedure for amendment

Amendments to the CP/CPS can only be made by the T-Systems Change Advisory Board. With every official change, this document receives a new ascending version number and publication date.

Amendments enter into force immediately upon publication (see also Section 2.3).

Updated versions result in the previous document versions becoming invalid. In the event of contradictory provisions, the T-Systems Change Advisory Board will decide on how to proceed.

9.12.2 Notification mechanisms and period

Subordinate certification authorities will be notified of amendments and are given the opportunity to object within six weeks. If no objections are made, the new document version enters into force after the end of this period. Any claims beyond this for individual end users to be notified are explicitly excluded.

If the T-Systems Change Advisory Board believes that significant (e.g., security-relevant) amendments are required immediately, the new CP/CPS will enter into force immediately upon its release (see Section 9.12.1).

9.12.3 Circumstances under which OID must be changed

There are no separate regulations.

9.13 Dispute resolution provisions

In the event of disputes, the parties shall come to an agreement taking into account any applicable laws, regulations, and agreements made.

9.14 Governing law

The law of the Federal Republic of Germany shall apply.

9.15 Compliance with applicable law

The present document is subject to the applicable German laws, regulations, guidelines, ordinances, acts, and orders, in particular the import and export provisions for security components described therein (software, hardware, or technical information). Applicable mandatory laws, regulations, guidelines, ordinances, acts, and orders result in the corresponding provisions of the present document becoming invalid.

9.16 Miscellaneous provisions

9.16.1 Entire agreement

Not applicable.

9.16.2 Assignment

Not applicable.

9.16.3 Severability

Should any provision of this CPS be or become invalid or unenforceable, this shall not affect the validity of the remainder of this statement. Instead of the invalid and unenforceable provision, a provision is deemed to have been agreed which comes closest to the economic purpose of this document in a legally effective manner. The same applies to additions made in order to close contractual lacunas.

9.16.4 Enforcement (attorneys' fees and waiver of rights)

Not applicable.

9.16.5 Force majeure

Not applicable.

9.17 Other provisions

Not applicable.