

*Rachel McKen*  
February 16, 2018

# TrustCor Systems S. de R.L.

## Certification Practice Statement

Version: 1.4.0

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## Contents

### 1. INTRODUCTION

#### 1.1 Overview

#### 1.2 Document name and identification

#### 1.3 PKI participants

##### 1.3.1 Certification authorities

##### 1.3.2 Registration authorities

##### 1.3.3 Subscribers

##### 1.3.4 Relying parties

##### 1.3.5 Other participants

#### 1.4 Certificate usage

##### 1.4.1 Appropriate certificate uses

##### 1.4.2 Prohibited certificate uses

#### 1.5 Policy administration

##### 1.5.1 Organization administering the document

##### 1.5.2 Contact person

##### 1.5.3 Person determining CPS suitability for the policy

##### 1.5.4 CPS approval procedures

#### 1.6 Definitions and acronyms

##### 1.6.1 Definitions

##### 1.6.2 Acronyms

##### 1.6.3 References

##### 1.6.4 Conventions

### 2. PUBLICATION AND REPOSITORY RESPONSIBILITIES

#### 2.1 Repositories

#### 2.2 Publication of certification information

##### 2.2.1 Notification of incorrect issuance

#### 2.3 Time or frequency of publication

#### 2.4 Access controls on repositories

### 3. IDENTIFICATION AND AUTHENTICATION

#### 3.1 Naming

##### 3.1.1 Types of names

##### 3.1.2 Need for names to be meaningful

##### 3.1.3 Anonymity or pseudonymity of subscribers

##### 3.1.4 Rules for interpreting various name forms

##### 3.1.5 Uniqueness of names

##### 3.1.6 Recognition, authentication, and role of trademarks

#### 3.2 Initial identity validation

##### 3.2.1 Method to prove possession of private key

##### 3.2.2 Authentication of organization identity

###### 3.2.2.1 Identity

###### 3.2.2.2 DBA/Tradename

###### 3.2.2.3 Verification of Country

###### 3.2.2.4 Validation of Domain Authorization or Control

###### 3.2.2.4.1 Validating the Applicant as a Domain Contact

###### 3.2.2.4.2 Email, Fax, SMS or Postal Mail to Domain Contact



*Rachel McKinnon*  
January 16, 2018

#### 4.7 Certificate re-key

4.7.1 Circumstance for certificate re-key

4.7.2 Who may request certification of a new public key

4.7.3 Processing certificate re-keying requests

4.7.4 Notification of new certificate issuance to subscriber

4.7.5 Conduct constituting acceptance of a re-keyed certificate

4.7.6 Publication of the re-keyed certificate by the CA

4.7.7 Notification of certificate issuance by the CA to other entities

#### 4.8 Certificate modification

4.8.1 Circumstance for certificate modification

4.8.2 Who may request certificate modification

4.8.3 Processing certificate modification requests

4.8.4 Notification of new certificate issuance to subscriber

4.8.5 Conduct constituting acceptance of modified certificate

4.8.6 Publication of the modified certificate by the CA

4.8.7 Notification of certificate issuance by the CA to other entities

#### 4.9 Certificate revocation and suspension

4.9.1 Circumstances for revocation

4.9.1.1 Reasons for Revoking a Subscriber Certificate

4.9.1.2 Reasons for Revoking a Subordinate CA Certificate

4.9.2 Who can request revocation

4.9.3 Procedure for revocation request

4.9.4 Revocation request grace period

4.9.5 Time within which CA must process the revocation request

4.9.6 Revocation checking requirement for relying parties

4.9.7 CRL issuance frequency

4.9.8 Maximum latency for CRLs

4.9.9 On-line revocation/status checking availability

4.9.10 On-line revocation checking requirements

4.9.11 Other forms of revocation advertisements available

4.9.12 Special requirements re key compromise

4.9.13 Circumstances for suspension

4.9.14 Who can request suspension

4.9.15 Procedure for suspension request

4.9.16 Limits on suspension period

#### 4.10 Certificate status services

4.10.1 Operational characteristics

4.10.2 Service availability

4.10.3 Optional features

#### 4.11 End of subscription

#### 4.12 Key escrow and recovery

4.12.1 Key escrow and recovery policy and practices

4.12.2 Session key encapsulation and recovery policy and practices

### 5. FACILITY, MANAGEMENT, AND OPERATIONAL CONTROLS

#### 5.1 Physical controls

5.1.1 Site location and construction

5.1.2 Physical access

*Rachel M. Miller*  
January 16, 2018

- 5.1.3 Power and air conditioning
- 5.1.4 Water exposures
- 5.1.5 Fire prevention and protection
- 5.1.6 Media storage
- 5.1.7 Waste disposal
- 5.1.8 Off-site backup
- 5.2 Procedural controls
  - 5.2.1 Trusted roles
  - 5.2.2 Number of persons required per task
  - 5.2.3 Identification and authentication for each role
  - 5.2.4 Roles requiring separation of duties
- 5.3 Personnel controls
  - 5.3.1 Qualifications, experience, and clearance requirements
  - 5.3.2 Background check procedures
  - 5.3.3 Training requirements
  - 5.3.4 Retraining frequency and requirements
  - 5.3.5 Job rotation frequency and sequence
  - 5.3.6 Sanctions for unauthorized actions
  - 5.3.7 Independent contractor requirements
  - 5.3.8 Documentation supplied to personnel
- 5.4 Audit logging procedures
  - 5.4.1 Types of events recorded
  - 5.4.2 Frequency of processing log
  - 5.4.3 Retention period for audit log
  - 5.4.4 Protection of audit log
  - 5.4.5 Audit log backup procedures
  - 5.4.6 Audit collection system (internal vs. external)
  - 5.4.7 Notification to event-causing subject
  - 5.4.8 Vulnerability assessments
- 5.5 Records archival
  - 5.5.1 Types of records archived
  - 5.5.2 Retention period for archive
  - 5.5.3 Protection of archive
  - 5.5.4 Archive backup procedures
  - 5.5.5 Requirements for time-stamping of records
  - 5.5.6 Archive collection system (internal or external)
  - 5.5.7 Procedures to obtain and verify archive information
- 5.6 Key changeover
- 5.7 Compromise and disaster recovery
  - 5.7.1 Incident and compromise handling procedures
  - 5.7.2 Computing resources, software, and/or data are corrupted
  - 5.7.3 Entity private key compromise procedures
  - 5.7.4 Business continuity capabilities after a disaster
- 5.8 CA or RA termination

*Rachit Mehra*  
January 16, 2018

## 6. TECHNICAL SECURITY CONTROLS

### 6.1 Key pair generation and installation

#### 6.1.1 Key pair generation

##### 6.1.1.1 CA Key Pair Generation

##### 6.1.1.2 Subscriber Key Pair Generation

#### 6.1.2 Private key delivery to subscriber

#### 6.1.3 Public key delivery to certificate issuer

#### 6.1.4 CA public key delivery to relying parties

#### 6.1.5 Key sizes

#### 6.1.6 Public key parameters generation and quality checking

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

### 6.2 Private Key Protection and Cryptographic Module Engineering Controls

#### 6.2.1 Cryptographic module standards and controls

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

#### 6.2.3 Private key escrow

#### 6.2.4 Private key backup

#### 6.2.5 Private key archival

#### 6.2.6 Private key transfer into or from a cryptographic module

#### 6.2.7 Private key storage on cryptographic module

#### 6.2.8 Method of activating private key

#### 6.2.9 Method of deactivating private key

#### 6.2.10 Method of destroying private key

#### 6.2.11 Cryptographic Module Rating

### 6.3 Other aspects of key pair management

#### 6.3.1 Public key archival

#### 6.3.2 Certificate operational periods and key pair usage periods

### 6.4 Activation data

#### 6.4.1 Activation data generation and installation

#### 6.4.2 Activation data protection

#### 6.4.3 Other aspects of activation data

### 6.5 Computer security controls

#### 6.5.1 Specific computer security technical requirements

#### 6.5.2 Computer security rating

### 6.6 Life cycle technical controls

#### 6.6.1 System development controls

#### 6.6.2 Security management controls

#### 6.6.3 Life cycle security controls

### 6.7 Network security controls

### 6.8 Time-stamping

## 7. CERTIFICATE, CRL, AND OCSP PROFILES

### 7.1 Certificate profile

#### 7.1.1 Version number(s)

#### 7.1.2 Certificate extensions

##### 7.1.2.1 Root CA Certificate

##### 7.1.2.2 Subordinate CA Certificate

##### 7.1.2.3 Subscriber Certificate



*Rachel M. Miller*  
January 16, 2018

- 9.3.3 Responsibility to protect confidential information
- 9.4 Privacy of personal information
  - 9.4.1 Privacy plan
  - 9.4.2 Information treated as private
  - 9.4.3 Information not deemed private
  - 9.4.4 Responsibility to protect private information
  - 9.4.5 Notice and consent to use private information
  - 9.4.6 Disclosure pursuant to judicial or administrative process
  - 9.4.7 Other information disclosure circumstances
- 9.5 Intellectual property rights
- 9.6 Representations and warranties
  - 9.6.1 CA representations and warranties
  - 9.6.2 RA representations and warranties
  - 9.6.3 Subscriber representations and warranties
  - 9.6.4 Relying party representations and warranties
  - 9.6.5 Representations and warranties of other participants
- 9.7 Disclaimers of warranties
- 9.8 Limitations of liability
- 9.9 Indemnities
  - 9.9.1 Indemnification by CAs
  - 9.9.2 Indemnification by Subscribers
  - 9.9.3 Indemnification by Relying Parties
- 9.10 Term and termination
  - 9.10.1 Term
  - 9.10.2 Termination
  - 9.10.3 Effect of termination and survival
- 9.11 Individual notices and communications with participants
- 9.12 Amendments
  - 9.12.1 Procedure for amendment
  - 9.12.2 Notification mechanism and period
  - 9.12.3 Circumstances under which OID must be changed
- 9.13 Dispute resolution provisions
- 9.14 Governing law
- 9.15 Compliance with applicable law
- 9.16 Miscellaneous provisions
  - 9.16.1 Entire agreement
  - 9.16.2 Assignment
  - 9.16.3 Severability
  - 9.16.4 Enforcement (attorneys' fees and waiver of rights)
  - 9.16.5 Force Majeure
- 9.17 Other provisions



*Rachel McKinnon*  
February 16, 2018

## 1. INTRODUCTION

The Certification Authority (CA) component of TrustCor Systems S. de R.L. (TrustCor CA) is that section of the company which deals with the requesting, validation, issuance and revocation of digital certificates following the X.509 standard for specified business purposes to the general public.

This document details the practices which TrustCor CA must follow in order to meet the policy specifications laid down in the TrustCor CA Certificate Policy document (CP). Accordingly this document is called the TrustCor CA Certification Practice Statement (CPS). It should also meet the disclosure and control statements required within the document "Trust Service Principles and Criteria for Certification Authorities, Version 2.0" (WebTrust CA), issued by AICPA/CICA in May 2011 (CICA now being CPA Canada since 2012).

### 1.1 Overview

This document is designed to conform with the Certificate Authority/ Browser Forum (CA/B Forum) requirements laid down in the Baseline Requirements for the Issuance and Management of Publicly-Trusted Certificate (Baseline Requirements). As of this version of the CPS, the version of the Baseline Requirements against which audit is performed is version 1.5.6 (February 5, 2018).

This document is one of a set of documents which establish the governance and practices of the TrustCor CA business offerings. Other documents include, but are not limited to:

- The TrustCor CA Certificate Policy (CP)
- The TrustCor CA Privacy Policy
- The TrustCor CA Security Policy (+)
- The Basic Secure Mail Subscriber Agreement
- The Enhanced Secure Mail Subscriber Agreement
- The Basic Secure Site Subscriber Agreement
- The Enhanced Secure Site Subscriber Agreement
- Enterprise Subordinate CA Business Agreement(s) (+)

Note that not all documents are in the public domain - those marked with (+) are held to be company confidential, and are not disclosed generally.

Those documents which are publicly available can be reached online at <http://www.trustcor.ca/resources>

*Rachel McKen*  
February 16, 2018

## 1.2 Document name and identification

This document is version 1.4.0 of the TrustCor CA Certification Practice Statement, created and published on 2018-02-16. It carries the OID of 1.3.6.1.4.1.44031.1.1.5.

1.3.6.1.4.1.44031 is the root branch of the enterprise OID space allocated to TrustCor Systems S. de R.L. via <https://www.iana.org/assignments/enterprise-numbers/enterprise-numbers>

The change record for this document relative to its predecessors is below:

Date	Changes	Version
2018-02-16	Update to 3.2.2.4, CT publication policy and SHA-256 signatures	1.4.0
2017-08-15	Update to OCSP Response Policy	1.3.3
2017-08-14	Clarifications added in response to Mozilla Public Discussion	1.3.2
2017-04-19	Changes to policies to meet with BR 1.4.4	1.3.1
2016-09-15	Changes to policies to meet with BRs 1.4.0	1.3.0
2016-07-04	Review of document - no changes made	1.2.2
2016-01-23	Change to typo in policyId root (1.3.6.1.4.4 -> 1.3.6.1.4.1)	1.2.2
2015-12-10	Change to Subordinate CA names, replacing obsolete ones	1.2.1
2015-11-16	This version replaces 1.1.0 and converts into RFC 3647 format	1.2.0

## 1.3 PKI participants

### 1.3.1 Certification authorities

TrustCor CA operates three root certificates in its CA infrastructure:

- The Basic Root Certificate (CA-1) - used to ultimately be the root of trust for all certificates issued under the Basic Assurance program. This certificate currently signs the subordinate CAs:
  - Basic Secure Email CA (Subordinate CA1-Email)
  - Basic Secure Site CA (Subordinate CA1-Site)
  - Basic Secure Site CA [Restricted Key Size] (Subordinate CA1-Site-2048)

*Rachel M. Miller*  
January 16, 2018

- The Enhanced Root Certificate (CA-2) - used as the root of trust for certificates issued under the Enhanced Assurance program. Currently two subordinate CA are issued under this root:
  - Enhanced Secure Email CA (Subordinate CA2-Email)
  - Enhanced Secure Site CA (Subordinate CA2-Site)
- The Enterprise Root Certificate (ECA-1) - used as the ultimate root for enterprise PKIs issuing credentials to their principals in restricted namespaces. There is one subordinate CA under this root:
  - Enterprise External PKI CA (Subordinate ECA1-External)

TrustCor CA undertakes to ensure that all operations conducted using these certificates, including registration of entities, validation of same, issuance and revocation of certificates are performed in accordance with the strictures of this document, the governing CP. Note that Enterprise Subordinate CA certificates are still TrustCor CA certificates, and TrustCor CA is responsible for their issuance, insofar as the enterprise subscriber agreements is obeyed. TrustCor CA is responsible for revoking an enterprise subordinate CA should it discover substantive violations of its enterprise agreements.

### **1.3.2 Registration authorities**

Registration authorities (RAs) are those parts of the PKI which deal with the collection of subscriber information, validation of same and approve or reject the issuance process of certificates.

TrustCor CA has an internal RA which is used to collect subscriber information, and react to requests for revocation and/or certificate pickup. It is managed in the same infrastructure as its CA offerings, detailed herein.

External RAs are present where external Enterprise CAs have been licensed to issue name restricted TrustCor CA certificates; such RAs must adhere to the terms of registration, validation and publication as noted in this document as well as the Enterprise Subscriber Agreement between TrustCor CA and the subscribing organization.

External RAs are not entitled to perform general domain or organizational validation; they are strictly limited to registration for credentials to domains and principals assigned to their specific organization.

*Rachel M. Miller*  
January 16, 2018

### **1.3.3 Subscribers**

Subscribers are those parties who apply for certificates or certification services from TrustCor CA and agree to be bound by the relevant Subscriber Agreement for the business offering selected. In this document, a subscriber who has registered, but not yet received, a certificate is referred to as an Applicant.

### **1.3.4 Relying parties**

Relying Parties (RPs) are those who elect to use the information contained within a TrustCor CA certificate to identify an entity using SSL/TLS or S/MIME cryptographic protocols, and to cryptographically protect information using the public keys inside those certificates.

In order to have any confidence that the identification is a valid one, RPs must use either the CRLs or OCSP responses issued by TrustCor CA to have confidence that the certificates issued are still valid.

RPs should also refer to the subsections in Section 1.4 of this document to see whether TrustCor CA permits or prohibits the identification within a particular context (for example, whether certificates can be for identification/protection in high hazard environments).

### **1.3.5 Other participants**

No stipulation.

## **1.4 Certificate usage**

All certificates issued by TrustCor CA have a set of identifiers embedded into them which limit the permissible types of use for the certificate (and its corresponding private key).

All certificates are issued under the aegis of a subscriber agreement which stipulates the permitted uses for the certificate. They are as follows:

- Basic and Enhanced Secure Email - to be used for protection of email contents and signing of emails.
- Basic and Enhanced Secure Site - to be used for termination of SSL/TLS connections to a particular IP service (for example, HTTPS, IMAP, LDAP, etc.)
- External PKI Subordinate CA - to be used to sign technically constrained S/MIME and SSL certificates (an agreement and certificate constraint may exist which limits publication to only one of those options). In all cases, the names expressible via the signed certificate will be embedded into the subordinate CA certificate.

*Rachel M. Miller*  
January 16, 2018

Subscribers are constrained by their agreements not to use certificates outside of those specified purposes.

#### **1.4.1 Appropriate certificate uses**

The uses permitted for each certificate vary by the business offering. Because TrustCor CA has different pricing for its offerings dependent on certificate type, prospective subscribers must evaluate which type of certificate is most likely to fit their needs dependent on the type of information they wish certified and the evidence of identity which they are willing to submit to TrustCor CA.

TrustCor CA will embed OIDs in its end-entity certificates which denote the type of validation which was used in the issuance process.

Domain Validated (DV) Certificates are those used to terminate SSL connections either as clients or servers using the TLS protocols. The validation establishes that the private key holder has the ability to control the domain or end points which the certificate will hold. DV certificates can only certify a single end point. They are intended to be used where the risk of damage to the private key holder, in the event of compromise, is relatively low.

Organization Validated (OV) Certificates can be used for either S/MIME or SSL certificates. They are issued after a greater degree of investigation into the rights of the private key holder to claim both the organizational identity in the certificate, as well as the individual identities claimed within. They should be used where asserting an organizational identity is needed, and where the data protected using the private key/certificate pair contains moderate risk in the event of compromise. OV Certificates for SSL use may have multiple host names contained within their certificates; OV S/MIME certificates may not.

The business offerings are:

- Basic Secure Mail - IV, maximum 398 day validity (S/MIME)
- Basic Secure Site - DV, maximum 398 day validity (SSL)
- Enhanced Secure Mail - OV, maximum 825 day validity (S/MIME)
- Enhanced Secure Site - OV, maximum 825 day validity (SSL)
- Enterprise PKI Subordinate CA - OV, issued end-entity certificates may have a maximum lifetime of 825 days.

#### **1.4.2 Prohibited certificate uses**

As per the CP, no TrustCor CA certificate may be used:

- in violation of local law where it is deployed

*Rachel McPherson*  
January 16, 2018

- for any purpose other than the permitted usages embedded in the certificate
- to act as testimony for an end-entity's identity which has not been established via the certificate issuance process.
- in violation of the subscriber agreement under which it was issued
- in any environment where fail-safe operation is required, or where it forms part of the control equipment involving hazardous materials. Such environments include, but are not limited to:
  - air traffic control systems
  - nuclear reactor facilities
  - weapons control systems
  - aircraft navigation systems
  - any system whose failure places human life in danger of injury or death

## **1.5 Policy administration**

### **1.5.1 Organization administering the document**

This document is maintained via the TrustCor Policy Authority (TCPA), which also administers the CP, and the other TrustCor CA governing documents. The TCPA can be contacted at this address:

TrustCor Policy Authority, 371 Front Street West #123, Toronto ON M5V3S8 Canada
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The TCPA can be emailed at: [legal@trustcor.ca](mailto:legal@trustcor.ca)

### **1.5.2 Contact person**

The following person can be used as a contact point for policy related enquiries:

Name: Rachel McPherson E-mail: <a href="mailto:rachel@trustcor.ca">rachel@trustcor.ca</a> Tel: +1 (289) 408-9998
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### **1.5.3 Person determining CPS suitability for the policy**

The TCPA determines whether this CPS adheres to the policy requirements set down in the CP.

### **1.5.4 CPS approval procedures**

The TCPA will review such changes as are required to this CPS and updated CPS versioning accordingly. The version of any document has three components: Major, Minor and Micro.

*Rachel M. Miller*  
January 16, 2018

As per Section 1.5.4 of the CP, versioning follows the same strategy.

Micro release changes are there to indicate minor syntactic changes (e.g. spelling errors, grammatical clarity, etc.). Micro releases do not require a new OID issue.

Minor release changes indicate new or altered information which has a bearing on TrustCor CA's processes, or imposes altered duties on PKI participants. Such changes will be accompanied by a new OID issue.

Major release changes indicate significantly altered information, such as entirely new business offerings, major liability changes, or significant changes to the duties imposed upon subscribers. A new OID issues is required for such major changes.

## **1.6 Definitions and acronyms**

### **1.6.1 Definitions**

#### **Affiliate**

A corporation, partnership, joint venture or other entity controlling, controlled by, or under common control with another entity, or an agency, department, political subdivision, or any entity operating under the direct control of a Government Entity.

#### **Applicant**

The natural person or Legal Entity that applies for (or seeks renewal of) a Certificate. Once the Certificate issues, the Applicant is referred to as the Subscriber. For Certificates issued to devices, the Applicant is the entity that controls or operates the device named in the Certificate, even if the device is sending the actual certificate request.

#### **Applicant Representative**

A natural person or human sponsor who is either the Applicant, employed by the Applicant, or an authorized agent who has express authority to represent the Applicant: (i) who signs and submits, or approves a certificate request on behalf of the Applicant, and/or (ii) who signs and submits a Subscriber Agreement on behalf of the Applicant, and/or (iii) who acknowledges and agrees to the Certificate Terms of Use on behalf of the Applicant when the Applicant is an Affiliate of the CA.

#### **Application Software Supplier**

A supplier of Internet browser software or other relying-party application software that displays or uses Certificates and incorporates Root Certificates.

#### **Attestation Letter**

A letter attesting that Subject Information is correct written by an accountant, lawyer, government official, or other reliable third party customarily relied upon for such information.

#### **Audit Report**

*Rachel M. Miller*  
January 16, 2018

A report from a Qualified Auditor stating the Qualified Auditor's opinion on whether an entity's processes and controls comply with the mandatory provisions of these Requirements.

#### CAA Record

From RFC 6844 (<http://tools.ietf.org/html/rfc6844>): "The Certification Authority Authorization (CAA) DNS Resource Record allows a DNS domain name holder to specify the Certification Authorities (CAs) authorized to issue certificates for that domain. Publication of CAA Resource Records allows a public Certification Authority to implement additional controls to reduce the risk of unintended certificate mis-issue."

#### Certificate

An electronic document that uses a digital signature to bind a public key and an identity.

#### Certificate Data

Certificate requests and data related thereto (whether obtained from the Applicant or otherwise) in the CA's possession or control or to which the CA has access.

#### Certificate Management Process

Processes, practices, and procedures associated with the use of keys, software, and hardware, by which the CA verifies Certificate Data, issues Certificates, maintains a Repository, and revokes Certificates.

#### Certificate Policy

This document.

#### Certificate Problem Report

Complaint of suspected Key Compromise, Certificate misuse, or other types of fraud, compromise, misuse, or inappropriate conduct related to Certificates.

#### Certificate Revocation List

A regularly updated time-stamped list of revoked Certificates that is created and digitally signed by the CA that issued the Certificates.

#### Certification Authority

An organization that is responsible for the creation, issuance, revocation, and management of Certificates. The term applies equally to both Roots CAs and Subordinate CAs.

#### Certification Practice Statement

One of several documents forming the governance framework in which Certificates are created, issued, managed, and used.

#### Control

"Control" (and its correlative meanings, "controlled by" and "under common control with") means possession, directly or indirectly, of the power to: (1) direct the management, personnel, finances, or plans of such entity; (2) control the election of a majority of the directors; or (3) vote that portion of voting shares required for "control" under the law of the entity's Jurisdiction of Incorporation or Registration but in no case less than 10%.

#### Country



*Rachel M. Miller*  
January 16, 2018

Either a member of the United Nations OR a geographic region recognized as a sovereign nation by at least two UN member nations.

**Cross Certificate**

A certificate that is used to establish a trust relationship between two Root CAs.

**Delegated Third Party**

A natural person or Legal Entity that is not the CA but is authorized by the CA to assist in the Certificate Management Process by performing or fulfilling one or more of the CA requirements found herein.

**Domain Authorization Document**

Documentation provided by, or a CA's documentation of a communication with, a Domain Name Registrar, the Domain Name Registrant, or the person or entity listed in WHOIS as the Domain Name Registrant (including any private, anonymous, or proxy registration service) attesting to the authority of an Applicant to request a Certificate for a specific Domain Namespace.

**Domain Name**

The label assigned to a node in the Domain Name System.

**Domain Name Registrant**

Sometimes referred to as the "owner" of a Domain Name, but more properly the person(s) or entity(ies) registered with a Domain Name Registrar as having the right to control how a Domain Name is used, such as the natural person or Legal Entity that is listed as the "Registrant" by WHOIS or the Domain Name Registrar.

**Domain Name Registrar**

A person or entity that registers Domain Names under the auspices of or by agreement with: (i) the Internet Corporation for Assigned Names and Numbers (ICANN), (ii) a national Domain Name authority/registry, or (iii) a Network Information Center (including their affiliates, contractors, delegates, successors, or assigns).

**Domain Namespace**

The set of all possible Domain Names that are subordinate to a single node in the Domain Name System.

**Effective Date**

These Requirements come into force on the date of approval of this document.

**Enterprise RA**

An employee or agent of an organization unaffiliated with the CA who authorizes issuance of Certificates to that organization.

**Expiry Date**

The "Not After" date in a Certificate that defines the end of a Certificate's validity period.

**Fully-Qualified Domain Name**

A Domain Name that includes the labels of all superior nodes in the Internet Domain Name System.

*Rachel Miller*  
January 16, 2018

#### Government Entity

A government-operated legal entity, agency, department, ministry, branch, or similar element of the government of a country, or political subdivision within such country (such as a state, province, city, county, etc.).

#### High Risk Certificate Request

A Request that the CA flags for additional scrutiny by reference to internal criteria and databases maintained by the CA, which may include names at higher risk for phishing or other fraudulent usage, names contained in previously rejected certificate requests or revoked Certificates, names listed on the Miller Smiles phishing list or the Google Safe Browsing list, or names that the CA identifies using its own risk-mitigation criteria.

#### Internal Name

A string of characters (not an IP address) in a Common Name or Subject Alternative Name field of a Certificate that cannot be verified as globally unique within the public DNS at the time of certificate issuance because it does not end with a Top Level Domain registered in IANA's Root Zone Database.

#### Issuing CA

In relation to a particular Certificate, the CA that issued the Certificate. This could be either a Root CA or a Subordinate CA.

#### Key Compromise

A Private Key is said to be compromised if its value has been disclosed to an unauthorized person, an unauthorized person has had access to it, or there exists a practical technique by which an unauthorized person may discover its value. A Private Key is also considered compromised if methods have been developed that can easily calculate it based on the Public Key (such as a Debian weak key, see <http://wiki.debian.org/SSLkeys>) or if there is clear evidence that the specific method used to generate the Private Key was flawed.

#### Key Generation Script

A documented plan of procedures for the generation of a CA Key Pair.

#### Key Pair

The Private Key and its associated Public Key.

#### Legal Entity

An association, corporation, partnership, proprietorship, trust, government entity or other entity with legal standing in a country's legal system.

#### Object Identifier

A unique alphanumeric or numeric identifier registered under the International Organization for Standardization's applicable standard for a specific object or object class.

#### OCSP Responder

*Rachel M. Miller*  
January 16, 2018

An online server operated under the authority of the CA and connected to its Repository for processing Certificate status requests. See also, Online Certificate Status Protocol.

**Online Certificate Status Protocol**

An online Certificate-checking protocol that enables relying-party application software to determine the status of an identified Certificate. See also OCSP Responder.

**Parent Company**

A company that Controls a Subsidiary Company.

**Private Key**

The key of a Key Pair that is kept secret by the holder of the Key Pair, and that is used to create Digital Signatures and/or to decrypt electronic records or files that were encrypted with the corresponding Public Key.

**Public Key**

The key of a Key Pair that may be publicly disclosed by the holder of the corresponding Private Key and that is used by a Relying Party to verify Digital Signatures created with the holder's corresponding Private Key and/or to encrypt messages so that they can be decrypted only with the holder's corresponding Private Key.

**Public Key Infrastructure**

A set of hardware, software, people, procedures, rules, policies, and obligations used to facilitate the trustworthy creation, issuance, management, and use of Certificates and keys based on Public Key Cryptography.

**Publicly-Trusted Certificate**

A Certificate that is trusted by virtue of the fact that its corresponding Root Certificate is distributed as a trust anchor in widely-available application software.

**Qualified Auditor**

A natural person or Legal Entity that meets the requirements of Section 8.2 (Identity/Qualifications of Assessor).

**Registered Domain Name**

A Domain Name that has been registered with a Domain Name Registrar.

**Registration Authority (RA)**

Any Legal Entity that is responsible for identification and authentication of subjects of Certificates, but is not a CA, and hence does not sign or issue Certificates. An RA may assist in the certificate application process or revocation process or both. When "RA" is used as an adjective to describe a role or function, it does not necessarily imply a separate body, but can be part of the CA.

**Reliable Data Source**

An identification document or source of data used to verify Subject Identity Information that is generally recognized among commercial enterprises and governments as reliable, and which was created by a

*Rachel M. Miller*  
January 16, 2018

third party for a purpose other than the Applicant obtaining a Certificate.

**Reliable Method of Communication**

A method of communication, such as a postal/courier delivery address, telephone number, or email address, that was verified using a source other than the Applicant Representative.

**Relying Party**

Any natural person or Legal Entity that relies on a Valid Certificate. An Application Software Supplier is not considered a Relying Party when software distributed by such Supplier merely displays information relating to a Certificate.

**Repository**

An online database containing publicly-disclosed PKI governance documents (such as Certificate Policies and Certification Practice Statements) and Certificate status information, either in the form of a CRL or an OCSP response.

**Requirements**

The CA/B Forum's Baseline Requirements for the Issuance and Management of Publicly-Trusted Certificates

**Reserved IP Address**

An IPv4 or IPv6 address that the IANA has marked as reserved: <http://www.iana.org/assignments/ipv4-address-space/ipv4-address-space.xml> (<http://www.iana.org/assignments/ipv4-address-space/ipv4-address-space.xml>) <http://www.iana.org/assignments/ipv6-address-space/ipv6-address-space.xml> (<http://www.iana.org/assignments/ipv6-address-space/ipv6-address-space.xml>)

**Root CA**

The top level Certification Authority whose Root Certificate is distributed by Application Software Suppliers and that issues Subordinate CA Certificates.

**Root Certificate**

The self-signed Certificate issued by the Root CA to identify itself and to facilitate verification of Certificates issued to its Subordinate CAs.

**Sovereign State**

A state or country that administers its own government, and is not dependent upon, or subject to, another power.

**Subject**

The natural person, device, system, unit, or Legal Entity identified in a Certificate as the Subject. The Subject is either the Subscriber or a device under the control and operation of the Subscriber.

**Subject Identity Information**

Information that identifies the Certificate Subject. Subject Identity Information does not include a domain name listed in the subjectAltName extension or the Subject commonName field.

**Subordinate CA**

*Rachel M. Miller*  
January 16, 2018

A Certification Authority whose Certificate is signed by the Root CA, or another Subordinate CA.

**Subscriber**

A natural person or Legal Entity to whom a Certificate is issued and who is legally bound by a Subscriber or Terms of Use Agreement.

**Subscriber Agreement**

An agreement between the CA and the Applicant/Subscriber that specifies the rights and responsibilities of the parties.

**Subsidiary Company**

A company that is controlled by a Parent Company.

**Technically Constrained Subordinate CA Certificate**

A Subordinate CA certificate which uses a combination of Extended Key Usage settings and Name Constraint settings to limit the scope within which the Subordinate CA Certificate may issue Subscriber or additional Subordinate CA Certificates.

**Terms of Use**

Provisions regarding the safekeeping and acceptable uses of a Certificate issued in accordance with these Requirements when the Applicant/Subscriber is an Affiliate of the CA.

**Trustworthy System**

Computer hardware, software, and procedures that are: reasonably secure from intrusion and misuse; provide a reasonable level of availability, reliability, and correct operation; are reasonably suited to performing their intended functions; and enforce the applicable security policy.

**Unregistered Domain Name**

A Domain Name that is not a Registered Domain Name.

**Valid Certificate**

A Certificate that passes the validation procedure specified in RFC 5280.

**Validation Specialists**

Someone who performs the information verification duties specified by these Requirements.

**Validity Period**

The period of time measured from the date when the Certificate is issued until the Expiry Date.

**Wildcard Certificate**

A Certificate containing an asterisk (\*) in the left-most position of any of the Subject Fully-Qualified Domain Names contained in the Certificate.

**1.6.2 Acronyms**

**AICPA**

American Institute of Certified Public Accountants

**CA**

Certification Authority

*Rachel M. Miller*  
January 16, 2018

CAA  
Certification Authority Authorization

ccTLD  
Country Code Top-Level Domain

CICA  
Canadian Institute of Chartered Accountants

CP  
Certificate Policy

CPA  
Chartered Professional Accountants (Canada)

CPS  
Certification Practice Statement

CRL  
Certificate Revocation List

DBA  
Doing Business As

DNS  
Domain Name System

EU  
The European Union

FIPS  
(US Government) Federal Information Processing Standard

FQDN  
Fully Qualified Domain Name

IANA  
Internet Assigned Numbers Authority

ICANN  
Internet Corporation for Assigned Names and Numbers

IM  
Instant Messaging

ISO  
International Organization for Standardization

NIST  
(US Government) National Institute of Standards and Technology

OCSP  
Online Certificate Status Protocol

OID  
Object Identifier

PII  
Personal Identifying Information

PKI  
Public Key Infrastructure

RA  
Registration Authority

RP  
Relying Party

S/MIME

*Rachel McKinnon*  
January 16, 2018

Secure MIME (Multipurpose Internet Mail Extensions)  
SSL  
Secure Sockets Layer  
TC-OID  
TrustCor CA OID branch: 1.3.6.1.4.1.44031  
TCPA  
TrustCor Policy Authority  
TLD  
Top-Level Domain  
TLS  
Transport Layer Security  
VOIP  
Voice Over Internet Protocol  
WebTrust for CAs  
Trust Service Principles and Criteria for Certification Authorities,  
Version 2.0

### **1.6.3 References**

No stipulation

### **1.6.4 Conventions**

No stipulation

## **2. PUBLICATION AND REPOSITORY RESPONSIBILITIES**

### **2.1 Repositories**

The public documents establishing the policies and practices for TrustCor CA's services can be found online at <http://www.trustcor.ca/resources>

The certificates which are used to sign TrustCor CA's end-entity certificates can be located under <http://www.trustcor.ca/certs>

Note that end-entity certificates are **not** published into a publicly facing repository.

Any CRLs issued are found under <http://crl.trustcor.ca/>

OCSP responders are located under <http://ocsp.trustcor.ca/>

These repositories are replicated across multiple geographical sites in order to preserve a 24x7 service availability, with no more than 1% downtime caused by failures, and no more than 0.5% of downtime caused by planned maintenance.

*Rachel McKen*  
February 16, 2018

## 2.2 Publication of certification information

In addition to the above web locations into which TrustCor CA publishes its certification information, email to [legal@trustcor.ca](mailto:legal@trustcor.ca) with requests for information will yield the same documentation.

TrustCor CA conforms to the current version of the Baseline Requirements for the Issuance and Management of Publicly-Trusted Certificates published at <http://www.cabforum.org>. In the event of any inconsistency between this document and those Requirements, those Requirements take precedence over this document.

Test web pages for valid, revoked and expired certificates for each root:

Root CA	State	URI
RootCert CA-1	valid	<a href="https://catest1.trustcor.ca/">https://catest1.trustcor.ca/</a>
RootCert CA-1	revoked	<a href="https://catest1-revoke.trustcor.ca/">https://catest1-revoke.trustcor.ca/</a>
RootCert CA-1	expired	<a href="https://catest1-expire.trustcor.ca/">https://catest1-expire.trustcor.ca/</a>
RootCert CA-2	valid	<a href="https://catest2.trustcor.ca/">https://catest2.trustcor.ca/</a>
RootCert CA-2	revoked	<a href="https://catest2-revoke.trustcor.ca/">https://catest2-revoke.trustcor.ca/</a>
RootCert CA-2	expired	<a href="https://catest2-expire.trustcor.ca/">https://catest2-expire.trustcor.ca/</a>
ECA1-External	valid	<a href="https://valid.epki.external.trustcor.ca/">https://valid.epki.external.trustcor.ca/</a>
ECA1-External	revoked	<a href="https://revoked.epki.external.trustcor.ca/">https://revoked.epki.external.trustcor.ca/</a>
ECA1-External	expired	<a href="https://expired.epki.external.trustcor.ca/">https://expired.epki.external.trustcor.ca/</a>

### 2.2.1 Notification of incorrect issuance

If and when TrustCor CA becomes aware of the issuance of any certificate which has breached the stipulations of the Baseline Requirements, or which has been issued contrary to the stipulations of this document, the following steps will be taken in regards to making the incorrect issuance known, with seven (7) days of the problem issuance being known to TrustCor CA:

- a description of the incident, listing the certificate identifiers involved, a root cause analysis of the incorrect issuance, and the remediation steps taken to address the requirements breach, shall be published under the URI <http://www.trustcor.ca/resources/issuance-incidents/> with a name which is the ISO-8601-Z (with colons replaced by hyphens) timestamp with a .txt suffix (e.g. 2016-05-01T18-12-07Z.txt). To the end of this report, the PEM formatted X.509 certificates shall be appended by of an appendix.

A browser based directory listing of this issuance-incidents directory shall show all reports generated by TrustCor CA over a seven year period.



*Rachel M. Miller*  
January 16, 2018

TrustCor CA's auditor shall have this information brought to his/her attention at the earliest possible date post-incident.

### **2.3 Time or frequency of publication**

Any published certificates (ie, CA certificates) are published to the above listed repositories, as soon as possible.

CPS and CP documents are published no more than seven days after the TCPA approves their contents. New CPS and CP documents are produced as and when the Baseline Requirements (BR) change such that new text is required, or when changes in TrustCor CA's business practices require such modification. The CP and CPS documents are reviewed every six months (even if merely to confirm that no changes are warranted).

The frequency of CRL issuance is covered in section 4.9.7 of this document.

### **2.4 Access controls on repositories**

All repositories have public read accessibility. File permissions and system security policies are in place to ensure that any alteration to the repository contents comes from authorized principals and trusted sources within TrustCor CA.

Updates to the documents are stored in a version control system to which TrustCor CA personnel alone have access; all changes are recorded with both the nature of the alteration as well as the author of the change. Document change logs are reviewed periodically as per the section on log review.

## **3. IDENTIFICATION AND AUTHENTICATION**

### **3.1 Naming**

TrustCor CA end-user certificates in the Basic Email or Basic Site categories may not have a subject DN in them, preferring a critical subjectAltName extension (RFC822Name in the case of Basic EMail certificates; dNSName in the case of Basic Site certificates). If the certificate does have a subject DN, it is constrained to be identical in content to the subjectAltName extension (which will not be marked critical) described before.

Enhanced grade certificates, as well as External PKI issued certificates will always have an identifying Subject DN, as well as any relevant subjectAltNames.

*Rachel McKinnon*  
January 16, 2018

### **3.1.1 Types of names**

All subject (and issuer) DNs inside TrustCor CA certificates have ITU X.501 format names, with the components having the standard semantics.

Name components (whether DNs or subjectAltNames) may not be IPv4 or IPv6 addresses.

Names are canonicalized with respect to whitespace upon registration. For example “Example Org “ will become “Example Org”. Thus names which differ only in terms of whitespace are not treated as being distinct.

TrustCor CA does not currently issue EU Qualified Certificates.

### **3.1.2 Need for names to be meaningful**

Any fully qualified domain name (FQDN) which is embedded into a certificate either as a DN component, or as a dnsName subjectAltName must conform to the standard semantics for DNS names described in RFC 1034. All DNS names must be validly formed and have a recognized public ICANN recognized suffix as found via <https://publicsuffix.org>

Organizational names must be validated to be syntactically identical to an entry in such public registries of organizations as was used to validate the certificate request. The only alteration permissible is where a commonly used contraction for the status of the company is substituted. For example, a British company with a “Limited” status in the Companies House registry may have the text “Ltd.” instead of the word “Limited” in the certificate name. The actual text of the organization may not deviate from that recorded in the public registry.

TrustCor CA does not populate organizational unit components in either DNs or subjectAltNames, since no agreed semantic exists for their interpretation. Subordinate CAs issued to name restricted enterprises may populate OUs to represent their internal business functions, but no Secure Email or Secure Site certificates may do so.

Country DN components must be represented as ISO-3166-1 2 letter codes, in upper case.

### **3.1.3 Anonymity or pseudonymity of subscribers**

Basic S/MIME certificates may possess pseudonymous email addresses, since personal identity information is not sought.

*Rachel McKinnon*  
February 16, 2018

Basic SSL certificates do not identify a person, thus pseudonymity is not applicable. TrustCor CA will certify a domain name where the WHOIS report does not identify an actual person as a point of contact, so long as effective control over the domain can be demonstrated to the satisfaction of TrustCor CA.

Enhanced S/MIME certificates may not have pseudonymous organizational details, but the email addresses and common names present therein may be pseudonymous if an authorized contact for the organization represents the email and name as being associated with the organization. The authorized contact must be verifiable via the organizational validation process (eg, listed as a director of the company, etc.)

Enhanced SSL certificates may not have pseudonymous organizational details, and the FQDNs represented in the certificate do not identify real-world persons.

TrustCor CA does not currently issue certificates for .onion domains, until its EV product offering becomes operational.

Enterprise subordinate CAs may offer pseudonymous S/MIME certificates or client certificates within their organization, as long as the names on such certificates satisfy the name restrictions present in their subscriber agreement and particular CA certificate.

### **3.1.4 Rules for interpreting various name forms**

The rules for DN name interpretation are defined in the X.520 standards, and also in RFC 4514. Where conflict between the two exists, the LDAP naming interpretation shall take precedence.

TrustCor CA does not permit multiple-AVA components in its DN components.

### **3.1.5 Uniqueness of names**

Subject DNs are unique under the aegis of a single issuer DN. Issuer DNs are unique to particular business offerings. No two **current** certificates may have the same (subject DN, issuer DN) pair. This is enforced by the CA software end entity issuer profiles.

Domain uniqueness is enforced by ICANN and fqdn uniqueness is enforced by the DNS records of the domain owner, but the same certificate uniqueness constraint above obtains.

*Rachel McKinnon*  
February 16, 2018

### **3.1.6 Recognition, authentication, and role of trademarks**

Each subscriber agreement contains text to state that no subscriber may knowingly assert identity information to which he or she has no title. This includes trademark information.

If TrustCor CA becomes aware of a dispute involving a trademark which is contained in a certificate it has issued, the company may, at its discretion, revoke any certificate bearing that trademark.

TrustCor CA checks against a list of known high value trademarks which flag any request as being potentially risky. This does not necessarily prevent issuance, but may slow it down as it escalates the level of supervision required to process the request. This list includes (but is not limited to) the trademarks and names of the Fortune 500 companies.

### **3.2 Initial identity validation**

TrustCor CA may use any legal and well known paths to contact applicants, for the purposes of validation, including:

- telephone calls to the applicant directly (for OV certs)
- telephone calls to the published telephone number for an organization with a request to contact a named applicant (for OV certs)
- SMS messages (DV and OV certs)
- E-mail (DV and OV certs)
- Postal Services (OV certs, enterprise Subordinate CAs)
- Courier Services (OV certs, enterprise Subordinate CAs)

Submission of a certificate request implies acceptance of TrustCor CA's right to contact the applicant for the purposes of identity validation.

The following information is collected at registration time:

- for all Secure Mail certificates, the email address of the operator of the private/key certificate pair
- for all Secure Site certificates, the fqdn of the endpoint which will appear as the primary identity in the subject DN
- for all Basic certificates, whether the requestor wishes for all of the certificates in the chain to the root CA to be limited to 2048 bit moduli only (sometimes needed for devices with limited processing power). This choice is not available for Enhanced grade certificates.

All Applicants generate a password/passphrase which can be used to authenticate future communications with TrustCor CA. Passwords can be changed at user request, and must pass quality checks; older passwords may

*Rachel McKinnon*  
January 16, 2018

not be reused once changed. Additionally, applicants may set an OTP seed, or register a U2F device, which is used to add an additional authentication factor to login attempts.

### **3.2.1 Method to prove possession of private key**

All certificate requests must include a PKCS#10 submission, which must pass signature validation in order to prove possession of a private key.

In general, every PKCS#10 request must carry a public key which has not been seen (by TrustCor CA) before. There is one permitted exception to this rule, detailed in section 4.8 below.

### **3.2.2 Authentication of organization identity**

For any OV certificate, the following information is collected upon registration (nb: other information may be collected which does not form part of the validation process):

- Legal name of the organization (publicly exposed)
- Status of the organization (company, charity, NGO, etc.)
- Country of place of registration (publicly exposed)
- Organization registry numbers (e.g. company number, charity registry, tax registry numbers, DUNS number - all which apply)
- State/Province of place of registration (publicly exposed)
- City/Town of place of registration (publicly exposed)
- Technical Contact Name (name, email, telephone)
- Business Contact Name (name, email, telephone)
- Payment Information (credit card, purchase order, etc.)
- Record of acceptance of the subscriber agreement

In addition to the information collected in Section 3.2, TrustCor CA will also collect the following identity data:

For Enhanced Secure Site certificates:

- any other FQDNs which will form subjectAltNames in the certificate

This information is validated as per the sections 3.2.2.[1-7]. Evidence or suspicion of alteration or fraudulent representations will be used to deny the certificate issuance, and may trigger reporting of the suspicion to relevant legal authorities.

TrustCor CA does not issue certificates whose Subject Identity Information consists solely of the countryName field.

*Rachel M. Miller*  
January 16, 2018

### 3.2.2.1 Identity

Organization identities are validated using one of the three methods below:

1. Within the jurisdiction of the applicant's organization, a check on a recognized government agency must yield that the organization is registered and currently active. Such agencies can be charity registries, company registries or lists of academic institutions. In all cases the identity of the organization must match the claimed name exactly.
2. A third party database sourced from agencies in part (1) and regularly updated such that TrustCor CA considers it a reliable data source.
3. An attestation letter from a source which TrustCor CA considers reliable and able to speak with authority on the right of the applicant to assert the trade name. This would typically come from a notary public, or other accredited source requiring publicly discoverable membership of a body having the power to enforce high standards of trust amongst its members.

### 3.2.2.2 DBA/Tradenname

DBA/Tradenames can be used within the Organization field of the Subject DN of certificates (Enhanced grade).

TrustCor CA will validate the organizational name details with one or more of the following:

1. A government agency in the jurisdiction of the applicant's incorporation capable of pronouncing authoritatively on the status of such trading names (e.g. tax agencies, local authorities, etc).
2. A third party database sourced from agencies in part (1) and regularly updated such that TrustCor CA considers it a reliable data source.
3. An attestation letter from a source which TrustCor CA considers reliable and able to speak with authority on the right of the applicant to assert the trade name.

In all cases, the validation must include reasonable evidence that the organization is currently operational, or has updated its registration with a relevant registry within the last year at time of request. Dormant or dissolved organizations may not be issued certificates.

*Rachel McKen*  
January 16, 2018

### 3.2.2.3 Verification of Country

For Basic grade certificates, country is not verified (and does not appear in the names contained within the certificate). Note that a country code, if present as part of an email address or FQDN does **NOT** count as an assertion by TrustCor CA that the applicant is present or has any relationship with the country identified. (e.g. applicant@this-company.co.uk does not entail validation that the applicant has any connection with the United Kingdom)

For Enhanced grade certificates, the country which appears in the certificate will be that which is derived from the validation process in Section 3.2.2.2; namely the country of incorporation of the organization.

TrustCor CA does not issue IP addressed certificates, so IP-Geo constraints are not required.

### 3.2.2.4 Validation of Domain Authorization or Control

For Secure Email certificates, a challenge email is sent to the mailbox requested in registration. If the mailbox owner is capable of viewing the email, and clicking on a link embedded within it AND entering a verification code provided in the email, then control over the email address is deemed validated. Alternatively, if the user can reply to the email and place the verification code in the subject of the email, then the control is deemed validated.

Verification codes generated uniquely per validation request and time out after a period not exceeding 7 days (although TrustCor CA may shorten that period at its discretion). The codes contain at least 128 bits of entropy and are generated using random number generators designed for cryptographic use.

Alternatively, if an applying user can demonstrate complete control over an email domain (i.e. by control over the MX records which answer for that domain), then any email address within that mail domain may be certified. The methods for domain validation are described below.

If the request was for a Basic Secure Mail certificate, the validation process is complete, and the certificate can be issued, assuming that it would pass the normal checks for uniqueness, key strength and so on.

For Basic Secure Site certificates (and Basic Secure Email certificates where control over a mail domain is being demonstrated), any of the following methods in the following subsections may be used.

*Rachel M. Miller*  
January 16, 2018

For all domain validations, the domain must end in a domain published via [https://www.publicsuffix.org/list/public\\_suffix\\_list.dat](https://www.publicsuffix.org/list/public_suffix_list.dat) and appearing within the ICANN DOMAINS section. Specifically, .int is recognized as meaning an international organization and **NOT** designating some internal domain.

#### **3.2.2.4.1 Validating the Applicant as a Domain Contact**

TrustCor CA does not use WHOIS domain contacts as a method for validating identity of the Applicant.

#### **3.2.2.4.2 Email, Fax, SMS or Postal Mail to Domain Contact**

TrustCor CA may initiate contact with the applicant the registrar supplied details, communicate with the registrant using email or postal mail to ensure that the request was genuine. If the contact can respond with the correct details regarding the registration request, the domain requested is deemed validated.

In all communications, a request token as formed per section 3.2.2.4.7 is sent to the purported applicant; that same value must be echoed back in all communications. Each application will have a different token. An application which goes for 7 days without response from the applicant will be cancelled, and a fresh application will be required. Details collected in the previous application will be discarded.

Note that the request token appears only in the body of the email, and not in a URL which could be triggered by an automated system. A confirmation URL is present, but the request token must be entered by the user.

TrustCor CA does not use Fax or SMS to validate Domain Contact identity.

#### **3.2.2.4.3 Phone Contact with Domain Contact**

If the WHOIS/RDAP reply contains a telephone number, TrustCor CA may use that number to conduct a validation process. If multiple FQDNs are requested, the same number must be present for each WHOIS record.

#### **3.2.2.4.4 Constructed Email to Domain Contact**

TrustCor CA may send a verification email to the well known administrative email addresses for the domains, pruning such components from the FQDN until a registered domain is reached. The administrative mailboxes will be “admin”, “administrator”, “hostmaster”, “postmaster” and



*Rachel M. Miller*  
January 16, 2018

“webmaster”. If the holder of any of those address can respond to an email challenge (as per section 3.2.2.4.2), then authority to use the fqdn is established.

#### 3.2.2.4.5 Domain Authorization Documents

As of this CPS, TrustCor CA does not rely upon domain authorization documents to validate applications.

#### 3.2.2.4.6 Agreed-Upon Change to Website

For each FQDN requested, TrustCor CA may require of the applicant to place a resource reachable via

```
http://{fqdn}/.well_known/pki-validation/trustcor-ca.txt
```

This document must contain a base64 representation of a request token (generated uniquely per application) - see Section 3.2.2.4.7 for token format. That token must appear on a line in the text document on its own (with leading or trailing spaces allowed).

The document may also be presented via the TLS URI

```
https://{fqdn}/.well_known/pki-validation/trustcor-ca.txt
```

In this case, no validation of the site certificate is done.

It is permissible for the document to contain multiple lines with different response values - since a website may be reachable by several URIs, each of which have a different certificate.

Requested random values have a lifespan of 7 days. If TrustCor CA’s automated web crawler does not pick up the response within that time, the application is rejected, and must be started again.

Note that this method of validation only establishes control over the particular FQDN. It does not demonstrate control over the Base Domain.

#### 3.2.2.4.7 DNS Change

TrustCor CA may request of the applicant that a change to the DNS zone be used to demonstrate domain control.

The applicant must create a TXT record (or augment an existing record) with a token of the following format:

```
trustcor-ca={base64 representation of a request token}
```

*Rachel McKinnon*  
February 16, 2018

This record must be placed at the root TXT location of the domain(s) encompassing the FQDNs requested in the application. Again, it is permissible for there to be multiple such TXT records belonging to separate applications. The validation server will only pay attention to ones matching the application random value.

As above, request tokens have a lifetime of 7 days from generation. If the value is not observed within that time, the application verification fails and must be restarted.

A request token is the ciphertext of a plaintext constructed as follows:

128 random bits	ISO-8601 timestamp (Zulu)	account name
-----------------	---------------------------	--------------

The cipher used is AES-128-GCM where the key is randomly generated by systems operated by TrustCor CA, and where encryption and decryption are audited events.

TrustCor CA will query the authoritative DNS servers for the domains, to minimize zone transfer latency to non-authoritative ones. Note that this method can be used to demonstrate full domain control.

#### **3.2.2.4.8 IP Address**

TrustCor CA does not use the IP Address validation lookup.

#### **3.2.2.4.9 Test Certificates**

TrustCor CA does not use the test certificate validation method.

#### **3.2.2.4.10 TLS Using a Random Number**

TrustCor CA does not use verification of a random value contained within a certificate as proof of domain control.

#### **3.2.2.5 Authentication for an IP Address**

TrustCor CA does not issue certificates containing IP address identities. Section not applicable.

#### **3.2.2.6 Wildcard Domain Validation**

TrustCor CA does not issue wildcard certificates. Section not applicable.

*Rachel McKinnon*  
January 16, 2018

### 3.2.2.7 Data Source Accuracy

TrustCor CA reviews its set of reliable data sources regularly and may add or remove entities to that list upon the results of such reviews. The criteria for inclusion is based upon:

- the update and filing process for registry inclusion
- the reliability of the regulatory process governing such institutions
- the timeliness of update to that registry
- the publication of the liveness status of organizations within the registry.

Typically, government information services can be used to fulfill this purpose. The Dun and Bradstreet DUNS number registry may also be used for commercial organizations.

### 3.2.2.8 CAA Records

As mentioned above, any certificate application which contains subject names which are FQDNs, will have the relevant DNS hierarchy searched for relevant CAA records, as per RFC 6844, amended by Errata 5065.

The record values which will permit TrustCor CA to issue the certificate are:

- `issue tag`: must contain the text `trustcor.ca`
- `issuewild tag`: not applicable. TrustCor CA does not issue wildcard certificates

If an application is found, where TrustCor CA is explicitly not entitled to issue, and an controlling iodef tagged record is present, which stipulates a `mailto:` or `https:` `schemed URI`, then TrustCor CA shall endeavor to use that URI to report the apparent attempt to mis-issue the certificate in violation of stated CAA policy.

Both `mailto:` and `https:` reports will contain an RFC 5070 IODEF formatted message. If the protocol is `https:` then the protocols of RFC 6546 will be observed. TrustCor CA will record in its audit logs the success or failure of any reporting attempts. TrustCor CA does not guarantee to retry any failed report.

CAA records are checked up to three times during the validation phase. If three subsequent DNS errors are detected, then the certificate shall not be issued.

*Rachel M. Miller*  
January 16, 2018

### 3.2.3 Authentication of individual identity

For Basic Secure Mail certificates, individual identity is established as per Section 3.2.2.1. For the purposes of this document, ‘the requestor’ means either the person requesting a certificate or a suitable representative capable of communicating on the requestors behalf (in the case where the requestor is not legally competent to execute a transaction because of age, incapacity, etc.).

For Enhanced Secure Mail certificates, the requestor must provide, in addition to the information above, the following documentation:

- a copy of a current government issued photo-ID, such as a passport, driving license or national identity card. The copy must establish date of birth.
- a copy of a document which establishes association with the organization claimed (letter of employment, assertion from an officer of the company). The document must be less than 1 year old from time of request.

If check codes are to be used to validate a given ID via automated services, a currently valid check code must also form part of the identity documentation submission (For example, the DVLA of the UK government allows a license holder to generate check codes such that an external validator can validate that a license is properly issued for a given purpose)

The above information is validated by contact with the appropriate government agency for identity issuance, and further contact with the organization using its published contact addresses/telephone numbers to establish the individual association.

Secure Site certificates do not establish individual identity, so this section does not apply.

### 3.2.4 Non-verified subscriber information

No information which cannot be verified can form any part of a TrustCor CA CA certificate’s identity information. If a field has no validation, it is omitted from the certificate.

DNS names need not be resolvable, but the domain in which they reside must be able to be validated. For example, an applicant which had established control over the entire `example.org` domain could request certificates for `test.example.org`, even if its DNS configuration did not allow `test.example.org` to be resolved from outside of its network.

*Rachel McKen*  
January 16, 2018

### **3.2.5 Validation of authority**

Any applicant may, as part of the registration process, designate a set of technical contacts allowed to request (or revoke) certificates within domains over which it has demonstrated effective control. If the applicant applies as an organization for certificates designating that organization, then TrustCor CA will use the methods described above to validate the organization, using contact details derived from the validation process to establish authoritative email addresses, phone numbers or physical addresses to use to contact the applicant.

Those contacts must be verifiable via email, physical address or telephone communications with the applicant. At any time, the applicant can request the current contacts from TrustCor CA, which must reply within 2 business days.

### **3.2.6 Criteria for interoperation**

TrustCor CA may cross-certify other CA certificates, subject to a specific agreement between TrustCor CA and another the other party. Equally, parts of TrustCor CA's CA hierarchy may be cross-certified by another CA, subject to business agreement.

In either case of certification, the cross-signed certificates will be made available under the same terms as TrustCor CA's own CA certificates on the repository specified in Section 2.1.

## **3.3 Identification and authentication for re-key requests**

Re-keying, in this section, is defined as being the reissue of a certificate with a different public key, but containing the same identity information as was present in the original certificate.

In all re-key requests, a new public key must be submitted as a PKCS#10 document within the request.

### **3.3.1 Identification and authentication for routine re-key**

Routine re-key is authenticated by the certificate owner presenting knowledge of a shared secret to TrustCor CA's rekeying service via:

- use of a TrustCor CA website which requests a user and password combination, the password being the shared secret

This user/password combination is sufficient for all Basic grade certificates.

For Enhanced Secure Site certificates, further authentication via a recognized one time password scheme (OTP) or U2F is required.

*Rachel M. Miller*  
February 16, 2018

For Enhanced Secure Site certificates, a signed email request signed by the certificate needing re-key will suffice (assuming that the certificate has not been revoked hitherto). Alternatively, authentication using password and OTP/U2F to the company certificate management site will be acceptable.

Enterprise Subordinate CAs may only be re-keyed via a manual process involving reassessment of the original documents and policies that the subscriber has submitted to TrustCor CA.

Under all circumstances, if identity validation was substantiated by documentation, that documentation must not be older than two years from time of re-keying. If the documentation is older, then a new certificate request must be made, after revoking the old certificate.

### **3.3.2 Identification and authentication for re-key after revocation**

For all Basic grade certificates and Enhanced Secure Mail certificates, re-keying is not allowed post revocation. The certificate may be applied for again; TrustCor CA reserves the right to credit some portion of registration and issuance fees to the subscriber in this instance.

For Enterprise Subordinate CAs, re-keying is not permitted post revocation.

For Enhanced Secure Site certificates, re-keying is only permitted as part of changing the set of DNS names certified. If the set of names desired excludes some of the names present in the original certificate, then the original certificate must be revoked. A new certificate is issued with the smaller set of names on a new certificate. TrustCor CA may credit the certificate fees pro-rata for the remaining lifetime of the original certificate.

### **3.4 Identification and authentication for revocation request**

Revocation authentication is dependent on who makes the request:

- Subscriber revocation: simple authentication via username and password (via website authentication) is sufficient to begin revocation. If the certificate is an S/MIME one, verifying a signed email requesting revocation of the signing certificate is sufficient identification and authentication.
- TrustCor CA revocation: CA/RA administrators are required to authenticate to the CA software via client certificates issued by an internal management CA, in order to revoke a subscriber's certificate.

*Rachel M. Miller*  
January 16, 2018

TrustCor CA will react to external trusted parties requesting revocation, evaluate the evidence, and revoke if circumstances dictate such action. In this case, the identification and authentication protocols for “TrustCor CA Revocation” hold.

## **4. CERTIFICATE LIFE-CYCLE OPERATIONAL REQUIREMENTS**

### **4.1 Certificate Application**

Certificate application can be done via one of two means:

- Website application: the applicant fills in a web form which then creates a certificate issuance request in TrustCor CA’s ticketing software.
- Email application: the applicant submits a specified format email to the certificate request email address for TrustCor CA, which then creates a certificate issuance request in TrustCor CA’s ticketing software.

#### **4.1.1 Who can submit a certificate application**

Any member of the general public can apply for a TrustCor CA certificate, assuming that they can either view HTTPS web servers or send and receive email.

Application will be turned down if the Applicant is on a blacklist operated by TrustCor CA, which lists those identities thought to present an unacceptable risk of fraud or damage to TrustCor CA’s business. That blacklist shall encompass those individuals on the US Treasury Department’s OFAC list of proscribed persons.

Any applicant who has had a TrustCor CA issued certificate revoked by reason of fraudulent representation will be added to the blacklist, and service refused for further requests.

Application for Enterprise Subordinate CA certificates may be initiated via email, but the process of registration and validation then requires postal/ courier communications, as well as possible site visit scrutiny from TrustCor CA.

#### **4.1.2 Enrollment process and responsibilities**

The enrollment process involves:

- generating an account for the certificate applicant
- collecting the identification information the applicant wishes to see included in the certificate.
- collecting a validly formed PKCS#10 (CSR) request containing either an RSA public key, or an ECC public key.

*Rachel M. Miller*  
January 16, 2018

- agreement from the applicant that TrustCor CA may use the methods specified in this CPS to validate any information which the applicant provides.

The responsibilities on the subscriber include:

- providing complete and accurate information regarding identity
- keeping the private key corresponding to the public key in the CSR confidential.
- generating a public key which satisfies the requirements of the TrustCor CA program.

The responsibilities on TrustCor CA include:

- preserving the integrity and confidentiality of communications between the subscriber and TrustCor CA
- not permitting unauthorized disclosure of any personal identifying information (PII) in compliance with the TrustCor CA Privacy Policy
- validating to the best of its ability that the evidence supplied to it is authentic, current and suitable to establish the identity guarantees which the certificate would assert

## **4.2 Certificate application processing**

For all Basic and Enhanced grade certificates, the processing of the application is done by TrustCor CA, and the issuance done under one of the CAs described in Section 1.3.1.

For Enterprise Subordinate CAs, the processing is done by the RA belonging to the enterprise subscriber, and issuance is done under the technically restricted CA software under the enterprise subscriber's control.

### **4.2.1 Performing identification and authentication functions**

After receiving an application for a certificate, TrustCor CA will perform several validation steps, dependent on the type of certificate requested.

For all certificate types, TrustCor CA establishes that the entity making the request is the one whose identity is going to appear in the certificate. TrustCor CA further ensures that the requestor has provided evidence of holding a private key. In no case, can any information used to validate a certificate request be older than 2 years from the time of request. This includes information which is used to re-validate a renewed certificate request.



*Rachel M. Miller*  
January 16, 2018

TrustCor CA will check its internal database of suspect applicants (those who have failed prior applications on grounds of providing false information, as well as those who have had certificates revoked because of improper behavior) to ensure that the applicant does not represent an unacceptable risk to TrustCor CA.

TrustCor CA will also check lists of proscribed organizations and people prohibited from receiving cryptographic services, via the OFAC sanctions lists published by the government of the United States of America, as well as lists of domains deemed to present unacceptable risks of fraud/phishing/malware propagation. The result of that check determines whether application can proceed or not.

TrustCor CA also maintains a list of high value trademarks and domains. If a request is visually similar to an entity on that list (via the confusables mapping) the request may be designated high risk and require human intervention to progress the application. If a request is felt (by TrustCor CA personnel) to possess a high likelihood of being fraudulent then the requestor's account may be blacklisted from future requests.

For all Secure Site certificates, TrustCor CA runs a check against DNS CAA records (as per RFC 6844) for the domains corresponding to the FQDNs to be in the certificate. The result of that check will instruct the certificate processing system whether to proceed or halt application.

For issuance to be permitted via CAA records, the string `trustcor.ca` must be present as one of the fields tagged with the `issue` tag.

For Enhanced grade certificates, TrustCor CA will use all reasonable means to validate the organizational identity claimed, and that the organization is a 'live' entity (ie, not dormant, prohibited from trading, or dissolved).

#### **4.2.2 Approval or rejection of certificate applications**

TrustCor CA may reject an application for a certificate for any reason, or for no reason at all.

While TrustCor CA's general policy is to provide an applicant with the reasons for which an application is rejected, it is under no obligation to do so.

TrustCor CA will only approve certificates containing FQDNs if it is not prohibited from issuance, or is explicitly permitted to issue, certificates via the CAA records for the relevant domains containing the FQDNs.

TrustCor CA will only issue certificates if the applicant is not on any sanctions list published by the government of the United States of America.

*Rachel McKen*  
January 16, 2018

Assuming that the validation checks succeed, and that the information for certificate processing is complete, TrustCor CA will approve the issuance of the certificate.

In the event that request details are found to be fraudulent, TrustCor CA reserves the right to store such details from the application as it deems useful to prevent further fraud or potential damage to its business. TrustCor CA also reserves the right to forward such information to law enforcement bodies for further investigation.

As mentioned elsewhere, all FQDNs and email addresses to be embedded in TrustCor CA certificates must be within the ICANN section of the publicsuffix database. Private domains will not be certified, even if they are under consideration for inclusion by ICANN.

Every 30 days, the public suffix list is consulted - if a gTLD is no longer on the approved ICANN list, all certificates under that previous gTLD certified by TrustCor CA will be revoked. Re-application or re-keying for such certificates will not be allowed.

#### **4.2.3 Time to process certificate applications**

For Basic certificates, TrustCor CA will process a certificate request within 2 days of submission. The application will close automatically, rejecting the request, if 7 days have gone from application without the relevant demonstration of domain control having been observed.

For Enhanced certificates, TrustCor CA will either approve or reject the request within 30 days of submission. If confirmation for the organizational identity cannot be gained in that time, then the application is rejected.

### **4.3 Certificate issuance**

#### **4.3.1 CA actions during certificate issuance**

TrustCor CA issues certificates immediately post approval. Each issuance is logged with the identity of the principal issuing the certificate, and the action logged in the CA audit log.

Serial numbers on issued certificates are randomly generated, and contain a minimum of 64 bits of entropy.

#### **4.3.2 Notification to subscriber by the CA of issuance of certificate**

For all Basic and Enhanced grade certificates, an email containing the certificate is sent to the technical contact named during application. The subscriber may also download the certificate from the certificate management website.

*Rachel M. Miller*  
January 16, 2018

Enterprise Subordinate CAs may elect to deliver their end-entity certificates through email or web-site download as they see fit.

## **4.4 Certificate acceptance**

### **4.4.1 Conduct constituting certificate acceptance**

If the subscriber deploys the certificate into use, by signing emails, or establishing a website fronted by that certificate, then the certificate is deemed to be accepted by the subscriber.

If the subscriber is not satisfied with the details contained within the certificate, he or she must email [support@trustcor.ca](mailto:support@trustcor.ca) explaining why the certificate is not being accepted. This communication must take place within 30 days of issuance, otherwise the certificate is deemed to have been accepted.

The mechanisms for acceptance are established in the subscriber agreement.

### **4.4.2 Publication of the certificate by the CA**

In the case of DV and OV certificates, upon a positive decision to issue the certificate under application, TrustCor CA shall first produce a pre-certificate (defined per RFC 6962); this precertificate shall be submitted to a minimum of two CT logs. These logs must, at time of issuance, be mentioned in the list of well known logs available via:

[Certificate Transparency Known Logs \(https://www.gstatic.com/ct/log\\_list/log\\_list.json\)](https://www.gstatic.com/ct/log_list/log_list.json)

Where possible, the logs used for publication shall not be owned and operated by the same company. However, in the event of temporary technical failure, it is permissible to have a single owner of the logs. The issuance log details shall record the failures encountered while attempting to publish to the logs.

Similarly, if technical failures only allow successful publication to one well known CT log, then the certificate may still be communicated to the end user.

If no CT log can be contacted, the precertificate must be held and retried (at least three times, per calendar day). If, after three calendar days of retrying, no CT logs can be used, the precertificate must be revoked, and the failure reported to the Applicant.

Once SCTs have been collected from as many logs as possible, those SCTs are embedded into the certificate as an extension. This certificate is then made available to the Applicant.

*Rachel McKinnon*  
January 16, 2018

The final certificate is also submitted (by TrustCor CA) to the CT logs, such that the SCTs so gained may be made available via a TLS header or OCSP extension. The logs for the final certificate are not guaranteed to be the same as the ones used for the pre-certificate, but the publication policy regarding number and ownerships of logs remains unchanged.

Note that any external partners who own and operate subordinate CA under the External PKI program are required to follow the above CT publication policy for their DV and OV certificates.

S/MIME certificates are not published to CT logs. These are only communicated to the end users.

CA certificates are published on the online repository explained in Section 2.1

#### **4.4.3 Notification of certificate issuance by the CA to other entities**

Other than CT publication per 4.4.2, no stipulation.

#### **4.5 Key pair and certificate usage**

##### **4.5.1 Subscriber private key and certificate usage**

Subscribers are prohibited from engaging in conduct which compromises the integrity or confidentiality of the private key.

The certificate issued may only be used for those purposes which the subscriber agreement denotes, and consonant with the keyUsage and extendedKeyUsage flags present within the certificate.

##### **4.5.2 Relying party public key and certificate usage**

RPs are under a duty to rely upon the information present in a certificate only where the following conditions apply:

- the certificate chain up to a trusted root certificate has been built
- the signatures on each certificate have been verified
- each certificate below the root has been validated against a current CRL or OCSP response
- the certificate is not being used for a purpose other than allowed in its key usage specifications

Even when this information has been validated, RPs cannot use it to place any reliability on the honesty or integrity of the certificate owner, since TrustCor CA can not verify such matters.

*Rachel McKinnon*  
January 16, 2018

## **4.6 Certificate renewal**

TrustCor CA will only renew a certificate (ie, re-issue it with the same identity and public key but with an updated validity period) under the same business offering which the certificate was first issued.

A Basic grade Certificate cannot be renewed to an Enhanced grade one, and vice versa. Similarly, a Secure Email certificate cannot be transformed into a Secure Site one (even if the identities were such as to make such a transformation meaningful).

Certificates may only be renewed for the lifetime of a certificate specified in the business offering.

### **4.6.1 Circumstance for certificate renewal**

If a request for certificate renewal is lodged with TrustCor CA, it will only renew when:

- the subscriber confirms that the details within the certificate have not altered from the original submission
- the documentation which was used to validate the original request is still current at time of renewal (for example, a driver's license is expired now, but was valid at original submission time)

### **4.6.2 Who may request renewal**

Subscribers can request renewal of certificates. TrustCor CA does not renew certificates automatically.

Enterprise Subordinate CA subscribers may accept renewal requests from agents within their enterprise if the relevant subscriber agreement allows this arrangement.

### **4.6.3 Processing certificate renewal requests**

The subscriber must authenticate himself or herself to the TrustCor CA system either by:

- use of a website function for renewal after authentication via username and shared secret. Enhanced grade certificates also require two-factor validation (either a TrustCor CA approved OTP method or U2F).
- use of secure email to send a renewal request, where the body of the email contains a signature capable of validating the request.

*Rachel M. Miller*  
January 16, 2018

Both methods require a statement from the subscriber that the details in the certificate have not altered and that any associations present in the certificate still hold. A PKCS#10 submission is not required, since the public key is not changing.

TrustCor CA will then verify that:

- the credentials demonstrated on the renewal are valid
- the original submission lives within the maximum renewal time stated by the business offering under which the certificate was issued
- that any documentation used to validate the original request are still valid, for Secure Site certificates and Enhanced Secure Mail certificates.

#### **4.6.4 Notification of new certificate issuance to subscriber**

See section 4.3.2 for notification protocols.

#### **4.6.5 Conduct constituting acceptance of a renewal certificate**

See section 4.4.1 for acceptance criteria. Note that the 30 day period for accepting of identity information in the certificate does not apply here, since that acceptance is deemed to have happened already.

#### **4.6.6 Publication of the renewal certificate by the CA**

End entity certificates are not published to any public resource, other than by notification to the subscriber.

#### **4.6.7 Notification of certificate issuance by the CA to other entities**

No stipulation.

#### **4.7 Certificate re-key**

Re-keying is defined as the re-issuance of a certificate with a new public key, but the same subject identity information.

Re-keying is not allowed to transform a certificate issued under one program to that issued under another.

TrustCor CA does not (in general) re-key after revocation of a certificate, but may credit a subscriber such that a resubmission for a certificate does not cost the subscriber any more.

*Rachel M. Miller*  
January 16, 2018

#### **4.7.1 Circumstance for certificate re-key**

Re-keying may take place by way of a renewal process. It may also take place in the case of Enhanced Secure Site certificates, where the certified set of names has been altered.

#### **4.7.2 Who may request certification of a new public key**

Subscribers may request re-keying. TrustCor CA at its discretion may also do so.

#### **4.7.3 Processing certificate re-keying requests**

A re-key request is similar to requesting a new certificate. The subscriber must (re-)state which subject details are to be present in the certificate, and provide a PKCS#10 document containing the public key to be certified.

If a subscriber initiates this process, the subscriber must authenticate to TrustCor CA by:

- website authentication using a user name and shared secret
- secure email where the re-key request body contains a valid signature from the subscriber

Note that in the event of certificate revocation, the signature validation will fail, so this may not always be possible.

The subject DN of a re-keyed certificate cannot change in any circumstance.

For Enhanced Secure Site certificates, the new set of names must include the name on the subject DN. If any name is deleted from this list, then the original certificate is automatically revoked, and the re-key processed with the new names.

For all Secure Site certificates, the documentation regarding authority to use the FQDNs must still be valid, and a CAA check is still required. If those checks fail, the re-key is halted.

#### **4.7.4 Notification of new certificate issuance to subscriber**

See Section 4.3.2 of this document for notification protocols.

#### **4.7.5 Conduct constituting acceptance of a re-keyed certificate**

See Section 4.4.1 of this document for acceptance criteria.

*Rachel M. Miller*  
January 16, 2018

#### **4.7.6 Publication of the re-keyed certificate by the CA**

Other than subscriber notification, the re-keyed certificate is not made public.

#### **4.7.7 Notification of certificate issuance by the CA to other entities**

No stipulation.

#### **4.8 Certificate modification**

TrustCor CA operates a certification modification process for Enhanced Secure Site certificates only, where additional subjectAltNames for FQDNs can be added into the certificate, without changing the key or subject DN of the certificate.

If the additional name process requires a PKCS#10 submission to TrustCor CA, this does not then require the public key to be unique. Indeed, the public key must match the one currently in the certificate to which the new name is being added.

Other than that, TrustCor CA does not allow certificate modification.

##### **4.8.1 Circumstance for certificate modification**

If a Enhanced Secure Site subscriber wishes additional dnsName subjectAltNames *added* to his/her certificate, he/she can apply to TrustCor CA to have those added.

If any names are to be deleted from the certificate, then the process becomes a revoke and resubmission as per the processes described above. Note that the resubmission need not contain a unique public key, which is the normal condition for certificate submission (see section 4.8 above).

##### **4.8.2 Who may request certificate modification**

Subscribers holding Enhanced Secure Site certificates may request modification.

TrustCor CA will modify end-entity certificates where the continued existence of the unmodified certificate would violate a competent court order, or because of algorithm weakness, represent an unacceptable threat to the integrity of TrustCor CA's business. All such TrustCor CA initiated modifications must be recorded as security events in the ticketing workflow system.



*Rachel McKen*  
January 16, 2018

#### **4.8.3 Processing certificate modification requests**

Additional subjectAltNames are collected, and the request authenticated, by one of two methods:

- via a website form where the username password and two factor response code are used as proof of identity
- via an email to `requests@trustcor.ca` requesting the modification, signed by a TrustCor CA Secure Email certificate. The emailAddress in the S/MIME certificate must match that of the username on the account owning the Enhanced Secure Site certificate.

Each new name on the certificate is validated to belong to the set of already validated domains within the existing certificate. If this is not the case, additional documentation validating the certificate holders right to claim the FQDN must be supplied. Such additional names are passed through the CAA check and normal domain validation rules.

#### **4.8.4 Notification of new certificate issuance to subscriber**

See section 4.3.2 for notification protocols.

#### **4.8.5 Conduct constituting acceptance of modified certificate**

See section 4.4.1 for acceptance criteria.

#### **4.8.6 Publication of the modified certificate by the CA**

Other than subscriber notification, the modified certificate is not made public.

#### **4.8.7 Notification of certificate issuance by the CA to other entities**

No stipulation.

#### **4.9 Certificate revocation and suspension**

TrustCor CA offers the services to permanently revoke any certificate issued by it.

TrustCor CA does not suspend certificates (that is, revoke and then unvoke them).

*Rachel M. Miller*  
January 16, 2018

#### **4.9.1 Circumstances for revocation**

##### **4.9.1.1 Reasons for Revoking a Subscriber Certificate**

TrustCor CA may revoke subscriber certificates for the following reasons:

- TrustCor CA has reason to believe that the private key is no longer under the sole control of the subscriber who owns the corresponding certificate. This can be through theft, loss, accidental disclosure, or any other such compromise.
- TrustCor CA is informed by the subscriber that the certificate is no longer required and that the subscriber does not wish to be bound any longer by the Subscriber Agreement.
- TrustCor CA becomes aware that the subscriber has violated the terms of the binding subscriber agreement.
- The identity assertions present in the certificate no longer hold.
- A trademark dispute has settled that the subscriber does not hold the right to assert the trade names present in the certificate.
- The account authentication information (e.g. shared secret) has become compromised (e.g. loss, theft, accidental disclosure)
- The subscriber engages in fraudulent or other such illegal conduct involving use of the certificate
- The subscription, or any validation evidence for the certificate, was obtained or produced improperly, through misrepresentation, fraud or lack of authority to produce such evidence.
- The subscriber appears (after proper issue) upon a proscribed list of entities or embargoed nations on the OFAC list produced by the government of the United States of America, and this appearance is brought to the attention of TrustCor CA.
- The subscriber does not wish to accept the certificate as issued.
- The subscriber has an Enhanced Secure Site certificate and wishes to delete some of the FQDNs from the certified set.
- Through self-audit, TrustCor CA discovers that a certificate was mistakenly or improperly issued.
- A ballot of the CA/B Forum determines that the content of any certificate constitutes an unacceptable risk to parties relying on the certificate information. (For example, if TrustCor CA had issued SHA-1 signed certificates, they would be revoked as those have been deemed insecure).

##### **4.9.1.2 Reasons for Revoking a Subordinate CA Certificate**

TrustCor CA may revoke CA certificates for the following reasons:

- TrustCor CA has reason to believe that the private key is no longer under the sole control of the party who is thought to own it

*Rachel McKen*  
January 16, 2018

(normally TrustCor CA itself, but in the case of an external subordinate CA, it could be a subscriber in a contractual relationship with TrustCor CA). This can be through theft, loss, accidental disclosure or any other such compromise.

- TrustCor CA ceases operations and is unable to pass its CA duties on to a successor entity.
- Widespread misuse of the CA certificate indicates that TrustCor CA does not control the certificate within the terms of its business controls, or where its technical controls have proven insufficient to safeguard asset integrity. Note that this would not be the case if an insufficiently aware staff member issued an improper certificate - only if such behavior had gone unmonitored and unchecked for a significant time.
- An Enterprise Subordinate CA issues certificates in violation of the terms of its agreement with TrustCor CA.
- An Enterprise Subordinate CA cannot maintain its operations consistent with behavior required in the Baseline Requirements.

#### **4.9.2 Who can request revocation**

The subscriber owning a certificate may request revocation.

For Enhanced grade certificates, either the business contact or technical contact for the certificate may request revocation. If TrustCor CA has issued certificates to employees/contractors of a organization, any officer of that organization may request (in writing) that such certificates be revoked, whether individually or en masse.

TrustCor CA, on its own initiative, may revoke a certificate.

Certain well trusted entities known to TrustCor CA may request revocation. These include, but are not limited to:

- representatives of the browser root certificate programs such as Microsoft, Mozilla, Apple, where TrustCor CA has been accepted into such programs.
- representatives of the CA/B Forum.

#### **4.9.3 Procedure for revocation request**

Revocation requests may come in one of two forms:

- via an S/MIME signed email, stating the issuer DN, serial number of the certificate and reason for revocation. This email is sent to `revoke@trustcor.ca` (the serial number and issuer DN may be fetched from the S/MIME signature, if the end-entity certificate is included)

*Rachel McKinnon*  
January 16, 2018

- via an unsigned email, stating issuer, serial and reason, and a stipulation that the sender is a listed officer or director of the organization represented within a certificate.
- via a web form, reached via a username and shared secret (and possible two factor response code), again listing issuer, serial and reason.
- via TrustCor CA's internal ticketing system, which is authenticated via username and password.

For signed emails, the signature will be validated to ensure that it sufficiently identifies the requestor as belonging to the authorized groups listed in Section 4.9.2.

For unsigned emails, TrustCor CA will attempt to:

- verify that the requestor named is an appropriately named officer or director of the organization involved, via reliable registries of organizations.
- contact the stated requestor using contact information obtained from those registries. If contact cannot be gained through this method, the revocation request will be denied.

The unsigned email approach is only usable for Enhanced grade certificates, which embed organizational identity.

For web forms, this limits the client to requesting revocation for any of the certificates assigned to that user account.

Once a request has been deemed valid, a certificate revocation request is added as a service request to TrustCor CA's internal ticketing software, which is acted upon by an agent allowed to contact the CA software and perform the revocation. Both the ticketing log and CA revocation log are audited events.

#### **4.9.4 Revocation request grace period**

If a subscriber is dissatisfied with the content of the certificate issued, that subscriber has 30 days to request a revocation.

If the circumstances change such that a subscriber may no longer assert the truth of certificate details, TrustCor CA must be informed of this within 4 business days.

Any private key compromise of an end-entity certificate must inform TrustCor CA of this compromise within 24 hours of discovery.

Private key compromise of a Subordinate CA must be reported to TrustCor CA within 1 hour of discovery.

*Rachel M. Miller*  
January 16, 2018

#### **4.9.5 Time within which CA must process the revocation request**

Properly validated revocation requests are normally processed within 1 hour of validation. TrustCor CA will not delay processing of a revocation request for longer than 24 hours post validation.

Subordinate CA revocation requests will be processed within 1 hour of validation of the request for revocation, unless a direct instruction from the TCPA states otherwise, should the disruption to business outweigh the harm from delayed revocation.

#### **4.9.6 Revocation checking requirement for relying parties**

Any RP must verify the validity of any subordinate certificate or end-entity certificate against the appropriate CRL or OCSP service. Failure to do so imposes the entire risk of reliance on the RP, and TrustCor CA can accept no responsibility whatsoever.

#### **4.9.7 CRL issuance frequency**

The CRLs containing the serial numbers for end-entity certificate are published at least every 24 hours, with issuance taking place at shorter intervals at TrustCor CA's discretion.

The CRLs issued by the root CAs are published at least every 6 months, with TrustCor CA having the right to re-issue at shorter intervals as it sees fit. If a subordinate CA under a root certificate is revoked, the new CRL is published no later than 24 hours after revocation.

#### **4.9.8 Maximum latency for CRLs**

From signing a new CRL to publishing it on the online repository, TrustCor CA will normally take no more than 1 hour to do so. In no case will latency exceed 24 hours.

Every new CRL must be published at least 10 minutes prior to the expiry of the previous CRL in the repository. That is, the most recent CRL on the repository will never be expired.

#### **4.9.9 On-line revocation/status checking availability**

TrustCor CA fields OCSP services at multiple global locations which provide very low latency (less than 5 minutes from certificate state change to globally available discovery) access to revocation information.

OCSP services are configured for failover capability and 24x7 availability.

*Rachel McKinnon*  
January 16, 2018

OCSP responses are signed by dedicated OCSP responder identities, not the CA identities themselves. OCSP responder certificates have a maximum validity period of 2 years. Those delegated responder certificates contain the `id-pkix-ocsp-nocheck` extension.

TrustCor CA's OCSP conforms to RFC 6960, as well as the profile stipulations of RFC5019. Note that TrustCor CA does not guarantee to observe all of the extensions mentioned in RFC 6960. In particular, TrustCor CA reserves the right not to honor nonce extensions present.

TrustCor CA's external OCSP servers are open to the public internet.

#### **4.9.10 On-line revocation checking requirements**

TrustCor CA OCSP servers support both the GET and POST methods for querying over HTTP.

TrustCor CA uses the method in section 2.2 of RFC 6960 to designate non-issued certificates, and uses the extension mentioned in section 4.4.8 (Extended Revoked Definition) to explicitly denote such responses.

Any RP checking TrustCor CA must conform to RFC6960, and is constrained to validate signatures by the methods described in section 3.2 of that document.

#### **4.9.11 Other forms of revocation advertisements available**

TrustCor CA does not require its customers to deploy OCSP stapling, and does not monitor that they do so.

#### **4.9.12 Special requirements re key compromise**

No stipulation over than the disclosure requirements of the CP in this section.

#### **4.9.13 Circumstances for suspension**

TrustCor CA does not suspend certificates. Revocation is permanent.

#### **4.9.14 Who can request suspension**

Not applicable.

#### **4.9.15 Procedure for suspension request**

Not applicable.

*Rachel McKinnon*  
January 16, 2018

#### **4.9.16 Limits on suspension period**

Not applicable.

#### **4.10 Certificate status services**

CRL download and OCSP services are made available on a global basis.

##### **4.10.1 Operational characteristics**

For Secure Site certificate, the serial number of a revoked certificate is retained in a CRL until 1 day after the certificate's expiry date has passed, and then it may no longer be present in the CRL. Secure Email certificates have their serial numbers retained in the CRL and OCSP repositories for 7 years after expiry.

Since the OCSP responses and CRL contents are convergent, OCSP responses will also reflect this archive cutoff.

##### **4.10.2 Service availability**

OCSP responses and CRLs are available 24x7 over at least 4 geographical locations.

Both OCSP and CRL download services are made available via plaintext HTTP, not HTTPS.

All OCSP responses and CRLs should be discoverable within 10 seconds of enquiry, assuming no non-TrustCor CA networking problems interfere.

Should any party become aware of a severe issue arising from any TrustCor CA certificate, such parties may inform TrustCor CA by mailing [security@trustcor.ca](mailto:security@trustcor.ca). This address will generate support tickets and message the Security Incident team. TrustCor CA personnel are directed to respond with urgency to such reports.

##### **4.10.3 Optional features**

No stipulation.

#### **4.11 End of subscription**

A subscriber agreement ends:

- when a certificate is revoked
- when a certificate expires and is not renewed under the same agreement

*Rachel M. Miller*  
January 16, 2018

#### **4.12 Key escrow and recovery**

TrustCor CA does not escrow keys for any party.

Enterprise Subordinate CAs are not permitted to escrow their keys.

##### **4.12.1 Key escrow and recovery policy and practices**

Not applicable.

##### **4.12.2 Session key encapsulation and recovery policy and practices**

No stipulation.

### **5. FACILITY, MANAGEMENT, AND OPERATIONAL CONTROLS**

TrustCor CA makes every reasonable effort to protect its certification business from damage, loss, unauthorized access or disruption to its business. The controls which it uses to do so are detailed in this section.

TrustCor CA receives annual reports from its data centers confirming that the policy requirements below are being met.

TrustCor CA maintains a security policy details its hiring practices, operational characteristics, monitoring methods, backup and disaster recovery practices. The contents of that policy are forwarded to its auditors, who validate that the policy is being followed.

#### **5.1 Physical controls**

TrustCor CA equipment is located in data centers which are hardened against physical attack and environmental damage.

##### **5.1.1 Site location and construction**

TrustCor CA's primary data center is in Phoenix, Arizona, USA.

TrustCor CA's secondary data center is in Curaçao.

The sites are situated in areas away from heavy industry or likely sources of biological, chemical or radiological pollution.

Sites have physically separated areas for visitor reception, clearance to enter the equipment cabinets and the equipment cabinets themselves.

Sites are solidly constructed in such a way as to prevent or inhibit physical attack or environmental hazard (fire, flood, etc.)



*Rachel M. Miller*  
January 16, 2018

### **5.1.2 Physical access**

All exits and entrances to controlled spaces within the data centers use card entry systems.

All exits and entrances have cameras which record ingress and egress 24x7.

All areas of the data centers are monitored by data center personnel 24x7.

External entrances and exits are patrolled by trained security personnel.

All cabinets housing TrustCor CA equipment are locked, and the keys stored in a separate area of the data center under the supervision of site personnel. Each cabinet also is equipped with cameras front and back, which transmit video to off-site monitoring facilities which can be viewed by TrustCor CA personnel.

### **5.1.3 Power and air conditioning**

All data centers have primary and secondary power systems and redundant HVAC systems to ensure consistent temperature and humidity levels.

All data centers have enough fuel to allow continuous powered operation in the event of mains electricity failure, and contracts in place for continuous delivery of generator fuel to allow operations to continue without restoration of mains power.

All cabinets are supplied via filtered UPS power.

### **5.1.4 Water exposures**

No data center is in a known flood risk area.

HVAC systems are in place to prevent humidity buildup.

All cabinets have sealed roofs to prevent water exposure.

Data centers are equipped with dry pipe sprinkler systems, rather than wet pipe.

All data centers have policies preventing the taking of liquids (e.g. drinks) into the cabinet areas.

### **5.1.5 Fire prevention and protection**

Data centers are equipped with automatic fire suppression systems which do not use water to limit fire. Data centers are provided with hand held fire extinguishers suitable for use around electrical equipment, and those extinguishers are inspected regularly to ensure capacity.

*Rachel M. Miller*  
January 16, 2018

Data centers have automated fire alarms linked to emergency service providers to allow rapid response to the outbreak of fire.

### 5.1.6 Media storage

Long term media storage is stored in TrustCor CA business premises, and the contents of same encrypted to ensure that only TrustCor CA personnel can access the clear text data.

Media is stored away from known fire/flood hazards, in a safe rated to at least UL 72 Class 100-2 Hour.

### 5.1.7 Waste disposal

All data centers have secure and safe disposal and destruction facilities for all media types likely to come from the data center, including paper, hard disks, optical disks, etc.

### 5.1.8 Off-site backup

TrustCor CA backs up its host's data to locations in the West Coast of the USA and to Western Europe.

Backups are taken daily, with full backups done once a week and incremental ones once a day.

Backup data access is restricted to TrustCor CA personnel. All backups are deemed to be company sensitive materials, meaning that they cannot be stored or transmitted in clear text.

## 5.2 Procedural controls

### 5.2.1 Trusted roles

TrustCor CA defines the follow roles for operations:

<b>Role Name</b>	<b>Function</b>	<b>Trust Level</b>
Systems Administrator	Deploying or controlling computers hosting TrustCor CA data	Normal
CA Administrator	Changing the configuration of profiles or operation of the CA software	Normal
CA Operator	Issuing and revoking end-entity certificates	Normal
Auditor	Reviewing log data to ensure compliance with stated policies	Normal

*Rachel M. Miller*  
January 16, 2018

<b>Role Name</b>	<b>Function</b>	<b>Trust Level</b>
HR	Admitting new personnel into TrustCor CA's employ	Normal
Root Operator	Causing the Root CA to sign a certificate request or CRL	High
Remote Hands	Physically installing, altering or removing TrustCor CA equipment in a data center	High

At least one person occupying a Highly Trusted role must be a recorded officer of TrustCor Systems S. de R.L.

Role assignments are granted, reviewed and revoked by the TCPA on at least a quarterly basis.

### **5.2.2 Number of persons required per task**

Generating, or using private keys stored on an offline HSM partition requires two people: one to activate the partition and another to perform the signing or generation.

Transferring CA equipment into data centers requires one person to record the equipment being shipped and one to perform the supervision that the packaged equipment is as recorded.

Tasks which require highly trusted roles are manually performed: not automated.

### **5.2.3 Identification and authentication for each role**

All principals performing CA operations must authenticate themselves using internal Management PKI credentials uniquely identifying the principal and role under which he/she operates.

All Remote Hands operatives must clear their visit to site with the data center beforehand, and submit government approved photo ID to site personnel before performing their task. The maximum duration of visit must also be provided, which is then monitored by site personnel.

### **5.2.4 Roles requiring separation of duties**

Only the Systems Administrator may act under another role designation, but even so, cannot use system level credentialling to assume that other role (ie, must be authenticated via management PKI controls).

*Rachel M. Miller*  
January 16, 2018

### **5.3 Personnel controls**

Physical access to TrustCor CA equipment is only granted to Remote Hands with the controls for access listed above.

#### **5.3.1 Qualifications, experience, and clearance requirements**

The TCPA shall evaluate the assignment of any role to a principal such that the body is satisfied that the principal possesses sufficient skill, qualifications and experience to perform the duties of that role without undue risk to TrustCor CA's equipment, operations or reputation.

No person appearing on the OFAC proscribed entities list may be assigned any role within TrustCor CA, and this is checked prior to role assignment.

The TCPA will also evaluate whether the principal being assigned a role has, or could reasonably be seen to have, a conflict of interest which could compromise TrustCor CAs integrity.

#### **5.3.2 Background check procedures**

All TrustCor CA personnel undergo background checks prior to employment. These checks include:

- criminal records checks
- employment and education history
- residences covering the previous five years
- identity checks using government issued photo ID
- court ordered disqualifications from office holding
- tax and social security references

#### **5.3.3 Training requirements**

Suitable training in job performance is given to all TrustCor CA personnel taking on a trusted role. Each person working for TrustCor CA is made aware of the requirements imposed upon them by:

- The TrustCor CA Security Policy
- The TrustCor CA Privacy Policy

Every employee is trained in TrustCor CA's business offerings as well as the basic operations of any CA/RA, and the operations of the CA software, if their duties require such operation.

All training is recorded in TrustCor CA's knowledge base, which is part of its workflow software.

*Rachel M. Miller*  
February 16, 2018

#### **5.3.4 Retraining frequency and requirements**

TrustCor CA monitors the activities of various standards/best practices bodies such as the CA/B Forum and IETF working groups relevant to TrustCor CA's area of operations. If it emerges that new duties or requirements are likely to be forthcoming as standards, the relevant personnel will be retrained such that they possess enough knowledge to continue in their roles.

This retraining is recorded as per Section 5.3.3

#### **5.3.5 Job rotation frequency and sequence**

No stipulation.

#### **5.3.6 Sanctions for unauthorized actions**

All employees of TrustCor CA are made aware than performing actions outside the rules established by operational regulation, security policy or privacy policy carries the possibility of disciplinary action up to and including termination of employment.

Should that violation of company policy encompass potential criminal wrongdoing, TrustCor CA will report the matter to the appropriate law enforcement agencies for further investigation and action.

Personnel who perform unauthorized actions have their role credentials revoked, to be re-issued if and when the TCPA deems that any retraining has been completed, such that it makes the risk or role recommencement an acceptable one for TrustCor CA.

#### **5.3.7 Independent contractor requirements**

TrustCor CA contractors must undergo the same background checking and conduct training as permanent employees. The sanctions for contractors extends to termination of contract and possible legal action to recover damages.

#### **5.3.8 Documentation supplied to personnel**

Personnel are granted access to such relevant training documents and governance documents as their intended roles dictate. This documentation is kept in an online knowledge base, or on the public repository (in the case of the CP and CPS documents).

## 5.4 Audit logging procedures

Auditable events are recorded on either manual or electronic logs, depending on activity.

### 5.4.1 Types of events recorded

The audited events are listed in the CP document, and are reproduced below.

- Host Level Events
  - Deployment of a new host
  - Reconfiguration of a host software via configuration management system
  - Addition of a user account to a host
  - Removal of a user account to a host
  - Modification of user authentication/authorization data
  - Patching of system level software to a new version
  - Reboot of a host
  - Host level firewall rule changes
  - Detection of modification of system binaries (programs, libraries, etc)
  - Detection of modification of application configuration files
  - Connection/disconnection of a device to a host level bus
  - Restoration from a backup of a host
  - Host clock synchronisation
  - Commissioning/decommissioning of host hardware
  - Audit subsystem failure
  - Log file shrinkage (not caused by normal log rotation)
  - Log archiving
- Network Level Events
  - Firewall rule changes
  - Anomaly detection
  - Commissioning/decommissioning of firewall/switch hardware
- Certificate Authority Internal Events
  - Addition of a new CA management principal
  - Authentication of a principal to the CA software
  - Modification of an authorization profile
  - Alteration of a principal's profile assignment
  - Addition, alteration or deletion of an end-entity
  - Modification of the validity period of a CRL
  - Modification of the validity period of OCSP responses
  - Snapshotting the CA software database
  - Restoration of the CA software database from a snapshot
- Certificate Authority Publishing Events
  - Generation of a certificate

*Rachel McKen*  
February 16, 2018

- Generation of CRL/OCSP data
- Publication of CRLs/certificates to online repositories
- Key Storage Events
  - Partition of an HSM
  - Import of a private key to an HSM
  - Export of a private key to another HSM
  - Signing data via a private key stored in an HSM
  - Decrypting data via a private key stored in an HSM
  - Transfer of an HSM from one site to another
  - Zeroizing an HSM
  - Recovering a split secret from multiple shares
  - Decommissioning of an HSM
- Site Events
  - Scheduling of a visit to site
  - Arrival at site for scheduled visit
  - Unauthorized access attempt to site
  - Opening of a CA/RA equipment cabinet
  - Power failure (Mains/Generator/UPS) at site
- Operational Events
  - Admission of a new hire into TrustCor CA
  - Existing personnel leaving TrustCor CA
  - Revocation of credentials pending investigation

#### **5.4.2 Frequency of processing log**

System logs (ie, the syslog output collected at the OS level) is collated and reviewed weekly by the system administration team.

All other logs are reviewed quarterly to inform future security and operational policies.

These periods reflect normal log reviews: events which trigger security incidents have much shorter processing times as detailed in Section 5.7.

#### **5.4.3 Retention period for audit log**

Audit logs are maintained for at least three months.

#### **5.4.4 Protection of audit log**

Audit logs are stored in such a way as to permit read-only access to all but administrative personnel. Log files are monitored for shrinkage by intruder detection software.

Auditors have full access to TrustCor CA's logs.

Off-system logs (e.g. backups onto removable media) are stored in off-site safes, rated to at least UL 72 Class 100-2Hour, and the keys to such safes in the hands of officers of TrustCor Systems S. de R.L.

*Rachel McKen*  
January 16, 2018

#### **5.4.5 Audit log backup procedures**

Multi-site audit log backup happens every day. Logs are encrypted both in transit to their destination and at rest.

Removal of audit logs onto removable storage happens every 3 months.

#### **5.4.6 Audit collection system (internal vs. external)**

All automated audit logs send their results to a central logging server for collation and analysis. If the audit system fails on any node, for reasons other than node shutdown, the personnel holding System Administrator and CA Administrator roles shall agree on whether to suspect CA operations until the node's integrity and operations can be reestablished.

#### **5.4.7 Notification to event-causing subject**

No stipulation.

#### **5.4.8 Vulnerability assessments**

TrustCor CA monitors various security related publications, as well as the update channels for its various operating systems. The TrustCor CA Security Policy gives more detail on how this is done.

All TrustCor CA hosts are scanned periodically using software which obtains feeds of the most recently discovered vulnerabilities. High sensitivity hosts are scanned daily, with deep scans being performed monthly.

In the event of a vulnerability being detected, TrustCor CA shall triage the vulnerability depending on the likely impact of its exploit; the likelihood of exploitation and the mitigations already in place.

Should a system be deemed to be vulnerable to a threat, the System Administrator personnel shall state whether operations must be suspended until the risk is mitigated. Any changes to configurations to address vulnerabilities must be recorded as change orders in the internal workflow software.

Where patches to software become available, and such patches are issued to fix security related issues, TrustCor CA shall deploy them as described in the CP document, whose main points are described here:

- Patching critical risk vulnerability: 24 hours to test, 48 hours to deploy
- Patching high risk vulnerability: 48 hours to test, 5 days to deploy
- Patching medium risk: 1 week to test, 1 month to deploy



*Rachel McKen*  
January 16, 2018

- Patching low risk: time as per medium.

The System Administrator personnel may elect not to deploy a given patch, but a change order must still be raised and sufficient reason given as to why the patch is deemed unnecessary.

## **5.5 Records archival**

### **5.5.1 Types of records archived**

TrustCor CA will backup the system log data for each of the hosts it runs in its infrastructure.

Also archived:

- All certificates issued by TrustCor CA
- All CRLs issued by TrustCor CA
- All documentation pertaining to certificate validation
- All audit reports generated for compliance purposes
- All records listing authorized personnel and role assignments
- All ticket workflows (including security incident reports)

### **5.5.2 Retention period for archive**

Archive records are maintained for a minimum of 7 years. An expiring or revoked certificate is retained in logs for 7 years after the certificate ceases to be valid.

### **5.5.3 Protection of archive**

Archive records are stored off-site on durable media, which is retained in a fire-proof safe. Access to those records is restricted to authorized personnel.

Logging data on systems which feed the archive is configured not to be mutable by anyone except system administrators. Since log data is also monitored for unexpected shrinkage (corresponding to the unauthorized removal of audit data), TrustCor CA asserts that this protects the integrity of the archive data and process.

### **5.5.4 Archive backup procedures**

System administrators operate (either by scheduled operation or manual) the backup process using software approved for such purposes by the TCPA.

A default backup process is configured to take a full dump of archive data every seven days, and transfer that data automatically to a data repository. Every day, an incremental backup is scheduled.

*Rachel M. Miller*  
January 16, 2018

Backups are signed and encrypted using keys which the system administrators keep secure. Backup files are transferred to their target locations using protocols which are cryptographically authenticated and protected (either TLS or SSH).

When offline backups are needed, these are copied onto durable write-once media, which is then removed to a safe storage location as described above.

### **5.5.5 Requirements for time-stamping of records**

Every system which archives records is required to run NTP in order to synchronize its clocks to a recognized UTC(k) participating laboratory, or other reliable national standards institution producing timestamp data.

All logs collected, whether email, or system log must carry a timestamp.

System logs and application logs are configured to use UTC on their timestamps, to allow easy ordering of time sequence data.

Physical site visit logs must also record time of entry and exit to the controlled facility. Such logs are maintained by the data center itself.

### **5.5.6 Archive collection system (internal or external)**

Internal archives are collected onto backup systems and transferred to offline media as described above. Those media have sequence numbers written onto them and are then sent via recorded courier delivery to the TrustCor CA storage location.

Enterprise Subordinate CAs are required to log their certificate issuance and revocation records as stated in this CPS, and to make those logs available to TrustCor CA for archive purposes.

### **5.5.7 Procedures to obtain and verify archive information**

Backup data is cryptographically signed, so its integrity can be validated (although not necessarily read) by anyone possessing the signing public key, which is made available to TrustCor CA personnel.

Plaintext backup data is only made available to TrustCor CA personnel with a business need to see that data (including auditors). It is not disclosed to any other party, except where a properly formed instrument has been presented, which has been issued by legally competent authority.

*Rachel M. Miller*  
January 16, 2018

## 5.6 Key changeover

As any CA certificate owned by TrustCor CA approaches the end of its life shall have new keys generated and a new certificate issued in its place. From the moment of the replacement being published, all new certificate requests which would have been signed by the old private key will be signed by the new key.

The old certificate is still published on the online repository until the expiry of the last certificate issued under it. CRLs will still be generated under the old certificate until the expiry of the last certificate issued under it.

## 5.7 Compromise and disaster recovery

### 5.7.1 Incident and compromise handling procedures

All TrustCor CA high security devices must be equipped with intruder detection system which watches for such anomalies as might indicate compromise of the system.

In the event of an apparent security incident, a security incident ticket is created in the ITIL workflow software and passed onto the security team to investigate. The security team will triage the incident report, and will act to:

- withdraw from service any component which might compromise the integrity of TrustCor CA operations
- assign appropriate resources to identification, mitigation and resolution of the incident
- before bringing a remediated component back into service, a person in the System Administrator role shall record in the security incident report that the incident is believed resolved and that operations using that component can continue.

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

TrustCor CA hosts are built and maintained by a consistent configuration management process. If such systems are corrupted (by accident rather than malice), the configuration management system is used to restore the system binaries, libraries and configurations to a known state.

System administrators shall restore files not managed by the configuration management software via backup snapshots.

If there is reason to believe that certificates have been issued during such time as the integrity of the software and processes might have been compromised, TrustCor CA may choose to revoke such certificates, and

*Rachel M. Miller*  
January 16, 2018

notify the subscribers of this action and the reasons for doing so. TrustCor CA will credit subscribers such that new certificates may be issued in place of the revoked certificates.

### **5.7.3 Entity private key compromise procedures**

Any CA keys held by TrustCor CA are deemed to be of critical importance. In the event of compromise, the TCPA shall determine what actions must be taken, given the nature and extent of that compromise.

This action could be as much as revoking all current certificates issued under that CA program, and deploying a new CA program to replace the compromised one. TrustCor CA subscribers affected by this revocation would be credited so that they could obtain new credentials from the replacement program.

### **5.7.4 Business continuity capabilities after a disaster**

TrustCor CA operates in (at least) two distinct geographies, so that services can be operated in the event of loss of a host providing that service.

HSMs operate in a paired configuration, meaning that CA signing operations can continue in the event of hardware failure.

As described above in Sections 5.1 and 5.2, sufficient data center capability exists to minimize the risk of outage of TrustCor CA services.

A certain amount of outage, detailed in Section 2.1 is allowed, for emergency maintenance or unplanned unavailability of services. Such minor outage should be published by TrustCor CA once it is resolved.

However, should major outage happen - such that the Section 2.1 guarantees cannot be met - TrustCor CA shall publish an ongoing record of what the outage is, what is being done to rectify it, and what the likely time of restoration shall be.

If there is any reason to believe that the outage has resulted in the loss of integrity of the CA's assets (including private keys), TrustCor CA shall immediately inform the CA/B Forum of this, as well as the operators of the browser root certificate programs to which TrustCor CA belongs. Restoration of services will not be permitted unless the TCPA can be assured of the integrity of the CA function.

## **5.8 CA or RA termination**

Should TrustCor CA be about to cease operations, it shall make the best efforts to communicate this state of affairs to:

- The operators of the browser root certificate programs
- The CA/B Forum

*Rachel M. Miller*  
January 16, 2018

- all subscribers to current certificates

This communication should take place 3 months from cessation of operations and must explain that current certificates will not remain valid after cessation of operations. The last act of the CA shall be the revocation of its existing certificate base and the publication of those CRLs.

If a successor CA is found which can adopt all of TrustCor CA's responsibilities under its governing documentation, notification to the above shall also be provided explaining this succession. In such a case, the mass revocation may not be warranted.

## **6. TECHNICAL SECURITY CONTROLS**

### **6.1 Key pair generation and installation**

#### **6.1.1 Key pair generation**

##### **6.1.1.1 CA Key Pair Generation**

All CA key pairs for TrustCor CA are generated and stored on FIPS 140 L3 or EAL 4+ rated Hardware Signing Modules (HSM).

For Root level CAs, a commissioning script must be made and archived, showing the personnel involved in the Root Certificate generation as well as the validation of the script. All participants must physically sign that script and it forms part of TrustCor CAs foundational documents.

##### **6.1.1.2 Subscriber Key Pair Generation**

TrustCor CA does not perform key generation on behalf of subscribers - such key generation and storage is entirely the responsibility of the subscriber.

Certificate requests are presented to TrustCor CA as PKCS#10 documents.

#### **6.1.2 Private key delivery to subscriber**

Not applicable.

#### **6.1.3 Public key delivery to certificate issuer**

Subscribers must deliver their public keys (as PKCS#10 documents) over HTTPS or encrypted (and possibly signed) S/MIME email.

#### **6.1.4 CA public key delivery to relying parties**

TrustCor CA publishes all CA certificates on its online repository.

*Rachel M. Miller*  
January 16, 2018

The browser root certificate programs of which TrustCor CA is a member will also publish the root certificates for TrustCor CA.

### **6.1.5 Key sizes**

The minimum key size allowed for RSA keys in any business offering is 2048 bits, except for Enterprise Subordinate CA keys, which must be 4096 bits long.

DSA keys are not used anywhere in TrustCor CA's certification operations.

The minimum key size for any ECC key is 384 bits. ECC keys are not accepted for Enterprise Subordinate CAs. ECC keys must use either the P-384 or P-521 curves.

The minimum digest size used is 256 bits. All digests used are from the SHA-2 family. The digest minimum applies to signatures on certificates, OCSP responses and CRLs.

### **6.1.6 Public key parameters generation and quality checking**

TrustCor CA generates its public keys from inside a FIPS 140-L3/EAL 4+ HSM.

Weak keys are checked for (and rejected if found) prior to further processing. In particular, RSA public key exponents must be an odd integer greater than or equal to 3.

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

CA certificates contain the keyUsage identifiers cRLSign and keyCertSign as well as digitalSignature (in case TrustCor CA wishes to use directly signed OCSP, which it currently does not).

OCSP responses are signed by separate OCSP agents, not the CA certificate directly. As such, OCSP certificates have a digitalSignature key Usage, and extendedKeyUsage set to id-kp-OCSPSigning. As required, they also embed the id-pkix-ocsp-nocheck OID, but not as a KU/EKU value)

See Section 7.1.2 for further details regarding end entity keyUsage and extendedKeyUsage values.

## **6.2 Private Key Protection and Cryptographic Module Engineering Controls**

For subscriber keys, TrustCor CA requires that the private key holder uses reasonable steps to protect the key, such as restrictive permissions and possibly key encryption using a strong passphrase.

*Rachel M. Miller*  
February 16, 2018

### **6.2.1 Cryptographic module standards and controls**

For all CA keys storage, HSMs rated at FIPS-140 L3, or EAL4+ are used.

For Basic grade keys, no controls are placed upon the user (other than those behavioral ones above).

For Enhanced grade keys, keys should be generated and stored according to FIPS-140 Level 1 requirements, whether in hardware or software.

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

For recovery of keys which are used to encrypt backups and logs, the private key components are split into multiple shares via the Shamir secret sharing scheme, and must be brought together to recover the key. The shares are distributed securely to TCPA approved personnel, with the requirement that no one person can have enough shares to recover a key.

Changes to HSM security policies must be performed by at least two persons using separate hardware keys.

### **6.2.3 Private key escrow**

Not applicable. TrustCor CA does not escrow its keys, nor permit subordinate CAs to do so.

### **6.2.4 Private key backup**

CA keys are backed up to a specific HSM backup hardware, issued by the same vendor which makes the main HSM.

Subscriber keys are not available to TrustCor CA, and are thus not backed up.

### **6.2.5 Private key archival**

TrustCor CA does not archive its private keys.

### **6.2.6 Private key transfer into or from a cryptographic module**

Private keys are transferred between HSMs according to manufacturers specifications, and only leave the originating device in encrypted form.

### **6.2.7 Private key storage on cryptographic module**

Private keys are generated and stored in partitions on TrustCor CA's HSMs. All HSMs are rated to FIPS-140 L3 or EAL4+.

*Rachel M. Miller*  
January 16, 2018

### **6.2.8 Method of activating private key**

Private keys are activated by bringing the partition which contains them online. This requires authentication to the HSM itself and use of trusted remote device.

A partition (and its keys) stays active until explicitly deactivated.

Partitions containing Root CA keys may not be held active for unattended operations. Activation data is required to be entered via trusted devices for each use of the Root CA key (e.g. signing subordinate CA CSR or issuance of CRLs).

### **6.2.9 Method of deactivating private key**

Private keys are deactivated by deactivating their containing partition. Any system administrator is permitted to take a partition offline.

Individual hosts may have their rights to use a partition (and thus the keys within such partitions) removed. Any system administrator can do this by deregistering host key information on the HSM.

### **6.2.10 Method of destroying private key**

Keys are securely destroyed using the HSMs manufacturer's instructions.

### **6.2.11 Cryptographic Module Rating**

See Section 6.2.1 of this document.

## **6.3 Other aspects of key pair management**

### **6.3.1 Public key archival**

See Section 5.5 of this document regarding archival of public keys (embedded in certificates).

### **6.3.2 Certificate operational periods and key pair usage periods**

The CA certificates operated directly by TrustCor CA are valid for a period of 15 years.

End entity certificates are valid for periods described in Section 1.4.1 depending on the type of certificate.



*Rachel M. Miller*  
January 16, 2018

## **6.4 Activation data**

Activation data in this section refers to the process by which partitions containing HSM keys may be used by authorized parties (usually the CA signing software for CRL generation and certificate issuance).

### **6.4.1 Activation data generation and installation**

HSM Activation data is generated according to the specifications of the HSM manufacturer. Devices which are used to enter activation data are initialized when the HSM is installed in the data center.

Registration information regarding which hosts may communicate with which HSM partitions are securely copied and encrypted in transit according to the specifications of the HSM manufacturer.

### **6.4.2 Activation data protection**

Activation data is resident within FIPS-140 Level 2 devices and may only be used via registered data entry devices. Repeated attempts to wrongly enter PIN data will cause the activation devices to lock out, and new device issuance to be required.

### **6.4.3 Other aspects of activation data**

No stipulation.

## **6.5 Computer security controls**

### **6.5.1 Specific computer security technical requirements**

TrustCor CA software runs on software that is designated high sensitivity, according to TrustCor CA's security policy.

The validation server (containing OCSP responders and hosting CRLs internally) is a medium sensitivity host.

The publicly facing website which contains a proxy web server to the CRL repository and OCSP responders is deemed normal sensitivity (it contains no private key or sensitive information).

High sensitivity hosts are administered under the security policy which means at least:

- all shell accounts on the host must use 2 factor authentication (public key and OTP code) to access it
- accounts failing 5 attempts at access are locked out for at least 10 minutes

*Rachel M. Miller*  
January 16, 2018

- HIDS software is running on the host, watching for known compromises, and unexpected file variations.

Medium sensitivity hosts must exhibit at least the following controls:

- accounts failing 5 attempts at access are locked out for at least 10 minutes
- HIDS software is running on the host, watching for known compromises, and unexpected file variations.

Normal sensitivity hosts are controlled using:

- HIDS software is running on the host, watching for known compromises, and unexpected file variations.

In all cases, system security logs still generate security incident reports which are filed in TrustCor CA's SIEM system.

## **6.5.2 Computer security rating**

No stipulation.

## **6.6 Life cycle technical controls**

### **6.6.1 System development controls**

All software coming from external vendors must be either in a package form which is signed by a key known to be under that vendor's control; or have a binary distribution which has a SHA-512 integrity code known to TrustCor CA's development team and recorded in the configuration management database. Direct deployment of software to any host inside TrustCor CA is not allowed, and is detected via HIDS monitoring.

Software developed in house is peer reviewed, and may only be commissioned from developers having signed contracts with TrustCor CA.

All changes to the production environment must be as the result of ITIL workflows which have been signed off by the TrustCor CA Change Management function. Such approval is not granted unless the change has been developed, tested and deployed on TrustCor CA's parallel test infrastructure.

Systems are not deployed by hand, but deployed via the configuration management software, which ensures that the system profile is consistent with a declared configuration. The same management software is used to revert any local changes on a host.

*Rachel McKen*  
February 16, 2018

All systems are required to run software which continually scans for alteration of executable software which is not performed through the normal configuration and package management processes. This includes anti-virus scanning for systems which are at risk of such malware.

### **6.6.2 Security management controls**

Intruder detection systems and rootkit detection systems are deployed on all TrustCor CA systems.

Changes to the database which controls system configuration itself is logged under a source code control system, such that changes can be identified and reverted if need be.

### **6.6.3 Life cycle security controls**

No stipulation.

## **6.7 Network security controls**

Changes to DNS, IP namespacing, routing and network fabric configuration are stored in the same configuration management software as for host deployment. The same change controls are in place to ensure auditability of changes.

All network connectivity for each host flows through firewalls controlled by TrustCor CA. Direct public facing network connectivity is prohibited.

All IP ports open on high risk systems are controlled by whitelisting the addresses which may access them. Those addresses reside in the TrustCor CA controlled network space.

## **6.8 Time-stamping**

All hosts run NTP to synchronize their clocks to reliable time providers.

Clock adjustment is an auditable event.

## **7. CERTIFICATE, CRL, AND OCSP PROFILES**

### **7.1 Certificate profile**

TrustCor CA issues certificates compliant with the ITU X.509 standard, as well as RFC 5280. They are also designed to comply with the Baseline Requirements.

*Rachel M. Miller*  
January 16, 2018

TrustCor CA certificate serial numbers are randomly generated, and incorporate a minimum of 64 random value bits. The randomness comes from algorithms designed for cryptographic purposes. TrustCor CA's software will not permit a value of zero to be used as a serial number, even if so generated.

### 7.1.1 Version number(s)

TrustCor CA certificates are X.509v3 certificates.

### 7.1.2 Certificate extensions

The extensions covering the various types of certificate are described below.

#### 7.1.2.1 Root CA Certificate

The Root CA certificates from TrustCor CA contain the following extensions:

- basicConstraints: CA = True [critical]
- subjectKeyIdentifier: hash of public key info, as per RFC 5280, 4.2.1.2
- authorityKeyIdentifier: keyid: (identical to subjectKeyIdentifier value)
- keyUsage: keyCertSign, cRLSign, digitalSignature [critical]

No other extensions are present.

#### 7.1.2.2 Subordinate CA Certificate

The Subordinate CA certificates contain the following extensions:

- basicConstraints: CA = True [critical]
- keyUsage: keyCertSign, cRLSign, digitalSignature [critical]
- subjectKeyIdentifier: hash of public key info, as per RFC 5280, 4.2.1.2
- authorityKeyIdentifier: key identifier of signer, per RFC 5280, 4.2.1.1
- authorityInformationAccess:
  - OCSP (URI):
    - Subordinate CA1-Email: <http://ocsp.trustcor.ca/root/ca1> (<http://ocsp.trustcor.ca/root/ca1>)
    - Subordinate CA1-Site: <http://ocsp.trustcor.ca/root/ca1> (<http://ocsp.trustcor.ca/root/ca1>)
    - Subordinate CA1-Site-2048: <http://ocsp.trustcor.ca/root/ca1> (<http://ocsp.trustcor.ca/root/ca1>)

*Rachel McKen*  
January 16, 2018

- Subordinate CA2-Email: <http://ocsp.trustcor.ca/root/ca2> (<http://ocsp.trustcor.ca/root/ca2>)
- Subordinate CA2-Site: <http://ocsp.trustcor.ca/root/ca2> (<http://ocsp.trustcor.ca/root/ca2>)
- Subordinate ECA1-External: <http://ocsp.trustcor.ca/root/eca1> (<http://ocsp.trustcor.ca/root/eca1>)
- CA Issuers (URI):
  - Subordinate CA1-Email: <http://www.trustcor.ca/root/certs/ca1.pem> (<http://www.trustcor.ca/root/certs/ca1.pem>)
  - Subordinate CA1-Site: <http://www.trustcor.ca/root/certs/ca1.pem> (<http://www.trustcor.ca/root/certs/ca1.pem>)
  - Subordinate CA1-Site-2048: <http://www.trustcor.ca/certs/root/ca1.pem> (<http://www.trustcor.ca/certs/root/ca1.pem>)
  - Subordinate CA2-Email: <http://www.trustcor.ca/certs/root/ca2.pem> (<http://www.trustcor.ca/certs/root/ca2.pem>)
  - Subordinate CA2-Site: <http://www.trustcor.ca/certs/root/ca2.pem> (<http://www.trustcor.ca/certs/root/ca2.pem>)
  - Subordinate ECA1-External: <http://www.trustcor.ca/certs/root/eca1.pem> (<http://www.trustcor.ca/certs/root/eca1.pem>)
- cRLDistributionPoints:
  - Subordinate CA1-Email: URI: <http://crl.trustcor.ca/root/ca1.crl> (<http://crl.trustcor.ca/root/ca1.crl>)
  - Subordinate CA1-Site: URI: <http://crl.trustcor.ca/root/ca1.crl> (<http://crl.trustcor.ca/root/ca1.crl>)
  - Subordinate CA1-Site-2048: URI: <http://crl.trustcor.ca/root/ca1.crl> (<http://crl.trustcor.ca/root/ca1.crl>)
  - Subordinate CA2-Email: URI: <http://crl.trustcor.ca/root/ca2.crl> (<http://crl.trustcor.ca/root/ca2.crl>)
  - Subordinate CA2-Site: URI: <http://crl.trustcor.ca/root/ca2.crl> (<http://crl.trustcor.ca/root/ca2.crl>)
  - Subordinate ECA1-External: URI: <http://crl.trustcor.ca/root/eca1.crl> (<http://crl.trustcor.ca/root/eca1.crl>)
- certificatePolicies:
  - policyIdentifier: 1.3.6.1.4.1.44031.1.1.1
  - policyQualifiers:policyQualifierId: id-qt-cps
  - policyQualifiers:qualifier:cpsURI: <http://www.trustcorsystems.com/resources/cps.pdf>

Note that AIA and CRLDP sections have only one URI per type, which changes per the type of CA certificate.

*Rachel McKen*  
February 16, 2018

Enterprise Subordinate CAs have different authorityInformationAccess and cRLDistributionPoints extensions:

- authorityInformationAccess:
  - OCSP (URI): <http://ocsp.trustcor.ca/sub/eca1-external> (<http://ocsp.trustcor.ca/sub/eca1-external>)
  - CA Issuers (URI): <http://www.trustcor.ca/certs/sub-eca1-external.pem> (<http://www.trustcor.ca/certs/sub-eca1-external.pem>)
- cRLDistributionPoints: URI: <http://crl.trustcor.ca/sub/eca1-external.crl> (<http://crl.trustcor.ca/sub/eca1-external.crl>)

as well as:

- certificatePolicies:
  - policyIdentifier: <OID from TrustCor CA's 1.3.6.1.4.1.44031.1 arc>
  - policyQualifiers:policyQualifierId: id-qt-cps
  - policyQualifiers:qualifier:cpsURI: <URI of enterprise's CPS document>

Enterprise subscribers are assigned a CPS OID from TrustCor CA's CPS space.

For Enterprise Subordinate CAs, there will also be a NameConstraints extension, which represents the following information:

- permittedSubtree:
  - dNSName: (repeated for each domain owned by the subscriber's enterprise)
  - dirName: C=, ST=, L=, O=
- excludedSubTree:
  - IP: 0.0.0.0/0.0.0.0
  - IP: 0:0:0:0:0:0:0:0/0:0:0:0:0:0:0:0

### 7.1.2.3 Subscriber Certificate

The extensions vary as per the type of end-entity certificate issued.

#### Basic Secure Mail

- subjectKeyIdentifier: hash of public key info, as per RFC 5280, 4.2.1.2
- authorityKeyIdentifier: key identifier of signer, per RFC 5280, 4.2.1.1
- certificatePolicies:
  - policyIdentifier: 1.3.6.1.4.1.44031.1.1.5 (the OID of this document)

Rachel M. Miller  
February 16, 2018

- policyQualifiers:policyQualifierId: id-qt-cps
- policyQualifiers:qualifier:cpsURI: <http://www.trustcor.ca/resources/cps.pdf> (<http://www.trustcor.ca/resources/cps.pdf>)
- basicConstraints: CA = False
- keyUsage: digitalSignature, keyEncipherment
- extendedKeyUsage: id-kp-emailProtection
- authorityInformationAccess:
  - OCSP (URI): <http://ocsp.trustcor.ca/sub/ca1-email> (<http://ocsp.trustcor.ca/sub/ca1-email>)
  - CA Issuers (URI): <http://www.trustcor.ca/certs/sub-ca1-email.pem> (<http://www.trustcor.ca/certs/sub-ca1-email.pem>)
- crlDistributionPoints: URI: <http://crl.trustcor.ca/sub/ca1-email.crl> (<http://crl.trustcor.ca/sub/ca1-email.crl>)
- subjectAlternativeName:
  - rfc822Name: *email address of subscriber*

### Basic Secure Site

- subjectKeyIdentifier: hash of public key info, as per RFC 5280, 4.2.1.2
- authorityKeyIdentifier: key identifier of signer, per RFC 5280, 4.2.1.1
- certificatePolicies:
  - policyIdentifier: 1.3.6.1.4.1.44031.1.1.5 (the OID of this document)
  - policyQualifiers:policyQualifierId: id-qt-cps
  - policyQualifiers:qualifier:cpsURI: <http://www.trustcor.ca/resources/cps.pdf> (<http://www.trustcor.ca/resources/cps.pdf>)
- basicConstraints: CA = False
- keyUsage: digitalSignature, keyEncipherment
- extendedKeyUsage: id-kp-clientAuth, id-kp-ServerAuth
- authorityInformationAccess:
  - OCSP (URI): <http://ocsp.trustcor.ca/sub/ca1-site> (<http://ocsp.trustcor.ca/sub/ca1-site>)
  - CA Issuers (URI): <http://www.trustcor.ca/certs/sub-ca1-site.pem> (<http://www.trustcor.ca/certs/sub-ca1-site.pem>)
- crlDistributionPoints: URI: <http://crl.trustcor.ca/sub/ca1-site.crl> (<http://crl.trustcor.ca/sub/ca1-site.crl>)
- subjectAlternativeName:
  - dnsName: *FQDN identical to CN component of subjectDN*

### Enhanced Secure Mail

- subjectKeyIdentifier: hash of public key info, as per RFC 5280, 4.2.1.2
- authorityKeyIdentifier: key identifier of signer, per RFC 5280, 4.2.1.1

Rachel M. Miller  
February 16, 2018

- certificatePolicies:
  - policyIdentifier: 1.3.6.1.4.1.44031.1.1.5 (the OID of this document)
  - policyQualifiers:policyQualifierId: id-qt-cps
  - policyQualifiers:qualifier:cpsURI: <http://www.trustcor.ca/resources/cps.pdf> (<http://www.trustcor.ca/resources/cps.pdf>)
- basicConstraints: CA = False
- keyUsage: digitalSignature, keyEncipherment
- extendedKeyUsage: id-kp-emailProtection
- authorityInformationAccess:
  - OCSP (URI): <http://ocsp.trustcor.ca/sub/ca2-email> (<http://ocsp.trustcor.ca/sub/ca2-email>)
  - CA Issuers (URI): <http://www.trustcor.ca/certs/sub-ca2-email.pem> (<http://www.trustcor.ca/certs/sub-ca2-email.pem>)
- crlDistributionPoints: URI: <http://crl.trustcor.ca/sub/ca2-email.crl> (<http://crl.trustcor.ca/sub/ca2-email.crl>)
- subjectAlternativeName:
  - rfc822Name: *email address of subscriber*

#### Enhanced Secure Site

- subjectKeyIdentifier: hash of public key info, as per RFC 5280, 4.2.1.2
- authorityKeyIdentifier: key identifier of signer, per RFC 5280, 4.2.1.1
- certificatePolicies:
  - policyIdentifier: 1.3.6.1.4.1.44031.1.1.5 (the OID of this document)
  - policyQualifiers:policyQualifierId: id-qt-cps
  - policyQualifiers:qualifier:cpsURI: <http://www.trustcor.ca/resources/cps.pdf> (<http://www.trustcor.ca/resources/cps.pdf>)
- basicConstraints: CA = False
- keyUsage: digitalSignature, keyEncipherment
- extendedKeyUsage: id-kp-clientAuth, id-kp-ServerAuth
- authorityInformationAccess:
  - OCSP (URI): <http://ocsp.trustcor.ca/sub/ca2-site> (<http://ocsp.trustcor.ca/sub/ca2-site>)
  - CA Issuers (URI): <http://www.trustcor.ca/certs/sub-ca2-site.pem> (<http://www.trustcor.ca/certs/sub-ca2-site.pem>)
- crlDistributionPoints: URI: <http://crl.trustcor.ca/sub/ca2-site.crl> (<http://crl.trustcor.ca/sub/ca2-site.crl>)
- subjectAlternativeName:
  - dnsName: *FQDN identical to CN component of subjectDN*
  - dnsName: *FQDN of additional names registered*



*Rachel M. Miller*  
January 16, 2018

#### **7.1.2.4 All Certificates**

No stipulation other than those given in sections 7.1.2.2 and 7.1.2.3.

#### **7.1.2.5 Application of RFC 5280**

TrustCor CA issues pre-certificates as described in section 4.4.2. Such certificates are not considered to be certificates (compliant with RFC 5280) as per BR section 7.1.2.5

#### **7.1.3 Algorithm object identifiers**

All signing algorithms are either sha256WithRSAEncryption or sha512WithRSAEncryption.

TrustCor CA does not, and never has, used SHA-1 as a component of any signature algorithm on a certificate.

#### **7.1.4 Name forms**

##### **7.1.4.1 Issuing CA Certificate Subject**

The Root CA certificates have the following CN component subjectNames:

- CA-1 : TrustCor CA RootCert CA-1
- CA-2 : TrustCor CA RootCert CA-2
- ECA-1 : TrustCor CA ECA-1

followed by the common components:

- OU [Organizational Unit] : TrustCor CA Certificate Authority
- O [Organization] : TrustCor Systems S. de R.L.
- L [Locality] : Panama City
- ST [State/Province] : Panama
- C [Country] : PA

The Issuer DN matches the above (being a self signed certificate).

The subordinate CA certificates have the follow CN components:

- Subordinate CA1-Email : TrustCor CA Basic Secure Email (CA1)
- Subordinate CA1-Site : TrustCor CA Basic Secure Site (CA1)
- Subordinate CA1-Site-2048 : TrustCor CA Basic Secure Site 2048 (CA1)
- Subordinate CA2-Email : TrustCor CA Enhanced Secure Email (CA2)
- Subordinate CA2-Site : TrustCor CA Enhanced Secure Site (CA2)

*Rachel M. Miller*  
 February 16, 2018

- Subordinate ECA1-External : TrustCor CA External PKI (ECA1)

followed by the common components:

- OU [Organizational Unit] : TrustCor CA Network
- O [Organization] : TrustCor Systems S. de R.L.
- ST [State/Province] : Panama
- C [Country] : PA

The Issuer DN will be one of the forms given for the Root CAs in this section.

The SHA-256 fingerprints for each CA certificate are as follows:

**Certificate Name SHA-256 Fingerprint**

RootCert CA-1	D4:0E:9C:86:CD:8F:E4:68:C1:77:69:59:F4:9E:A7:74:FA:54:86:84:B6:C4:06:F3:90:92:61:F4:DC:E2:57:5C
Subordinate CA-1 Email	02:BE:F9:22:B3:2D:46:DF:E7:52:0B:0E:E7:E3:EA:F5:88:EE:2B:9C:AB:81:B8:48:37:E6:B9:55:E0:75:9A:90
Subordinate CA-1-Site	FE:1E:CA:DB:DE:E0:E5:58:06:8D:DB:C7:B3:3A:B7:8D:D5:7D:0D:C2:2F:CC:1C:36:01:19:01:03:75:B0:A6:1B
Subordinate CA-1-Site-2048	4E:FA:AA:10:40:AC:2F:44:D3:DE:E2:06:D9:52:2A:28:8D:84:EC:38:DD:F5:92:98:C9:26:E0:2F:4C:9D:9A:EF
RootCert CA-2	07:53:E9:40:37:8C:1B:D5:E3:83:6E:39:5D:AE:A5:CB:83:9E:50:46:F1:BD:0E:AE:19:51:CF:10:FE:C7:C9:65
Subordinate CA2-Email	A6:D3:65:16:1B:58:53:9C:B4:4B:29:D7:7C:64:81:26:F3:3D:B3:C4:93:11:6C:30:40:E1:8D:E3:E0:1A:42:42
Subordinate CA2-Site	38:30:DB:8E:A1:52:0B:6C:DF:57:E1:E0:0A:5F:12:97:BE:11:D9:E6:43:0C:83:60:71:76:21:2F:F8:5D:2D:B8
External ECA-1	5A:88:5D:B1:9C:01:D9:12:C5:75:93:88:93:8C:AF:BB:DF:03:1A:B2:D4:8E:91:EE:15:58:9B:42:97:1D:03:9C
Subordinate ECA1-External	78:82:D9:FA:A4:9A:8B:B3:51:F0:FC:6E:D6:85:EF:1F:C5:15:41:D0:CE:0A:42:22:07:4D:1D:9E:16:FD:C3:0B

**7.1.4.2 Subject Information for Standard Server Authentication certificates**

If a Subject DN is present for Basic Secure Site certificates, it will always be:

- CN = *certified FQDN*

The subject of Enhanced Secure Site certificates is always:

- CN = *certified FQDN*

*Rachel M. Miller*  
January 16, 2018

- O = *certified organization name*
- ST = *state/province of certified organization*
- L = *locality of certified organization*
- C = *country of certified organization*

While not required in this section, the subject of Basic Secure Mail certificates (if one is present) is always:

- emailAddress = *address of subscriber*

and that of Enhanced Secure Mail certificates is:

- emailAddress = *certified FQDN*
- CN = *common name of organization associated entity*
- O = *certified organization name*
- ST = *state/province of certified organization*
- L = *locality of certified organization*
- C = *country of certified organization*

In all cases, the Issuer DN will be identical to the subject DN of the issuing CA certificate, as described in Section 7.1.4.1.

### **7.1.4.3 Subject Alternative Names for Standard Server Authentication certificates**

### **7.1.5 Name constraints**

Name constraints are only present in Enterprise Subordinate CA certificates, and are described in Section 7.1.2.2

### **7.1.6 Certificate policy object identifier**

#### **7.1.6.1. Reserved Certificate Policy Identifiers**

The DV and OV policy identifiers are included in certificates as described in Section 7.1.6.4.

#### **7.1.6.2. Root CA Certificates**

Root CAs have no certificatePolicies extension.

#### **7.1.6.3 Subordinate CA Certificates**

All subordinate CAs contain policy identifiers noting the governing CPS policy at the time of issuance. In addition, Enterprise Subordinate CAs contain the extendedKeyUsage identifiers restricting the CAs to issue particular categories of end entity certificates.

*Rachel M. Miller*  
February 16, 2018

#### **7.1.6.4 Subscriber Certificates**

In addition to general CPS policy identifiers, additional identifiers may be present in end entity certificates, described below:

##### **Basic Secure Mail**

These certificates carry no policy identifier.

##### **Basic Secure Site**

These certificates carry the policy identifier of 2.23.140.1.2.1 (DV)

##### **Enhanced Secure Mail**

These certificates carry the policy identifier of 2.23.140.1.2.3 (IV)

##### **Enhanced Secure Site**

These certificates carry the policy identifier of 2.23.140.1.2.2 (OV)

#### **7.1.7 Usage of Policy Constraints extension**

Not applicable.

#### **7.1.8 Policy qualifiers syntax and semantics**

TrustCor CA does not currently add explicit text into the policy extensions of its certificate.

#### **7.1.9 Processing semantics for the critical Certificate Policies extension**

No stipulation.

#### **7.2 CRL profile**

Root CA CRLs have a validity period of 6 months.

Subordinate CA CRLs are issued with a validity period covering 24 hours.

##### **7.2.1 Version number(s)**

CRLs are issued as version 2 CRLs, as defined in RFC3280/5280.

##### **7.2.2 CRL and CRL entry extensions**

The CRL number is a monotonically increasing integer.

The Authority Key Identifier matches that in the signing certificate.

*Rachel M. Miller*  
January 16, 2018

The Invalidity date is given as a UTC date.

### **7.3 OCSP profile**

OCSP responses have a maximum of 24 hours validity.

#### **7.3.1 Version number(s)**

The OCSP responder conforms to the specifications of RFC 6960, and uses v1 as its version number.

#### **7.3.2 OCSP extensions**

TrustCor CA OCSP will not honor nonce extensions, but will accept them. TrustCor CA uses the Extended Revoked Definition of RFC 6960, 4.4.8 to denote non-issued certificates.

TrustCor CA OCSP may opt to use certificate SCTs as an extension to the OCSP response. Such extensions will not be marked as critical.

## **8. COMPLIANCE AUDIT AND OTHER ASSESSMENTS**

This document is designed to meet the standards required of the Baseline Requirements as well as Webtrust's "Trust Service Principles and Criteria for Certification Authorities" (WebTrust for CAs).

### **8.1 Frequency or circumstances of assessment**

TrustCor CA is audited according the requirements above at least once per year. TrustCor CA may elect to begin its audit assessment earlier at its discretion.

### **8.2 Identity/qualifications of assessor**

The auditor is chosen from the list of WebTrust's licensed practitioners.

### **8.3 Assessor's relationship to assessed entity**

The auditor does not have any business relationship with TrustCor CA S. de R.L. or any other company which TrustCor CA owns. The auditor selected will not have any interest which would cause a bias in any direction regarding audit findings.

### **8.4 Topics covered by assessment**

The topics under audit will be:

- Business Practices disclosure:
  - TrustCor CA documents its services

*Rachel McKinnon*  
February 16, 2018

- TrustCor CA provides those services in accordings with this CPS
- Key Lifecycle Management:
  - TrustCor CA documents the controls that it exercises of key material, and demonstrates that those controls are sufficient in order to manage the risk of compromise of its key materials
- Certificate Lifecycle Management:
  - TrustCor CA documents and demonstrates effective controls to provide assurances that subscriber information is properly collected, validated and archived for the purposes of certificate issuance, renewal, rekeying, modification and revocation.
- Environmental Controls:
  - TrustCor CA documents the physical controls required to safeguard its physical assets from unauthorized tampering
  - TrustCor CA demonstrates its logical controls to ensure that the software on its equipment is deployed and maintained properly, in order to ensure that its operations are not subject to undue risk
  - TrustCor CA demonstrates its development lifecycle in such a way as to present assurances that the CA systems as a whole do not deviate from expected behavior.

## **8.5 Actions taken as a result of deficiency**

In the event of deficiencies being discovered, this must be reported to the TCPA as soon as is reasonably practical. The TCPA directs the appropriate personnel to devise a plan to remediate the deficiencies.

Once the plan has been implemented, TrustCor CA will call for an auxiliary audit to verify that the noted deficiencies have been remediated.

TrustCor CA may revoke certificates if the deficiencies were such that the issuance process is likely to have been faulty.

If the deficiency is deemed so serious, or the time to remediate so long as to call into question the integrity of certificates issued, TrustCor CA CA will inform the relevant browser root certificate program managers that a serious deficiency in practice has been uncovered, and that they should take such steps as to mitigate the risk to their program's integrity.

## **8.6 Communication of results**

TrustCor CA will communicate the audit report to WebTrust, who will place the audit for inspection on its website. That report is linked via the relevant WebTrust seal on TrustCor Systems S. de R.L.'s main website.

*Rachel M. Miller*  
January 16, 2018

## **8.7 Self-Audits**

At any given point between audits, TrustCor CA will select at least three percent of all certificates issued from each business offering, and verify that the information collected was:

- properly collected
- properly validated
- archived in such a way as required by this CPS

and that the certificate was properly, formatted, issued and communicated to the subscribers.

The results of this self audit is stored in the company archive and is made available to the external auditor. Self-audits are performed quarterly.

## **9. OTHER BUSINESS AND LEGAL MATTERS**

### **9.1 Fees**

#### **9.1.1 Certificate issuance or renewal fees**

TrustCor CA may charge fees for its business offerings regarding issuance, renewal, re-keying or modification as it sees fit.

#### **9.1.2 Certificate access fees**

TrustCor CA does not charge subscribers for the ability to access their own certificates.

TrustCor CA does not provide a general ability to search through its list of issued certificates.

TrustCor CA makes its CA certificates available online free of charge.

#### **9.1.3 Revocation or status information access fees**

There is no cost to any third party for revocation of a certificate.

OCSP and CRL access is provided free of charge.

#### **9.1.4 Fees for other services**

No stipulation.

*Rachel M. Miller*  
February 16, 2018

### **9.1.5 Refund policy**

If a certificate is not deemed to be acceptable within 30 days, the subscriber may request a refund from TrustCor CA of any monies remitted for issuance. Revocation of the unaccepted certificate then follows.

## **9.2 Financial responsibility**

### **9.2.1 Insurance coverage**

TrustCor Systems S. de R.L. maintains errors and omissions insurance coverage.

### **9.2.2 Other assets**

No stipulation.

### **9.2.3 Insurance or warranty coverage for end-entities**

No warranties exist covering Basic grade certificates. TrustCor CA will not make good any financial loss caused by use of its certificates, even in the event that the certificate was issued through mistake or negligence on TrustCor CA's part.

For Enhanced grade certificates, where misissuance has occurred as a result of negligence or improper behavior on the part of TrustCor CA, the subscriber will be compensated thus:

- for each certificate wrongly issued: \$10,000
- a maximum cap of compensation of: \$100,000 (in the case where more than 10 certificates have been wrongly issued to a customer)

## **9.3 Confidentiality of business information**

TrustCor CA makes commercially reasonable efforts to maintain the integrity and confidentiality of information which it deems to be company confidential, covered by the privacy policy, or subject to legal confidentiality requirements.

### **9.3.1 Scope of confidential information**

Company confidential information includes, but is not limited to:

- TrustCor Systems S. de R.L.s business agreements
- Contingency and Business Continuity Plans
- Subscriber Agreements between Enterprise Subordinate CAs and TrustCor CA
- Any PII which is not to form a part of an issued certificate



*Rachel M. Miller*  
January 16, 2018

- Audit records which are not required to be openly published

### **9.3.2 Information not within the scope of confidential information**

Information which is to be certified in a TrustCor CA certificate is deemed to be public information, regardless of its dissemination policy from TrustCor CA.

### **9.3.3 Responsibility to protect confidential information**

TrustCor CA personnel are trained in handling of confidential data. As part of any subscriber agreement, an Enterprise Subordinate CA must also handle confidential information in a proper manner.

## **9.4 Privacy of personal information**

### **9.4.1 Privacy plan**

TrustCor CA maintains and publishes a company privacy policy. All TrustCor CA personnel are required to be familiar with, and to abide by that policy document.

### **9.4.2 Information treated as private**

Any information which is gathered by TrustCor CA and is tied to a particular person (natural or legal) is deemed to be private, unless it is specifically noted as public in Section 9.4.3.

### **9.4.3 Information not deemed private**

Any PII published in an issued certificate is public. Note that this extends to details which formed a certificate which was subsequently rejected by the subscriber as being unacceptable. The contents of any CRL or OCSP response is similarly public.

### **9.4.4 Responsibility to protect private information**

All TrustCor CA personnel are expected to handle PII in compliance with legal requirements and the company privacy policy. Failure to do so can result in disciplinary action up to and including termination of employment.

### **9.4.5 Notice and consent to use private information**

Any subscriber agreement grants TrustCor CA the right to request, store and archive such information as is required for its business purposes, as described in this CPS.

*Rachel M. Miller*  
January 16, 2018

By engaging in the registration and submission process, an applicant consents to such use.

#### **9.4.6 Disclosure pursuant to judicial or administrative process**

TrustCor CA will not release any PII unless specifically ordered by a competent legal authority, acting under a properly formed legal instrument.

TrustCor CA reserves the right to publish online a statement that no such disclosure demand has been received; and to withdraw that statement should such disclosure be legally compelled.

#### **9.4.7 Other information disclosure circumstances**

No stipulation.

### **9.5 Intellectual property rights**

TrustCor CA will respect the IPR of any third party.

TrustCor CA asserts that any trade names and trademarks which it uses in the course of its business are its own.

### **9.6 Representations and warranties**

#### **9.6.1 CA representations and warranties**

TrustCor CA will obey the requirements of this document and any other documents which form its governance specification, including the company security, privacy and certification policies.

TrustCor CA promises, in addition to any other representations and warranties expressed elsewhere to:

- Comply with all company policies and specifically its published CP and CPS documents.
- Issue certificates according to the terms of its CPS
- Revoke certificates according to the terms of its CPS
- Publish revocation data and make that data available to all RPs
- Promptly inform all concerned parties of any breach or compromise of its private key material
- Protect all information which it receives and is not expressly permitted to publish
- Document and publish all its business offerings, and the validation standards which exist for each one

*Rachel M. Miller*  
January 16, 2018

### **9.6.2 RA representations and warranties**

Any RA which acts on TrustCor CAs behalf is under the same obligations regarding information processing as TrustCor CA itself.

Enterprise Subordinate CA contracts require them to inform TrustCor CA of all incidents which violate the terms of this document and any others which bind them.

### **9.6.3 Subscriber representations and warranties**

Subscribers are required to warrant to TrustCor CA that:

- they are legally entitled to assert any of the information submitted as part of a certificate application
- they will protect private key information from compromise or disclosure to any unauthorized party
- that all of the information which is submitted to TrustCor CA is complete and accurate
- that the certificate shall not be used for any purpose other than that expressly permitted in the subscriber agreement
- that TrustCor CA will be informed promptly as and when private key compromise is noted or suspected by the subscriber

In the event that any of the above conditions are breached, TrustCor CA shall revoke the certificate(s) involved as per the above revocation procedures.

### **9.6.4 Relying party representations and warranties**

Any RP must:

- not rely on any information in a certificate which has expired, been revoked or is being used for any purpose other than contained in the certificate itself
- verify that the chain of signing for any certificate purporting to come from a TrustCor CA is genuine, by chaining the signatures up to a trusted root certificate.
- rely on those certificates in operation of hazardous equipment

### **9.6.5 Representations and warranties of other participants**

No stipulation.

### **9.7 Disclaimers of warranties**

Other than as required by law and by the terms described in this document, TrustCor CA disclaims any warranty, express or implied.

*Rachel McKen*  
January 16, 2018

## **9.8 Limitations of liability**

While Enterprise Subordinate CAs may limit their liability according to their business purposes, such limitation cannot violate the terms of TrustCor CA's CP and CPS documents.

## **9.9 Indemnities**

### **9.9.1 Indemnification by CAs**

Any Application Software Subscribers are neither obliged nor held liable for any damages for which TrustCor CA has been found liable, insofar as they have distributed TrustCor CA certificate materials or communicated the validity of TrustCor CA issued CAs with the proviso that such communications are accurate.

TrustCor CA will NOT defend, indemnify or hold harmless any Application Software Suppliers which communicates incorrectly any information regarding the revocation status of any TrustCor CA issued certificate, when that Supplier did, or reasonably could have, discovered the status of the certificate from any of the repositories described in this document.

Any Enterprise Subordinate CA indemnifies TrustCor CA for any behavior of the licensed enterprise which violates the terms of either TrustCor CA's CP or CPS documents.

### **9.9.2 Indemnification by Subscribers**

Subscribers indemnifies TrustCor CA from liability from any events arising from:

- inaccurate or incomplete documentation supplied by the subscriber
- any failure of a subscriber to disclose any material fact which could mislead or deceive any RP
- failure to protect a private key from compromise
- failure to inform TrustCor CA of any compromise of which the subscriber is aware
- conduct of the subscriber which is unlawful (where such conduct involves use of the certificate as issued by TrustCor CA)

### **9.9.3 Indemnification by Relying Parties**

No stipulation.

*Rachel M. Miller*  
January 16, 2018

## **9.10 Term and termination**

### **9.10.1 Term**

The terms of this CPS begins from the publication in the online repository, and remains in effect until this document is replaced by a TCPA approved CPS.

### **9.10.2 Termination**

The terms of this document may only be terminated by the issuance of a properly approved newer version.

### **9.10.3 Effect of termination and survival**

Changes to the versions of this documents are also published on TrustCor CA CA's online repository. Regardless of such changes, the following rights and responsibilities survive:

- protection of confidential and/or private information in its custody
- any representations and warranties described in Section 9.4.4
- All limitations of liabilities as described in Section 9.8
- All indemnities described in Section 9.9 of this document

## **9.11 Individual notices and communications with participants**

Notices should be sent via digitally signed email or paper form to the TCPA. The address of the TCPA (electronic and physical is given in Section 1.5.1 of this document).

## **9.12 Amendments**

Amendments to this document are classified by severity:

- minimal - no changes to conditions to any party is involved. Typically used when correcting grammar, clarifying meaning or reformatting the appearance of text.
- small - additional business offerings or minor changes to existing business offerings are made which have minimal impact on any party's obligations
- large - major changes to rights or responsibilities are entailed. Major new business offerings, withdrawal of existing lines of business (where premature revocation of certificates might be needed) would be classified as major.

*Rachel McKinnon*  
January 16, 2018

### **9.12.1 Procedure for amendment**

Any proposed change to this CPS is made in a source code controlled repository operated by TrustCor CA. When the proposal is submitted, the repository is tagged, and the TCPA will check out the documents from that tag.

If accepted for inclusion, the TCPA will issue the severity of the change. The version of the document will change as follows:

- minimal: the micro version of this document is incremented. No new OID is generated. (e.g. 1.0.1 -> 1.0.2)
- small: the minor version of this document is incremented, and a new OID is generated for this document, and included in all future certificates issued pursuant to the new CPS. (e.g. 1.2.4 -> 1.3.0)
- large: the major version of this document is incremented, and a new OID is generated (e.g. 1.3.5 -> 2.0.0)

The approved document is produced in PDF form, and that logged on the website, along with previous versions for comparison.

### **9.12.2 Notification mechanism and period**

Notice is given by publication of the CPS to the online repository.

### **9.12.3 Circumstances under which OID must be changed**

See Section 9.12.1 for new OID circumstances.

### **9.13 Dispute resolution provisions**

Any dispute regarding the contents of this CPS should be made to TrustCor CA prior to seeking third party involvement.

### **9.14 Governing law**

TrustCor Systems S. de R.L. is incorporated in Panama, so the law of the Republic of Panama shall govern the interpretation of this document.

### **9.15 Compliance with applicable law**

With regard to the PII provisions of Section 9.4.5, the requirements of the data protection regulations of the European Union regarding access, disclosure and destruction shall hold.

*Rachel M. Miller*  
January 16, 2018

## **9.16 Miscellaneous provisions**

### **9.16.1 Entire agreement**

Any of TrustCor CA's enterprise subordinate CAs are bound to adhere to all of the terms of this CPS.

### **9.16.2 Assignment**

No entity may assign its rights or responsibilities under this document to any other party without the written consent of TrustCor Systems S. de R.L.

### **9.16.3 Severability**

In the event that a clause of this document is held invalid by a judicial authority which TrustCor CA recognizes as competent over its affairs, the remainder of the document is still held to be valid and enforceable.

If the same authority requires changes to this document in order to remain legally sound, then the changes shall be made and published in the normal fashion described above, with an additional condition:

- a report of why the changes have been made, citing the authority and law or, regulation shall be published to the email address [questions@cabforum.org](mailto:questions@cabforum.org)

If the relevant law or regulation is no longer operative, such changes as were required shall be reversed, and a similar notification to the CA/B Forum mailing list be made.

### **9.16.4 Enforcement (attorneys' fees and waiver of rights)**

TrustCor CA shall enforce its rights and seek damages (including attorneys' fees and losses) from any party which violates the terms of any agreement with TrustCor CA. The terms of this CPS are not waived by a failure to enforce all or part of them with regard to any party bound by this document (except where a waiver is granted by explicit written permission by TrustCor CA).

### **9.16.5 Force Majeure**

TrustCor CA accepts no liability for failure to perform any obligation under the terms of this document, where such failure results from events outside TrustCor CA's reasonable control.

## **9.17 Other provisions**

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No stipulation.