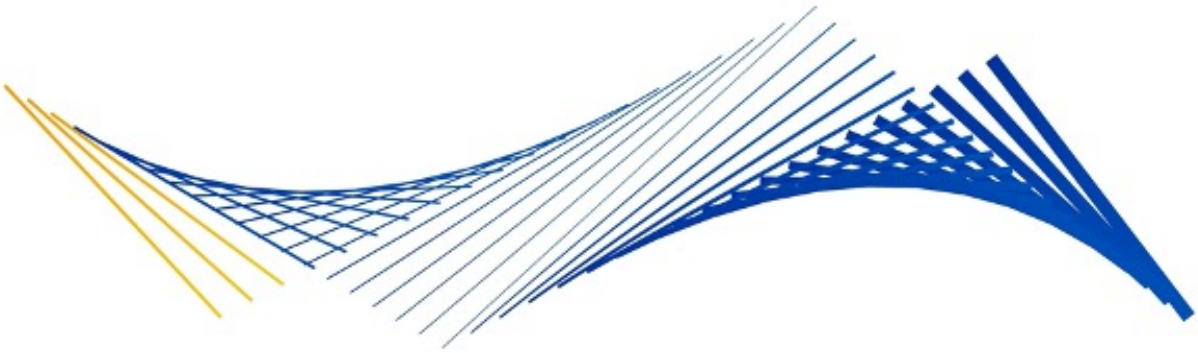
Visa Public Key Infrastructure Certificate Policy (CP)

Version 4.2

Visa PKI

March 22, 2024



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Important Note on Confidentiality and Copyright

About This Guide

Visa Certificate Policy (CP) is the first in a set of documents related to the *Visa Public Key Infrastructure (PKI)* operations.

Audience

The target audience for this document includes Visa entities such as Business Groups, Visa subsidiaries, and Visa clients and their agents who use Visa-issued certificates in conjunction with Visa products and/or services.

1. INTRODUCTION

1.1. Overview

A Public Key Infrastructure (PKI) system is an umbrella term for a collection of Certificate Authorities (CAs), computer applications, people, and processes that issue digital certificates.

A CA with functions that are performed by the PKI administrators issues CA certificates to the Issuing CA as well as End-Entity certificates.

The Visa Certificate Policy (CP) describes the business and technical requirements and provides the framework and context within which certificates are requested, created, issued, renewed, managed, revoked and/or used by participants of the Visa PKIs.

The Visa PKIs issue certificates for use in conjunction with various Visa products and services. These certificates are used to authenticate the participating entities in an online transaction, to provide session confidentiality for the data being communicated, and to provide message integrity of transactions.

Visa PKI certificates must only be used in conjunction with Visa products and services unless Visa grants prior approval by the Visa Cryptographic Review Forum (CRF).

With the exception of the Visa Smart Debit/Credit (VSDC) PKI, CA certificates can only be issued to Visa or Visa Business Groups. For the VSDC PKI only, Visa clients may be issued CA certificates known as Issuer Public Key (IPK) certificates in VSDC.

CA certificates may be renewed.

End-Entity certificates are used for authentication, data integrity, and confidentiality but they must not be used to sign CA certificates or Certificate Revocation Lists (CRLs). These End-Entity certificates can be issued to Visa business groups, Visa clients and their agents, employees, merchants, and cardholders. Root CAs must not issue End-Entity certificates. End-Entity certificates cannot be renewed.

Reliance upon Visa PKI issued certificates is limited to entities that have agreed to the Visa By-Laws, Operating Regulations, and policies. No other person or entity may rely upon Visa PKI issued certificates for any other purpose.

The type of certificates issued will vary depending upon the product and service.

The certificate request process may vary by product or service. Certificate requests may be processed either electronically or manually.

At the top of the Visa PKI hierarchy are the following Root CAs:

- Visa Information Delivery Root Certificate Authority
- Visa Public ECC Root CA
- Visa Public RSA Root CA
- Visa TLS Root CA
- VSDC Certificate Authority

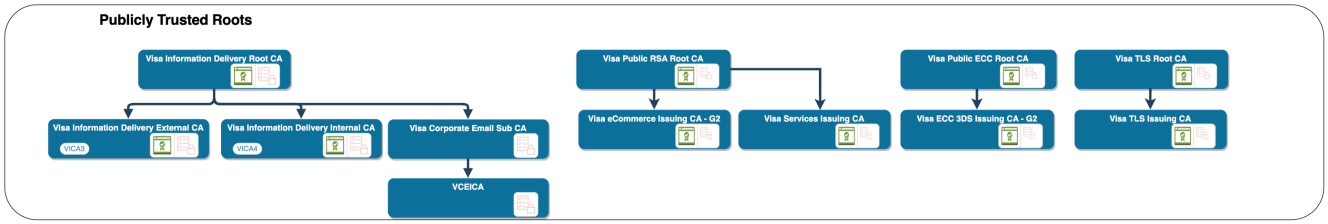
The CAs are organized in hierarchies as follows:

1. **Root CAs** are at the top of the hierarchy.
2. **Intermediate Issuing CAs** are directly subordinate to the Root CAs, which have subordinate Issuing CAs.

3. **Issuing CAs** are the lowest level of the hierarchy, and only issue End-Entity certificates. They are subordinate to the Intermediate CAs or Root CAs.

The following figure illustrates the Visa PKI hierarchies.

Figure 1–1: Visa PKI Hierarchies



Cross-certification between external CAs and CAs is not supported. The Visa PKI hierarchy is a closed PKI.

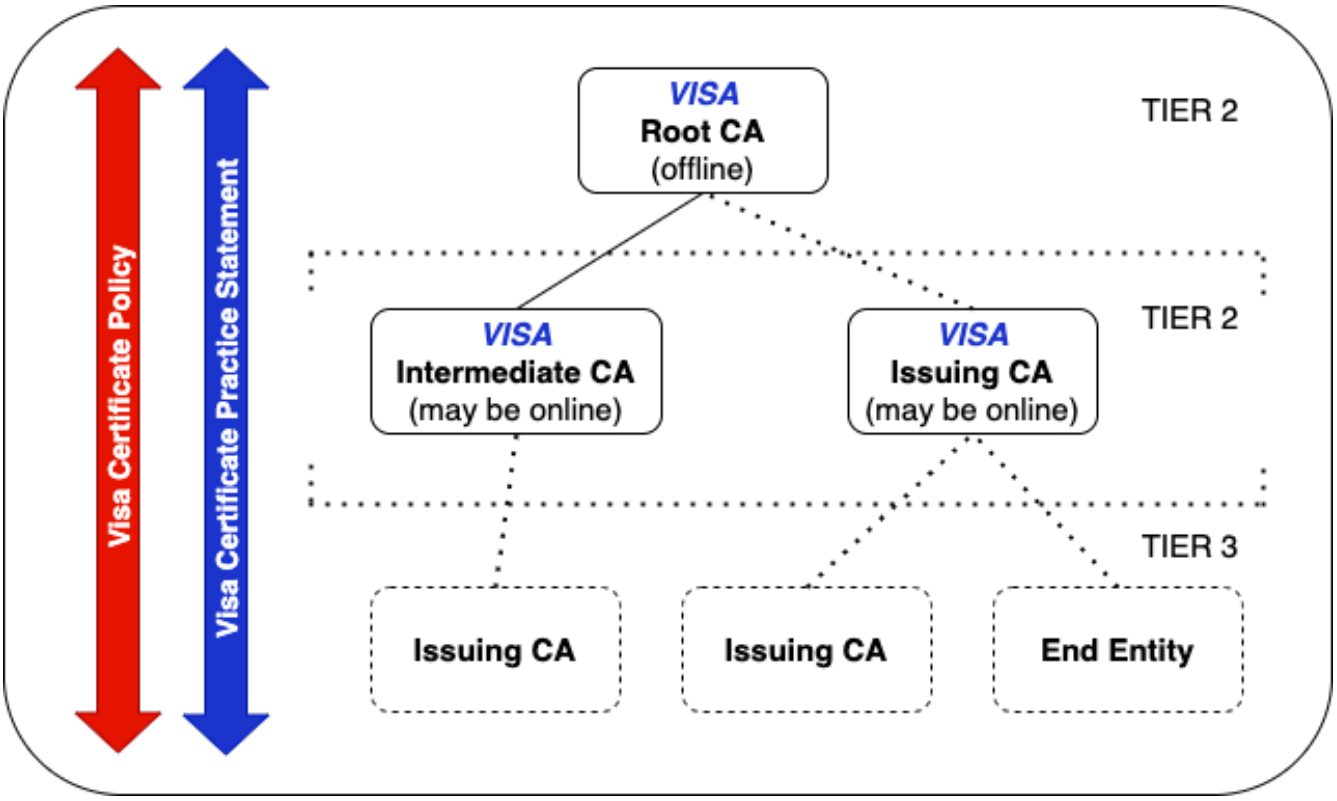
Visa CAs conform to Baseline Requirements for the Issuance and Management of Publicly-Trusted Certificates published at http://www.cabforum.org with an exclusion of the exceptions listed below.

Baseline Requirements Exceptions:

Subordinate CA Certificate: authorityInformationAccess —this extension is not present in all the Visa Subordinate CA certificates.

As shown in the following figure, the Visa CPS applies to Visa CAs. Other documents, such as general security policies, operation procedures, key ceremony guides, disaster recovery plans, and so on, may also supplement this Visa CP and the Visa CPS.

Figure 1–2: Visa Document Structure



This Visa CP generally conforms to the Internet Engineering Task Force (IETF) Public Key Infrastructure Extensions (PKIXs) Internet X.509 PKI Certificate Policy and Certification Practice Statement Framework (also known as RFC 3647).

Visa has implemented multiple X.509 PKIs and EMVCo PKI for issuing and distributing digital certificates in support of Visa products and services. This infrastructure is known as the Visa PKIs and is made up of a hierarchy of entities called CAs.

A CA is a trusted third-party that issues digital certificates to Subscribers (End-Entities or other CAs) within the hierarchy.

1.2. Document Name and Identification

☒ Visa Information Delivery Root, Intermediates, and Issuing Certificate Authorities (CAs)
☐ Visa Smart Debit/Credit (VSDC) Certificate Authorities (CAs)
☒ Visa Public ECC Root CA and Issuing Certificate Authorities (CAs)
☒ Visa Public RSA Root CA and Issuing Certificate Authorities (CAs)
☒ Visa TLS Root CA and Issuing Certificate Authorities (CAs)

The Object Identifiers (OIDs) used for certificates issued under this CP are:

- OID: 2.23.131.1.1 – Visa eCommerce PKI
- OID: 2.23.131.2.1 – Visa Information Delivery PKI
- OID: 2.23.140.1.2.2 – Adheres to Baseline Requirements for Organization Validated Server Certificates with the exclusion of the exceptions listed in ”Overview”.
- OID: 2.23.140.1.2.1 - Adheres to Baseline Requirements for the Issuance and Management of Domain Validated Server Certificates with the exclusion of the exceptions listed in “Overview”.

Certificates issued from Visa eCommerce PKI, Visa Information Delivery PKI, contain the corresponding OID value that indicates adherence to and compliance with the CA/Browser Forum Baseline Requirement 9.3.4 Subscriber Certificates.

Visa has assigned a reserved OID value 2.23.140.1.2.2 for asserting conformance with the current version of the Visa CA/Browser Forum Baseline Requirements for the Issuance and Management of Publicly-Trusted Organization-Validated Certificates with the exclusion of the exceptions listed in ”Overview”. This OID value is reserved for use by Visa CAs as a means of asserting compliance with these CA/Browser Forum Baseline Requirements.

Visa has assigned a reserved OID value 2.23.140.1.2.1 for asserting conformance with the current version of the Visa CA/Browser Forum Baseline Requirements for the Issuance and Management of Publicly-Trusted Domain-Validated Certificates with the exclusion of the exceptions listed in ”Overview”. This OID value is reserved for use by Visa CAs as a means of asserting compliance with these CA/Browser Forum Baseline Requirements.

1.2.1. Revisions

Version	Details	Date
3.1	CAB/F Baseline Requirement 1.4.2 and structure mapping in accordance with RFC 3647Updated to include G2 CA information.	31 March 2017
3.2	Added new Visa Public ECC Root CA information	31 January 2018
3.3	Aligned to CAB/F Baseline Requirement 1.5.6.Clarified key sizes for SSL/TSL certificates and S/MIME certificates. Clarified certificate revocation time and process between SSL/TLS and S/MIME certificates.	29 March 2018
3.4	Updated Visa PKI Hierarchies diagram.	31 May 2018
3.5	Updated the domain validation methods.	1 August 2018
3.6	Updated section 3.1.1, 3.2.2.4.12, 3.2.4.13Added section 4.2.4 Certificate Authority (CAA)Updated section 4.6.3, 4.9.3, 5.2.1, 5.5.2, 6.1.2, 7.1.4.2.1	21 March 2019
3.7	Updated section 1.1, 4.9.1, 6.1.5	20 May 2019
3.8	Updated section 3.2.2, 4.9.10, 7.1, formatting and cleanup	25 August 2020

Version	Details	Date
3.9	Change certificate profiles, updated OIDs, change retention period from 7 to 2 years, updated to CAB 1.7.3, removed corporate CA hierarchy, added public ECC, added public RSA, removed LDAP. Updated the following sections 1.1, 1.2, 2.1, 3.2, 4.6, 4.9, 4.10, 5.4, 5.5, 5.8, 6.1, 6.3, 6.7, 7.1	15 April 2021
4.0	Changed from Word to MD. Updated to include changes from BR 1.7.4, 1.7.5, 1.7.6, 1.7.7, 1.7.8, 1.7.9, 1.8.0	26 January 2022
4.1	Updated to include changes from BR 1.8.1, 1.8.2, 1.8.3, 1.8.4. Removed references to Visa eCommerce Root and Issuing CAs which has expired.	30 January 2023
4.2	Updated to include changes from BR 1.8.5, 1.8.6, 1.8.7, 2.0.0, 2.0.1. Visa TLS Root CA added. Inclusion of domain validated certificates	01 March 2024

1.2.2. Relevant Dates

Refer to CA/Browser Forum's latest Baseline Requirement document for relevant dates.

1.3. PKI Participants

The Visa CP governs the Visa PKIs and Subscribers that are issued certifications by a CA. Visa does not have delegated third-parties.

1.3.1. Certification Authorities

Certificate Authorities' functions are performed by PKI administrators. CAs sign public certificates that bind Subscribers to their private keys operating within the Visa PKIs and are responsible for:

- Creating and signing certificates binding Subscribers CAs. For more information, refer to ”Subscribers”.
- Publishing certificate status through CRLs or Online Certificate Status Protocol (OCSP), if supported by Relying Parties. For more information, refer to ”Relying Parties”.
- Requiring adherence to the Visa CP.
- Creating, storing, and recovering End-Entity confidential key pairs, if required.

A CA may have other duties delegated by the CRF. A CA PKI administrator may perform duties on more than one CA. A CA PKI administrator must be an employee of Visa.

1.3.2. Registration Authorities

Registration Authorities' (RAs) functions are performed by Vettors and are approved by a CA.

RAs are responsible for:

- Establishing enrollment procedures and processing certificate requests.
- Ensuring that certificate request has been transferred to/from the originator in a secured manner.
- Identification and authentication of certificate applicants.
- Verifying that the party submitting the certificate request is:
- Who they claim to be
- Is authorized to submit the request on behalf of the certificate request originator
- Has a valid business relationship with Visa consistent with the certificate request
- Initiating or passing along revocation or certificate status change requests.
- Verifying that certificate revocation requests are from people whose identity is verified and that they are authorized to submit the revocation request.
- Approving applications for issue, revocation, or reissue of certificates.

An RA may have other duties delegated by the CA or the CRF. An RA may perform duties on more than one CA. RA staff must be a Visa employee or contractor.

1.3.3. Subscribers

A Subscriber is a person, device or application that is issued a digital certificate.

The certificate binds a public/private key pair to a single Subscriber. For a device or application, the person authorized by the organization may also be referred to as the Subscriber. Subscribers must have a valid business relationship and must be contractually bound to comply with the Visa By-Laws, Operating Regulations, and policies.

There are two categories of Subscribers:

End-Entity Subscribers are individuals or organizations that obtain certificates for use with Visa products and services. End-Entity Subscribers have certificates that must only be used for authentication, confidentiality, or message integrity. An End-Entity Subscriber's eligibility is at the discretion of the Issuing CA and should be consistent with Visa's overall policies. End-Entity Subscribers include:

- Individuals (that is, employees or contractors of Visa, Visa clients or their agents)
- Devices or applications (for example, servers or client software) used

CA Subscribers may sign other certificates or CRLs and may administer any number of CA Subscribers. These Subscriber's certificates may be used for authentication, confidentiality, or message integrity. CA Subscribers include:

- Intermediate CAs who must only issue and sign certificates to Issuing CAs
- Issuing CAs who must only issue and sign End-Entity certificates

1.3.4. Relying Parties

Relying Parties (RPs) are persons or entities that trust a digital certificate. RPs must have a valid business relationship and be contractually bound to comply with the Visa By-Laws, Operating Regulations, and policies.

1.3.5. Other Participants

No stipulations.

1.4. Certificate Usage

Certificate usage implies the certificate's full life-cycle, including the issuance, usage, suspension, revocation, and expiration of digital certificates.

1.4.1. Appropriate Certificate Uses

Digital certificates may be used for integrity and authenticity of business transactions and used for encryption of information.

1.4.2. Prohibited Certificate Uses

Other uses of digital certificates, unless specified in ”Appropriate Certificate Uses”, are prohibited.

1.5. Policy Administration

Visa CRF is the administrative authority of the Visa CP.

1.5.1. Organization Administering the Document

The Visa CRF is the authority for reviewing and approving changes to this Visa CP. Proposed changes or comments must be directed to the CRF contact as shown below. Decisions to proposed changes are at the sole discretion of the CRF.

1.5.2. Contact Person

Chairman, Visa Cryptographic Review Forum
Mailstop: M2-10910
800 Metro Center Blvd
Foster City, CA 94404-2775
PKIPolicy@visa.com

1.5.3. Person Determining CPS Suitability for the Policy

Visa CRF approves the Visa CPS which is subordinate to the Visa CP.

1.5.4. CPS Approval Procedures

The Visa CRF reviews any modifications, additions, or deletions to the Visa's CP/CPS and determines if these changes are acceptable. At its sole discretion, the Visa CRF must approve or reject any proposed changes to the Visa CPS.

1.6. Definitions and Acronyms

1.6.1. Definitions

Access control: The granting or denial of use or entry. Specifically, allowing or denying access to some component of the PKI such as, key component, CA system, or CA facility.

Activation Data: Data (other than the keys themselves) that are used and needed to activate a private key. For example, Personal Identification Number (PIN), password, or a portion of a key or other data used to enforce multi-person control over a private key.

Administrator: A trusted person within the organization of a region, client, or their designated agent (that is, third-party certificate service provider) that performs validation and other CA or Registration Authority (RA) functions.

Administrator Certificate: A certificate issued to an administrator that may only be used to perform CA or RA functions.

Authentication: The act of verifying identities. In the CAs, this would be validating an identity.

Authorization: The granting of permissions of use.

ANSI X9.30: U.S. financial industry standard for digital signatures based on the federal Digital Signature Algorithm (DSA). American National Standards Institute (ANSI) X9.30 requires the SHA1 hash algorithm.

Business process: A set of one or more linked procedures or activities which collectively realize a business objective or policy goal, generally within the context of an organizational structure defining functional roles and relationships.

Certificate: The public key of a user, together with related information, digitally signed with the private key of the CA that issued the certificate. The certificate format is in accordance with International Telecommunication Union (ITU)-T Recommendation X.509 or other Visa-accepted standard such as EMVCo. Typically, certificates are used to verify the identity of an individual, organization, device, or an application. They are also used to ensure message integrity through private key signature and enable confidentiality of data through public-key encryption.

Certificate Chain: An ordered list of certificates containing an End-Entity Subscriber certificate, the CA certificate that signed it, and all of the CA certificates up to the Root CA.

Certificate Authority: An authority trusted by one or more users to issue and manage X.509 certificates and Certificate Revocation Lists (CRLs). The CAs have certificates that allow them to sign other certificates and/or CRLs. Within the Visa PKI, CA Subscribers include:

- Root and Issuing CAs that may issue certificates to subordinate CAs and/or End- Entities within the PKI.
- Issuing CAs that may only issue End-Entity certificates.

Certificate Policy (CP): A named set of rules that indicates the applicability of a certificate to a particular community and/or class of applications with common security requirements. It is the principal statement of certificate policy governing the Visa PKI. The Visa CP is a high-level document that describes the requirements, terms and conditions, and policy for issuing, using, and managing certificates issued by a CA.

Certification Practice Statement (CPS): A statement of the practices that a CA uses in issuing certificates. It is a comprehensive description of such details as the precise implementation of service offerings and detailed procedures of certificate life-cycle management. It is more detailed than the certificate policies supported by the CA. The CPS illustrates how the CA satisfies the requirements included in the CP that governs it.

Certificate Revocation List (CRL): A periodically issued list, digitally signed by the Issuing CA, of certificates issued by that CA that have been revoked or suspended prior to their expiration dates. The list generally indicates the CRL issuer's name, the date of issue, the date of the next scheduled CRL issue, the revoked certificates' serial numbers, and the specific times and reasons for revocation. CRLs are used to check the status of certificates. They might be published on a repository or through an Online Certificate Status Protocol (OCSP) responder.

Certificate Systems: The system used by a CA or Delegated Third-Party in providing identity verification, registration and enrollment, certificate approval, issuance, validity status, support, and other PKI-related services.

Confidential: Information that has an identifiable value associated with it such that if disclosed, might cause damage to an entity.

Cross-Certification: The process describing the establishment of trust between two or more CAs. It usually involves the exchange and signing of CA certificates between two CAs in different PKI hierarchies and involves the verification of assurance levels.

Delegated Third Party: A natural person or legal entity that is not the Visa CA and that operates any part of a Certificate System.

Digital Signature: The result of the transformation of a message by means of a cryptographic system using keys such that a person who has the initial message can determine that the key that corresponds to the signer's key created the transformation and that the message was not altered.

Distinguished Name: A Distinguished Name (DN) is used in a certificate to identify a certificate owner (Subscriber) or a certificate issuer (Certificate Authority). The Issuer and Subject DNs in a certificate are formed from a combination of the following possible attributes (also referred to as relative DNs):

- Common Name(cn)
- Country(c)
- Organization name(on)
- Organizational unit name(ou)
- Locality(l)
- State or Province(st)
- Email Address(e)
- UserID
- Domain component(dc)

No two certificates issued by a particular Certificate Authority (CA) can have the same DN. Examples of DNs include:

cn=Road Runner, ou=bird, on=mammal, c=US ou=bird, dc=carton, dc=com

Every entry in an X.500 or in a Lightweight Directory Access Protocol (LDAP) directory has a DN. It is a unique entry identifier throughout the complete directory. No two entries within the same directory can have the same DN.

Dual Control: A process using two or more separate entities (usually persons), operating in concert, to protect sensitive functions or information, whereby no single entity is able to access or utilize the materials, for example, cryptographic key.

ECC: Is an approach to public-key cryptography based on the algebraic structure of elliptic curves over finite fields.

Email Certificates: Certificates used for encrypting and verifying digital signatures. Generally, there are two separate certificates: one for encryption and one for signature verification.

EMVCo: EMVCo manages, maintains, and enhances the EMV® Integrated Circuit Card Specifications for chip-based payment cards and acceptance devices, including point-of-sale (POS) terminals and ATMs. EMVCo also establishes and administers testing and approval processes to evaluate compliance with the EMV Specifications. EMVCo is currently owned by American Express, JCB, MasterCard, and Visa.

End-Entity Subscriber: End-Entity Subscribers have certificates that can only be used for authentication, confidentiality, or message integrity. End-Entity Subscribers cannot themselves issue certificates (that is, they are not CAs). End-Entity Subscribers include:

- Individuals associated directly with, or through, the agents of the Issuing CA, a business group or client (that is, cardholders, merchants, and employees).
- Organizations (that is, Visa Business Groups, clients or their agents or merchants).
- Devices or applications (for example, servers, client software) to be used by the Issuing CA, business group, or its agent in conjunction with the delivery of a Visa product or service.
- Visa personnel-issued certificates for the purpose of administering a CA.

Entity: Any autonomous element or component within the PKI that participates in one form or another, such as managing or using certificates. An Entity can be a CA, RA, Subscriber, Relying Party (RP), and so on.

Failover: The capability to switch from a faulty primary server to a backup server either manually or automatically.

FIPS 140-2: Federal Information Processing Standard 140-2 (FIPS 140-2) is a standard that describes US Federal government requirements that information technology (IT) products should meet for Sensitive, but Unclassified (SBU) use. The standard published by the National Institute of Standards and Technology (NIST), has been adopted by the Canadian Government's Communication Security Establishment (CSE), and might be adopted by the financial community through the American National Standards Institute (ANSI). The different levels (1 to 4) within the standard providing different levels of security, and in the higher levels, have different documentation requirements.

FIPS 140-3: Federal Information Processing Standard 140-3 (FIPS 140-3) is a standard that describes US Federal government requirements that information technology (IT) products should meet for Sensitive, but Unclassified (SBU) use. FIPS 140-3 Security Requirements for Cryptographic Modules supercedes FIPS 140-2.

FIPS 180-4: Standard specifying the Secure Hash Algorithm for SHA-1, SHA-224, SHA-256, SHA-384, SHA-512, SHA-512/224 and SHA-512/256 for computing a condensed representation of a message or a data file.

Integrity: It ensures consistency of an object or information. Within security systems, integrity is the principle of ensuring that a piece of data has not been modified, maliciously or accidentally.

Issuer Public Key: Issuer Public Key (IPK) is a Visa Smart Debit/Credit (VSDC) PKI-generated digital certificate.

Key: When used in the context of cryptography, it is a value (which may be secret), a sequence of characters that is used to encrypt and decrypt data. A key is a unique, generated electronic string of bits used for encrypting, decrypting, creating digital signatures, or validating digital signatures.

Key Pair: Often referred to as a public/private key pair. One key is used for encrypting (or digitally signing) and the other key is used for decrypting (or signature validation). Although related, the keys are sufficiently different that knowing one does not allow derivation or computation of the other. This means that one key can be made publicly available without reducing security, provided the other key remains private.

Non-repudiation: Protection against the denial of the transaction or service or activity occurrence.

Online Certificate Status Protocol: Online Certificate Status Protocol (OCSP) is a protocol developed by the Internet Engineering Task Force (IETF) (Request for Comment [RFC] 2560) to allow a Relying Party to obtain

more timely information regarding the revocation status of a certificate than is possible with CRLs.

Object Identifier: The unique alphanumeric identifier registered under the International Standards Organization (ISO) registration standard to reference a standard object or class.

Intermediate Certificate Authority: An Intermediate CA directly subordinate to a Root CA which has subordinate Issuing CAs.

Issuing Certificate Authority: Within the Visa PKI, Issuing CAs are the lowest level of the hierarchy, and only issue End- Entity certificates. They are subordinate to the Intermediate CAs and to the Root CAs.

PKCS #1: Standard that provides recommendations for the implementation of public-key cryptography based on the Rivest, Shamir, Adelman (RSA) algorithm, covering the following aspects, such as:

- Cryptographic primitives
- Encryption schemes
- Signature schemes

PKCS #7: A cryptographic message format or syntax managed and edited by RSA Laboratories. A standard describing general syntax for data that may have cryptography applied to it, such as digital signatures and digital envelopes. This format is frequently used by CAs to transmit a certificate to the requesting Subscriber.

PKCS #10: A certificate request format or syntax managed and edited by RSA Laboratories. It is a standard describing syntax for a request for certification of a public key, a name, and possibly a set of attributes.

PKIX: The Public Key Infrastructure (X.509) or PKIX is an Internet Engineering Task Force (IETF) Working Group established with the intent of developing Internet standards needed to support an X.509-based PKI. The scope of PKIX extends to also developing new standards for use of X.509-based PKI in the Internet.

Public Key Infrastructure Personnel: PKI personnel are generally employees associated with the operation, administration, and management of a CA or RA.

Policy: The set of laws, rules, and practices that regulates how an organization manages its business. Specifically, security policy would be the set of laws, rules, and practices that regulates how an organization manages, protects, and distributes sensitive information.

PrintableString: String format for representing names, such as Common Name (CN), in X.509 certificates. The encoding of a value in this syntax is the string value itself. PrintableString characters include: A-Z, a-z, 0-9, space '( ) + , - . / : = ?.

Private Key: The private key is one of the keys in a public/private key pair. This is the key that is kept secret as opposed to the other key that is publicly available. Private keys are used for digitally signing documents, uniquely authenticating an individual, or decrypting data that was encrypted with the corresponding public key.

Public Key Infrastructure: A set of policies, procedures, technology, audit, and control mechanisms used for the purpose of managing certificates and keys.

Public: A security classification for information that, if disclosed, would not result in any personal damage or financial loss.

Public Key: The community verification key for digital signature and the community encryption key for encrypting information to a specific End-Entity.

Registration Authority: An entity that performs registration services on behalf of a CA. Registration Authorities (RAs) work with a particular CA to vet requests for certificates that will then be issued by theCA.

Re-Key: The process of replacing the key(s). The expiration of the crypto period involves the replacement of the public key in the certificate and, therefore, the generation of a new key pair and associated certificate request.

Relative Distinguished Name: A Distinguished Name (DN) is made up of a sequence of Relative Distinguished Names (RDNs). The sequences of RDNs are separated by commas (,) or semicolons (;). There can be more than one identical RDN in a directory, but they must be in different bases, or branches, of the directory. Example of a DN is "cn=Road Runner, ou=bird, on=mammal, and c=US".

RDNs would be:

RDN => cn=Road Runner RDN => ou=bird

RDN => on=mammal RDN => c=US

Relying Party: A person or entity that is authorized to act in reliance upon a certificate issued within the Visa PKI, including by means of devices under their control. The RPs within the Visa PKI must have a valid business relationship with Visa and be contractually bound to comply with the Visa By-Laws, Operating Regulations, and policies.

Relying Party Agreement: A Relying Party (RP) Agreement is entered into by a party wishing to rely on a certificate and the information contained in it. An RP Agreement governs the terms and conditions under which the RP is permitted to rely upon the certificate. Most commonly, the agreement requires the RP to check the status of the certificates in the chain of certificates upon which the RP wishes to rely. For Visa products and services, RP Agreements are typically contained within the applicable Visa product or service participation agreement.

Repository: A place or container where objects are stored. A data repository is a technology where data is stored logically. In PKI terms, a repository accepts certificates and CRLs from one or more CAs and makes them available to entities that need them for implementing security services.

Revocation: In PKI, revocation is the action associated with revoking a certificate. Revoking a certificate is to make the certificate invalid before its normal expiration. The CA that issued the certificate is the entity that revokes a certificate. The revoked status is usually published on a CRL and/or posted on an Online Certificate Status Protocol (OCSP) responder.

RSA: A public-key cryptographic algorithm invented by Rivest, Shamir, and Adelman.

Sanitization: The process of removing data from storage media such that there is reasonable assurance that the data cannot be retrieved and reconstructed. See National Institute of Standards and Technology (NIST) Special Publication SP800-88.

Sensitive: Used to describe the security classification of information where the information, if disclosed, would result in serious financial loss, serious loss in confidence, or could result in personal harm or death. This is equivalent to the Visa Confidential classification.

Signature Verification Certificate: Often referred to as simply a Signature Certificate. It is the certificate containing the public key used to verify a digital signature that was signed by the corresponding private key.

Split Knowledge: A condition under which two or more parties, separately and confidentially, have custody of components of a single key that, individually, conveys no knowledge of the resulting cryptographic key. The resulting key exists only within secure cryptographic devices.

SSL/TLS Client Certificate: Certificate used to verify the authentication of an End-Entity to a server when a connection is being established through a Secure Socket Layer/Transport Layer Security (SSL/TLS) session (secure channel).

SSL/TLS Server Certificate: Certificate used to verify the authentication of a web or application server to the End- Entity (client) when a connection is being established through a Secure Socket Layer/Transport Layer Security (SSL/TLS) session (secure channel).

Subscriber: A Subscriber is an entity; a person, device, or application that is a holder of a private key corresponding to a public key, and has been issued a certificate. In the certificate of a device, a person authorized by the organization owning the device may be referred to as the Subscriber. A Subscriber is capable of using, and is authorized to use, the private key that corresponds to the public key listed in the certificate. There are two categories of Subscribers: End-Entities and CAs.

Subscriber Agreement: A Subscriber Agreement is an agreement entered into by a Subscriber obtaining a certificate that will contain the terms and conditions of the use of the Subscriber's certificate and private key corresponding to the public key contained in the certificate. For Visa products and services, Subscriber agreements are typically contained within the applicable Visa product or service participation agreement.

Suspension: In PKI, revocation is the action associated with suspending a certificate. Suspending a certificate makes the certificate invalid for a period of time while a condition that might result in revocation is investigated. During the suspension period, the suspended certificate will be listed on the Issuing CAs CRLs as 'on hold' and treated by RPs as revoked. At the end of the suspension period, the certificate will be reinstated or revoked. The

CA that issued the certificate is the entity that suspends a certificate. The suspended status is usually published on a CRL and/or posted on an Online Certificate Status Protocol (OCSP) responder. Suspending a certificate can potentially avoid an unnecessary or unwarranted revocation.

System: One or more pieces of equipment or software that stores, transforms, or communicates data.

Threat: A danger to an asset in terms of that asset's confidentiality, integrity, availability, or legitimate use.

Uniform Resource Indicator: Uniform Resource Indicator (URI) refers to an address on the Internet. The most common version of URI is the Uniform Resource Locator(URL).

User Notice Qualifier: A User Notice Qualifier in an X.509 certificate intended for display to an RP when the certificate is used.

UTF-8String: Unicode Transformation Format (8-bit) UTF-8 is a type of Unicode, which is a character set supported across many commonly used software applications and operating systems. UTF (8 bit) UTF-8 is a multi-byte encoding in which each character can be encoded in as little as one byte and as many as four bytes. Most Western European languages require less than two bytes per character. Greek, Arabic, Hebrew, and Russian require an average of 1.7 bytes. Japanese, Korean, and Chinese typically require three bytes per character. Such Unicode is important to ensure that universal characters/foreign characters are supported. After 31st December, 2003, all certificates were required to use UTF8String encoding for subject names.

Vettor: A person who verifies the information provided by a person applying for a certificate.

Visa Certificate Authority: Visa Certificate Authority (CA) is comprised of the Root CA and the Issuing CAs, subordinate to the Root CA that are at the top of the Visa PKI. The Root CA is an offline CA that only issues certificates to Intermediate CAs. The Intermediate CAs may be either offline or online and issue certificates to the following Subscribers:

- End-Entities (that is, individuals associated directly with, or through, the agents of the Visa Regional Business Units, clients, or their agents)
- CAs (Regional Business Units or clients only)

Visa Public Key Infrastructure: This is an X.509 Public Key Infrastructure (PKI) implemented by Visa for issuing and managing digital certificates to be used in conjunction with Visa products and services. This PKI consists of a hierarchy of entities called CAs that issue certificates to Subscribers (that is, End-Entities or other CAs) within the hierarchy. The term Visa PKI is used to refer to all of the Subscribers from the Root CA all the way down to the lowest level End-Entity.

Visa Products and Services: Visa programs that are associated with the Visa-Owned Mark. These include both the products and the underlying services operated by Visa or its agents that are used to support these products.

Visa Smart Debit/Credit: Visa's chip-based payment program.

Vulnerability: Weaknesses in a safeguard or the absence of a safeguard.

X.500: Specification of the directory service required to initially support X.400 email but also commonly used by other applications.

X.501 PrintableString: String format for representing names, such as Common Name (CN), in X.509 certificates. The encoding of a value in this syntax is the string value itself; an arbitrary string of printable characters. The characters included in this set include:

A,B,…,Z

a,b,…,z

0,1,…,9

(space) ' ( ) + , - . / : = ?.

X.509: An International Organization for Standardization (ISO) standard that describes the basic format for digital certificates.

1.6.2. Acronyms

Acronym	Spelled Out Form
BIN	Bank Identification Number used for VSDC PKI processing
BRP	Business Recovery Plan
Business Group	Visa designation for distributed business locations
CA	Certificate Authority
Client	A financial institution, processor, or acquirer that has a service agreement with Visa
CP	Certificate Policy
CPS	Certification Practice Statement
CRF	Cryptographic Review Forum
CRL	Certificate Revocation List
DN	Distinguished Name
DSA	Digital Signature Algorithm
EAS Application	Extended Access Server application
EAL	Evaluation Assurance Level
ECC	Elliptic curve cryptography
EMV	EuroPay, MasterCard, Visa chip card specification
FIPS	Federal Information Processing Standard
GIS	Global Information Security
GIS Reviewer	The Business Group GIS staff member who performs the annual validation review
HSM	Host Security Module
HTTP	Hypertext Transfer Protocol
IETF	Internet Engineering Task Force
Information Delivery	Visa's Online PKI certificate authorities VICA1 and VICA2 have been deprecated and succeeded by Internal Issuing CA (VICA3) and External Issuing CA (VICA4) respectively
IPK	Visa Smart Debit/Credit formatted Issuer Public Key certificate
ITU	International Telecommunications Union
LDAP	Lightweight Directory Access Protocol
OCSP	Online Certificate Status Protocol
PIN	Personal Identification Number
PKCS	Public-Key Cryptography Standards
PKI	Public Key Infrastructure
PKIX	Public Key Infrastructure Extensions
RA	Registration Authority
RA Manager	Business Group PKI management support personnel
Requester	An authorized member of an approved Visa client, processor, or acquirer who may request a certificate
Reviewer	See GIS Reviewer
Reviewer Checklist	List used by the GIS Reviewer to complete the annual Validation review
RFC	Request for Comment
RSA	Rivest, Shamir, Adleman
S/MIME	Secure Multipurpose Internet Mail Extension
SHA	Secure Hash Algorithm
Smart Card	Electronic identity and authorization card used by Information Delivery Vettors to access and approve certificate requests
SSL/TLS	Secure Sockets Layer/Transport Layer Security
Subscriber	See Requester
Tracking Number	A Business Group number system used to track submitted certificates for the VSDC PKI request process
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
Vettor	Visa employee or contractor who processes a certificate request
Vettor Agreement Statement	Annual form signed by the Vettor attesting to his/her responsibilities as a Vettor

Acronym	Spelled Out Form
VICA3	Information Delivery PKI Internet-Facing PKI Certificate Authority
VICA4	Information Delivery PKI Internal Server PKI Certificate Authority
VOL Application	Visa Online access application
VSDC	Visa Smart Debit/Credit
VSDC PKI	Visa Smart Debit/Credit Online PKI

1.6.3. References

- National Institute of Technology (NIST) Special Publication SP800-88.
- Internet Engineering Task Force (IETF) Public Key Infrastructure Extensions (PKIXs) Internet X.509 PKI Certificate Policy and Certification Practice Statement Framework (also known as RFC3647).
- CA/Browser Forum Baseline Requirements for the Issuance and Management of Publicly-Trusted Certificates.

1.6.4. Conventions

The document conventions used in this guide are shown in the following table.

Table 1–1: Document Conventions

Document Convention	Purpose In This Guide
Bold	Used for:
Italics	Used for:
NOTE:	Gives more information about the preceding topic.
IMPORTANT	Highlights important information in the text.
EXAMPLE	Helps to support or explain a general statement.
n/a	Stands for *not applicable*. Also used to indicate that there is not any information.
Courier typeface	Used for email addresses and for URLs.
Letter Gothic	Used to recreate screen captures and sample report layouts.
”text in quote marks”	Used to refer to section names in a chapter.

2. PUBLICATION AND REPOSITORY RESPONSIBILITIES

2.1. Repositories

- ☒ Visa Information Delivery Root, Intermediates, and Issuing Certificate Authorities (CAs)
- ☐ Visa Smart Debit/Credit (VSDC) Certificate Authorities (CAs)
- ☒ Visa Public ECC Root CA and Issuing Certificate Authorities (CAs)
- ☒ Visa Public RSA Root CA and Issuing Certificate Authorities (CAs)
- ☒ Visa TLS Root CA and Issuing Certificate Authorities (CAs)

An electronic copy of the Visa Certificate Policy (CP) is to be made available on a 24x7 basis at http://visa.com/pki or by emailing a request for an electronic copy to the Chairman of the Visa Cryptographic Review Forum (CRF), as described in Chapter 1, INTRODUCTION.

A Certificate Authority (CA) must have at least one certificate repository, and one certificate status repository. A repository may or may not be on the same hosting system as the CA, and either certificates or Certificate Revocation Lists (CRLs) may be published to a remote repository or an Online Certificate Status Protocol (OCSP) responder. CRLs must be published to a Visa website.

2.2. Publication of Information

- ☒ Visa Information Delivery Root, Intermediates, and Issuing Certificate Authorities (CAs)
- ☐ Visa Smart Debit/Credit (VSDC) Certificate Authorities (CAs)
- ☒ Visa Public ECC Root CA and Issuing Certificate Authorities (CAs)
- ☒ Visa Public RSA Root CA and Issuing Certificate Authorities (CAs)
- ☒ Visa TLS Root CA and Issuing Certificate Authorities (CAs)

The Distribution Point (DP) field within each digital certificate identifies the publicly accessible location where the certificate status information is published in accordance with ”Confidentiality of Business Information” and ”Privacy of Personal Information”.

Online Certificate Status Protocol (OCSP) responders and the CRL publication must be in accordance with Chapter 4, CERTIFICATE LIFE-CYCLE OPERATIONAL REQUIREMENTS.

A CA must publish certificate status information as specified by the Visa CPS.

With the exception of the Visa CP, Visa may withhold the security controls and procedures related to the CA.

2.3. Time or Frequency of Publication

Visa must annually review and update the CP for required compliance changes. Any changes to the CP must be submitted to the CRF for approval as described in ”Policy Administration”.

Certificate information must be distributed and/or published after issuance as specified in the Visa CPS. The Visa CP is published in accordance with ”Amendments”.

Subscriber Agreements or Relying Party Agreements, if applicable, are published as required.

2.4. Access Controls on Repositories

- ☒ Visa Information Delivery Root, Intermediates, and Issuing Certificate Authorities (CAs)
- ☐ Visa Smart Debit/Credit (VSDC) Certificate Authorities (CAs)
- ☒ Visa Public ECC Root CA and Issuing Certificate Authorities (CAs)
- ☒ Visa Public RSA Root CA and Issuing Certificate Authorities (CAs)
- ☒ Visa TLS Root CA and Issuing Certificate Authorities (CAs)

RPs may be given access to certificate status information such as CRLs or by OCSP.

Certificates status information must be distributed and/or published as defined in the Visa CPS and must be in accordance with ”CRL Issuance Frequency”.

3. IDENTIFICATION AND AUTHENTICATION

☒ Visa Information Delivery Root, Intermediates, and Issuing Certificate Authorities (CAs)
☐ Visa Smart Debit/Credit (VSDC) Certificate Authorities (CAs)
☒ Visa Public ECC Root CA and Issuing Certificate Authorities (CAs)
☒ Visa Public RSA Root CA and Issuing Certificate Authorities (CAs)
☒ Visa TLS Root CA and Issuing Certificate Authorities (CAs)

The certificate request must be submitted by a Subscriber on his own behalf or on the behalf of the Visa organization, device, or application that uses the certificate.

This chapter describes the requirements for authentication of the Subscriber.

3.1. Naming

3.1.1. Types of Names

Each certificate must have a name for the Subscriber in the certificate Distinguished Name (DN) field. The DN cannot be blank and must use printable characters.

Subscribers may be required to use other subject name fields or attributes including:

- Common Name (user or device name)
- User ID
- Email Address
- Organizational Unit
- Organization
- Locality
- State or Province
- Country

The Visa Certification Practice Statement (CPS) defines the DN requirements for Subscribers.

Distinguished Names Restrictions

The name by which a Subscriber is known to Visa, Visa regional business groups or Visa client must be used.

Subscribers cannot use fictitious names.

The Visa CPS may specify additional structure to the naming convention such as including a Visa business group or Visa client name.

Certificates that contain wildcard characters (”wildcard certificates”) may be signed with the following restrictions in accordance to Section 3.2.2.6, Wildcard Domain Validation: - The naming convention of *.;..com is used (for example,*.VOL.VISA.COM). - The application processes transactions at multiple geographic locations where ”application session stickiness” is required (for example, active/active at multiple data centers). - Not more than 30 servers or containers can use a single wildcard certificate. - Certificates that contain a domain name not owned by Visa (”foreign entity certificates”), for example, server_name.BankX.com, may be signed and requires signed written permission by an authorized officer from the company.

Restriction of Use of Domain Names, Email Addresses, and Registered Names - The use of a domain name is restricted to the legal owner of that domain name. - The use of an email address is restricted to the legal owner of that email address. - The use of a registered name is restricted to the legal owner of that registered name.

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

A certificate request must be a self-signed certificate (for example, Public Key Cryptographic Standard (PKCS #10) to demonstrate possession of a private key.

3.2.2. Authentication of Organization and Domain Identity

A Subscriber enrollment process must be made by a person authorized to act on behalf of the organization.

The enrollment process must include details about the Subscriber as requested by the Certificate Authorities (CAs). The details must be provided in a secure manner.

The CAs or Registration Authorities (RAs) must verify the identity of the Subscriber and the Visa business relationship. Records of the details used for the Subscriber's identification must be kept for at least two (2) years.

The CA SHALL confirm that, as of the date the Certificate issues, either the CA or a Delegated Third-Party has validated each Fully-Qualified Domain Name (FQDN) listed in the Certificate using at least one of the methods listed below.

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

The CA SHALL confirm that, as of the date of the certificate issuance, the CA has validated each Fully-Qualified Domain Name (FQDN) listed in the Certificate for non-Visa owned domains using **at least one** of the methods listed below.

FQDNs may be listed in Subscriber Certificates using dNSNames in the subjectAltName extension or in Subordinate CA Certificates via dNSNames in permittedSubtrees within the Name Constraints extension.

Visa does not issue certificate with ”onion” as the rightmost label.

3.2.2.4.1. Validating the Applicant as a Domain Contact This method is not used.

3.2.2.4.2. Email, Fax, SMS, or Postal Mail to Domain Contact The CA SHOULD confirm the Applicant's control over the FQDN by sending a Random Value through email, fax, SMS, or postal mail, and receive a confirming response utilizing the Random Value. The Random Value MUST be sent to an email address, fax or SMS number, or postal mail address identified as a Domain Contact.

3.2.2.4.3. Phone Contact with Domain Contact This method has been retired and MUST NOT be used.

3.2.2.4.4. Constructed Email to Domain Contact The CA SHOULD confirm the Applicant's control over the FQDN by

1. sending an email to one or more addresses created by using 'admin', 'administrator', 'webmaster', 'hostmaster', or 'postmaster' as the local part, followed by the at-sign ('@'), followed by an Authorization Domain Name,
2. including a Random Value in the email, and
3. receiving a confirming response utilizing the Random Value.

3.2.2.4.5. Domain Authorization Document This method is not used.

3.2.2.4.6. Agreed-Upon Change to Website This method has been retired and MUST NOT be used.

3.2.2.4.7. DNS Change The CA SHALL confirm the Applicant's control over the FQDN by confirming the presence of either a Random Value or Request Token in a DNS CNAME, TXT, or CAA record for (i) an Authorization Domain Name, or (ii) an Authorization Domain Name that is prefixed with a label that begins with an underscore character('_').

3.2.2.4.8. IP Address The CA SHALL confirm the Applicant's control over the FQDN by confirming that the Applicant controls an IP address returned from a DNS lookup for A or AAAA records for the FQDN in accordance with Section 3.2.2.5.

Note: Once the FQDN has been validated using this method, the CA MUST NOT issue Certificates for other FQDNs that end with all the labels of the validated FQDN unless the CA performs a separate validation for that FQDN using an authorized method. This method is NOT suitable for validating Wildcard Domain Names.

3.2.2.4.9. Test Certificate This method has been retired and MUST NOT be used. Prior validations using his method and validation data gathered according to this method SHALL NOT be used to issue certificates.

3.2.2.4.10. TLS Using a Random Number This method has been retired and MUST NOT be used.

3.2.2.4.11. Other Methods This method has been retired and MUST NOT be used.

3.2.2.4.12. Validating Applicant as a Domain Contact Confirming the Applicant's control over the FQDN by validating the Applicant is the Domain Contact. This method may only be used if the CA is also the Domain Name Registrar, or an Affiliate of the Registrar, of the Base Domain Name.

Note: Once the FQDN has been validated using this method, the CA MAY also issue Certificates for other FQDNs that end with all the labels of the validated FQDN. This method is suitable for validating Wildcard Domain Names.

3.2.2.4.13. Email to DNS CAA Contact Confirming the Applicant's control over the FQDN by sending a Random Value via email and then receiving a confirming response utilizing the Random Value. The Random Value MUST be sent to a DNS CAA Email Contact.

Each email MAY confirm control of multiple FQDNs, provided that each email address is a DNS CAA Email Contact for each Authorization Domain Name being validated. The same email MAY be sent to multiple recipients as long as all recipients are DNS CAA Email Contacts for each Authorization Domain Name being validated.

The Random Value SHALL be unique in each email. The email MAY be re-sent in its entirety, including the re-use of the Random Value, provided that its entire contents and recipient(s) SHALL remain unchanged. The Random Value SHALL remain valid for use in a confirming response for no more than 30 days from its creation. The CPS MAY specify a shorter validity period for Random Values.

Note: Once the FQDN has been validated using this method, the CA MAY also issue Certificates for other FQDNs that end with all the labels of the validated FQDN. This method is suitable for validating Wildcard Domain Names.

3.2.2.4.14. Email to DNS TXT Contact Confirming the Applicant's control over the FQDN by sending a Random Value via email and then receiving a confirming response utilizing the Random Value. The Random Value MUST be sent to a DNS TXT Record Email Contact for the Authorization Domain Name selected to validate the FQDN.

Each email MAY confirm control of multiple FQDNs, provided that each email address is DNS TXT Record Email Contact for each Authorization Domain Name being validated. The same email MAY be sent to multiple recipients as long as all recipients are DNS TXT Record Email Contacts for each Authorization Domain Name being validated.

The Random Value SHALL be unique in each email. The email MAY be re-sent in its entirety, including the re-use of the Random Value, provided that its entire contents and recipient(s) SHALL remain unchanged. The Random Value SHALL remain valid for use in a confirming response for no more than 30 days from its creation. The CPS MAY specify a shorter validity period for Random Values.

Note: Once the FQDN has been validated using this method, the CA MAY also issue Certificates for other FQDNs that end with all the labels of the validated FQDN. This method is suitable for validating Wildcard Domain Names.

3.2.2.4.15. Phone Contact with Domain Contact Visa does not support this method.

3.2.2.4.16. Phone Contact with DNS TXT Record Phone Contact Visa does not support this method.

3.2.2.4.17. Phone Contact with DNS CAA Phone Contact Visa does not support this method.

3.2.2.4.18. Agreed-Upon Change to Website v2 Visa does not support this method.

3.2.2.4.19. Agreed-Upon Change to Website – ACME Visa does not support this method.

3.2.2.4.20. TLS Using ALPN Visa does not support this method.

3.2.2.5. Authentication for an IP Address

The CA or RA SHALL confirm for each IP Address listed in the certificate that, as of the date the Certificate was issued, the Applicant has control over the IP Address.

3.2.2.5.1. Agreed-Upon Change to Website Visa does not support this method.

3.2.2.5.2. Email, Fax, SMS, or Postal Mail to IP Address Contact The CA or RA SHALL confirm the Applicant's control over the IP Address by sending a Random Value via email, fax, SMS, or postal mail and then receiving a confirming response utilizing the Random Value. The Random Value MUST be sent to an email address, fax/SMS number, or postal mail address identified as an IP Address Contact.

3.2.2.5.3. Reverse Address Lookup The CA or RA SHALL confirm the Applicant's control over the IP Address by obtaining a Domain Name associated with the IP Address through a reverse-IP lookup on the IP Address and then verifying control over the FQDN using a method permitted under BR Section 3.2.2.4.

3.2.2.5.4. Any Other Method CA or RA SHALL NOT perform validations using this method after July 31, 2019. Completed validations using this method SHALL NOT be re-used for certificate issuance after July 31, 2019. Any certificate issued prior to August 1, 2019 containing an IP Address that was validated using any method that was permitted under the prior version of this section 3.2.2.5 MAY continue to be used without revalidation until such certificate naturally expires.

3.2.2.5.5. Phone Contact with IP Address Contact Visa does not support this method.

3.2.2.5.6. ACME "http-01" method for IP Addresses Visa does not support this method.

3.2.2.5.7. ACME "tls-alpn-01" method for IP Addresses Visa does not support this method.

3.2.2.6. Wildcard Domain Validation

Before issuing a Wildcard Certificate, the CA MUST establish that the wildcard character occurs in the first label position to the left of a "registry-controlled" label or "public suffix" (e.g. "*.com", "*.co.uk", see RFC 6454 Section 8.2 for further explanation).

If a wildcard would fall within the label immediately to the left of a registry-controlled† or public suffix, CAs MUST refuse issuance unless the applicant proves its rightful control of the entire Domain Namespace. (E.g. CAs MUST NOT issue "*.co.uk" or "*.local", but MAY issue "*.example.com" to Example Co.).

3.2.2.7. Data Source Accuracy

The CA or RA SHALL prior to using any data source evaluate the source for its reliability, accuracy, and resistance to alteration or falsification.

3.2.2.8. CAA Records

As part of the issuance process, the CA must check for a CAA record for each dNSName in the subjectAltName extension of the certificate to be issued, according to the procedure in RFC 8659, following the processing instructions set down in RFC 8659 for any records found. CAs are permitted to treat a record lookup failure as permission to issue if:

- the failure is outside the CA's infrastructure;
- the lookup has been retried at least once; and
- the domain's zone does not have a DNSSEC validation chain to the ICANN root.

CAs MUST document potential issuances that were prevented by a CAA record in sufficient detail to provide feedback to the CAB Forum on the circumstances, and SHOULD dispatch reports of such issuance requests to the contact(s) stipulated in the CAA iodef record(s), if present. CAs are not expected to support URL schemes in the iodef record other than mailto: or https:

3.2.3. Authentication of Individual Identity

Authorized individuals of Visa business groups, Visa clients, employees, or merchants may submit a request to become a Subscriber to a CA.

Individuals must only be End-Entity Subscribers. The Subscriber is responsible for:

- Generating a request that meets Visa Public Key Infrastructure (PKI) requirements as stated in this CP.
- Delivering an authenticated request to the RA in a secure manner (for example, Secure Multipurpose Internet Mail Extension (S/MIME) or equivalent protected file).

The RA has the responsibility, on behalf of a CA, for:

- Completing the verification and authorization requirements as stated in the Visa Vettor GuideTemplate.
- Verifying successful completion of the prerequisites that must be performed before the generation of the key pair and certificate request.
- Authenticating the entity submitting the request in accordance with the identification and authentication procedures specified for the type of certificate and/or for the Visa product or service with which the certificate is intended to be used.
- Verifying that the certificate request has been transferred from the Subscriber to the RA in a secure manner as defined by the Visa CPS.
- Processing the certificate request, along with the appropriate documentation, to the CA as defined by the Visa CPS.

The CA or RA must keep a record of the certificate processing documentation for at least two (2) years.

3.2.4. Non-Verified Subscriber Information

Non-verified subscriber information is any certificate information not validated through the requirements set forth in the Visa Vetting Guide Template.

3.2.5. Validation of Authority

Authorization to request a certificate is required to be an official appointment (for example, company/organization letter signed by an organizational authority).

Prior to using any data source as a Reliable Data Source, the Vettor SHALL evaluate the source for its reliability, accuracy, and resistance to alteration or falsification. The vettor SHOULD consider the following during its evaluation:

- The age of the information provided.
- The frequency of updates to the information source.
- The data provider and purpose of the data collection.
- The public accessibility of the data availability.
- The relative difficulty in falsifying or altering the data.

Databases maintained by the CA Vettor, do not qualify as a Reliable Data Source if the primary purpose of the database is to collect information for the purpose of fulfilling the validation requirements.

Authenticity of the Applicant Representative's certificate request is verified as stated in the Visa Vettor Guide Template.

3.2.6. Criteria for Interoperation or Certification

Cross certification within CAs or with external CAs is not supported. The Visa PKI hierarchy is a closed PKI.

3.3. Identification and Authentication for Re-Key Requests

Re-key of End-Entity certificates is not supported.

3.3.1. Identification and Authentication for Routine Re-key

Not applicable.

3.3.2. Identification and Authentication for Re-key After Revocation

Not applicable.

3.4. Identification and Authentication for Revocation Requests

CAs or RAs must authenticate a request for revocation of a certificate in the same manner as a certificate request.

The CAs or RAs must keep a record of the type and details of the revocation request, including the identity and authentication of the person making the request, for at least two (2) years effective on the publish date of Visa CP version 3.9.

4. CERTIFICATE LIFE-CYCLE OPERATIONAL REQUIREMENTS

4.1. Certificate Application

An application for a certificate does not oblige a Certificate Authority (CA) to issue a certificate.

Required Information for a Certificate Request Subscriber information must be complete, validated, and accurate with full disclosure of required information in connection with a certificate request.

Subscribers Agreement or Equivalent Documentation Subscribers registering for a Visa product or service using a Visa-issued certificate must be required to consent to a Subscribers Agreement or equivalent prior to certificate issuance.

4.1.1. Who Can Submit a Certificate Application

The following list of roles is authorized to submit certificate applications:

- An authorized representative of an Organization or entity that has a current business relationship with Visa, Inc.
- Any individual who is the subject of the certificate.
- Any authorized representative of an Organization or entity.
- Any authorized representative of a CA.
- Any authorized representative of a Registration Authority (RA).

4.1.2. Enrollment Process and Responsibilities

End-user Certificate Subscribers consent to the relevant Subscriber Agreement and complete the enrollment process by:

- Completing the relevant Certificate Application form with true and correct information, generating or arranging to have generated a key pair.
- Delivering an owned public key, directly or through an RA, to Visa CAs.
- Demonstrating possession and/or exclusive control of the private key corresponding to the public key delivered to Visa.

4.2. Certificate Application Processing

4.2.1. Performing Identification and Authentication Functions

A CA or an RA must perform identification and authentication procedures to validate a certificate request. Vettors perform identification and authentication of required Subscriber information as stated in “Initial Identity Validation”.

The CA MAY use the documents and data provided in Section 3.2 to verify certificate information, provided that the CA obtained the data or document from a source specified under Section 3.2 no more than 825 days prior to

issuing the Certificate. For the validation of Domain Names and IP Addresses according to Section 3.2 any reused data, document, or completed validation must be obtained no more than 398 days prior to issuing the Certificate.

4.2.2. Approval or Rejection of Certificate Applications

A CA or an RA must notify a Subscriber that the request has been rejected or accepted. If accepted, the CA must create a certificate and provide the Subscriber with access to the certificate.

CAs SHALL NOT issue Certificates containing Internal Names or Reserved IP Addresses (see Section 3.2.2.4 or Section 3.2.2.5.).

4.2.3. Time to Process Certificate Applications

The processing time for certificate requests is described in the Visa Certification Practice Statement (CPS).

4.2.4. Certificate Authority (CAA) record

Visa Certificate Authorities validates Certificate Authority (CAA) DNS Resource Records for server certificates FQDN in publicly trusted certificates as described in section 3.2.2.8. Visa CA's Issuer Domain Names recognized in ”issue” and ”issue wild” CAA record is ”VISA.COM”.

Visa MAY not check for CAA records:

- If Visa is the DNS (as defined in RFC 7719) of the domain's DNS
- CAA checking is optional for certificates issued by a Technically Constrained Subordinate CA Certificate as set out in Baseline Requirements section 7.1.5, where the lack of CAA checking is an explicit contractual provision in the contract with the Applicant.
- CAA checking is optional for certificates for which a Certificate Transparency pre-certificate was created and logged in at least two public logs, and for which CAA was checked.

VISA treats a record lookup failure as permission to issue if:

- The failure is outside the CA's infrastructure;
- The lookup has been retried at least once;
- and the domain's zone does not have a DNSSEC validation chain to the ICANN root

4.3. Certificate Issuance

4.3.1. CA Actions during Certificate Issuance

A certificate is created and issued following the approval of a certificate request by authorized individuals or following receipt of an RA's request to issue the Certificate. Certificates are issued based on the information in a certificate request, validation of the requestor and information provided, and approval of the certificate request.

4.3.2. Notification to Subscriber by the CA of Issuance of Certificate

Visa, either directly or through an RA, notifies the Subscribers that their certificates are available. Certificates are made available to end-user Subscribers, either by allowing them to download them from a web site or through a message containing the Certificate sent to the Subscriber.

4.4. Certificate Acceptance

4.4.1. Conduct Constituting Certificate Acceptance

By accepting and using the certificate, the Subscriber agrees to comply with the terms of any policies referenced within the Certificate Policies (CPs) field of the certificate.

4.4.2. Publication of the Certificate by the CA

A CA is responsible for repository and publication functions. A CA must publish certificates in a repository based on the certificate publishing practices defined in the Visa CPS.

4.4.3. Notification of Certificate Issuance by the CA to Other Entities

4.5. Key Pair and Certificate Usage

4.5.1. Subscriber Private Key and Certificate Usage

A CA must only use its private key to sign certificates and Certificate Revocation Lists (CRLs) for use with production implementations of Visa products and services. A CA must not transfer its private key from the platform on which it was generated to another platform except for business recovery or load balancing purposes, unless it obtains prior written permission from the Visa Cryptographic Review Forum (CRF). A CA must use commercially reasonable efforts to ensure that issued certificates and associated private and public key pairs are used only for functions to access and operate Visa products and services.

Private keys used by an RA for authentication in order to operate the RA applications must not be used for any other purpose.

The Subscriber must only use production certificates issued by an Issuing CA for access to Visa products and services. The certificates must not be used in a test environment unless a variance is obtained from the CRF and the appropriate CA prior to their use. A separate process is available for requesting test certificates.

Publisher Certificate and Usage

A publisher certificate is a certificate with code or document signing extensions. Publisher certificates private keys must be stored with a tamper-resistant security module, for example, smart card.

4.5.2. Relying Party Public Key and Certificate Usage

It is recommended that a Relying Party (RP) verify that a Subscriber's certificate is appropriate for the application prior to use.

Email Encryption and Signing Certificate and Usage

An email encryption certificate is a certificate with email encryption extensions. An email signing certificate is a certificate with email signing extensions. Only the Visa Corporate Email Issuing CA (VCEICA) shall sign email encryption and signing certificates and only for Visa Internal use. Individual email encryption and signing certificates private keys must be stored within *Visa Approved* Secure Storage.

4.6. Certificate Renewal

4.6.1. Circumstance for Certificate Renewal

Any procedures for the revocation and renewal of a certificate must conform to the relevant provisions of the Visa CP and the Visa CPS.

4.6.2. Who May Request Renewal

4.6.3. Processing Certificate Renewal Requests

4.6.4. Notification of New Certificate Issuance to Subscriber

4.6.5. Conduct Constituting Acceptance of a Renewal Certificate

4.6.6. Publication of the Renewal Certificate by the CA

4.6.7. Notification of Certificate Issuance by the CA to Other Entities

4.7. Certificate Re-Key

4.7.1. Circumstance for Re-Key

Re-key of End-Entity certificates is not supported. A new certificate request using a new key pair must be submitted prior to the expiration of a public/private key pair.

Any exception to this policy whereby an existing key pair is 'reused' to obtain another certificate for the same entity must be approved in writing by the Visa CRF. The approval may only apply to the specific instance for which it is requested.

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

Certificate modification is not supported.

4.8.1. Circumstance for Certificate Modification

No Stipulation.

4.8.2. Who May Request Certificate Modification

No Stipulation.

4.8.3. Processing Certificate Modification Requests

No Stipulation.

4.8.4. Notification of New Certificate Issuance to Subscriber

No Stipulation.

4.8.5. Conduct Constituting Acceptance of Modified Certificate

No Stipulation.

4.8.6. Publication of the Modified Certificate by the CA

No Stipulation.

4.8.7. Notification of Certificate Issuance by the CA to Other Entities

No Stipulation.

4.9. Certificate Revocation and Suspension

4.9.1. Circumstances for Revocation

A certificate must be revoked or otherwise invalidated under any of the following circumstances:

- When a Subscriber fails to comply with obligations set forth in the Visa Certificate Policy (CP) or this Visa CPS.
- When the basis for any information in the certificate changes.
- When a change in the business relationship under which the certificate was issued.
- When a Subscriber is no longer participating in the Visa product or service for which the certificate was issued.
- Upon suspected or known compromise of the private key or the media holding the key.
- Upon termination of a Subscriber.
- When the certificate has been issued to an ineligible Subscriber.
- When a Subscriber no longer needs access to Visa products or services

4.9.1.1. Reasons for Revoking a Subscriber Certificate

Refer to CPS for details.

4.9.1.2. Reasons for Revoking a Subordinate CA Certificate

Refer to CPS for details.

4.9.2. Who Can Request Revocation

The revocation of a certificate must only be requested by:

- The Subscriber to whom the certificate is issued. If requesting revocation, the Subscriber to whom the certificate is issued must notify the Business Group/Application Vettor.
- An authorized client or supervisor or manager on behalf of a Subscriber.
- An RA associated with the Issuing CA.
- The Issuing CA.

4.9.3. Procedure for Revocation Request

A Certificate Authority (CA) must make certificate revocation data available to Subscribers or RPs. The notice of revocation must be posted to a Certificate Revocation List (CRL) within the time limits stated in this Visa CPS. The address of the CRL must be defined in the certificate.

All requests for revocation must be submitted to the Certificate Authority (CA) or RA or vettors authorized to act on behalf of subscribers and Visa's clients.

The revocation request and any resulting actions taken by the Certificate Authority (CA) must be recorded and retained for a minimum of two (2) years.

Suspected Private Key compromise, fraud, or any matter related to certificate compromise or fraud must be reported to PKIPolicy@visa.com.

Visa responds to revocation requests and other requests on a 24x7 basis.

Subscribers must follow the Certificate Revocation procedures in the Visa Certificate Policy located at http://www.visa.com/pki.

Suspension of Certificates Pending Revocation Validation

The Certificate Authority (CA) or RA may, at its discretion, suspend a certificate immediately upon notification of a revocation request.

Revocation Processing Time frame

The CA must process a revocation request within the time period, as defined in the Visa CPS.

4.9.4. Revocation Request Grace Period

The revocation grace period is the maximum period available within which the Subscriber must make a revocation request upon suspicion of compromise. The grace period cannot extend beyond one (1) Visa business day for the relevant geographical location.

A CA reserves the right to not re-issue a certificate if the grace period was not respected (that is, negligence on behalf of the Subscriber).

4.9.5. Time Within Which Certificate Authority Must Process the Revocation Request

The period of time between the receipt of a request for certificate revocation and the beginning of the investigation process for a certificate problem or certificate revocation will be a maximum of 24 hours for the active issuing CA.

Revocation entries on a CRL or OCSP Response MUST NOT be removed until after the Expiry Date of the revoked Certificate.

S/MIME certificates are revoked upon due process through HR notification to the relevant parties.

4.9.6. Revocation Checking Requirement for Relying Parties

RPs should check the status of certificates in the certificate validation chain against current CRLs before their use, including the authenticity and integrity of CRLs. If the RP stores a copy of the CRL, they should retrieve a 'fresh' CRL at least daily.

Online Certificate Status Protocol (OCSP) responders are available on the URL: http://ocsp.visa.com/ocsp

4.9.7. CRL Issuance Frequency

A CA must issue CRLs with the most current certificate status of issued certificates. The CRL issuance frequency is specified in the Visa CPS.

4.9.8. Maximum Latency for CRLs

No stipulation.

4.9.9. Online Revocation/Status Checking Availability

OCSP responses MUST conform to RFC6960 and/or RFC5019. OCSP responses MUST either:

1. Be signed by the CA that issued the Certificates whose revocation status is being checked, or
2. Be signed by an OCSP Responder whose Certificate is signed by the CA that issued the Certificate whose revocation status is being checked.

In the second case, the OCSP signing the Certificate MUST contain an extension of type *id-pkix-ocsp-nocheck*, as defined by RFC6960.

Online revocation and other certificate status information are available 24x7 through a web-based repository and OCSP. OCSP certificate status information is also provided to those who contact the OCSP services to check certificate status. The URL for the relevant OCSP Responder is communicated in the certificate.

4.9.10. Online Revocation Checking Requirements

The following SHALL apply for communicating the status of Certificates which include an Authority Information Access extension with an id-ad-ocsp accessMethod.

A relying party should confirm the validity of a certificate in accordance with "Revocation Checking Requirement for Relying Parties" before relying on the certificate.

OCSP responders operated by the CA SHALL support the HTTP GET method as described in RFC 6960 and/or RFC 5019.

The validity interval of an OCSP response is the difference in time between the thisUpdate and nextUpdate field, inclusive. For purposes of computing differences, a difference of 3,600 seconds shall be equal to one hour, and a difference of 86,400 seconds shall be equal to one day, ignoring leap-seconds.

For the status of Subscriber Certificates:

1. OCSP responses MUST have a validity interval greater than or equal to eight hours;
2. OCSP responses MUST have a validity interval less than or equal to ten days;
3. For OCSP responses with validity intervals less than sixteen hours, then the CA SHALL update the information provided via an Online Certificate Status Protocol prior to one-half of the validity period before the nextUpdate.
4. For OCSP responses with validity intervals greater than or equal to sixteen hours, then the CA SHALL update the information provided via an Online Certificate Status Protocol at least eight hours prior to the nextUpdate, and no later than four days after the thisUpdate.

For the status of Subordinate CA Certificates:

- The CA SHALL update information provided through an Online Certificate Status Protocol at least (i) every twelve months and (ii) within 24 hours after revoking a Subordinate CA Certificate.

If the OCSP responder receives a request for the status of a certificate serial number that is "unused", then the responder SHOULD NOT respond with a "good" status. If the OCSP responder is for a CA that is not Technically Constrained in line with Section 7.1.2.3 or Section 7.1.2.5 the responder MUST NOT respond with a "good" status for such requests.

The CA SHOULD monitor the OCSP responder for requests for "unused" serial numbers as part of its security response procedures.

The OCSP responder MAY provide definitive responses about "reserved" certificate serial numbers, as if there was a corresponding Certificate that matches the Precertificate [RFC6962].

A certificate serial number within an OCSP request is one of the following three options:

1. "assigned" if a Certificate with that serial number has been issued by the Issuing CA, using any current or previous key associated with that CA subject: or
2. "reserved" if a Precertificate [RFC6962] with that serial number has been issued by (a) the Issuing CA: or (b) a Precertificate Signing Certificate [RFC6962] associated with the Issuing CA: or
3. "unused" if neither of the previous conditions are met.

4.9.11. Other Forms of Revocation Advertisements Available

Not applicable.

4.9.12. Special Requirements Related to Key Compromise

Visa makes reasonable efforts to notify potential RPs if it discovers or has a reason to believe that there has been a compromise of the private key.

4.9.13. Circumstances for Suspension

The Repository MUST NOT include entries that indicate that a Certificate is suspended.

A certificate may be suspended or revoked whenever any of the conditions listed in "Circumstance for Certificate Renewal" are suspected or known. A CA may, at its discretion, suspend a certificate rather than revoke it immediately, pending validation of the revocation request.

4.9.14. Who Can Request Suspension

The suspension of a certificate can only be requested by:

- The Subscriber to whom the certificate is issued. If requesting suspension, the Subscriber to whom the certificate is issued must notify the Business Group/Application Vettor.
- An authorized client or supervisor or manager on behalf of a Subscriber.
- An RA associated with the Issuing CA.

4.9.15. Procedure for Suspension Request

With respect to a certificate's suspension, the procedures and requirements are equivalent to those for revocation defined in "Procedure for Revocation Request" to "CRL Issuance Frequency".

4.9.16. Limits on Suspension Period

When a certificate is suspended pending verification of a revocation request, the suspension period must be appropriate to validate the revocation request. At the end of the suspension period, the CA must make a determination regarding whether the certificate will be reinstated, revoked, or the suspension period extended.

4.10. Certificate Status Services

4.10.1. Operational Characteristics

Certificate status information is available through CRL, and OCSP responder as described in "Revocation Checking Requirement for Relying Parties".

Revocation entries on a CRL or OCSP response MUST NOT be removed until after the expiry date of the revoked Certificate.

4.10.2. Service Availability

CRL and OCSP will provide a response time of ten seconds or less under normal operating circumstances.

The Certificate status service is available on a 24x7 basis.

4.10.3. Optional Features

OCSP is an optional status service feature that is not available for all certificate types and is specifically enabled for all SSL certificates.

4.11. End of Subscription

A Subscriber's subscription service ends if:

- Its certificate expires.
- Its certificate is revoked.
- The business relationship with Visa expires.
- The business relationship with Visa is terminated.

4.12. Key Escrow and Recovery

4.12.1. Key Escrow and Recovery Policy and Practices

The CA private key(s) must not be escrowed.

End-Entity Key Escrow and Recovery Policy and Practices SHALL be followed for S/MIME certificates

4.12.2. Session Key Encapsulation and Recovery Policy and Practices

Corporate End-Entity certificates for email encryption may be recovered by processes as defined in the Visa CPS. Any other End-Entity private key(s) must not be escrowed.

5. MANAGEMENT, OPERATIONAL, AND PHYSICAL CONTROLS

The CA SHALL develop, implement, and maintain a comprehensive security program designed to:

1. Protect the confidentiality, integrity, and availability of Certificate Data and Certificate Management Processes;
2. Protect against anticipated threats or hazards to the confidentiality, integrity, and availability of the Certificate Data and Certificate Management Processes;
3. Protect against unauthorized or unlawful access, use, disclosure, alteration, or destruction of any Certificate Data or Certificate Management Processes;
4. Protect against accidental loss or destruction of, or damage to, any Certificate Data or Certificate Management Processes; and
5. Comply with all other security requirements applicable to the CA by law.
6. The Certificate Management Process MUST include:
7. Physical security and environmental controls;
8. System integrity controls, including configuration management, integrity maintenance of trusted code, and malware detection/prevention;
9. Network security and firewall management, including port restrictions and IP address filtering;
10. User management, separate trusted-role assignments, education, awareness, and training; and logical access controls, activity logging, and inactivity time-outs to provide individual accountability.
11. The CA's security program MUST include an annual Risk Assessment that:
12. Identifies foreseeable internal and external threats that could result in unauthorized access, disclosure, misuse, alteration, or destruction of any Certificate Data or Certificate ManagementProcesses;
13. Assesses the likelihood and potential damage of these threats, taking into consideration the sensitivity of the Certificate Data and Certificate Management Processes; and
14. Assesses the sufficiency of the policies, procedures, information systems, technology, and other arrangements that the CA has in place to counter such threats.
15. Based on the Risk Assessment, the CA SHALL develop, implement, and maintain a security plan consisting of security procedures, measures, and products designed to achieve the objectives set forth above and to manage and control the risks identified during the Risk Assessment, commensurate with the sensitivity of the Certificate Data and Certificate Management Processes. The security plan MUST include administrative, organizational, technical, and physical safeguards appropriate to the sensitivity of the Certificate Data and Certificate Management Processes. The security plan MUST also take into account then-available technology and the cost of implementing the specific measures, and SHALL implement a reasonable level of security appropriate to the harm that might result from a breach of security and the nature of the data to be protected.

5.1. Physical Security Controls

The Certificate Authority (CA) facilities must provide the physical security controls as outlined in the Visa Certification Practice Statement (CPS).

5.1.1. Site Location and Construction

The following requirements and procedures must be implemented:

- The access control systems must:
  - Be inspected at least semi-annually by qualified personnel.
  - Have documentation retained for at least one (1) year.
- Access control and monitoring systems must be supported with an Uninterruptable Power Supply (UPS) system. The UPS system must:
  - Be inspected at least annually.
  - Have documentation retained for at least one (1) year.

5.1.2. Physical Access

The physical access controls are defined in the Visa CPS.

5.1.3. Power and Air Conditioning

The CA facility management must ensure that the power and air conditioning are sufficient to support the operation of the CA system.

5.1.4. Water Exposure

The CA facility management must ensure that water exposures, fire prevention and protection, and other environmental controls are sufficient to support the operation of the CA system.

5.1.5. Fire Prevention and Protection

The CA facility management must ensure that the fire prevention and protection are sufficient to support the operation of the CA system.

5.1.6. Media Storage

The PKI must ensure that the storage media used by a CA system is protected from environmental threats such as temperature, humidity, and magnetic activity.

5.1.7. Waste Disposal

A CA must ensure the destruction or sanitization of confidential media.

5.1.8. Off-site Backup

A CA must ensure that the business recovery site maintains a comparable level of security as the primary site.

5.2. Procedural Controls

5.2.1. Trusted Roles

A CA must require at least the separation of critical CA functions. The CA personnel must perform the following functions with separate knowledge and dual control:

- Generation of a new CA key pair.
- Replacement or renewal of a CA key pair.
- Change in the certificate profile security policy as approved by the Visa Change Management Process.

CA administrators must be individually accountable for their actions by a combination of the following physical, electronic, and policy controls:

- Restricted access to facility. Entry and exit must be controlled and monitored.
- Audit logs must record the following:
  - The administrator's activities of logging in and logging out of the operating system.
  - The administrator's activities of logging in and logging out of the CA application.
  - Certificate creation, issuance, suspension, revocation, and changes by the CA.

- Policy, procedural, and technical controls that require dual access.

Registration Authority Trusted Roles

The Visa CRF requires that the Registration Authority (RA) personnel understand their responsibility for the identification and authentication of prospective Subscribers and that they perform the following functions:

- Acceptance of certificate requests, certificate changes, certificate revocation requests, and key recovery requests (if applicable).
- Verification of a Subscriber's identity and authorizations.
- Secure transmission of applicant information to the issuing CA.
- Provide shared secrets, as required, for authenticating Subscribers.
- RA agents (vettors) issuing SSL/TLS (except-S/MIME) certificates must undergo annual compliance to affirm their knowledge and responsibilities.

5.2.2. Number of Individuals Required Per Task

The Visa Public Key Infrastructure (PKI) must implement the principle of split-knowledge and dual control for the following tasks:

- Generation of a new CA key pair.
- Signing of a root, intermediate, or issuing CA certificate.
- Replacement or renewal of a CA key pair.
- Change in the certificate profile security policy as approved by the Visa Change Management Process.
- Starting CA services.
- Activating a CA signing key.

The Visa PKI must have a verification process that provides an oversight of activities performed by privileged CA role holders.

The activities include issuing certificates, generating keys, and administering the CA configuration settings.

5.2.3. Identification and Authentication for Trusted Roles

CA personnel must have their identity and authorization verified before they are:

- Granted physical access to a CA facility.
- Given logical access to a CA system.
- Given a certificate for the performance of their CA operation's role. Each certificate:
  - Must be directly attributable to an individual.
  - Must not be shared.
  - Must be restricted to actions authorized for that role through the use of the CA software, operating system, and procedural controls.

5.2.4. Roles Requiring Separation of Duties

Roles requiring separation of duties include, but are not limited to:

- Key recovery requests.
- Generation, issuing, or destruction of a CA certificate.
- Loading of a CA to a Production environment.
- Performing duties related to CA key management or CA administration.

5.3. Personnel Controls

Personnel performing duties with respect to the operation of a CA (for example, PKI administrators, key custodians, and vettors) must:

- Be bound by the terms and conditions of the position they support.
- Not disclose sensitive CA information or Subscriber information.

- Regional Vettor personnel are required to validate their understanding of their job function through a signed Vettor Agreement form as defined in Appendix A of the Visa Certification Practice Statement (CPS).

5.3.1. Qualifications, Experience, and Clearance Requirements

A CA must require that personnel performing duties with respect to the operation of a CA have sufficient training, qualifications, and experience in PKI. CA personnel must also meet Visa personnel security requirements.

5.3.2. Background Check Procedures

Background checks must be performed on the CA operations personnel in accordance with Visa standard hiring practices and any relevant country legal restrictions.

5.3.3. Training Requirements and Procedures

The PKI must provide comprehensive training for PKI personnel performing duties with respect to the operation of a CA. Such training must include at least:

- Information Security and general PKI knowledge.
- CA administration and operation.
- CA business recovery processes.
- Applicable industry and government guidelines.
- Visa Security Compliance training.

The Visa CA maintains records of training and ensures that personnel entrusted with Validation Specialist duties maintain a skill level that enables them to perform the duties satisfactorily.

Validation Specialists engaged in Certificate issuance maintain skill levels consistent with the Visa CAs training and performance programs.

The Visa CA documents that each Validation Specialist possesses the skills required by a task before allowing the Validation Specialist to perform that task.

The Visa CA requires Validation Specialists to pass an examination, provided by the Visa CA, on the information verification requirements outlined in these requirements.

5.3.4. Retraining Frequency and Requirements

The requirements for training (see ”Training Requirements and Procedures”) must be kept current to accommodate changes in CA system software and procedures.

Refresher training must be conducted as required, and management must review these requirements periodically.

5.3.5. Job Rotation Frequency and Sequence

When there is job rotation, relevant service account passwords must be changed, and individual credentials must be deleted.

5.3.6. Sanctions for Unauthorized Actions

When there is an actual or suspected unauthorized action by a person performing duties with respect to the operation of a CA, that CA must immediately revoke the person's access to the CA system.

A CA may revoke a certificate when an entity fails to comply with obligations set out in this Visa Certificate Policy (CP) and the Visa CPS. A CA may suspend a certificate at any time if a CA suspects that conditions may lead to a compromise of keys or certificates.

5.3.7. Independent Contractor Controls

A CA must limit contractor access to the CA facility in accordance with the Visa CPS. Contractor personnel must be escorted while in the CA facilities.

5.3.8. Documentation Supplied to Personnel

Visa PKIs must provide access to this Visa CP and Visa CPS to Visa personnel performing duties with respect to the operation of a CA.

5.4. Audit Logging Procedures

5.4.1. Types of Events Recorded

A CA must record relevant events, successes, and failures related to the security of that CA system in audit log files. Whether electronic or manual, logs must include the date and time of the event and who or what entity (for example, application) caused the event.

A CA must indicate what information is logged in the Visa CPS. Certificate Authority Physical Security Logs CA physical access events must be recorded as follows:

- Automated mechanisms must exist for logging access.
- Access granting, revocation, and review procedures must be documented.
- Visitors (contractors, maintenance personnel, and so on) to the physically secure environments must be escorted and must sign an access logbook. This log must be maintained within the physically secure facility. This logbook must include:
  - Date and time in/out
  - Name and signature of visitor
  - Affiliation of visitor
  - Name and signature of individual escorting the visitor
  - Reason for visit
- Alarm events must be documented. Under no circumstances can an individual sign-off on an alarm event in which they were involved.
- The use of any emergency entry or exit mechanism must cause an alarm event. An assessment must occur within 24 hours to identify the effect (for example, loss of dual control by authorized individuals) of the use of this mechanism. This assessment must be documented and retained for at least one (1) year.
- A process must exist for synchronizing the time and date stamps of the access, intrusion detection, and monitoring (camera) systems to ensure accuracy of the logs. This may be done by either automated or manual mechanisms. If a non-continuous process is used, the process must occur at least quarterly. Documentation of the synchronization must be retained for at least one (1) year.

5.4.2. Frequency of Processing Audit Log

At a minimum, a review must be conducted once in thirty (30) days for online CAs. Significant events must be explained in an audit log summary. Actions taken following these reviews must be documented.

5.4.3. Retention Period for Audit Log

A CA must retain its audit logs for records related to the issuance and any revocation of a certificate for at least two (2) years after the certificate is expired. Timelines for retention of other audit records must conform to standard commercial and legal requirements.

5.4.4. Protection of Audit Log

An electronic audit log system must include mechanisms to protect the log files from unauthorized viewing, modification, or deletion.

Manual audit information must be physically protected from unauthorized viewing, modification, or deletion.

5.4.5. Audit Log Backup Procedures

Audit logs and audit summaries must be backed up or copied daily. For offline CAs, this must occur after each ceremony generation. Timelines for retaining backups must conform to standard commercial and legal requirements.

At a minimum, backups must be retained for two (2) years for records related to the issuance and/or revocation of a certificate, after the certificate is revoked or has expired.

5.4.6. Audit Collection System (Internal vs. External)

Access to the building, room and/or cage, cabinets, and safes where the CA system components are stored and used must be monitored.

Operating System audit processes must be invoked at system startup and end only at operating system shutdown. The CA system audit processes must be invoked at CA application startup and must end only at CA system shutdown. If the automated audit system has failed and the integrity of the system or confidentiality of the information protected by the system is at risk, the PKI determines whether to suspend CA operations until the problem is resolved.

5.4.7. Notification to Event-Causing Subject

When an event is logged, no notice needs to be given to the individual or entity that caused the event.

5.4.8. Vulnerability Assessments

Events in the audit process are logged to monitor system vulnerabilities and/or compromises. A CA must perform a vulnerability assessment, and action must be taken following these monitored events.

Visa performs annual risk assessments that identify and assess reasonably foreseeable internal and external threats, which could result in unauthorized access, disclosure, misuse, alteration, or destruction of any certificate data or certificate issuance process.

5.5. Records Archival

Public verification keys contained in digital certificates and confidentiality private keys stored by the issuing CA must be retained for a minimum of two (2) years after the expiration of the key material.

5.5.1. Types of Records Archived

Refer to CPS for details of type of records to be archived.

5.5.2. Retention Period for Archive

The minimum retention period for archive data is two (2) years, customer-specific information must be disposed of according to Visa Key Controls.

5.5.3. Protection of Archive

See CPS for details.

5.5.4. Archive Backup Procedures

See CPS for details.

5.5.5. Requirements for Time-stamping of Records

See CPS for details.

5.5.6. Archive Collection System (Internal or External)

See CPS for details.

5.5.7. Procedures to Obtain and Verify Archive Information

See CPS for details.

5.6. Key Changeover

Automatic key changeover (renewal) is not supported.

5.7. Compromise and Disaster Recovery

Information related to business recovery of the CA is provided in the Visa CPS and is further described in the CA Business Recovery Plan (BRP).

When there is a compromise of a CA, the CA must notify its Subscribers promptly. Detailed instructions are specified in the Visa CPS.

Steps to be followed are summarized below:

1. Notify the dependent CAs and customers.
2. Revoke certificates associated with the compromised keys (for CAs except VSDC, where revocation is not currently supported).
3. Investigate the compromise.
4. Report results of the investigation and required actions.
5. Implement the actions.
6. Perform key ceremonies for dependent CAs.
7. Issue new certificates.
8. Notify browser vendors (for CAs except VSDC, where revocation is not currently supported).

5.7.1. Incident and Compromise Handling Procedures

Detailed instructions are specified in the Visa CPS.

5.7.2. Recovery Procedures if Computing Resources, Software, and/or Data are Corrupted

Local failover capabilities must be implemented to mitigate the loss of computing resources and software or data corruption. When a primary site is inoperable, the BRP must be implemented.

5.7.3. Recovery Procedures After Key Compromise

See CPS for details.

5.7.4. Business Continuity Capabilities after a Disaster

See CPS for details.

5.8. CA or RA Termination

When a CA plans to cease operation, it must notify the Visa CRF and the CA Subscribers of its intention to cease operation at least forty-five (45) days prior to the termination of the service. Certificates must be revoked if there is potential for inappropriate use; otherwise, certificates might be allowed to expire. The CA must arrange for the certificate files to be archived for two (2) years effective on the publish date of Visa CPS version 3.9 if there are disputes. Private keys used for signing a certificate or CRL, or for creating a digital signature must not be transferred. The private keys must be destroyed in accordance with Cryptographic Key Generation and Destruction. See Section 5.14.2.3, ”Key Management” in Visa Key Controls. Details of these arrangements are described in Visa CPS.

6. TECHNICAL SECURITY CONTROLS

6.1. Key Pair Generation and Installation

6.1.1. Key Pair Generation

Key pair generation must be supported in either hardware or software as stipulated in ”Public Key Parameters Generation and Quality Checking”.

6.1.1.1. CA Key Pair Generation

Refer to CPS for details on CA key Pair Generation.

6.1.1.2. RA Key Pair Generation

6.1.1.3. Subscriber Key Pair Generation

The CA SHALL reject a certificate request if the requested Public Key does not meet the requirements set forth in Sections 6.1.5 and 6.1.6 or if it has a known weak Private Key

6.1.2. Private Key Delivery to Subscriber

Subscribers requesting TLS certificates must generate their key pair and retain their private key.

Visa Corporate users are issued S/MIME certificates on their behalf through the enterprise card management system. Visa is the owner of the S/MIME public and private key pair, and users are authorized to use the S/MIME certificate as long as their employment status is active.

6.1.3. Public Key Delivery to Certificate Issuer

Public keys and certificates may be stored in the Certificate Authority (CA) repository. Delivery of public keys may be in Distinguished Encoding Rules (DERs) encoded (binary or base64) Public Key Cryptography Standard (PKCS) #10 format or EMV format.

6.1.4. CA Public Key Delivery to Relying Parties

Public keys and certificates may be stored in the CAs repository. The CA public key, as part of the certificate, may be delivered to a Subscriber as part of the issuing process. The format may be DERs encoded (binary or base64) or PKCS #7 (binary or base64), with or without chain, or EMV format depending on the Subscriber's requirements as outlined in the Visa Certification Practice Statement (CPS).

6.1.5. Algorithm Type and Key Sizes

A CA must require that the RSA key pairs for Public Key Infrastructure (PKI) entities be a minimum of RSA 2048, and the modulus is evenly divisible by 8. For Visa Smart Debit/Credit (VSDC), key sizes approved by the CRF can be used for card-level keys. For ECDSA NIST P-256, P-384 curves are used.

6.1.6. Public Key Parameters Generation and Quality Checking

CA keys must be generated using a random or pseudo-random number generator that is capable of satisfying the statistical tests and the cryptographic module requirements, as defined in Federal Information Processing Standards (FIPS) Publication 140-2 or 140-3, level 3.

End-Entity key pairs for Visa Business Groups, clients, or their agents that are destined for use with Visa products and services must be generated and protected, as described in the relevant Visa product and service documentation. At a minimum, the key generation requirements must meet the business objectives of the Visa product and/or service.

Key pairs for other entities not listed above may be generated and stored in software or protected by secure cryptographic hardware modules as defined by the Visa CPS.

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

6.2. Private Key Protection and Cryptographic Module Engineering Controls

The Subscriber must protect its private key from disclosure according to the requirements defined by the Visa CPS. The Subscriber is responsible for its private keys.

The private key of an entity must be protected from unauthorized use by a combination of commercially reasonable cryptographic and physical access control mechanisms defined by the Issuing CA and described in the Visa CPS. The level of protection must be adequate to deter a motivated attacker with substantial resources.

- ☒ Visa Information Delivery Root, Intermediates, and Issuing Certificate Authorities (CAs)
- ☐ Visa Smart Debit/Credit (VSDC) Certificate Authorities (CAs)
- ☒ Visa Public ECC Root CA and Issuing Certificate Authorities (CAs)
- ☒ Visa Public RSA Root CA and Issuing Certificate Authorities (CAs)
- ☒ Visa TLS Root CA and Issuing Certificate Authorities (CAs)

If key recovery is implemented, the data encryption private keys used for email encryption must be stored in a password-protected media or in the end-user's smart card or stored by the CA protected by cryptographic hardware.

6.2.1. Cryptographic Module Standards and Controls

CAs digital signature key storage and certificate signing operations must be performed in a secure cryptographic hardware module rated to at least FIPS (FIPS 140-2 or 140-3, Level 3 or Level 4, as appropriate to the device)or otherwise verified to an equivalent level of functionality and assurance.

At a minimum, the key generation and protection must meet the business objectives and requirements of the Visa product and/or service.

6.2.2. Private Key (n out of m) Multi-Person Control

There must be multiple-person control for CA key generation operations. At a minimum, there must be multi-person control for operational procedures so that no one can gain control over the CA signing key. The principle of split knowledge and dual control must be applied as described in ”Trusted Roles”.

6.2.3. Private Key Escrow

CA Private Signing Key(s) must not be escrowed.

Subscriber Digital Signature private keys must not be escrowed.

6.2.4. Private Key Backup

The CAs must back up CA private signing keys in a secure manner to support business recovery operations.

6.2.5. Private Key Archival

Corporate End-Entity key recovery for email encryption may be archived according to documented processes. Other End-Entity private keys must not be archived.

6.2.6. Private Key Transfer into or from a Cryptographic Module

CA keys are generated by and in a cryptographic module. CA Private Keys are not exported from the cryptographic module.

6.2.7. Private Key Storage on Cryptographic Module

CA Keys are generated and protected by hardware cryptographic modules which have been evaluated to at least FIPS 140-2 or 140-3 Level 3.

6.2.8. Activating Private Keys

The use of a private key requires authenticating with a password.

6.2.9. Deactivating Private Keys

When keys are deactivated, the application must clear the keys from memory before the memory is de-allocated. Any disk space where keys were stored must be sanitized before the space is released to the operating system. The cryptographic module must automatically deactivate the private key after a pre-set period of inactivity.

6.2.10. Destroying Private Keys

Upon termination of the use of a private key, over-writing must securely destroy copies of the private key in computer memory and shared disk space. The private keys must be destroyed in accordance with Cryptographic Key Generation and Destruction. See Section 5.14.2.3, "Key Management" in Visa Key Controls. Details of these arrangements are described in the Visa CPS.

6.2.11. Cryptographic Module Rating

Cryptographic Module's used in CA and VA systems SHOULD be FIPS 140-2 or 140-3 certified.

6.3. Other Aspects of Key Pair Management

6.3.1. Public Key Archival

Issuing CAs must retain verification public keys for the period of time defined in the Visa CPS.

6.3.2. Certificate Operational Periods and Key Pair Usage Periods

Issuing CA private signing keys must expire prior to the CA key that signed the public verification key. If the CA certificate contains a private key usage extension, the expiration date for the private signing key must correspond to the date included in that extension.

Subscriber keys must have a validity period appropriate to the intended use of the certificate as described in the relevant Visa product and/or service documentation. Subscriber keys and certificates must expire prior to the Issuing CA key that signed the Subscriber's public verification key.

TLS Server certificates have a validity period of 398 days or less.

6.4. Activation Data

If activation data is used to protect any CA private key, it must be unique and unpredictable, and it must be protected from unauthorized use by a combination of cryptographic and physical access control mechanisms.

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. Computer Security Requirements

Computer security controls for CAs must provide protection from unauthorized access, modification, substitution, insertion, and/or deletion. These controls provide protection to help ensure that any such attempts are prevented or will have a high probability of being detected in a timely manner.

The following functionality for CAs must be provided by the operating system or through a combination of operating systems, CA software, and/or physical safeguards (policies and procedures).

Each CA server must include the following functions:

- Access control to CA services.
- Enforced separation of duties for CA administrative roles.
- Identification and authentication of CA administrative roles and associated identities.
- Use of cryptography for session communication and database security.
- Archival of CA and End-Entity history and audit data.
- Audit of security-related events.
- Trusted path for identification of PKI roles and associated identities.
- Recovery mechanisms for keys and the CA system.
- Multi-factor authentication for certificate issuing accounts.

6.5.2. Computer Security Rating

6.6. Life Cycle Technical Controls

6.6.1. System Development Controls

Visa PKIs must use CA software that has been designed and developed under a documented development methodology. An integrity verification process to influence security safeguard design and minimize residual risk should support the design and development process.

6.6.2. Security Management Controls

☒ Visa Information Delivery Root, Intermediates, and Issuing Certificate Authorities (CAs)
☐ Visa Smart Debit/Credit (VSDC) Certificate Authorities (CAs)
☒ Visa Public ECC Root CA and Issuing Certificate Authorities (CAs)
☒ Visa Public RSA Root CA and Issuing Certificate Authorities (CAs)
☒ Visa TLS Root CA and Issuing Certificate Authorities (CAs)

A formal configuration management methodology must be used for installation and ongoing maintenance of a CA system. CA software, when first loaded, must provide a method for a CA to verify that the software on the system:

- Originated from the software developer.
- Has not been modified prior to installation.
- Is the intended version.

The PKI operating environment must provide a commercially reasonable mechanism to verify the integrity of the CA software.

The PKI operating environment must have commercially reasonable mechanisms and policies in place to control and monitor the configuration of the CA system.

6.6.3. Life Cycle Security Controls

6.7. Network Security Controls

- ☒ Visa Information Delivery Root, Intermediates, and Issuing Certificate Authorities (CAs)
- ☒ Visa Smart Debit/Credit (VSDC) Certificate Authorities (CAs)
- ☒ Visa Public ECC Root CA and Issuing Certificate Authorities (CAs)
- ☒ Visa Public RSA Root CA and Issuing Certificate Authorities (CAs)
- ☒ Visa TLS Root CA and Issuing Certificate Authorities (CAs)

The Visa Root CAs are not connected to any network, which eliminates a threat of attack through open or general-purpose networks.

The online Issuing CAs must use commercially reasonable efforts to protect their servers from attack through any open or general-purpose networks. The protection must be provided through a combination of hardware and/or software (firewalls and network monitoring) configured to allow only the protocols and commands required for the operation of the CA and the Visa product and/or service.

Those protocols and commands required for the protection of the CAs are defined in the Visa CPS.

6.8. Time-Stamping

Certificates, CRLs, and Online Certificate Status Protocol (OCSP) responders contain time and date information. Time information does not need to be cryptographic-based.

7. CERTIFICATE, CRL, AND OCSP PROFILES

- ☐ Visa Information Delivery Root, Intermediates, and Issuing Certificate Authorities (CAs)
- ☒ Visa Smart Debit/Credit (VSDC) Certificate Authorities (CAs)
- ☐ Visa Public ECC Root CA and Issuing Certificate Authorities (CAs)
- ☐ Visa Public RSA Root CA and Issuing Certificate Authorities (CAs)
- ☐ Visa TLS Root CA and Issuing Certificate Authorities (CAs)

Visa Smart Debit/Credit (VSDC) certificates must conform to the EMV specification.

- ☒ Visa Information Delivery Root, Intermediates, and Issuing Certificate Authorities (CAs)
- ☐ Visa Smart Debit/Credit (VSDC) Certificate Authorities (CAs)
- ☒ Visa Public ECC Root CA and Issuing Certificate Authorities (CAs)
- ☒ Visa Public RSA Root CA and Issuing Certificate Authorities (CAs)
- ☒ Visa TLS Root CA and Issuing Certificate Authorities (CAs)

7.1. Certificate Profile

7.1.1. Version Number(s)

Certificate Authorities (CAs) must issue X.509 Version 3 certificates based on the Internet Engineering Task Force (IETF) Public Key Infrastructure Extensions (PKIX) Certificate, and Certificate Revocation List (CRL) Profile as defined in Request for Comment (RFC) 3280 and its successors. The PKI End-Entity software must support all the base (non-extension) X.509 fields as well as any certificate extensions as defined in Visa Certification Practice Statement (CPS).

Base Certificate Format

The Base Certificate Format conforms to the Internet Engineering Task Force (IETF) Public Key Infrastructure Extensions (PKIX) Request for Comment (RFC) 4325, "Internet X.509 Public Key Infrastructure (PKI) Certificate and Certificate Revocation List (CRL) Profile," dated December 2005.

The following table shows the base certificate fields supported. Additional extensions are allowable if required.

Table 7–1: Supported Base Certificate Fields

Certificate Field	Description
Version	3
Serial Number	Unique non-sequential identifying number that exhibits at least 64 bits of entropy for this certificate assigned by the Public Key Infrastructure (PKI).
Signature	CRF-approved algorithms.
Issuer	The Visa CA Shall conform with "Issuer Information".
Validity	Start and expiration dates and times of the certificate.
Subject	Fully qualified domain name (DN) (X.500) of the subject, as per "Types of Names".
Subject public key information	The value of the public key for the subject along with an identifier of the algorithm with which this public key is to be used.

7.1.2. Certificate Content and Extensions

Extensions used by the CAs must be published in the Visa CPS. Critical extensions must be interpreted as defined in PKIX.

7.1.2.1. Root CA Certificate Profile

Refer to CPS for details.

7.1.2.2. Cross-Certified Subordinate CA Certificate Profile

Refer to CPS for details.

7.1.2.3. Technically Constrained Non-TLS Subordinate CA Certificate Profile

Refer to CPS for details.

7.1.2.4. Technically Constrained Precertificate Signing CA Certificate Profile

Refer to CPS for details.

7.1.2.5. Technically Constrained TLS Subordinate CA Certificate Profile

Refer to CPS for details.

7.1.2.6. TLS Subordinate CA Certificate Profile

Refer to CPS for details.

7.1.2.7. Subscriber (Server) Certificate Profile

Refer to CPS for details.

7.1.2.8. OCSP Responder Certificate Profile

Refer to CPS for details.

7.1.2.9. Precertificate Profile

For purposes of clarification, a Precertificate, as described in RFC 6962 - Certificate Transparency, shall not be considered to be a ”certificate” subject to the requirements of RFC 5280 - Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile.

7.1.2.10. Common CA Fields

Refer to CPS for details.

7.1.2.11. Common Certificate Fields

Refer to CPS for details.

7.1.3. Algorithm Object Identifiers

The CAs must use, and the Subscribers and Relying Parties (RPs) must support for signing and verification, the following:

- RSA (2048 bit modulus or higher unless approved by the Visa CRF) or equivalent algorithm in accordance with Public Key Cryptography Standard (PKCS)#10. Nist Curves P-256 and P-384.
- Secure Hash Algorithm (SHA-1 SHA-2) algorithm in accordance with Federal Information Processing Standard (FIPS) Publication (PUB) 180-4 2012.

CA's MUST NOT issue any SSL/TLS Subscriber certificates or Subordinate CA certificates using the SHA-1 hash algorithm. CA's MAY issue Root CA certificates or Subordinate CA Certificates that are Cross Certificates using the SHA-1 hash algorithm.

CA's MAY continue to use their existing SHA-1 Root Certificates.

Subscriber certificates SHOULD NOT chain up to a SHA-1 Subordinate CA Certificate.

S/MIME certificates SHALL continue to be issued with RSA 2048 key sizes with SHA-2 hash algorithm.

7.1.3.1. SubjectPublicKeyInfo

7.1.3.2. Signature AlgorithmIdentifier

7.1.4. Name Forms

Distinguished Names (DNs) must be in the form of X.501 DirectoryStrings.

7.1.4.1. Name Encoding

Refer to CPS for details.

7.1.4.2. Subject Attribute Encoding

Subject attributes MUST NOT contain only metadata such as '.','-', and '' (i.e. space) characters, and/or any other indication that the value is absent, incomplete, or not applicable. CAs shall meeting requirements specified in Baseline Requirements section 7.1.4.

7.1.4.3. Subscriber Certificate Common Name Attribute

7.1.4.3.1. Subject Distinguished Name Fields

7.1.4.4. Other Subject Attributes

7.1.5. Name Constraints

Subject and Issuer DNs must comply with PKIX standards and be present in all certificates.

7.1.6. Certificate Policy Object Identifier

A CA must have the Policy Object Identifier (OID) contained within the certificates issued.

7.1.6.1. Reserved Certificate Policy Identifiers

Visa uses the Certificate Policy identifier 2.23.140.1.2.2 for Organization Validated Server Certificates. Visa uses the Certificate Policy identifier 2.23.140.1.2.1 for Domain Validated Server Certificates.

7.1.7. Usage of Policy Constraints Extension

A CA may populate and mark the policy constraints extension as critical.

7.1.8. Policy Qualifiers Syntax and Semantics

A CA may populate the certificatePolicies extension with the OID and policyQualifiers containing the Uniform Resource Locator (URL) of the Visa CPS. A User Notice Qualifier, which points to an applicable RP Agreement, may be used at the discretion of the Issuing CA.

7.1.9. Processing Semantics for the Critical Certificate Policies Extension

7.2. CRL Profile

CAs must issue X.509 Version 2 CRLs in accordance with the RFC 4325 "Internet X.509 PKI Authority Information Access CRL Extension" dated December 2005 and its successors. The CRLs must be published on a repository and/or an Online Certificate Status Protocol (OCSP) responder. The Subscriber and RP software must support the entire base (non-extension) X.509 fields.

The Visa CPS must define the use of extensions supported by the CAs.

7.2.1. Version Number(s)

Refer to CPS for details.

7.2.2. CRL and CRL Entry Extensions

Refer to CPS for details.

7.3. OCSP Profile

OCSP Responses issued by a CA under this policy will conform to the OCSP profile specified in the Internet Engineering Task Force (IETF) Request for Comments number 2560 and/or RFC5019.

OCSP responses MUST either:

- Be signed by the CA that issued the Certificates whose revocation status is being checked, or
- Be signed by an OCSP Responder whose Certificate is signed by the CA that issued the Certificate whose revocation status is being checked. In the latter case, the OCSP signing Certificate MUST contain an extension of type id-pkix-ocsp-nocheck, as defined by RFC2560.

Certificate status servers (CSSs) operated under this policy will sign responses using algorithms designated for CRL signing, specified in the Internet Engineering Task Force (IETF) Request for Comments number 2528, and specified in "Certificate Profile", under the subtitle Algorithm Object Identifiers.

7.3.1. Version Number(s)

The Certificate status servers operated under this policy will use OCSP version 1, specified in the Internet Engineering Task Force (IETF) Request for Comments number 2560.

7.3.2. OCSP Extensions

The detailed CRL profiles and use of each extension are specified in "Certificate Profile" and "CRL Profile".

8. COMPLIANCE AUDIT AND OTHER ASSESSMENTS

☒ Visa Information Delivery Root, Intermediates, and Issuing Certificate Authorities (CAs)
☐ Visa Smart Debit/Credit (VSDC) Certificate Authorities (CAs)
☒ Visa Public ECC Root CA and Issuing Certificate Authorities (CAs)
☒ Visa Public RSA Root CA and Issuing Certificate Authorities (CAs)
☒ Visa TLS Root CA and Issuing Certificate Authorities (CAs)

8.1. Frequency or Circumstances of Assessment

A compliance audit provides an independent third-party certification that the CA is operating as stated in this CP and in the Visa Certification Practice Statement (CPS).

The CA must have a compliance audit performed annually as part of a WebTrust CA assessment. This annual compliance audit determines whether the CA performance (business practices and controls) meets the requirements of this CP, the standards established in the Visa CPS.

A copy of the compliance audit report must be submitted to the Visa Cryptographic Review Forum (CRF).

The Visa CRF reserves the right to verify that a compliance audit has been performed and that the CA's have complied with the requirements of this CP.

8.2. Identity and Qualifications of Assessor

The compliance auditor must demonstrate competence in the field of Public Key Infrastructure (PKI) and must be thoroughly familiar with the requirements that the CRF imposes on the issuance and management of certificates. The compliance auditor should perform compliance audits as a primary responsibility.

8.3. Assessor's Relationship to Assessed Entity

To prevent any biased outcome, the compliance auditor must not have any financial, legal, or conflicting business relationship with the CA that is being audited.

8.4. Topics Covered by Assessment

The purpose of a compliance audit is to verify that the entity that is subject to the requirements of this Certificate Policy (CP) is acting in accordance with these requirements. The compliance audit covers the requirements that define the operation of a Certificate Authority (CA) under this CP including:

- CA business practices disclosure.
- CA service integrity (key and certificate life cycle management) with respect to the Visa product or service.
- CA security controls as defined in the Visa CPS.

8.5. Actions Taken as a Result of Deficiency

When a finding is noted, the following actions must be taken:

- The compliance auditor must note the finding as part of the report.
- The compliance auditor must meet with the CA to determine if the finding can be remedied. An action plan must be developed and steps taken to remedy the finding.
- The compliance auditor must report the finding to the Visa CRF.

8.6. Communication of Results

The compliance auditor must provide CA management with a copy of the results of the compliance audit.

The Visa CA makes the Audit Report publicly available. The Visa CA is not required to make any general audit findings that do not impact the overall audit opinion publicly available.

The Audit Report explicitly states that it covers the relevant systems and processes used in the issuance of Certificates that assert one or more of the policy identifiers listed in the CA/Browser Forum Baseline Requirements 9.3.1.

8.7. Self-Audits

Visa monitors adherence to its CP, CPS, and these Requirements by performing self-audits on at least a quarterly basis. The audits are against a randomly selected sample of the greater of one certificate or at least three percent of the certificates issued during the period immediately after the previous self-audit sample was taken, as required by CA/Browser Forum Baseline Requirements.

9. OTHER BUSINESS AND LEGAL MATTERS

9.1. Fees

Imposing fees on a Subscriber or on a Relying Party (RP) is subject to the appropriate authority and policy of the Visa Pricing Committee. Notice of any fee charged to a Subscriber or an RP must be brought to the Pricing Committee's attention.

9.1.1. Certificate Issuance or Renewal Fees

9.1.2. Certificate Access Fees

9.1.3. Revocation or Status Information Access Fees

9.1.4. Fees for Other Services

9.1.5. Refund Policy

9.2. Financial Responsibilities

No stipulation.

9.2.1. Insurance Coverage

9.2.2. Other Assets

9.2.3. Insurance or Warranty Coverage for End-Entities

9.3. Confidentiality of Business Information

9.3.1. Scope of Confidential Information

Subscriber information not appearing in certificates and in public directories held by a Certificate Authority (CA) or by a Registration Authority (RA) is considered confidential.

This includes, for example, registration and revocation information, logged events, and correspondence between Subscriber and CA. This confidential information must not be disclosed by the CA unless required by law.

Audit information must be considered confidential and must not be disclosed to anyone for any purpose other than audit purposes or where required by law.

The digital signature private key of each Subscriber is to be held only by the Subscriber and must be kept confidential. Any disclosure of the private key or media containing the private key by the Subscriber is at the Subscriber's own risk.

Confidentiality keys may be backed up by the Issuing CA. These keys must be protected in accordance with Chapter 6, TECHNICAL SECURITY CONTROLS. They must not be disclosed without prior consent of the Subscriber or

of a duly authorized representative, such as Visa Human Resources, Legal, and Internal Audit, or as required by law.

Any request for the disclosure of information must be signed by the requester and delivered in writing to the Issuing CA. Any disclosure of information is subject to the requirements of any privacy laws and to any other relevant legislation and applicable policy.

9.3.2. Information Not Within the Scope of Confidential Information

Certificates, Certificate Revocation Lists (CRLs), and personal or corporate information appearing in them and in public directories are not considered confidential information. Additionally, information that meets the following criteria is not considered confidential information:

- Information that is documented by the receiving party as having been independently developed by it without unauthorized reference to, or reliance on, the confidential information of the disclosing party.
- Information that the receiving party lawfully receives free of restriction from a source other than the disclosing party.
- Information that is, or becomes, generally available to the public through no wrongful act or omission on the part of the receiving party.
- Information that at the time of disclosure to the receiving party was known to the receiving party free of restriction as evidenced by documentation in the receiving party's possession.
- Information that the disclosing party agrees, in writing, is free of restrictions.

9.3.3. Responsibility to Protect Confidential Information

A CA must ensure that confidential information be either physically and/or logically protected from unauthorized viewing, modification, or deletion. In addition, the CA must ensure that storage media used by the CA system is protected from environmental threats.

9.4. Privacy of Personal Information

9.4.1. Privacy Plan

Visa Public Key Infrastructure (PKI) policy is to not disclose private personal information about its Subscribers, customers, employees, and partners without their prior consent, unless required by law.

9.4.2. Information Treated as Private

Personal information not appearing in certificates and in public directories, held by a CA or an RA are considered private. This includes, for example, registration and revocation information, logged events, and correspondence between Subscriber and CA. This private information must not be disclosed by the CA or by the RA.

9.4.3. Information Not Deemed Private

Personal information that is publicly available, appearing in certificates and in public directories, is not considered private.

9.4.4. Responsibility to Protect Private Information

A CA must ensure that private personal information be either physically and/or logically protected from unauthorized viewing, modification, or deletion. The CA must also ensure that storage media used by the CA system is protected from environmental threats.

9.4.5. Notice and Consent to Use Private Information

Private personal information will only be used with prior consent unless required by law.

9.4.6. Disclosure Pursuant to Judicial or Administrative Process

Private personal information will only be disclosed if required by law or with prior consent of the individual to which the private personal information applies.

Any request for the disclosure of private information must be signed by the requester and delivered in writing to the issuing CA. Any disclosure of private information is subject to the requirements of any privacy laws and of any other relevant legislation and applicable organizational policy.

9.4.7. Other Information Disclosure Circumstances

9.5. Intellectual Property Rights

The private key is the sole property of the legitimate holder of the corresponding public key identified in a certificate and it may only be used for the purpose of accessing Visa products and services.

Visa PKIs retain all intellectual property rights in and to the certificates and revocation information that it issued.

Visa retains all intellectual property rights in and to this Visa Certificate Policy (CP).

9.6. Representations and Warranties

A CA issues and revokes certificates, operates its certification and repository services, and provides certificate status information in accordance with this Visa CP.

Authentication and validation procedures are implemented, as described in Chapter 3, IDENTIFICATION AND AUTHENTICATION.

9.6.1. CA Representations and Warranties

CAs must operate in accordance with this Visa CP, the Visa Certification Practice Statement (CPS), and applicable laws when issuing and managing certificates provided to subordinate CAs, RAs, and Subscribers under this Visa CP. See “Compliance with Applicable Law”.

CAs must require that the RAs operating on their behalf must comply with the relevant provisions of this Visa CP regarding the operations of the RAs.

CAs should provide notice of any limitation of liability. See “Indemnities”.

CAs must:

- Issue and administer the Visa CPS that complies with this Visa CP.
- Issue certificates based on requests that are correctly and properly verified, according to “Naming”, if applicable. A CA may delegate this verification, that is, perform due diligence on the certificate requester and certificate request to an RA; however, the CA retains responsibility for ensuring that these functions are performed properly.
- Issue certificates only for use in conjunction with those applications approved by the Visa PKI Team as being appropriate to make use of the PKI.
- Have mechanisms and procedures in place to make subordinate CAs, RAs, and Subscribers aware of and bound to the stipulations in this Visa CP that apply to them.
- Provide a secure environment and proper operations to protect the confidentiality and integrity of the CA.
- Through compliance audit, verify that the operation of the CA complies with this Visa CP. If there are any material changes in the operation of the CA, for example, a change in location or CA platform, the CA must immediately notify the Visa CRF. The CA must verify, through an audit, that the operation of the CA still complies with this Visa CP.
- When publishing or delivering a certificate:
  - Declare that it has issued a certificate to a Subscriber and that the information stated in the certificate was verified in accordance with this Visa CP.
  - Publish the certificate in a repository to which the Subscriber has access or deliver a signed certificate to the Subscriber. This constitutes notice of certification.

- Be individually accountable for actions they perform if the CA personnel are associated with PKI roles. Individually accountable means that there must be evidence that attributes an action to the person performing the action.
- Issuing CAs must take commercially reasonable measures to make Subscribers and RPs aware of their rights and obligations. This applies to the operation and management of any keys, certificates, or hardware and software used in connection with the PKI. Subscribers should also be notified about procedures for dealing with suspected key compromise, certificate or key renewal, and service cancellation.
- Right to Use Domain Name or IP Address: That, at the time of issuance, (i) an implemented procedure described in the CP and/or CPS for verifying that the Applicant either had the right to use or had control of the Domain Name(s) and IP address(es) listed in the Certificate's subject field and subjectAltName extension (or, only in the case of Domain Names, was delegated such right or control by someone who had such right to use or control); (ii) the procedure was followed when issuing the Certificate, and (iii) accurately described the procedure in the Certification Practice Statement(CPS).
- Authorization for Certificate: That, at the time of issuance, an implemented procedure described in the CP and/or CPS for verifying that the Subject authorized the issuance of the Certificate and that the Applicant Representative is authorized to request the Certificate on behalf of the Subject, was followed when issuing the Certificate.
- Accuracy of Information: That, at the time of issuance, an implemented procedure described in the CP and/or CPS for verifying the accuracy of the information contained in the Certificate was followed.
- No Misleading Information: That, at the time of issuance, an implemented procedure described in the CP and/or CPS for reducing the likelihood that the information contained in the Certificate's subject:organizationalUnitName attribute would be misleading was followed when issuing the Certificate.
- Identity of Applicant: That, if the Certificate contains Subject Identity Information, an implemented procedure described in the CP and/or CPS to verify the identity of the Applicant was followed when issuing the Certificate.
- Subscriber Agreement: That, if the Visa CA and Subscriber are not Affiliated, the Subscriber and CA are parties to a Subscriber Agreement that satisfies these Requirements. If the Visa CA and Subscriber are Affiliated, the Applicant Representative acknowledged and accepted the Terms of Use.
- Status: a 24 x 7 publicly-accessible repository with current information regarding the status (valid or revoked) of unexpired Certificates will be maintained.
- Revocation: That a Certificate will be revoked for any of the reasons specified in these Requirements.

9.6.2. RA Representations and Warranties

A CA must require that its RAs comply with the relevant provisions of this Visa CP and the Visa CPS, as defined in "Registration Authorities".

The RA is responsible for the identification and authentication of Subscribers according to "Initial Identity Validation" and "Certificate Application". Subscribers' rights and obligations, as well as a description of an RP's obligations with respect to use, verification, and validation of certificates are provided by the Visa product or service participation agreement.

An RA may be responsible for revoking certificates in accordance with "Certificate Revocation and Suspension".

RAs are individually accountable for actions performed on behalf of a CA. "Individually accountable" means that there must be evidence that attributes an action to the person performing the action. Records of actions carried out in performance of RAs duties must identify the individual who performed the particular duty. Each Vettor performing RA duties must protect his or her private keys in accordance with Chapter 4, CERTIFICATE LIFE-CYCLE OPERATIONAL REQUIREMENTS, and Chapter 6, TECHNICAL SECURITY CONTROLS. Vettor personnel must undergo an annual compliance validation process.

When an RA submits Subscriber information to a CA, it must certify to that CA that it has authenticated the identity of that Subscriber and that the Subscriber is authorized to submit a certificate request, in accordance with Chapter 3, IDENTIFICATION AND AUTHENTICATION and Chapter 4, CERTIFICATE LIFE-CYCLE OPERATIONAL REQUIREMENTS.

Submission of the certificate request to the CA must be performed in a secure manner, as described in "Initial Identity Validation".

9.6.3. Subscriber Representations and Warranties

The Subscriber may only use its key pairs and the associated certificates issued under a Visa PKI for the purposes identified in this Visa CP. Key pairs intended for use in a production environment must be generated in that environment in accordance with this Visa CP and Visa CPS. These key pairs must not be cloned, copied, or otherwise conveyed for use in a test or development environment. Key pairs and the associated certificates must not be shared by multiple functional entities. Key pairs generated in a non-production environment must not be used in production implementations of Visa products and/or services.

The Visa CA must obtain an executed version of the Subscriber Agreement prior to issuing the Certificate.

The Subscriber or Terms of Use Agreement must contain provisions imposing the following obligations and warranties (on the Applicant) as required in the Baseline Requirements.

- **Accuracy of Information** —An obligation and warranty to provide accurate and complete information to the Visa CA, both in the certificate request and as otherwise requested by the Visa CA in connection with the issuance of the Certificate(s) to be supplied by the Visa CA.
- **Protection of Private Key** —An obligation and warranty by the Applicant to take reasonable measures to maintain sole control of, keep confidential, and properly protect the Private Key that corresponds to the Public Key to be included in the requested Certificate(s) and any associated activation data or device, for example, password or token, in accordance with Chapter 6, TECHNICAL SECURITY CONTROLS.
- **Acceptance of Certificate** —An obligation and warranty that the Subscriber will review and verify the Certificate contents for accuracy.
- **Use of Certificate** —An obligation and warranty to install the Certificate only on servers that are accessible at the subjectAltName(s) listed in the Certificate, and to use the Certificate solely in compliance with applicable laws and solely in accordance with the Subscriber or Terms of Use Agreement.
- **Reporting and Revocation** —An obligation and warranty to promptly cease using a Certificate and its associated Private Key and promptly request The Visa CA to revoke the Certificate if:
  - Any information in the Certificate is, or becomes, incorrect or inaccurate.
  - There is any actual or suspected misuse or compromise of the Subscriber's Private Key associated with the Public Key included in the Certificate. Refer to the procedures in "Certificate Revocation and Suspension".
- **Termination of Use of Certificate** —An obligation and warranty to promptly cease use of the Private Key corresponding to the Public Key included in the Certificate upon revocation of that Certificate for reasons of Key Compromise.
- **Responsiveness** —An obligation to respond to the Visa CAs instructions concerning Key Compromise or Certificate misuse within a specified time period.
- **Acknowledgment and Acceptance** —An acknowledgment and acceptance that the Visa CA is entitled to revoke the certificate immediately if the applicant violates the terms of the Subscriber or Terms of Use Agreement, or if the Visa CA discovers that the Certificate is being used to enable criminal activities, such as phishing attacks, fraud, or the distribution of malware.

9.6.4. Relying Party Representations and Warranties

The RPs must adhere to Visa By-Laws, Operating Regulations, policies, and Visa product or service agreements that relate to specific instances in which an RP trusts or otherwise uses a certificate issued within the Visa PKI. An RP may not act in reliance upon a certificate that has expired, been suspended, revoked, or that includes a revoked certificate in the chain of trust back to the Root CA.

Before using a Subscriber's certificate, an RP must verify that the certificate is appropriate for the intended use.

☒ Visa Information Delivery Root, Intermediates, and Issuing Certificate Authorities (CAs)
☐ Visa Smart Debit/Credit (VSDC) Certificate Authorities (CAs)
☒ Visa Public ECC Root CA and Issuing Certificate Authorities (CAs)
☒ Visa Public RSA Root CA and Issuing Certificate Authorities (CAs)
☒ Visa TLS Root CA and Issuing Certificate Authorities (CAs)

Before using a certificate, an RP should check the status of the certificate using the relevant CRL, in accordance with the requirements in "Certificate Revocation and Suspension". As part of the verification process, the digital signature on the CRL must also be validated.

9.6.5. Representations and Warranties of Other Participants

9.7. Disclaimers of Warranties

This section is not meant to replace the liability and indemnification provisions of the Visa By-Laws, Operating Regulations, and policies, which must continue to be enforced and in effect.

Nothing in this Visa CP must confer on any third-party authority to act for, bind, create, or assume any obligation or responsibility, or make any representation on behalf of another, except as set forth in this Visa CP. Issuance of certificates in accordance with this Visa CP does not make a CA or an RA, an agent, partner, joint venture, fiduciary, trustee, or other representative of Subscribers or of other RPs. The applicable Subscriber Agreement or Relying Party Agreement defines the relationship between a CA, an RA, and the Subscriber.

9.8. Limitations of Liability

A Visa PKI will not be liable for any damages to Subscribers, RPs, or to any other party arising out of, or related to, the misuse of or reliance on certificates issued by a CA that have been:

- Revoked, suspended, or expired
- Used for unauthorized purposes
- Tampered with
- Compromised
- Subject to misrepresentation, misleading acts, or omissions

Visa does not have Delegated Third-Parties as stated in ”PKI Participants”.

9.9. Indemnities

The indemnification obligations of Subscribers and RPs are set forth in applicable Subscriber and RPAgreements.

Unless otherwise set forth in this Visa CP and/or Subscriber Agreement and/or Relying Party Agreement, the Subscriber and/or RP agrees to indemnify and hold Visa PKI harmless from any claims, actions, or demands that are caused by the use or publication of a certificate that arises from:

- Any false or misleading statement of fact by the Subscriber.
- Any failure by the Subscriber to disclose a material fact, if such omission was made negligently or with the intent to deceive.
- Any failure on the part of the Subscriber to protect its Private Key and/or token, if applicable, or to take the precautions necessary to prevent the compromise, disclosure, loss, modification, or unauthorized use of the Subscriber's private key.
- Any failure on the part of the Subscriber to protect its Private Key and/or token, if applicable, or to take the precautions necessary to prevent the compromise, disclosure, loss, modification, or unauthorized use of the Subscriber's private key.

9.9.1. Indemnification by CAs

Any failure on the part of the Subscriber to promptly notify a CA within the Visa PKI of a compromise, disclosure, loss, modification, or unauthorized use of the Subscriber's private key once there has been an actual notification of such an event.

9.9.2. Indemnification by Relying Subscribers

9.9.3. Indemnification by Relying Parties

9.10. Term and Termination

9.10.1. Term

This Visa CP remains in force until a notice is communicated by Visa CRF on its website at http://visa.com/pki.

9.10.2. Termination

Termination of this document will be upon publication of a newer version or a replacement document, or upon termination of CA operations.

9.10.3. Effect of Termination and Survival

The conditions and effects resulting from termination of this document will be communicated by Visa CRF on its website at http://visa.com/pki and will outline the provisions that may survive its termination and remain in force.

9.11. Individual Notices and Communications with Participants

The Visa CRF will define in any applicable agreement the appropriate provisions governing notices.

9.12. Amendments

The Visa CRF is the responsible authority for reviewing and approving changes to the Visa CP. Written and signed comments on proposed changes must be directed to the Visa CRF Chairman as described in "Contact Person". Decisions about proposed changes are at the sole discretion of the Visa CRF.

9.12.1. Procedure for Amendment

The PKI may provide notification, in writing, of any proposed changes to this Visa CP following approval by the CRF. The notification will contain a statement of proposed changes and the final date that comments can be submitted.

Written and signed comments on proposed changes should be directed to the Chairman of the Visa CRF, as described in "Contact Person". Decisions about proposed changes are at the sole discretion of the Visa CRF.

9.12.2. Notification Mechanism and Period

9.12.3. Circumstances under which OID must be Changed

Changes to Object Identifiers (OIDs) are at the discretion of the Visa CRF.

9.13. Dispute Resolution Provisions

Refer to Visa Operating Regulations and Visa By-Laws.

9.14. Governing Law

Refer to Visa Operating Regulations and Visa By-Laws.

9.15. Compliance with Applicable Law

Refer to Visa Operating Regulations and Visa By-Laws.

9.16. Miscellaneous Provisions

9.16.1. Entire Agreement

Refer to Visa Operating Regulations and Visa By-Laws.

9.16.2. Assignment

Refer to Visa Operating Regulations and Visa By-Laws.

9.16.3. Severability

Refer to Visa Operating Regulations and Visa By-Laws.

9.16.4. Enforcement

Refer to Visa Operating Regulations and Visa By-Laws.

9.16.5. Force Majeure

A Visa PKI is not to be held responsible for any delay or failure in performance of its obligations if such delay or failure is caused by fire, flood, strike, civil, governmental, or military authority, acts of terrorism or war, an act of God, or other similar causes beyond its reasonable control, and without the fault or negligence of the delayed or non-performing party or of its subcontractors.

9.17. Other Provisions