# X.509 Identity Certificates White Paper for Cisco Show and Share 5.2.x

**Revised: August 20, 2010**

**NEW IN CISCO DMS 5.2.1** — You can manage the digital certificates for a Cisco *Show and Share* appliance from its local instance of Appliance Administration Interface (AAI).

**Caution** Although you might see these certificate management features and options on another type of Cisco DMS appliance than a *Show and Share* appliance, **WE HAVE NOT TESTED AND DO NOT SUPPORT** their use, except on a *Show and Share* appliance.

**Activation** This chapter describes options and features that **do not exist** in Cisco DMS 5.2.0. You must upgrade to Cisco DMS 5.2.1 before these options are available to you.



## Concepts




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# Terminology

**Timesaver** Go to terms that start with... [ **A** | **C** | **D** | **K** | **P** | **S** | **X** ].

## A

**asymmetric key exchange** Asymmetric or public key cryptography is based on the concept of a key pair. Each half of the pair (one key) can encrypt information so that only the other half (the other key) can decrypt it. One part of the key pair, the private key, is known only by the designated owner; the other part, the public key, is published widely but is still associated with the owner.

## C

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**CA** *certification authority.* Authority in a network that issues and manages security credentials and public keys for message encryption and decryption. As part of a public key infrastructure (PKI), a CA checks with a registration authority (RA) to verify information provided by the requestor of a digital certificate. If the RA verifies the requestor's information, the CA can then issue a certificate.

**CA signature** Digital code that vouches for the authenticity of a digital certificate. The certification authority (CA) that issues a certificate also signs it.

**certificate chain** Hierarchical list of public-key certificates, each signed by the subsequent certificate, ending with a Root CA certificate.

**CSR** *certificate signing request.* A block of ciphertext that (**1.**) describes an entity to a CA and (**2.**) requests a digital identity certificate to authenticate the entity for SSL. The CSR includes encrypted information to identify the entity, such as its location, serial number, and public key. This example shows a CSR.

```
-----BEGIN NEW CERTIFICATE REQUEST-----
MIICrTCCAZUCAQAwaDEXMBUGA1UEAxMOZHN5cy5jaXNjby5jb20xDzANBgNVBAsTBmp5Z2podjEO
MAwGA1UEChMFaGd1eWcxDzANBgNVBAcTBnV5dHlnajEOMAwGA1UECBMFbWhoanYxCzAJBgNVBAYT
AlVTMIIBIjANBgkqhkiG9w0BAQEFAAOCAQ8AMIIBCgKCAQEAlz+sEkBbIoXTiE13O28FX558enM0
6tVdnNlWmySbtKulYJ+xvHlsdzbCLOPYJhOvr1JJIxaNjf2dT1fdQp4Qd1U/lk5+v9Nmqtlr9Fxl
bUkxkCaYr6H4RYrmqi0+YpLyUgMXqoQ+vFRDdKUGHD5lxQK9dggXvdJQNgylGawXkqG8WepC3XwK
Zyl9CS2S4CbnLs6yHcz86/VE1X4+DqnS3yvfko+Yyg/yUe151Hcwp97C0KtFrZnQcnIDYU4rEaV+
nqKWc52cQ0kuoJjJlzNSlVUGLGA+yPf+fz+0K5liqA6HnE22yA7SWlskcR668JCR9tjqyWnIC+yu
Cd13HUfSpwIDAQABoAAwDQYJKoZIhvcNAQEFBQADggEBAAVj0f6B6lmtVEvCaUxKAI7DDgFjBJhv
BRJMZA+3BVD6OOX8T2J8druEb18bloEX989f81124KceO8Y037/a4RPdxhXM3eeVYTMnz4QcbI6G
MU58jdHgRM1pxmYweixNTmzFTLc3uhp8JHWk286pHOMNHX2OR+cL+Cbj/mYRnmf4hg4LD0oCTS9f
pVEDgmiOpZ/go9OfAZ4nu1SwnqCaNpV+k/hM2RnlAqtaQDR89B4K18IF6odnjc9TL0kXUrsK79BD
Qp1bZQS+MElgnEqHpFjzvaopwXnZSv4CFHi6IwN2HPALY24Bo3XGW85j71HYPbwoVnZtcqdN56X6
HM0lto8=
-----END NEW CERTIFICATE REQUEST-----
```

## D

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**digital certificate** Digital representation of an entity (human or otherwise), as defined in International Organization for Standardization (ISO) standard X.509. A certificate is normally issued by a CA on behalf of an entity. Common fields within a certificate include distinguished names (DN) for the entity and CA, a serial number, expiration dates, a copy of the certificate holder's public key (used for encrypting messages and digital signatures), and the digital signature of the certificate-issuing authority so that a recipient can verify that the certificate is legitimate.

**DN** *distinguished name*. A set of attributes that help a CA to authenticate an entity for SSL.

## K

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**keystore** An exported KEYSTORE.DAT file from your Cisco *Show and Share* appliance contains a backup copy of its digital certificates.

## P

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**PEM** *privacy enhanced email*. An implementation of base64-encoded ASCII in X-509, used to protect identity certificates and CA certificates. **PEM is the only format of its kind that we support in this release.**

**private key** A cryptographic value to decrypt messages and digital signatures upon receipt by one authenticated entity from another. Each private key is unique and confidential to one entity. As one half of an asymmetric key pair, each private key is bound to its opposite half, a public key.

**public key** A cryptographic value to encrypt messages and digital signatures for delivery from one authenticated entity to another. Each public key is verifiably unique to one entity, which can reveal it widely without compromising the private key. As one half of an asymmetric key pair, each public key is bound to its opposite half, a private key.

## S

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**self-signed** Acknowledgement from an entity that its own digital certificate was not issued by, and is not signed by, any trusted certification authority. Instead, the entity issued and affixed its own signature to its digital certificate. In common practice, a self-signed digital certificate is not considered valid, authentic, or trustworthy until proven so.

**signed** Endorsement from a trusted certification authority, affixed to another entity's digital certificate. In common practice, a signed digital certificate is considered valid, authentic, and trustworthy unless proven otherwise.

## X

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**X-509** A standard for public key infrastructure. X.509 specifies, among other things, standard formats for public key certificates and a certification path validation algorithm.

# Restrictions



## Expiration

**Caution**

- In Cisco DMS 5.2.1, we do not show any advance notice as a certificate approaches its expiration date. Because most certificates are valid for years at a time, this condition is not likely to disrupt anything in your production network.
- *Show and Share* appliances refuse web connections unless their certificates are current and valid. When they are not, you must import a new certificate. You can obtain and install one from your CA or—temporarily—you can generate and use a self-signed certificate.

## Encoding

**Caution** We support only PEM in this release. Certificate import fails when you use any other encoding format. (Likewise, import of PEM-compliant certificates fails when they are wrapped within ZIP archives or any other binary file format.)

**Related Topics**

- Verify That Your Certificate Format is PEM, page 9

## Carriage Returns

**Caution** Avoid extra carriage returns at the end of a certificate file. Certificate import fails when extra carriage returns are present.

## Subject CN Elements

**Caution**

- Do not use any wildcards (*) in the common name (CN) element of a certificate's subject. Certificate import fails when a wildcard is present. For example, we would reject a certificate with ***.example.com** as its subject.
- Do not use any certificate whose subject omits the CN element. Certificate import fails when the subject is missing its CN. At least one well known certification authority (*Go Daddy*) sometimes issues certificates without any CN in their subject.

### Concatenation

**Caution** Do not combine multiple certificates together in one file. Certificate import fails for merged certificates.

# Workflows for Certificate Management

You are most likely to use AAI certificate management features in the context of a workflow.

- **Workflow A**—*Obtain and Install Provider-signed Certificates, page 5*
- **Workflow B**—*Your Certificates Expire or You Do Not Have Any Certificates, page 5*
- **Workflow C**—*Back Up and Restore Certificates, page 5*

**Workflow A**

## Obtain and Install Provider-signed Certificates

**NEW IN CISCO DMS 5.2.1**—This sequence represents the typical workflow to use digital certificates from a trusted certification authority.

1. Generate and Submit Certificate Signing Requests (CSR), page 6
2. Import (Install) Provider-signed Identity Certificates, page 10
3. View a Certificate Chain to Verify its Certificates, page 15
4. Export a Keystore to Back It Up, page 16

**Workflow B**

## Your Certificates Expire or You Do Not Have Any Certificates

**NEW IN CISCO DMS 5.2.1**—This sequence represents the typical workflow to use self-signed digital certificates.

1. Generate Self-signed Certificates, page 13
2. View a Certificate Chain to Verify its Certificates, page 15

**Workflow C**

## Back Up and Restore Certificates

**NEW IN CISCO DMS 5.2.1**—This sequence represents the typical workflow to back up your digital certificates and, later, restore them.

1. Export a Keystore to Back It Up, page 16
2. Import a Keystore to Restore It from a Backup, page 17
3. View a Certificate Chain to Verify its Certificates, page 15

# Procedures



## Generate and Submit Certificate Signing Requests (CSR)

**Caution** **WE HAVE NOT TESTED AND DO NOT SUPPORT** this procedure, except on a *Show and Share* appliance.

### Workflow Context

This topic is part of Workflow A.

### Before You Begin

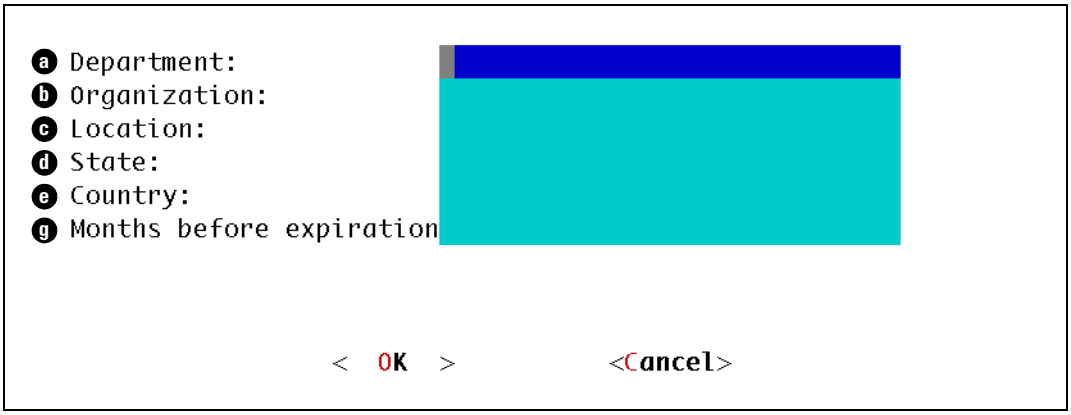
- Contact a certification authority to learn about its process to receive a request. Many CAs will expect to receive your request through their FTP or SFTP server. Although you can use any CA, these four are among the best known.
  - *VeriSign*—www.verisign.com
  - *GoDaddy*—www.godaddy.com
  - *Comodo*—www.comodo.com
  - *Network Solutions*—www.networksolutions.com
- Log in as **admin** to the Appliance Administration Interface (AAI).

### Procedure

**Step 1** Choose **CERTIFICATE_MANAGEMENT > MANAGE_SIGNED_CERTS > GENERATE_CSR**.

**Step 2** Enter values in the fields, as illustrated.

**Note** **Do not use any of these characters.**
`, + = " \ ' \ < > # ;`




a. Use the Department field to enter the name for your organizational unit—such as *Finance Ministry*, *Taiwan Office*, *College of Engineering*, or *Publications Department*. Then, press the **Down** (↓) key.

b. Use the Organization field to enter the full legal name for your entire organization, as it is known to your national government or intergovernmental authority—such as *Cisco Systems*, *Cambridge University*, or *Médecins Sans Frontières*. Then, press the **Down** (↓) key.

c. Use the Location field to enter the full and officially designated place name of your city, town, township, village, hamlet, civil parish, or settlement—such as *Madrid* or *Tokyo*. Then, press the **Down** (↓) key.

d. Use the State field to enter the full name of your state, province, commonwealth, territory, republic, periphery, dependency, or protectorate—such as *Montserrat*, *California*, *Tamil Nadu*, *Chechnya*, *São Paulo,* or *Crete*. Then, press the **Down** (↓) key.

e. Use the Country field to enter the 2-character country code, as managed by the Internet Assigned Names Agency (IANA).

- Even if this code **is *not* part** of your Internet domain name, it is a necessary attribute of your digital certificate.
- Even if this code **is part** of your Internet domain name, you must not prefix it here with a period.

**Note** Your IANA country code might differ from all country name abbreviations that you know. The "Internet Assigned Names Agency (IANA) Country Codes" section on page 18 directs you to your country code.

f. Press the **Down** (↓) key.

**Note** The "Months Before Expiration" field is not useful in this procedure. You can safely ignore it.

**Step 3** Choose **OK**.

**Step 4** Use this checklist to prequalify a CA.

- ☐ We require certificates that use PEM encoding.
  **Does the CA use PEM?**
- ☐ We require that all certificate subjects include the CN element.
  **Does the CA include the CN element?**
- ☐ We require that each certificate has its own, standalone file.
  **Does the CA isolate each certificate?**

**Step 5** After you choose a CA, enter values that it provides to you, which identify its server specifically and you specifically. Then, choose **OK**.

OR

If your CA does not use an FTP or SFTP server to receive CSRs, enter values to identify a server that you control. Later, you can retrieve your encrypted CSR for delivery to your CA through its alternative process. For example, you might paste your CSR ciphertext into a form on the CA website.

**Note** **Your CA might ask you to specify what server platform—such as Apache or Microsoft Internet Application Server (IIS)—will use your new certificate. You must choose Apache. Otherwise, your new certificate is not PEM-encoded and therefore Cisco DMS products cannot use it.**

**Step 6** Stop. You have completed this procedure.

### What to Do Next

- **OPTIONAL**—*Would you like to check whether your digital certificates use the correct format?* Go to the "Verify That Your Certificate Format is PEM" section on page 9.
- **OPTIONAL**—*Would you like to install signed digital certificates that you received from a CA?* Go to the "Import (Install) Provider-signed Identity Certificates" section on page 10.

# Verify That Your Certificate Format is PEM

**Note** We support only PEM in this release. **We do not support any other digital certificate encoding format.**

You can use an ordinary text editor, such as Notepad on Windows or TextEdit on Mac, to confirm quickly that your certificates use PEM encoding—as they must do with this release.

### Procedure

**Step 1** Start your text editor.

**Step 2** Use its **Open** command to load your unaltered certificate file for viewing.

**Step 3** Examine the certificate.

- Does its first line say exactly `-----BEGIN CERTIFICATE-----` and nothing else?
- Does its last line say exactly `-----END CERTIFICATE-----` and nothing else?

When an unaltered certificate meets these requirements, it is encoded correctly for use with this release. You can import it.

**Note** Do not merely add the BEGIN and END statements to a certificate file that lacks them. Their presence does not—by itself—change how a certificate is encoded.

**Step 4** Otherwise, do not import the certificate. We cannot use it. Contact your CA instead and request a replacement certificate that uses PEM encoding.

**Step 5** Stop. You have completed this procedure.

### What to Do Next

- **OPTIONAL**—*Would you like to install signed digital certificates that you received from a CA?* Go to the "Import (Install) Provider-signed Identity Certificates" section on page 10.

# Import (Install) Provider-signed Identity Certificates

**Caution**

- **WE HAVE NOT TESTED AND DO NOT SUPPORT** this procedure, except on a *Show and Share* appliance.
- When you import identity certificates, they overwrite all others.

### Workflow Context

This topic is part of Workflow A.

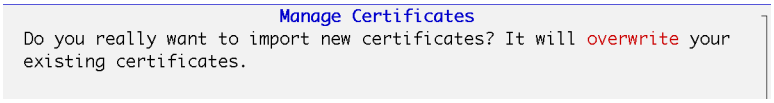
### Before You Begin

- Request and obtain a digital certificate from a trusted CA.
- Log in as **admin** to the Appliance Administration Interface (AAI).
- Consider certificate restrictions for:
  - Expiration
  - Encoding
  - Carriage Returns
  - Subject CN Elements
  - Concatenation

### Procedure

**Step 1** Choose **CERTIFICATE_MANAGEMENT > MANAGE_SIGNED_CERTS > IMPORT_CERTIFICATE**.


**Step 2** Choose **Yes** at the prompt to overwrite your active identity certificates with their replacements.



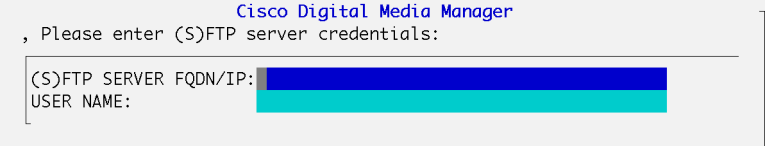

**Step 3** Enter information about the FTP or SFTP server where you store your digital certificates.

a. Use the first field to enter a routable IP address or DNS-resolvable FQDN for the server.

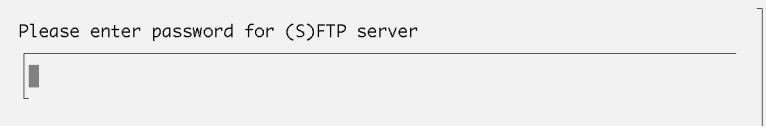
b. Press the **Down** (↓) key.

c. Use the second field to enter a username that has sufficient permissions to read your identity certificates from the server.

d. Choose **OK**.




**Step 4** Enter your password for the FTP or SFTP server, and then choose **OK**.




**Step 5** Enter absolute file paths, as prompted.

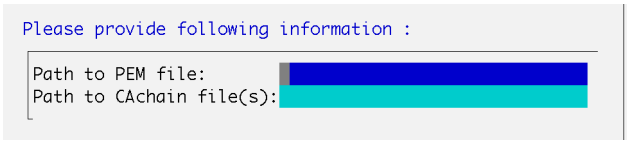
a. Use the first field to specify the path to the PEM-encoded identity certificate files for your *Show and Share* server. If you will specify more than one file, comma-separate the filenames.

**Note** Do not specify a ZIP archive that contains your PEM files. If you do, an error message will state that the certificate chain is damaged and at least one of your certificates is not formatted correctly.

b. Press the **Down** (↓) key.

c. Use the second field to specify the path to one or more files in your CAchain. For example: **`/certificate_01.crt,/certificate_02.crt,/trusted_root,crt`**

d. Choose **OK**.



**Note** An error message might state that AAI could not retrieve any CAchain files from the remote server. If so, several additional messages might load in sequence. In this case, you must choose OK after each message to dismiss it. For example, a sequence of messages might say:

- `Failed to get file usage: from remote server.`
- `Failed to get file tokenize from remote server.`
- `Failed to get file [separator] from remote server.`
- `Failed to get file [string_to_tokenize] from remote server.`
- `1 MISSING_CA_CERTIFICATE`

If access failed after AAI exceeded that maximum number of retries, please check that the server is running and reachable, and that you entered both paths correctly.

**Step 6** Stop. You have completed this procedure.

### What to Do Next

- **MANDATORY**—*The appliance identity has changed. You must now re-establish trust among your Cisco DMS appliances.* Go to the "Pair Your Appliances" section in *Administration Guide for Cisco Digital Media Suite 5.2.x Appliances* on Cisco.com.
- **OPTIONAL**—*Would you like to verify any of your digital certificates?* Go to the "View Identity Certificates" section on page 14.

### Related Topics

- Generate and Submit Certificate Signing Requests (CSR), page 6

# Generate Self-signed Certificates

**Caution** **WE HAVE NOT TESTED AND DO NOT SUPPORT** this procedure, except on a *Show and Share* appliance.

### Workflow Context

This topic is part of Workflow B.

### Before You Begin

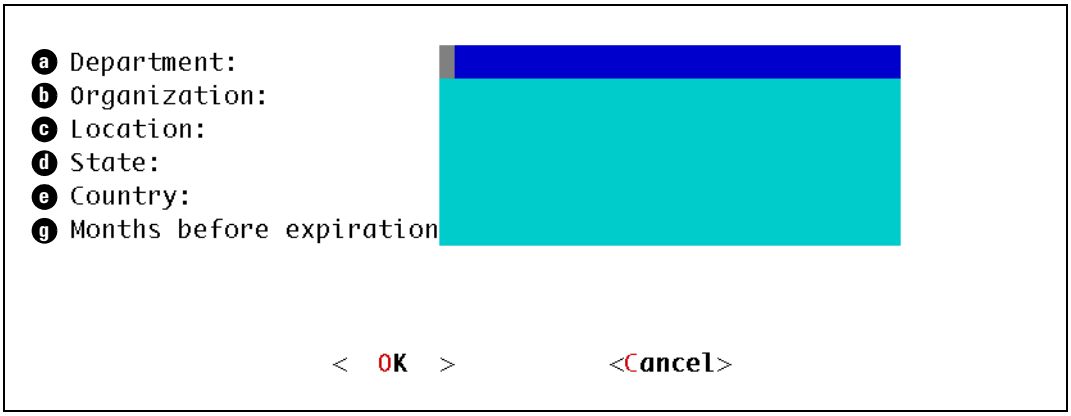
- Log in as **admin** to the Appliance Administration Interface (AAI).

### Procedure

**Step 1** Choose **CERTIFICATE_MANAGEMENT > MANAGE_SELF_SIGNED_CERTS > GENERATE_NEW_CERT**.

**Step 2** Enter values in the fields, as illustrated.

**Note** **Do not use any of these characters.**
, + = " \ ' ` < > # ;




a. Use the Department field to enter the name for your organizational unit—such as *Finance Ministry*, *Taiwan Office*, *College of Engineering*, or *Publications Department*. Then, press the **Down** (↓) key.

b. Use the Organization field to enter the full legal name for your entire organization, as it is known to your national government or intergovernmental authority—such as *Cisco Systems*, *Cambridge University*, or *Médecins Sans Frontières*. Then, press the **Down** (↓) key.

c. Use the Location field to enter the full and officially designated place name of your city, town, township, village, hamlet, civil parish, or settlement—such as *Madrid* or *Tokyo*. Then, press the **Down** (↓) key.

d. Use the State field to enter the full name of your state, province, commonwealth, territory, republic, periphery, dependency, or protectorate—such as *Montserrat*, *California*, *Tamil Nadu*, *Chechnya*, *São Paulo,* or *Crete*. Then, press the **Down** (↓) key.

e. Use the Country field to enter the 2-character country code, as managed by the Internet Assigned Names Agency (IANA).
   - Even if this code **is *not* part** of your Internet domain name, it is a necessary attribute of your digital certificate.
   - Even if this code **is part** of your Internet domain name, you must not prefix it here with a period.

**Note** Your IANA country code might differ from all country name abbreviations that you know. The "Internet Assigned Names Agency (IANA) Country Codes" section on page 18 directs you to your country code.

f. Press the **Down** (↓) key.

g. Use the Months Before Expiration field to count the months until your digital certificate should expire. Briefer durations improve security at the cost of convenience. Longer durations improve convenience at the cost of security. Permitted values range from 1 to 999.

**Step 3** Choose **OK**.

**Step 4** Stop. You have completed this procedure.

### What to Do Next

- **MANDATORY**—*The appliance identity has changed. You must now re-establish trust among your Cisco DMS appliances.* Go to the "Pair Your Appliances" section in *Administration Guide for Cisco Digital Media Suite 5.2.x Appliances* on Cisco.com.
- **OPTIONAL**—*Would you like to verify any of your digital certificates?* Go to the "View Identity Certificates" section on page 14.

# View Identity Certificates

**Caution** **WE HAVE NOT TESTED AND DO NOT SUPPORT** this procedure, except on a *Show and Share* appliance.

### Workflow Context

This topic is not part of any workflow.

### Before You Begin

- Log in as **admin** to the Appliance Administration Interface (AAI).
- Obtain and install certificates.

### Procedure

**Step 1** Choose **CERTIFICATE_MANAGEMENT > VIEW_CERTIFICATE**.

**Step 2** Examine the certificate.

**Step 3** Choose **EXIT** when you are done.

**Step 4** Stop. You have completed this procedure.

### What to Do Next

- **OPTIONAL**—*Would you like to back up your digital certificates?* Go to the "Export a Keystore to Back It Up" section on page 16.

### Related Topics

- Generate and Submit Certificate Signing Requests (CSR), page 6
- Import (Install) Provider-signed Identity Certificates, page 10
- Generate Self-signed Certificates, page 13

## View a Certificate Chain to Verify its Certificates

**Caution** **WE HAVE NOT TESTED AND DO NOT SUPPORT** this procedure, except on a *Show and Share* appliance.

### Workflow Context

This topic is part of Workflow A, Workflow B, and Workflow C.

### Before You Begin

- Log in as **admin** to the Appliance Administration Interface (AAI).
- Obtain and install certificates.

### Procedure

**Step 1** Choose **CERTIFICATE_MANAGEMENT > VIEW_CERT_CHAIN**.

**Step 2** Examine the certificate chain.

**Step 3** Choose **EXIT** when you are done.

**Step 4** Stop. You have completed this procedure.

### What to Do Next

- **OPTIONAL**—*Would you like to back up your digital certificates?* Go to the "Export a Keystore to Back It Up" section on page 16.

### Related Topics

- Generate and Submit Certificate Signing Requests (CSR), page 6
- Import (Install) Provider-signed Identity Certificates, page 10
- Generate Self-signed Certificates, page 13

# Export a Keystore to Back It Up

**Caution** **WE HAVE NOT TESTED AND DO NOT SUPPORT** this procedure, except on a *Show and Share* appliance.

### Workflow Context

This topic is part of Workflow A and Workflow C.

**Tip** Your certificates are included whenever you back up your *Show and Share* appliance from AAI.

### Before You Begin

- Log in as **admin** to the Appliance Administration Interface (AAI).
- Obtain and install certificates.

### Procedure

**Step 1** Choose **CERTIFICATE_MANAGEMENT > EXPORT_KEYSTORE**.

**Step 2** Enter the passphrase from which your private key was derived.

**Step 3** Press **Enter**.

**Step 4** Use the first field to enter a routable IP address or DNS-resolvable FQDN for the FTP or SFTP server where you will transfer an exported copy of your digital certificates.

**Step 5** Press the **Down** (↓) key.

**Step 6** Use the second field to enter a username that has read-write permissions on the server that you specified. Then, press **Enter**.

**Step 7** Enter the password that authenticates the username. Then, press **Enter**.

**Step 8** Enter the full pathname where to save your keystore file on the remote server. Then, press **Enter**.

**Step 9** Stop. You have completed this procedure.

### What to Do Next

- **OPTIONAL**—*Would you like to restore certificates from a backup?* Go to the "Import a Keystore to Restore It from a Backup" section on page 17.

### Related Topics

- Generate and Submit Certificate Signing Requests (CSR), page 6
- Import (Install) Provider-signed Identity Certificates, page 10
- Generate Self-signed Certificates, page 13

# Import a Keystore to Restore It from a Backup

**Caution** **WE HAVE NOT TESTED AND DO NOT SUPPORT** this procedure, except on a *Show and Share* appliance.

### Workflow Context

This topic is part of Workflow C.

### Before You Begin

- Log in as **admin** to the Appliance Administration Interface (AAI).
- Export a keystore.

### Procedure

**Step 1** Choose **CERTIFICATE_MANAGEMENT > IMPORT_KEYSTORE**.

**Step 2** Enter the passphrase from which your private key was derived.

**Step 3** Press **Enter**.

**Step 4** Use the first field to enter a routable IP address or DNS-resolvable FQDN for the FTP or SFTP server where you store your digital certificates.

**Step 5** Press the down key.

**Step 6** Use the second field to enter a username that has sufficient permissions to read your certificates from the server that you specified. Then, press **Enter**.

**Step 7** Enter the password that authenticates the username. Then, press **Enter**.

**Step 8** Enter the full pathname that points to your keystore file on the remote server. Then, press **Enter**.

**Step 9** Stop. You have completed this procedure.

### What to Do Next

- **MANDATORY**—*The appliance identity has changed. You must now re-establish trust among your Cisco DMS appliances.* Go to the "Pair Your Appliances" section in *Administration Guide for Cisco Digital Media Suite 5.2.x Appliances* on Cisco.com.
- **OPTIONAL**—*Would you like to verify any of your digital certificates?* Go to the "View Identity Certificates" section on page 14.

### Related Topics

- Export a Keystore to Back It Up, page 16

# Reference



## Internet Assigned Names Agency (IANA) Country Codes

Digital certificates use one standard set of codes to describe the international locations of entities whose identities are certified. IANA assigns these codes. IANA closely derives almost all of its codes from "A2" country and region codes, which the *ISO 3166-1 alpha-2* standard defines. However, the set of IANA-assigned codes is not perfectly identical to the set of A2 codes. In some cases, IANA has defined new country and region codes for its own purposes. Some of these, in turn, were then added to ISO 3166.

Furthermore, geopolitical changes over time cause governmental federations to develop and dissolve. Lands are conquered, colonized, reapportioned, renamed, and so on. Slow but continual changes like these can create confusion about which country and region code to use in a certificate signing request (CSR). And while there are precedents for deleting country codes from ISO 3166, removal there does not result in immediate removal also from the country code top-level domains (ccTLDs) that exist in DNS.

Table 1 sorts countries and regions alphabetically by their names in English. Its cross-references redirect you in cases where geopolitical events, shared governance, or other factors might lead to confusion about which code to use.

***Table 1 IANA Country and Region Codes***

| Code | Country or Region |
|---|---|
| AF | Afghanistan, Islamic State of |
| AX | Åland Islands<br>*see also* Finland |
| AL | Albania |
| DZ | Algeria, Democratic Popular Republic of |
| AS | American Samoa, Territory of<br>*see also* Guam, Territory of; Northern Mariana Islands, Commonwealth of the; Puerto Rico, Commonwealth of; Samoa, Independent State of; United States of America, Federal Union of the; and Virgin Islands, U.S. Territory of the |
| For *Andaman*, see India | |
| AD | Andorra, Principality of |
| AO | Angola |
| AI | Anguilla |
| AQ | Antarctica |
| AG | Antigua and Barbuda |
| For *Aosta Valley*, see Italy | |
| AR | Argentina |
| AM | Armenia |

*Table 1 IANA Country and Region Codes (continued)*

| Code | Country or Region |
|---|---|
| AW | Aruba |
| For *Ascension*, see Saint Helena, Ascension and Tristan da Cunha | |
| AC | Ascension Island<br>*see also* Saint Helena, Ascension and Tristan da Cunha |
| For *Assam*, see India | |
| AU | Australia<br>**Note** All subdomains that previously used OZ as their country code top-level domain were transitioned to OZ.AU. |
| AT | Austria |
| AZ | Azerbaijan |
| BS | Bahamas, Commonwealth of |
| BH | Bahrain, Emirate of |
| For *Bali*, see Indonesia | |
| BD | Bangladesh |
| For *Bangui*, see Central African Republic | |
| BB | Barbados |
| For *Barbuda*, see Antigua and Barbuda | |
| BY | Belarus |
| BE | Belgium, Kingdom of |
| BZ | Belize |
| For *Bengal*, see Bangladesh and India | |
| BJ | Benin |
| BM | Bermuda |
| BT | Bhutan, Kingdom of |
| For *Bodoland Territory*, see India | |
| BO | Bolivia |
| For *Bolzano-Bozen (Alto Adige-South Tyrol)*, see Austria; Germany, Federal Republic of; Hungary; and Italy | |
| For *Borneo*, see Indonesia | |
| BA | Bosnia and Herzegovina |
| BW | Botswana |
| For *Bougainville*, see Papua New Guinea, Independent State of | |
| BV | Bouvet Island, Territory of<br>**Note** Although the BV country code exists in *ISO-3166-1 alpha-2*, and exists as a country code top-level domain in DNS, it does not contain any subdomains.. |
| BR | Brazil, Federative Republic of |
| For *Britain*, see Ireland and United Kingdom of Great Britain and Northern Ireland | |
| IO | British Indian Ocean Territory |

*Table 1 IANA Country and Region Codes (continued)*

| Code | Country or Region |
|---|---|
| BN | Brunei Darussalam, Sultanate of |
| For *Brussels*, see Belgium, Kingdom of | |
| For *Buenos Aires*, see Argentina | |
| BG | Bulgaria |
| BF | Burkina Faso |
| For *Burma*, see Myanmar | |
| BI | Burundi |
| For *Caicos Islands*, see Turks and Caicos Islands, Territory of | |
| KH | Cambodia, Kingdom of |
| CM | Cameroon |
| CA | Canada |
| CV | Cape Verde |
| KY | Cayman Islands |
| CF | Central African Republic |
| For *Ceuta*, see Spain | |
| For *Ceylon*, see Sri Lanka | |
| TD | Chad |
| For *Chakma Autonomous District*, see India | |
| For *Channel Islands*, see Guernsey, Bailiwick of and Jersey, Bailiwick of | |
| For *Chiapas*, see Mexico | |
| CL | Chile |
| CN | China, People's Republic of<br>*see also* Hong Kong; Macau, Special Administrative Region of; and Taiwan, Republic of China |
| CX | Christmas Island, Territory of |
| CC | Cocos (Keeling) Islands |
| CO | Colombia |
| KM | Comoros |
| CG | Congo<br>*see also* Congo, the Democratic Republic of the |
| CD | Congo, the Democratic Republic of the<br>*see also* Congo |
| CK | Cook Islands |
| For *Corsica, Territorial Collectivity of*, see France, Metropolitan | |
| CR | Costa Rica |
| CI | Cote d'Ivoire |

*Table 1 IANA Country and Region Codes (continued)*

| Code | Country or Region |
|---|---|
| HR | Croatia |
| CU | Cuba |
| CY | Cyprus |
| For *Czechoslovalia*, see Czech Republic | |
| CZ | Czech Republic<br>*see also* Slovakia |
| For *Darjeeling Gorkha Hills*, see India | |
| DK | Denmark, Kingdom of<br>*see also* Faroe Islands and Greenland |
| DJ | Djibouti |
| DM | Dominica, Commonwealth of<br>*see also* Dominican Republic |
| DO | Dominican Republic<br>*see also* Dominica, Commonwealth of |
| For *East Bengal*, see Bangladesh and Pakistan, Islamic Republic of | |
| For *East Indies*, see Indonesia; Malaysia, Kingdom of; Philippines; and Solomon Islands | |
| For *East Timor*, see Timor-Leste | |
| EC | Ecuador |
| EG | Egypt, Arab Republic of |
| SV | El Salvador |
| GQ | Equatorial Guinea |
| For *Ghana*, see Ghana | |
| For *Guiana*, see French Guiana, Overseas Department of | |
| For *Guinea*, see Guinea | |
| For *Guyana*, see Guyana, Cooperative Republic of | |
| ER | Eritrea |
| EE | Estonia |
| ET | Ethiopia, Federal Democratic Republic of |
| EU | European Union |
| FK | Falkland Islands (Malvinas Islas), Colony of |
| FO | Faroe Islands |
| FJ | Fiji |
| FI | Finland<br>*see also* Åland Islands |
| FR | France |
| FX | France, Metropolitan |

*Table 1 IANA Country and Region Codes (continued)*

| Code | Country or Region |
|---|---|
| GF | French Guiana, Overseas Department of |
| | For *Equatorial Guinea*, see Equatorial Guinea |
| | For *Ghana*, see Ghana |
| | For *Guinea*, see Guinea |
| | For *Guyana*, see Guyana, Cooperative Republic of |
| PF | French Polynesia, Overseas Territory of |
| TF | French Southern Territories |
| | For *Friuli-Venezia Giula*, see Croatia; Italy; and Slovenia |
| GA | Gabon |
| GM | Gambia |
| | For *Garo Hills Autonomous District*, see India |
| GE | Georgia<br>*see also* South Georgia and the South Sandwich Islands |
| DE | Germany, Federal Republic of |
| GH | Ghana |
| | For *Equatorial Guinea*, see Equatorial Guinea |
| | For *Guiana*, see French Guiana, Overseas Department of |
| | For *Guinea*, see Guinea |
| | For *Guyana*, see Guyana, Cooperative Republic of |
| GI | Gibraltar |
| | For *Gilbert Islands*, see Kiribati |
| | For *Great Britain*, see United Kingdom of Great Britain and Northern Ireland |
| GR | Greece |
| GL | Greenland<br>*see also* Denmark, Kingdom of and Faroe Islands |
| GD | Grenada<br>*see also* Saint Vincent and the Grenadines |
| | For *Grenadines*, see Saint Vincent and the Grenadines |
| GP | Guadeloupe and Dependencies, Overseas Department of |
| GU | Guam, Territory of<br>*see also* American Samoa, Territory of; Northern Mariana Islands, Commonwealth of the; Puerto Rico, Commonwealth of; United States of America, Federal Union of the; and Virgin Islands, U.S. Territory of the |
| | For *Guangxi Zhung Autonomous Region*, see China, People's Republic of |
| GT | Guatemala |

*Table 1 IANA Country and Region Codes (continued)*

| Code | Country or Region |
|---|---|
| GG | Guernsey, Bailiwick of<br>*see also* Jersey, Bailiwick of |
| For *Guiana*, see French Guiana, Overseas Department of | |
| GN | Guinea<br>*see also* Guinea-Bissau |
| GW | Guinea-Bissau<br>*see also* Guinea |
| GY | Guyana, Cooperative Republic of |
| For *Equatorial Guinea*, see Equatorial Guinea<br>For *Ghana*, see Ghana<br>For *Guiana*, see French Guiana, Overseas Department of<br>For *Guinea*, see Guinea | |
| HT | Haiti |
| HM | Heard and McDonald Islands, Territory of |
| For *Herzegovina*, see Bosnia and Herzegovina | |
| VA | Holy See, State of Vatican City<br>*see also* Italy |
| HN | Honduras |
| HK | Hong Kong<br>*see also* China, People's Republic of; Macau, Special Administrative Region of; and Taiwan, Republic of China |
| HU | Hungary |
| IS | Iceland |
| IN | India |
| ID | Indonesia |
| For *Inner Mongolia Autonomous Region*, see China, People's Republic of | |
| IR | Iran, Islamic Republic of |
| IQ | Iraq |
| For *Iraqi Kurdistan*, see Iraq | |
| IE | Ireland |
| IM | Isle of Man, Territory of |
| IL | Israel, State of<br>*see also* Palestine, Occupied Territory of |
| IT | Italy<br>*see also* Holy See, State of Vatican City |
| For *Ivory Coast*, see Cote d'Ivoire | |

*Table 1 IANA Country and Region Codes (continued)*

| Code | Country or Region |
|---|---|
| | For *Jaintia Hills Autonomous District*, see India |
| JM | Jamaica |
| | For *Jammu*, see India |
| | For *Jan Mayen*, see Svalbard and Jan Mayen Islands, Territory of |
| JP | Japan, Imperial State of |
| | For *Java*, see Indonesia |
| | For *Jeju-do*, see Korea, Republic of |
| JE | Jersey, Bailiwick of<br>*see also* Guernsey, Bailiwick of |
| | For *Jewish Autonomous Oblast*, see Russia, Federation of |
| JO | Jordan, Hashemite Kingdom of |
| | For *Kampuchea*, see Cambodia, Kingdom of |
| | For *Karbi Anglong Autonomous Council*, see India |
| | For *Kashmir*, see China, People's Republic of; India; and Pakistan, Islamic Republic of |
| KZ | Kazakhstan |
| | For *Keeling Islands*, see Cocos (Keeling) Islands |
| KE | Kenya |
| | For *Khasi Hills Autonomous District*, see India |
| KI | Kiribati<br>*see also* Marshall Islands; Micronesia, Federated States of; and Nauru |
| KP | Korea, Democratic People's Republic of<br>*see also* Korea, Republic of |
| KR | Korea, Republic of<br>*see also* Korea, Democratic People's Republic of |
| | For *Kosovo*, see Serbia |
| | For *Kurdistan*, see Armenia; Iran, Islamic Republic of; Iraq; Syria, Arab Republic of; and Turkey |
| KW | Kuwait, Emirate of |
| KG | Kyrgyzstan |
| | For *Ladakh Autonomous Hill Development*, see India |
| | For *Lai Autonomous District*, see India |
| LA | Lao People's Democratic Republic |
| LV | Latvia |
| LB | Lebanon |
| LS | Lesotho, Kingdom of |
| LR | Liberia |
| LY | Libyan Arab Jamahiriya, Socialist People's |

*Table 1 IANA Country and Region Codes (continued)*

| Code | Country or Region |
|---|---|
| LI | Liechtenstein, Principality of |
| LT | Lithuania |
| LU | Luxembourg, Grand Duchy of |
| For *Luzon*, see Philippines | |
| MO | Macau, Special Administrative Region of<br>*see also* China, People's Republic of; Hong Kong; and Taiwan, Republic of China |
| MK | Macedonia, the former Yugoslav Republic of |
| MG | Madagascar |
| For *Madeira*, see Portugal | |
| MW | Malawi |
| For *Malay Archipelago*, see Malaysia, Kingdom of and Philippines | |
| For *Malay Peninsula*, see Malaysia, Kingdom of; Myanmar; Philippines; Singapore; and Thailand, Kingdom of | |
| MY | Malaysia, Kingdom of<br>*see also* Singapore |
| MV | Maldives |
| ML | Mali |
| MT | Malta |
| For *Malvinas*, see Falkland Islands (Malvinas Islas), Colony of | |
| For *Mara Autonomous District*, see India | |
| MH | Marshall Islands<br>*see also* Kiribati and Micronesia, Federated States of |
| For *Mariana Islands*, see Northern Mariana Islands, Commonwealth of the | |
| MQ | Martinique, Overseas Department of the |
| MR | Mauritania, Islamic Republic of<br>*see also* Mauritius |
| MU | Mauritius<br>*see also* Mauritania, Islamic Republic of |
| YT | Mayotte, Territorial Collectivity of |
| For *McDonald Islands*, see Heard and McDonald Islands, Territory of | |
| For *Meghalaya*, see India | |
| For *Melilla*, see Spain | |
| MX | Mexico |
| FM | Micronesia, Federated States of<br>*see also* Kiribati; Marshall Islands; and Northern Mariana Islands, Commonwealth of the |
| For *Mindanao*, see Philippines | |
| For *Miquelon*, see Saint Pierre and Miquelon, Overseas Territorial Collectivity of | |

*Table 1 IANA Country and Region Codes (continued)*

| Code | Country or Region |
|---|---|
| | For *Mizoram*, see India |
| | For *Moldavia*, see Moldova, Republic of |
| MD | Moldova, Republic of |
| MC | Monaco, Principality of |
| MN | Mongolia |
| ME | Montenegro |
| MS | Montserrat, Territory of |
| MA | Morocco, Kingdom of |
| | For *Mount Athos*, see Greece |
| MZ | Mozambique |
| MM | Myanmar |
| NA | Namibia<br>*see also* South Africa |
| NR | Nauru<br>*see also* Kiribati; Marshall Islands; and Micronesia, Federated States of |
| NP | Nepal, Kingdom of |
| NL | Netherlands, Kingdom of the<br>*see also* Netherlands Antilles |
| AN | Netherlands Antilles<br>*see also* Netherlands, Kingdom of the |
| | For *Nevis*, see Saint Kitts and Nevis |
| NC | New Caledonia and Dependencies, Overseas Territory of |
| | For *New Guinea*, see Papua New Guinea, Independent State of |
| | For *New Hebrides*, see Vanuatu |
| NZ | New Zealand<br>*see also* Cook Islands; Niue; and Tokelau |
| NI | Nicaragua |
| | For *Nicobar Islands*, see India |
| NE | Niger<br>*see also* Nigeria, Federal Republic of |
| NG | Nigeria, Federal Republic of<br>*see also* Niger |
| | For *Ningxia Hui Autonomous Region*, see China, People's Republic of |
| NU | Niue<br>*see also* Cook Islands; New Zealand; and Tokelau |
| NF | Norfolk Island, Territory of |

*Table 1 IANA Country and Region Codes (continued)*

| Code | Country or Region |
|---|---|
| For *North Cachar Hills Autonomous District*, see India | |
| For *North Korea*, see Korea, Democratic People's Republic of | |
| For *North Sentinel Island*, see India | |
| MP | Northern Mariana Islands, Commonwealth of the<br>*see also* American Samoa, Territory of, Guam, Territory of, Puerto Rico, Commonwealth of, United States of America, Federal Union of the, and Virgin Islands, U.S. Territory of the |
| NO | Norway, Kingdom of |
| OM | Oman, Sultanate of |
| PK | Pakistan, Islamic Republic of |
| PW | Palau |
| PS | Palestine, Occupied Territory of<br>*see also* Israel, State of |
| PA | Panama, Unified Republic of |
| PG | Papua New Guinea, Independent State of |
| PC | Paracel Islands, Territory of |
| PY | Paraguay |
| For *Peninsular Malaysia*, see Malaysia, Kingdom of | |
| PE | Peru |
| PH | Philippines |
| PN | Pitcairn |
| PL | Poland |
| For *Polynesia*, see French Polynesia, Overseas Territory of | |
| PT | Portugal |
| TP | *Portuguese Timor* (being phased out) |
| For *Principe*, see Sao Tome and Principe | |
| PR | Puerto Rico, Commonwealth of<br>*see also* American Samoa, Territory of, Guam, Territory of, Northern Mariana Islands, Commonwealth of the, United States of America, Federal Union of the, and Virgin Islands, U.S. Territory of the |
| QA | Qatar, Emirate of |
| RE | Reunion, Overseas Department of the |
| For *Rhodesia*, see Zambia and Zimbabwe | |
| For *Rodrigues*, see Mauritius | |
| RO | Romania |
| RU | Russia, Federation of |
| RW | Rwanda |
| For *Sahara*, see Western Sahara | |

*Table 1 IANA Country and Region Codes (continued)*

| Code | Country or Region |
|---|---|
| BL | Saint Barthelemy<br>**Note** Although the BL country code exists in *ISO-3166-1 alpha-2*, and exists as a country code top-level domain in DNS, it does not contain any subdomains. |
| SH | Saint Helena, Ascension and Tristan da Cunha<br>*see also* Ascension Island |
| KN | Saint Kitts and Nevis |
| LC | Saint Lucia |
| MF | Saint Martin<br>**Note** Although the MF country code exists in *ISO-3166-1 alpha-2*, and exists as a country code top-level domain in DNS, it does not contain any subdomains. |
| PM | Saint Pierre and Miquelon, Overseas Territorial Collectivity of |
| VC | Saint Vincent and the Grenadines<br>*see also* Grenada |
| WS | Samoa, Independent State of<br>*see also* American Samoa, Territory of |
| SM | San Marino |
| For *Sandwich Islands*, see South Georgia and the South Sandwich Islands | |
| ST | Sao Tome and Principe |
| For *Sardinia*, see Italy | |
| SA | Saudi Arabia, Kingdom of |
| For *Scotland*, see United Kingdom of Great Britain and Northern Ireland | |
| SN | Senegal |
| RS | Serbia |
| SC | Seychelles |
| For *Siam*, see Thailand, Kingdom of | |
| For *Sicily*, see Italy | |
| SL | Sierra Leone |
| SG | Singapore<br>*see also* Malaysia, Kingdom of |
| SK | Slovakia<br>*see also* Czech Republic |
| SI | Slovenia<br>*see also* Macedonia, the former Yugoslav Republic of |
| SB | Solomon Islands |
| SO | Somalia |

*Table 1 IANA Country and Region Codes (continued)*

| Code | Country or Region |
|---|---|
| ZA | South Africa<br>*see also* Namibia |
| GS | South Georgia and the South Sandwich Islands |
| For *South Korea*, see Korea, Republic of | |
| For *South Sandwich Islands*, see South Georgia and the South Sandwich Islands | |
| For *South Yemen*, see Yemen | |
| For *Southern Sudan*, see Sudan | |
| SU | Soviet Union (being phased out) |
| ES | Spain |
| LK | Sri Lanka |
| SD | Sudan |
| For *Sulawesi*, see Indonesia | |
| For *Sumatra*, see Indonesia | |
| SR | Suriname |
| SJ | Svalbard and Jan Mayen Islands, Territory of<br>**Note** Although the SJ country code exists in *ISO-3166-1 alpha-2*, and exists as a country code top-level domain in DNS, it does not contain any subdomains.. |
| SZ | Swaziland |
| SE | Sweden, Kingdom of |
| CH | Switzerland |
| SY | Syria, Arab Republic of |
| TW | Taiwan, Republic of China<br>*see also* China, People's Republic of, Hong Kong, and Macau, Special Administrative Region of |
| TJ | Tajikistan |
| For *Tanganyika*, see Tanzania, United Republic of | |
| TZ | Tanzania, United Republic of |
| For *Tashkent*, see Uzbekistan | |
| TH | Thailand, Kingdom of |
| For *Tibet Autonomous Region*, see China, People's Republic of | |
| TL | Timor-Leste |
| For *Tobago*, see Trinidad and Tobago | |
| TG | Togo |
| TK | Tokelau<br>*see also* Cook Islands; New Zealand; and Niue |
| TO | Tonga, Kingdom of |
| For *Trento (Trentino)*, see Austria; Germany, Federal Republic of; Hungary; and Italy | |

*Table 1 IANA Country and Region Codes (continued)*

| Code | Country or Region |
|---|---|
| TT | Trinidad and Tobago |
| For *Tripura Tribal Areas Autonomous District*, see India | |
| For *Tristan da Cunha*, see Saint Helena, Ascension and Tristan da Cunha | |
| TN | Tunisia |
| TR | Turkey |
| TM | Turkmenistan |
| TC | Turks and Caicos Islands, Territory of |
| TV | Tuvalu |
| UG | Uganda |
| UA | Ukraine |
| AE | United Arab Emirates |
| GB | United Kingdom of Great Britain and Northern Ireland |
| UK | **Note** Although the GB region code exists in *ISO-3166-1 alpha-2*, and exists as a country code top-level domain (ccTLD) in DNS, it contains only one subdomain. Other United Kingdom sites use UKas their ccTLD. Nonetheless, IANA defined the UK region code, which does not exist in *ISO 3166-1 alpha-2*. |
| US | United States of America, Federal Union of the<br>*see also* American Samoa, Territory of, Guam, Territory of, Northern Mariana Islands, Commonwealth of the, Puerto Rico, Commonwealth of, and Virgin Islands, U.S. Territory of the |
| UM | United States Minor Outlying Islands<br>**Note** Although the UM country code top-level domain was deactivated, it is still available with restrictions. |
| UY | Uruguay |
| UZ | Uzbekistan |
| VU | Vanuatu |
| For *Vatican*, see Holy See, State of Vatican City | |
| VE | Venezuela, Bolivarian Republic of |
| VN | Viet Nam, Socialist Republic of |
| VG | Virgin Islands, British Territory of the |
| VI | Virgin Islands, U.S. Territory of the<br>*see also* American Samoa, Territory of, Guam, Territory of, Northern Mariana Islands, Commonwealth of the, Puerto Rico, Commonwealth of, and United States of America, Federal Union of the |
| For *Visayas*, see Philippines | |
| For *Vojvodina*, see Serbia | |
| For *Volta*, see Burkina Faso | |
| For *Wales*, see United Kingdom of Great Britain and Northern Ireland | |

*Table 1 IANA Country and Region Codes (continued)*

| Code | Country or Region |
|---|---|
| WF | Wallis and Futuna Islands, Overseas Territory of |
| For *West Bengal*, see Bangladesh and India | |
| EH | Western Sahara<br>**Note** Although the EH country code exists in *ISO-3166-1 alpha-2*, it does not exist as a country code top-level domain in DNS. |
| For *Xinjiang Uyghur Autonomous Region*, see China, People's Republic of | |
| YE | Yemen |
| YU | Yugoslavia, Federation of<br>**Note** Most, if not all, sites that used the YU country code top-level domain have been reassigned to Serbia or Montenegro. |
| For *Yugoslav Republic*, see Bosnia and Herzegovina; Croatia; Macedonia, the former Yugoslav Republic of; Montenegro; Serbia; Slovenia; and Yugoslavia, Federation of | |
| For *Zaire*, see Congo, the Democratic Republic of the | |
| ZM | Zambia |
| For *Zanzibar*, see Tanzania, United Republic of | |
| For *Zelaya*, see Nicaragua | |
| ZW | Zimbabwe |

# FAQs and Troubleshooting



## FAQs

**Q. What's the difference between a provider-signed certificate and a self-signed certificate?**

**A.** Please compare and contrast these definitions from the "Terminology" section on page 2.

- signed
- self-signed

# Troubleshooting



## Error Messages

Error messages guide you if problems affect your digital certificates. These messages describe a problem and suggest possible ways to solve it.

**Error Message** `Cannot process CA certificate:`

**Explanation** **`<exception message>`**

**Recommended Action** Cause unknown. We cannot recommend any workaround.

**Error Message** `Cannot unpack` **`<archive file path>.`**

**Explanation** The archive is corrupted or its source was not valid.

**Recommended Action** Cause unknown. We cannot recommend any workaround.

**Error Message** `Certificate import failed.`

**Explanation** An internal error occurred.

**Recommended Action** Please contact Cisco technical support.

**Error Message** `Certificate import failed.`

**Explanation** At least one parameter is not valid.

**Recommended Action** Cause unknown. We cannot recommend any workaround.

**Error Message** `Certificate is not readable or does not exist:`

**Explanation** **`<absolute file path>`**

**Recommended Action** Cause unknown. We cannot recommend any workaround.

**Error Message** `Certificate not yet valid.`

**Explanation** It takes effect in the future, on **`<date in YYYY-MM-DD format>`**.

**Recommended Action** Please check that it is correct.

**Error Message** `Certificate rejected.`

**Explanation** It does not match the newest certificate signing request (CSR) for **<FQDN>**.

**Recommended Action** Please generate a new certificate signing request (CSR), and then contact your certification authority (CA).

**Error Message** `Certificate rejected.`

**Explanation** It has expired and is no longer valid.

**Recommended Action** Please generate a new certificate signing request (CSR), and then contact your certification authority (CA).

**Error Message** `Certificate rejected.`

**Explanation** Its subject does not match **<FQDN>**.

**Recommended Action** Please confirm that you imported the correct identity certificate. Alternatively, please generate a new certificate signing request (CSR), and then contact your certification authority (CA).

**Error Message** `Internal Error:`

**Explanation** Cannot build certificate chain.

**Recommended Action** Confirm that no CA certificates are missing.

**Error Message** `The certificate chain is broken.`

**Explanation** An identity certificate is missing for **<FQDN>**.

**Recommended Action** Please edit the certificate chain to include all digital certificates that your certification authority (CA) has issued to you.

**Error Message** `Warning! Browsers will reject this certificate.`

**Explanation** It is self-signed.

**Recommended Action** We recommend that you use certificates from a valid certification authority (CA).