BOSCH
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Intelligent Insights Certificate handling 1.0.2

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1 Introduction

This technical note describes how to install and configure certificates with Intelligent Insights. It also describes the different security options.

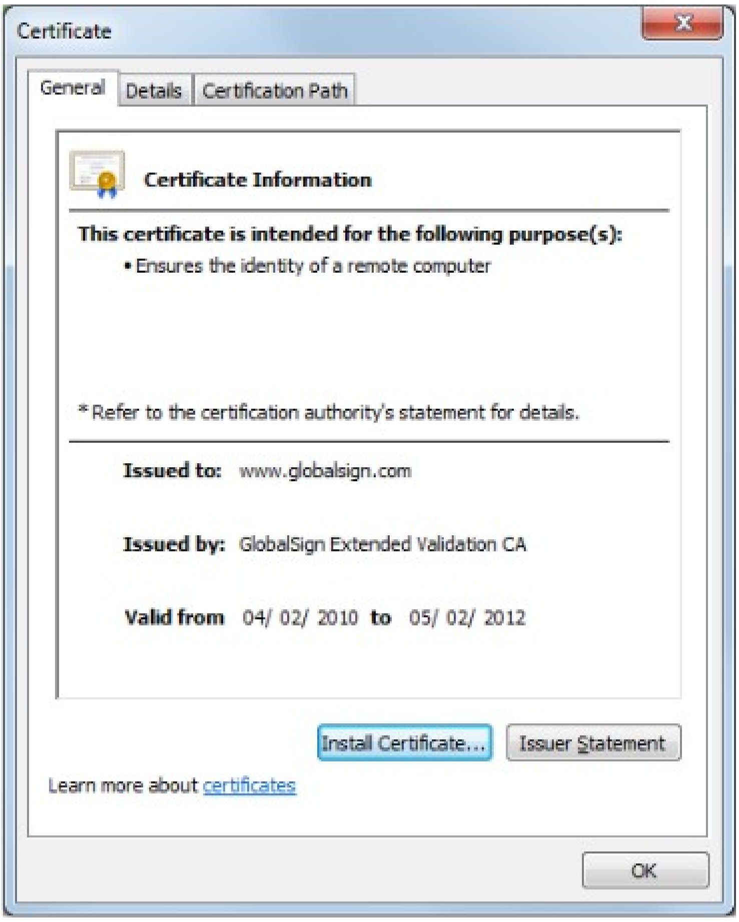
TLS (Transport Layer Security) is a common security protocol that most web servers use to ensure a secure machine-to-machine connection via an unsecure network like the internet. This white paper helps you choosing the most suitable type of certificate for your business's requirements, whether an internal network or external website. It informs about the features and benefits of using TLS, describes the different available types of certificates and also recommends the appropriate use of each type.

1.1 About TSL

The Transport Layer Security (TLS) along with Secure Sockets Layer (SSL) is the most common security protocol today. Essentially, it provides a secure channel between two machines operating via the internet or an internal network. TLS/SSL is used when a web browser needs to securely connect to a web server via the unsecure internet.

The key success of TLS/SSL is the simplicity to the end user. Technically, TLS/SSL is a transparent protocol, which requires little interaction from the end user when establishing a secure session. In the instance of a browser, the end user is alerted about the use of TLS/SSL as they see a yellow padlock. In the case of Extended Validation TLS/SSL, the address bar displays a padlock, also switches the address bar green and displays the URL as HTTPS. Websites use HTTP as standard, which is unsecure and subject to eavesdropping attacks. Especially if critical information like credit card details and account logins are transmitted, the websites can give attackers access to online accounts and sensitive information, leading to fraud or even identity theft.

1.2 About TLS/SSL certificates



Certificate

General | Details | Certification Path

Certificate Information

This certificate is intended for the following purpose(s):

- Ensures the identity of a remote computer

* Refer to the certification authority's statement for details.

Issued to: www.globalsign.com

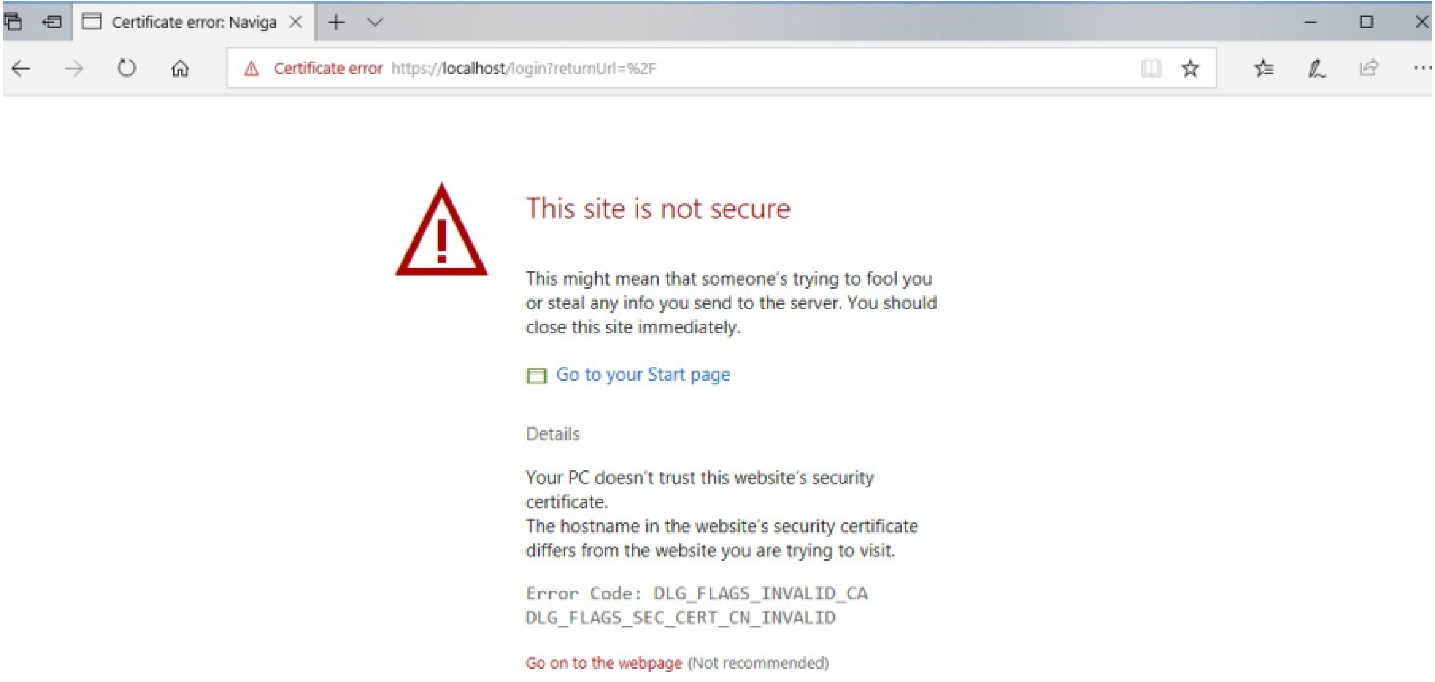
Issued by: GlobalSign Extended Validation CA

Valid from 04/ 02/ 2010 to 05/ 02/ 2012

A TLS/SSL certificate is required in order to access and use a TLS/SSL protocol. A TLS/SSL certificate is a small data file issued by one of a limited number of trusted certificate authorities (CAs), such as GlobalSign, that digitally bind a cryptographic key to organizations corporate details. Such details can include domain, server or host name, company name and location and in some cases organizational contact details.
Organizations need to install the certificate on their web servers to initiate SSL sessions with browsers.
An individual or an organization can apply for varying levels of vetting for each type of certificate. Once a certificate is installed, it is possible to connect to a website using a HTTPS connection. A HTTPS connnection establishes a secure connection with the browser. When the secure connection is established, all web traffic between server and browser is secure.
Anyone can view a TLS/SSL certificate in a browser by clicking on a padlock symbol and selecting **View Certificate**. Different browsers display the certificate in different ways, but the information is the same.

1.3 Self signed and trusted certifcates

Security wise, both certificates work in the same way. Data transferred through a SSL or HTTPS connection is encrypted to provide a high level of security. The difference is getting customers' trust. A certificate from a CA implies that your website is secure as it is certified by a trusted source. CAs, like Verisign, verify the ownership of the domain and even check the trustworthiness of the business before issuing an SSL security certificate. That is why customers trust Verisign certificates when providing sensitive information such as credit card details to e-commerce sites.
Security certificates from a certificate authority are not free of charge. You have to pay for an SSL security certificate. To optimize costs, you can use a self-signed certificate whenever possible. For instance, webpages that do not require credit card information or sensitive data can be handled with a self-signed certificate. More specifically, when developers are working on a secure website, they can test the site using a self-signed SSL security certificate.
The primary operational difference between a self-signed certificate and a CA certificate is that with a self-signed certificate, the browser will generally give an error warning that the certificate is not issued by a CA.


Certificate error: Naviga
Certificate error https://localhost/login?returnUrl=%2F

This site is not secure

This might mean that someone's trying to fool you or steal any info you send to the server. You should close this site immediately.

Go to your Start page

Details

Your PC doesn't trust this website's security certificate.
The hostname in the website's security certificate differs from the website you are trying to visit.

Error Code: DLG_FLAGS_INVALID_CA
DLG_FLAGS_SEC_CERT_CN_INVALID

Go on to the webpage (Not recommended)

This is the same warning message you receive when connecting to Intelligent Insights using a self-signed certificate. Generally, this warning should occur only once per browsing session.

1.3.1 Risk of using self-signed on public sites

The security warnings associated with self-signed SSL certificates could scare potential clients that the website does not secure their credentials. Both, brand reputation and customer trust, could be damaged.

1.3.2 Risk of using self-signed on internal sites

While the dangers of using self-signed certificates on public sites may be obvious, there is also a risk of using them internally. Self-signed certificates on internal sites (for example employee portals) still result in browser warnings. Many organizations advise employees to simply ignore the warnings, since they know the internal site is safe. But this can encourage dangerous public browsing behavior. Employees accustomed to ignore warnings on internal sites may be inclined to ignore warnings on public sites as well, leaving them, and your organization, vulnerable to malware and other threats.

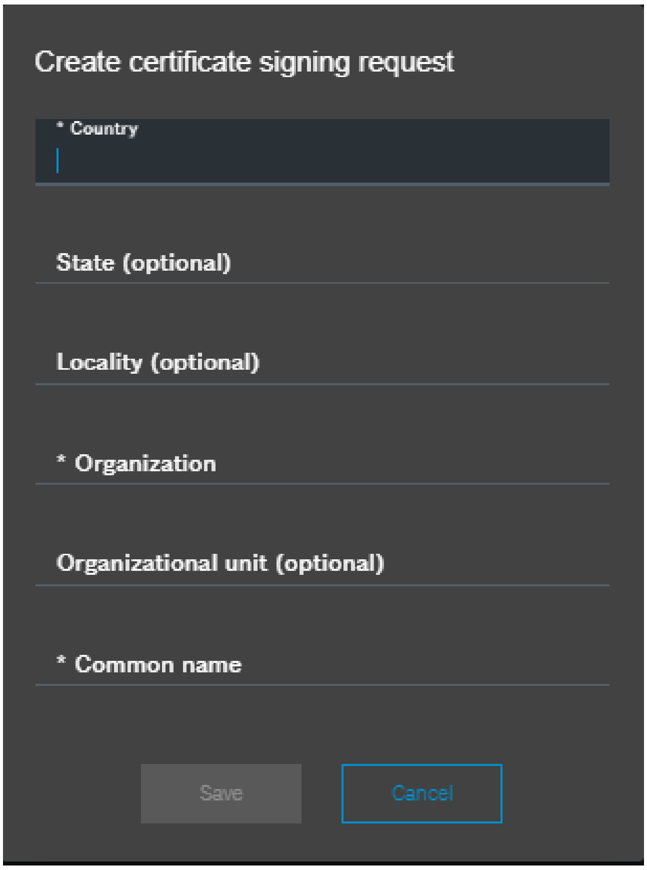
2 Managing certificates in Intelligent Insights

2.1 Signing request

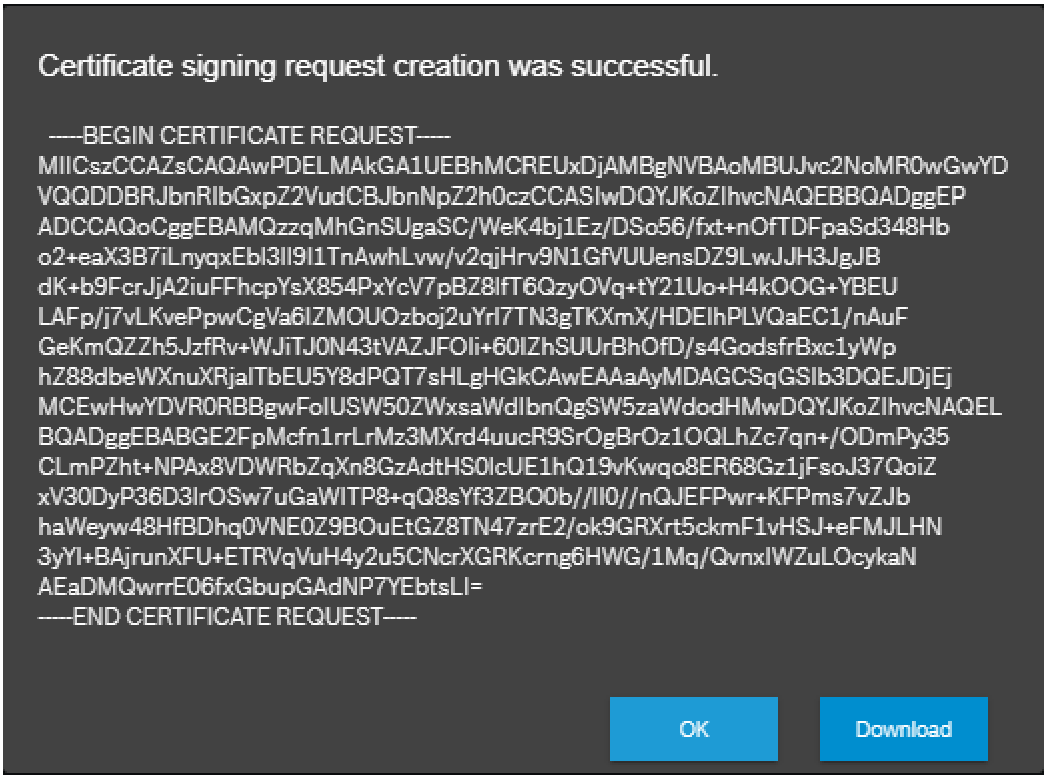
SSL secures all website traffic between two points, ensuring that any data shared between your customers and your webserver is safe and secure. It achieves this in two ways:

- It encrypts the data between the two computers, preventing anyone from eavesdropping on your communications.
- It confirms the identity of the website you are communicating with.

In order to confirm your identity it is important that a "trusted authority" that vouches for your identity, signs your SSL certificate. You can ask a "trusted authority" to sign a certificate confirming your identity by creating a certificate signing request and submitting it to a certified agent. The certificate signing request will generate the private and public keys that are needed to encrypt data between yourself and your customers. It will also record information regarding your company or organization.
A certificate signing request (CSR) is a message that an applicant (usually a person or organization who owns a website that needs to be secured) sends to a certification authority in order to apply for a specific digital identity certificate.
A CSR is usually generated by the server software, which the certificate uses on. The request contains a block of encrypted text which contains specific information that will be included in the certificate such as the owner or organization name, domain name or common name, country, locality, email address, etc.
For details on the included information, see chapter 2.3 Create self-signed certificate. To start a signing request provide at least the "Country code" and "Common Name".



Create certificate signing request



Certificate signing request creation was successful.

```
-----BEGIN CERTIFICATE REQUEST-----
MIICszCCAZsCAQAwPDELMAkGA1UEBhMCREUxDjAMBgNVBAoMBUJvc2NoMR0wGwYD
VQQDDBRJbnRlbGxpZ2VudCBJbnNpZ2h0czCCASIwDQYJKoZIhvcNAQEBBQADggEP
ADCCAQoCggEBAMQzzqMhGnSUgaSC/WeK4bj1Ez/DSo56/fxt+nOfTDFpaSd348Hb
o2+eaX3B7iLnyqxEbl3Il9I1TnAwhLvw/v2qjHrv9N1GfVUUensDZ9LwJJH3JgJB
dK+b9FcrJjA2iuFFhcpYsX854PxYcV7pBZ8IfT6QzyOVq+tY21Uo+H4kOOG+YBEU
LAFp/j7vLKvePpwCgVa6IZMOUOzboj2uYrl7TN3gTKXmX/HDEIhPLVQaEC1/nAuF
GeKmQZZh5JzfRv+WJiTJ0N43tVAZJFOli+60IZhSUUrBhOfD/s4GodsfrBxc1yWp
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MCEwHwYDVR0RBBgwFoIUSW50ZWxsaWdlbnQgSW5zaWdodHMwDQYJKoZIhvcNAQEL
BQADggEBABGE2FpMcfn1rrLrMz3MXrd4uucR9SrOgBrOz1OQLhZc7qn+/ODmPy35
CLmPZht+NPAx8VDWRbZqXn8GzAdtHS0lcUE1hQ19vKwqo8ER68Gz1jFsoJ37QoiZ
xV30DyP36D3lrOSw7uGaWITP8+qQ8sYf3ZBO0b//lI0//nQJEFPwr+KFPms7vZJb
haWeyw48HfBDhq0VNE0Z9BOuEtGZ8TN47zrE2/ok9GRXrt5ckmF1vHSJ+eFMJLHN
3yYI+BAjrunXFU+ETRVqVuH4y2u5CNcrXGRKcrng6HWG/1Mq/QvnxIWZuLOcykaN
AEaDMQwrrE06fxGbupGAdNP7YEbtsLI=
-----END CERTIFICATE REQUEST-----
```
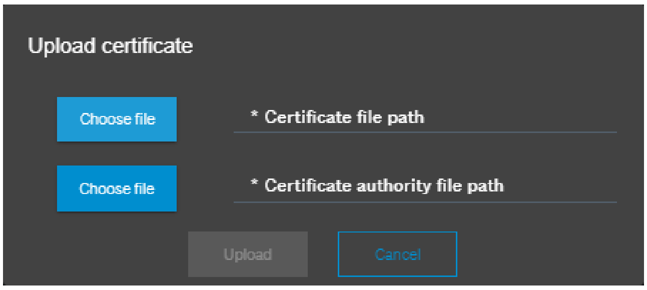

2.2 Uploading a certificate

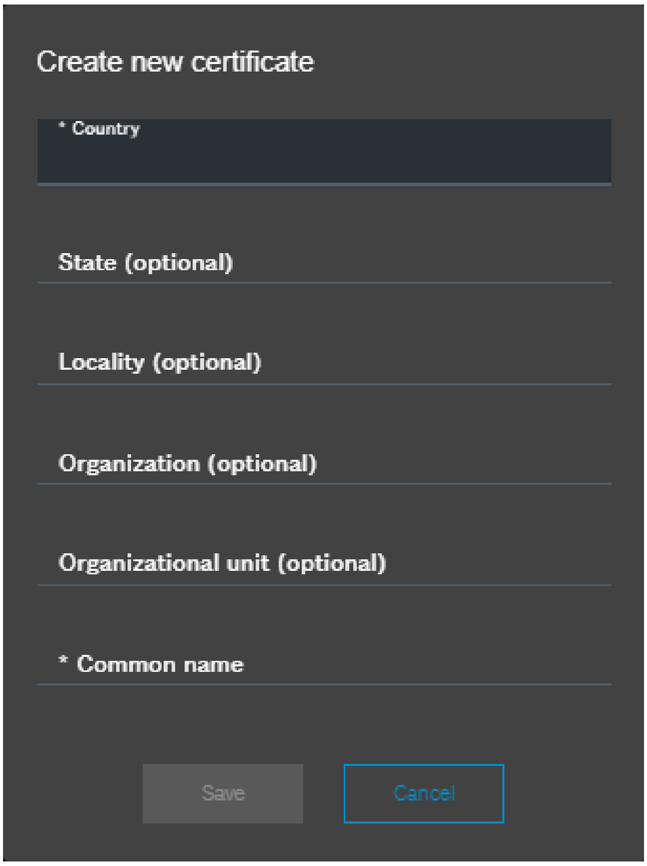
A TLS/SSL Certificate is a text file with encrypted data that you install on your server to be able to secure or encrypt sensitive communications between your site and your customers.
After you create a CSR and purchase a certificate, you need to upload the certificate to the server in order to let the server use the certificate for the encryption. With the function **Upload certificate** you can upload the issued certificate

from the "trusted authority" to be used by Intelligent Insights. The uploaded certificate is used by the Intelligent Insight webservice. The HTTPS communication from client web browsers to Intelligent Insights is encrypted by the uploaded certificate.



2.3 Creating a self-signed certificate

When using a self-signed certificate, there is no chain of trust. The certificate has signed itself. The web browser will then issue a warning, telling you that the web site certificate can not be verified. Therefore you should not use self-signed certificates for professional usage, as your visitors will not trust your web site to be safe.



In order to create a self-signed certificate you need to enter:

2.3.1 Country:

Enter your Country code from the list of valid country codes. For example: US for United States of America, DE for Germany or NL for Netherlands.

2.3.2 State:

Enter a state or a province name. For example: Bavaria, California, North Holland

2.3.3 Locality:

Enter a city name. For example: Munich, San Francisco, Rotterdam

2.3.4 Organization:

Enter the organization name.

2.3.5 Organizational unit:

Enter the organization unit name.

2.3.6 Common name:

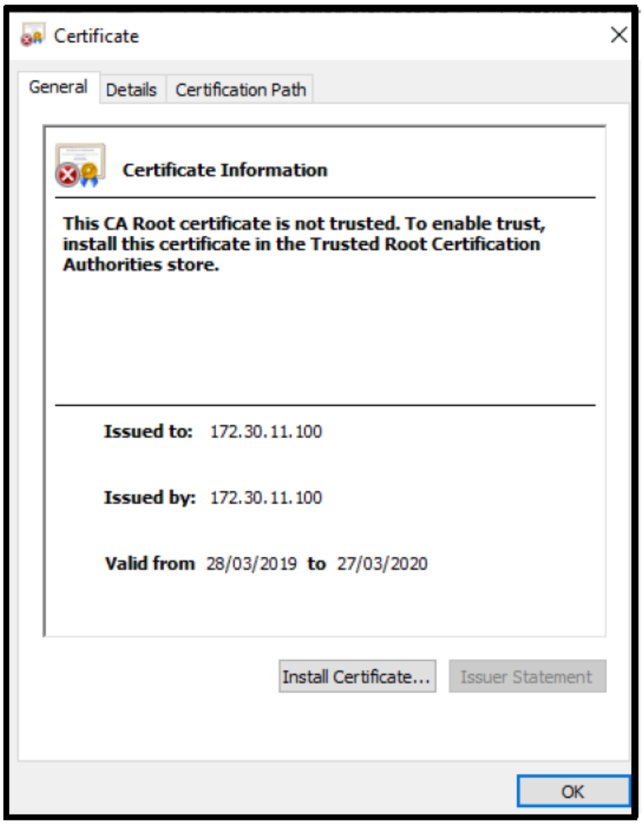
The common name (CN) is the computer or server name associated with your TLS/SSL certificate. For example: MyComputer.
The generated certificate is valid for 3 years.
To create a self-signed certificate, provide at least the "Country code" and "Common Name".

2.4 Using self-signed certificates with BVMS

When integrating Intelligent Insights with a self-signed certificate, the BVMS operator client always shows an error message when opening a widget in the BVMS operator client image pane. In order to solve this issue, install the self-signed certificate in the trusted root certificate store of the local machine.
To install the certificate in the root certificate store of the local machine, connect to Intelligent Insights with a web browser and download the certificates. Once downloaded, install the certificate in the trusted root certificate store.

1. Double-click the downloaded certificate.

2. Click **Install certificate**.



Certificate

Certificate Information

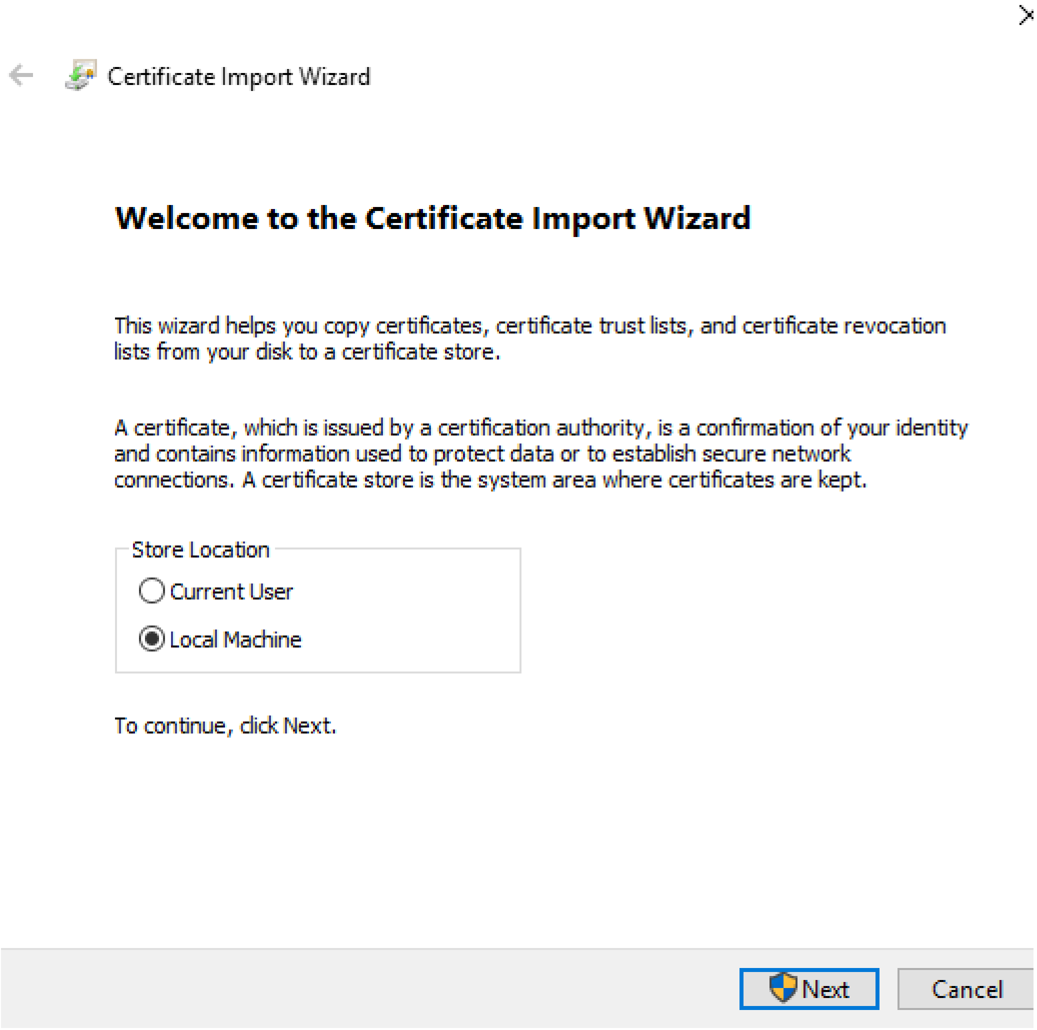
This CA Root certificate is not trusted. To enable trust, install this certificate in the Trusted Root Certification Authorities store.

Issued to: 172.30.11.100

Issued by: 172.30.11.100

Valid from 28/03/2019 **to** 27/03/2020

3. Select **Local Machine**.



Certificate Import Wizard

Welcome to the Certificate Import Wizard

This wizard helps you copy certificates, certificate trust lists, and certificate revocation lists from your disk to a certificate store.

A certificate, which is issued by a certification authority, is a confirmation of your identity and contains information used to protect data or to establish secure network connections. A certificate store is the system area where certificates are kept.

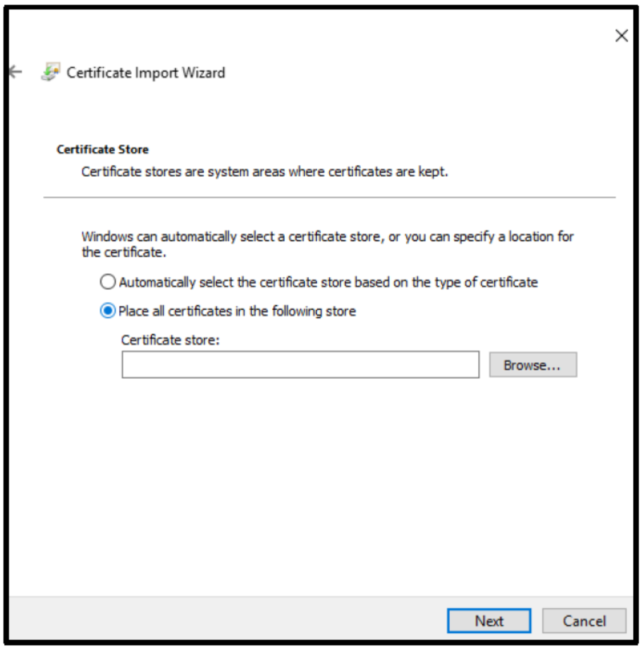
Store Location

○ Current User

● Local Machine

To continue, click Next.

4. Select the certificate store.



Certificate Import Wizard

Certificate Store

Certificate stores are system areas where certificates are kept.

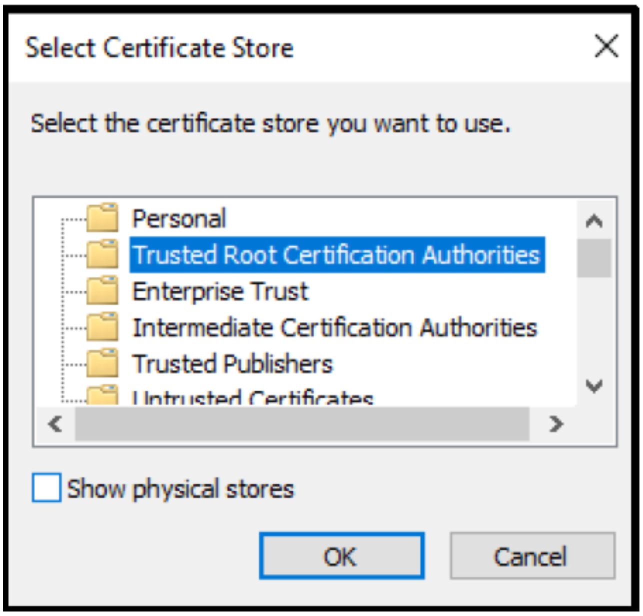
Windows can automatically select a certificate store, or you can specify a location for the certificate.

○ Automatically select the certificate store based on the type of certificate

● Place all certificates in the following store

Certificate store:

5. Select **Trusted root certificate authorities**.

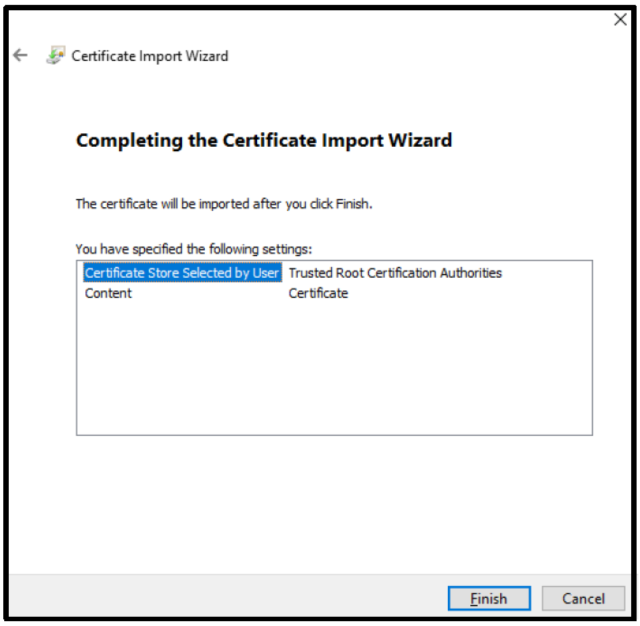


Select Certificate Store

Select the certificate store you want to use.

- Personal
- Trusted Root Certification Authorities
- Enterprise Trust
- Intermediate Certification Authorities
- Trusted Publishers
- Untrusted Certificates

6. Click **Finish** to complete the certificate installation



Certificate Import Wizard

Completing the Certificate Import Wizard

The certificate will be imported after you click Finish.

You have specified the following settings:

Certificate Store Selected by User	Trusted Root Certification Authorities
Content	Certificate