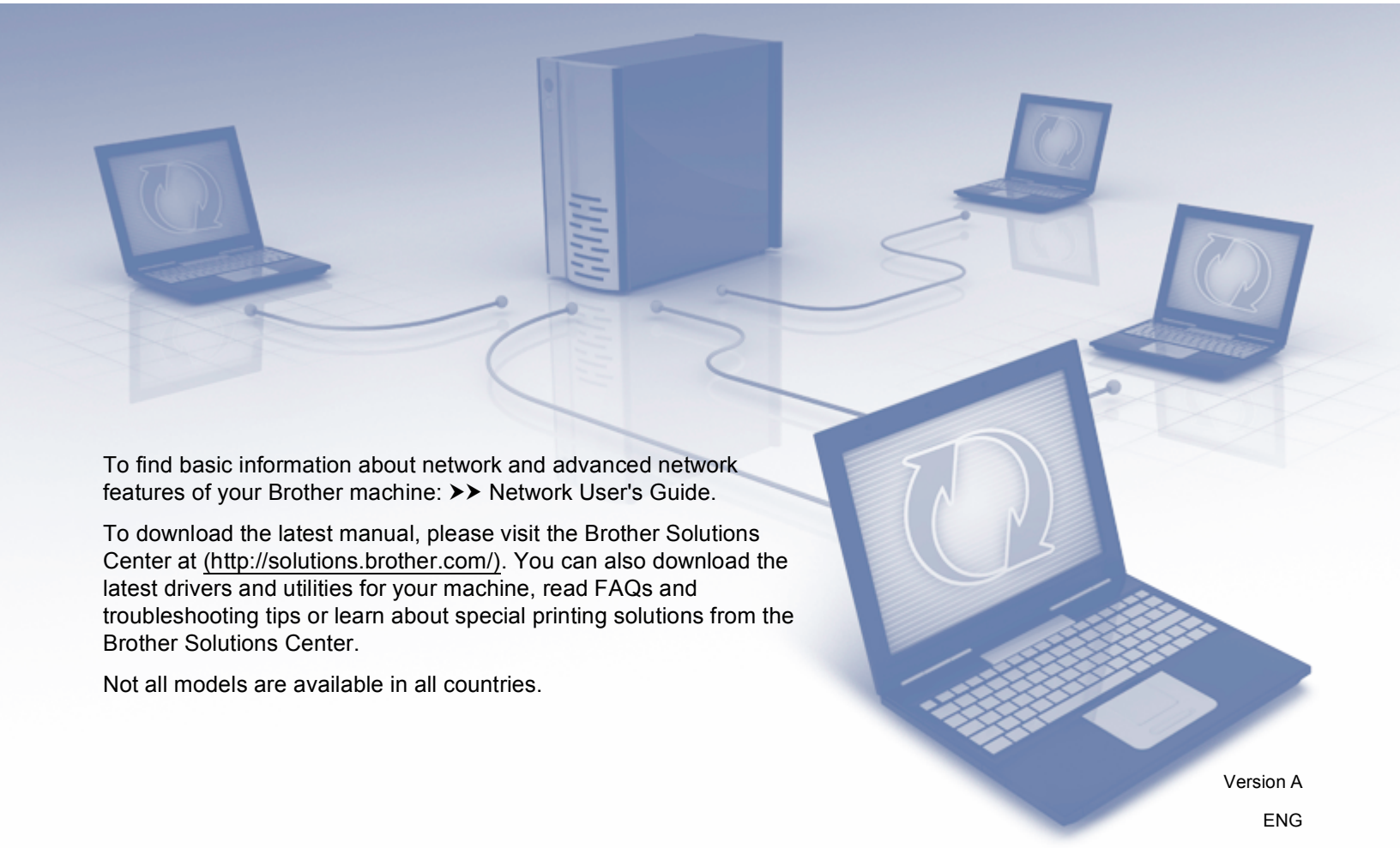
SSL Guide

(Secure Socket Layer)



To find basic information about network and advanced network features of your Brother machine: ➤➤ Network User's Guide.

To download the latest manual, please visit the Brother Solutions Center at (http://solutions.brother.com/). You can also download the latest drivers and utilities for your machine, read FAQs and troubleshooting tips or learn about special printing solutions from the Brother Solutions Center.

Not all models are available in all countries.

Version A

ENG

Applicable models

This User's Guide applies to the following models.

HL-5450DN(T)/5470DW(T)/6180DW(T)

DCP-8110DN/8150DN/8155DN/8250DN/MFC-8510DN/8710DW/8810DW/8910DW/8950DW(T)

Definitions of notes

We use the following icon throughout this User's Guide:

Note	Notes tell you how you should respond to a situation that may arise or give tips about how the operation works with other features.

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IMPORTANT NOTE

- This product is approved for use in the country of purchase only. Do not use this product outside the country of purchase as it may violate the wireless telecommunication and power regulations of that country.
- In this manual, the screens of the MFC-8950DW(T) are used unless specified.
- Windows® XP in this document represents Windows® XP Professional, Windows® XP Professional x64 Edition and Windows® XP Home Edition.
- Windows Server® 2003 in this document represents Windows Server® 2003 and Windows Server® 2003 x64 Edition.
- Windows Server® 2008 in this document represents Windows Server® 2008 and Windows Server® 2008 R2.
- Windows Vista® in this document represents all editions of Windows Vista®.
- Windows® 7 in this document represents all editions of Windows® 7.
- Please go to the Brother Solutions Center at http://solutions.brother.com/ and click Manuals on your model page to download the other manuals.

Table of Contents

1 Introduction

Overview

Secure Socket Layer (SSL) is an effective method of protecting data which is sent over a local or wide area network. It works by encrypting data sent over a network, i.e. a print job, so anyone trying to capture it will not be able to read it as all the data will be encrypted.

It can be configured on both wired and wireless networks and will work with other forms of security such as WPA keys and firewalls.

Brief History of SSL

SSL was originally created to secure web traffic information, in particular data sent between web browsers and servers. For example, when you use Internet Explorer® for Internet Banking and you see https:// and the little padlock in the web browser, you are using SSL. It then grew to work with other applications such as Telnet, printers and FTP software in order to become a universal solution for online security. Its original design intentions are still being used today by many online retailers and banks to secure sensitive data, such as credit card numbers, customer records etc.

SSL uses extremely high levels of encryption and is trusted by banks all over the world since it is unlikely that it will be broken.

Benefits of using SSL

The sole benefit to using SSL on Brother machines is to provide secure printing over an IP network by restricting unauthorized users from being able to read data sent to the machine. Its key selling point is that it can be used to print confidential data securely. For example, a HR department for a large company may be printing wage slips on a regular basis. Without encryption, the data contained on these wage slips can be read by other network users. However, with SSL, anyone trying to capture the data will only see a confusing page of code and not the actual wage slip.

Using Certificates for device security

Your Brother machine supports the use of multiple security certificates allowing secure management, authentication and communication with the machine. The following security certificate features can be used with the machine. When you print a document or use Web Based Management (web browser) securely using SSL, you must install the certificate onto your computer. See *Digital Certificate Installation* ➤➤ page 4.

- SSL/TLS communication
- SSL communication for SMTP/POP3

The Brother machine supports the following certificates.

- Pre-installed certificate

  Your machine has a pre-installed self-signed certificate.

  Using this certificate, you can easily use the SSL/TLS communication without creating or installing a certificate. If you want to use your machine's Google Cloud Print feature, you can use this pre-installed certificate to configure the Google Cloud Print settings securely. For more information on Google Cloud Print, go to the Brother Solutions Center at http://solutions.brother.com/ and click Manuals on your model page to download the Google Cloud Print Guide.

Note

The pre-installed self-signed certificate cannot protect your communication from spoofing. We recommend using a certificate that is issued by a trusted organization for better security.

- Self-signed certificate

  This print server issues its own certificate. Using this certificate, you can easily use the SSL/TLS communication without having a certificate from a CA. (See *Creating a self-signed certificate* ➤➤ page 6.)

- Certificate from a CA

  There are two methods for installing a certificate from a CA. If you already have a certificate from a CA or if you want to use a certificate from an external trusted CA:

  - When using a CSR (Certificate Signing Request) from this print server. (See *Creating a Certificate Signing Request (CSR)* ➤➤ page 7.)
  - When importing a certificate and a private key. (See *Import and export the certificate and private key* ➤➤ page 17.)

■ CA certificate

If you use a CA certificate that identifies the CA (Certificate Authority) itself, you must import a CA certificate from the CA, prior to the configuration. (See *Import and export a CA certificate* ➤➤ page 18.)

Note

- If you are going to use SSL/TLS communication, we recommend that you contact your system administrator first.
- When you reset the print server back to its default factory settings, the certificate and the private key that are installed will be deleted. If you want to keep the same certificate and the private key after resetting the print server, export them before resetting and re-install them. (See *How to import the self-signed certificate, the certificate issued by a CA, and the private key* ➤➤ page 17.)

2 Digital Certificate for SSL communication

Digital Certificate Installation

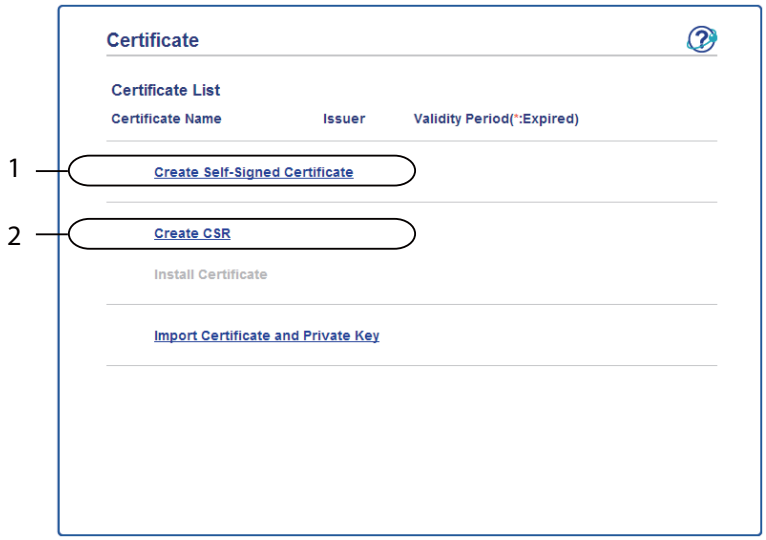
Printing over a secured network or secure management using Web Based Management (web browser) requires a digital certificate to be installed on both the machine and device which is sending data to the machine, e.g. a computer. Your machine has a pre-installed certificate. In order to configure the certificate, the user needs to log onto the machine remotely through a web browser using its IP address.

Note

We recommend Windows® Internet Explorer® 7.0/8.0 or Firefox® 3.6 for Windows® and Safari 4.0/5.0 for Macintosh. Please also make sure that JavaScript and Cookies are always enabled in whichever browser you use. If a different web browser is used, make sure it is compatible with HTTP 1.0 and HTTP 1.1.

1. Start your web browser.
2. Type “http://machine’s IP address/” into your browser's address bar (where “machine’s IP address” is the IP address of the machine or the print server name).
   - For example: http://192.168.1.2/
3. No password is required by default. If you have previously set a password, enter it and press →.
4. Click **Network**.
5. Click **Security**.
6. Click **Certificate**.

7 You can configure the certificate settings.
To create a self-signed certificate using Web Based Management, go to *Creating a self-signed certificate* ➤➤ page 6.
To create a Certificate Signing Request (CSR), go to *Creating a Certificate Signing Request (CSR)* ➤➤ page 7.



1 To create and install a self-signed certificate

2 To use a certificate from a Certificate Authority (CA)

Note

- The functions that are grayed and unlinked indicate they are not available.
- For more information on configuration, see the Help text in the Web Based Management.

Creating a self-signed certificate

1. Click **Create Self-Signed Certificate**.
2. Enter a **Common Name** and a **Valid Date**.

Note

- The length of the **Common Name** must be less than 64 characters. Enter an identifier such as an IP address, node name or domain name to use when accessing this machine through SSL/TLS communication. The node name is displayed by default.
- A warning will pop-up if you use the IPPS or HTTPS protocol and enter a different name in the URL than the **Common Name** that was used for the self-signed certificate.

3. You can choose the **Public Key Algorithm** and **Digest Algorithm** settings from the pull-down list. The default settings are **RSA(2048bit)** for **Public Key Algorithm** and **SHA256** for **Digest Algorithm**.
4. Click **Submit**.
5. The self-signed certificate is created and saved in your machine's memory successfully.

Creating a Certificate Signing Request (CSR)

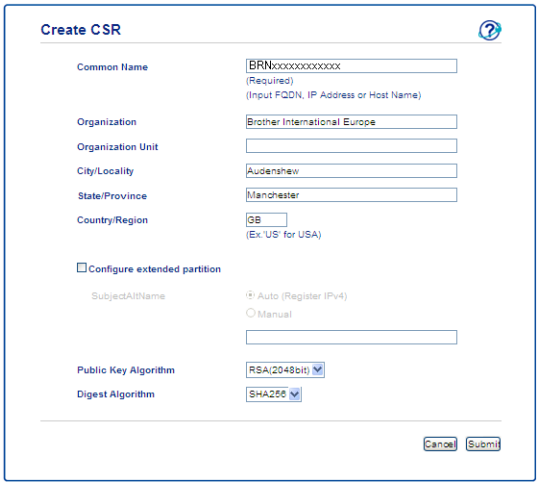
A Certificate Signing Request (CSR) is a request sent to a CA in order to authenticate the credentials contained within the certificate.

Note

We recommend that the Root Certificate from the CA be installed on your computer before creating the CSR.

1. Click **Create CSR**.

2. Enter a **Common Name** and your information, such as **Organization**.
   Your company details are required so that a CA can confirm your identity and attest to the outside world.



Note

- The length of the **Common Name** must be less than 64 characters. Enter an identifier such as an IP address, node name or domain name to use when accessing this machine through SSL/TLS communication. The node name is displayed by default. The **Common Name** is required.
- A warning will pop-up if you enter a different name in the URL than the Common Name that was used for the certificate.
- The length of the **Organization**, the **Organization Unit**, the **City/Locality** and the **State/Province** must be less than 64 characters.
- The **Country/Region** should be an ISO 3166 country code composed of two characters.
- If you are configuring the X.509v3 certificate extension, choose the **Configure extended partition** check box and then choose **Auto (Register IPv4)** or **Manual**.

3. You can choose the **Public Key Algorithm** and **Digest Algorithm** settings from the pull-down list. The default settings are **RSA(2048bit)** for **Public Key Algorithm** and **SHA256** for **Digest Algorithm**.

4 Click **Submit**. The following screen will appear.

5 After a few moments, you will be presented with the certificate, which can be saved into a small file or copied and pasted directly into an online CSR form offered by a Certificate Authority. Click **Save** to save the CSR file to your computer.

Note

Follow your CA policy regarding the method to send a CSR to your CA.

6 The CSR is created. For instructions on how to install the certificate to your machine, go to *How to install the certificate to your machine* ➤➤ page 9.

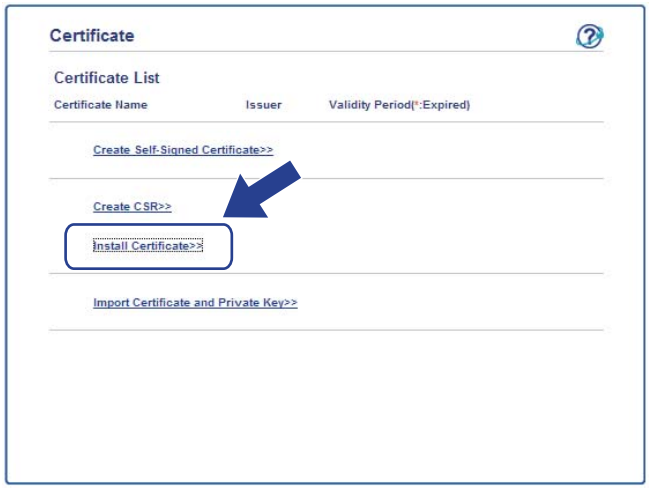
How to install the certificate to your machine

When you receive the certificate from a CA, follow the steps below to install it into the print server.

Note

Only a certificate issued with this machine's CSR can be installed. When you want to create another CSR, make sure that the certificate is installed before creating another CSR. Create another CSR after installing the certificate to the machine. Otherwise the CSR you made before installing will be invalid.

1. Click **Install Certificate** on the **Certificate** page.



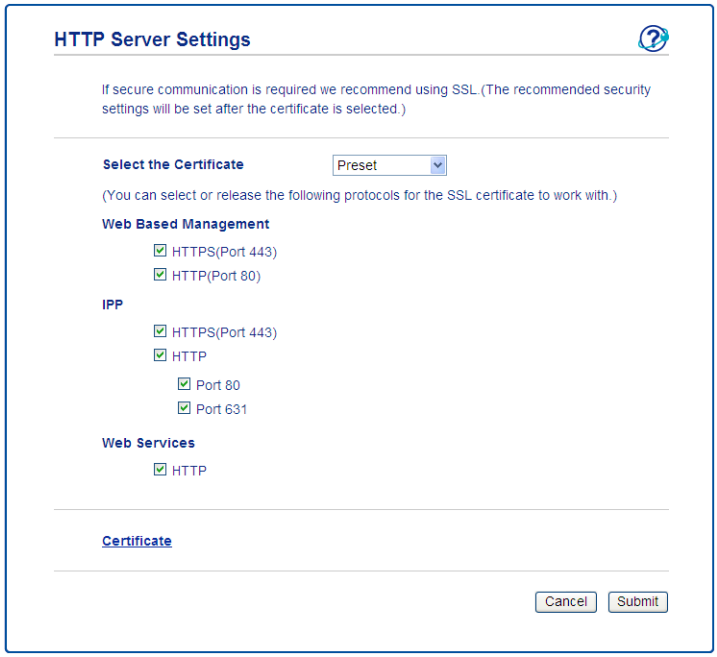
2. Specify the file of the certificate that has been issued by a CA, and then click **Submit**.

3. Now the certificate has been created successfully and saved in your machine memory successfully. To use SSL/TLS communication, the Root Certificate from the CA needs to be installed on your computer. Contact your network administrator about installation.
You have completed the digital certificate configuration. If you want to send or receive an E-mail using SSL, see *Sending or Receiving (for DCP and MFC models) an E-mail securely* ➤➤ page 25 for the necessary configuration steps.

Choosing the certificate

After you install the certificate, follow the steps below to choose the certificate you want to use.

1. Click **Network**.
2. Click **Protocol**.
3. Click **HTTP Server Settings** and then choose the certificate from the **Select the Certificate** pull-down list.



Note

- If the following dialog box appears, Brother recommends disabling the Telnet, FTP, TFTP protocols and the network management with older versions of BRAdmin Professional (2.8 or less) for secure communication. If you enable them, user authentication is not secure.

- For DCP and MFC models:

  If you disable FTP, the Scan to FTP function will be disabled.

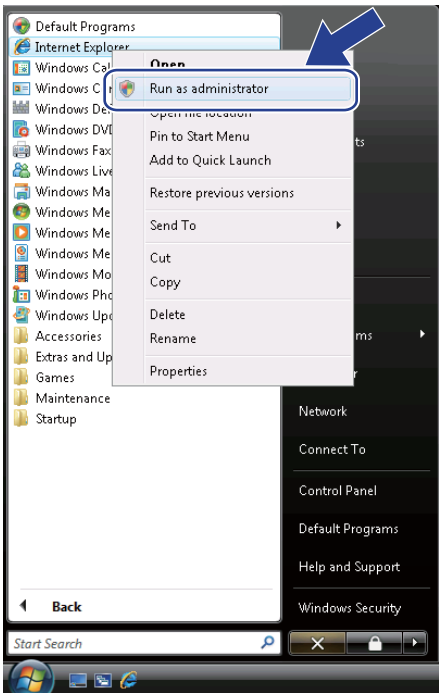
4 Click **Submit**.

Installing the self-signed certificate or pre-installed certificate onto Windows Vista®, Windows® 7 and Windows Server® 2008 for users with administrator rights

Note

- The following steps are for Windows® Internet Explorer®. If you use another web browser, follow the help text of the web browser itself.
- You must have administrator rights to install the self-signed certificate or pre-installed certificate.

1. Click the button and **All Programs**.
2. Right-click **Internet Explorer**, and then click **Run as administrator**.



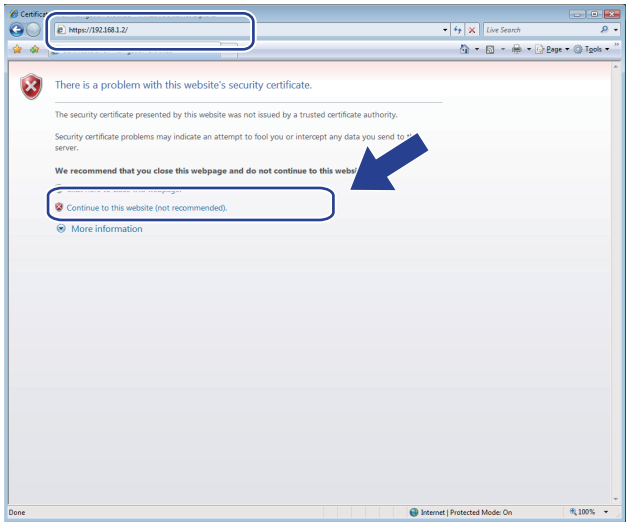
Note

If the **User Account Control** screen appears,

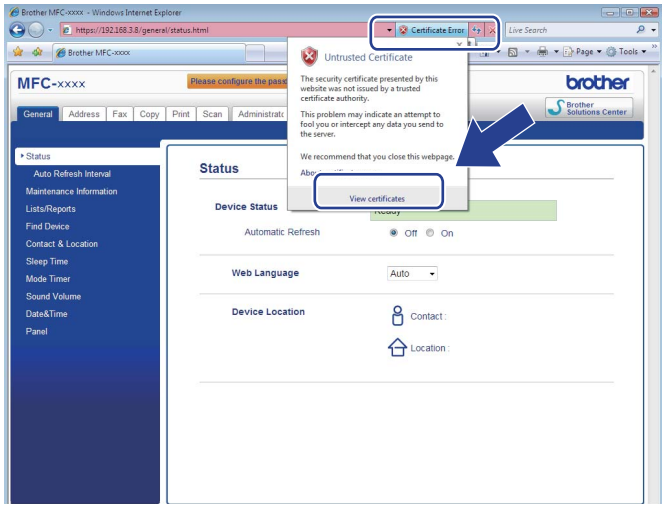
(Windows Vista®) Click **Continue (Allow)**.

(Windows® 7) Click **Yes**.

3 Type “https://machine’s IP address/” into your browser to access your machine (where “machine’s IP address” is the machine’s IP address or the node name that you assigned for the certificate). Then, click **Continue to this website (not recommended).**.



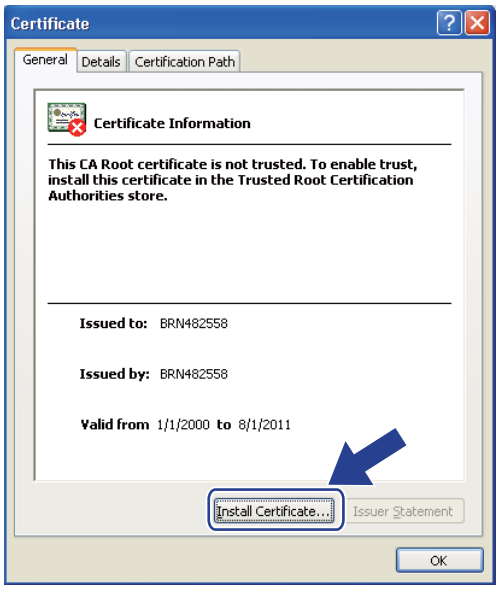
4 Click **Certificate Error**, and then click **View certificates**. For the rest of the instructions, follow the steps from step ❹ in *Installing the self-signed certificate or pre-installed certificate for Windows® XP and Windows Server® 2003 users* ➤➤ page 14.



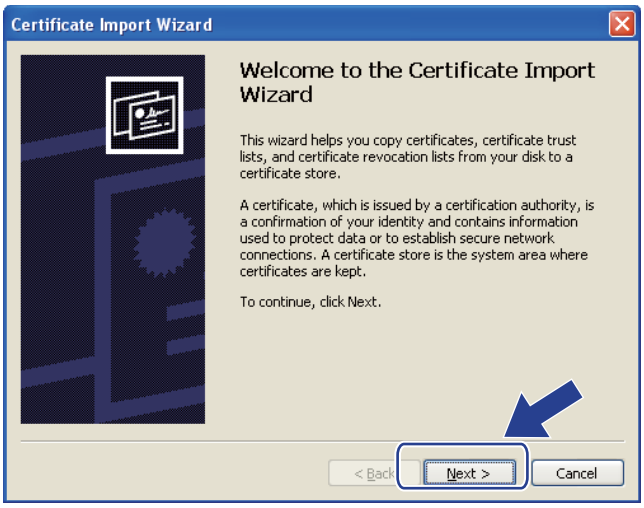
Installing the self-signed certificate or pre-installed certificate for Windows® XP and Windows Server® 2003 users

1. Start your web browser.
2. Type “https://machine’s IP address/” into your browser to access your machine (where “machine’s IP address” is the IP address or the node name that you assigned for the certificate).
3. When the security alert dialog box appears, do one of the following:
   - Click **Continue to this website (not recommended).**. Click **Certificate Error**, and then click **View certificates**.
   - If the following dialog box appears, click **View Certificate**.

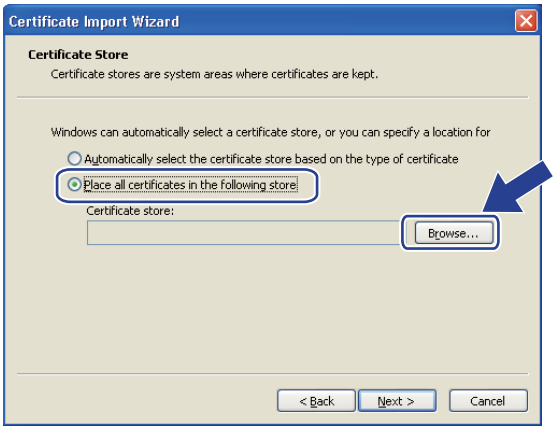
4. Click **Install Certificate...** from the **General** tab.



5 When the **Certificate Import Wizard** appears, click **Next**.

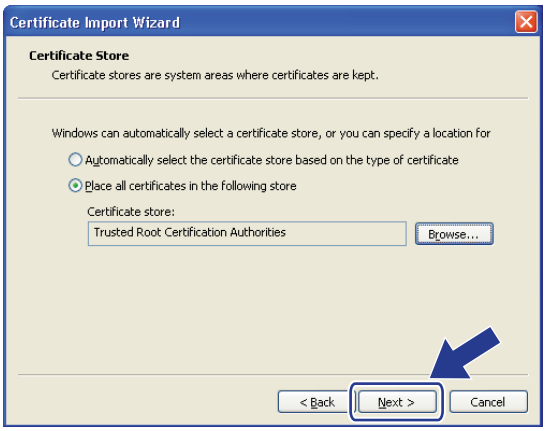


6 You need to specify a location to install the certificate. We recommend you choose **Place all certificates in the following store** and then, click **Browse...**.



7 Choose **Trusted Root Certification Authorities** and then click **OK**.

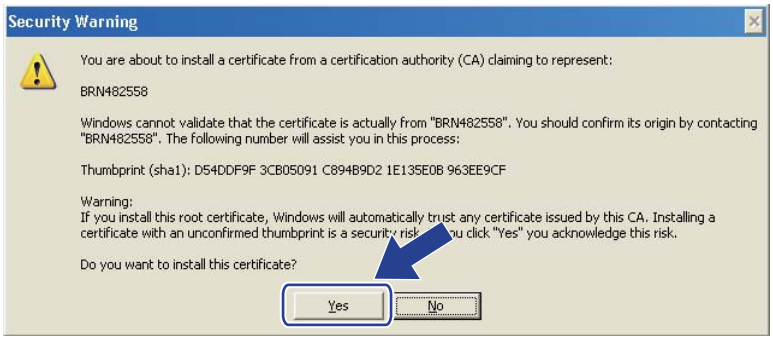
8 Click **Next**.



9 On the next screen, click **Finish**.

10 You will then be asked to install the certificate.
Do one of the following:

- If you are installing the self-signed certificate, confirm the fingerprint (thumbprint) and then click **Yes**.
- If you are installing the pre-installed certificate, click **Yes**.



Note

- For the self-signed certificate, the fingerprint (thumbprint) is printed on the Network Configuration Report.

  To learn how to print the Network Configuration, see *Printing the Printer Settings Page (For HL-5450DN(T))* ➤➤ page 29 or *Printing the Network Configuration Report (For other models)* ➤➤ page 29.
- For the pre-installed certificate, the fingerprint is not printed on the Network Configuration Report.

11 Click **OK**.

12 The self-signed certificate or pre-installed certificate is now installed on your computer, and SSL/TLS communication is available.

Each computer wanting to print securely must do the same. However, once it has been installed, these steps will not need to be repeated unless the certificate changes.

Import and export the certificate and private key

You can store the certificate and private key on the machine and manage them by importing and exporting.

How to import the self-signed certificate, the certificate issued by a CA, and the private key

1. Click **Import Certificate and Private Key** on the **Certificate** page.
2. Specify the file that you want to import.
3. Enter the password if the file is encrypted, and then click **Submit**.
4. Now the certificate and private key are imported to your machine successfully.

How to export the self-signed certificate, the certificate issued by a CA, and the private key

1. Click **Export** shown with **Certificate List** on the **Certificate** page.
2. Enter a password if you want to encrypt the file.

Note

If a blank password is used, the output is not encrypted.

3. Enter the password again for confirmation, and then click **Submit**.
4. Specify the location where you want to save the file.
5. Now the certificate and private key are exported to your computer.

Import and export a CA certificate

You can store a CA certificate on the machine by importing and exporting.

How to import a CA certificate

1. Click **CA Certificate** on the **Security** page.
2. Click **Import CA Certificate** and choose the certificate. Click **Submit**.

How to export a CA certificate

1. Click **CA Certificate** on the **Security** page.
2. Choose the certificate you want to export and click **Export**. Click **Submit**.
3. Click **Save** to choose the destination folder.
4. Choose the destination you want to save the exported certificate and then save the certificate.

Managing multiple certificates

The multiple certificate feature allows you to manage each certificate that you have installed using Web Based Management. After installing certificates, you can view what certificates are installed from the **Certificate** page and then view each certificate's content, delete or export the certificate. For information on how to access the **Certificate** page, see *Digital Certificate Installation* ➤➤ page 4.

■ For Printer models

The Brother machine allows you to store up to three self-signed certificates or up to three certificates issued by a CA. You can use the stored certificates for using the HTTPS/IPPS protocol or IEEE 802.1x authentication.

■ For DCP and MFC models

The Brother machine allows you to store up to four self-signed certificates or up to four certificates issued by a CA. You can use the stored certificates for using the HTTPS/IPPS protocol, IEEE 802.1x authentication or a Signed PDF.

You can also store up to four CA certificates for using IEEE 802.1x authentication and SSL for SMTP/POP3.

We recommend you store one certificate less and keep the last free to deal with certificate expiration. For example, if you want to store a CA certificate, store three certificates and leave one storage as a backup. In the case of re-issuing the certificate, such as when the certificate is expired, you can import a new certificate to the backup and then you can delete the expired certificate, to avoid configuration failure.

Note

- When you use HTTPS/IPPS, IEEE 802.1x or Signed PDF (for DCP and MFC models), you must choose which certificate you are using.
- When you use SSL for SMTP/POP3 communications (for DCP and MFC models), you do not have to choose the certificate. The necessary certificate will be chosen automatically.

3 Managing your network machine securely using SSL/TLS

To manage your network machine securely, you need to use the management utilities with security protocols.

Secure Management using Web Based Management (web browser)

We recommend to use HTTPS protocol for secure management. To use these protocols, the following machine settings are required.

Note

- The HTTPS protocol is enabled by default.

  You can change the HTTPS protocol settings and the certificate to use on the Web Based Management screen, by clicking **Network**, **Protocol** and then **HTTP Server Settings**.

- You must also install the certificate you have installed to the machine onto your computer. See *Installing the self-signed certificate or pre-installed certificate onto Windows Vista®, Windows® 7 and Windows Server® 2008 for users with administrator rights* ➤➤ page 12 or *Installing the self-signed certificate or pre-installed certificate for Windows® XP and Windows Server® 2003 users* ➤➤ page 14.

1. Start your web browser.
2. Type “https://machine’s IP address/” into your browser. (If you use the created certificate, type “https://Common Name/” into your browser. Where “Common Name” is the Common Name that you assigned for the certificate, such as an IP address, node name or domain name. For how to assign a Common Name for the certificate, see *Using Certificates for device security* ➤➤ page 2.)

   ■ For example:

   https://192.168.1.2/ (if the Common Name is the machine’s IP address)
3. No password is required by default. Enter a password if you have set one and press OK.

4 Printing documents securely using SSL

Printing documents securely using IPPS for Windows®

We recommend to use IPPS protocol for secure management. To use the IPPS protocol, the following machine settings are required.

Note

- Communication using IPPS cannot prevent unauthorized access to the print server.
- You must also install the certificate you have installed to the machine onto your computer. See *Installing the self-signed certificate or pre-installed certificate onto Windows Vista®, Windows® 7 and Windows Server® 2008 for users with administrator rights* ➤➤ page 12 or *Installing the self-signed certificate or pre-installed certificate for Windows® XP and Windows Server® 2003 users* ➤➤ page 14.
- The IPPS protocol must be enabled. The default setting is enabled. You can change the IPPS protocol settings and the certificate to use on the Web Based Management screen, by clicking **Network**, **Protocol** and then **HTTP Server Settings**.

Windows® XP and Windows Server® 2003

1. Click **Start** and choose **Printers and Faxes**.
2. Click **Add a printer** to start **Add Printer Wizard**.
3. Click **Next** when you see the **Welcome to the Add Printer Wizard** screen.
4. Choose **A network printer, or a printer attached to another computer**.
5. Click **Next**.
6. Choose **Connect to a printer on the Internet or on a home or office network** and then enter the following in the URL field:
   “https://machine’s IP address/ipp” (where “machine’s IP address” is the machine’s IP address or the node name.)

Note

- It is important that you use “https://” and not “http://” otherwise printing over IPP will not be secure.
- If you have edited the hosts file on your computer or are using a Domain Name System (DNS), you can also enter the DNS name of the print server. As the print server supports TCP/IP and NetBIOS names, you can also enter the NetBIOS name of the print server. The NetBIOS name can be seen in the Network Configuration Report. (To learn how to print the Network Configuration Report, see *Printing the Printer Settings Page (For HL-5450DN(T))* ➤➤ page 29 or *Printing the Network Configuration Report (For other models)* ➤➤ page 29.) The NetBIOS name assigned is the first 15 characters of the node name, and by default it will appear as “BRNxxxxxxxxxxx” for a wired network or “BRWxxxxxxxxxxx” for a wireless network. (“xxxxxxxxxxx” is your machine’s MAC Address / Ethernet Address.)

7 When you click **Next**, Windows® XP and Windows Server® 2003 will make a connection with the URL that you specified.

- If the printer driver has already been installed:

  You will see the printer selection screen in the **Add Printer Wizard**.

  Go to step ⓫.

- If the printer driver has NOT been installed:

  One of the benefits of the IPP printing protocol is that it establishes the model name of the printer when you communicate with it. After successful communication you will see the model name of the printer automatically. This means that you do not need to inform Windows® XP and Windows Server® 2003 about the type of printer driver to be used.

  Go to step ❽.

Note

If the printer driver that you are installing does not have a Digital Certificate you will see a warning message. Click **Continue Anyway** to continue with the installation.

8 Click **Have Disk**. You will then be asked to insert the driver disk.

9 Click **Browse** and choose the appropriate Brother printer driver that is contained on the CD-ROM or in the network share.
Click **OK**.

10 Click **OK**.

11 Choose your machine and click **OK**.

12 Check **Yes** if you want to use this machine as the default printer. Click **Next**.

13 Click **Finish** and the machine is now configured and ready to print. To test the printer connection, print a test page.

Windows Vista®, Windows® 7 and Windows Server® 2008

1. (Windows Vista®)
   Click the button, **Control Panel**, **Hardware and Sound**, and then **Printers**.
   (Windows® 7)
   Click the button, and then click **Devices and Printers**.
   (Windows Server® 2008)
   Click **Start**, **Control Panel**, **Hardware and Sound**, and then **Printers**.
2. Click **Add a printer**.
3. Choose **Add a network, wireless or Bluetooth printer**.
4. Click **The printer that I want isn't listed**.
5. Choose **Select a shared printer by name** and then enter the following in the URL field:
   "https://machine's IP address/ipp" (where "machine's IP address" is the machine's IP address or the node name.)

Note

- It is important that you use "https://" and not "http://" otherwise printing over IPP will not be secure.
- If you have edited the hosts file on your computer or are using a Domain Name System (DNS), you can also enter the DNS name of the print server. As the print server supports TCP/IP and NetBIOS names, you can also enter the NetBIOS name of the print server. The NetBIOS name can be seen in the Network Configuration Report. (To learn how to print the Network Configuration Report, see *Printing the Printer Settings Page (For HL-5450DN(T))* ➤➤ page 29 or *Printing the Network Configuration Report (For other models)* ➤➤ page 29.) The NetBIOS name assigned is the first 15 characters of the node name, and by default it will appear as "BRNxxxxxxxxxxxx" for a wired network or "BRWxxxxxxxxxxxx" for a wireless network. ("xxxxxxxxxxxx" is your machine's MAC Address / Ethernet Address.)

6. When you click **Next**, Windows® 7, Windows Vista® and Windows Server® 2008 will make a connection with the URL that you specified.
   - If the printer driver has already been installed:

     You will see the printer selection screen in the Add Printer Wizard. Click **OK**.

     If the appropriate printer driver is already installed on your computer, Windows® 7, Windows Vista® and Windows Server® 2008 will automatically use that driver. In this case, you will simply be asked if you wish to make the driver the default printer, after which the Driver installation wizard will complete. You are now ready to print.

     Go to step ⓫.

■ If the printer driver has NOT been installed:

One of the benefits of the IPP printing protocol is that it establishes the model name of the printer when you communicate with it. After successful communication you will see the model name of the printer automatically. This means that you do not need to inform Windows® 7, Windows Vista® and Windows Server® 2008 about the type of printer driver to be used.

Go to step ❼.

7. If your machine is not in the list of supported printers, click **Have Disk**. You will then be asked to insert the driver disk.

8. Click **Browse** and choose the appropriate Brother printer driver that is contained on the CD-ROM or in the network share. Click **Open**.

9. Click **OK**.

10. Specify the model name of the machine. Click **OK**.

Note

- When the User Account Control screen appears, click **Continue**.
- If the printer driver that you are installing does not have a Digital Certificate you will see a warning message. Click **Install this driver software anyway** to continue with the installation. The **Add Printer Wizard** will then complete.

11. You will see the **Type a printer name** screen in the **Add Printer** Wizard. Check the **Set as the default printer** check box if you want to use this machine as the default printer, and then click **Next**.

12. To test the printer connection, click **Print a test page**, and then click **Finish**. The machine is now configured and ready to print.

5 Sending or Receiving (for DCP and MFC models) an E-mail securely

Configuration using Web Based Management (web browser)

You can configure secured E-mail sending with user authentication or E-mail sending and receiving (for DCP and MFC models) using SSL/TLS on the Web Based Management screen.

1. Start your web browser.
2. Type “http://machine’s IP address/” into your browser (where “machine’s IP address” is the machine’s IP address).
   - For example:

     http://192.168.1.2/
3. No password is required by default. Enter a password if you have set one and press .
4. Click **Network**.
5. Click **Protocol**.
6. Click **Advanced Setting** of **POP3/SMTP** and make sure that the status of **POP3/SMTP** is **Enabled**.
7. You can configure the **POP3/SMTP** settings on this page.

Note

- For more information, see the Help text in Web Based Management.
- You can also confirm whether the E-mail settings are correct after configuration by sending a test E-mail.
- If you do not know the POP3/SMTP server settings, please contact your system administrator or ISP (Internet Service Provider) for details.

8. After configuring, click **Submit**. The **Test E-mail Send Configuration** or **Test E-mail Send/Receive Configuration** screen appears.
9. Follow the instructions on-screen if you want to test with the current settings.

Sending or Receiving (for DCP and MFC models) an E-mail securely using SSL/TLS

This machine supports SSL/TLS methods to send or receive (for DCP and MFC models) an E-mail via an E-mail server that requires secure SSL/TLS communication. To send or receive E-mail via an E-mail server that is using SSL/TLS communication, you must configure SMTP over SSL/TLS or POP3 over SSL/TLS correctly.

Verifying Server Certificate

- If you choose SSL or TLS for **SMTP over SSL/TLS** or **POP3 over SSL/TLS**, the **Verify Server Certificate** check box will be automatically checked to verify the Server Certificate.
  - Before you verify the Server Certificate, you must import the CA certificate that has been issued by the CA that signed the Server Certificate. Contact your network administrator or your ISP (Internet Service Provider) whether a CA certificate import is necessary. For importing the certificate, see *Import and export a CA certificate* ➤➤ page 18.
  - If you do not need to verify the Server Certificate, uncheck **Verify Server Certificate**.

Port Number

- If you choose SSL or TLS, the **SMTP Port** or **POP3 Port** value will be changed to match the protocol. If you want to change the port number manually, enter the port number after you choose **SMTP over SSL/TLS** or **POP3 over SSL/TLS**.
- You must configure the POP3/SMTP communication method to match the E-mail server. For details of the E-mail server settings, contact your network administrator or ISP (Internet Service Provider). In most cases, the secured webmail services require the following settings:
  - **SMTP**
    - **SMTP Port**: 587
    - **SMTP Server Authentication Method**: SMTP-AUTH
    - **SMTP over SSL/TLS**: TLS
  - **POP3**
    - **POP3 Port**: 995
    - **POP3 over SSL/TLS**: SSL

6 Troubleshooting

Overview

This chapter explains how to resolve typical network problems you may encounter when using the Brother machine. If, after reading this chapter, you are unable to resolve your problem, please visit the Brother Solutions Center at: (http://solutions.brother.com/).

Please go to the Brother Solutions Center at (http://solutions.brother.com/) and click Manuals on your model page to download the other manuals.

Identifying your problem

Make sure that the following items are configured before reading this chapter.

First check the following:
The power cord is connected properly and the Brother machine is turned on.
All protective packaging has been removed from the machine.
The toner cartridges and drum unit are installed properly.
The front and back covers are fully closed.
Paper is inserted properly in the paper tray.
The machine is connected to the network properly.

Go to the page for your solution from the lists below

- I cannot print the document over the internet using IPPS.

  See *I cannot print the document over the internet using IPPS.* ➤➤ page 28.

- I want to check my network devices are working properly.

  See *I want to check my network devices are working properly.* ➤➤ page 28.

I cannot print the document over the internet using IPPS.

Question	Solution
I cannot communicate with my Brother machine using SSL.	■ Obtain valid certificate and install on both your machine and computer again. ■ Make sure the port setting of your machine is correct. You can confirm your machine's port setting on the Web Based Management screen, by clicking **Network**, **Protocol** and then **HTTP Server Settings**.

I want to check my network devices are working properly.

Question	Solution
Is your Brother machine turned on?	Make sure you have confirmed all instructions in *First check the following:* ➤➤ page 27.
Where can I find my Brother machine's network settings, such as IP address?	Print the Network Configuration Report. See *Printing the Printer Settings Page (For HL-5450DN(T))* ➤➤ page 29 or *Printing the Network Configuration Report (For other models)* ➤➤ page 29.

Printing the Printer Settings Page (For HL-5450DN(T))

Note

Node name: The Node name appears on the Network Configuration Report. The default node name is “BRNxxxxxxxxxxxx”. (“xxxxxxxxxxxx” is your machine’s MAC Address / Ethernet Address.)

The Printer Settings Page prints a report listing all the current printer settings including the network print server settings.

You can print the Printer Settings Page using the **Go** button on the machine.

1. Make sure that the front cover is closed and the power cord is plugged in.
2. Turn on the machine and wait until the machine is in the Ready state.
3. Press **Go** three times within 2 seconds. The machine will print the current Printer Settings Page.

Printing the Network Configuration Report (For other models)

Note

Node name: The Node name appears on the Network Configuration Report. The default node name is “BRNxxxxxxxxxxxx” for a wired network or “BRWxxxxxxxxxxxx” for a wireless network. (“xxxxxxxxxxxx” is your machine’s MAC Address / Ethernet Address.)

The Network Configuration Report prints a report listing all the current network configuration including the network print server settings.

For HL-5470DW(T) and HL-6180DW(T)

1. Press ▲ or ▼ to choose `Machine Info.`.
   Press **OK**.
2. Press ▲ or ▼ to choose `Print NetSetting`.
   Press **OK**.

For DCP-8110DN, DCP-8150DN, DCP-8155DN, MFC-8510DN, MFC-8710DW, MFC-8810DW and MFC-8910DW

1. Press **Menu**.
2. (For MFC models) Press ▲ or ▼ to choose `Print Reports`.
   (For DCP models) Press ▲ or ▼ to choose `Machine Info.`.
   Press **OK**.
3. Press ▲ or ▼ to choose `Network Config`.
   Press **OK**.
4. Press **Start**.

For DCP-8250DN and MFC-8950DW(T)

1. Press `Menu`.
2. Press ▲ or ▼ to display `Print Reports` and then press `Print Reports`.
3. Press `Network Config`.
4. Press **Start**.

Note

If the **IP Address** on the Network Configuration Report shows **0.0.0.0**, wait for one minute and try again.

Network terms and concepts

SSL technical overview

Secure Socket Layer (SSL) is a method for protecting transport layer data sent over a local or wide area network by using the Internet Printing Protocol (IPP), to prevent unauthorised users being able to read them.

It achieves this by using authentication protocols in the form of digital keys, of which there are 2:

- A public key – known by everyone who is printing.
- A private key – known only by the machine used to decrypt packets and make them readable again by the machine.

The public key uses either 1024bit or 2048bit encryption and is contained inside a digital certificate. These certificates can either be self signed or approved by a Certificate Authority (CA).

First, there are three different keys, Private, Public and Shared.

The Private key, known only to the machine, is associated with the Public key but not contained within the client's (sender's) digital certificate. When the user first establishes the connection, the machine will send the Public key with the certificate. The client PC trusts that the Public key is from the machine with the certificate. The client generates the Shared key, and encodes it with the Public key, then sends to the machine. The machine encodes the Shared key with the Private key. Now the machine and client share the Shared key safely, and establish the safe connection for print data transfers.

The print data is encoded and decoded with the Shared key.

SSL will not stop unauthorised users from accessing packets, however, it will make them unreadable without the private key, which is not disclosed to anyone apart from the machine.

It can be configured on both wired and wireless networks and will work with other forms of security such as WPA keys and firewalls, given the appropriate configuration.

Network terms

- Secure Socket Layer (SSL)

  The security communication protocol encrypts data to prevent security threats.

- Internet Printing Protocol (IPP)

  IPP is a standard printing protocol used for managing and administering print jobs. It can be used both locally and globally so anyone in the world can print to the same machine.

- IPPS

  The version of the printing protocol Internet Printing Protocol (IPP Version 1.0) that uses SSL.

- HTTPS

  The version of the internet protocol Hyper text Transfer Protocol (HTTP) that uses SSL.

- CA (Certificate Authority)

  A CA is an entity that issues digital certificates (especially X.509 certificates) and vouches for the binding between the data items in a certificate.

- CSR (Certificate Signing Request)

  A CSR is a message sent from an applicant to a CA in order to apply for issue of a certificate. The CSR contains information identifying the applicant, the public key generated by the applicant and the digital signature of the applicant.

- Certificate

  A Certificate is the information that binds together a public key with an identity. The certificate can be used to verify that a public key belongs to an individual. The format is defined by the x.509 standard.

- Public key cryptosystem

  A Public key cryptosystem is a modern branch of cryptography in which the algorithms employ a pair of keys (a public key and a private key) and use a different component of the pair for different steps of the algorithm.

- Shared key cryptosystem

  A Shared key cryptosystem is a branch of cryptography involving algorithms that use the same key for two different steps of the algorithm (such as encryption and decryption).