

DJIGZO EMAIL ENCRYPTION

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# Djigzo S/MIME Setup Guide

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## Contents

<b>1</b>	<b>Introduction</b>	<b>3</b>
<b>2</b>	<b>S/MIME</b>	<b>3</b>
2.1	PKI . . . . .	3
2.2	X.509 certificate . . . . .	4
2.3	Revocation checking . . . . .	6
<b>3</b>	<b>Gateway S/MIME quick setup</b>	<b>6</b>
3.1	Certificate Authority (CA) . . . . .	6
3.2	Certificates for internal users . . . . .	7
3.3	Certificates for external users . . . . .	9
<b>4</b>	<b>Email clients setup</b>	<b>11</b>
4.1	Outlook . . . . .	11
4.1.1	Importing the pfx attachment . . . . .	11
4.1.2	Receiving and sending S/MIME . . . . .	14
4.1.3	Sending signed and encrypted email . . . . .	16
4.2	Outlook Express . . . . .	16
4.2.1	Importing the pfx attachment . . . . .	17
4.2.2	Receiving and sending S/MIME . . . . .	18
4.2.3	Sending signed and encrypted email . . . . .	18
4.3	Thunderbird . . . . .	20
4.3.1	Importing the pfx attachment . . . . .	21
4.3.2	Receiving signed and encrypted email . . . . .	25
4.3.3	Sending signed and encrypted email . . . . .	26
4.4	Apple Mail . . . . .	27
4.4.1	Importing the pfx attachment . . . . .	27
4.4.2	Receiving signed and encrypted email . . . . .	28
4.4.3	Sending signed and encrypted email . . . . .	28
4.5	Gmail . . . . .	28
4.5.1	Installing the Firefox add-in . . . . .	29
4.5.2	Importing the pfx attachment . . . . .	29
4.5.3	Sending signed and encrypted email . . . . .	33
4.5.4	Sending signed and encrypted email . . . . .	33
4.5.5	Notes . . . . .	35
4.6	Lotus Notes . . . . .	36
4.6.1	Importing the pfx attachment . . . . .	36
4.6.2	Receiving signed and encrypted email . . . . .	37
4.6.3	Sending signed and encrypted email . . . . .	40
<b>A</b>	<b>Djigzo S/MIME headers</b>	<b>41</b>
<b>B</b>	<b>Links</b>	<b>42</b>

## 1 Introduction

The first part of this guide will give a short introduction on S/MIME. The second part of this guide will briefly explain how to setup a Djigzo gateway for S/MIME (for a more detailed guide on managing a Djigzo gateway see the *Djigzo Administration Guide*). The third part of this guide will explain how to setup S/MIME for some of the most popular email clients (like Outlook, Lotus Notes etc.).

## 2 S/MIME

S/MIME is a widely supported email encryption standard. S/MIME is natively supported by most common email clients like Outlook, Outlook express, Windows Mail, Lotus Notes, Thunderbird, Evolution, Apple Mail, BlackBerry etc. This section will give a brief introduction to S/MIME. S/MIME is based on *Public Key Infrastructure* (PKI) and uses X.509 certificates.

**Note:** this section is a direct copy of the S/MIME section of the *Djigzo Administration Guide* and can be skipped if the section has already been read.

### 2.1 PKI

Public Key Infrastructure is a technology which can be used to securely exchange information over insecure networks using public key cryptography. PKI uses X.509 certificates to bind a public key to an identity. The main advantage of PKI is that there is no need to directly trust everyone involved because trust can be inferred. Roughly speaking there are two trust models in use today: hierarchical (via trusted CAs) or “Web Of Trust”.

With the hierarchical trust model, trust is inferred bottom-up. The root (the bottom) is blindly trusted (that makes it by definition a root) and all leaf nodes and branches (the end-user and intermediate certificates) are trusted because they are child’s of the trusted root (to be precise the intermediate certificates are issued by the root certificate). S/MIME uses a hierarchical trust model.

In a “Web of Trust” model, trust is inferred from trusted neighbors in a mesh like structure (a web). **For example:** *Alice* trusts *Bob* and *Ted* trusts *Alice* and therefore *Ted* now also trusts *Bob* (through *Alice*). The hierarchical model can be viewed as a “Web of Trust” model with additional constraints.

Because trust is inferred from other entities, it is possible to securely check whether one entity trusts another entity and that it is not possible to “spoof” any trust. Trust checking is done using *Public Key Cryptography*. An intermediate certificate is digitally signed by the issuer of the certificate using the issuers private key. With the public key of the issuer, it can be checked whether the certificate was really issued by the issuer. The public key together with some extra information forms an X.509 certificate.

## 2.2 X.509 certificate

A typical X.509 certificate contains the following elements (this is a non-exhaustive list):

- Public Key
- Subject
- Email address
- Issuer
- Serial Number
- Not Before
- Not After
- Key Usage
- Extended Key Usage

An X.509 certificate is digitally signed by the issuer of the certificate. By digitally signing the certificate, any changes done after signing will break the signature. Any changes to the certificate will therefore be noticed. A brief introduction of some of the main elements of an X.509 now follows.

**Public Key** The public key, like the name already implies, is the key that everyone is allowed to know. If a message must be encrypted, the public key of the recipient is used for encryption. The public key is used to verify a digital signature (the digital signature is created with the associated private key).

**Subject** The subject of a certificate contains the name of the “owner” and optionally an email address (or sometimes multiple email addresses).

**Email address** A certificate can contain multiple email addresses. X.509 certificates for S/MIME should normally contain the email address for which the certificate was issued.

**Issuer** The issuer contains the name of the issuer of this certificate (i.e., the issuer element should be equal to the subject of the issuer). If the subject of a certificate is equal to the issuer of a certificate the certificate is most likely a self-signed certificate. Root certificates are almost always self-signed.

**Serial Number** Every certificate should have a serial number. The serial number should be unique for the issuer (i.e., an issuer should use the serial number only once).

**Not Before** This is the date at which the certificate becomes valid. If the current date is before the *Not Before* date, the certificate is not yet valid.

**Not After** This is the date at which the certificate is no longer valid. If the current date is after the *Not After* date, the certificate is no longer valid.

**Key Usage** The public key of the certificate can be used for multiple purposes. Sometimes however the issuer of the certificate wants to restrict the key usage to only certain types. The following key usage types can be identified:

- digitalSignature
- nonRepudiation
- keyEncipherment
- dataEncipherment
- keyAgreement
- keyCertSign
- CRLSign
- encipherOnly
- decipherOnly

If the key usage is not specified it implies that the key may be used for all purposes. For S/MIME encryption, if a key usage is specified it should at least contain *keyEncipherment*. For S/MIME signing, if a key usage is specified it should at least contain *digitalSignature* or *nonRepudiation*.

**Extended Key Usage** The extended key usage, if specified, further specifies for what purposes the certificate has been issued. The following extended key usages can be identified:

- anyKeyUsage
- serverAuth
- clientAuth
- codeSigning
- emailProtection
- timeStamping
- OCSPSigning
- IPSecEndSystem
- IPSecUser
- IPSecTunnel
- smartcardLogin

If the extended key usage is not specified it implies that the key may be used for all purposes. For S/MIME, if an extended key usage is specified, it should at least contain *anyKeyUsage* or *emailProtection*.

**Thumbprint** The thumbprint is strictly speaking not part of an X.509 certificate. The thumbprint is the *cryptographic hash*<sup>1</sup> calculated over the bytes of the encoded certificate. The thumbprint uniquely identifies a certificate. The default algorithm used by Djigzo for calculating the thumbprint is *SHA-512*.

## 2.3 Revocation checking

Sometimes it can happen that a certificate should no longer be used. For example because the *private key* has been compromised or an employee has left the company. Certificates can be revoked by putting the certificates on a “Certificate Revocation List” (CRL). A CRL is issued by a certificate authority (CA) and is periodically updated. A revoked certificate should no longer be used. When a CRL is not available or when the administrator would like to “black list” a specific certificate, the certificate can be added to the *Certificate Trust List* (CTL). For more info on CTL see the Certificate Trust List section in the *Djigzo Administration Guide*.

## 3 Gateway S/MIME quick setup

Djigzo supports S/MIME encryption and digital signatures. Both the sender and receiver require a certificate and private key. Djigzo therefore has a built-in CA server that can be used to issue certificates and keys to internal and external users for free.

External users, without a Djigzo gateway, can use any S/MIME capable email client to start sending and receiving encrypted email once the certificate has been installed. External and internal users however are not required to use the built-in CA. If an external recipient already possesses an S/MIME certificate, the certificate can be used instead.

What now follows is a quick-start-guide on setting up a Djigzo gateway for S/MIME. It is assumed that the Djigzo gateway is already setup and is capable of sending email.

### 3.1 Certificate Authority (CA)

The Djigzo gateway contains a built-in CA server which can be used to create end-user certificates for internal and external users. This helps to quickly setup an S/MIME infrastructure without having to resort to external CAs for certificates and keys. Certificates and private keys can be securely transported to external recipients using a password encrypted certificate store (.pfx). The external recipients can use the certificate with any S/MIME capable email client like *Outlook*, *Outlook express*, *Lotus Notes* and start receiving and sending S/MIME encrypted email without having to install additional software.

A brief explanation of the CA functionality will now follow. This section can be skipped if a CA is already setup.

<sup>1</sup>See [http://en.wikipedia.org/wiki/Cryptographic\\_hash\\_function](http://en.wikipedia.org/wiki/Cryptographic_hash_function) for more info on cryptographic hash functions.

**Note:** the built-in CA has limited functionality. If support for multiple CA profiles, OCSP, CRLs for intermediate and root certificates is required a dedicated external CA should be used instead (for example EJBCA).

### Creating new CA

A new CA can be created by clicking *Create new CA* on the CA page (CA→*Create new CA*). The *Create new CA* page will be opened (see figure 1).

With the following steps, a new CA can be created:

1. Set validity to 1825 days (5 years) and key length to 2048<sup>2</sup>.
2. Leave the email field empty.
3. Set a common name that uniquely identifies your CA. The common name of the root must be different from the common name of the intermediate.
4. Select *make default CA*.
5. Set signature algorithm to *SHA1 With RSA*<sup>3</sup>.
6. Click *Create* to create the new root and intermediate certificate.

## 3.2 Certificates for internal users

For every internal user an S/MIME certificate should be created. The domains for which email is received should be internal domains and should be set to allow encrypted S/MIME messages to be sent.

For every domain for which you receive email do the following:

1. Add the domain.
2. Set *Encrypt mode* to *Allow*<sup>4</sup>.
3. Set the *Locality* property to *Internal*.
4. Set the S/MIME *Allow* property.

For every internal user (i.e., a user from an internal domain) do the following:

1. Create a new end-user certificate by clicking CA (this opens the *Create end-user certificate* page, see figure 2)
2. Set validity to 1825 days (5 years) and key length to 2048<sup>5</sup>.

<sup>2</sup>2048 is the best compromise between security and key length.

<sup>3</sup>Windows versions prior to *XP-sp3* do not support *SHA256 With RSA* or better. If older Windows versions should be supported, you are advised to use *SHA1 With RSA*. If support for older Windows versions is not required, you are advised to select *SHA256 With RSA*.

<sup>4</sup>Alternatively *No Encryption* can be used in combination with a *Subject trigger*.

<sup>5</sup>2048 is the best compromise between security and key length.

Certificates Roots CRLS CA SMS Settings Queues Logs Ad

### Create new CA

---

**Root certificate**

Validity in days

Key length in bits

Email

Common name required

more

**Intermediate certificate**

Validity in days

Key length in bits

Email

Common name required

more

**General**

Make default CA

Signature algorithm for certificate signature

Figure 1: Create new CA

3. Set signature algorithm to *SHA1 With RSA*<sup>6</sup>.
4. Set email to the email address of the internal user.
5. Set a common name to identify the user (for example use the first and last name of the user).
6. Click *Create* to create the certificate and private key for the user.

**Note:** For advanced settings like CRL distribution point see the *Djigzo Administration Guide* for more information.

### 3.3 Certificates for external users

In order to send and receive S/MIME encrypted and digitally signed email, every external recipient should possess a certificate and private key. An external recipient can request a certificate from an external CA (for example from Verisign). However, getting a certificate from Djigzo's built-in CA is much simpler than requesting a certificate from an external CA. With Djigzo's built-in CA, the external user only need to install a password protected pfx file.

**Note:** the email address of the CA should be specified before the password protected pfx file can be sent. For more information, see *CA email* setting in section *CA settings* of the *Djigzo Administration Guide*.

For each external recipient requiring an S/MIME certificate do the following:

1. Create a new user.
2. Set the S/MIME *Allow* property.
3. Create a new end-user certificate by clicking CA (this opens the *Create end-user certificate* page, see figure 2)
4. Set validity to 1825 days (5 years) and key length to 2048<sup>7</sup>.
5. Set signature algorithm to *SHA1 With RSA*<sup>8</sup>.
6. Set email to the email address of the external user.
7. Set a common name to identify the user (for example use the first and last name of the user).
8. If the certificate and private key should be sent by email to the external recipient in a password encrypted pfx file, select *Send by email* and select a secure password<sup>9</sup>.

<sup>6</sup>Windows versions prior to *XP-sp3* do not support *SHA256 With RSA* or better. If older Windows versions should be supported, you are advised to use *SHA1 With RSA*. If support for older Windows versions is not required, you are advised to select *SHA256 With RSA*.

<sup>7</sup>2048 is the best compromise between security and key length.

<sup>8</sup>Windows versions prior to *XP-sp3* do not support *SHA256 With RSA* or better. If older Windows versions should be supported, you are advised to use *SHA1 With RSA*. If support for older Windows versions is not required, you are advised to select *SHA256 With RSA*.

<sup>9</sup>the 'gear' icon generates a secure random password

### Create new end-user certificate

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[Create CRL](#) | [Send certificates](#) | [Bulk request](#) | [Pending requests](#)

#### General

---

validity  
in days

Key length  
in bits

Signature algorithm  
for certificate signature

#### Certificate subject

---

Email  
required

Common name  
required

more

#### email delivery

---

Send by email   
send key file to user

Password   
password for key file 

SMS password   
send password via SMS

Store password   
store the pfx password  
in the user preferences

#### Advanced

---

show advanced settings

Add CRL dist. point   
add to certificate

CRL dist. point   
fully qualified URL

Certificate Authority   
the CA to use for the  
certificate request

Add user   
add a user object for the  
requested certificate

Figure 2: Create end-user certificate

9. If the recipient should receive the pfx password via an SMS Text message, select *SMS password*. The recipients telephone number should be set for the external user.
10. Click *Create* to create the certificate and private key for the user.

After the certificate has been created, the certificates will be added to the certificate store. If *Send by email* was selected, the certificate and private key will be stored inside a password encrypted pfx file and a message with the pfx file will be sent to the recipient. If the *SMS password* was selected, the password for the pfx file will be sent to the recipient via an SMS Text message. If the password was not sent via an SMS Text message, an alternative channel should be used to let the recipient know what the password is.

The pfx file with the certificate and private key should be installed on the recipients email client. The next sections will briefly explain the pfx file installation procedures for some of the most used email clients.

## 4 Email clients setup

The next sections will explain the pfx file installation procedures for some of the most used email clients.

### 4.1 Outlook

#### 4.1.1 Importing the pfx attachment

An Outlook recipient receives a message with the password encrypted pfx file as an attachment (see figure 3).

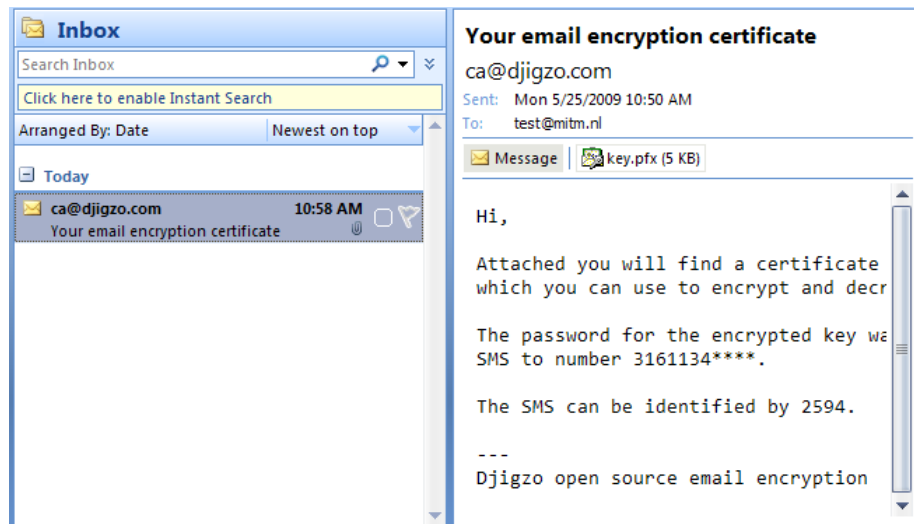


Figure 3: Outlook pfx attachment

The pfx file can be imported with the following procedure:

1. Start the “certificate import wizard”.
2. Go to password page.
3. Enter the private key password.
4. Go to finish page.
5. Accept the trusted root certificate.

These steps will now be explained in more detail.

**1. Start the “certificate import wizard”** Double click the attached pfx file (alternatively save the pfx file and open it with the file Explorer). A warning will be shown asking whether the pfx file should be opened (see figure 4). Click on the *Open* button. The *certificate import wizard* will now be started.

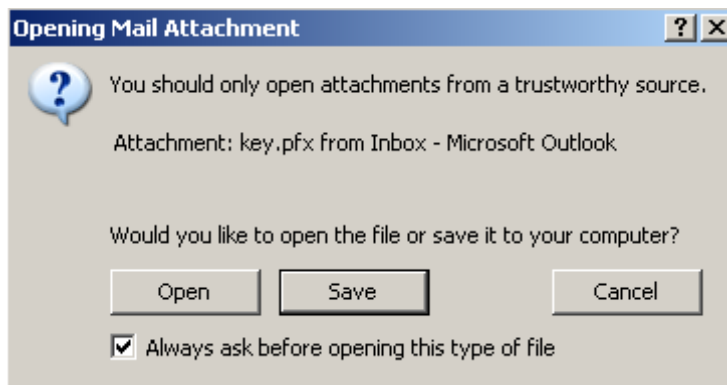


Figure 4: Outlook open pfx file

**2. Go to password page** Click Next button until the password page (see figure 5).

**3. Enter the private key password** Enter the pfx file password (see figure 6). The following two options can optionally be enabled: *Enable strong private key protection* and *Mark this key as exportable*

**Enable strong private key protection** If this option is selected Windows will always ask for permission when a program tries to access the private key.

**Mark this key as exportable** If this option is selected, the private key can be exported to create a backup of the private key.

**4. Go to finish page** Click next until the finish page (see figure 7).



Figure 5: Certificate import wizard



Figure 6: Enter pfx password

**5. Accept the trusted root certificate** On the final page, click *Finish* to start the certificate and private key import procedure. The pfx file not only contains an end-user certificate and private key, but also the root and intermediate certificates. The import wizard will try to import the root and intermediate certificates. When importing a root certificate a warning dialog is shown asking for permission to import the root certificate (see figure 8). Click **Yes** to accept the root certificate.



Figure 7: Certificate wizard finish

**Warning:** Only accept the root certificate if it comes from a trusted entity.



Figure 8: Certificate wizard root import warning

#### 4.1.2 Receiving and sending S/MIME

Now a certificate and private key have been installed, S/MIME encrypted and digitally signed email can be sent and received. An example of a signed and encrypted email in Outlook is shown in figure 9.

The "padlock" indicates that the message was encrypted and the "ribbon" indicates that the message was signed (see figure 10). The signed and encrypted message contains the public certificate of the sender. To make it pos-



Figure 9: Outlook signed and encrypted

sible to reply to the message, the public certificate should be associated with the sender. This can be done by clicking the sender's email address then right-click and select *Add to Outlook Contacts* (see figure 11).



Figure 10: Outlook sign and encrypt icons

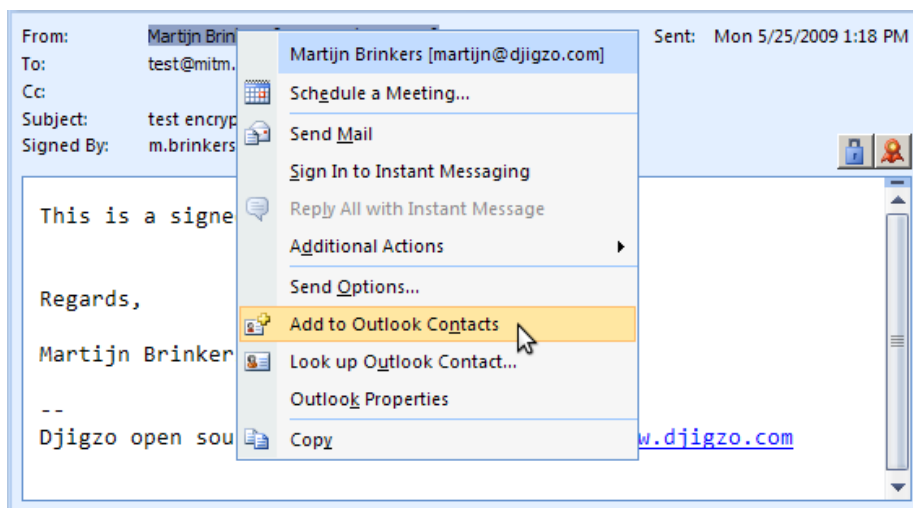


Figure 11: Outlook add to contacts

Now save the newly added Outlook contact. If the contact is already part of your contacts you will receive a "Duplicate Contact Detected" (see figure 12).

Click *Update* to add the certificate to the contact.

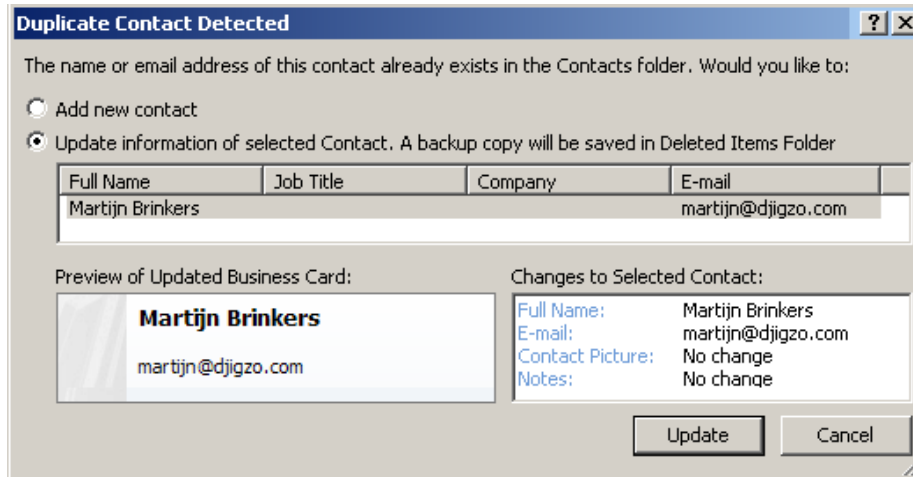


Figure 12: Outlook duplicate contact

**Note:** You only need to associate the certificate with the sender contact the first time you receive a signed and encrypted email.

#### 4.1.3 Sending signed and encrypted email

Sending a signed and encrypted email with Outlook is similar to sending a normal non-encrypted email. Sign and encrypt is triggered by selecting the sign and encrypt options. Outlook 2007 adds these icons to the toolbar (see figure 13). With older versions of Outlook the sign and encrypt icons can be manually added to the toolbar or the sign and encrypt option can be selected by opening the message options and selecting the *Security Settings...* (see figure 14).

In order to encrypt an email for a recipient, the certificate of the recipient must be available. If Outlook cannot find a certificate for one of the recipients a warning will be shown (see figure 15).

A message cannot be encrypted when the recipient does not have a certificate associated with the contact. A copy of the recipients certificate can be directly imported into the associated contact. To do this, open the contact and select the *Certificates* for the contact<sup>10</sup> (see figure 16) and import the certificate file (.cer or .p7b).

## 4.2 Outlook Express

An Outlook Express recipient receives a message with the password encrypted pfx file as an attachment (see figure 17).

<sup>10</sup>In Outlook 2003 you should open the *Certificates* tab.



Figure 13: Outlook sign and encrypt options

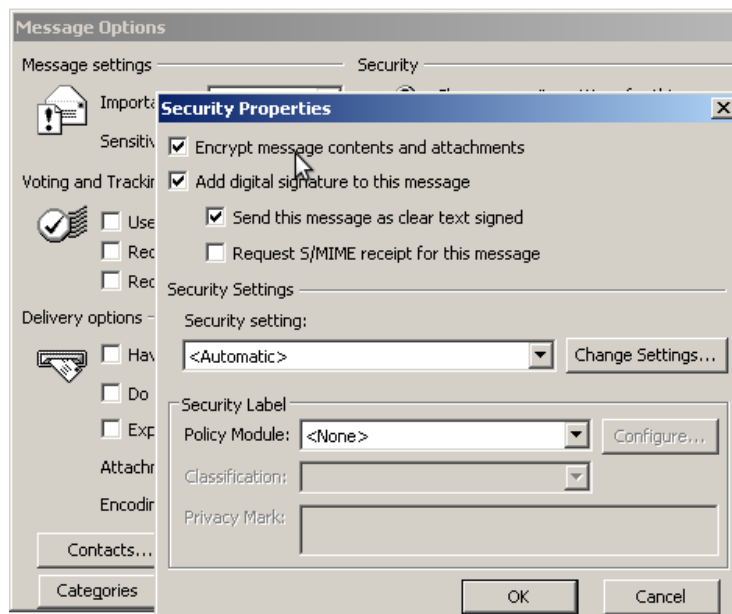


Figure 14: Outlook security properties

#### 4.2.1 Importing the pfx attachment

Importing the pfx from Outlook Express is similar to importing from Outlook. See section 4.1.1 for a detailed explanation on how to import the pfx attachment.



Figure 15: Outlook encryption problems

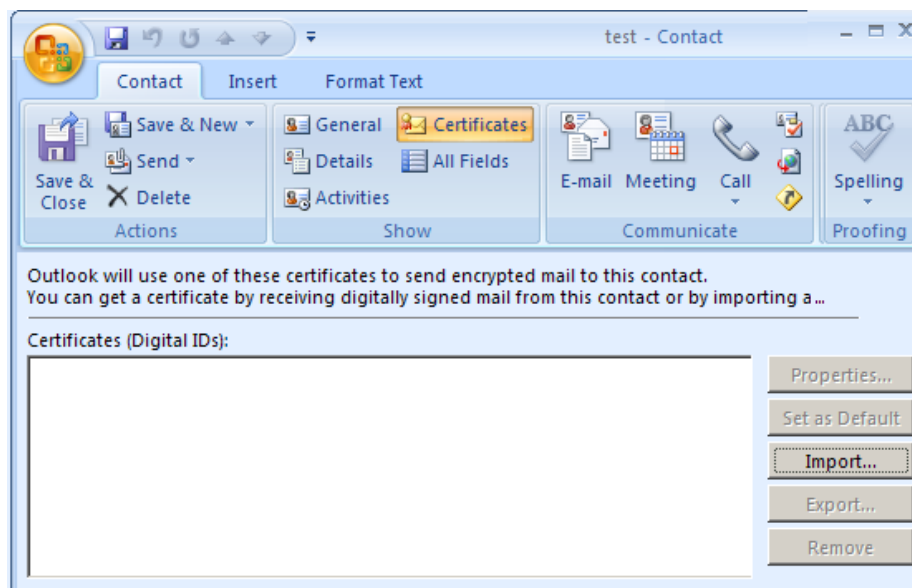


Figure 16: Outlook contact certificates

#### 4.2.2 Receiving and sending S/MIME

Now a certificate and private key have been installed, S/MIME encrypted and digitally signed email can be sent and received. An example of a signed and encrypted email in Outlook Express is shown in figure 18.

The “padlock” indicates that the message was encrypted and the “ribbon” indicates that the message was signed (see figure 19) Outlook Express automatically associates the certificate of the sender with the sender's contact.

#### 4.2.3 Sending signed and encrypted email

Sending a signed and encrypted email with Outlook is similar to sending a normal non-encrypted email. Sign and encrypt is triggered by selecting the sign and encrypt options (see figure 20)

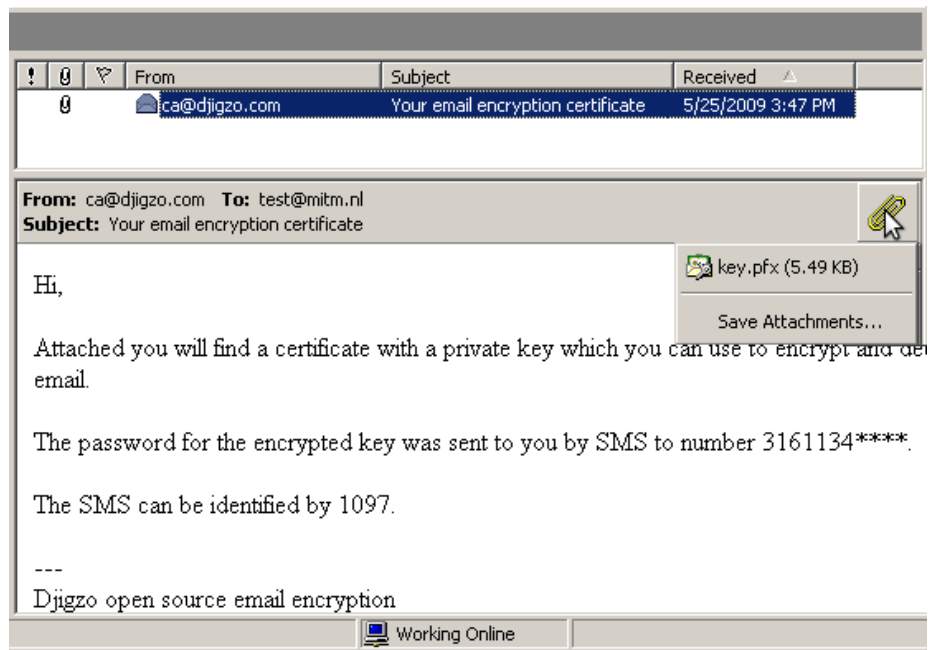


Figure 17: Outlook Express pfx attachment

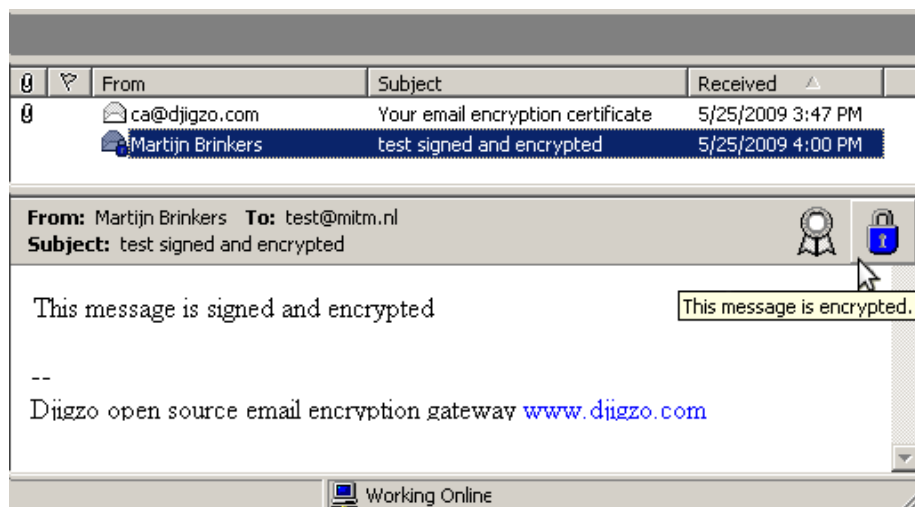


Figure 18: Outlook Express signed and encrypted



Figure 19: Outlook Express sign and encrypt icons



Figure 20: Outlook Express sign and encryption options

### 4.3 Thunderbird

A Thunderbird recipient receives a message with the password encrypted pfx file as an attachment (see figure 21).

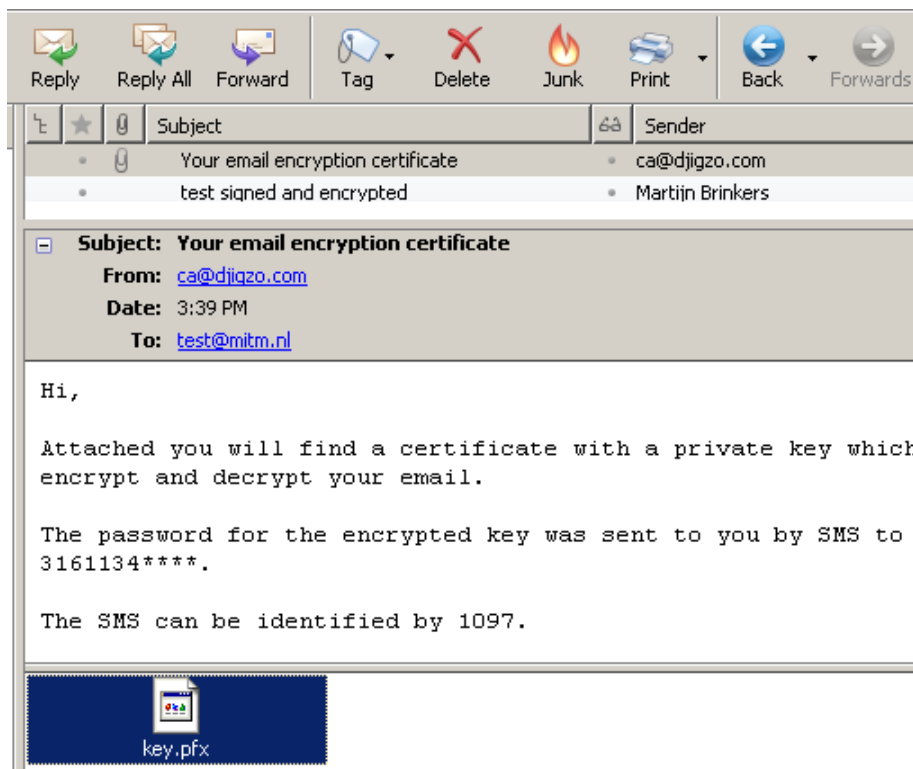


Figure 21: Thunderbird pfx attachment

### 4.3.1 Importing the pfx attachment

The pfx file can be imported with the following procedure:

1. Save the pfx file to the desktop.
2. Open the certificate manager.
3. Import the pfx.
4. Set the master password.
5. Enter the pfx password.
6. Lookup the name of the imported root.
7. Enable the imported root for S/MIME.
8. Select a signing and encryption certificate.

These steps will now be explained in more detail.

**1. Save the pfx file to the desktop** The pfx attached to the messages should be saved before the pfx can be imported. The the key.pfx attachment should be saved to the desktop (or to any other location normally used for attachments).

**2. Open the certificate manager** Open the Thunderbird options dialog (**Tools**→**Options**<sup>11</sup>). Select the *Advanced settings* and select the *Certificates* tab (see figure 22). Now click *View Certificates*. The *Certificate Manager* will now be opened (see figure 23).



Figure 22: Thunderbird certificates options

**3. Import the pfx** On the *Certificate Manager* select the *Your Certificates* tab, click the *Import* button and select the pfx file which was previously saved in step 1.

<sup>11</sup>On some Thunderbird versions the options dialog should be opened with **Edit**→**Preferences**

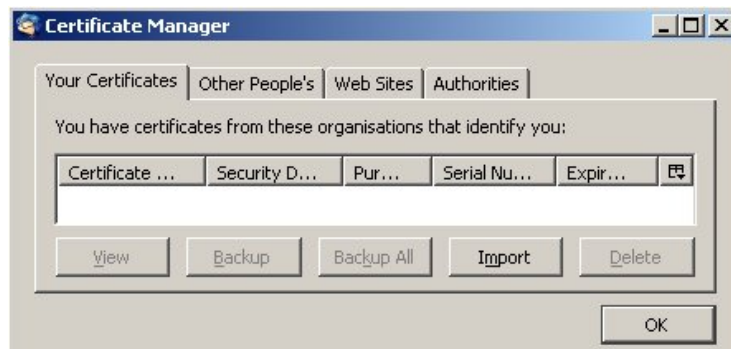


Figure 23: Thunderbird certificate manager

**4. Set the master password** The first time a certificate is added to Thunderbird, the *Master Password* for the key store should be set (see figure 24). The master password is used to protect the private keys which are stored in Thunderbird. The private keys are encrypted with the *Master Password* to ensure that only the owner can access the private keys.

**Note:** this is NOT the password of the pfx file from step 1! A secure master password should be selected by the computer owner or administrator. If the master password was already set, the master password should be entered before a new certificate can be imported.



Figure 24: Thunderbird master password

**5. Enter the pfx password** The password for the pfx file should now be entered (see figure 25). This is the password that was provided via an SMS Text message or provided by other means. Clicking *OK* will start the import process.

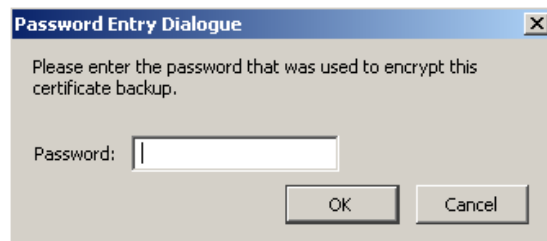


Figure 25: Thunderbird password entry dialog

**6. Lookup the name of the imported root** The imported root certificate is not yet enabled for S/MIME. Before the root certificate can be enabled for S/MIME the name of the root certificate should be looked up first. Open the *Certificate Manager*, select the *Your Certificates* tab and select the certificate that was just imported (see figure 26).

Double click the certificate to open the certificate details page (see figure 27). The first entry in the *Certificate Hierarchy* is the root certificate. The name of the root certificate is needed in the following steps.

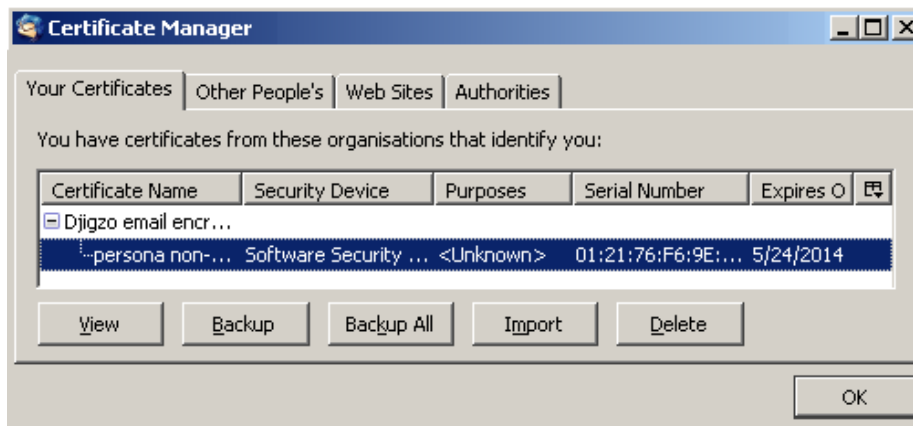


Figure 26: Thunderbird manager your certificates

**7. Enable the imported root for S/MIME** Open the *Certificate Manager* and select the *Authorities* tab (see figure 28). Select the root certificate from step 6 and click the *Edit* button to open the *Edit CA certificate trust settings* page.

On the *Edit CA certificate trust settings* page, select “This certificate can identify mail users” to enable the root certificate for S/MIME (see figure 29). Click *OK* and close all dialogs.

**8. Select a signing and encryption certificate** Now that a certificate and private key have been imported, the encryption and signing certificate should

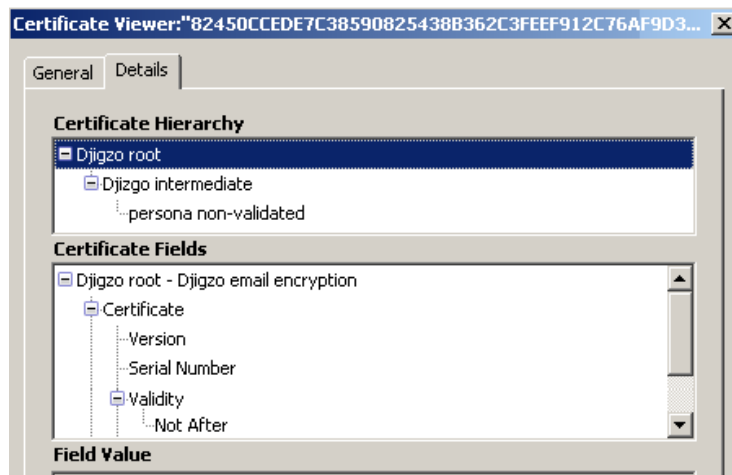


Figure 27: Thunderbird certificate details



Figure 28: Thunderbird authorities



Figure 29: Thunderbird CA certificate trust settings

be selected. Open the *Account Settings* page (**Tools**→**Account Settings...**<sup>12</sup>). Now select the security options of the email account for which the signing and encryption certificate should be set (see figure 30).

To select a signing and encryption certificate, click the *Select...* button for *Digital Signing* and *Encryption* and select the newly added certificate. Leave all other settings to their default values and close the account settings dialog.

Thunderbird is now ready for sending and receiving signed and encrypted email.

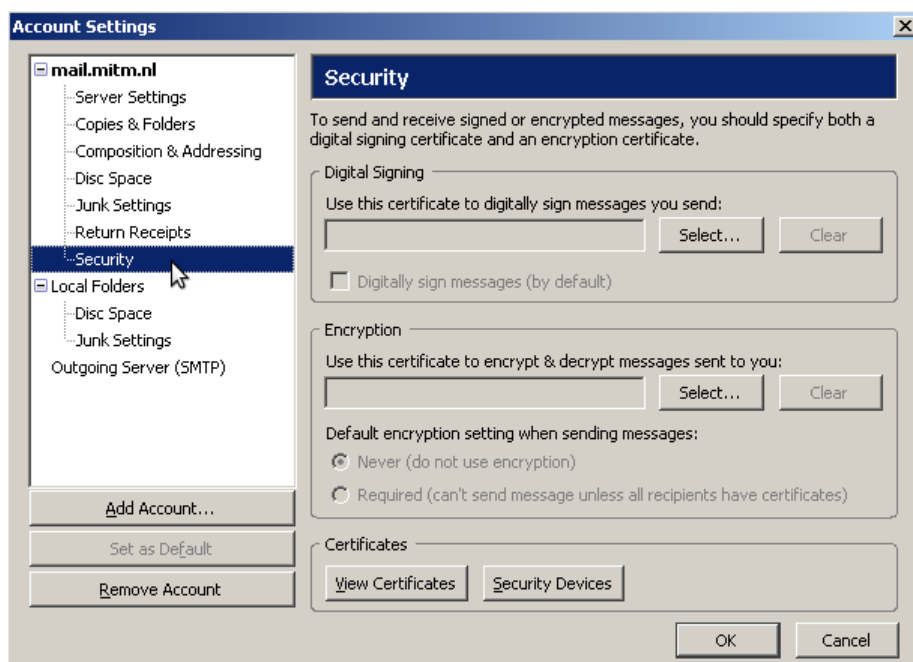


Figure 30: Thunderbird Account Settings

### 4.3.2 Receiving signed and encrypted email

An example of a signed and encrypted email in Thunderbird is shown in figure 32. The “padlock” indicates that the message was encrypted and the “ribbon” indicates that the message was signed (see figure 31)



Figure 31: Thunderbird sign and encrypt icons

<sup>12</sup>On some Thunderbird versions the Account Settings should be opened with **Edit**→**Account Settings...**



Figure 32: Thunderbird signed and encrypted

### 4.3.3 Sending signed and encrypted email

A message in Thunderbird can be signed and encrypted by selecting *Encrypt This Message* and *Digitally Sign This Message* from the *Security* pull-down menu (see figure 33).

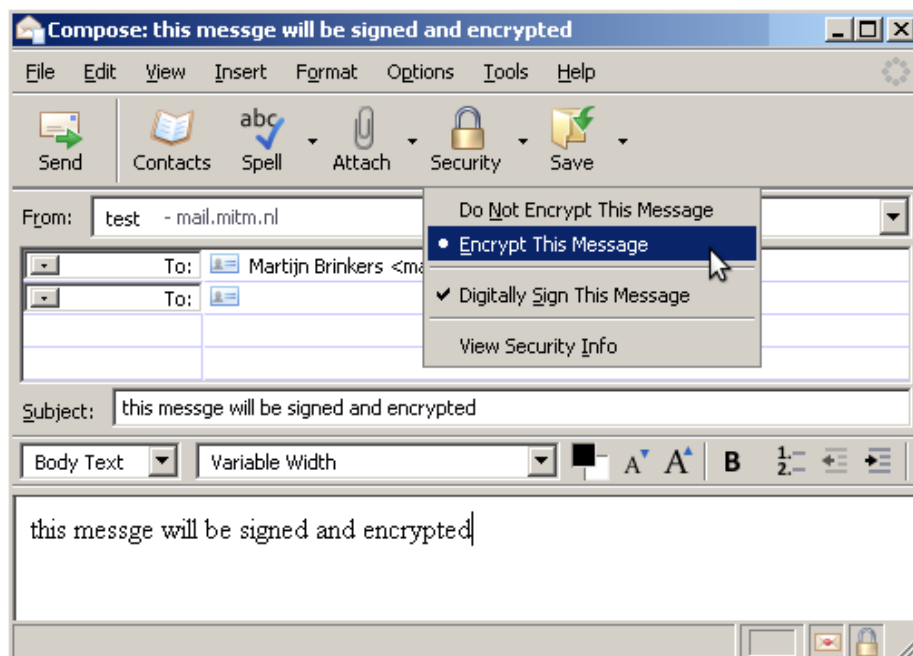


Figure 33: Thunderbird sign and encrypt

## 4.4 Apple Mail

### 4.4.1 Importing the pfx attachment

The pfx file can be imported with the following procedure:

1. Start the *Keychain Access* application.
2. Enter the pfx password.
3. Accept the root certificate.
4. Restart Mail.

These steps will now be explained in more detail.

**1. Start the *Keychain Access* application** By double-clicking the pfx file, the *Keychain Access* application will be started. The *Keychain Access* application will automatically start the certificate and private key import process. If the *Keychain Access* application is not automatically opened, drag the pfx file onto the *Keychain Access* application icon<sup>13</sup>.

**2. Enter the pfx password** The password for the pfx file should now be entered. This is the password that was provided via an SMS Text message or provided by other means.

**3. Accept the root certificate** The pfx file not only contains the end-user certificate and private key but also the root and intermediate certificate. When import a root certificate, the *Keychain Access* application asks whether the root certificate should be trusted<sup>14</sup> (see figure 34). Select *Always trust*.

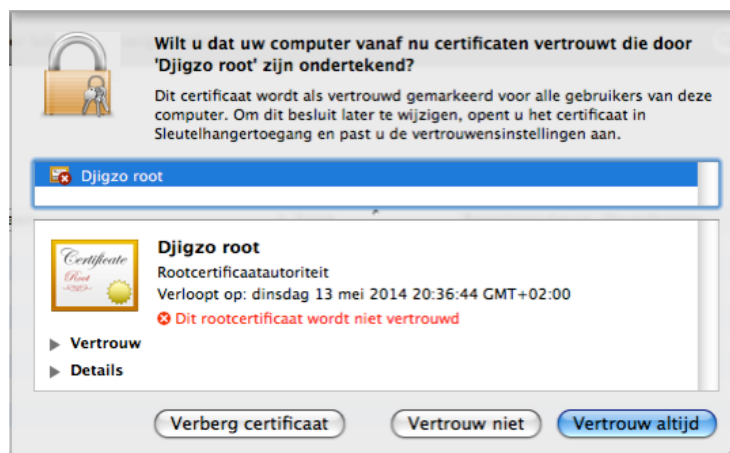


Figure 34: Apple Mail trust root certificate

<sup>13</sup>/Applications/Utilities

<sup>14</sup>This example is in Dutch. Dialogs for other languages should look similar.

**4. Restart Apple Mail** After installing the private key, Apple Mail should be restarted. Apple Mail is now setup for sending and receiving signed and encrypted email.

#### 4.4.2 Receiving signed and encrypted email

An example of a signed and encrypted email in Apple Mail is shown in figure 35.



Figure 35: Apple Mail signed and encrypted

#### 4.4.3 Sending signed and encrypted email

A message can be signed and encrypted by selecting the sign and encrypt options in the compose window (see figure 36).



Figure 36: Apple Mail sign and encrypt buttons

## 4.5 Gmail

If Gmail is accessed via the Gmail web interface, a dedicated browser add-in is required for reading and sending S/MIME messages since Gmail does not natively support S/MIME. A cross-platform add-in is available for Firefox with which S/MIME encrypted email can be sent and received directly from the Gmail web interface.

**Note:** If Gmail is accessed with POP3 or IMAP using an email client, like for instance Outlook, see the guide for the specific email client. This section only explains how to use S/MIME with the Gmail web interface.

### 4.5.1 Installing the Firefox add-in

The Gmail add-in can be downloaded from <https://addons.mozilla.org/en-US/firefox/addon/592>. The add-in can be installed by clicking *Add to Firefox*.

### 4.5.2 Importing the pfx attachment

A Gmail recipient receives a message with the password encrypted pfx file as an attachment (see figure 37).



Figure 37: Gmail pfx attachment

The pfx file can be imported with the following procedure:

1. Save the pfx file to the desktop.
2. Open the certificate manager.
3. Import the pfx.
4. Set the master password.
5. Enter the pfx password.
6. Lookup the name of the imported root.
7. Enable the imported root for S/MIME.

These steps will now be explained in more detail.

**1. Save the pfx file to the desktop** Because the Gmail add-in works with Firefox, the pfx file must be saved to the desktop (or to any other location) before it can be imported into Firefox.

**2. Open the certificate manager** Open the Firefox options dialog from the Firefox menu (**Tools**→**Options**<sup>15</sup>). Select the *Advanced settings* and select the *Certificates* tab (see figure 38). Now click *View Certificates*. The *Certificate Manager* will now be opened (see figure 39).

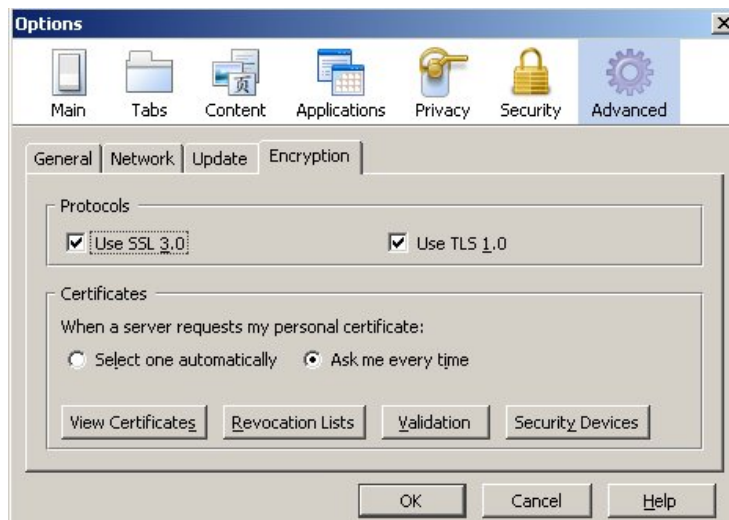


Figure 38: Firefox certificates options



Figure 39: Firefox certificate manager

**3. Import the pfx** On the *Certificate Manager* select the *Your Certificates* tab, click the *Import* button and select the pfx file which was previously saved in step 1.

<sup>15</sup>On some Firefox versions the options dialog should be opened with **Edit**→**Preferences**

**4. Set the master password** The first time a certificate is added to Firefox the *Master Password* for the key store should be set (see figure 40). The master password is used to protect the private keys which are stored in Firefox. The private keys are encrypted with the *Master Password* to ensure that only the owner can access the private keys.

**Note:** this is NOT the password of the pfx file from step 1! A secure master password should be selected by the computer owner or administrator. If the master password was already set, the master password should be entered before a new certificate can be imported.



Figure 40: Firefox master password

**5. Enter the pfx password** The password for the pfx file should now be entered (see figure 41). This is the password that was provided via an SMS Text message or provided by other means. Clicking *OK* will start the import process.

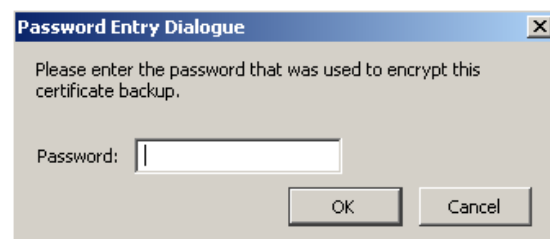


Figure 41: Firefox password entry dialog

**6. Lookup the name of the imported root** The imported root certificate is not yet enabled for S/MIME. Before the root certificate can be enabled for

S/MIME the name of the root certificate should be looked up first. Open the *Certificate Manager*, select the *Your Certificates* tab and select the certificate that was just imported (see figure 42).

Double click the certificate to open the certificate details page (see figure 43). The first entry in the *Certificate Hierarchy* is the root certificate. The name of the root certificate is needed in the following steps.

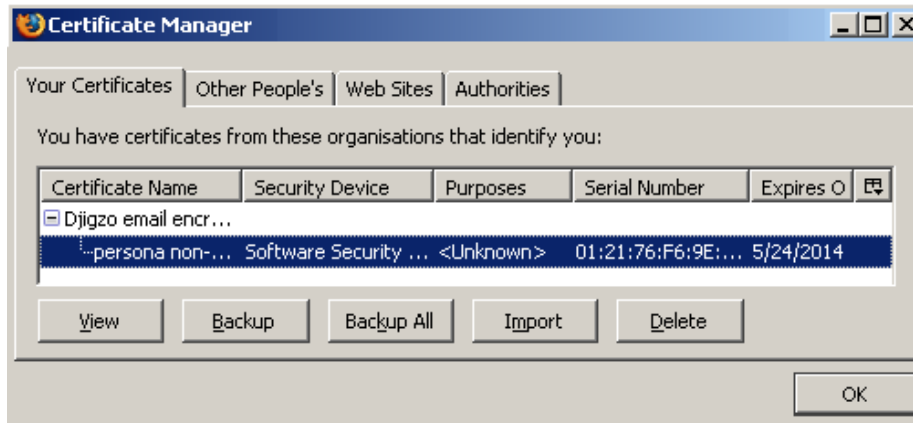


Figure 42: Firefox manager your certificates

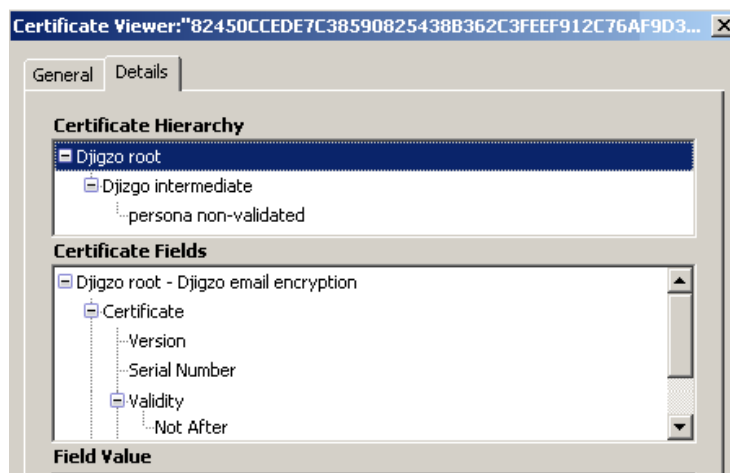


Figure 43: Firefox certificate details

**7. Enable the imported root for S/MIME** Open the *Certificate Manager* and select the *Authorities* tab (see figure 44). Select the root certificate from step 6 and click the *Edit* button to open the *Edit CA certificate trust settings* page.

On the *Edit CA certificate trust settings* page, select "This certificate can identify mail users" to enable the root certificate for S/MIME (see figure 45). Click

OK and close all dialogs.

Gmail is now ready for sending and receiving signed and encrypted email.



Figure 44: Firefox authorities



Figure 45: Firefox CA certificate trust settings

### 4.5.3 Sending signed and encrypted email

An example of a signed and encrypted email in Gmail is shown in figure 46.

**Note:** The Gmail S/MIME add-in currently does not verify digital signatures.

### 4.5.4 Sending signed and encrypted email

A message can be signed and encrypted by selecting the sign and encrypt option (see figure 47).

Click *Send* to sign, encrypt and send the message. When a message is signed





Figure 48: Gmail sign confirmation

should be entered (see figure 49). The Gmail add-in sends the signed and encrypted message via the Gmail SMTP servers. The Gmail password is required for sending the message via the Gmail SMTP servers.

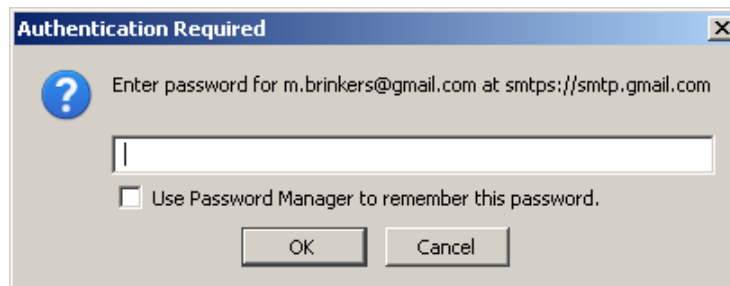


Figure 49: Gmail SMTP password

#### 4.5.5 Notes

The Gmail S/MIME add-in has some shortcomings compared to S/MIME support in other mail clients.

- Signatures are not verified.

- Drafts are not stored securely.

For more information see <http://richard.jones.name/google-hacks/gmail-smime/gmail-smime.html>.

## 4.6 Lotus Notes

A Lotus Notes recipient receives a message with the password encrypted pfx file as an attachment (see figure 50).



Figure 50: Lotus Notes pfx attachment

### 4.6.1 Importing the pfx attachment

The pfx file can be imported with the following procedure:

1. Save the pfx file to the desktop.
2. Open the *User Security* settings.
3. Import Internet Certificates.
4. Enter the pfx password.
5. Accept all certificates.

These steps will now be explained in more detail.

**1. Save the pfx file to the desktop** The pfx attached to the messages should be saved before the pfx can be imported. The the key.pfx attachment should be saved to the desktop (or to any other location normally used for attachments).

**2. Open the *User Security* settings** Open the *User Security* settings page from main menu **File**→**Security**→**User Security...** (see figure 51).

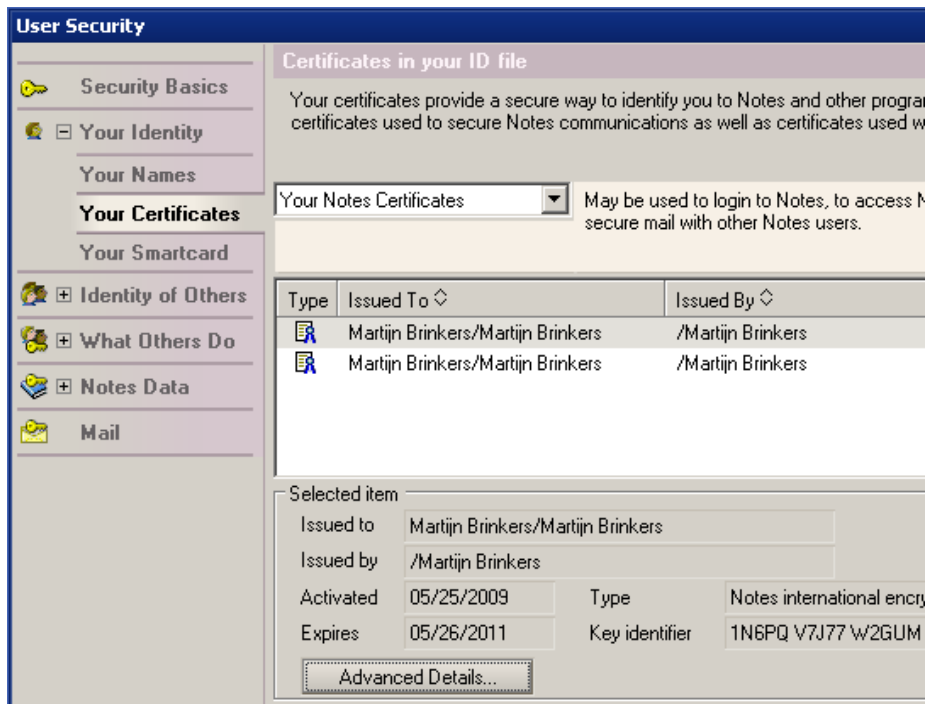


Figure 51: Lotus Notes Your Certificates

**3. Import Internet Certificates** On the *User Security* page, select **Your Identity**→**Your Certificates** and click *Get Certificates* and select *Import Internet Certificates* from the pull-down menu (see figure 52). Select the pfx file which was saved in step 1. A pop-up dialog opens in which the file format of the file to import should be selected (see figure 53). Select *PKCS 12 encoded* and click *Continue*.

**4. Enter the pfx password** The password for the pfx file should now be entered (see figure 54). This is the password that was provided via an SMS Text message or provided by other means. Clicking *OK* will start the import process.

**5. Accept all certificates** The import wizard will now be opened listing all certificates which will be imported (see figure 55). Click *Accept All* to start importing all the certificates.

#### 4.6.2 Receiving signed and encrypted email

The first time a signed and encrypted message is received by Lotus Notes, the signer certificates should be *Cross certified*. Click *Cross certify* to approve the

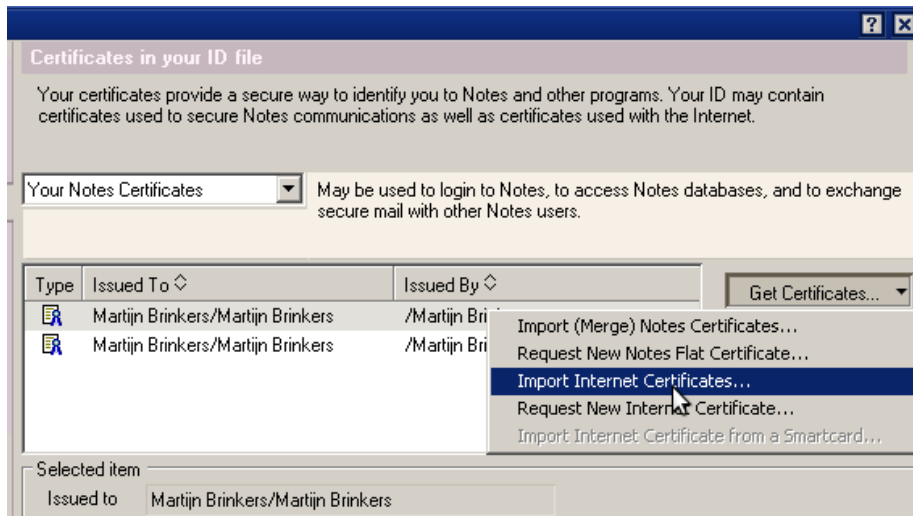


Figure 52: Lotus Notes Import Internet Certificates

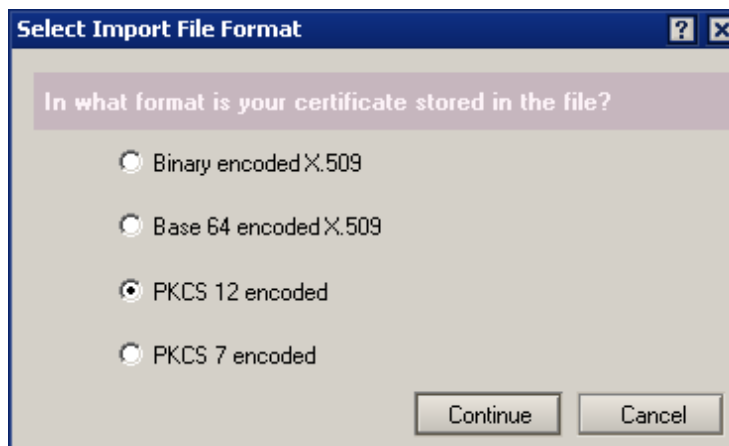


Figure 53: Lotus Notes Import File Format

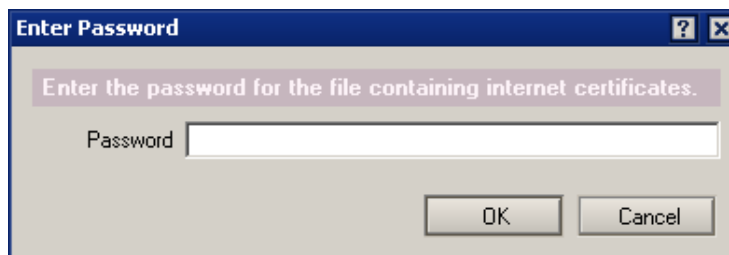


Figure 54: Lotus Notes PFX password

certificate (see figure 56).

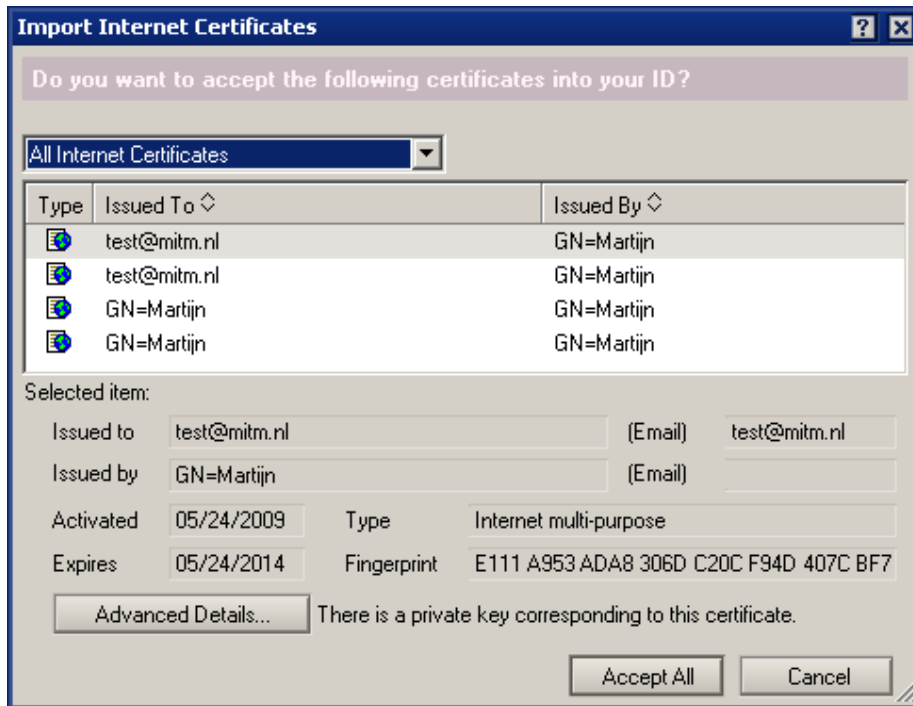


Figure 55: Lotus Notes confirm import

**Note:** A certificate only need to be cross certified once.

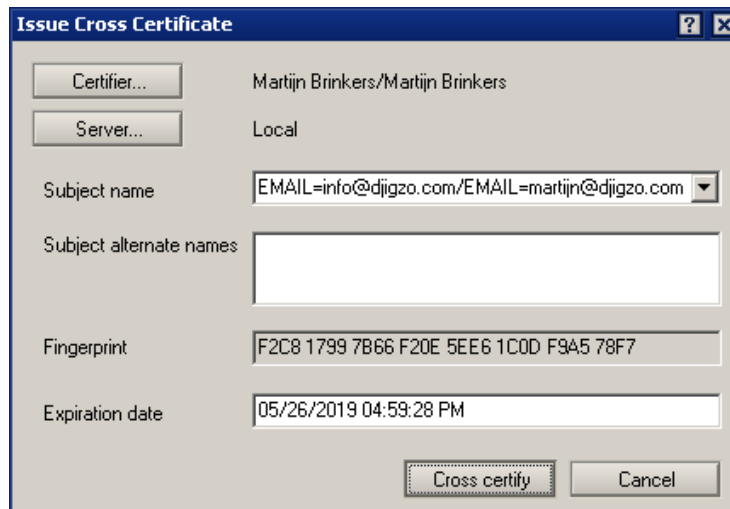


Figure 56: Lotus Notes Cross Certify

A signed and encrypted email can be recognized by clicking the *Security* icon (see figure 57). This opens a pop-up page showing the security details of the

message.

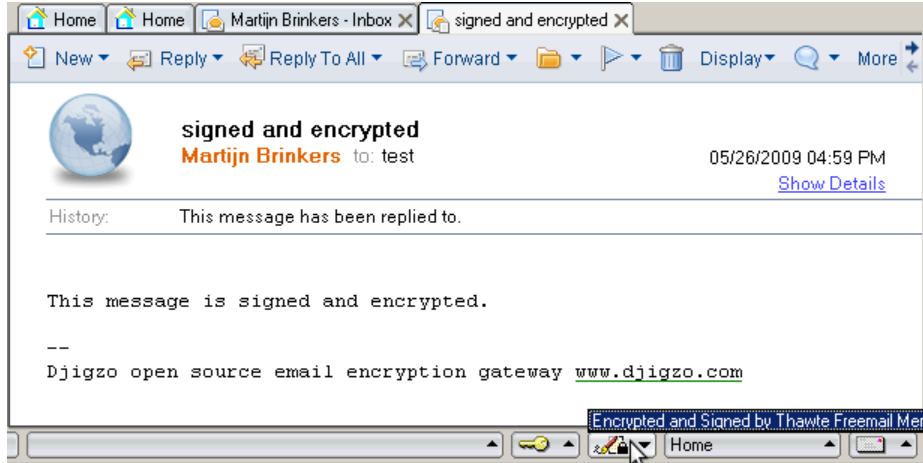


Figure 57: Lotus Notes signed and encrypted

#### 4.6.3 Sending signed and encrypted email

A message can be signed and encrypted by selecting the *Sign* and *Encrypt* options on the *Delivery Options* page (see figure 58). The message will be signed and encrypted when the message will be sent.

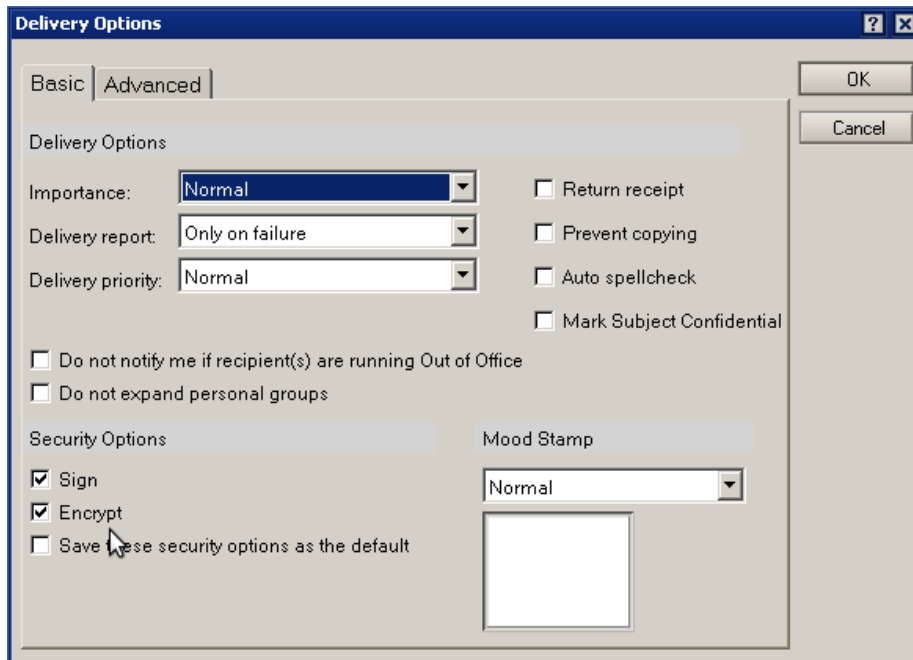


Figure 58: Lotus Notes delivery options

## A Djigzo S/MIME headers

When an incoming email is handled by Djigzo, special headers about the security properties of the email are automatically added to the email. For example, if an encrypted message sent to an internal users is decrypted by Djigzo relevant information about the encryption algorithm and recipients is added to the header. Because the message is decrypted by Djigzo the message is no longer encrypted. The internal recipient can therefore not see that the message was encrypted. Djigzo therefore adds some security related headers that can be used to check if the message was encrypted and or signed.

The following headers will be added:

```
X-Djigzo-Info-Signer-ID -*
X-Djigzo-Info-Signer-Verified-*
X-Djigzo-Info-Signer-Trusted -*
X-Djigzo-Info-Signer-Trusted-Info-*
X-Djigzo-Info-Encryption-Algorithm -*
X-Djigzo-Info-Encryption-Recipient -*
```

**Note:** The \* is replaced with an index and level as explained below.

```
[INDEX-]LEVEL
```

where INDEX and LEVEL are integer numbers starting at 0. INDEX is not used for all headers (optional).

### Example:

```
X-Djigzo-Info-Signer-ID-0-0
```

LEVEL denotes the S/MIME level the values applies to. An S/MIME message supports multiple nested levels of protection (CMS layers). For example, a message can first be signed and then encrypted. LEVEL 0 is the first level found by the S/MIME handler. Multiple items can exist within one level. For example, a message can be encrypted for multiple recipients. INDEX is the index of an item within a level.

### Example Headers:

```
X-Djigzo-Info-Encryption-Algorithm-0: AES128, Key size: 128
```

```
X-Djigzo-Info-Encryption-Recipient-0-0:
  CN=Thawte Personal Freemail Issuing CA, O=Thawte Consulting (Pty) Ltd.,
  C=ZA/6B55D312FF5F9D5DAD9866FF827FFEB5//1.2.840.113549.1.1.1
```

```
X-Djigzo-Info-Encryption-Recipient-1-0:
  EMAILADDRESS=support@cacert.org, CN=CA Cert Signing Authority,
  OU=http://www.cacert.org, O=Root CA/6683C//1.2.840.113549.1.1.1
```

```
X-Djigzo-Info-Signer-ID-0-1: CN=UTN-USERFirst-Client Authentication and Email,
```

OU=http://www.usertrust.com, O=The USERTRUST Network, L=Salt Lake City, ST=UT, C=US/88F9874A02A53042E0228D78CBD55795/

X-Djigzo-Info-Signer-Verified-0-1: True

X-Djigzo-Info-Signer-Trusted-0-1: True

---

The example headers shows that the message was first signed and then encrypted. The encryption algorithm was AES128. The message was encrypted with two certificates:

X-Djigzo-Info-Encryption-Recipient-0-0

X-Djigzo-Info-Encryption-Recipient-1-0

One certificate was issued by Thawte and the other was issued by CACert. The message was signed by one signer with a certificate issued by Usertrust.

**X-Djigzo-Info-Signer-Verified** This headers shows whether the message content was signed and whether the message has not been changed after signing (tampered).

**X-Djigzo-Info-Signer-Trusted** This headers shows whether the signing certificate was trusted (signed by root etc.) by the gateway. If the signing certificate was not trusted, the reason for not trusting the certificate is given in the X-Djigzo-Info-Signer-Trusted header.

**Note:** When email is received by Djigzo and delivered to an internal user, it will remove all X-Djigzo-\* headers to make sure that an external sender cannot fake any Djigzo specific headers.

## B Links

### Outlook

**Using S/MIME in Microsoft Outlook** [http://searchexchange.techtarget.com/generic/0,,sid43\\_gci1252311,00.html](http://searchexchange.techtarget.com/generic/0,,sid43_gci1252311,00.html)

**Installing and using your certificate in Microsoft Outlook 2003** [http://www.globalsign.com/support/personal-certificate/per\\_outlook03.html](http://www.globalsign.com/support/personal-certificate/per_outlook03.html)

**Overview of certificates and cryptographic e-mail messaging in Outlook** <http://office.microsoft.com/en-us/outlook/HP012305341033.aspx?pid=CH100622191033>

**Configuring S/MIME Security with Outlook Web Access 2003** <http://www.msexchange.org/tutorials/Configuring-SMIME-Security-Outlook-Web-Access-2003.html>

**Implementing Outlook Web Access with the S/MIME Control** [http://technet.microsoft.com/en-us/library/aa998939\(EXCHG.65\).aspx](http://technet.microsoft.com/en-us/library/aa998939(EXCHG.65).aspx)

## **Apple**

**How to Use a Secure Email Signing Certificate (Digital ID)** [http://support.apple.com/kb/TA22353?viewlocale=en\\_US](http://support.apple.com/kb/TA22353?viewlocale=en_US)

**S/MIME for Apple Mail** <http://joar.com/certificates/>

## **Webmail**

**Gmail** <http://richard.jones.name/google-hacks/gmail-smime/gmail-smime.html>