Secure eMails with Mailvelope

1. Introduction

Mailvelope is a browser add-on or a plugin that extends its capability in encrypting email contents and is based on OpenPGP cryptography standards. To be able to send, receive or digitally sign emails securely using OpenPGP based services like Mailvelope, users first have to create public, private key pair and share the public key.

2. Installation

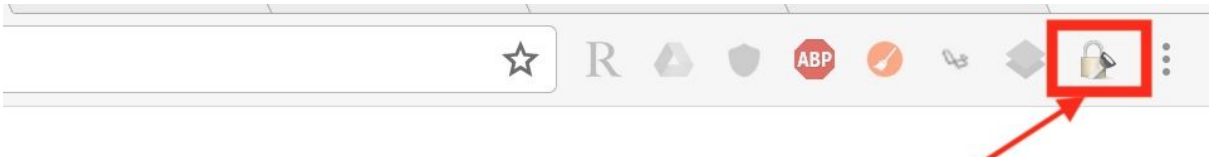
Click the following links to install Mailvelope on Google Chrome and Firefox browsers:

- Google Chrome

  https://chrome.google.com/webstore.

- Firefox
- download.mailvelope.com

If Mailvelope is successfully installed, a lock icon is displayed somewhere in the main toolbar, beside the address bar as shown in the image below.



Click this icon to configure your encryption keys and access other management settings.

3. Basics

To be able to encrypt emails you need to:

a. **Generate** encryption keys *(Public and Private key pair)* to **receive/sign** encrypted emails

   i. Public key – It is a key used for encrypting a message. The key must be made available to the public. It is mainly used while sending an encrypted email. When you send an encrypted email, you will need to use the public key of the recipient.

   ii. Private key – Used to decrypt a message. To decipher or read an encrypted message, you need to use the private key. This key should

be kept away from anyone else who is not its owner. Needs to be stored securely. Access is restricted by password.

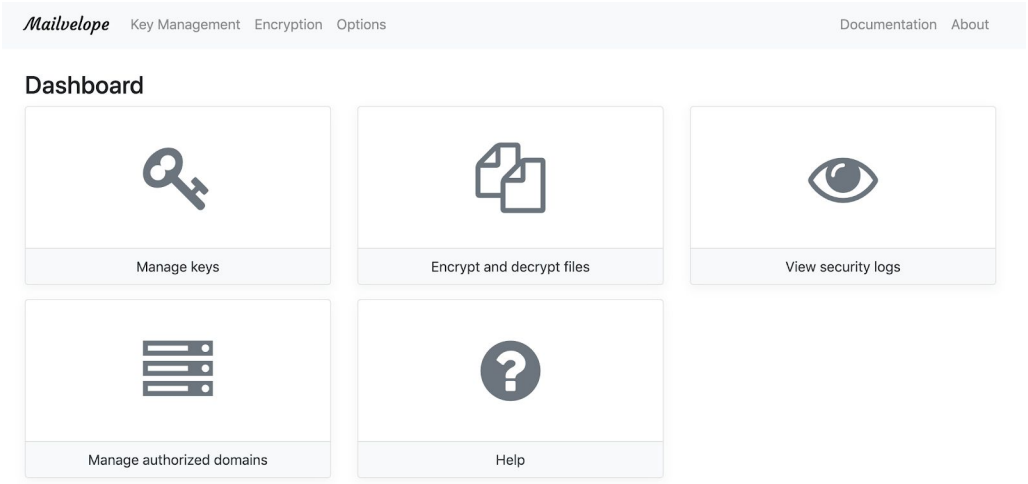
b. **Import** public keys of users you want to **send** encrypted emails to

This concept is illustrated on the page "How Gpg4win works". Gpg4win is another application based on the same working principles.

4. Key Management

Before we go on to encrypting emails , let's see how we handle keys for that.

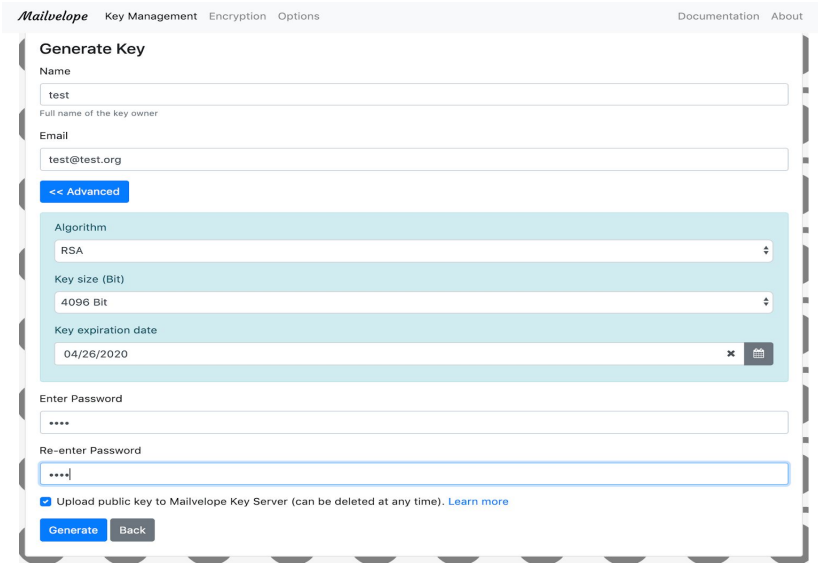
Click on Mailvelope's lock icon in the toolbar and click on dashboard, you will land in the following page. From here click on manage keys



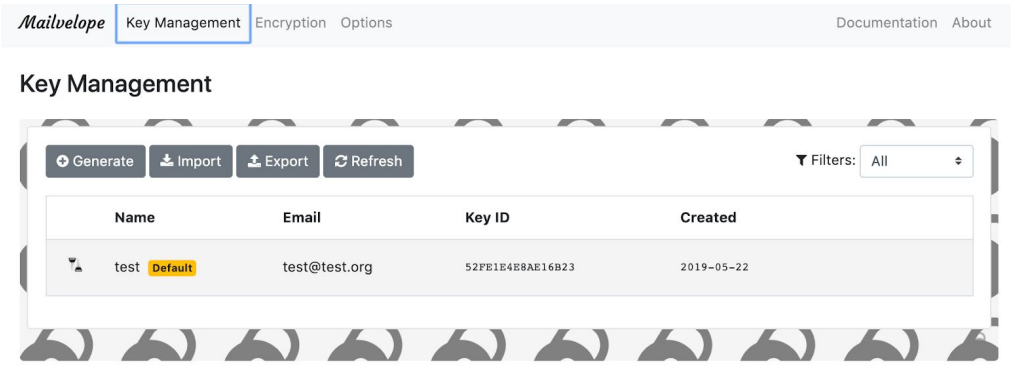
5. Generating Keys

Click **Generate +** to open the key generation dialog. Fill out the boxes and assign a key password. Make sure you never lose this password. If it is lost, the password cannot be recovered and the key can no longer be used. It might be a good idea to use your ***keychain Access/keepass*** (Password Manager) to manage your newly created password.

Enter all the necessary information, click on advance and ensure secure algorithm and key size is selected . Click **Generate** to start generating a key. Repeat for any other email accounts.

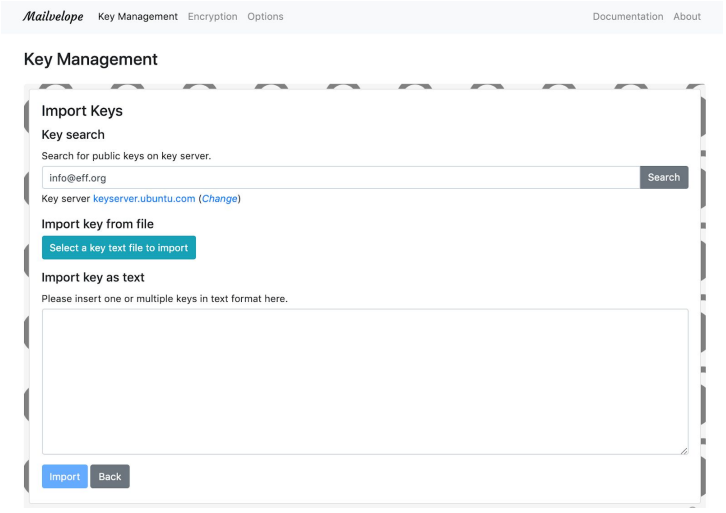


Afterwards, you can see the result in the key list by selecting **Key Management**.

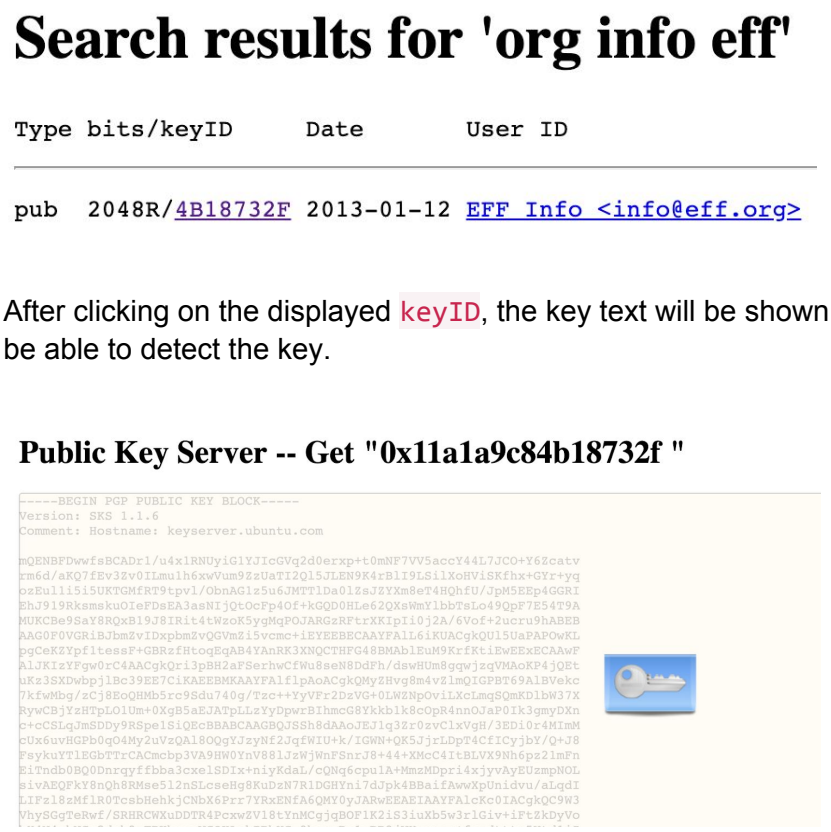


6. Importing Keys

To import existing keys, click **Key Management** in the option menu and then **Import Key**. You can import key either from public key servers, from a text file or paste text. Following demonstrated importing key from key server.



Search results will be displayed on the key server website in a new tab.



After clicking on the displayed `keyID`, the key text will be shown and Mailvelope will be able to detect the key.

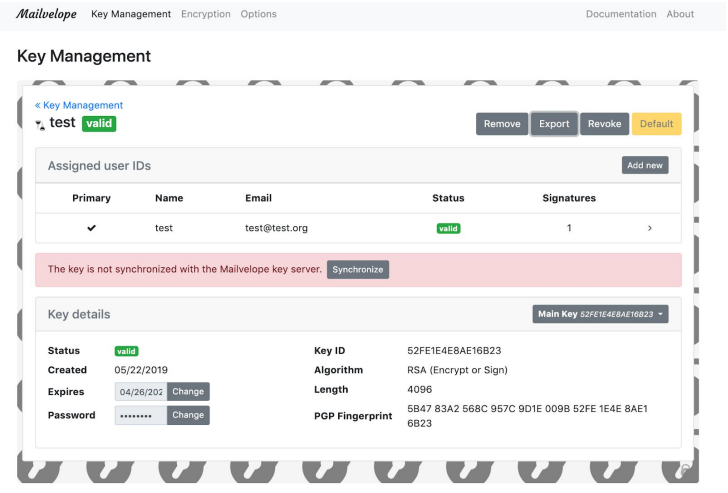
With another click on the key symbol the key is imported into Mailvelope.

7. Exporting Keys

Key export functionality is used to export keys into ``.asc`` files or to copy the file to clipboard. We can use this function to make public keys available for others to import or to make a backup of a public-private key pair in a secure place.

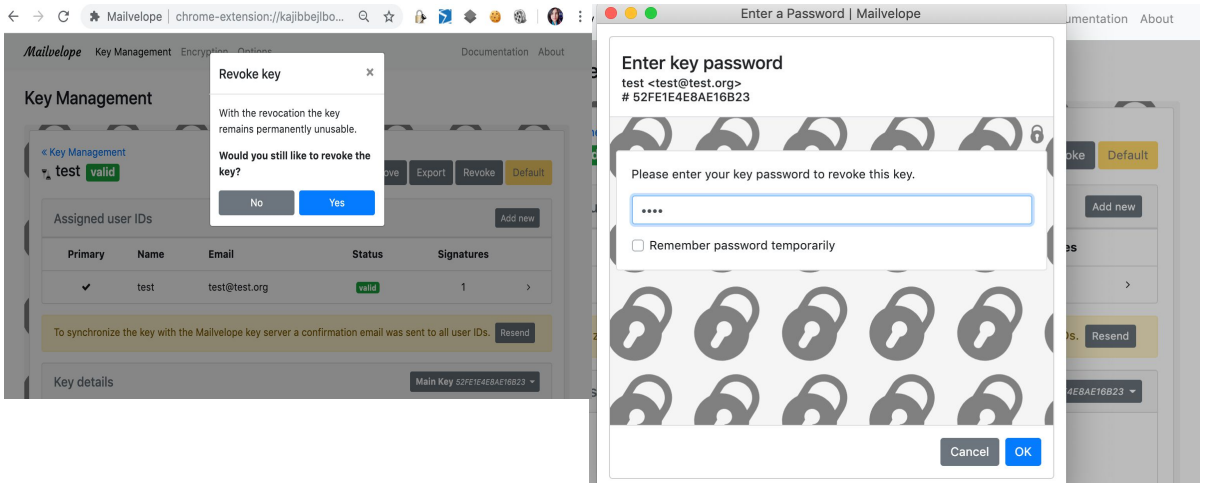
To export all keys, click **Key Management** in the option menu and then **Export Key**.

To export individual key, click **Key Management** in the option menu, select the key and then **Export**

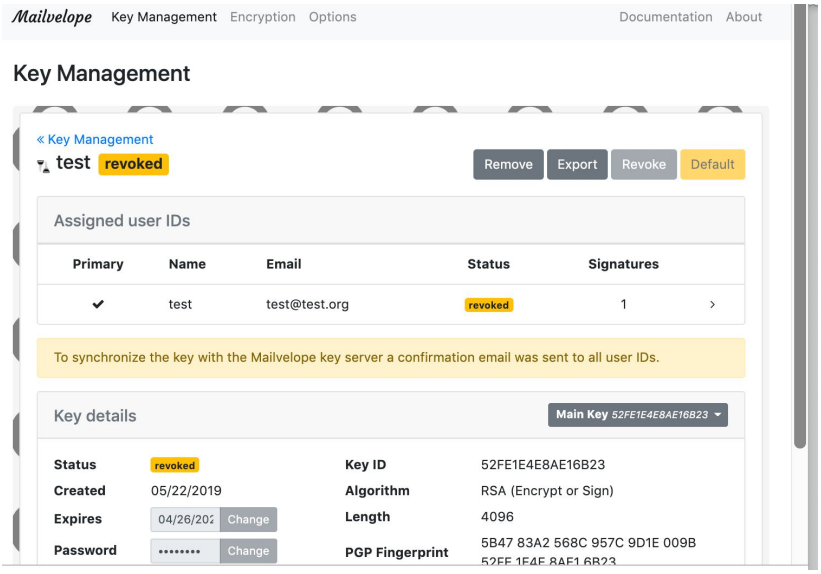


8. Revoke Keys

To revoke keys/ delete them from mailvelope server, click **Key Management** in the option menu, select the key and then Revoke.
You can also delete it from https://keys.mailvelope.com/manage.html



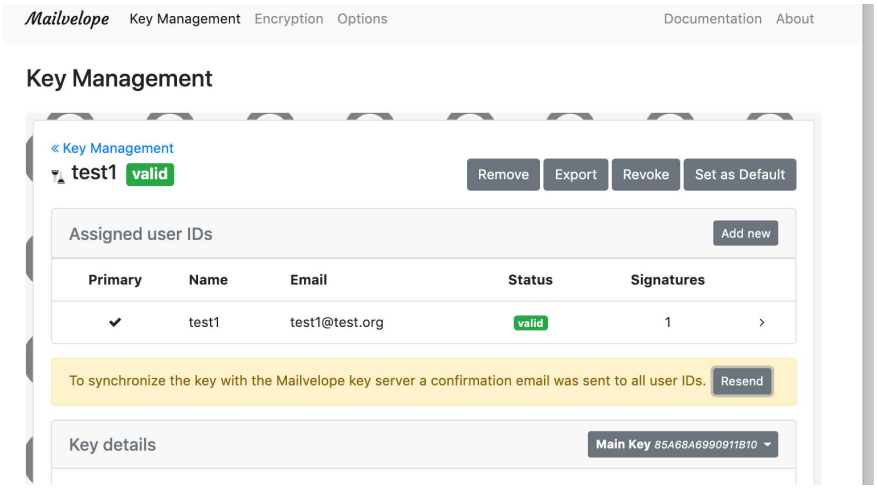
If the email id exists and the operation has been successful your key status will change to Revoked. Confirmation link will be sent to your email, once you confirm, your key is removed from key server.



Check your inbox for new email from Mailvelope and follow the instructions there to complete key removal.

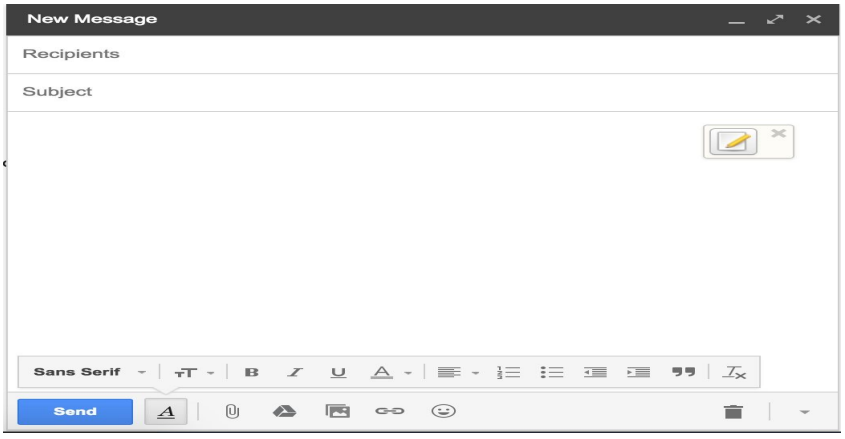
9. Defining the primary Key

To define a key as primary/default key them, click **Key Management** in the option menu, select the key click and then Set as Default. The primary/default key is always used unless another key is explicitly selected.

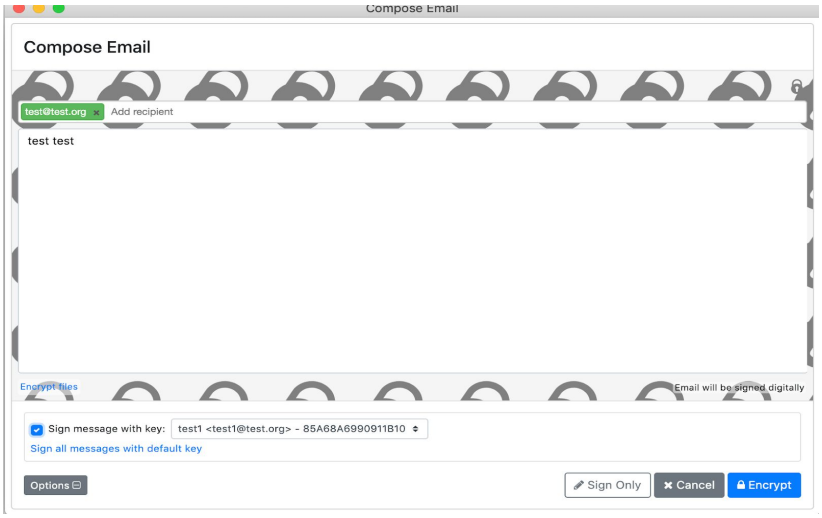


10. Encrypting Messages

Email messages are created and encrypted in an external editor. The compose button  is displayed in all email composing areas of the webmail provider and will launch Mailvelope's external editor.



Clicking on the **Compose** button will open a new popup with a separate editor. This ensures that the email creation and encryption process is completely isolated from the webmail provider.



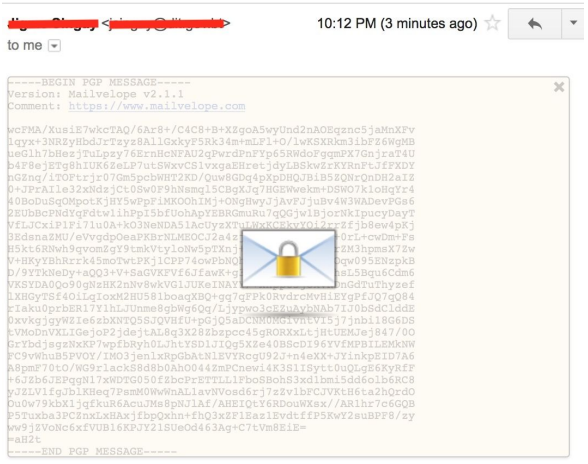
The email can now be composed. You can choose the recipients, or more specifically the people who should be allowed to decrypt the message, by adding the email address to the upper input field in the dialog. Like in other email clients you can also search in this field for recipients by name. For each recipient, there has to be a public key available in Mailvelope's keyring. If you enter an unknown email address, Mailvelope will automatically search the Mailvelope key server (keys.mailvelope.com) for PGP keys and import the matching keys without further action required. Alternatively, you can also import keys manually as described in Importing keys earlier.

Next, click the **Encrypt** button to encrypt the message and transfer the results back to the webmail client

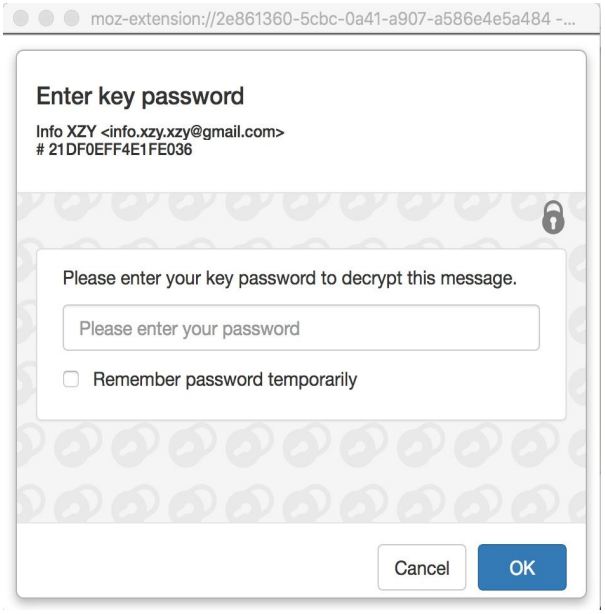
With the **Options** button in the Mailvelope editor you can access the option to sign the message.

11. Message Decryption

Whenever Mailvelope detects an encrypted message in your webmail client, it marks the mail with a closed envelope icon. Click on it to decrypt the message.



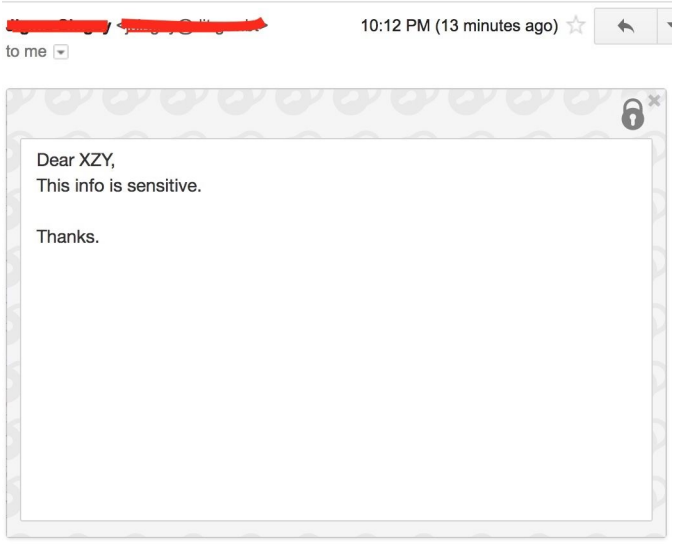
Next, enter your key password and click **OK**.



Mailvelope tries to find the private key that is required to decrypt the message. If the correct key is found in the keyring, the corresponding User and Key ID are displayed in the password dialog.

If Mailvelope does not have the correct private key to decrypt the message in its keyring, the following error message is displayed: **No private key found for this message. Required private key IDs: ...**.

After the key is unlocked with the password, the message is decrypted and directly shown in the marked area.



If an encrypted message contains a signature, Mailvelope will verify the signature and show the result with a label in the upper right corner of the decrypted message.

A click on the *Signed digitally* label will open up a dialog showing the verification result and signature details.

Signature verification is currently only enabled for the following email providers: Gmail™, Outlook.com™ and Yahoo!™.

12. File Encryption

Click on Mailvelope's lock icon in the toolbar to open the main menu. Click **Options** and choose **File Encryption** from the top menu bar.

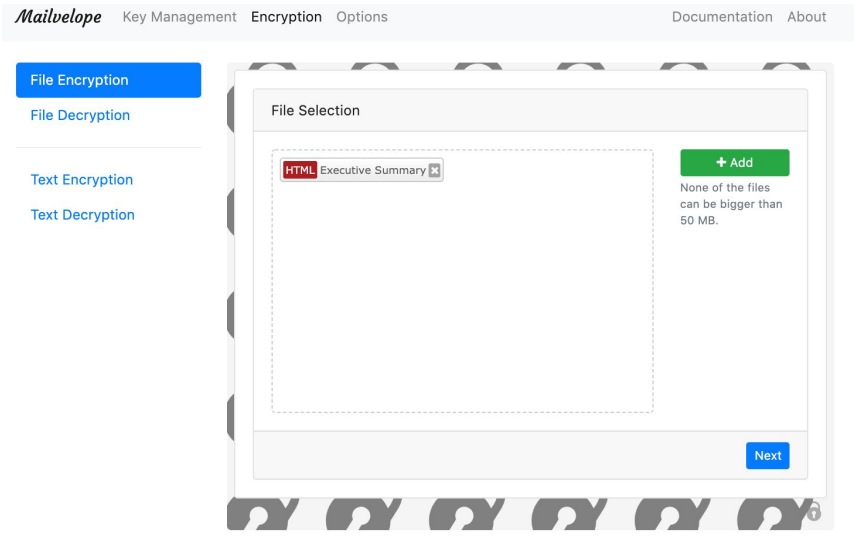
With the file encryption feature of Mailvelope, you can encrypt files on your storage devices according to the PGP standard. As with email encryption, the files will be encrypted with the recipient's public key.

The file encryption feature can also be used to encrypt and decrypt email attachments.

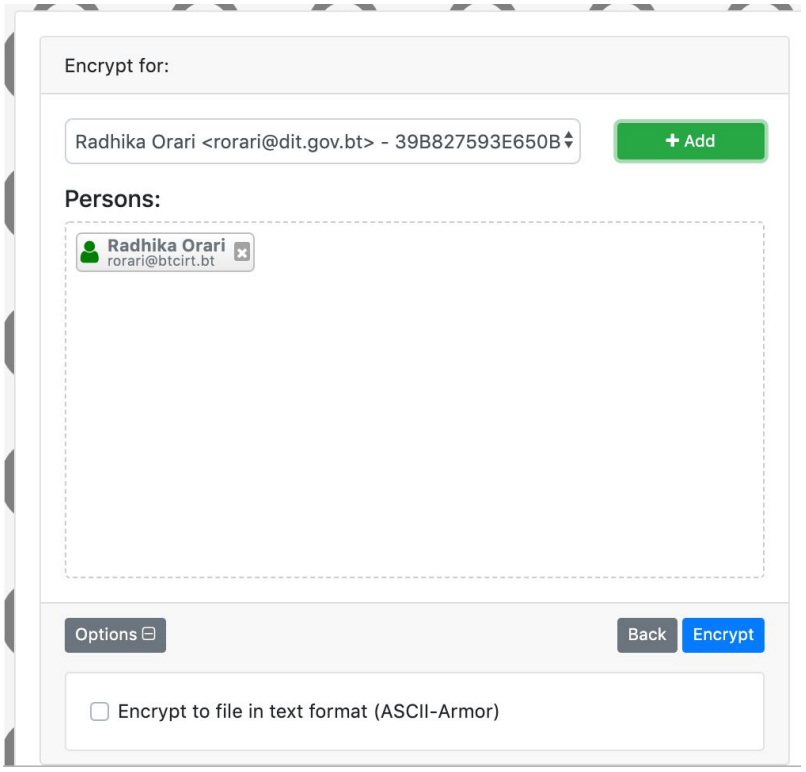
Background: email providers that directly integrate Mailvelope into their email application will support encrypted email attachments automatically. For email providers like Gmail™, Yahoo!™ or Outlook.com™ there are restrictions in the Mailvelope editor and encrypted attachments are not directly supported. The file encryption outlined here offers an alternative in this case, as it is possible to encrypt email attachments manually instead.

- Encrypt files

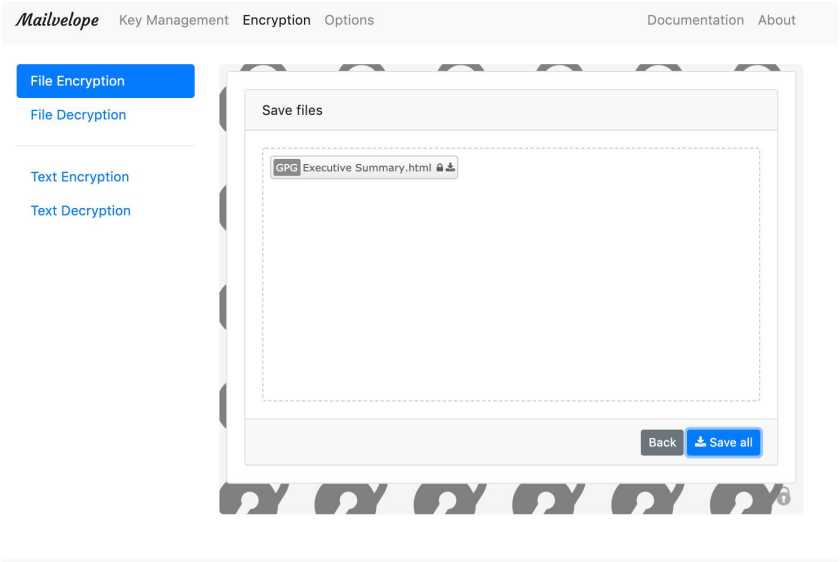
  In a first step files on the storage devices will be selected for encryption with **+ Add**.



Click on **Next** and choose the recipients you want to encrypt the files for.



The file by default will be saved as .gpg, you can click on option and check Encrypt to file in text format(ASCII-Armor) to save as .asc. After clicking **Encrypt** the files are encrypted for the selected recipients. Finally click on **Save all** to save the file



- Decrypt files

  The steps to decrypt files are similar to the encryption process. First, choose **File Decryption** in the left menu. Then, use the **+ Add** button to select the file to be decrypted. The decrypted files will be displayed once you enter your private key password.