

mecplugins for wikidPad

User Manual



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What is WikidPad

WikidPad is a personal information manager or personal wiki software. This software is very good at organizing information that is not inherently well defined. It can be understood as a collection of notebook pages in text format where cross linking of pages is very easy.

What is mecplugins

Mecplugins extend wikidPad with functions that improve the journaling functionality or notebook keeping as well as some functions specific for molecular biology. The functions can be installed separately if one but not the other is needed.

Mecplugins installation

First, wikidPad must be installed. For windows there is a point and click installer available from the website (<http://wikidpad.sourceforge.net/>). Follow the installation instructions and use default settings if there are no obvious reasons not to. The mecplugins installer is available from google code (<http://code.google.com/p/mecplugins/>), under the “Downloads” tab. The newest installers are always at the top of the list.

There are two optional installs, “Development” and “Extended wikilanguage”. The “development” adds a test plugin for further development of plugins. The extended wiki language adds more potential wiki words such as all words containing a dash such as the ISO date format yyyy-mm-dd.

After selecting the plugin options, you will be asked for the plugin directory. If you installed wikidPad in C:/Program Files/WikidPad, then the plugin directory is C:/Program Files/WikidPad/**user_extensions**.

Set up

The email and the stamping functions need to be set up before use. This is done by editing special pages within wikidPad. The mecplugins installation process adds the following pages to the wiki:

[[WikiSettings/mecplugins/PCR-mix](#)]

[[WikiSettings/mecplugins/archive](#)]

[[WikiSettings/mecplugins/ePCR](#)]

[[WikiSettings/mecplugins/mail-contacts](#)]

[[WikiSettings/mecplugins/mail-settings](#)]

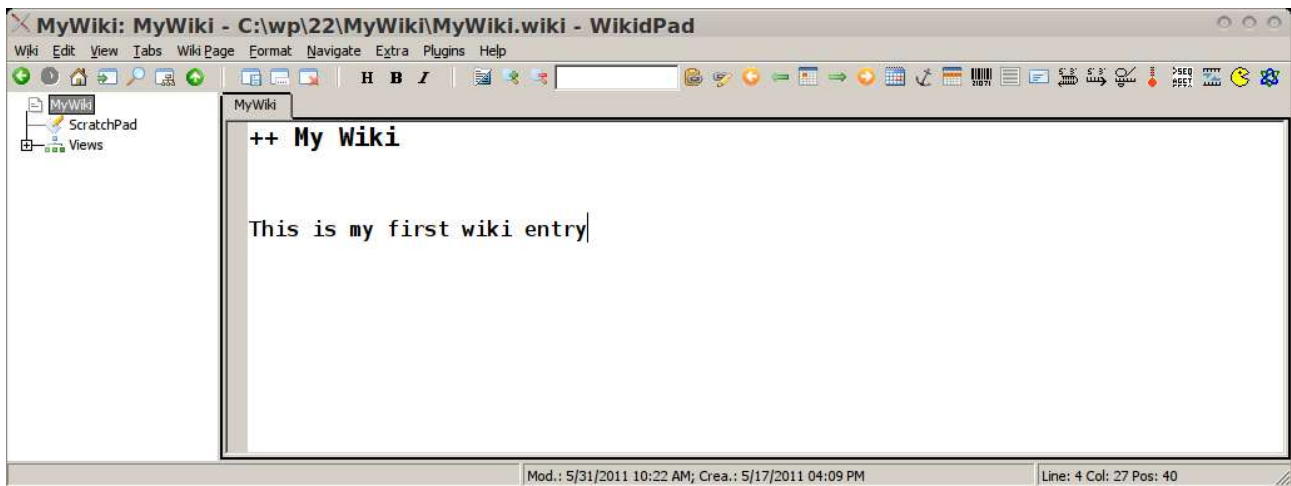
[[WikiSettings/mecplugins/open with ape](#)]

[[WikiSettings/mecplugins/word processor](#)]

These are all sub pages of the WikiSettings page. You can open them by ctrl-O or selecting “Navigate>Go To Page...” from the file menu.

These pages contain Python code that will be executed by each plugin. Therefore, be careful not to introduce syntax errors. If this happens, you can delete the page and restart the wiki. This will install a fresh copy of the settings page.

When mecplugins have been successfully installed, the wikidPad main window should look like this:



Nineteen of the leftmost icons (from to) are provided by mecplugins. The same functions can also be found by selecting “Plugins>mecplugins” where there are also more functions not displayed as icons.

Some of the functions provided by mecplugins:

DNA Sequence Tools



Reverse complement



Complement



Translate



Tm



Toggle format



Open sequence with ApE










PCR simulation





Restriction analysis

Journal utilities

	Today
	Tomorrow/yesterday
	Previous/next defined
	This week
	Calendar
	Copy link
	

Miscellaneous utilities

	Send selected text by mail
	Dewrap text

DNA sequence tools

Reverse complement

This function turns the selected text into its reverse complement, it accepts DNA in raw format.

Example:

aactg → cagtt

Complement

This function turns the selected text into its complement, it accepts DNA in raw format.

Example:

aactg → ttgac

Translate

This function translates the selected text into amino acids, it accepts DNA in raw format. The amino acid sequence is given in one letter code. This function can also take a one letter amino acid code and produce a three letter code. The stop codon (tag) is not translated.

Example:

atgagatag → M R → MetArg

MR → MetArg

tm

This function provides primer melting temperature calculations using the nearest neighbor algorithm using the thermodynamics reported by [SantaLucia, 1998]. Melting temperature using the naïve Marmur formula $(A+T)*2 + (G+C)*4$ is also provided as well as GC content and length.

Gatcagctatctggttaactc →



toggle format

This fuction provides changing sequence formats for biological sequences. Accepted formats are raw, fasta, embl and genbank (gb), produced formats are fasta or gb.

AAA

|
▼

>Sequence_3bp
AAA

|
▼

LOCUS Sequence_3bp 3 bp DNA
UNK 01-JAN-1980
DEFINITION Sequence_3bp
ACCESSION Sequence_3bp
VERSION Sequence_3bp
KEYWORDS .
SOURCE .
 ORGANISM .
 .
FEATURES Location/Qualifiers
ORIGIN
 1 AAA
//

|
▼

>Sequence_3bp
AAA

Open sequence with ApE

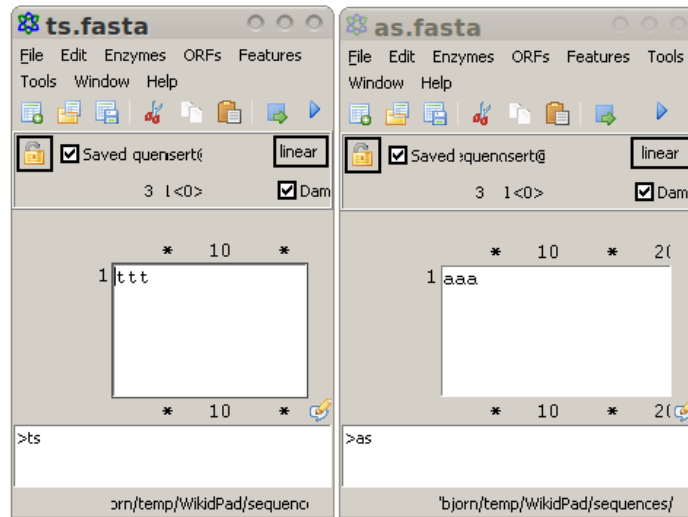
ApE is a free DNA editor that is fast and stable and has many useful functions. ApE can be integrated with WikidPad through mecplugins so that you can open one or more selected sequences in ApE. Sequences can be in raw, fasta or genbank formats.

>ts

ttt

>as

aaa



PCR simulation

The PCR simulation tool is a powerful way to predict the sequence of a PCR product given sequences of primers and template. This function requires pre-designed primers so it is not a primer design tool. A number of sequences (at least three) are selected, the last one is interpreted as template and the preceding ones as primers. For each potential PCR product found, a report containing the PCR product sequence,

```
>primer1
tacatcacgtactgactgac
>primer2
atcactattacgaaacgttg
>template
tacatcacgtactgactgacacaacgtttcgtaatagtgat
```

----->

```
=====
PCR simulation
=====
```

Template template:

Primer primer1 anneals at position 20

Primer primer2 anneals reverse at position 21

PCR product from template

```
>primer1
tacatcacgtactgactgac
>primer2
atcactattacgaaacgttg
>PCR product (41 bp) primers primer1 and primer2
tacatcacgtactgactgacacaaacgtttcgtaatagtgat
```

5tacatcacgtactgactgac3

| | | | | | | | | | | | | | | | | | | | tm 48.6C

5tacatcacgtactgactgac...caacgtttcgtaatagtgat3

3atgtagtgcatgactgactg...gttgcaaagcattatcacta5

|||||tm 45.8C

3gttgcaaagcattatcacta5 ta 41.0C

Primer sequences and template can also be present on different pages. If the page [Primers] has the following content:

```
++ Primer  
  
>seq1  
tacatcacgtactgactgac  
  
>seq2  
tacatcacgtactgactgac
```

Then processing the following on another page produces the same result as already shown:

```
[Primer]  
  
>temp  
tacatcacgtactgactgacagtcagtcagtcacgtgatgta
```

If a primer catalog is maintained on one page (for example [Primer]), this function may be useful for screening many primers against a specific DNA sequence.

Restriction analysis

Restriction analysis can be performed on one or more sequences. If one sequence (fasta or genbank) is present in the selection, enzymes cutting once, twice or more and enzymes not cutting the sequence will be reported:

```
>seq
tacatcacGGATCCgtactgactgac
```

Restriction analysis of a single sequence

The following enzymes cut once:

AclWI AfaI AlwI BamHI BfuCI Bsp143I BspLI BspPI BstKTI BstMBI BstX2I BstYI Csp6I CviQI DpnI DpnII
Kzo9I Mali MboI MflI NdeII NlaIV PspN4I PsuI RsaI RsaNI Sau3AI XhoII

The following enzymes are absent:

AanI ... Zsp2I

The following enzymes cut twice or more:

If more than one sequence is present in the selection, a different analysis will be performed:

```
>seq1
tacatcacGGATCCgtactgactgac
>seq2
tacatcacGGTACCgtactgaGAATTCctgac
```

Restriction analysis of 2 sequences

The following enzymes cut once in each sequence:

BspLI NlaIV PspN4I

The following enzymes do not cut in any sequence:

AanI ... Zsp2I

The following enzymes cuts once in the last sequence and are absent in the preceding sequence(s):

Acc65I AccB1I AcsI ApoI Asp718I BanI BseMII BshNI BspCNI BspT107I BstDEI DdeI EcoRI Hpy188III HpyF3I
KpnI Sse9I Tsp509I XapI

The following enzymes cut twice in the last sequence and are absent in the preceding sequence(s):

Bst4CI HpyCH4III TaaI

for two or more sequences, enzymes cutting once or absent in all sequences are reported. Additionally, enzymes cutting once or twice in the last sequence but absent in the preceding sequences are also reported. These can aid in the planning of cloning experiments if the planned vector is the last sequence and the insert(s) are the preceding ones.

```
>seq1
tacatcacGGATCCgtactgactgac
>seq2
tacatcacGGTACCgtactgaGAATTCctgac
```

Restriction analysis of 2 sequences

The following enzymes cut once in each sequence:

BspLI NlaIV PspN4I

The following enzymes do not cut in any sequence:

AanI ... Zsp2I

The following enzymes cuts once in the last sequence and are absent in the preceding sequence(s):

Acc65I AccB1I AcsI ApoI Asp718I BanI BseMII BshNI BspCNI BspT107I BstDEI DdeI EcoRI Hpy188III HpyF3I
KpnI Sse9I Tsp509I XapI

The following enzymes cut twice in the last sequence and are absent in the preceding sequence(s):

Bst4CI HpyCH4III TaaI

Journal utilities

Today

This function opens a page named after the current date in ISO8601 format (yyyy-mm-dd, for example 2011-05-24 for May 24, 2011). If the page does not already exist, it is created.

Tomorrow/yesterday

This opens a page similar to the today function, but for current date of tomorrow or yesterday. Alternatively, if current wiki page is a ISO8601 date page, a page named as this date plus or minus one day is opened or created.

Previous/next defined

This function has two modes, if no text is selected it opens the previous or next date page that has been already created. If text is selected a search will be performed for this text in preceding or succeeding pages. This is useful for looking up some search term in previous or future pages.

This week

This function opens all pages for the current week.

Calendar

This function opens a calendar control (Open journal entry) where date pages can be selected and opened. The weekdays of the calendar control opens all weekdays of the current month, the link Wed opens all Wednesdays visible in the calendar control. Existing pages are shown in green.



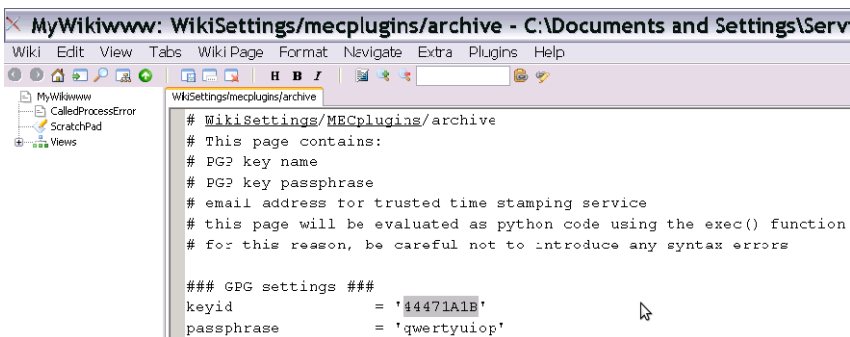
Archive and stamp pages and linked files

This function requires the installation of Gnu Privacy Guard (gpg), which is also free software. The installation of gpg under windows is covered in the install gpg section. You also need to generate a digital key if you do not already have one you want to use.

1. Set up the use of GpG, first open the page [WikiSettings/mecplugins/archive]

you can do this by hitting “ctrl-o” (letter O, not 0 zero) and typing the page name (without the braces!) in the “Open Wiki Word” window. Alternatively go to “Navigate>Go to Page...” in the main menu.

2. When the page is open, it should look something like below. Replace the keyid that comes pre installed with mecplugins with the new keyID from your key. Important! Keep the citation marks!



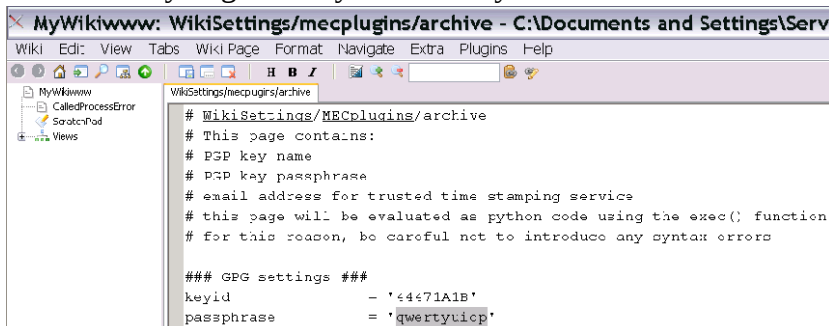
The screenshot shows a web browser window titled "MyWikiwww: WikiSettings/mecplugins/archive - C:\Documents and Settings\Serv...". The browser has a menu bar with "Wiki", "Edit", "View", "Tabs", "Wiki Page", "Format", "Navigate", "Extra", "Plugins", and "Help". Below the menu bar is a toolbar with various icons. The main content area displays the following text:

```
# WikiSettings/mecplugins/archive
# This page contains:
# PG? key name
# PG? key passphrase
# email address for trusted time stamping service
# this page will be evaluated as python code using the exec() function
# for this reason, be careful not to introduce any syntax errors

### GPG settings ###
keyid      = '44471A1B'
passphrase = 'qwertyuiop'
```

3. Replace the passphrase with

the one that you gave for your own key.



The screenshot shows the same web browser window as before, but the passphrase has been updated. The main content area displays the following text:

```
# WikiSettings/mecplugins/archive
# This page contains:
# PG? key name
# PG? key passphrase
# email address for trusted time stamping service
# this page will be evaluated as python code using the exec() function
# for this reason, be careful not to introduce any syntax errors

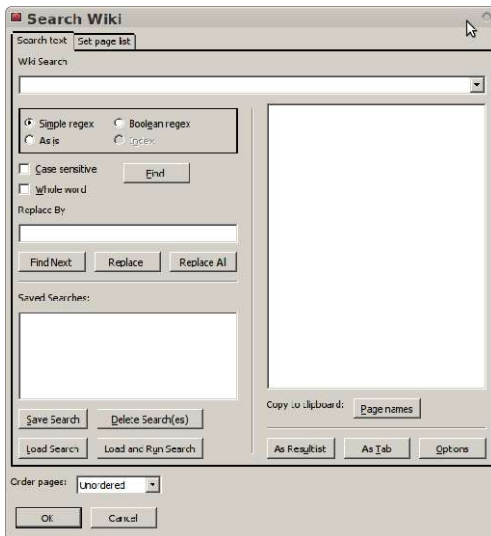
### GPG settings ###
keyid      = '44471A1B'
passphrase = 'qwertyuicp'
```

4. Set up your SMTP mail server settings on the same page. These are needed for mecplugins to send mails to the time stamping server. This set up is similar to the one used for “Send selected text by mail”. This is described under miscellaneous functions.

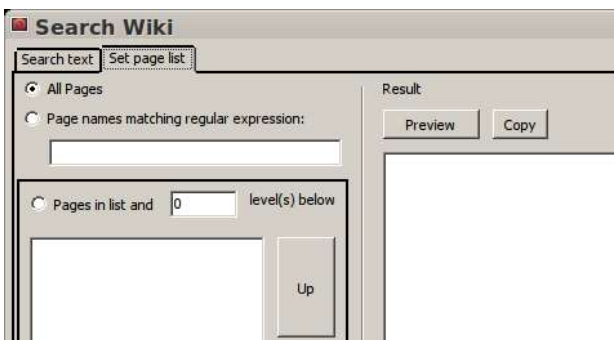
Using the stamping function

Select Plugins>mecplugins>Journal utils>Archive and stamp pages and linked files from the menu or click on the barcode icon.

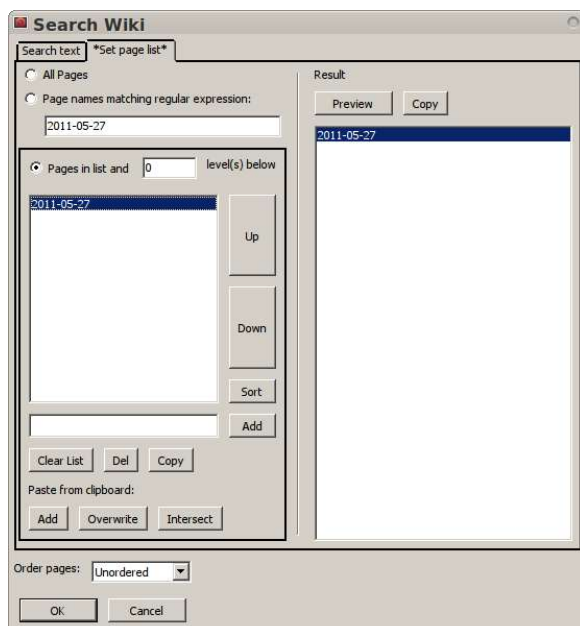
You should see the WikidPad page search dialog



There are several options to search for pages, by content or by name. If you click on the “Set page list” tab you can search for page names.

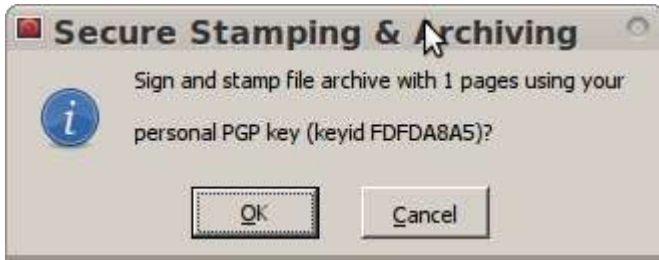


If you click on the upper “Add” button, you can put the current wiki page in the list to the left in the dialog, the page name in this case is “2011-05-27”



click “OK” (you may have to click OK twice)

You will see this dialog, click OK or Cancel to abort.



The archive function packs all pages and all linked files in a zip archive



The size reading may be 0 if the archive is very small. Click OK.



You will receive a message if GPG managed to sign the archive. The signature has the same name as the archive but for the ".asc" ending.



A mail is sent to the stamping service (stamper by default). Usually within 24 hours you will receive a signed (by stamper) response email from stamper with your zip archive signature.

Miscellaneous utilities

Send selected text by mail

First you may have to set up the SMTP server, user and password. This function comes pre-set with the gmail SMTP server, a gmail user id and a password. This should in principle work, but some networks do not permit sending gmail in this way.

Open the page “WikiSettings/mecplugins/mail-settings”

Change the line

```
smtpserver = 'smtp.gmail.com'
```

to whatever SMTP server you would like to use. Do not remove the citation marks.

Change the port number to whatever port should be used (usually 25)

```
smtpport = 587
```

The host name is usually localhost

```
smtphostname = 'localhost'
```

The SMTP user should be set to your specific

```
smtpuser = 'padwikid@gmail.com'
```

The password needs to be set to your password:

```
smtppass = 'ch2p9AQuR8tHaSp76egeDRUWu'
```

Sender and sent from are not the same thing. Sender is the id given to the SMTP server from the mail transaction. Sentfrom is the email address that will appear as sender to the receiver of the email. These can often be set to the same thing. Some systems require the “<>” symbols.

```
sender = '<padwikid@gmail.com>' #<JohnDoe@bio.uminho.pt>  
sentfrom = '<padwikid@gmail.com>' #<JohnDoe@bio.uminho.pt>
```

When the settings are done, open the page “WikiSettings/mecplugins/mail-contacts”

change the addresses you find there to something else (for example your own for testing).

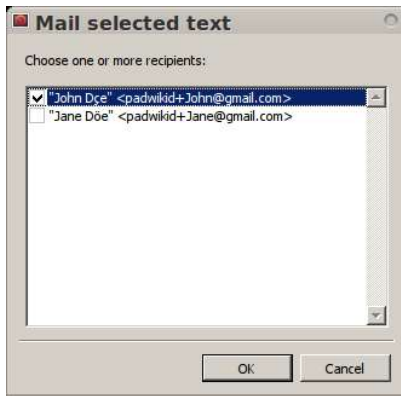
"John Doe" <padwikid+John@gmail.com>

"Jane Doe" <padwikid+Jane@gmail.com>

To use the function, select some text in a page and click on the mail icon:



select a recipient or more from the list:



If successful, the following dialog is shown:



if not, the following dialog will be shown after the server time out (set to 30 seconds by default):



List utilities

The list utilities may aid working with lists in WikidPad. Sorting or inverting will change the order of the rows of selected text, where each row is taken to be a row in a list. Removing duplicates will look for identical rows and remove all but one of them. Unzip will split a list into two, one containing even rows and the other containing odd rows.

Text utilities

These utilities help working with text in WikidPad. The Unwrap function removes line breaks in selected text. The lines are join together with a space replacing the line breaks. This is useful to rewrap text to a new width. If the text has no whitespace other than line breaks (such as a DNA sequence) the lines will be join together without spaces.

Copy link

This function will put the name of the current page on the clip-board so that it could be pasted on another page to provide a link between the pages. If text is selected, a link is provided that will search that particular text.

For example, selecting Project A on page MyWiki will produce the link `MyWiki#Project# A` which will provide a link to the page MyWiki and the first occurrence of the text “Project A”

Annex

Gnu Privacy Guard (GpG) installation instructions for Windows

1. Go to the gpg download page <http://www.gpg4win.org/download.html>



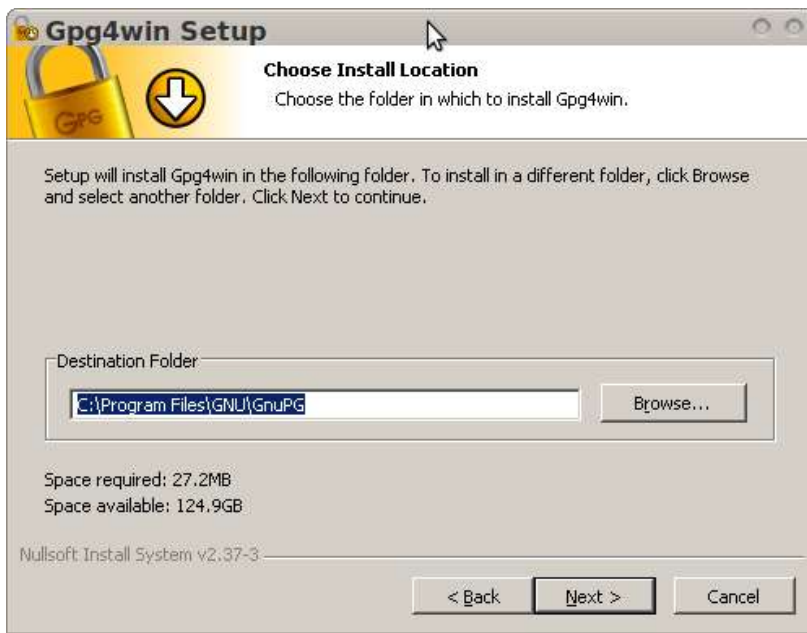
2. run the installer



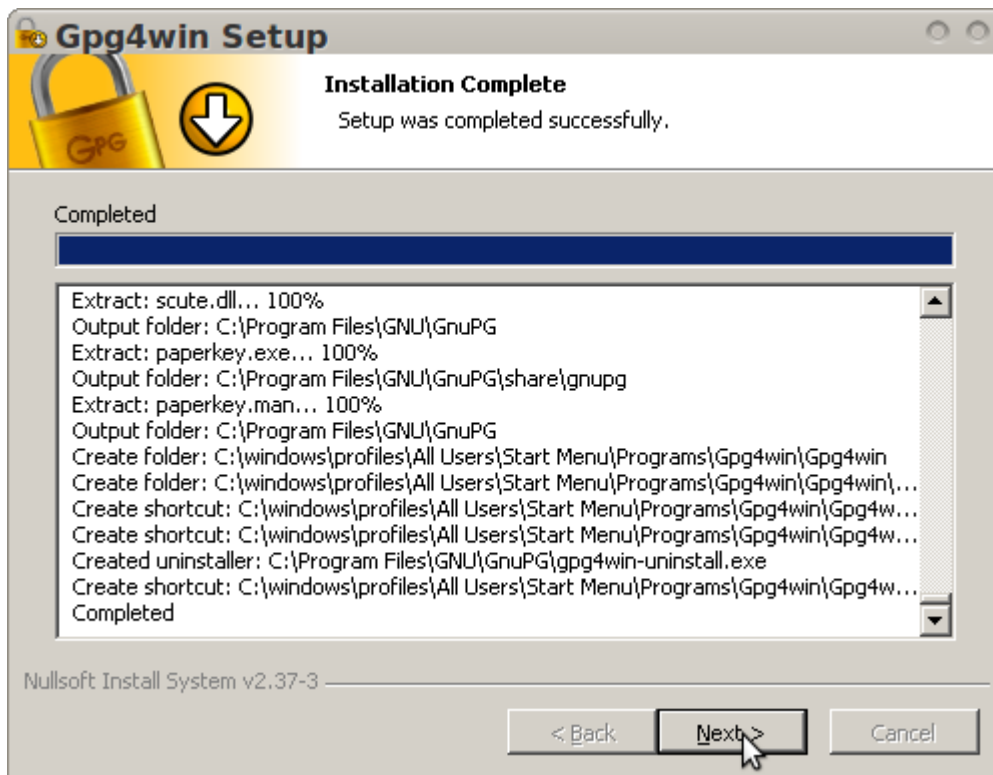
3. You only need gpg and gpa, but it is ok to install the other options.



4. It is best to install in the default location



5. A successful installation should produce the window below:

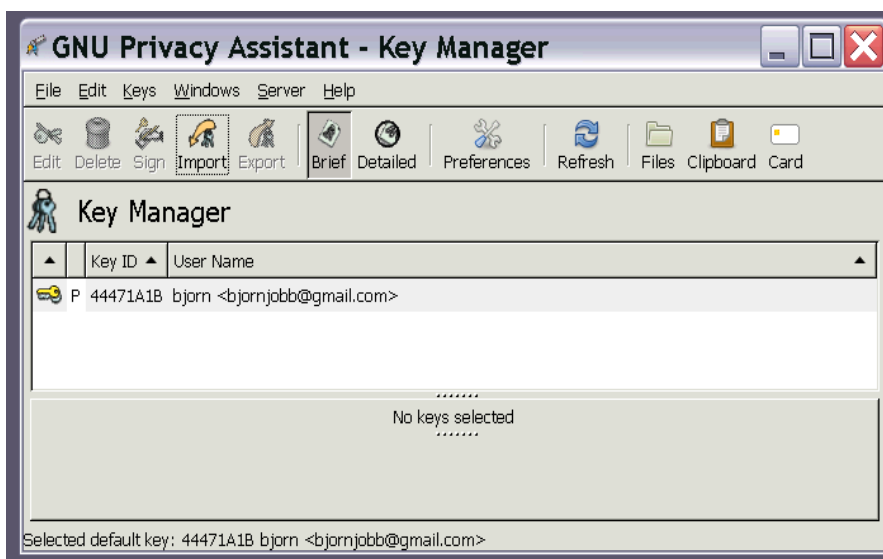


Generate public/secret key pair (Windows)

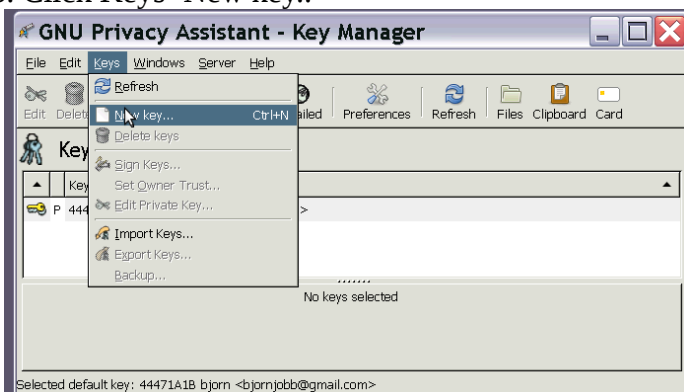
1. Start the GPA software (Gnu Privacy Assistant)



2. This window might be empty, we will have to generate a new key. In the example below there is already a key with the keyID 44471A1B



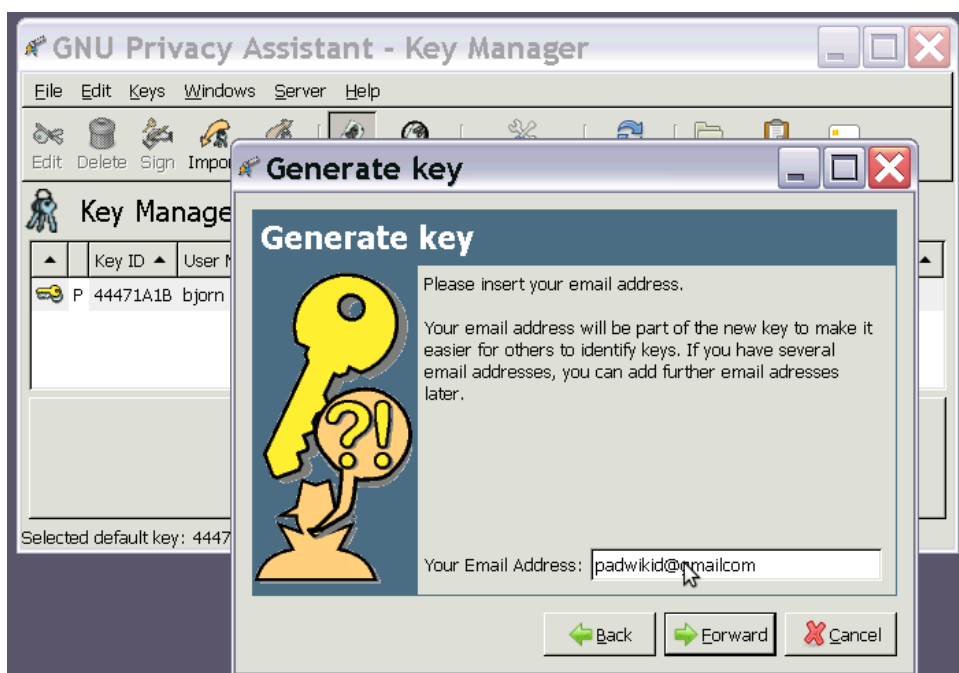
3. Click Keys>New key..



4. Give a name to be associated with this key, you own name is fine



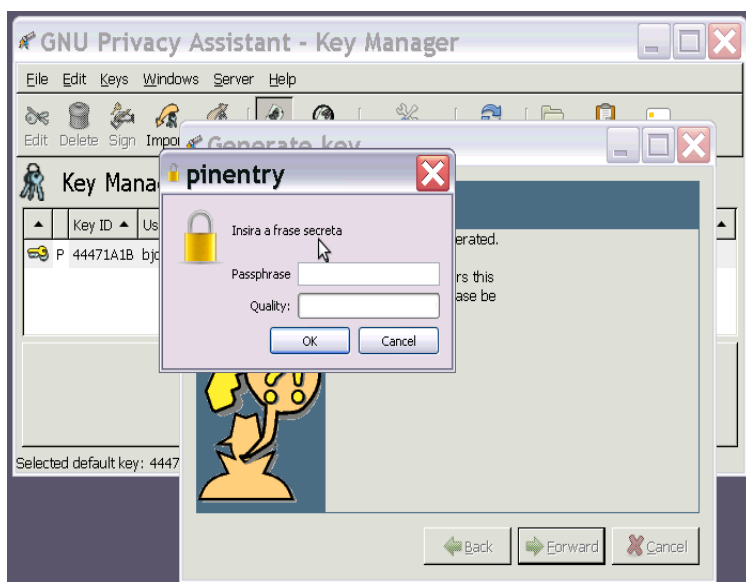
5. You will be asked for an email address, you can choose any of your addresses if you have more than one.



6. You will be asked to make a backup copy of the key. If you do, make sure to put it in a safe place like a removable harddrive.



7. Choose a pass-phrase and remember to write it down or save a copy of it for later



8. It will take some time to generate the key, when it is ready take note of the keyID (see the highlighted selection at the bottom of the page. You will need this keyID for setting up the meclugins “Archive and stamp pages and linked files” function.

