Pretty Good Privacy (PGP) And GNU Privacy Guard (GPG): Just Enough Training to Make You Dangerous

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https://www.stsauver.com/joe/pgp-tutorial-sfo/

0. Introduction

Obligatory Screen: Eligibility For Strong Encryption

- This is not legal advice (for that, please contact your attorney), however please note that some people are NOT ALLOWED to use strong encryption under prevailing laws.
- **By continuing with this training, you certify that you are NOT:**
  -- a citizen, national, or resident of a country barred from access to strong encryption by the U.S. or other countries, including but not limited to persons from the Crimea region of the Ukraine, Cuba, Iran, North Korea, Sudan, or Syria;
  -- nor are you a "Specially Designated National" (see http://www.treasury.gov/resource-center/sanctions/SDN-List/Pages/default.aspx), nor a person (or representative of a company) that is subject to any other US or other sanctions program or restriction.
- If you are subject to any such prohibition or restriction, you must NOT participate in today's encryption training.

Disclaimer

- While all due care was used in preparing the content of this training, we cannot ensure that you will not inadvertently make a mistake, or encounter a vulnerability while using PGP/GPG.
- Given that you cannot "unring the bell once it has been rung," and given that some potential "losses of confidentiality" may have grave or even catastrophic consequences, please remember that:
  -- you should **not** use PGP/GPG for "life/safety-critical" purposes
  -- today's training is provided on a "best efforts," as-is, where-is basis, with all evident and/or latent faults/flaws
  -- should you decide to use and rely on PGP/GPG, the decision to do so is your own and at your own risk; we disclaim all responsibility for any impacts associated with the use, misuse, or abuse of PGP/GPG by anyone here today or using this talk.
- If you do not agree with these terms, please do not rely on the information in this talk, and please do not stay for this training.

Our Goal Today: 'Basic PGP/GPG Functional Literacy'

- **Background**
  -- understanding why you might need or want PGP/GPG
  -- understanding criticisms/limitations of PGP/GPG
  -- understanding (in general) how PGP/GPG works
- **Installing and Configuring PGP/GPG (Mac [and Linux], and MS Windows)**
- **Creating and Managing Keys**
  -- creating and publishing your own keypair
  -- getting other peoples' PGP/GPG keys
- **Digitally Signing/Validating Messages**
  -- sending a *signed message*
  -- validating a *signed message* you've received
- **Encrypting/Decrypting Messages**
  -- sending an *encrypted message*
  -- decrypting an *encrypted message* you've received
- **Signing PGP/GPG Keys**
- **Convenience Tools: Enigmail, Mailvelope and Mailpile**
- **Optional Key Signing Party**

I. Why Bother Learning To Use PGP/GPG?

All Email Is Private, Right?

- You might **expect** your email to be private, exchanged just between you and your intended correspondent(s). However, many people may potentially be in a position to look at it:
  - **Network engineers/system administrators** with privileged access
  - **Supervisors/managers** with administrative power to obtain access
  - **Hardware techs** with physical access when fixing hardware issues
  - **Advertising/automatic marketing systems** (at least on some free ad-sponsored email services)
  - **Family members** with access to automatically-logged in mail clients
  - **Hacker/crackers** with unauthorized access due to bugs/exploits
  - **Civil litigants** engaged in compulsory pre-trial discovery during a lawsuit
  - **Law enforcement officers** (LEOs) with a warrant or other paperwork (or exigent circumstances)
  - **Members of the intelligence community** (foreign or domestic)
  - **Customs officers** at international borders
  - **FOIA requestors** (for government officials), etc.

"But Joe! I've Got Nothing to Hide!"

- And that's terrific. Most folks don't. But sometimes **others** may want to share something with you in confidence – wouldn't it be nice if they could?
- Maybe you're trying to talk about spam or malware, and just need a way to avoid having your messages automatically filtered when your message contains malware samples or spam samples?
- In other cases, perhaps you need to know how to use PGP/GPG simply because a group you want to work with may require you to be able to do so, whether **you** perceive a need for it or not.
- Another possibility: maybe you'd like to **digitally sign** your email, so that there's no question that it came from you, and hasn't been tampered with since it was sent?
- Bottom line, there are many, many legitimate reasons why people might need or want to use PGP/GPG

"But What About PGP/GPG and the <u>Bad Guys</u>???"

- It's true – the bad guys are interested in PGP/GPG, too. Some really unsavory types (terrorists, pedophiles, organized crime members, etc.) would love to keep their messages away from the authorities. Those bad guys dream about the privacy that PGP/GPG provides (and they likely already use it).
- Sadly, there's no way that I know of to keep the bad guys from using PGP while still allowing everyone else to use it including:
  -- law-abiding international businessmen
  -- peaceful religious or political dissidents
  -- investigative journalists, and
  -- ordinary privacy-minded men and women.
- Criminal misuse can and *should* be punished, but lawful use by everyone else shouldn't be precluded.

II. PGP/GPG: "Too Hard To Learn To Use?"

PGP/GPG: A "Daunting" Crypto Option?

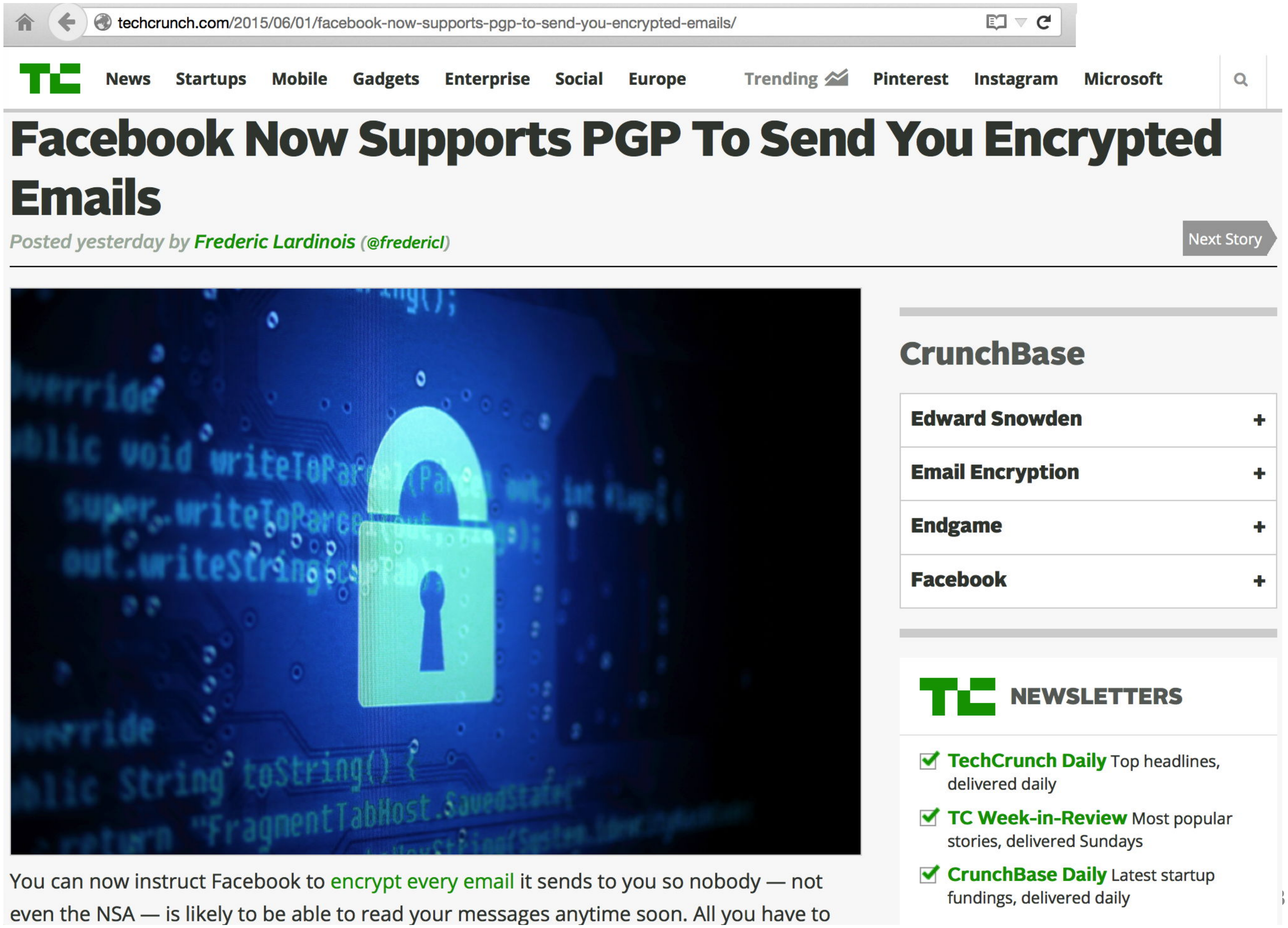
- PGP/GNU PrivacyGuard has often been viewed as technically daunting, even spawning academic studies such as the famous:
  - **"Why Johnny Can't Encrypt"** (1999), http://www.eecs.berkeley.edu/~tygar/papers/Why_Johnny_Cant_Encrypt/USENIX.pdf

    "Our twelve test participants were generally educated and experienced at using email, yet **only one third of them were able to use PGP 5.0 to correctly sign and encrypt an email message** when given 90 minutes in which to do so. Furthermore, **one quarter of them accidentally exposed the secret they were meant to protect in the process, by sending it in email they thought they had encrypted but had not.**" [emphasis added]
- But hey, that was sixteen years ago, right? Surely we've perfected PGP/GPG since then? We'll see! :-)

Is PGP/GPG Something of A "Dead End?"

- In the spirit of full disclosure, some people will tell you that learning to use PGP may be a waste of your time.
- See for example:
  -- Matthew Green's "What's the matter with PGP?" http://blog.cryptographyengineering.com/2014/08/whats-matter-with-pgp.html (But also see the rejoinder at: https://pthree.org/2014/08/18/whats-the-matter-with-pgp/)
  -- Moxie Marlinspike's "GPG and Me" http://www.thoughtcrime.org/blog/gpg-and-me/
  -- Secushare's "15 reasons to not start using PGP," http://secushare.org/PGP
  -- "The World's Email Encryption Software Relies on One Guy, Who is Going Broke," http://www.propublica.org/article/the-worlds-email-encryption-software-relies-on-one-guy-who-is-going-broke [don't worry too much, he's gotten funding now]

If PGP/GPG Is "Dying," No One's Told Facebook That



techcrunch.com/2015/06/01/facebook-now-supports-pgp-to-send-you-encrypted-emails/

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Facebook Now Supports PGP To Send You Encrypted Emails

Posted yesterday by Frederic Lardinois (@fredericl)

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You can now instruct Facebook to encrypt every email it sends to you so nobody — not even the NSA — is likely to be able to read your messages anytime soon. All you have to

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Some Genuine Limitations of PGP/GPG

- PGP/GPG isn't perfect by any means. Real limitations include:
  - It can take some time and effort to learn to use PGP/GPG.
  - PGP/GPG isn't "built-in" to most messaging software; you need to manually add it.
  - Both you AND your correspondent need to use it if you want the protection of encryption
  - PGP/GPG doesn't encrypt message subject lines
  - It also doesn't protect you from traffic analysis attacks (an observer can still see who's sending a message, and who it's being sent to); that can be surprisingly revealing, in and of itself (but see also –hidden-recipient)
  - If you're careless, you can end up accidentally sending plain text when you meant to send cipher text.
  - If you forget your passphrase, you <u>**will**</u> lose everything encrypted with that passphrase. PGP/GPG is like a power tool or a firearm: if you fail to pay attention while using crypto/power tools/guns, you very well may get hurt. **Do NOT forget your passphrase!**

On Balance, However...

- I still think it is worth while learning to use PGP/GPG, which is why I'm excited to have the chance to offer you this training today for M3AAWG attendees in SFO.

- Having previously taught other people how to use PGP/GPG, I'm confident that I can teach you how to use it, too.

- I don't use PGP/GPG all the time, but I do use it when it makes sense to do so. I'd encourage you to adopt a similar policy.

- If it turns out you don't ever use it, that's fine too – I want the choice to be yours. Once you know how to use PGP/GPG, the choice **will** be yours.

Platforms

- People have been known to run PGP/GPG on pretty much everything or anything you can name.

- Today we're going to cover running PGP/GPG on:

  -- Mac OS/X laptops (and Linux laptops, if we have any Linux users in the audience), and
  -- MS Windows laptops.

- Once you have the outline from those platforms, you should be able to generalize that information to other operating systems (Linux, tablet operating systems, smart phones, etc.)

III. How PGP/GPG Works (In General)

PGP/GPG vs. Alternative End-To-End Crypto Options

- Before you sign up to become part of the PGP/GPG "club," you should know that there *are* alternatives for end-to-end email encryption, most notably S/MIME, and/or just use of a shared key.

- **S/MIME** relies on PKI personal certs, and has its own advantages and limitations. If you're interested in S/MIME, see the M3AAWG training I previously did on it; those slides are available at:

  "Client Certs & S/MIME Signing and Encryption: An Introduction," https://www.stsauver.com/joe/maawg24/maawg24.pdf

- You could also just encrypt a file using something like 7-Zip and a **symmetric key** (a key that both you and your correspondent know), and then send that encrypted file to your colleague.

Symmetrically Encrypting a File with 7-Zip*

- 7-Zip is an archiver that includes AES-256 symmetric encryption.
- Assume your secret message is in sample.txt, and your shared secret password is "SecretSecretFoo" (without quotes)
- Encrypt sample.txt with z7a creating sample.zip:

```
$ 7za  a  -pSecretSecretFoo  sample.zip  sample.txt
```

- Recipient would then extract and decrypt sample.zip with:

```
$ 7za e sample.zip
Enter password (will not be echoed) :
SecretSecretFoo
```

* 7-Zip is available free from http://www.7-zip.org/download.html

But There's The Rub....

- If you DON'T use something like PGP/GPG (or S/MIME), you and your correspondent both need to agree to use the **same secret key** (such as "SecretSecretFoo" in the preceding example). Remember, encryption that uses the same key for both encryption and decryption is called "symmetric encryption."
- If you and your correspondent meet face-to-face, you can agree on a secret key that you'll use for all your future correspondence. But what if you've NEVER met a particular person face-to-face, yet you'd still like to be able to confidentially communicate with them? How do you bootstrap that initial "shared secret?"
- Or what if you want to communicate with **multiple people:** do you share the same common key with all of them? Ugh.
- Do you really want to manually set up personalized keys face-to-face with hundreds of people? I really doubt it.

Scaling Key Exchange: Symmetric Crypto Can't

Number of Correspondents	Symmetric crypto with a unique key for each pair of correspondents	Public key crypto, as used by PGP/GPG
2 (you and someone else)	1 key that you both know	2 key *pairs*
3 (you and two others)	(3*2)/2=3 keys, one for each pair	3 key *pairs*
12 people (you & 11 others)	(12*11)/2=66 keys	12 key *pairs*
100 people	(100*99)/2=4,950 keys	100 key *pairs*
500 people	(500*499)/2=124,750 key	500 key *pairs*

Understanding the math: consider the 100 person case. The first person needs a key for the other 99 people, ditto the 2nd person, the third person, etc. For a 100 people, that gets you to "(100*99)"

However, because we assume that the same key is used from sender A to receiver B, AND FROM sender B back to receiver A, that lets us divide the total number of unique keys required in half.

Why Not Just Share <u>One</u> Common Community-Wide Key?

- If you tried to short circuit this "itsy-bitsy" scaling problem by just having one common secret key shared by all correspondents, then all it would take would be for **one** untrustworthy correspondent to disclose the common key, and then your **entire** crypto network would be insecure!

- And in a network of 500 users, you're pretty safe in assuming that there's *at least* one person who's less than totally trustworthy (or at least somewhat careless).

- **Symmetric crypto just isn't the right answer.**

- **Symmetric crypto just doesn't scale, and it doesn't have a good way to bootstrap initial secret keys for remote colleagues, either.**

Asymmetric Cryptography

- PGP/GPG works by leveraging asymmetric ("public key") cryptography: instead of using the same key to encrypt AND decrypt, you'll use a **pair** of related keys, one to encrypt, and a corresponding (but different) one to decrypt.

- Half of your key pair is a **private key** that you'll never reveal to anyone. The other half is a corresponding **public key** that you can (and should!) share with the world.

- Knowing one of those keys (e.g., the public part) does NOT allow you to derive the other corresponding one.

- **Every user of PGP/GPG will normally have their own key pair.**

How Does Someone Get A PGP/GPG Key Pair?

- You make yourself one – anyone with the PGP/GPG software can do so.

- Creating a key pair for each of you is one of the things we'll do as part of today's session.

How Does Someone Get <u>Someone Else</u>'s Public Key?

- PGP/GPG public keys are often distributed via public database servers known as "key servers." That said, some people may not know about key servers, or may choose not to use them.
- Those people will often put their public key on a web page, or they may simply email you their public key on request (they're free to distribute their public key any way they might like). Note that you MUST share your publicly key with others *some* way or another. Unless you have a compelling reason not to, I recommend using PGP/GPG key servers.
- Why do some people not just use key servers? Three main reasons: they worry that spammers will harvest them to find email addresses to spam; they may find using key servers confusing; or they may be confused by the PGP/GPG "web of trust" concept.

Picking the RIGHT PGP/GPG Public Key

- **Anyone** can submit a PGP/GPG public key to a key server.
- Logical question, then: if **anyone** can submit a public key to a PGP/GPG public key server (and they can), "what keeps people from submitting **bogus** PGP/GPG public keys?"
- The answer to that is simple: **nothing.** Nothing prevents people from **submitting** totally bogus keys to a public key server.
- YOU are responsible for **selecting** the right/real one, assuming **any** of the available PGP/GPG keys are real (they might all be bad)
- But how to choose the right PGP/GPG key?
- There are essentially two approaches that people tend to use: you can rely on information received directly from the person who owns the key (such as a key fingerprint printed on a business card you received directly from that person), OR you can rely on the PGP/GPG "web of trust"

The PGP/GPG Web of Trust

- **Basic idea behind the web of trust: the owner of a PGP/GPG keypair asks others to digitally sign his/her public key.**
- Key signers sign after confirming the identity of a key holder by inspecting a government-issued ID document (driver's license, passport, etc.). After signing a key, the signed key gets sent back to its owner.
- How do we know that those signing the key are who THEY claim to be? Well, ***their*** keys are in turn signed by other people... And the keys of those other people are in turn signed by other people...
- This creates an interwoven "web of trust" that ultimately acts to tie an identity to an associated key pair.
- The more broadly a key has been signed by other trusted signers, the more confidence you should have that the signed key belongs to the person whom it claims to represent.

NOTE: Signing a Key ^= "Vouching" For Someone

- From time to time I've run into people who confuse the signing of a key with "vouching" for someone's "trustworthiness" or "integrity." That's NOT what signing a PGP/GPG key is about.
- Signing a PGP/GPG key *IS* about asserting that there is a connection between:
  -- a PGP/GPG key pair, and
  -- an asserted identity.
- The actual person associated with an identity could be "as good "as Mother Theresa" or "as evil as Hitler," you're NOT vouching for them just by signing their key! You ARE saying that you have personally made the connection between their real life identity and their keys.
- Then again, ***because of the confusion around this point,*** I'd probably suggest NOT signing the keys of obviously evil people.

Is Signing PGP/GPG Keys "Required?"

- Signing PGP/GPG keys is NOT required. There is no PGP/GPG police who will "pull you over" for having an unsigned key.
- Some people NEVER bother to get their keys signed; when that's true, it is up to you to figure out an alternative way to ensure you've got the "right" key for that person.
- Likewise, you are NOT required to sign anyone else's key, although if you're a nice person, it's a kind thing to do for someone. We'll show you how to do this later in this training.
- In the other direction, no one else is required to sign YOUR key. If they do agree to sign it, they're doing you a favor, so be polite when asking and be gracious if someone declines to do so.

So Why Doesn't Everyone Use PGP/GPG?

- When we think about why PGP/GPG hasn't been more broadly adopted, you now are aware of several reasons:

  -- Some people think they have nothing that needs protection (although they're probably wrong)
  -- You need to download and install PGP/GPG, it doesn't come "built in" or "preinstalled"
  -- It's relatively complex (not as hard as taking a class in differential equations, but not as simple as grilling a burger)
  -- Your correspondents may not be using PGP/GPG
  -- Key distribution may feel *ad hoc* or insecure (even though it it can be perfectly secure when properly utilized), and the web of trust may seem somehow "kludgy" or *ad hoc.*
  -- There are alternatives (such as S/MIME, or use of symmetric crypto) that may end up getting used instead of PGP/GPG.

Nonetheless, Let's Give It A Try Today

- The process isn't all that hard -- at least once you've gotten things setup and you've collected keys for all the people you routinely correspond with who are ALSO doing PGP/GPG

- Let's start by getting you setup...

- **These are tasks that you'll (hopefully) only need to do once.**

III. One-Time Setup Tasks

Versions of PGP/GPG

- There are several different versions of PGP/GPG.
- PGP ("Pretty Good Privacy") has now largely been supplanted by GNU Privacy Guard (GPG).
- Where possibly, we're going to illustrate use of the classic version of GNU Privacy Guard, Version 1.4.20 (as released on December 20th, 2015)
- I prefer classic GPG (e.g., GPG 1.x, NOT GPG 2.x) because GPG 1.x does **NOT** use pinentry. At one point I thought that I was the only fossil who felt this way, but in talking with GPG using colleagues, I've learned that I'm not alone. :-)
- If you do want to install GPG 2.x, you can install it right alongside GPG 1.x, but we're not going to cover that today (except for folks who basically have no other option), such as our Windows-using colleagues.

Installation for the Various Platforms

- We are going to show installing GPG on both Macs [and Linux] and on Windows PC.

- **We'll begin with the Mac [and any Linux People]**

- Windows people, hang tight for a minute. After we get the Mac and Linux users get rolling, we'll come back to you.

- **On the Mac [and Linux], we're going to compile and install GNU Privacy Guard from source.**

MAC USERS

(And Linux Users, If Any…
You'll Start a Few Slides In)

Mac-1. Mac Users:

GNU Privacy Guard Installation

Installing GPG From Source for the Mac

- Normally, for ease of use, I would recommend simply installing the precompiled binary version of a program (any program!), rather than compiling from source.
- However, in this case, there are no precompiled binaries available for the classic version of GNU Privacy Guard for the Mac.
- GNU Privacy Guard is also security-sensitive software, so I'm happier building it from scratch, anyhow.
- Therefore, we have a little work to do, first...

- Hopefully, you all saw a note from me, forwarded by Amy, urging you to preinstall Xcode and the Xcode command line tools.
- **If you're a Mac user, did anyone NOT get that note, or NOT get that "homework" done?**

I'm Going to Assume We DO Have There's At Least One Mac User Who Didn't Get That Prep Work Done

- Therefore, let's go over this...

- To build GNU Privacy Guard on the Mac, you'll need to:

  -- Be able to get to the Mac OS X terminal application on your Mac

  -- Know the admin password for your Mac

  -- Have Apple Xcode installed

  -- Have the Apple Xcode command line tools installed

- We'll now take care of those points.

The Mac Terminal App

- **We'll eventually move to a graphical point-and-click environment, but we're going to start by working at the command line.**

- On the Mac, that means using the Mac Terminal app, which emulates an old DEC VT100-family terminal.

- If you don't routinely use the Mac Terminal app, you can find it at:

  Finder → Applications → Utilities → Terminal.app

- Once you launch it, you'll be looking at a plain terminal window with a Unix command line shell prompt (the dollar sign). **Do NOT type the dollar sign when it is shown in subsequent commands!**

Mac Administrative User

- Mac OS X allows users to have different roles: you can be an regular user, for example, or an administrator with enhanced privileges.

- When you first installed Mac OS X on your laptop, one of the first things you did was to create an administrator account.

- For the purpose of installing GNU Privacy Guard, **you should be working from that administrator account. That means you should know the password for it.**

- Not sure if an account's an admin account? Go to
  Apple → System Preferences → Users & Groups
  and look to see if you're using an account tagged as "admin"

Install the Apple Developer Tools

- Compiling software on the Mac generally requires Xcode, the Apple developer tools. Anyone can register to become an Apple "developer" and you can then freely download Xcode.

- **IF** you didn't already install Xcode, you can **download Xcode 7.2.1 for free from Apple.** See the link located at:

  https://developer.apple.com/xcode/downloads/

- Note that this is a LARGE download (4.4GB+)and may take a substantial amount of time over a shared wireless network. **If you've not previously downloaded and installed Xcode, you may want to try JUST installing the XCode Command Line tools, INSTEAD.**

Xcode

By Apple

Essentials

Open the Mac App Store to buy and download apps.

View in Mac App Store

Free

Category: Developer Tools
Updated: Feb 02, 2016
Version: 7.2.1
Size: 4.41 GB
Language: English
Seller: Apple Inc.
© 1999-2016 Apple Inc.

Description

Xcode includes everything developers need to create great applications for Mac, iPhone, iPad, Apple TV, and Apple Watch. Xcode provides developers a unified workflow for user interface design, coding, testing, and debugging. The Xcode IDE combined with the Cocoa frameworks and Swift programming language make developing apps easier and

Apple Web Site ▸ Xcode Support ▸ Application License Agreement ▸ ...More

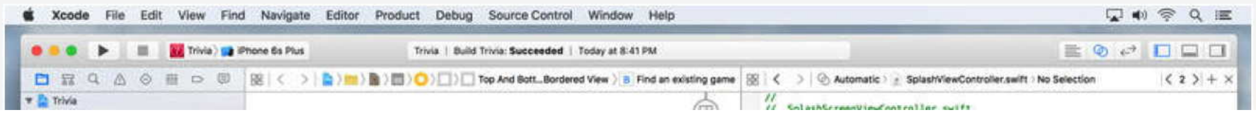
What's New in Version 7.2.1

Xcode 7.2.1 includes Swift 2.1.1 and SDKs for iOS 9.2, watchOS 2.1, tvOS 9.1, and OS X 10.11.2 El Capitan.

Fixed in Xcode 7.2.1:

...More

Screenshots


Xcode File Edit View Find Navigate Editor Product Debug Source Control Window Help
Trivia iPhone 6s Plus
Trivia | Build Trivia: Succeeded | Today at 8:41 PM
Top And Bott...Bordered View
Find an existing game
Automatic
SplashViewController.swift
No Selection
Trivia

Installing The Command Line Tools

- **IF YOU *HAVE* INSTALLED Xcode but *HAVEN'T* installed the Command Line Tools, you also need to download the command line tools**. Do so by (a) starting Xcode, then (b) going to the Xcode→Preferences→Downloads tab and clicking "Install" next to the Command Line Tools entry.
- **IF YOU *HAVEN'T* INSTALLED Xcode (and don't WANT to!),** you can try downloading JUST the command line tools by entering
  $ **xcode-select --install**
  That MAY be all you actually need.
- Regardless of the approach you use, signify that you accept the Command Line Tool license by entering in a Terminal window:
  $ **sudo xcodebuild -license**
  Hit space, space, space, etc., to scroll down through the text of the legal agreement. When you get down to the very bottom, enter:
  agree

Linux Users, You Should Start Paying Attention Here

- If you're a Linux person and you want to build GNU Privacy Guard from scratch, start paying attention here, please!
- The command line process is basically the same for Mac users and for you...

Downloading GPG 1.4.20 Source Code

- Download a copy of the GPG 1.4.20 source code by going to a Terminal window, and then entering (at the dollar sign prompt):
  $ **curl -O https://www.gnupg.org/ftp/gcrypt/gnupg/**
  gnupg-1.4.20.tar.bz2
  (that's curl space dash capital oh, not curl space dash zero, and continue the second line as part of the first line, without any intervening space

- Next, verify the checksum of that file (and thus its integrity):
  $ **shasum gnupg-1.4.20.tar.bz2**
  cbc9d960e3d8488c32675019a79fbfbf8680387e
  gnupg-1.4.20.tar.bz2
  That checksum should match what's shown above (and what's shown online at https://lists.gnupg.org/pipermail/gnupg-announce/2015q4/000382.html)

Unpack The GNUPG Distribution

- Uncompress the archive you downloaded:

  $ **bunzip2 gnupg-1.4.20.tar.bz2**

  This will leave you with the uncompressed archive file gnupg-1.4.20.tar

- Untar that tar archive:

  $ **tar xfv gnupg-1.4.20.tar**

  That will unpack the GNU Privacy Guard distribution into the subdirectory gnupg-1.4.20

Installing GPG

- Change directory down into the gnupg-1.4.20 subdirectory:
  $ **cd gnupg-1.4.20**

- Configure the package:
  $ **./configure** ← **NOTE THE DOT at the start of that command!**

- Build and check the program:
  $ **make**
  $ **make check**

- Install gpg if all checks are reported as passing okay:
  $ **sudo make install**

  Note: sudo will ask for your administrator password to run.

Confirm That GPG Is Installed

```
$ gpg --version
gpg (GnuPG) 1.4.20
Copyright (C) 2015 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.

Home: ~/.gnupg
Supported algorithms:
Pubkey: RSA, RSA-E, RSA-S, ELG-E, DSA
Cipher: IDEA, 3DES, CAST5, BLOWFISH, AES, AES192, AES256, TWOFISH,
        CAMELLIA128, CAMELLIA192, CAMELLIA256
Hash: MD5, SHA1, RIPEMD160, SHA256, SHA384, SHA512, SHA224
Compression: Uncompressed, ZIP, ZLIB, BZIP2
```

See A Short Summary of GPG Commands

- $ **gpg --help | more**

```
[...]
Syntax: gpg [options] [files]
Sign, check, encrypt or decrypt
Default operation depends on the input data

Commands:

-s, --sign [file]             make a signature
    --clearsign [file]        make a clear text signature
-b, --detach-sign             make a detached signature
-e, --encrypt                 encrypt data
[etc]
```

See Also The GPG Unix Manual Page

- $ **man gpg**

```
GPG(1)                GNU Privacy Guard 1.4                GPG(1)

NAME
    gpg - OpenPGP encryption and signing tool

SYNOPSIS
    gpg [--homedir dir] [--options file] [options] command [args]

DESCRIPTION
    gpg is the OpenPGP only version of the GNU Privacy Guard (GnuPG). It is
    a tool to provide digital encryption and  signing  services  using  the
    OpenPGP  standard.  gpg  features complete key management and all bells
    and whistles you can expect from a decent OpenPGP implementation.

    This is the standalone version of gpg.  For desktop use you should con-
    sider using gpg2 from the GnuPG-2 package
[etc]
```

Mac-2. Mac [and Linux] Users:

Creating and Managing YOUR OWN Keypair

Create A Keypair For Yourself

- $ **gpg --gen-key**

```
[...]

Please select what kind of key you want:
  (1) RSA and RSA (default)
  (2) DSA and Elgamal
  (3) DSA (sign only)
  (4) RSA (sign only)
Your selection? 1

RSA keys may be between 1024 and 4096 bits long.
What keysize do you want? (2048) 4096
Requested keysize is 4096 bits
```

Key Duration/Validity Period

- Please specify how long the key should be valid.
  [...]
  Key is valid for? (0) **5y**
  Key expires at Sat May 16 16:53:55 2020 PDT
  Is this correct? (y/N) **y**

- **Notes:** You can pick whatever duration you like. I recommend five years as a reasonable key validity period. Some people like a shorter period (such as just 1 year), other people might do 20 years. I think 5 years is a reasonable compromise value.

- Make a mistake? Hit a control-C to abort and then re-run
  $ **gpg --gen-key**

Put In Your Name, Email, and An <u>Optional</u> Comment

- You need a user ID to identify your key [etc]:

  Real name: **Joe St Sauver**
  Email address: **joe@stsauver.com**
  Comment: **Code 40**
  You selected this USER-ID:
      "Joe St Sauver (Code 40) <joe@stsauver.com>"

  Change (N)ame, (C)omment, (E)mail or (O)kay/(Q)uit? **o**

- ***Note:*** Enter <u>your own</u> information, obviously

  Please also note that you do NOT need to enter a comment (this would be a good time not to just blindly copy what I enter)

Enter A Strong Passphrase

- You need a Passphrase to protect your secret key.

  [enter a long/strong passphrase]

- ***Notes:*** Do NOT forget/lose this password. If you do, you'll be totally "out of luck." There is no magic backdoor for recovering your passphrase!

  Also, while you DO want a long/strong passphrase, don't "go overboard" because you're going to be entering this all the time. If you make it TOO long/TOO strong, you'll regret it. You're going to be typing this password a LOT.

  15-25 characters should be fine

Do Some Other Stuff While Your Keys Gets Created

- We need to generate a lot of random bytes. [etc]

```
.........+++++
..........+++++
gpg: key 36AD91D7 marked as ultimately trusted
public and secret key created and signed.

gpg: checking the trustdb
gpg: 3 marginal(s) needed, 1 complete(s) needed, PGP trust model
gpg: depth: 0  valid:   1  signed:   0  trust: 0-, 0q, 0n, 0m, 0f, 1u
gpg: next trustdb check due at 2020-05-16
pub   4096R/36AD91D7 2015-05-18 [expires: 2020-05-16]
Key fingerprint = 54A7 02D4 E156 1037 4ADF  2290 9D54 F6B4
36AD 91D7
uid    Joe St Sauver (Code 40) <joe@stsauver.com>
sub   4096R/964600F3 2015-05-18 [expires: 2020-05-16]
```

Backup Your PRIVATE Key

- You routinely backup ***everything,*** right? Be sure to ALSO backup your SECRET (private) key

- To get a copy of your private key, enter:

  ```
  $ gpg --export-secret-key --armor "joe@stsauver.com" > sec.key
  ```

  Obviously, use YOUR email address, not mine, in this command.

- Save "sec.key" somewhere safe (perhaps on a thumb drive you can put in your bank's safety deposit box), then securely delete sec.key ($ **srm sec.key**). Note that you will still need your passphrase to use your private key, so be sure to save THAT some place safe, too (ideally separate from the thumb drive, e.g., in your *other* bank safety deposit box)

Push Your PUBLIC Key to the Keyservers

- We'll now push your public key to the keyservers. The first step to doing this is finding the key ID of your key. List your keys with the gpg --list-keys command:

  ```
  $ gpg --list-keys "joe@stsauver.com"
  ```

  Notes: Substitute YOUR email address for my email address in this command. Look for the key ID (8 digit hexadecimal number) identifying **your** key; **my** key ID is 36AD91D7

- Now push your public key to one or more key servers (most of them periodically synchronize with each other). In my case I'd say:

  ```
  $ gpg --keyserver pool.sks-keyservers.net --send-keys 36AD91D7
  ```

Sharing Your PUBLIC Key 1:1 With Someone

- Sometimes people either can't (or won't) work with public key servers. You can share your public key with them directly**.**

- For example, to export a copy of my public key to send to someone, I'd say:

  $ **gpg --export --armor joe@stsauver.com > temp.pubkey**

  $ **cat temp.pubkey**

```
-----BEGIN PGP PUBLIC KEY BLOCK-----
Version: GnuPG v1

mQINBFVae+sBEACt1jsKMhRlTthHI6qou4Dnr/O6frVPZkqBe+TG9oZddtiMAOZk
NG8tKKB4Qn3BOOnxaN4OikAql96uFs9sfr9B0hBcMVuiOQPvO7c59o+W3kTlKMNn
[etc]
```

- Cut and paste the entire public key block (including the dashed line bits) into a mail message to your potential correspondent.

A Quick Cut and Paste Review

- If you're working with GPG at the command line, you may be "cutting and pasting" stuff a lot.

- Most of you already know how, but just as a Mac refresher:

  -- Highlight a block of text by clicking at the start of what you want to copy, and then dragging the mouse downwards (while holding down the mouse button)

  -- Copy the text by hitting Command-C (or by going to the menus and navigating to Edit → Copy)

  -- Click where you want the text to go, then hit Command-V (or go to Edit → Paste)

Mac-3. Mac [and Linux] Users:

Getting and Managing Other People's Public Keys

Find a Correspondent's Public Key (And Automatically Downloading A Copy Of It)

- Assume we want to find the PGP public key for a correspondent, perhaps info@us-cert.gov

  We'd search for that key by saying:

  ```
  $ gpg --keyserver  pool.sks-keyservers.net  \
  --search-keys "<info@us-cert.gov>"
  ```

  Notes: Put less than/greater than brackets around the email address as shown, within the enclosing double quote marks!

  If there is more than one matching key, as in this case, you'll be asked to pick which one you want. Once you've selected the one you want, it will be downloaded and imported to your keyring

Getting A Correspondent's Public Key Shared 1:1, And Then Incorporating It Into Your Keychain

- Some correspondents may prefer to share their public key directly, rather than via a public keyserver. Perhaps they'll send it to you in an email message, or they may publish it on the web as the REN-ISAC does (http://www.ren-isac.net/0x4DFD37BE.asc)

  To add such a key to your local key ring, put a copy of it into a file, perhaps called tempkey.txt. Any easy way to do that is to just copy and paste the key into that file using your favorite text editor (vi, emacs, Apple TextEdit.app, etc.)

- Then, at the $ prompt, import that key by saying:

  $ **gpg --import < tempkey.txt**

Mac-4. Mac [and Linux] Users:

Signing A Message You've Made

Getting Ready to Cryptographically <u>Sign</u> A Message

- Cryptographically signing a message proves that you are taking responsibility for it, and that it hasn't been tampered with during delivery (assuming the signature validates OK on the other end).

- To do this, begin by creating a message using a text editor of your choice (vi, emacs, or the Apple TextEdit.app).

- Let's save that file as "sample.txt"

Now Sign That Message...

- $ **gpg --clearsign < sample.txt > sample.gpg**

  ```
  You need a passphrase to unlock the secret key for
  user: "Joe St Sauver (Code 40) <joe@stsauver.com>"
  4096-bit RSA key, ID 36AD91D7, created 2015-05-18
  ```

- **Important Note: a digitally SIGNED message is NOT ENCRYPTED**

- **Signing provides cryptographic proof of attribution and non-tampering, it does NOT provide protection against eavesdropping.**

- **You MUST encrypt the message if you want to protect it against potential eavesdropping!**

Looking at the clearsign'd Message

- $ **cat sample.gpg**

```
-----BEGIN PGP SIGNED MESSAGE-----
Hash: SHA1

This is a sample message,

Joe
-----BEGIN PGP SIGNATURE-----
Version: GnuPG v1

iQIcBAEBAgAGBQJVcL6oAAoJEJ1U9rQ2rZHXG2UQAIo6h/r6mBK8uwVmQTOCblxI
NyCnyi4+OKUvW9LN5TsuDPM/kW9XsHaPDUiDgH6RB2pyJabFqbRDov894Q1TZ5UB
lerfUbpPJeF6DwwTcZy/f94rGXPz3CKxfWNDCr30u8AYNWmnjuR5qarMab6HyOQg
[etc]
-----END PGP SIGNATURE-----
```

- Note that the message has two parts: the original message body, and the associated signature part, all in one file. This is only one of multiple signature formats (but we're not going into that today)

Sending The clearsign'd Message

- Highlight the PGP message **(including the signature and the dashed lines)** with your mouse, and copy it (Cmd-C)
- Go to your favorite email client and compose a new message
- Paste the message into the body of the message (Cmd-V)
- Send the message as you normally would

Mac-5. Mac [and Linux] Users:

Validating A Signed Message You've Received

Validating A Signed Message You've Just Received

- Received a PGP/GPG signed message sent "inline?" Highlight the PGP part of the message **(including the dashed lines)** with your mouse, and then copy it (Cmd-C)

- Go to your favorite editor, create a new file, and paste the message into file (Cmd-V). Save the file as temp.txt

- Run that file through GPG:

  ```
  $ gpg < temp.txt
  ```

- Receive a PGP/GPG signed message sent as an **attachment**? Save the attachment(s) as a file, then run that file through GPG as shown above.

What You'll See For a Sample Valid Signature

- $ **gpg < sample.out**

```
This is a sample message,

Joe
gpg: Signature made Mon Jun  1 17:20:21 2015 PDT using RSA key ID 36AD91D7
gpg: Good signature from "Joe St Sauver (Code 40) <joe@stsauver.com>"
```

- You're looking for "Good signature"

- You're also looking to make sure the message came from who you think it should have come from

Mac-6. Mac [and Linux] Users:

Encrypting a Message To Protect Against Eavesdropping

Getting Ready to <u>Encrypt</u> A Message

- Encrypting a message protects that message against eavesdropping

- To do this, begin by creating a message using a text editor of your choice (vi, emacs, or the Apple TextEdit.app).

- Let's save that file as "sample.txt"

Now Encrypt That Message...

- $ **gpg --encrypt --armor < sample.txt > sample.gpg**

```
You did not specify a user ID. (you may use "-r")

Current recipients:

Enter the user ID.  End with an empty line: ren-isac@iu.edu
gpg: 1AF9AF6A: There is no assurance this key belongs to the named user [...]

It is NOT certain that the key belongs to the person named
in the user ID.  If you *really* know what you are doing,
you may answer the next question with yes.

Use this key anyway? (y/N) y

Current recipients:
2048g/1AF9AF6A 2005-08-08 "REN-ISAC <ren-isac@iu.edu>"

Enter the user ID.  End with an empty line: <just hit return>
```

Side Bar: "What's 'ASCII armor'?"

- PGP/GPG can produce binary files, or 'ASCII armored' files, an easily transmitted ASCII-encoded file (think of ASCII armor as a "base64"-like encoding using printable ASCII characters only)
- If you ever go to cut and paste a PGP/GPG file and see something that looks like an ugly binary mess, you're probably looking at a file that was NOT sent in ASCII armor format.
- Simple rule for you: ALWAYS use PGP/GPG ASCII armor format when sending an encrypted file.

Some Notes About Encrypting

- When you are sending an encrypted message to someone, you need to **specify the recipient of that message** (e.g., you're encrypting the message with YOUR CORRESPONDENT's public key)
- If GNU Privacy Guard doesn't want to let you encrypt the message with their key (perhaps because it doesn't have a copy of it), do you actually have a copy of your correspondent's public key? If not, go get it, either from a key server or directly from him or her.
- If you think you DO already have their public key in your key ring, check to see if you're got a typo in their email address
- If your correspondent has a unique string in their name (perhaps they're the only person named "Freddy" in your PGP/GPG key chain), you can just enter that unique string to select their key.
- If you plan to keep a carbon copy of your encrypted message for reference, be sure to **ALSO** encrypt with **your own** key as an additional recipient.

Sending The Encrypted Message

- $ **cat sample.gpg**

```
-----BEGIN PGP MESSAGE-----
Version: GnuPG v1

hQIOAzmmxFoa+a9qEAgArFjMBpCyt+bQcssD4Io2Jdc40tbpxCmgpzlBQ6i3Circ
4yrfJ4IvI/6T0lX5Tadw5lSwy8mZinz1Nbuo/T56g5aVQ1PLHGIhcVcJiytCJAoj
JQR/uNKnk43FNuY+DSwI/Ok3dl6/D9fIeBR+cL8gZG64dOfmPmXOpzhoNNpZHI9s
/GHj+6QP9S6dht+CpKw+DL+qz04PiIk7L/dMdhlnfKAc+e1TGw9FnRdoIxUoYryH
0fJDowVKNxdPd9j47nqDd9GvmDDJED2WhhFSa4p66E07n0o7hgIO2i93PIQJ9Nyb
[etc]
-----END PGP MESSAGE-----
```

- Highlight the PGP message **(including the dashed lines)** with your mouse, and then copy it (Cmd-C)
- Go to your favorite email client and compose a new message
- Paste the message into the body of the message (Cmd-V)
- Send the message as you normally would

Quick Notes About Sending Encrypted Messages

- If you're sending an ASCII armored message, you do NOT need to send it as an attachment. It's plain text, generally safe to send in the body of a regular message.

- If you are sending sensitive content in an encrypted message, "perhaps" it would be a good idea to NOT tip your hand by using an informative Subject line for your message.

  In general, **NO subject line** is the best Subject line for encrypted messages.

- Some sites may refuse ALL encrypted email messages since they normally can't scan those messages for malware. If you have a rejected message returned for that reason, contact your recipient via an alternative method.

Mac-7. Mac [and Linux] Users:

Decrypting an Encrypted Message You've Just Received

Decrypting An Encrypted Message You've Just Received

- PGP encrypted message sent "inline?" Highlight the PGP part of the message **(including the dashed lines)** with your mouse, and then copy it (Cmd-C). Now Go to your favorite editor, create a new file, and paste the message into file (Cmd-V). Save the file as temp.txt

- Run the message through GPG:

  ```
  $ gpg < temp.txt
  ```

  You will need to enter your passphrase to decrypt the message

- PGP/GPG encrypted message sent as an **attachment**? Save the attachment as a file, then run it through GPG as shown above.

Notes About Decrypting An Encrypted Message

- Encrypted messages normally aren't (and can't be!) scanned for malware, phishing, spam, or other undesirable content.

  You've been warned. Be careful! You may be potentially decrypting dangerous content when you decrypt a PGP/GPG message!

- NOTE: Now you understand one reason why I just show decrypting messages to the screen on the previous slide. While you could decrypt a message to a file, doing so increases the chance that you will end up decrypting a troublesome/unsafe file.

- **In general, strongly encourage your correspondents to only send you plain text files through PGP/GPG.**

Mac-8. Mac [and Linux] Users:

Signing Another User's Public Key

Signing Another User's Public Key

- Import the user's public key to your key ring if you haven't already done so. See Section Mac-3, earlier in this talk.
- Confirm that they key you have for the user is actually the key the user uses (check the fingerprint of the key). For example:
  ```
  $ gpg  --list-keys  johnsmith@example.com
  ```
- Confirm the user's identity by inspecting the user's government-issued identification (his passport, driver's license, etc.)
- If that all checks out okay, sign the key:
  ```
  $ gpg --sign-key  johnsmith@example.com
  [...]
  Really sign? (y/N) y
  You need a passphrase to unlock the secret key for [your userID]:
  [enter your passphrase here]
  ```
- Export the key you've signed, and send that file to the user:
  ```
  $ gpg --export --armor johnsmith@example.com
  ```

Why Not Send The Key You've Signed <u>Directly</u> to the Keyserver?

- Generally speaking, you should NOT send a key you've signed directly to a public keyserver.
- Why?
- Some users may not want their public key distributed via the public keyserver infrastructure.
- Since you generally can't remove a key once it's been published to the public keyservers, please do NOT send another user's key to the public keyservers unless they explicitly ask you to do so.
- Send the signed public key back to the user for them to handle.

Mac-9. Mac [and Linux] Users:

Importing Your Own Key After It Has Been Signed

Updating Your Key Ring With A Key That Someone Has Signed For You

- Once you've received a newly signed key, you will likely want to update your key ring with that new signature.
- Save the signed key you've received to a file, such as temp.key
- Import/merge that key:

```
$ gpg  --import  <  temp.key
```

Updating Your Key As Saved On The Public Keyservers

- When you've received a newly signed key, you may also want to update your key on the public keyservers.

- After merging the signed key into your own keychain, update the key by pushing the signed key to the keyserver as described previously (see "Push Your PUBLIC Key to the Keyservers" in section Mac-2)

Mac-10. Mac [and Linux] Users:

PRACTICE!

Okay Mac/Linux Users, Now Practice For A Few Minutes!

- You've now got all the skills you need to do simple PGP/GPG messages. We're now going to work with the Windows folks a little

- Pair up with another Mac [or Linux] user, and do the following:

  a) create a key pair for yourself if you haven't already done so
  b) get a copy of your partner's public key
  c) send a signed message to your partner
  d) send an encrypted message to your partner
  e) verify the signature of the message you received from your partner
  f) decrypt the message you received from your partner
  g) if so inclined, sign your partner's key and send it back to them

WINDOWS

USERS

Windows-1:

Windows GNU Privacy Guard Installation

Installing The Windows Gpg4win Binary

- Most attendees should have received a note last week asking them to download Gpg4win 2.3.0 (26Mbyte version) from

  http://www.gpg4win.org/download.html

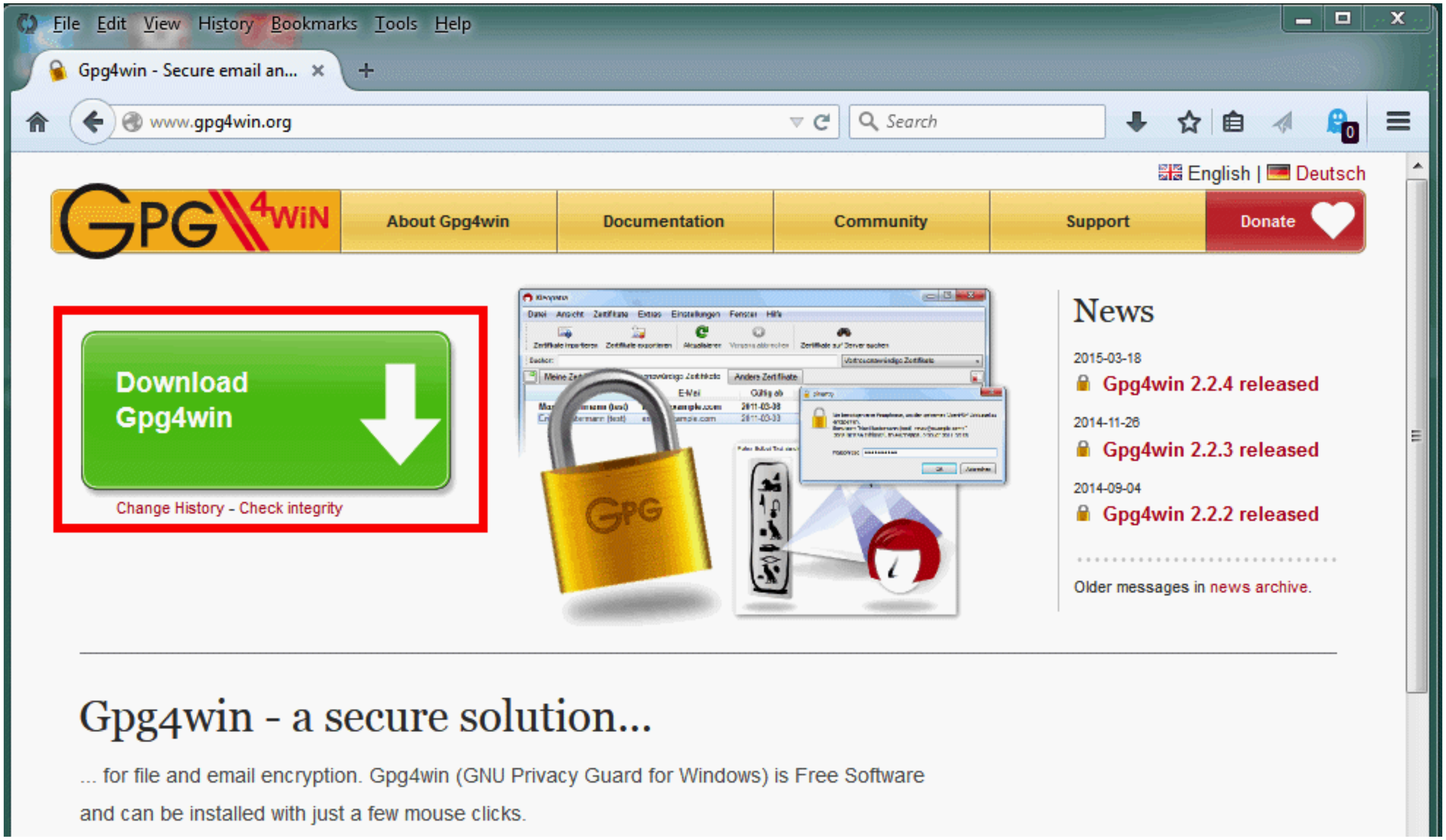
  If you've not already done so, please do so now.

- **This is the official Windows implementation of GNU Privacy Guard.**

Why Do A Binary Version For Windows Users?

- I'd generally have preferred to do a built-from-source version for Windows users, just as we did for Mac users, but there are a variety of complexities associated with doing so that makes that less practical.
- In a somewhat ironic twist, for example, Gpg4win, the binary we'll be using, actually gets cross-compiled on a Linux system, not built "native" on Windows
- See http://www.gpg4win.org/build-installer.html for details – it just isn't realistic/practical to try to walk you through it for today's session.
- We're going with the binary as a result, sorry.

The Gpg4Win Top Level Web Site's Download Link


File Edit View History Bookmarks Tools Help
Gpg4win - Secure email an...
www.gpg4win.org
Search
English | Deutsch
About Gpg4win
Documentation
Community
Support
Donate
Download Gpg4win
Change History - Check integrity

News

2015-03-18
Gpg4win 2.2.4 released

2014-11-26
Gpg4win 2.2.3 released

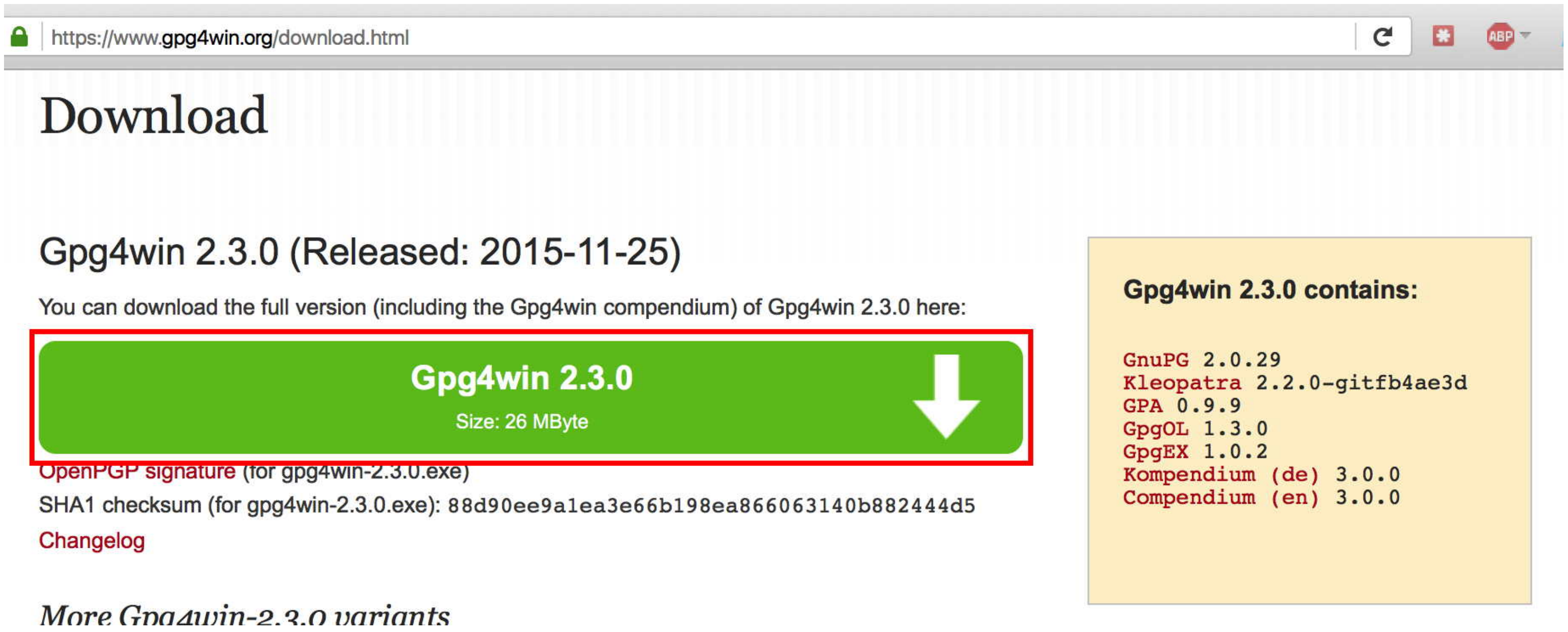
2014-09-04
Gpg4win 2.2.2 released

Older messages in news archive.

Gpg4win - a secure solution...

... for file and email encryption. Gpg4win (GNU Privacy Guard for Windows) is Free Software and can be installed with just a few mouse clicks.

There Are Several Download Options; Unless Space Is Really Tight, Do The Full One



https://www.gpg4win.org/download.html

Download

Gpg4win 2.3.0 (Released: 2015-11-25)

You can download the full version (including the Gpg4win compendium) of Gpg4win 2.3.0 here:

OpenPGP signature (for gpg4win-2.3.0.exe)

SHA1 checksum (for gpg4win-2.3.0.exe): `88d90ee9a1ea3e66b198ea866063140b882444d5`

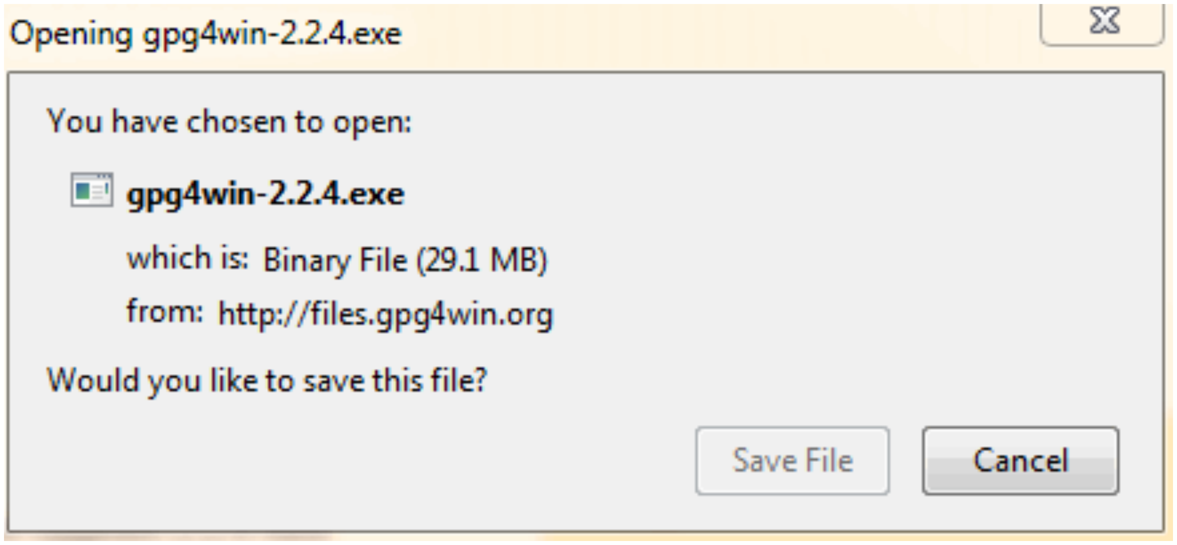
Changelog

More Gpg4win-2.3.0 variants

Gpg4win 2.3.0 contains:

```
GnuPG 2.0.29
Kleopatra 2.2.0-gitfb4ae3d
GPA 0.9.9
GpgOL 1.3.0
GpgEX 1.0.2
Kompendium (de) 3.0.0
Compendium (en) 3.0.0
```

Normal Firefox Download Process, Yielding...


Opening gpg4win-2.2.4.exe

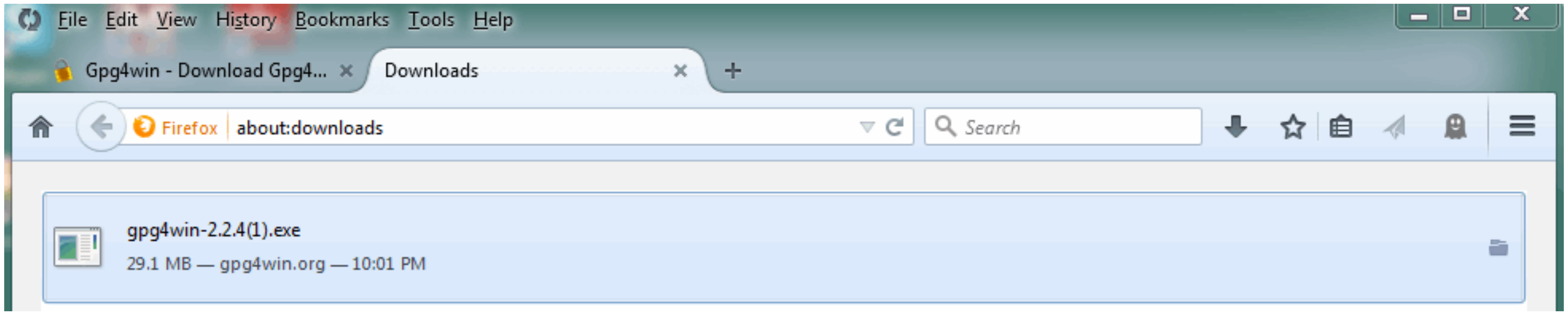
You have chosen to open:

gpg4win-2.2.4.exe

which is: Binary File (29.1 MB)

from: http://files.gpg4win.org

Would you like to save this file?



gpg4win-2.2.4(1).exe

29.1 MB — gpg4win.org — 10:01 PM

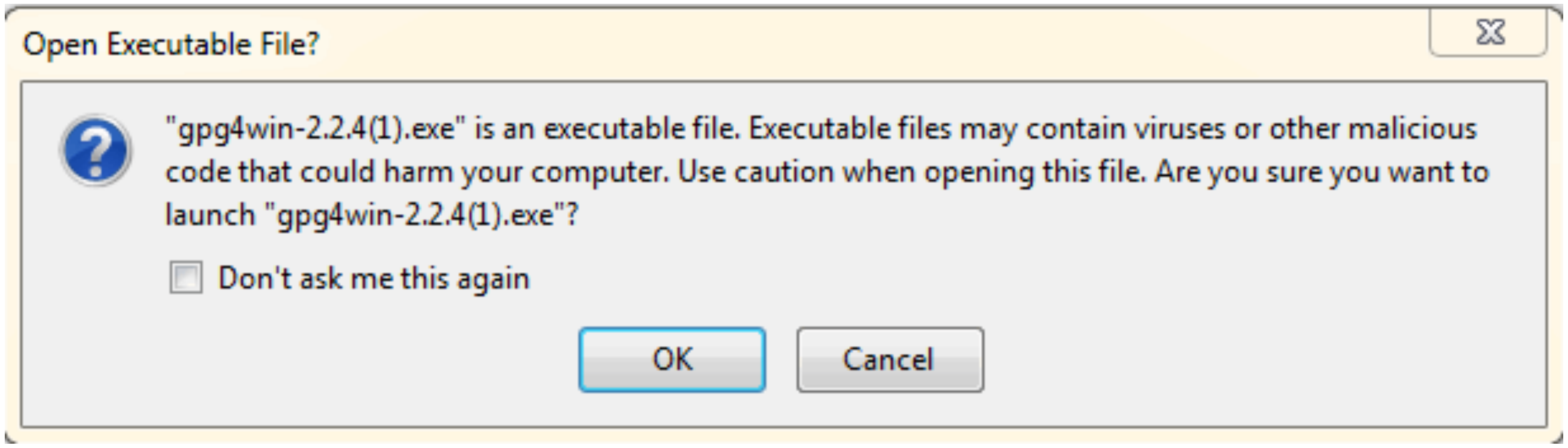
Verifying The Distribution's Integrity

- To check that the binary has not been tampered with, you can check it's sha1 checksum value. For information on how to do this, see: https://support.microsoft.com/en-us/kb/889768

  The sha1 checksum you see should be
  8ddcbf14eb6df11139f709320a71d197a83bf9e1
  (and as shown at http://www.gpg4win.org/download.html)

- However, note that the Gpg4Win installers are signed with a globally trusted cert, which may incline you to skip or deprioritize this step (See http://www.gpg4win.org/package-integrity.html)

Anyhow, When Ready to Proceed, Just Double Click The Downloaded File to Start the Installer


Open Executable File?

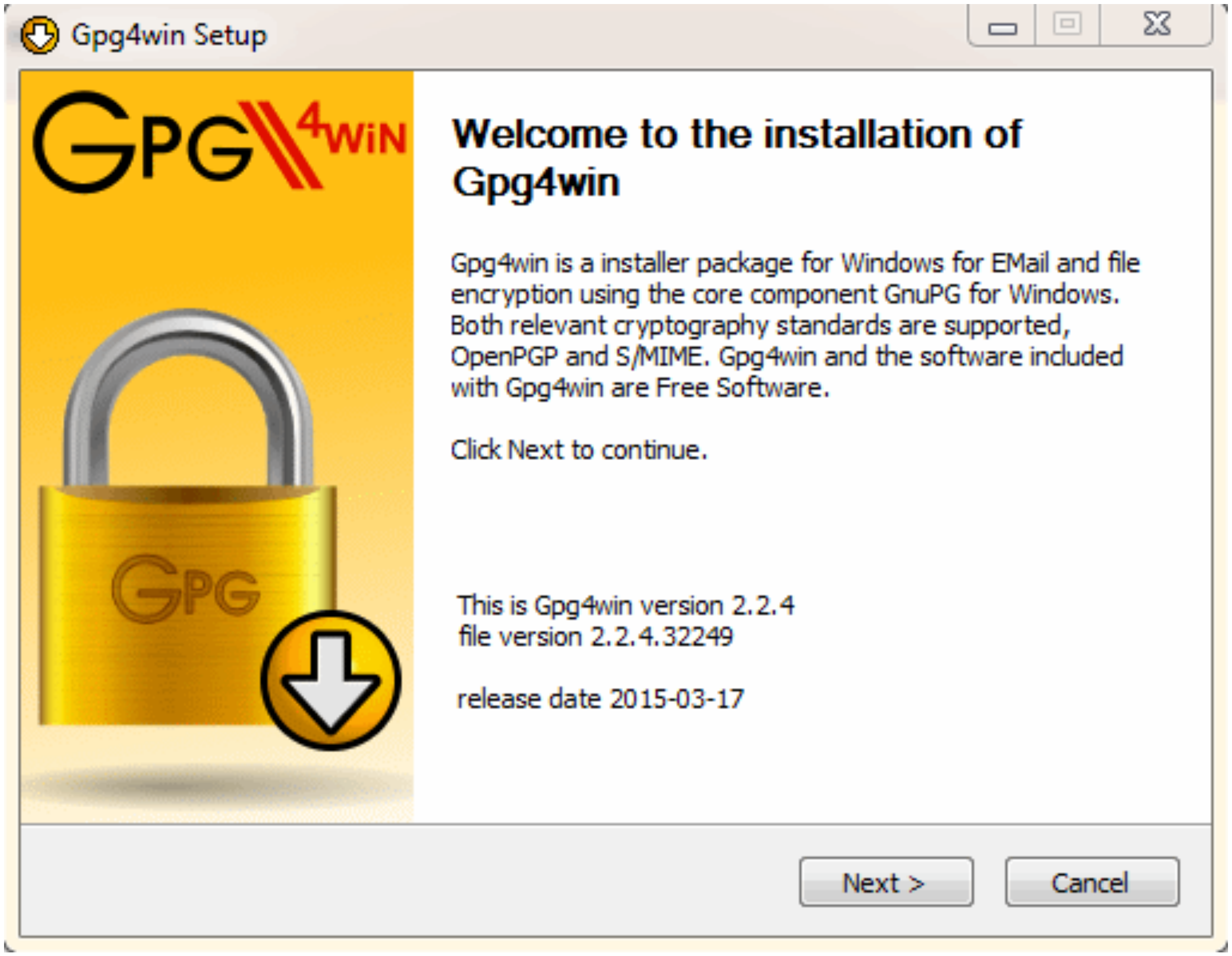
"gpg4win-2.2.4(1).exe" is an executable file. Executable files may contain viruses or other malicious code that could harm your computer. Use caution when opening this file. Are you sure you want to launch "gpg4win-2.2.4(1).exe"?

☐ Don't ask me this again

Note: Depending on the version of Windows you're running, you may need to explicitly allow the installer to modify your computer (please allow this, if asked).

You may also be asked to pick a preferred language.

Opening Screen



Welcome to the installation of Gpg4win

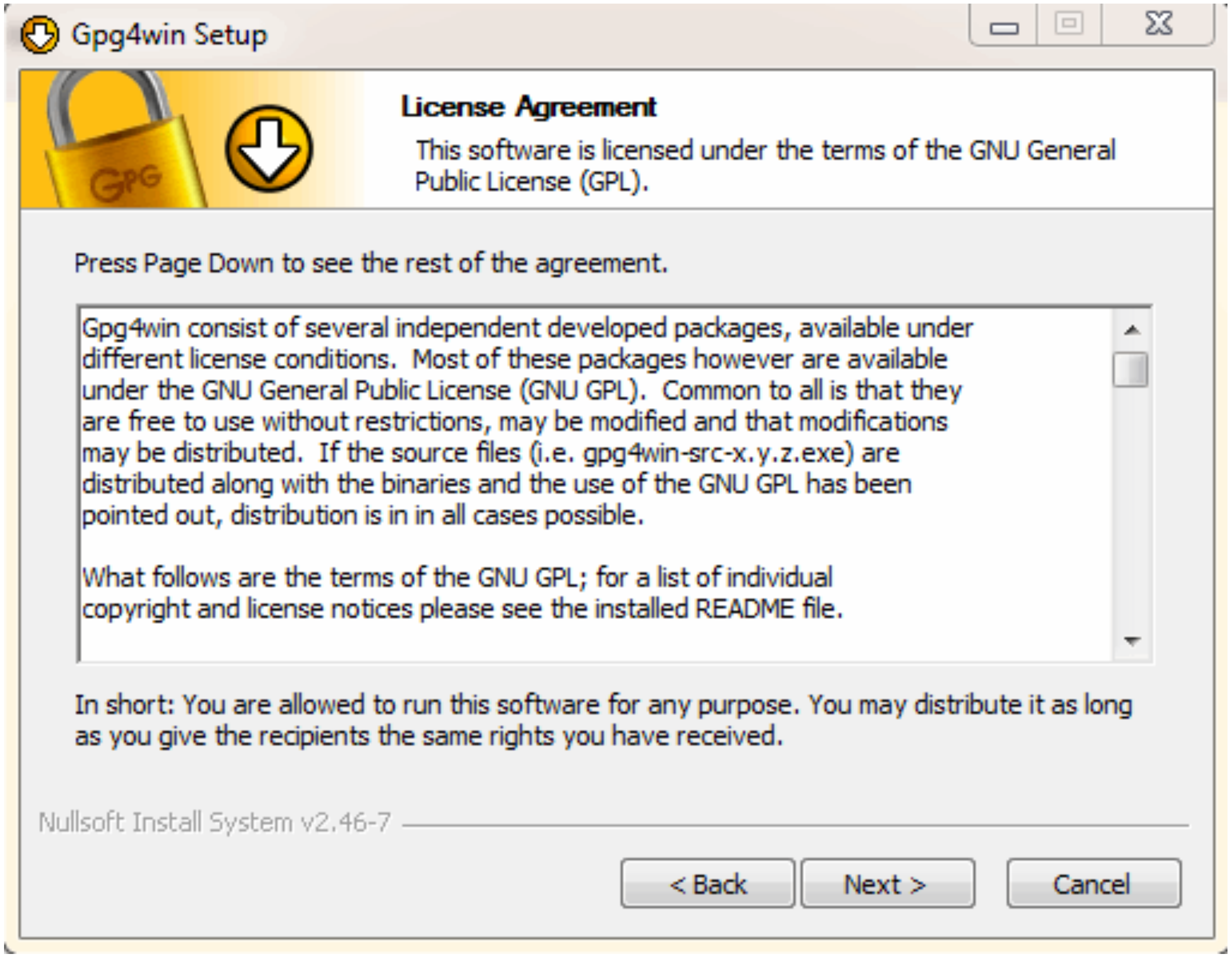
Gpg4win is a installer package for Windows for EMail and file encryption using the core component GnuPG for Windows. Both relevant cryptography standards are supported, OpenPGP and S/MIME. Gpg4win and the software included with Gpg4win are Free Software.

Click Next to continue.

This is Gpg4win version 2.2.4
file version 2.2.4.32249

release date 2015-03-17

Accept The GNU GPL



License Agreement

This software is licensed under the terms of the GNU General Public License (GPL).

Press Page Down to see the rest of the agreement.

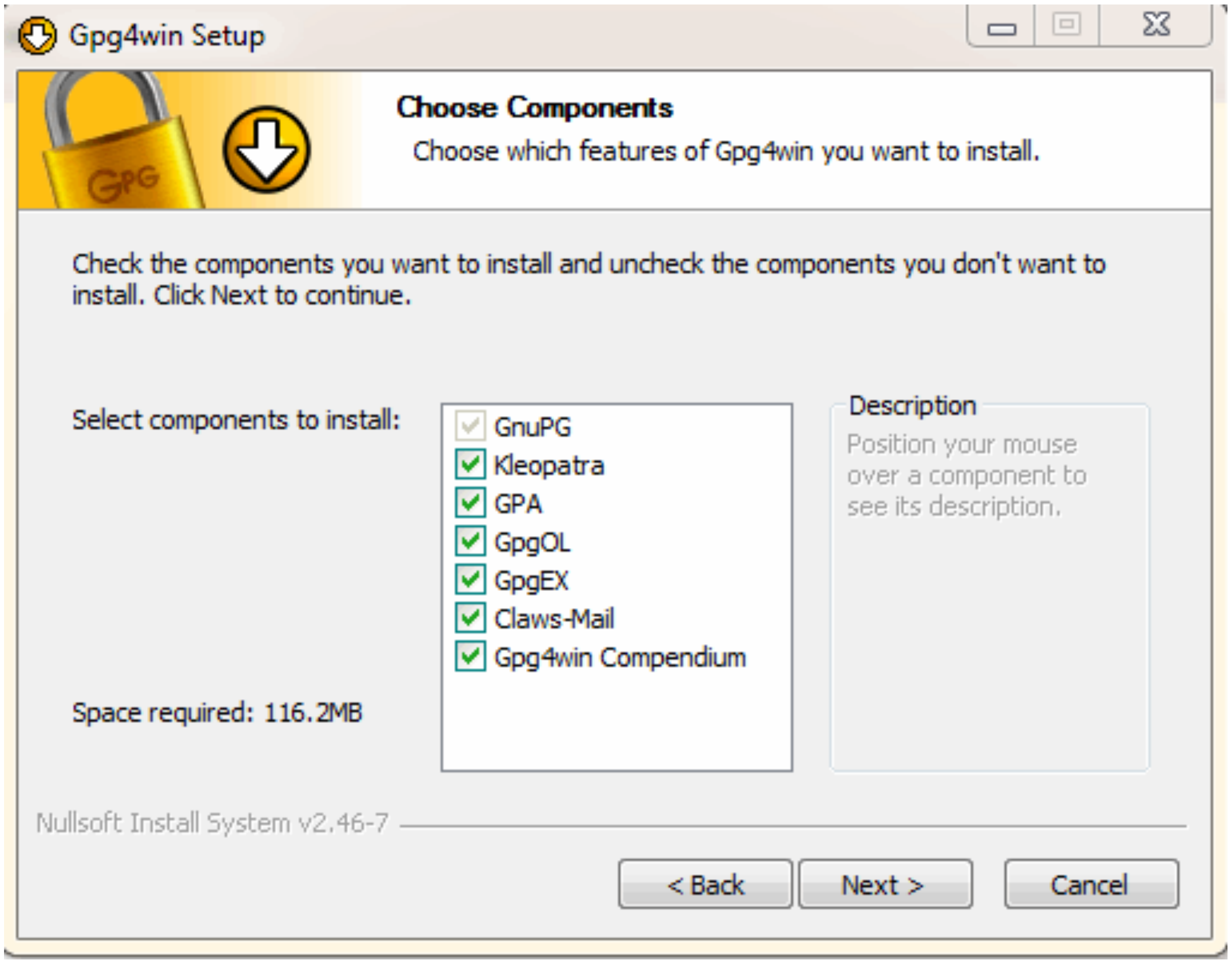
Gpg4win consist of several independent developed packages, available under different license conditions. Most of these packages however are available under the GNU General Public License (GNU GPL). Common to all is that they are free to use without restrictions, may be modified and that modifications may be distributed. If the source files (i.e. gpg4win-src-x.y.z.exe) are distributed along with the binaries and the use of the GNU GPL has been pointed out, distribution is in in all cases possible.

What follows are the terms of the GNU GPL; for a list of individual copyright and license notices please see the installed README file.

In short: You are allowed to run this software for any purpose. You may distribute it as long as you give the recipients the same rights you have received.

Nullsoft Install System v2.46-7

Choose Components To Install (Go Ahead and Choose Everything)



Choose Components

Choose which features of Gpg4win you want to install.

Check the components you want to install and uncheck the components you don't want to install. Click Next to continue.

Select components to install:

- [✓] GnuPG
- [✓] Kleopatra
- [✓] GPA
- [✓] GpgOL
- [✓] GpgEX
- [✓] Claws-Mail
- [✓] Gpg4win Compendium

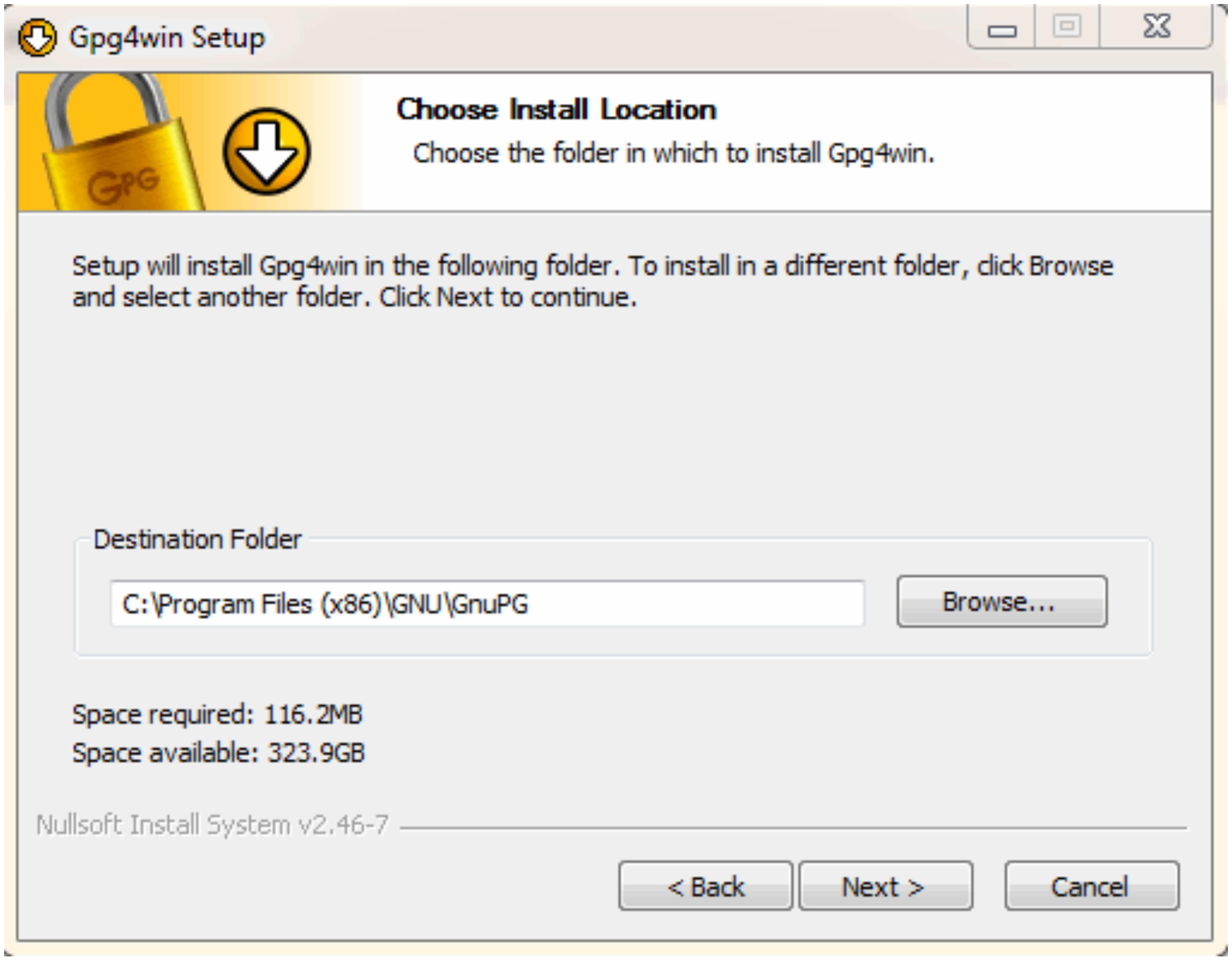
Description

Position your mouse over a component to see its description.

Space required: 116.2MB

Nullsoft Install System v2.46-7

Pick An Install Location
(I Suggest Accepting the Default Location)


Gpg4win Setup

Choose Install Location

Choose the folder in which to install Gpg4win.

Setup will install Gpg4win in the following folder. To install in a different folder, click Browse and select another folder. Click Next to continue.

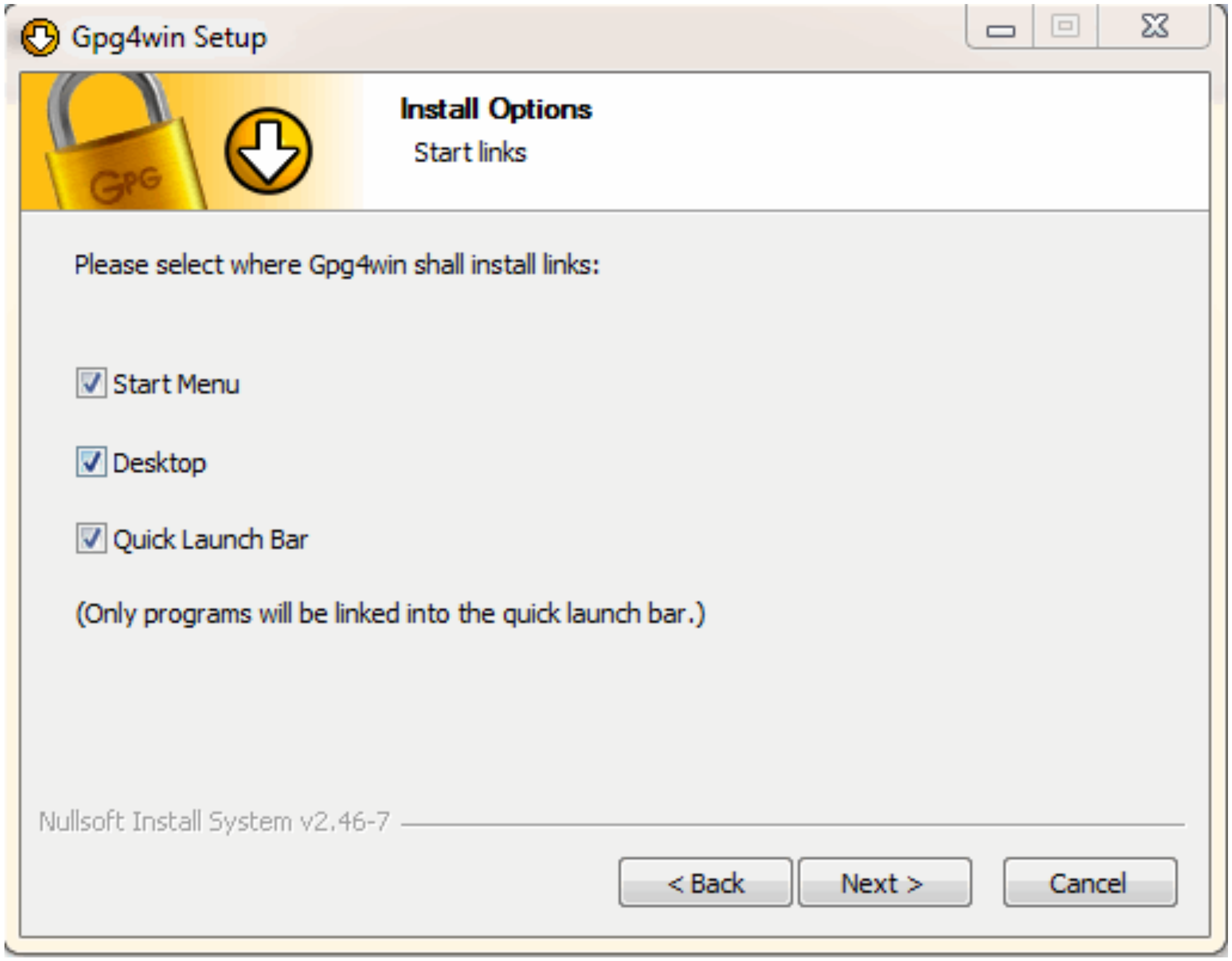
Destination Folder

C:\Program Files (x86)\GNU\GnuPG

Space required: 116.2MB
Space available: 323.9GB

Nullsoft Install System v2.46-7

Stick Start Links "Everywhere"



Install Options

Start links

Please select where Gpg4win shall install links:

[✓] Start Menu

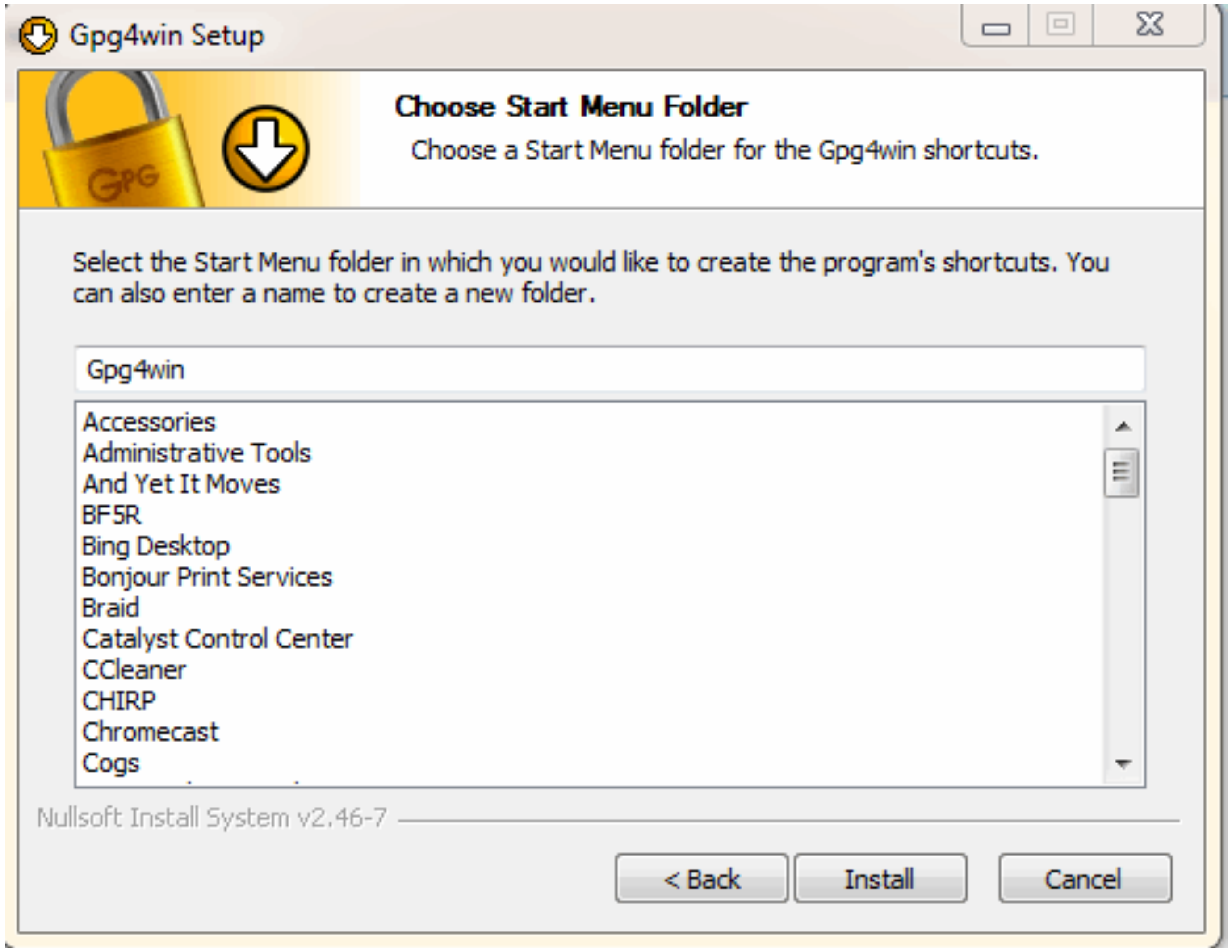
[✓] Desktop

[✓] Quick Launch Bar

(Only programs will be linked into the quick launch bar.)

Nullsoft Install System v2.46-7

Confirm The Default Start Menu Folder Name



Gpg4win Setup

Choose Start Menu Folder

Choose a Start Menu folder for the Gpg4win shortcuts.

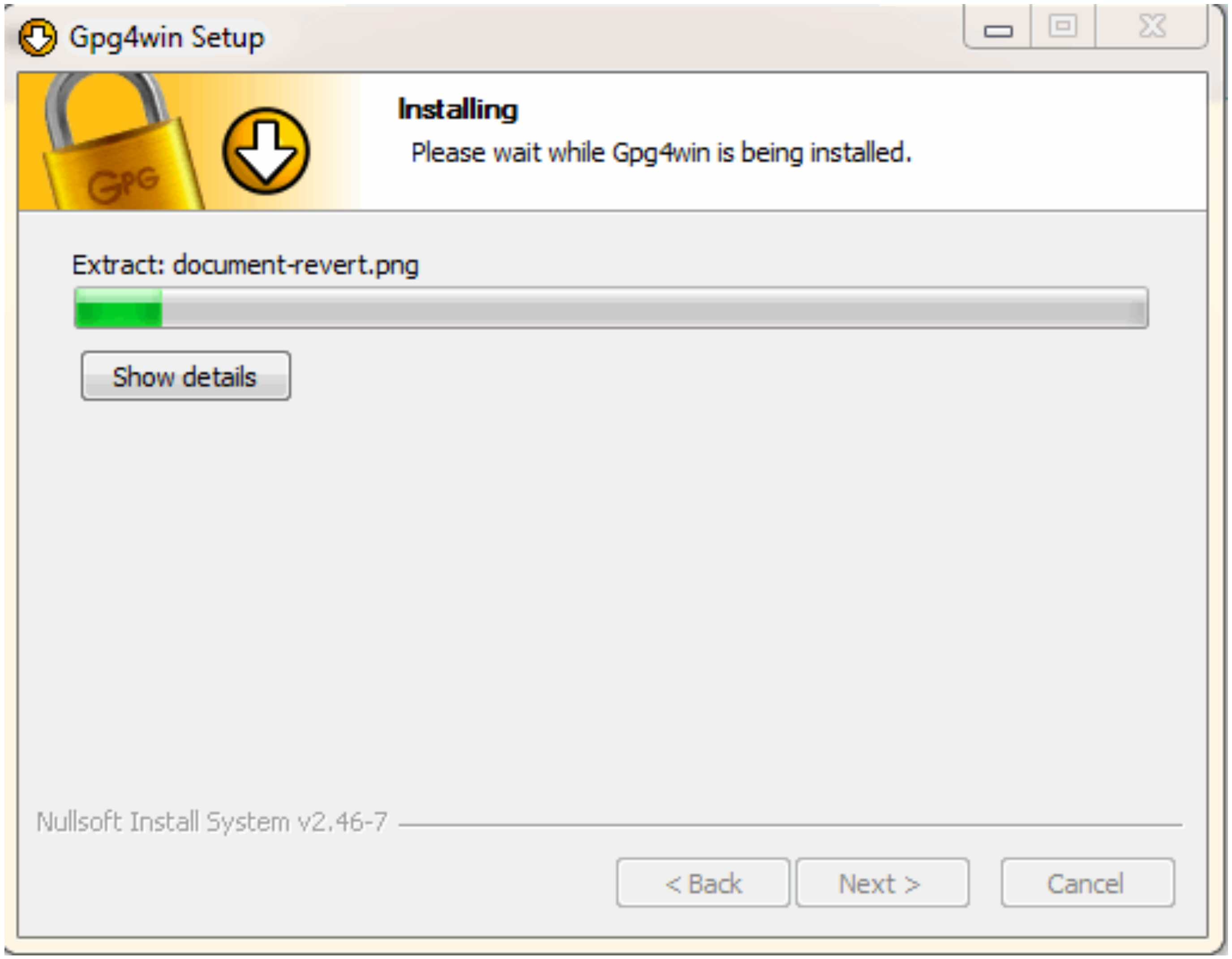
Select the Start Menu folder in which you would like to create the program's shortcuts. You can also enter a name to create a new folder.

Gpg4win

Accessories
Administrative Tools
And Yet It Moves
BF5R
Bing Desktop
Bonjour Print Services
Braid
Catalyst Control Center
CCleaner
CHIRP
Chromecast
Cogs

Nullsoft Install System v2.46-7

Installing...

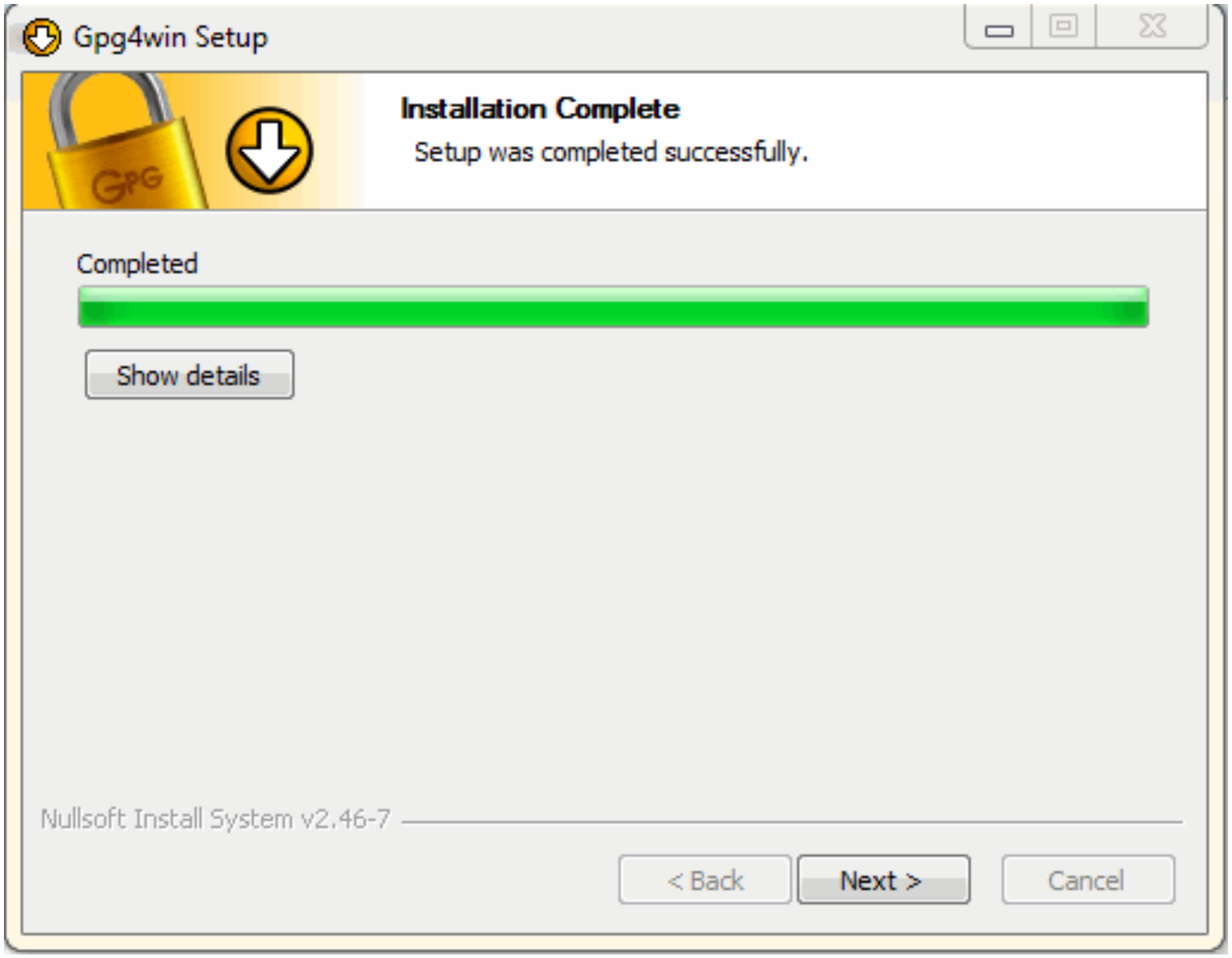

Gpg4win Setup

Installing

Please wait while Gpg4win is being installed.

Extract: document-revert.png

Normal End of Installation



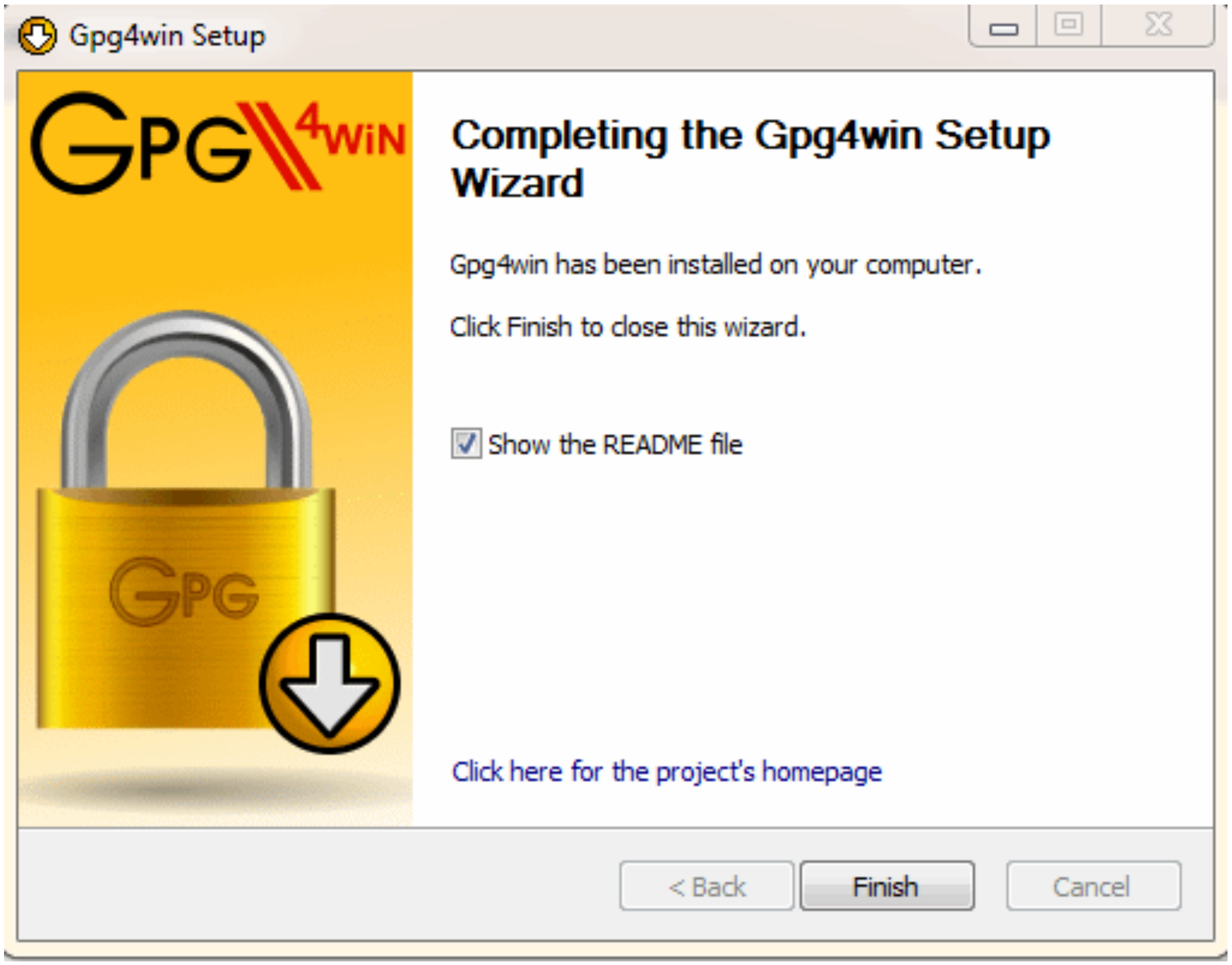
Gpg4win Setup

Installation Complete

Setup was completed successfully.

Completed

Setup Process' Last Step Shows You the README



Completing the Gpg4win Setup Wizard

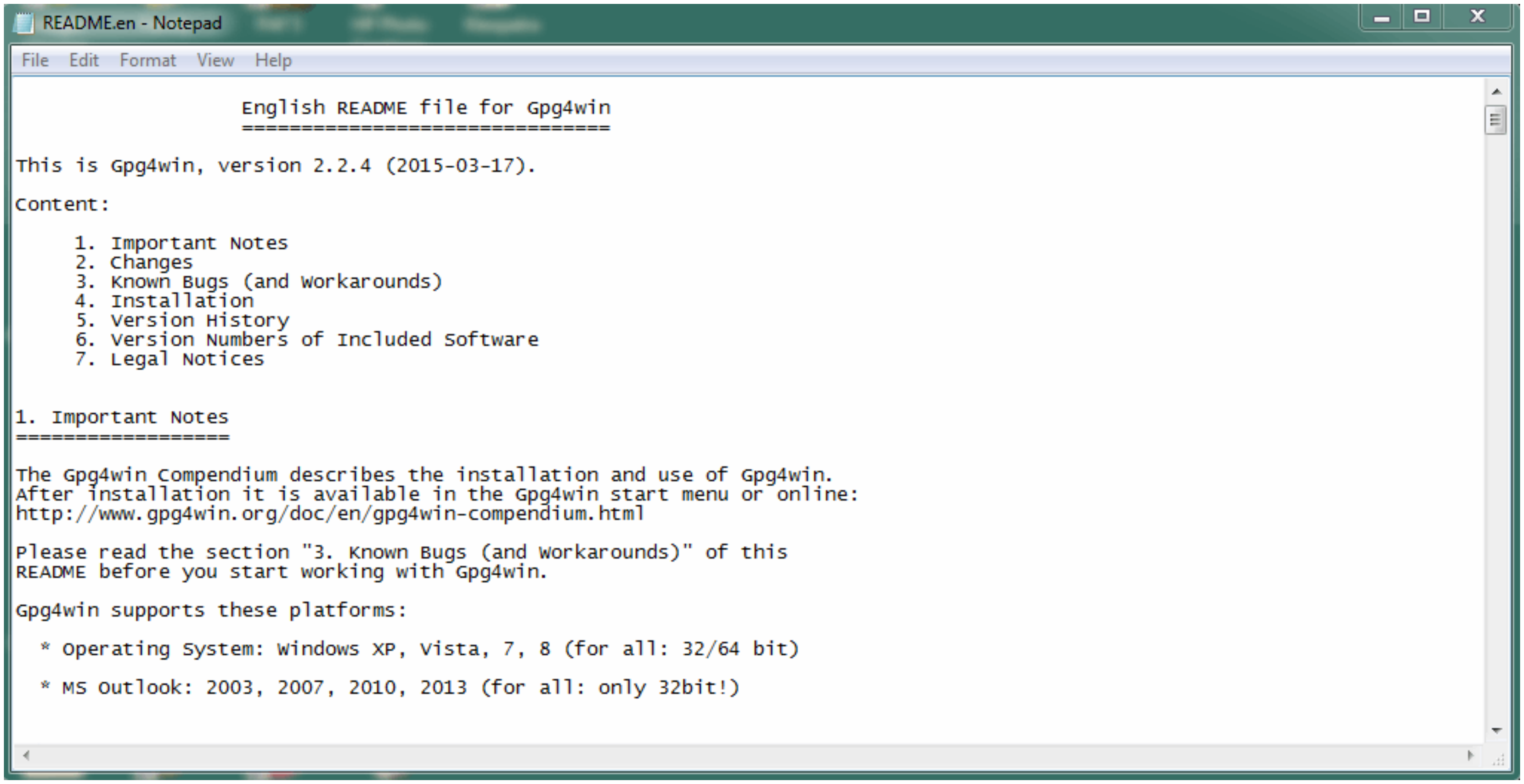
Gpg4win has been installed on your computer.

Click Finish to close this wizard.

[✓] Show the README file

Click here for the project's homepage

The README file



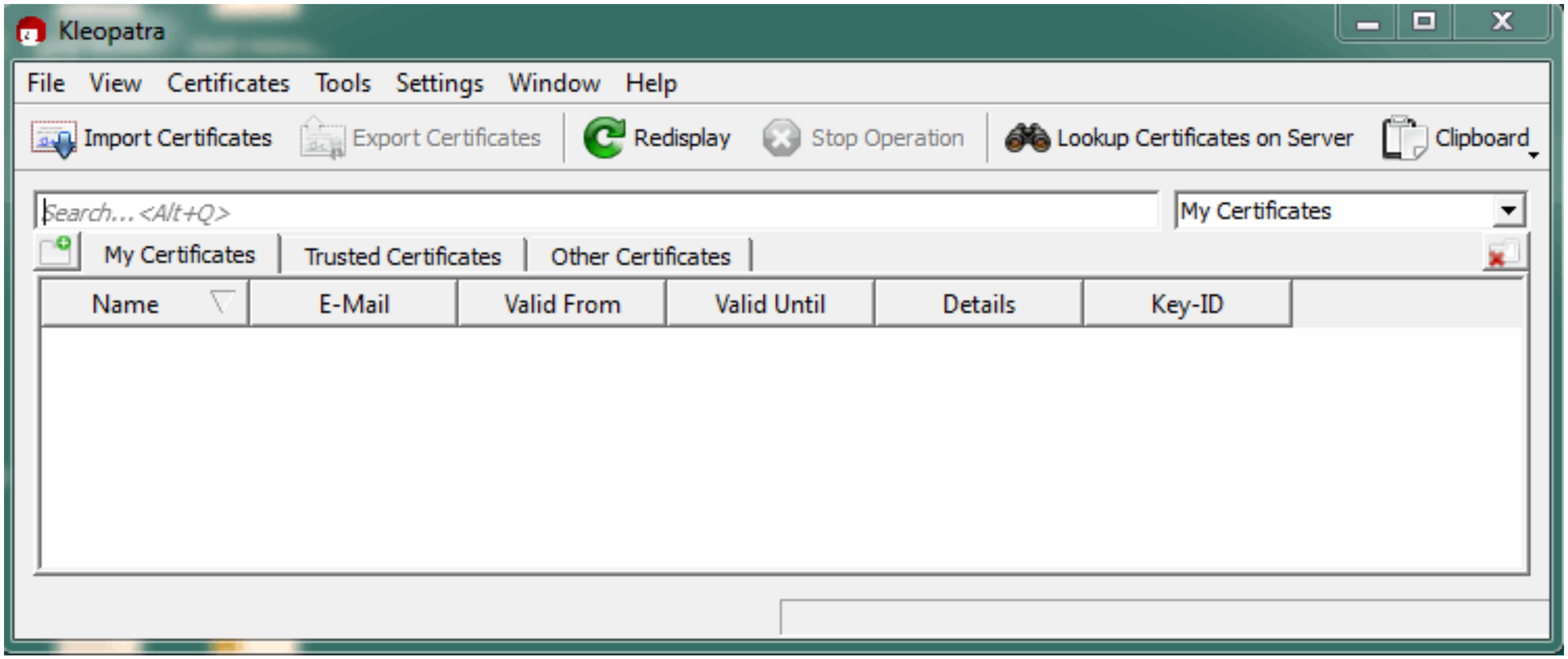
```
                    English README file for Gpg4win
                    ================================

This is Gpg4win, version 2.2.4 (2015-03-17).

Content:

     1. Important Notes
     2. Changes
     3. Known Bugs (and Workarounds)
     4. Installation
     5. Version History
     6. Version Numbers of Included Software
     7. Legal Notices


1. Important Notes
==================

The Gpg4win Compendium describes the installation and use of Gpg4win.
After installation it is available in the Gpg4win start menu or online:
http://www.gpg4win.org/doc/en/gpg4win-compendium.html

Please read the section "3. Known Bugs (and Workarounds)" of this
README before you start working with Gpg4win.

Gpg4win supports these platforms:

  * Operating System: Windows XP, Vista, 7, 8 (for all: 32/64 bit)

  * MS Outlook: 2003, 2007, 2010, 2013 (for all: only 32bit!)
```

Note: The "Gpg4win Compendium" == the Gpg4win user manual

Windows-2:

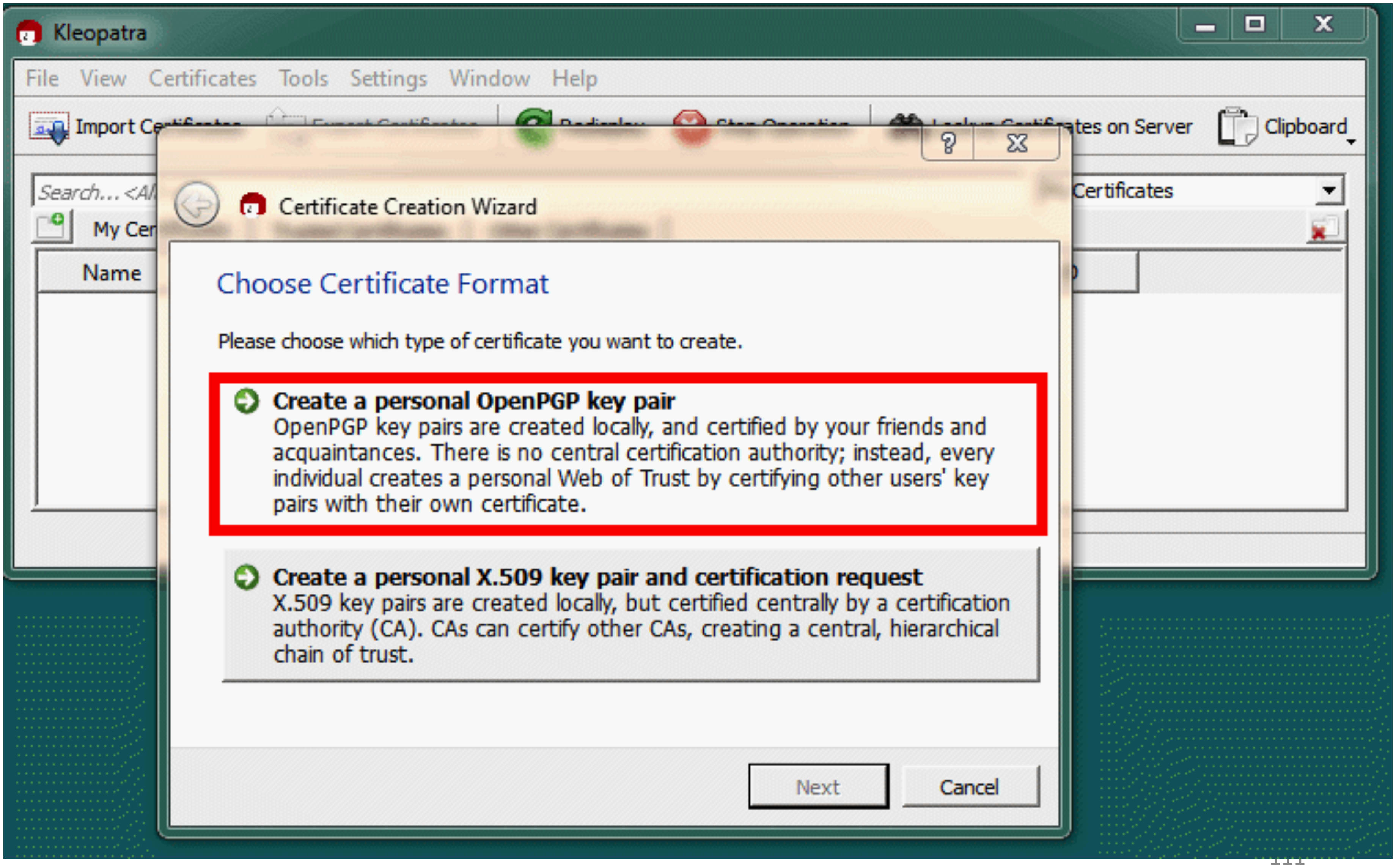
Creating and Managing YOUR OWN Keypair

Start Kleopatra From Your Desktop or From The "All Programs" Menu



Note: You may be prompted to create a key pair the first time you run Kleopatra; if not, simply go to **File → New Certificate**

Choose Your Key's Format: Select OpenPGP


Kleopatra
File View Certificates Tools Settings Window Help
Import Certificates
Lookup Certificates on Server
Clipboard
Search...<All
My Certificates
Name
Certificates
Certificate Creation Wizard
Next
Cancel

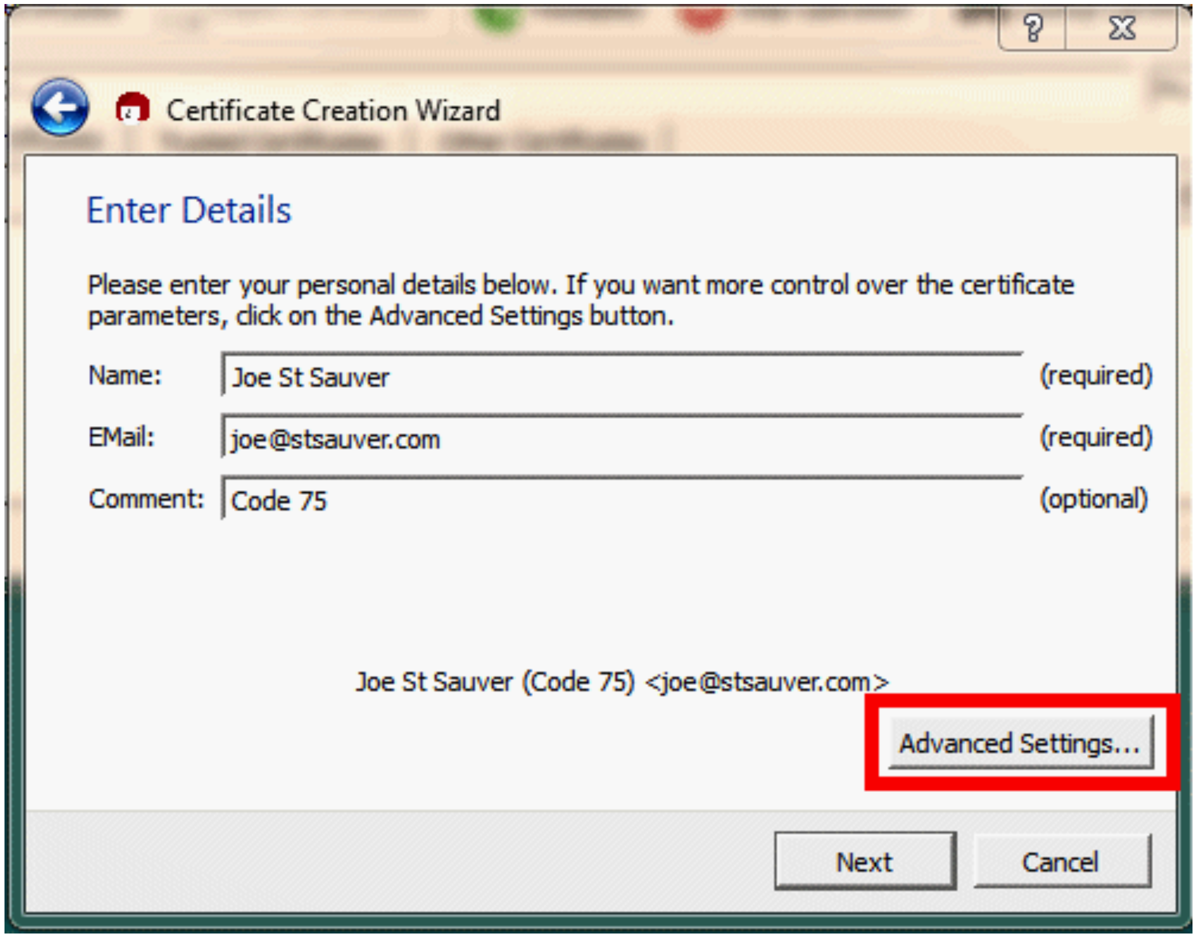
Choose Certificate Format

Please choose which type of certificate you want to create.

Create a personal OpenPGP key pair
OpenPGP key pairs are created locally, and certified by your friends and acquaintances. There is no central certification authority; instead, every individual creates a personal Web of Trust by certifying other users' key pairs with their own certificate.

Create a personal X.509 key pair and certification request
X.509 key pairs are created locally, but certified centrally by a certification authority (CA). CAs can certify other CAs, creating a central, hierarchical chain of trust.

Create Your Keypair



Enter Details

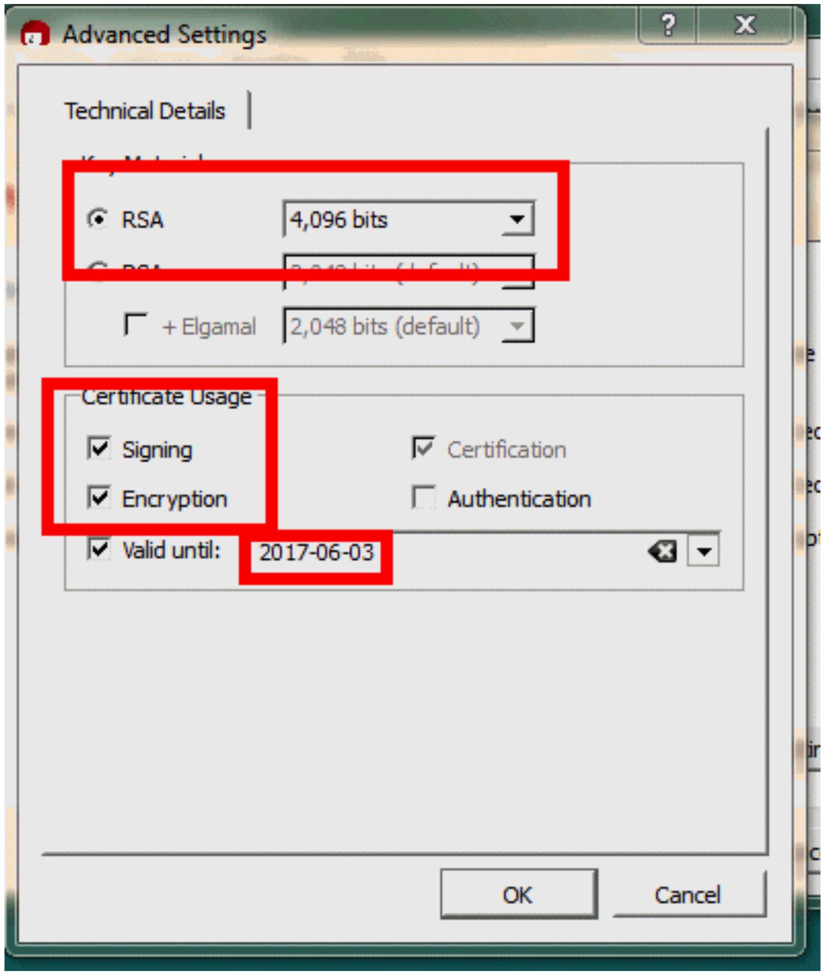
Please enter your personal details below. If you want more control over the certificate parameters, click on the Advanced Settings button.

Name:	Joe St Sauver	(required)
EMail:	joe@stsauver.com	(required)
Comment:	Code 75	(optional)

Joe St Sauver (Code 75) <joe@stsauver.com>

Note: Enter **your own** information; a comment is optional.
Note: Do NOT just click NEXT! Click on Advanced Settings, instead!

Create Your Keypair: Advanced Settings


Advanced Settings

Technical Details

RSA: 4,096 bits

+ Elgamal: 2,048 bits (default)

Certificate Usage

[✓] Signing

[✓] Certification

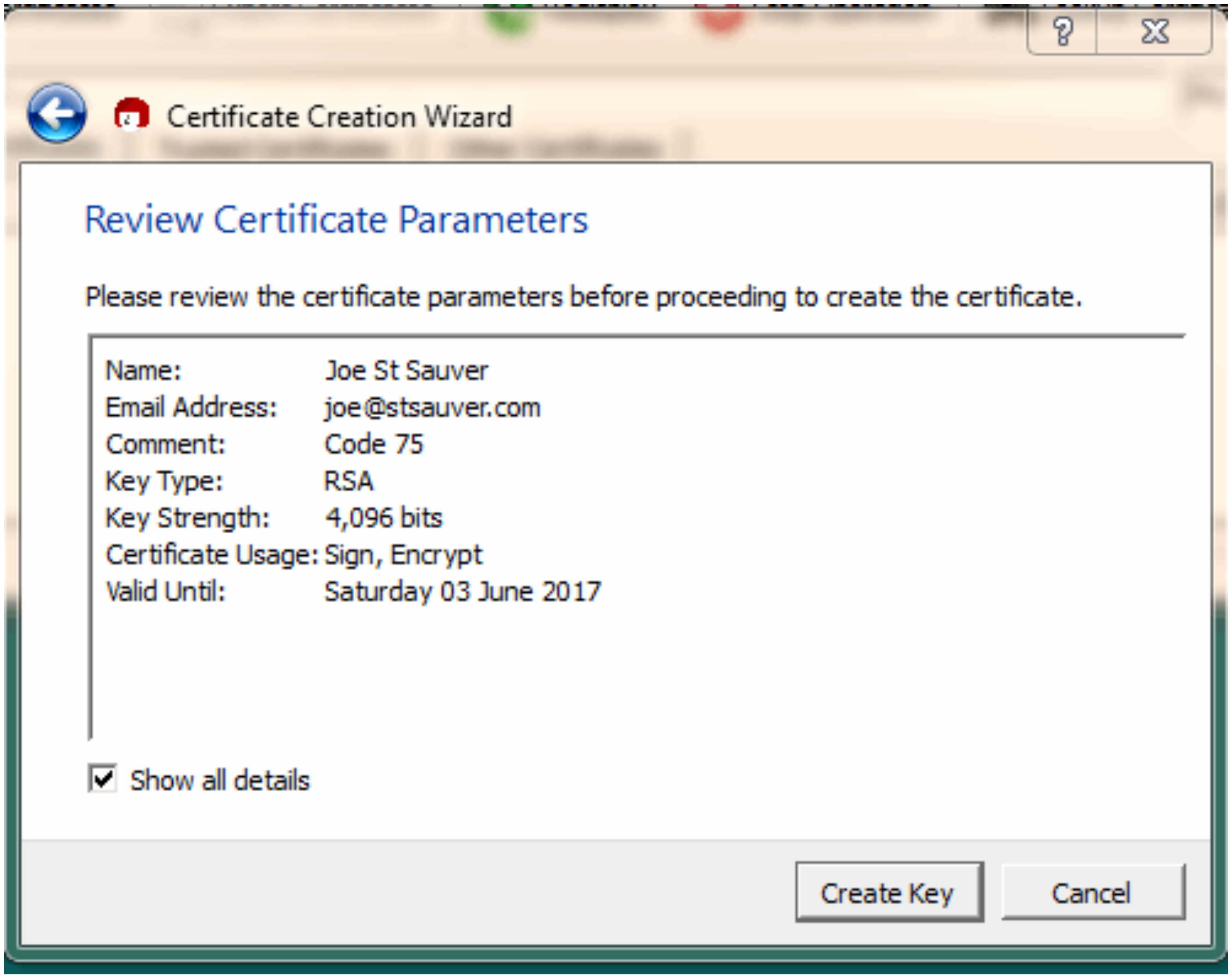
[✓] Encryption

[ ] Authentication

[✓] Valid until: 2017-06-03

Note: Do an RSA 4096 bit key, used for signing and encryption
Note: Pick a reasonable expiration date (1-5 years is usually fine)

Review Certificate Parameters



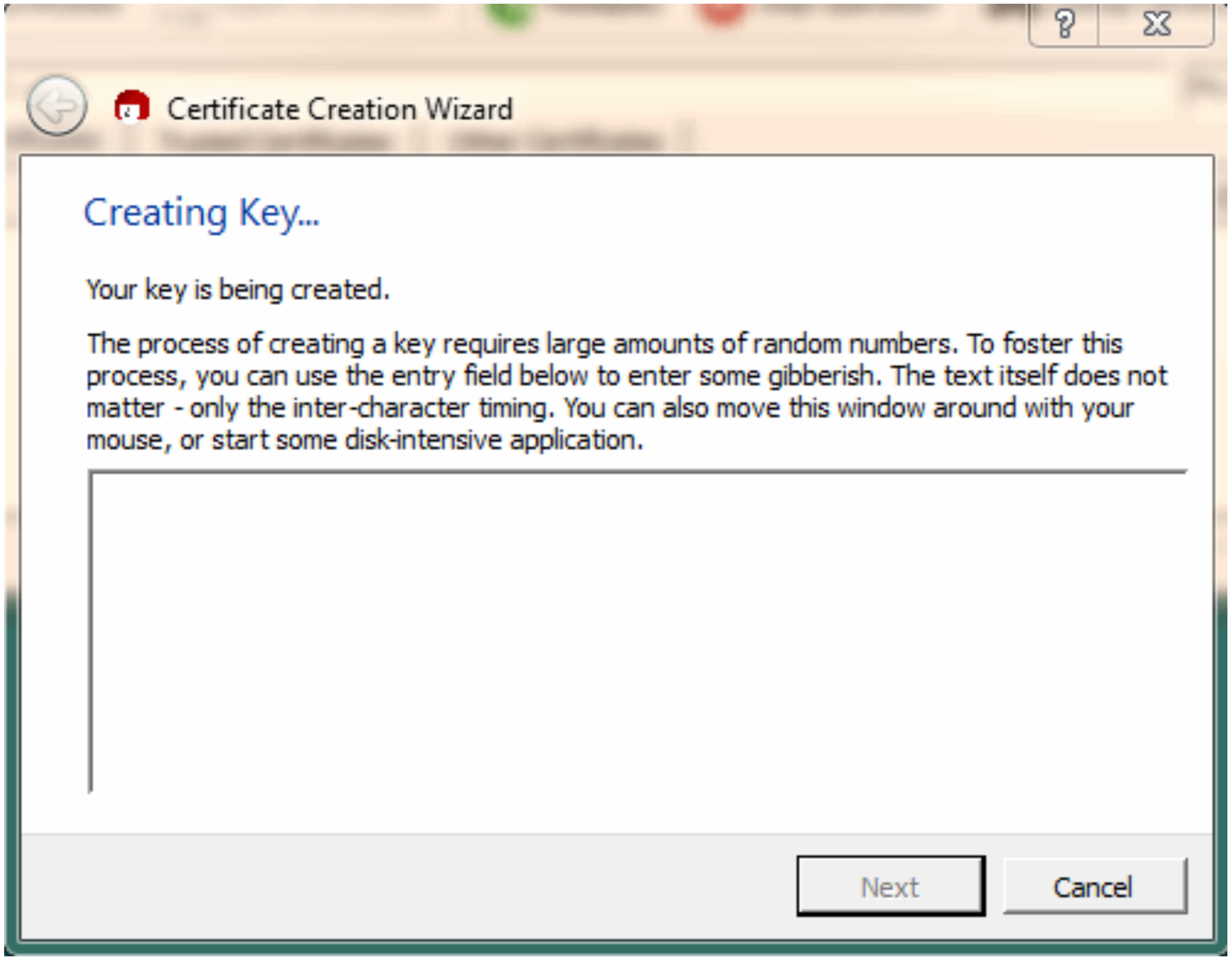
Review Certificate Parameters

Please review the certificate parameters before proceeding to create the certificate.

Name:	Joe St Sauver
Email Address:	joe@stsauver.com
Comment:	Code 75
Key Type:	RSA
Key Strength:	4,096 bits
Certificate Usage:	Sign, Encrypt
Valid Until:	Saturday 03 June 2017

[✓] Show all details

Do Stuff While Your Keys Are Being Created

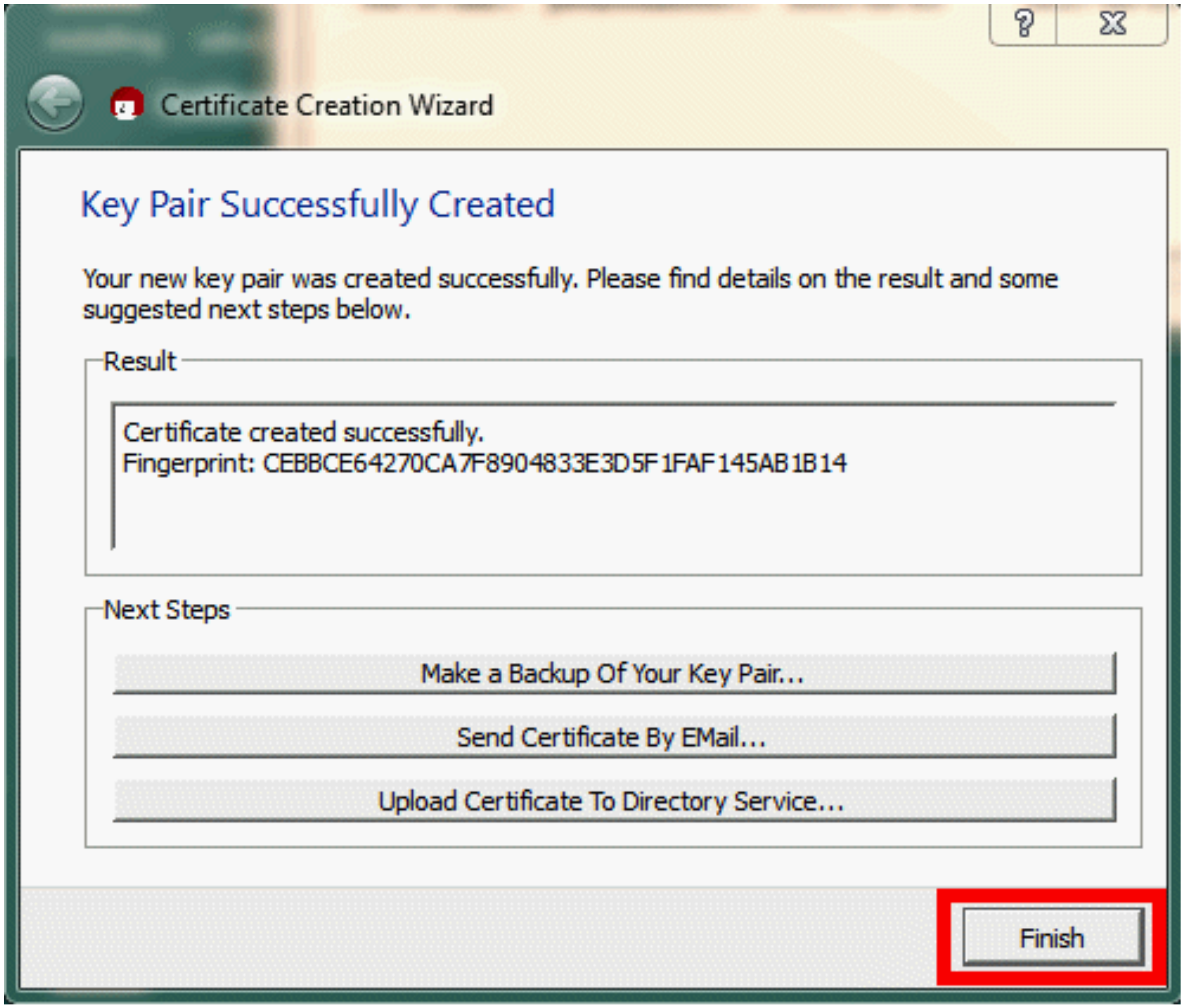

Certificate Creation Wizard

Creating Key...

Your key is being created.

The process of creating a key requires large amounts of random numbers. To foster this process, you can use the entry field below to enter some gibberish. The text itself does not matter - only the inter-character timing. You can also move this window around with your mouse, or start some disk-intensive application.

Key Pair Successfully Created


Certificate Creation Wizard

Key Pair Successfully Created

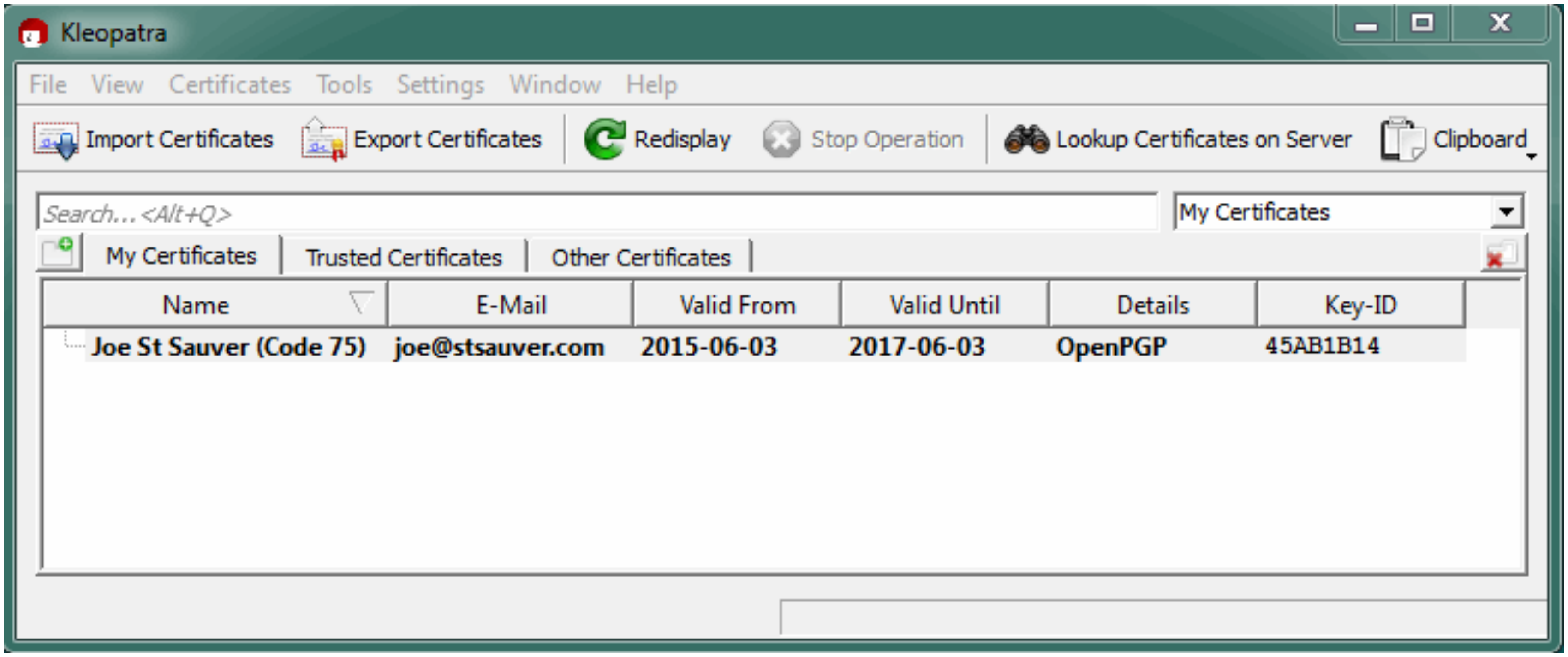
Your new key pair was created successfully. Please find details on the result and some suggested next steps below.

Result

```
Certificate created successfully.
Fingerprint: CEBBCE64270CA7F8904833E3D5F1FAF145AB1B14
```

Next Steps
Make a Backup Of Your Key Pair...
Send Certificate By EMail...
Upload Certificate To Directory Service...
Finish

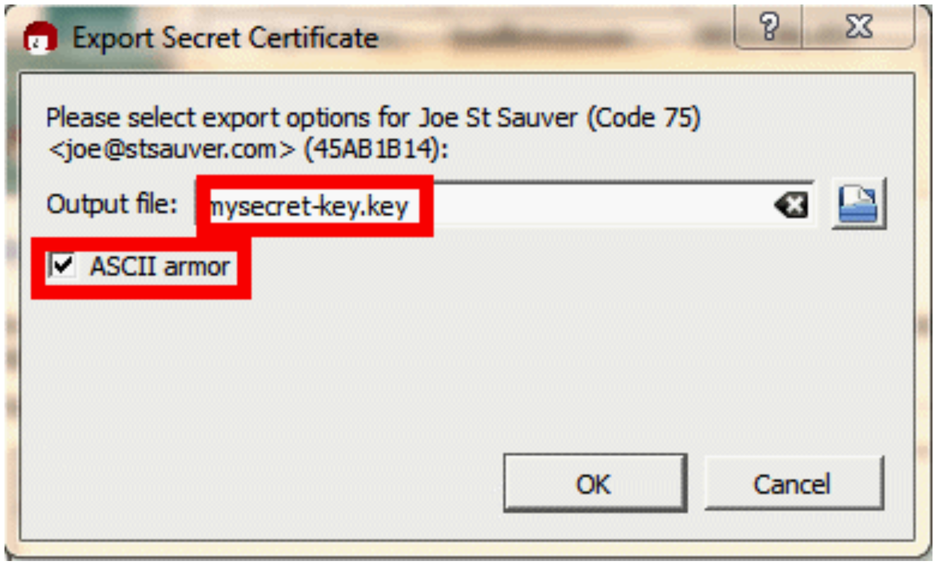
My New Key in the Kleopatra Certificate Display



Name	E-Mail	Valid From	Valid Until	Details	Key-ID
Joe St Sauver (Code 75)	joe@stsauver.com	2015-06-03	2017-06-03	OpenPGP	45AB1B14

Export Your SECRET Key For Backup Purposes

Select your new keypair in the Kleopatra Certificate Display Window, then go to File → Export Secret Key



Export Secret Certificate

Please select export options for Joe St Sauver (Code 75) <joe@stsauver.com> (45AB1B14):

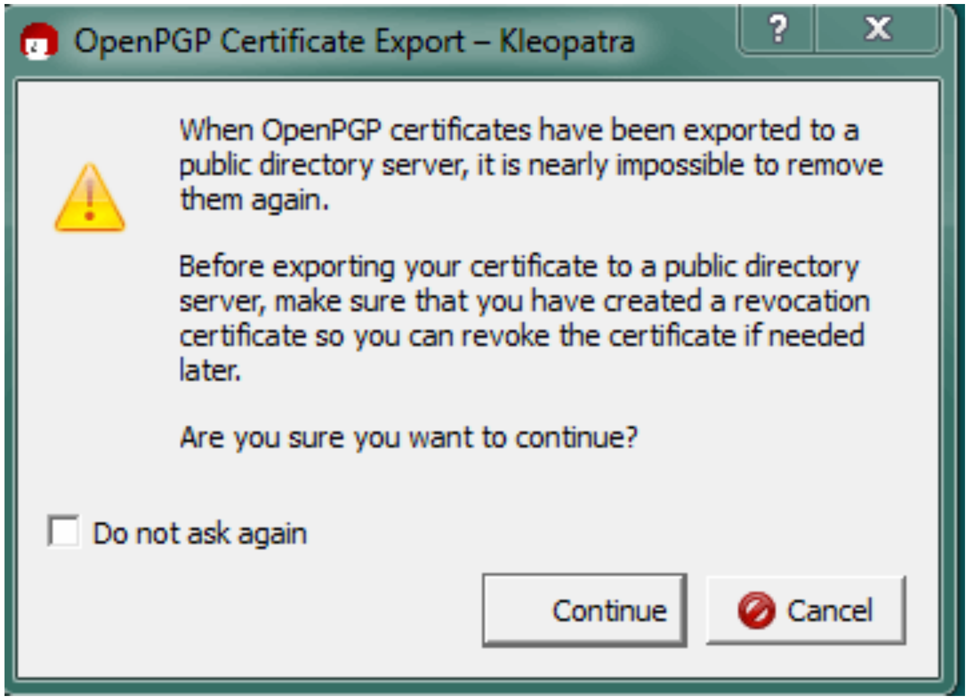
Output file: nysecret-key.key

☑ ASCII armor

Provide a file name, and confirm the directory where you'll be saving this file. Also be sure to check the "ASCII armor" box. Save this file somewhere safe, such as on a thumb drive in your safe deposit box. Safely save your passphrase somewhere else.

Now Push Your PUBLIC Key To the Keyservers

Select your new keypair in the Kleopatra Window, then go to File → Export Certificates to Server


OpenPGP Certificate Export – Kleopatra

When OpenPGP certificates have been exported to a public directory server, it is nearly impossible to remove them again.

Before exporting your certificate to a public directory server, make sure that you have created a revocation certificate so you can revoke the certificate if needed later.

Are you sure you want to continue?

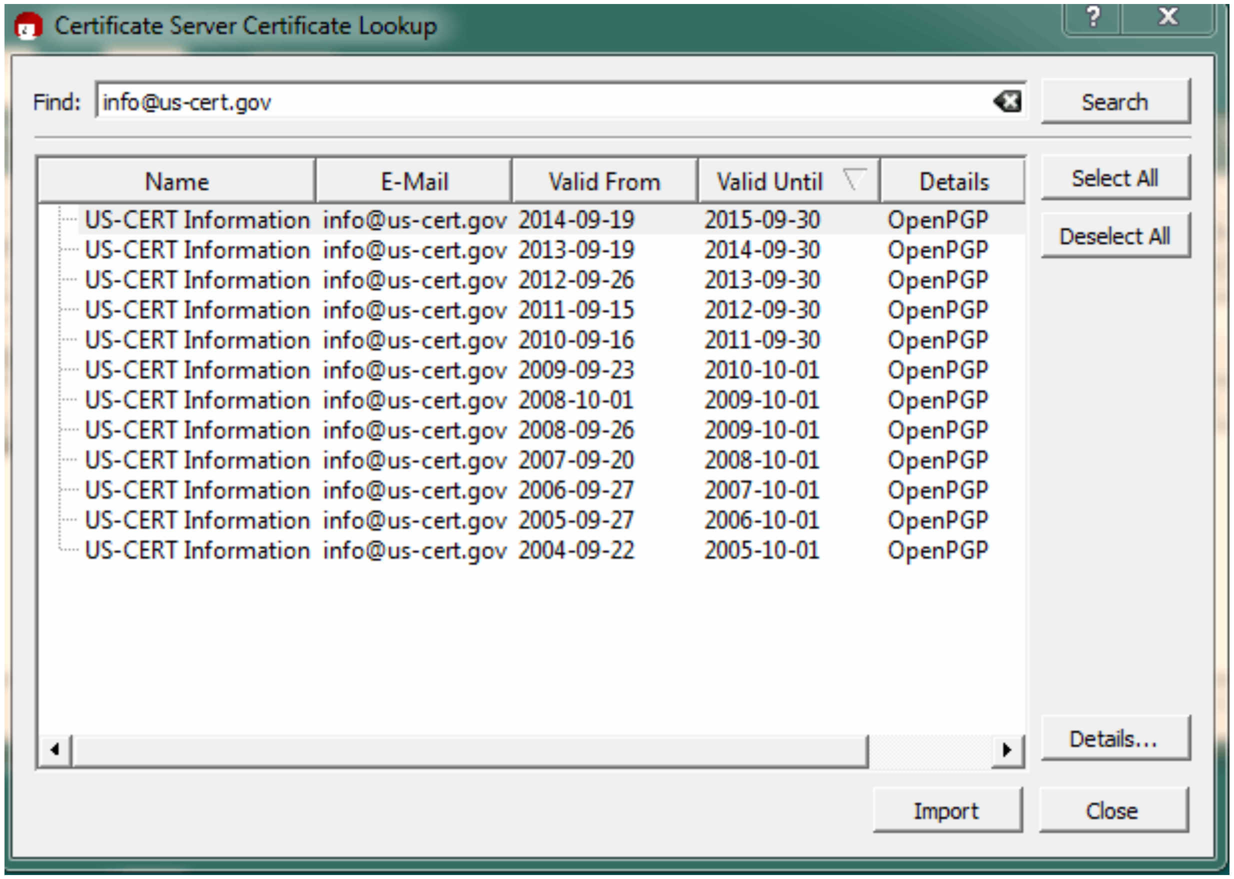
Note: You may also want to export a copy of your certificate (File → Export Certificate) for mailing directly to those who prefer not to use keyservers.

Windows-3:

Getting and Managing Other People's Public Keys

Look Up A Cert on the Public Keyservers

For example, let's find the one for info@us-cert.gov...

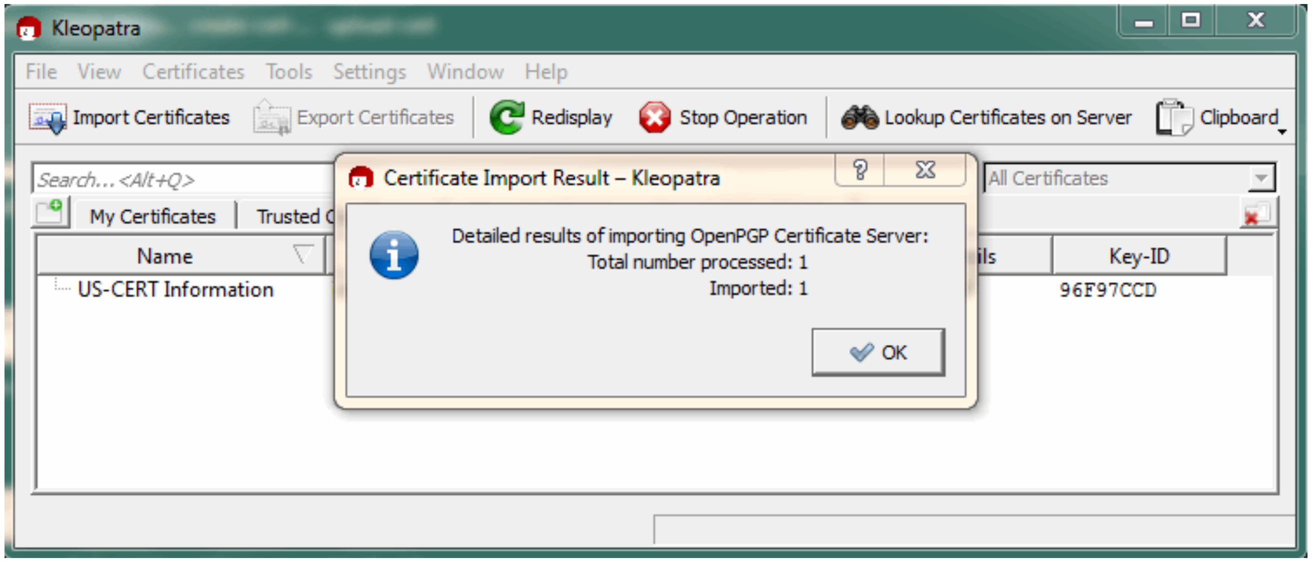


Find: info@us-cert.gov

Name	E-Mail	Valid From	Valid Until	Details
US-CERT Information	info@us-cert.gov	2014-09-19	2015-09-30	OpenPGP
US-CERT Information	info@us-cert.gov	2013-09-19	2014-09-30	OpenPGP
US-CERT Information	info@us-cert.gov	2012-09-26	2013-09-30	OpenPGP
US-CERT Information	info@us-cert.gov	2011-09-15	2012-09-30	OpenPGP
US-CERT Information	info@us-cert.gov	2010-09-16	2011-09-30	OpenPGP
US-CERT Information	info@us-cert.gov	2009-09-23	2010-10-01	OpenPGP
US-CERT Information	info@us-cert.gov	2008-10-01	2009-10-01	OpenPGP
US-CERT Information	info@us-cert.gov	2008-09-26	2009-10-01	OpenPGP
US-CERT Information	info@us-cert.gov	2007-09-20	2008-10-01	OpenPGP
US-CERT Information	info@us-cert.gov	2006-09-27	2007-10-01	OpenPGP
US-CERT Information	info@us-cert.gov	2005-09-27	2006-10-01	OpenPGP
US-CERT Information	info@us-cert.gov	2004-09-22	2005-10-01	OpenPGP

Suggestion: select the one that's currently valid! ☺

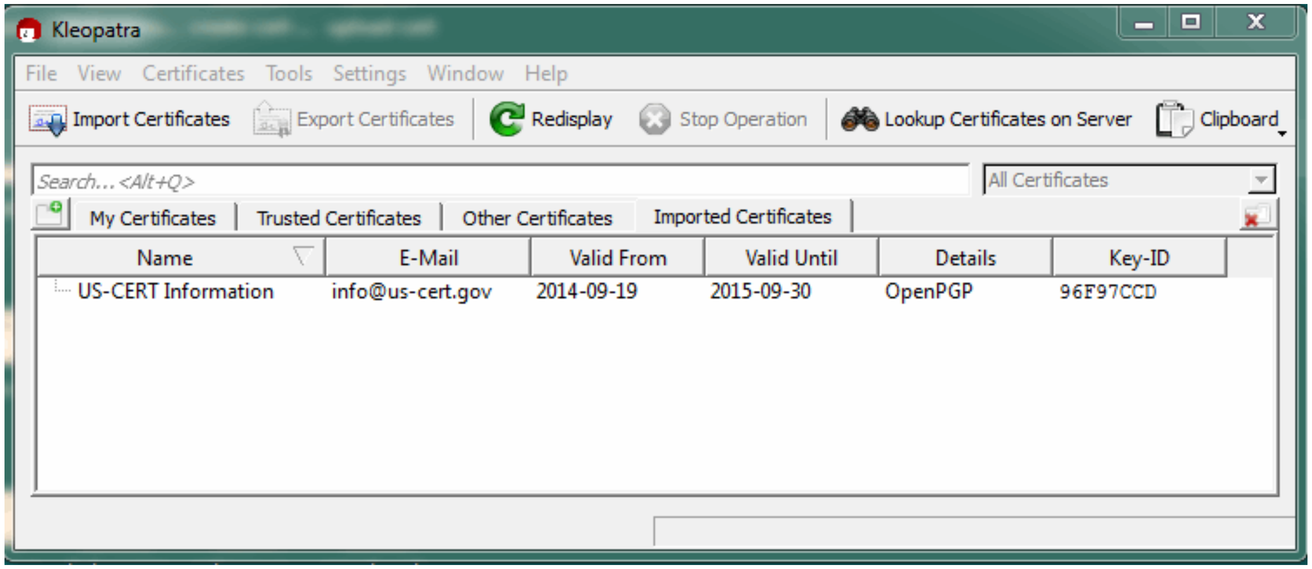
After Importing, You'll See...



Certificate Import Result – Kleopatra

Detailed results of importing OpenPGP Certificate Server:
Total number processed: 1
Imported: 1

Name	Key-ID
US-CERT Information	96F97CCD

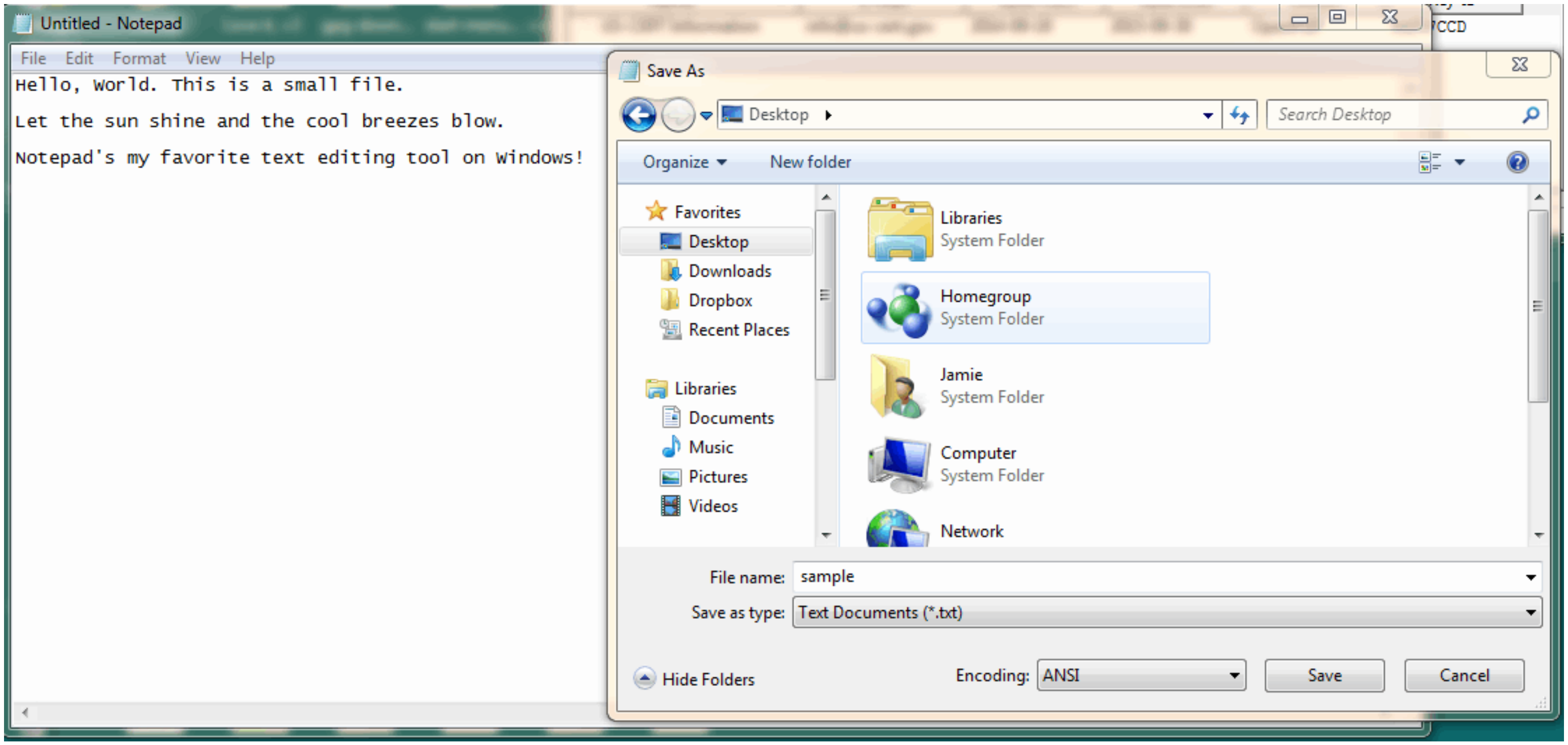


Name	E-Mail	Valid From	Valid Until	Details	Key-ID
US-CERT Information	info@us-cert.gov	2014-09-19	2015-09-30	OpenPGP	96F97CCD

Windows-4:

Signing A Message You've Made

Create a Small Sample Message Using Notepad And Save It On Your Desktop (sample.txt) in ANSI Format



```
Hello, world. This is a small file.

Let the sun shine and the cool breezes blow.

Notepad's my favorite text editing tool on Windows!
```

File name: sample

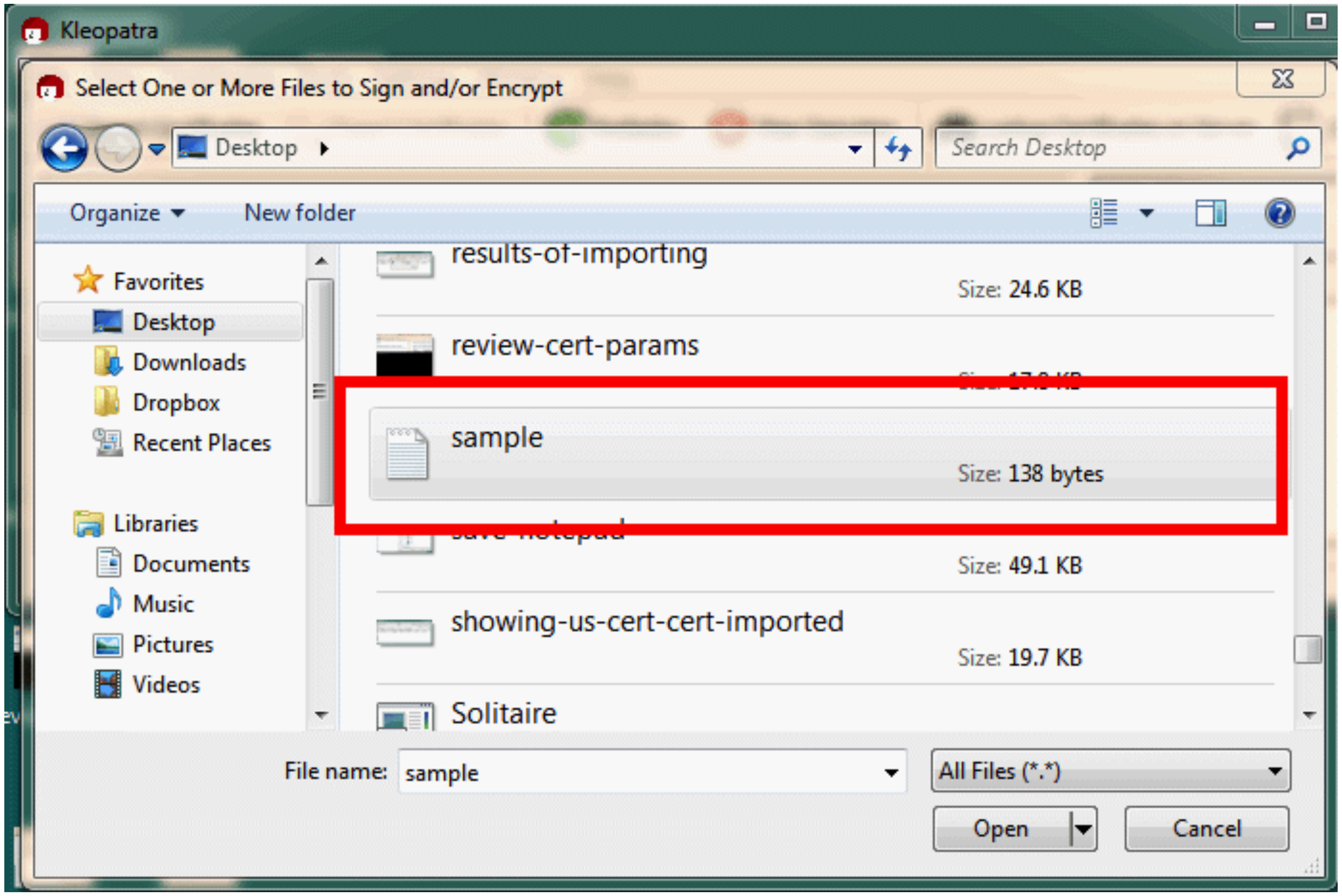
Save as type: Text Documents (*.txt)

Encoding: ANSI

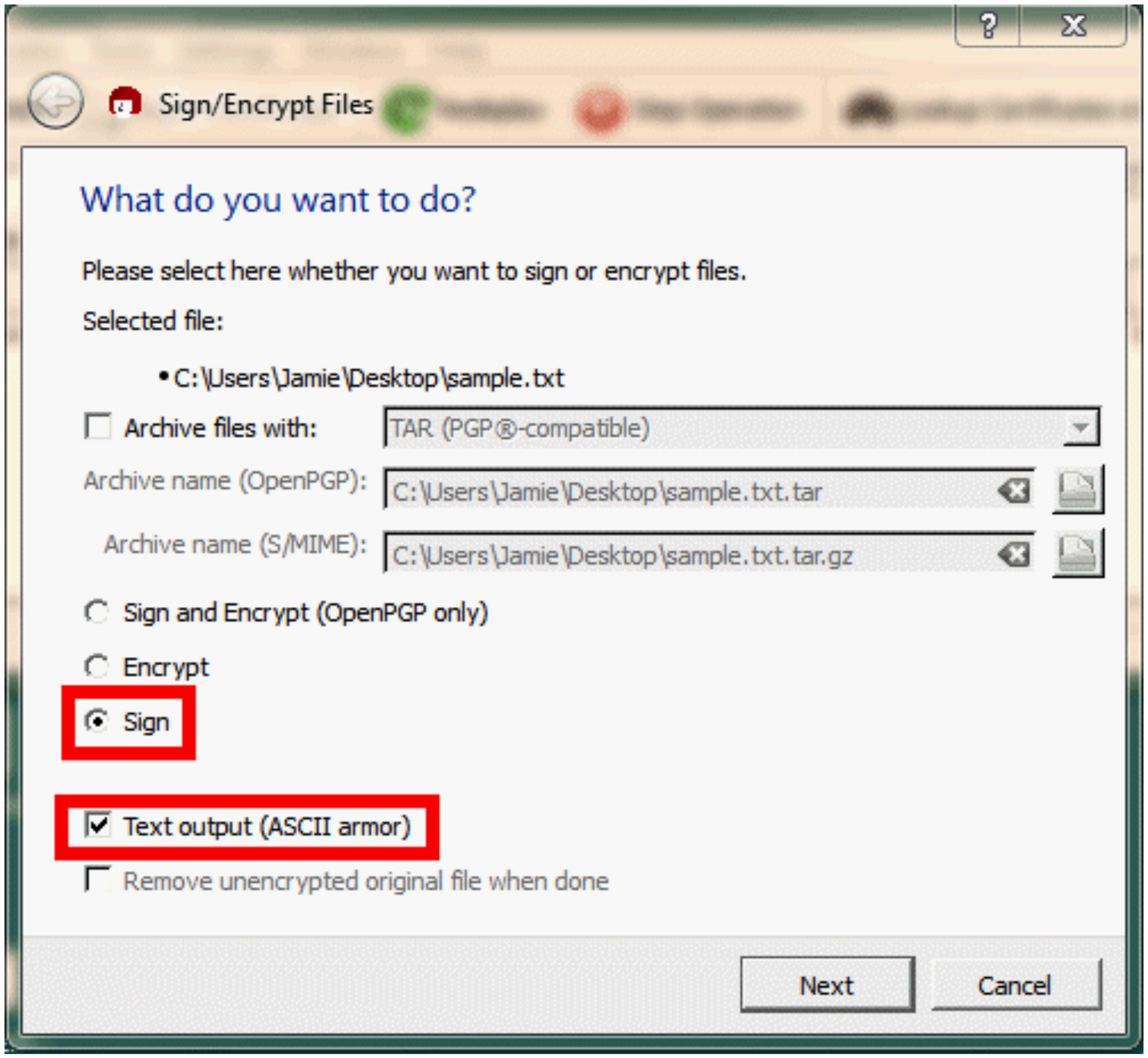
Note: If you don't normally use Notepad, you can find it under All Programs → Accessories folder → Notepad

Select That File For Signing

Go to File → Sign/Encrypt Files..., then select the sample.txt file from the Desktop (the .txt extension may not show by default



Sign The File



Sign/Encrypt Files

What do you want to do?

Please select here whether you want to sign or encrypt files.

Selected file:

- C:\Users\Jamie\Desktop\sample.txt

☐ Archive files with: TAR (PGP®-compatible)

Archive name (OpenPGP): C:\Users\Jamie\Desktop\sample.txt.tar

Archive name (S/MIME): C:\Users\Jamie\Desktop\sample.txt.tar.gz

○ Sign and Encrypt (OpenPGP only)

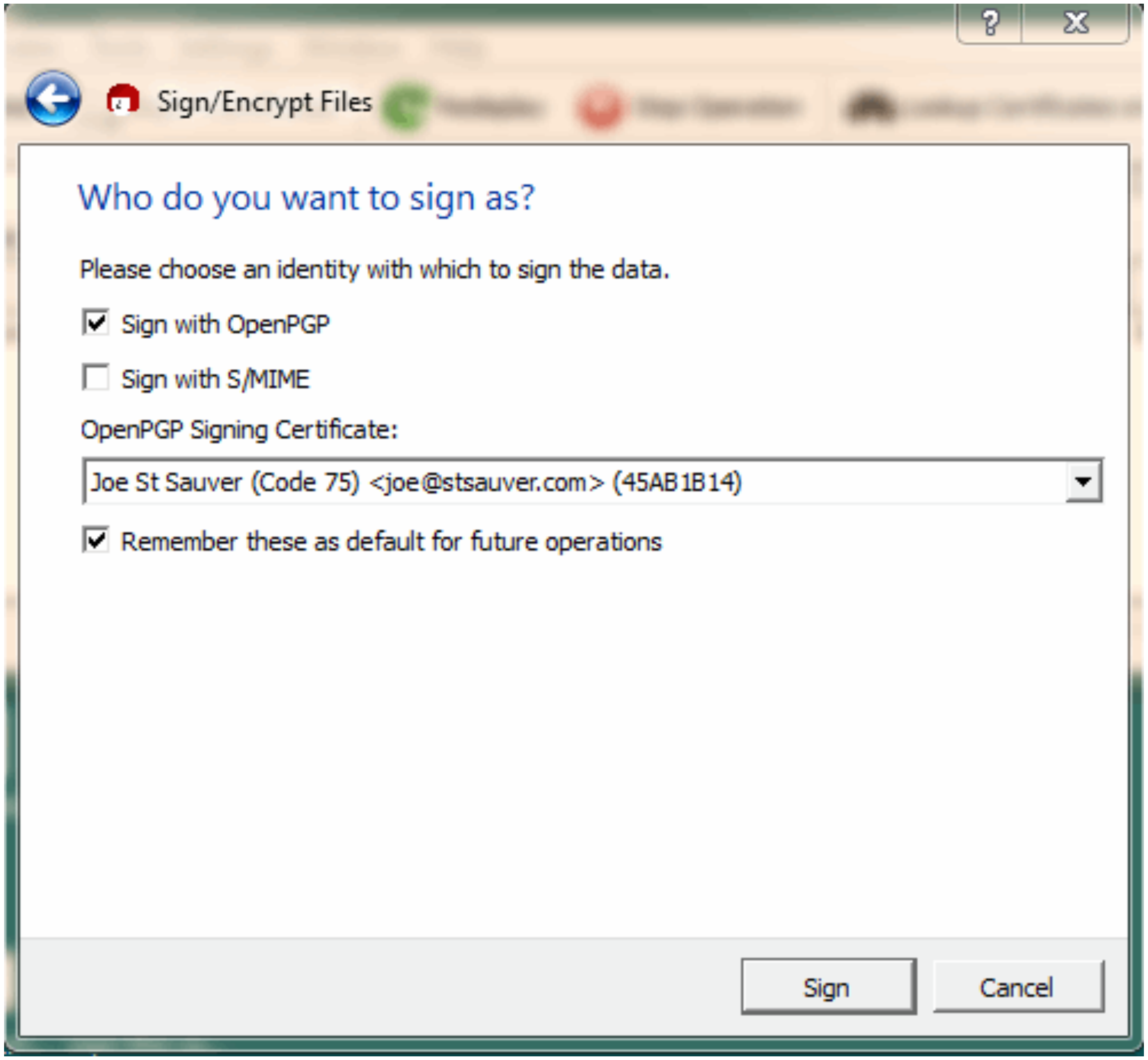
○ Encrypt

● Sign

☑ Text output (ASCII armor)

☐ Remove unencrypted original file when done

Pick HOW You'll Sign



Who do you want to sign as?

Please choose an identity with which to sign the data.

[✓] Sign with OpenPGP

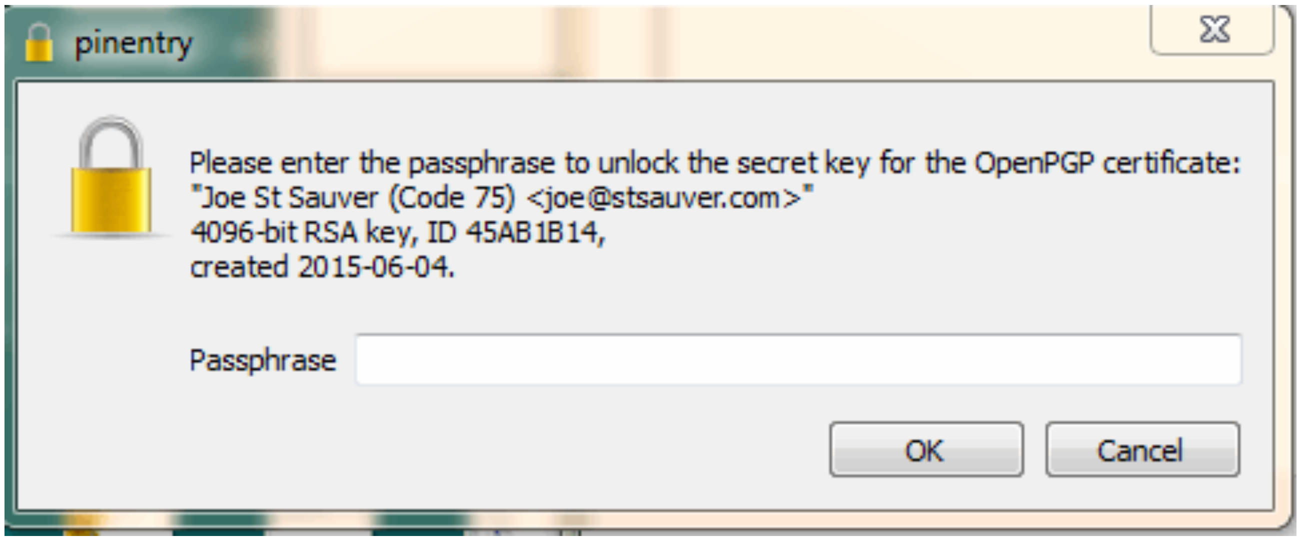
[ ] Sign with S/MIME

OpenPGP Signing Certificate:

Joe St Sauver (Code 75) <joe@stsauver.com> (45AB1B14)

[✓] Remember these as default for future operations

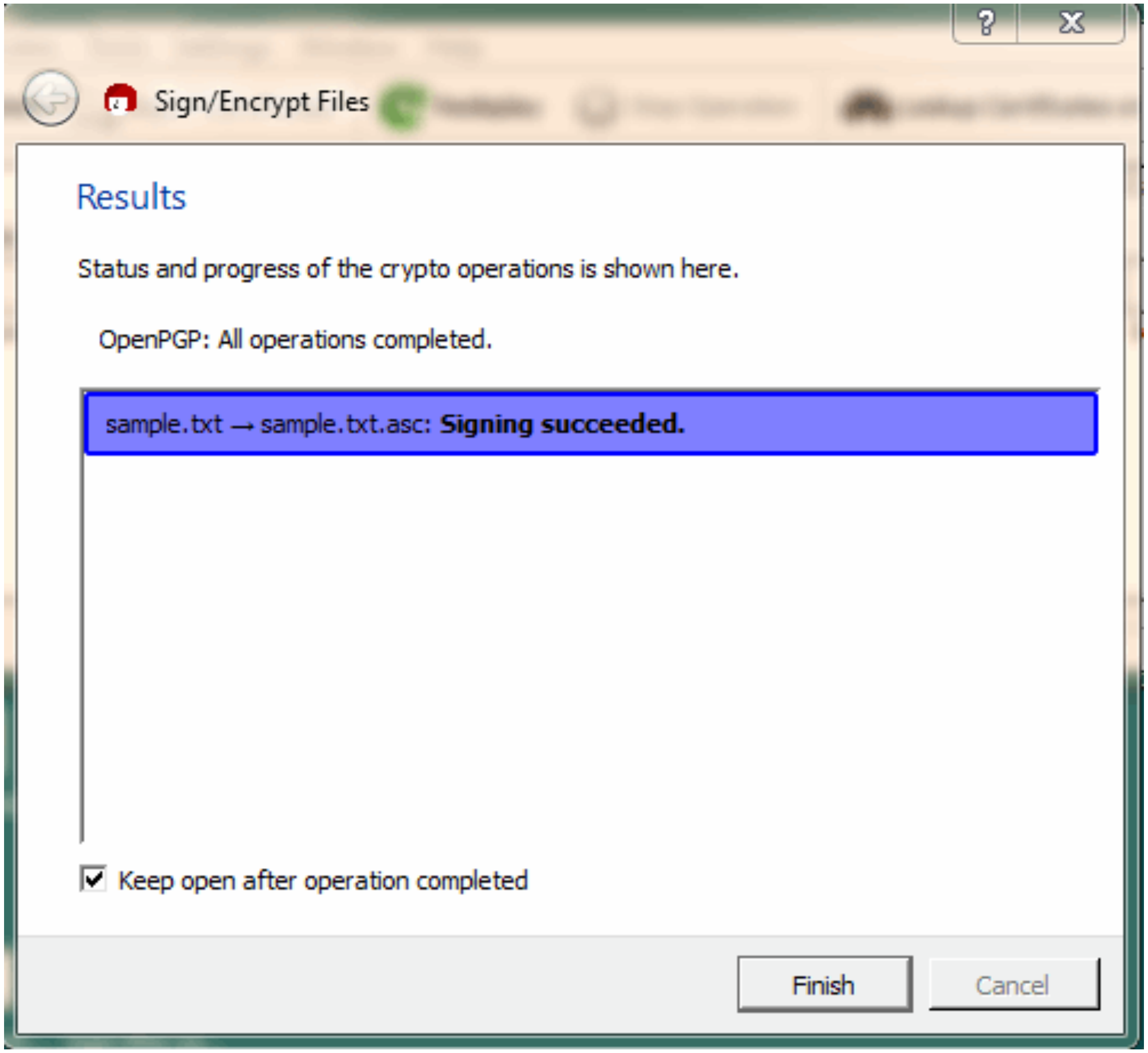
Enter Your Passphrase



Please enter the passphrase to unlock the secret key for the OpenPGP certificate:
"Joe St Sauver (Code 75) <joe@stsauver.com>"
4096-bit RSA key, ID 45AB1B14,
created 2015-06-04.

Passphrase

Signing Successful



Results

Status and progress of the crypto operations is shown here.

OpenPGP: All operations completed.

sample.txt → sample.txt.asc: **Signing succeeded.**

☑ Keep open after operation completed

Windows-5:

Validating A Signed Message You've Received

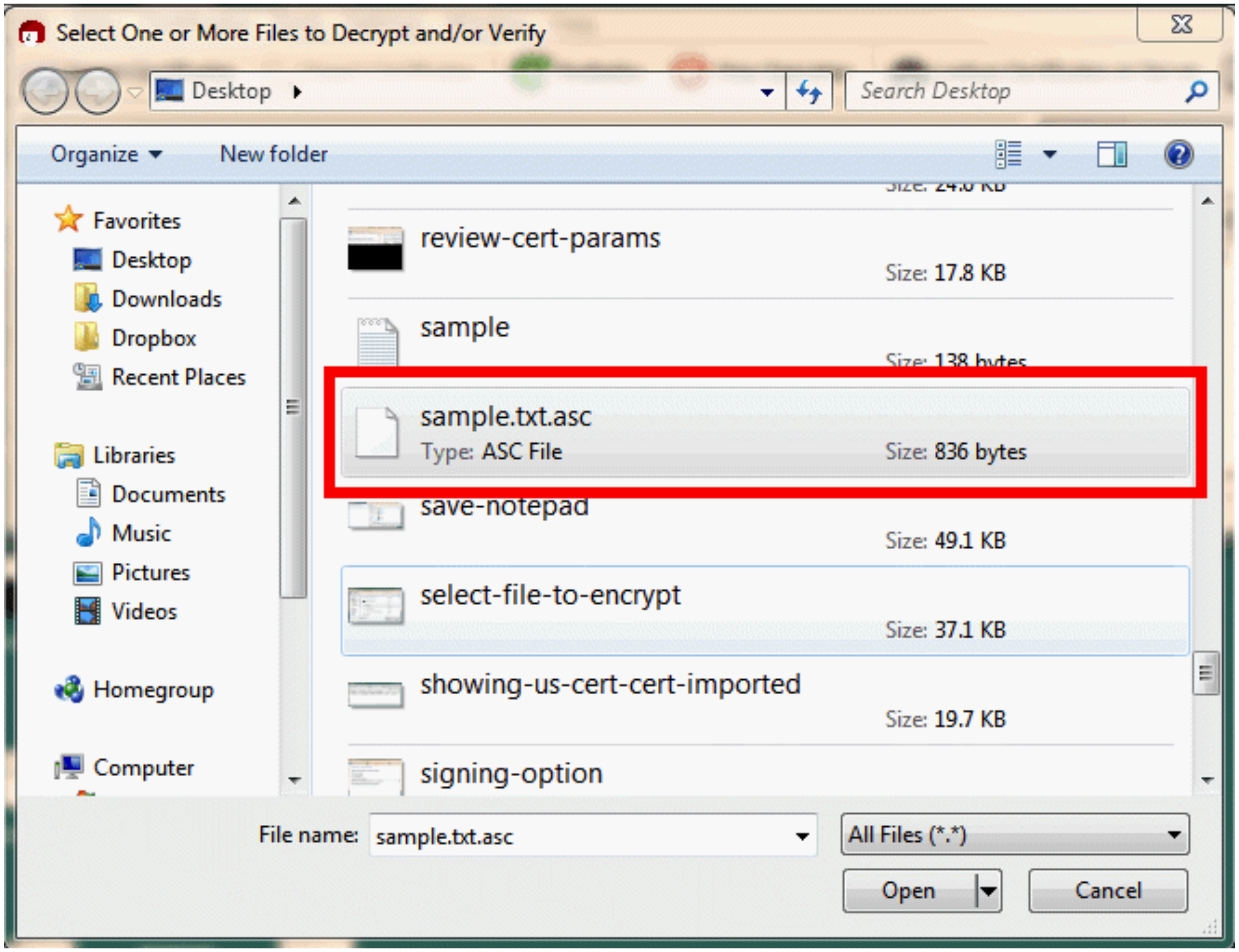
When You Receive A PGP-Signed Message...

- Save the message to a file.

- In Kleopatra, go to File → Decrypt/Verify Files... and select the file whose signature you want to verify

- If you don't have the key needed to validate that file, see the Windows-3 section above discussing how to get a user's public key (you probably WILL already have that key, at least if it's someone you routinely exchange PGP/GPG messages with)

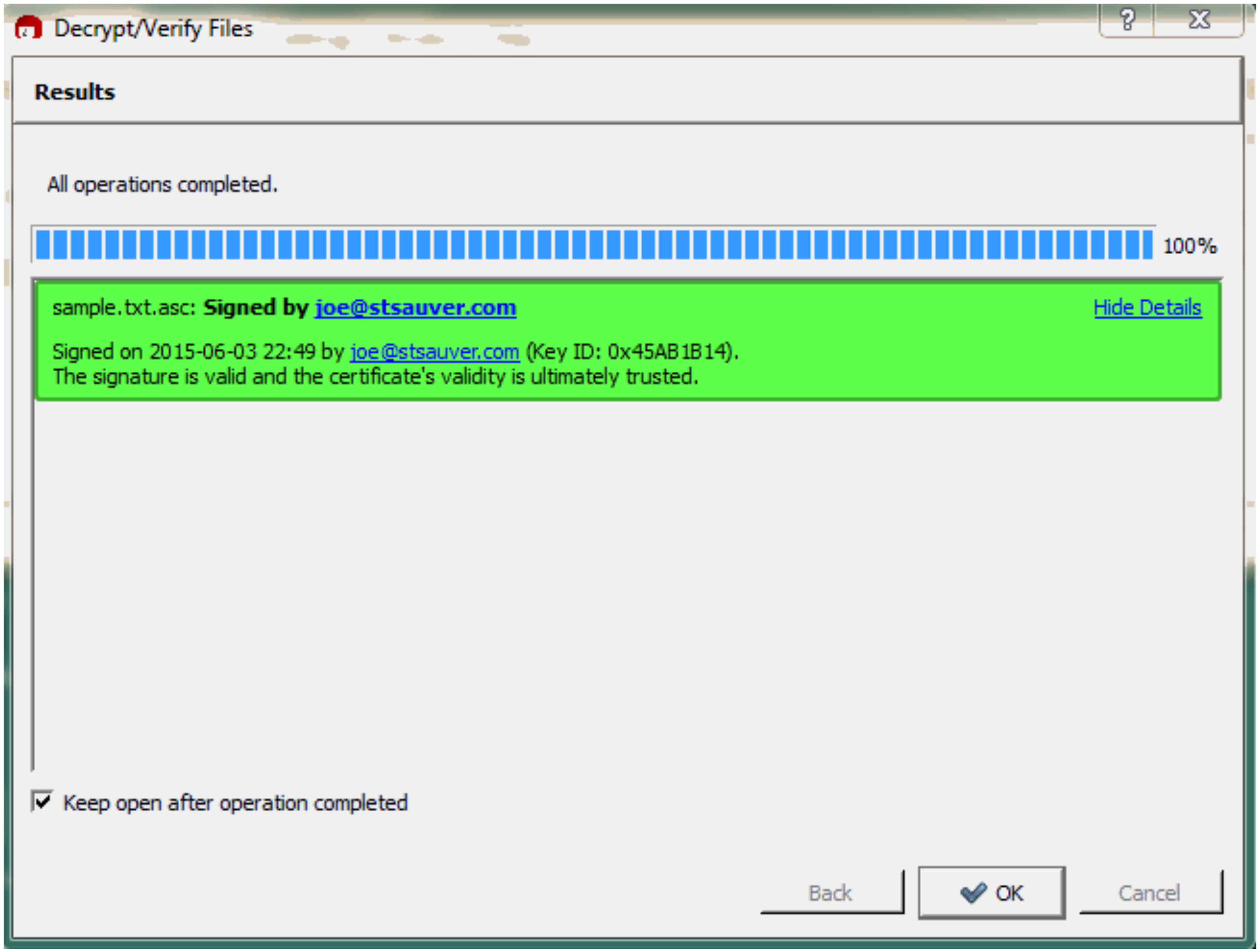
Select A Signed File To Validate – Heck, Let's Validate The Sig on the Msg We Just Signed!



review-cert-params Size: 17.8 KB
sample Size: 138 bytes
sample.txt.asc Type: ASC File Size: 836 bytes
save-notepad Size: 49.1 KB
select-file-to-encrypt Size: 37.1 KB
showing-us-cert-cert-imported Size: 19.7 KB
signing-option

File name: sample.txt.asc
All Files (*.*)

The Signature On Our File Is Valid



All operations completed.

100%

sample.txt.asc: **Signed by joe@stsauver.com**

Signed on 2015-06-03 22:49 by joe@stsauver.com (Key ID: 0x45AB1B14).
The signature is valid and the certificate's validity is ultimately trusted.

☑ Keep open after operation completed

Different PGP/GPG Signature Structures

- One of PGP/GPG's challenges is the wealth of features it has accumulated over time. This is true for signatures as well as for other aspects of PGP/GPG.
- Signed documents can be in clearsign'd form, binary form, or ASCII armored form.
- Signatures can also be sent either as part of the file itself, or as a separate ("detached") signature.

  If you're signing a text document, either will work, but if you're signing a binary file, the detached signature will ensure that the binary file isn't accidentally "munged" by the signing process. **(The downside of doing a detached signature is that both the original file <u>AND the separate signature file</u> need to get sent)**

Files Damaged In Transit

- Some mail clients may try to be "helpful" by doing things like wrapping lines or otherwise messing around with a message.

- In other cases, some sites may intentionally rewrite URLs in messages so that if any of those URLs ultimately "go rogue," security software can remotely break those dangerous links.

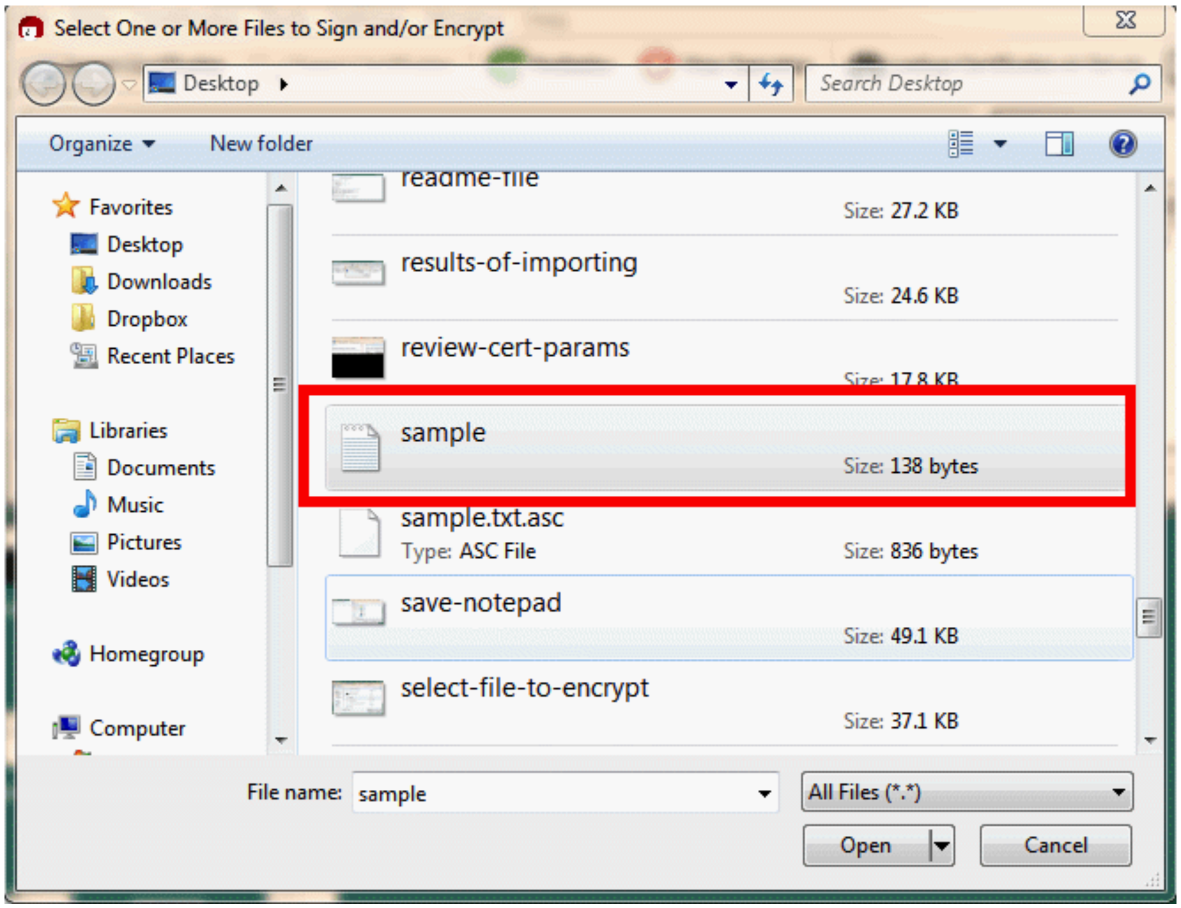
- **Sadly, ANY change to the body of a PGP/GPG-signed message, even just reformatting lines, will invalidate the signature associated with that message.**

Windows-6:

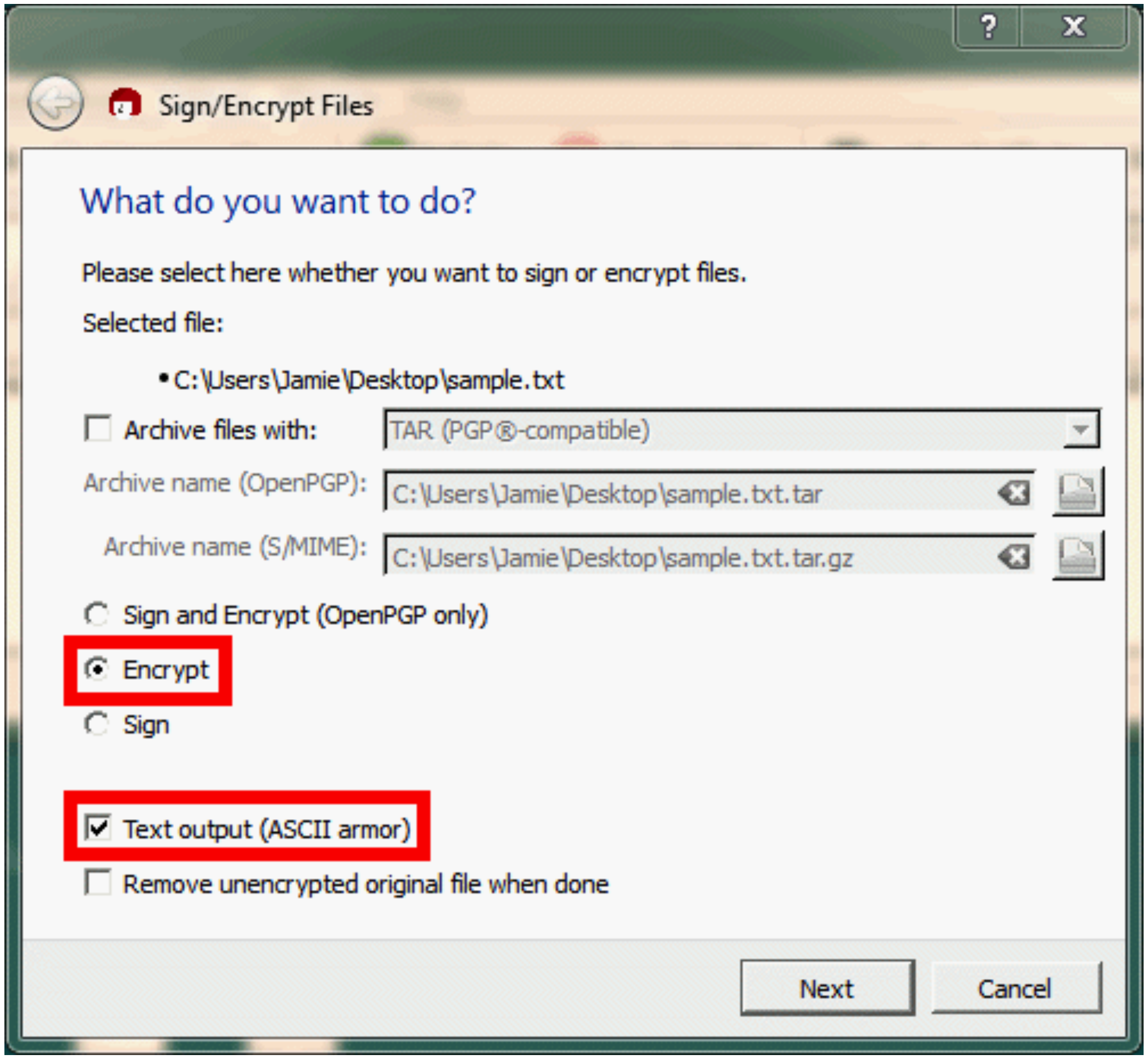
Encrypting a Message To Protect Against Eavesdropping

Encrypting a File With Gpg4win

Start the encryption process by going to File → Encrypt/Sign... and picking the file you want to encrypt.



Select "Encrypt" and "Text Output"



Sign/Encrypt Files

What do you want to do?

Please select here whether you want to sign or encrypt files.

Selected file:

- C:\Users\Jamie\Desktop\sample.txt

☐ Archive files with: TAR (PGP®-compatible)

Archive name (OpenPGP): C:\Users\Jamie\Desktop\sample.txt.tar

Archive name (S/MIME): C:\Users\Jamie\Desktop\sample.txt.tar.gz

○ Sign and Encrypt (OpenPGP only)

● Encrypt

○ Sign

☑ Text output (ASCII armor)

☐ Remove unencrypted original file when done

BE CAREFUL! Do NOT accidentally click "remove unencrypted original file!"

On NOT Deleting Unencrypted Original Files

- The encryption panel in Gpg4win gives you the option of deleting your original unencrypted file after producing the encrypted version. While this is a tempting "convenience" option, I would encourage you to NOT routinely use it.

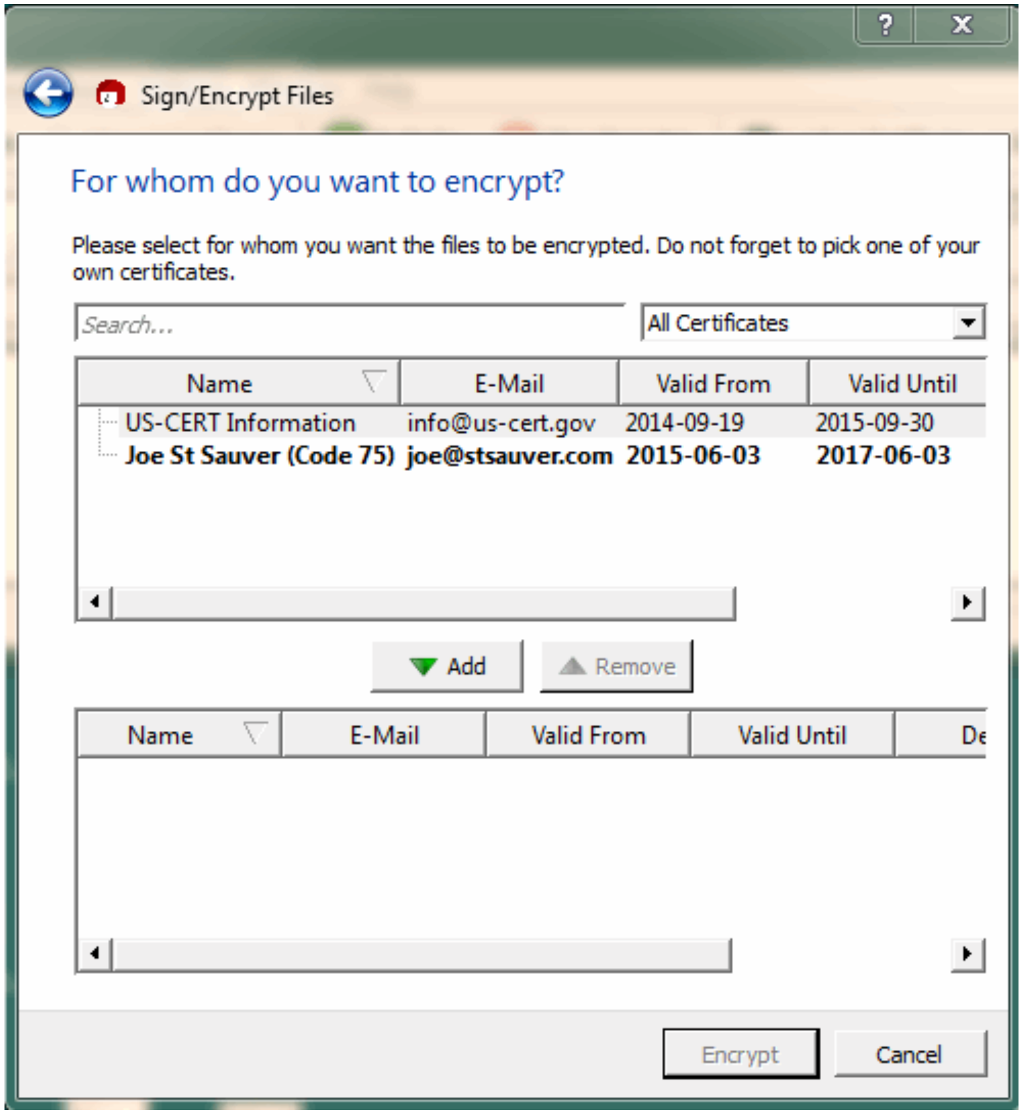
- My thinking:

  a) Sometimes you simply want to keep an unencrypted copy of your original file

  b) Other times you may *think* you're going to send an encrypted copy to yourself, but *forget to actually do so* – won't you be happy that you still have the unencrypted original?

  c) You can manually delete the file with a file wiping program

Select A Recipient For The Encrypted File Then Hit the Green "Down Arrow" Add Button



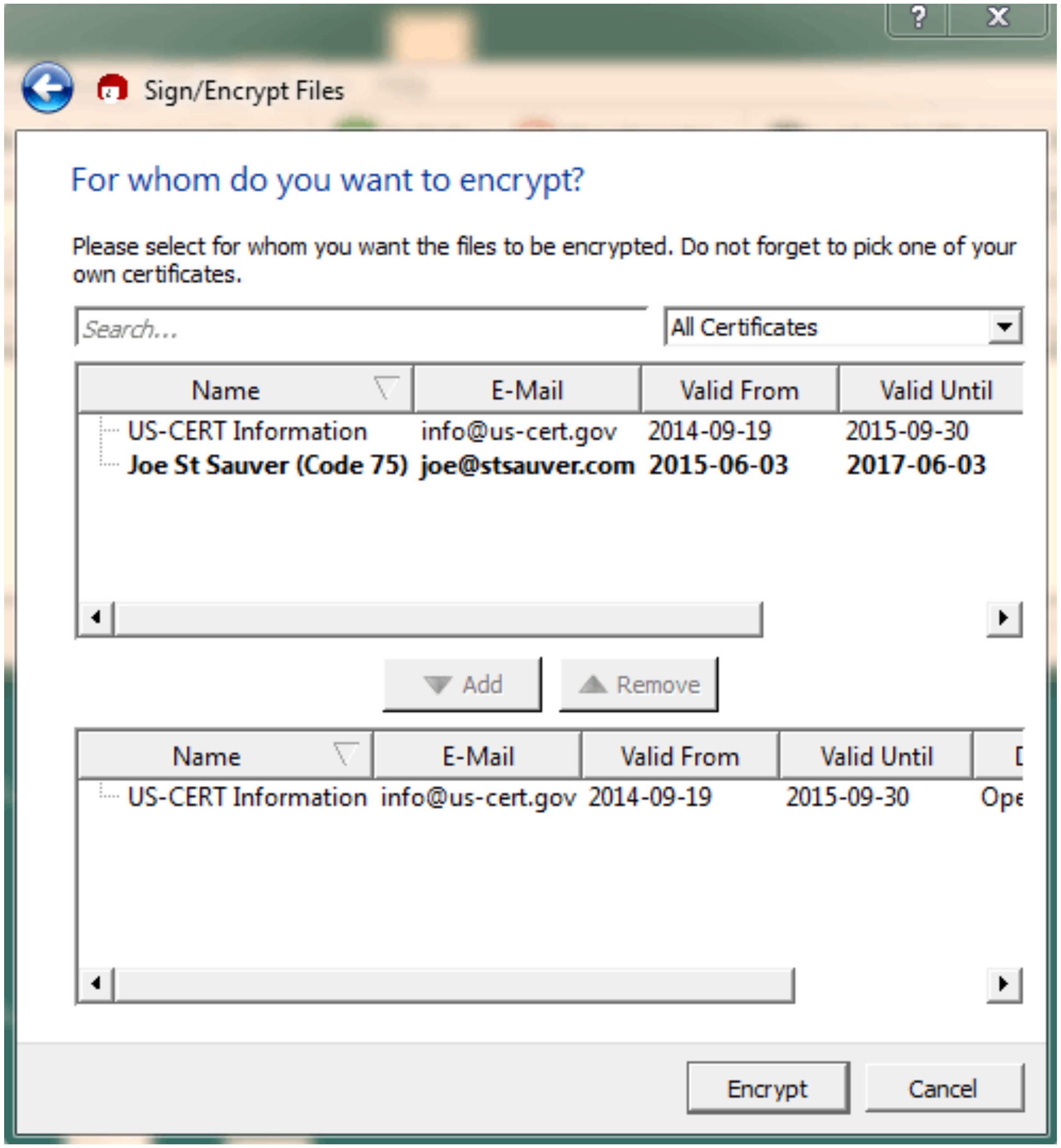
For whom do you want to encrypt?

Please select for whom you want the files to be encrypted. Do not forget to pick one of your own certificates.

Name	E-Mail	Valid From	Valid Until
US-CERT Information	info@us-cert.gov	2014-09-19	2015-09-30
Joe St Sauver (Code 75)	**joe@stsauver.com**	**2015-06-03**	**2017-06-03**

Name	E-Mail	Valid From	Valid Until	De

For Example, We Chose US-CERT...



Sign/Encrypt Files

For whom do you want to encrypt?

Please select for whom you want the files to be encrypted. Do not forget to pick one of your own certificates.

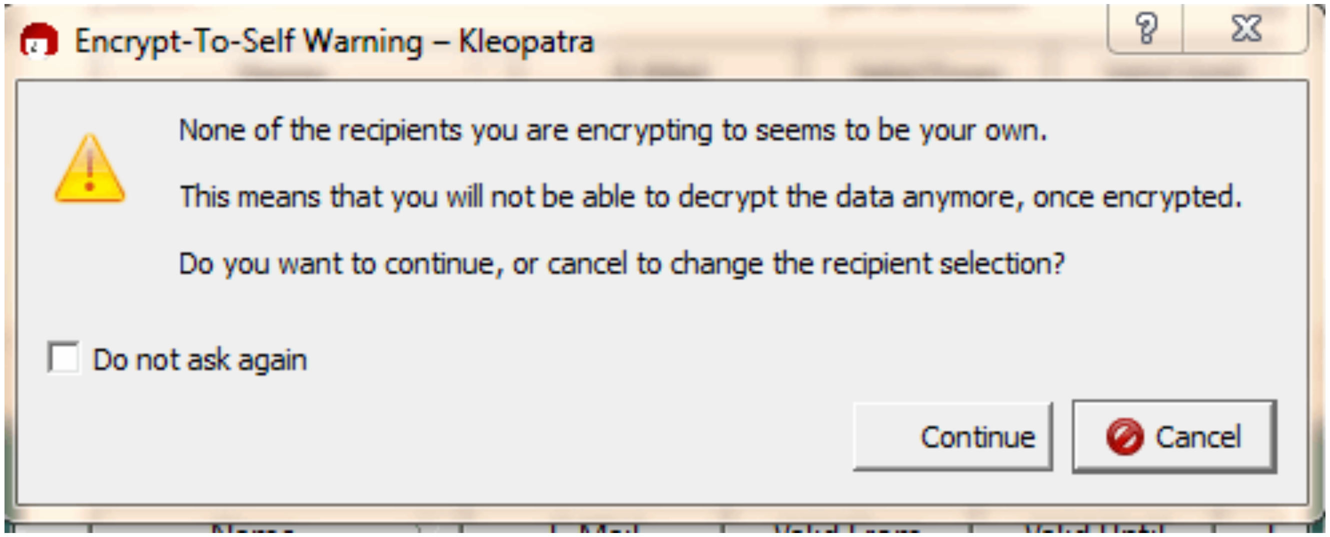
Search...

All Certificates

Name	E-Mail	Valid From	Valid Until
US-CERT Information	info@us-cert.gov	2014-09-19	2015-09-30
Joe St Sauver (Code 75)	**joe@stsauver.com**	**2015-06-03**	**2017-06-03**

Name	E-Mail	Valid From	Valid Until	D
US-CERT Information	info@us-cert.gov	2014-09-19	2015-09-30	Ope

Since We DIDN'T Also Add Ourselves, We're Going to Get A Warning


Encrypt-To-Self Warning – Kleopatra

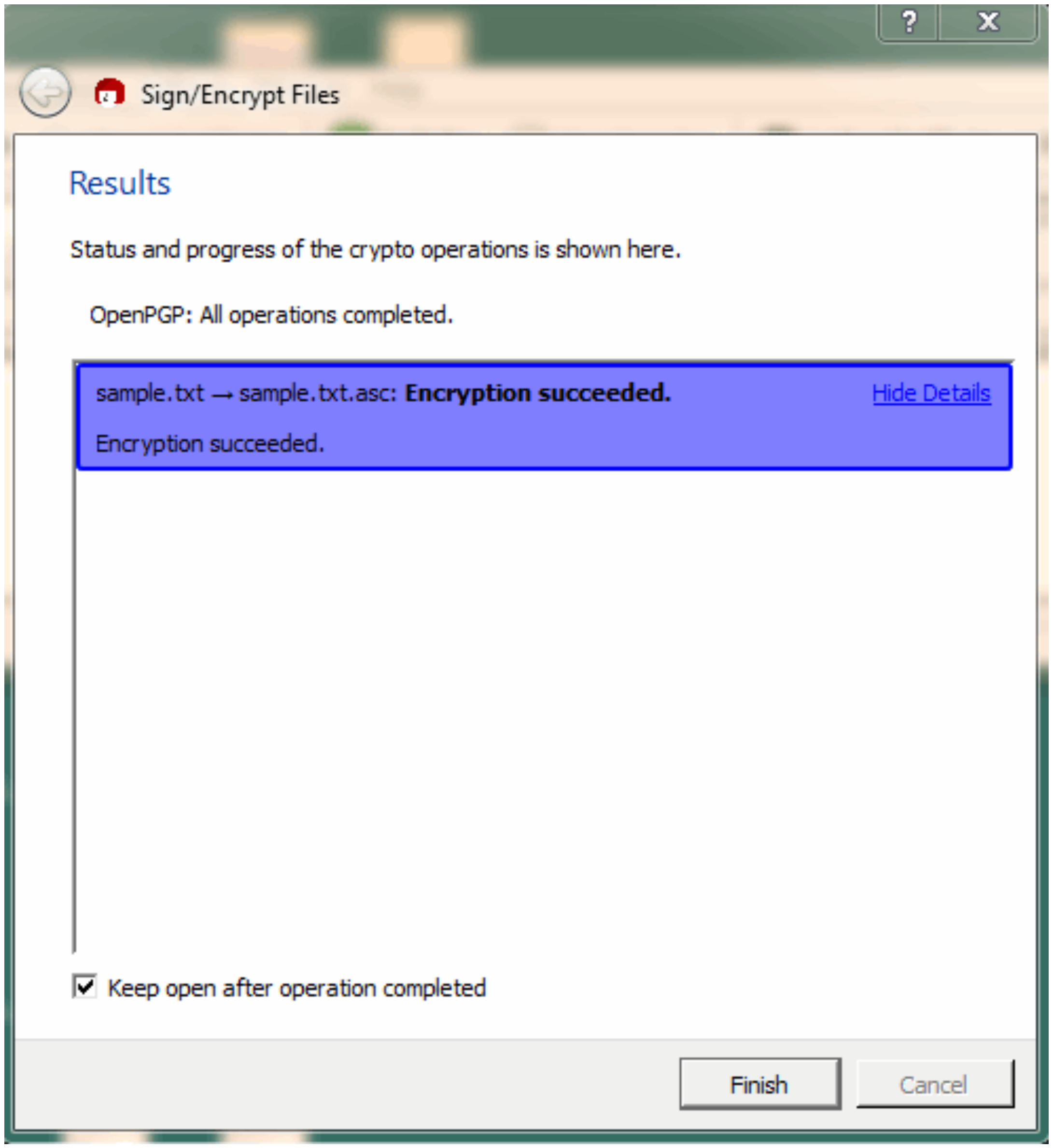
None of the recipients you are encrypting to seems to be your own.

This means that you will not be able to decrypt the data anymore, once encrypted.

Do you want to continue, or cancel to change the recipient selection?

☐ Do not ask again

Wingpg4 Verifies That The Encryption's Done


Sign/Encrypt Files

Results

Status and progress of the crypto operations is shown here.

OpenPGP: All operations completed.

sample.txt → sample.txt.asc: **Encryption succeeded.** Hide Details

Encryption succeeded.

[✓] Keep open after operation completed

Send That Encrypted File To Your Recipient

- The encrypted file temp.txt.asc can then be sent to your recipient by cutting and pasting it into a regular email message

- **NOTES:** Be SURE you get the right file, e.g., the encrypted one!

- Encrypted files about sensitive topics should NOT have revealing email **subject lines** (remember, those are NOT encrypted)

- If you encrypt one file to multiple people, each person will be able to ascertain the identities of all the other recipients also able to read that file; in some circumstances, this may be sensitive information. You can deal with this by encrypting your message for just one user at a time.

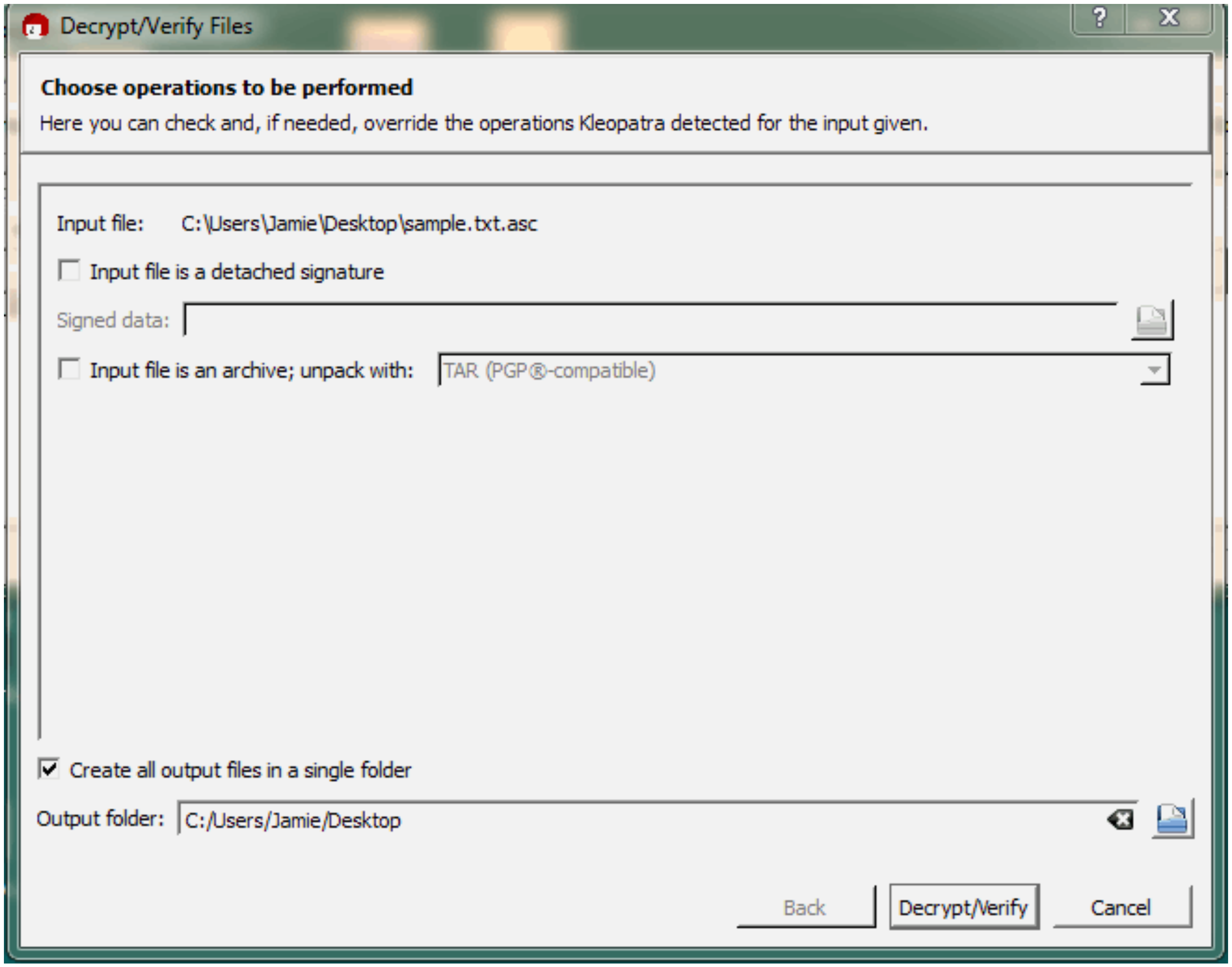
Windows-7:

Decrypting an Encrypted Message You've Just Received

To Decrypt an Encrypted Message You've Received

- Copy and paste or save the encrypted message to a file.
- In Kleopatra, go to File → Decrypt/Verify
- Choose the file you want to decrypt

Decrypting...


Decrypt/Verify Files

Choose operations to be performed

Here you can check and, if needed, override the operations Kleopatra detected for the input given.

Input file: C:\Users\Jamie\Desktop\sample.txt.asc

☐ Input file is a detached signature

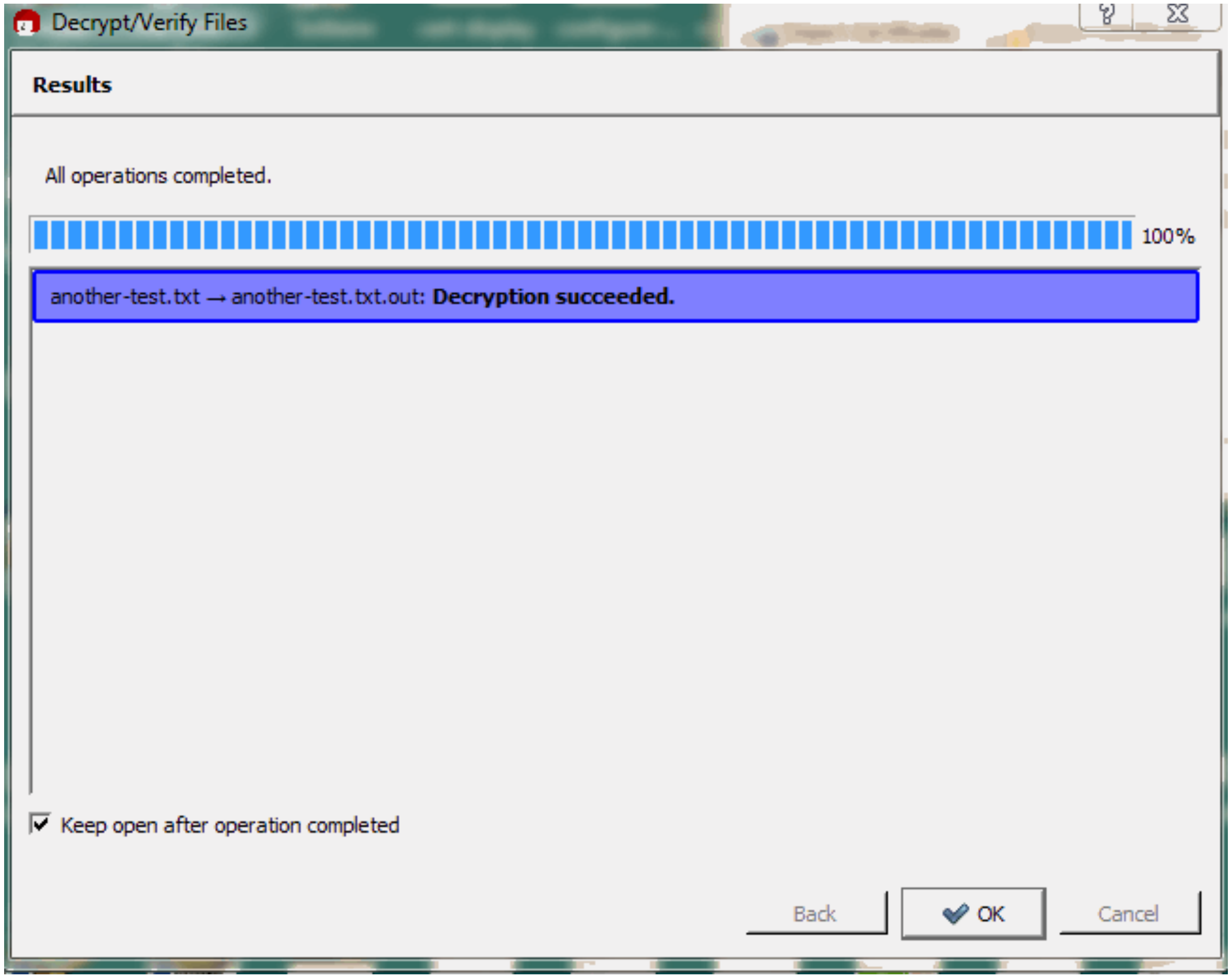
Signed data:

☐ Input file is an archive; unpack with: TAR (PGP®-compatible)

☑ Create all output files in a single folder

Output folder: C:/Users/Jamie/Desktop

Successful Decryption!

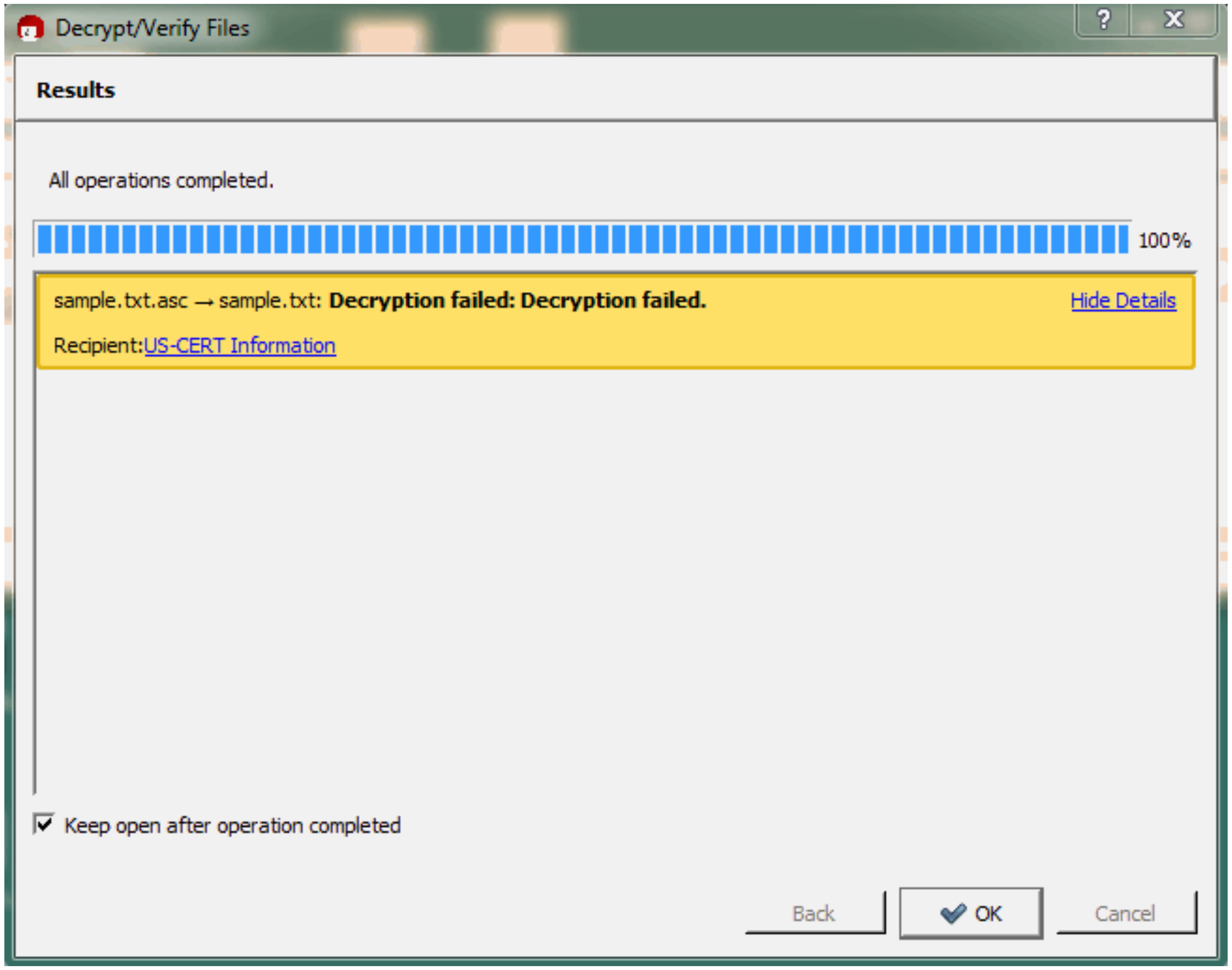


All operations completed.

100%

another-test.txt → another-test.txt.out: **Decryption succeeded.**

What You'll See If You CAN'T Decrypt (Since I'm Not US-CERT, And This Message Was Encrypted ONLY For Them With Their Key, This Makes Sense, Right?)



All operations completed.

sample.txt.asc → sample.txt: **Decryption failed: Decryption failed.**

Recipient:US-CERT Information

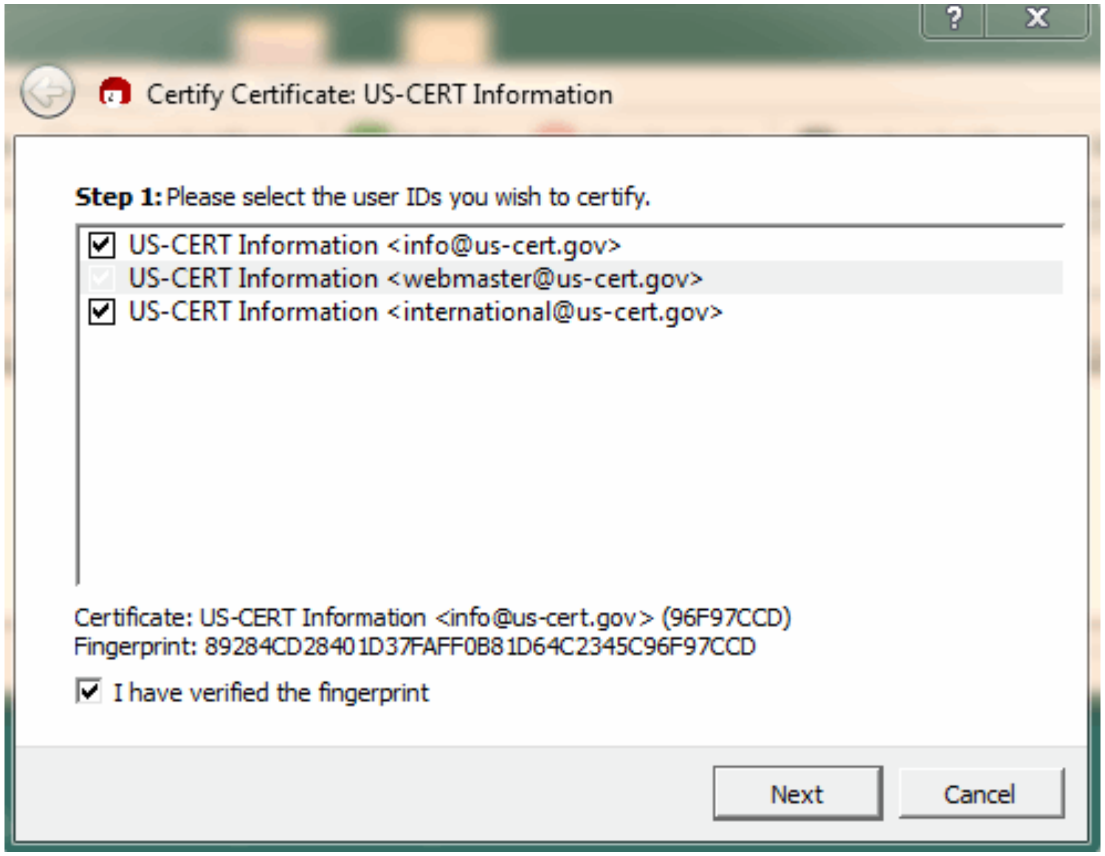
☑ Keep open after operation completed

Windows-8:

Signing Another User's Public Key

To Sign Another User's Key (After You've Verified Their Passport & Confirmed Their Key Fingerprint)...

Select the public key you want to sign from the Kleopatra's List of "Other" certificates, then go to Kleopatra's Certificates Menu → Certify Certificates and pick the relevant IDs



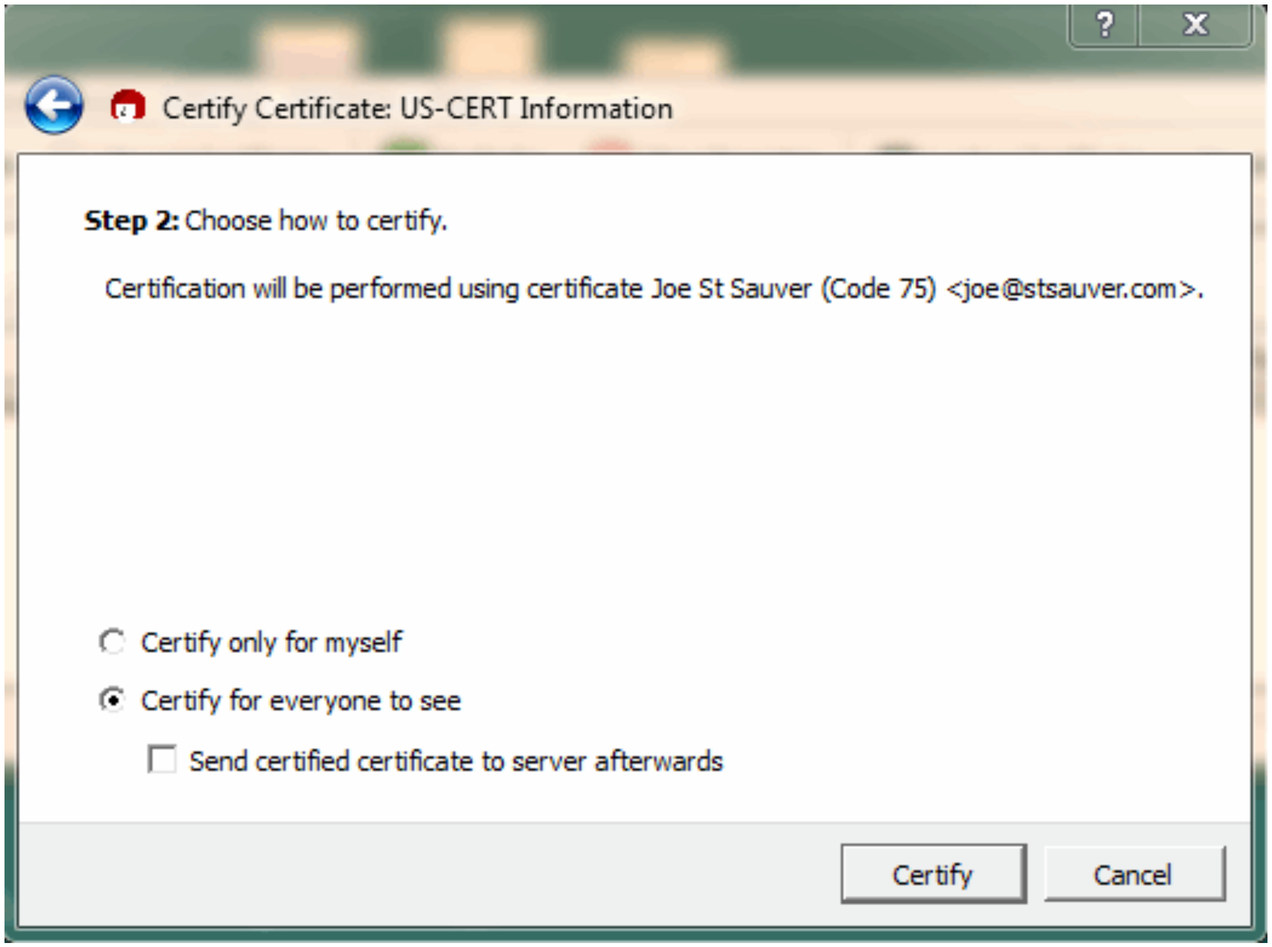
Step 1: Please select the user IDs you wish to certify.

- [✓] US-CERT Information <info@us-cert.gov>
- [ ] US-CERT Information <webmaster@us-cert.gov>
- [✓] US-CERT Information <international@us-cert.gov>

Certificate: US-CERT Information <info@us-cert.gov> (96F97CCD)
Fingerprint: 89284CD28401D37FAFF0B81D64C2345C96F97CCD

[✓] I have verified the fingerprint

Confirm That You Want To Publicly Sign It...



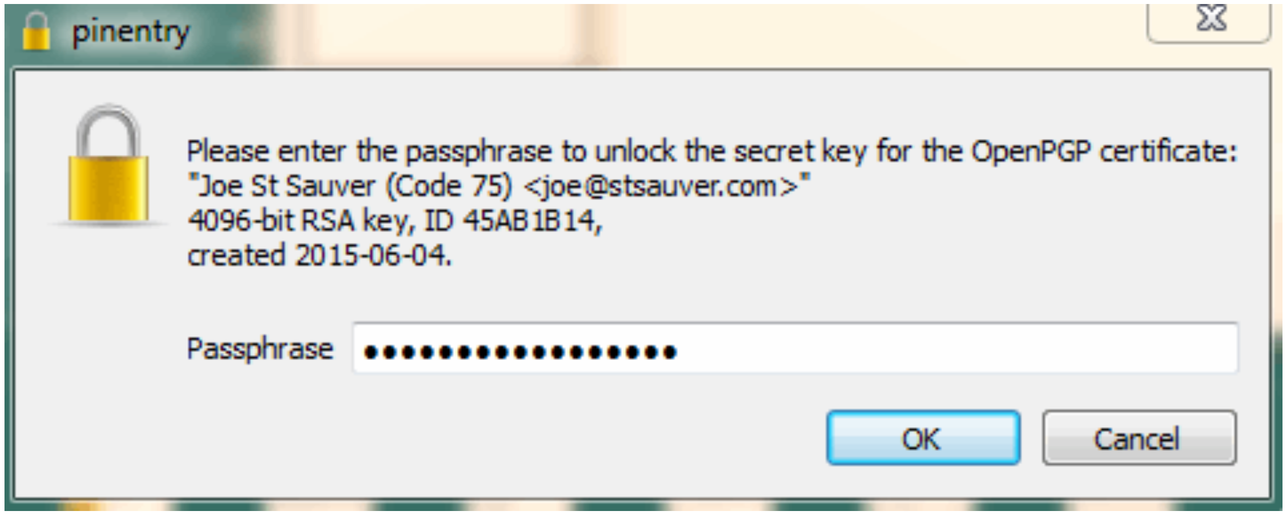
Step 2: Choose how to certify.

Certification will be performed using certificate Joe St Sauver (Code 75) <joe@stsauver.com>.

- ( ) Certify only for myself
- (●) Certify for everyone to see
  - [ ] Send certified certificate to server afterwards

Do NOT click "send certified certificate to server afterwards"

Enter Your Passphrase


pinentry

Please enter the passphrase to unlock the secret key for the OpenPGP certificate:
"Joe St Sauver (Code 75) <joe@stsauver.com>"
4096-bit RSA key, ID 45AB1B14,
created 2015-06-04.

Passphrase ••••••••••••••••••

Send The Signed Key Back To Its Owner

- Select the key you just signed
- Click "Export Key"
- Save that key to a file
- Send that file to its owner by email for their use (or for THEM to publish to a public key server, if they want to do so)
- Is this a bit of a hassle? Yes. Is it the courteous way to sign a key? Yes.

Windows-9:

Importing Your Own Key After It Has Been Signed

Assume Someone's Just Sent You Your Public Key, Signed By Them

- Check your notes: is this someone who properly validated my ID and key fingerprint somewhere? If so, save the signed key to a file. If not maybe check with the user and figure out what's going on?

- In the Kleopatra certificate viewer, use the Import Certificates button to select the file you just created (containing the newly signed key) and add it to your key ring.

- Optionally, export that signed file to a key server by going to File → Export Certificates to Server...

  ONLY EXPORT YOUR OWN PUBLIC KEYS TO A KEYSERVER; DO NOT PRESUME TO MAKE THIS IRREVOCABLE CHOICE FOR OTHERS!

Windows-10:

PRACTICE!

Windows Users: Practice For A Few Minutes!

- You've now got all the skills you need to do simple PGP/GPG messages.

- Pair up with another user from class, and do the following:

  a) create a key pair for yourself if you haven't already done so
  b) get a copy of your partner's public key
  c) send a signed message to your partner
  d) send an encrypted message to your partner
  e) verify the signature of the message you received from your partner
  f) decrypt the message you received from your partner
  g) if so inclined, sign your partner's key and send it back to them

GPG CONVENIENCE TOOLS

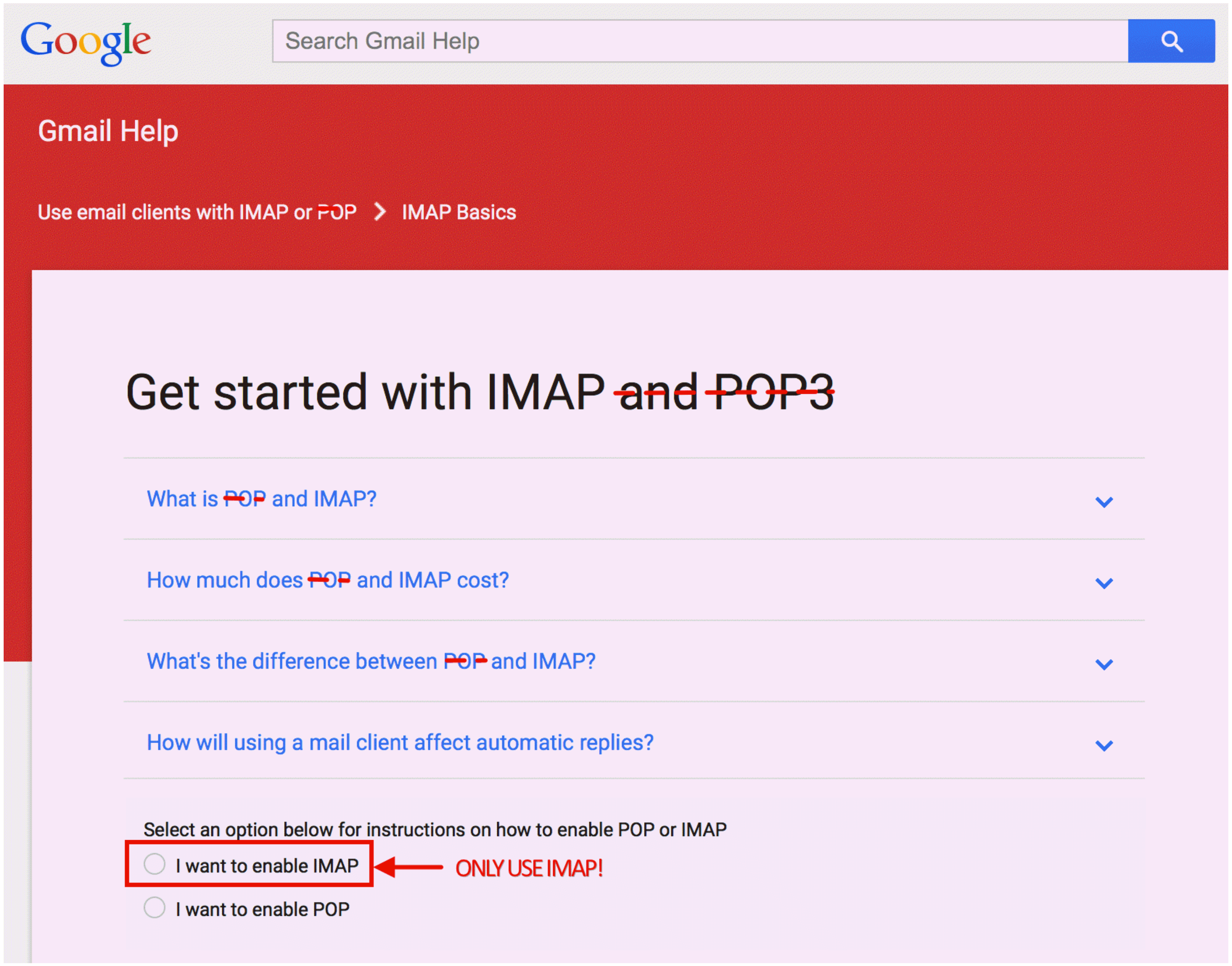
Integrate GPG With Thunderbird Using Enigmail

- The approach we've shown up until now is (candidly) pretty clunky, often involving copying and pasting stuff. While that works fine for an occasional message, you probably wouldn't want to have to do it for a hundred messages a day.
- If you're going to be routinely using GPG all the time, you probably want it to be closely integrated with a point-and-click email client such as Mozilla Thunderbird.
- The best way to integrate GPG with Thunderbird is by installing the free Enigmail plugin. It works on Macs, PCs, Linux, etc.
- It's available from https://www.enigmail.net/download/index.php or in Thunderbird go to Tools → Addons and search for enigmail
- If you don't already have Thunderbird installed, you can get it from https://www.mozilla.org/en-US/thunderbird/

Thunderbird Configuration Caution #1

- Thunderbird supports both POP and IMAP connections.
- Thunderbird will attempt to heuristically configure your connection the first time you run it.
- **BE CAREFUL. Do NOT configure Thunderbird to use POP** to access your existing email account! If you do, you will download all your existing email to your laptop and it may be deleted from your server!
- **Use IMAP instead! Do NOT use POP!**

GMail and IMAP



Get started with IMAP ~~and POP3~~

What is ~~POP~~ and IMAP?

How much does ~~POP~~ and IMAP cost?

What's the difference between ~~POP~~ and IMAP?

How will using a mail client affect automatic replies?

Select an option below for instructions on how to enable POP or IMAP

- I want to enable IMAP ← ONLY USE IMAP!
- I want to enable POP

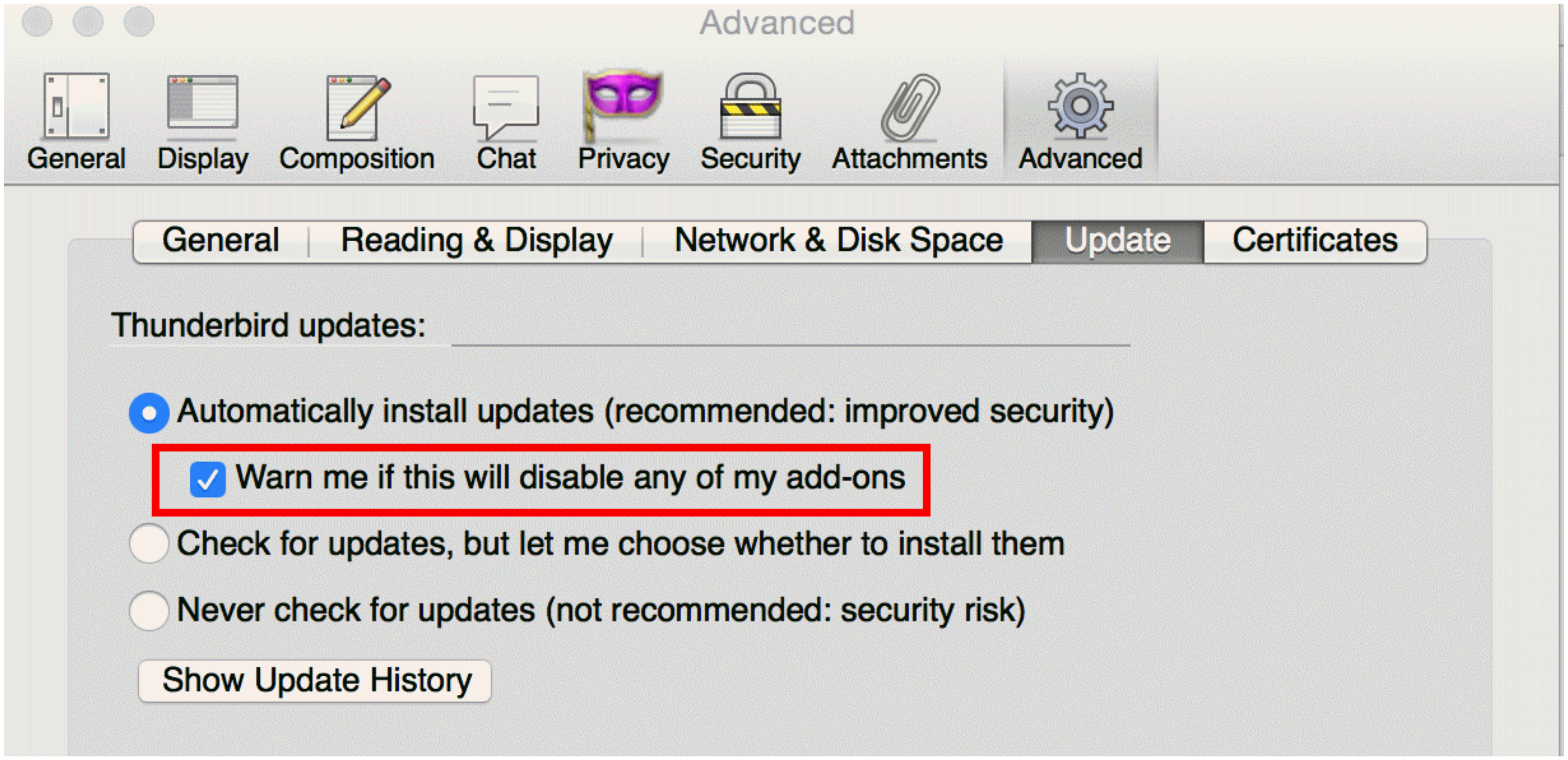
Caution #2: Enigmail and Thunderbird Updates

- From time-to-time, the Thunderbird project may produce updated versions of Thunderbird. When that happens, the Enigmail plugin may continue to be compatible, or it may need to be tweaked and updated in order to continue to interoperate. **If you routinely use and heavily rely on Enigmail, do NOT update Thunderbird unless you're SURE Enigmail is compatible with the new version.**

- Normally you will be automatically prevented from "shooting yourself in the foot" this way, but **sometimes folks will override the compatibility check and install an incompatible new version without pondering the implications of their decision.**

- Don't do that. Really. Just don't.

The Critical Check In Thunderbird Advanced Prefs



Thunderbird updates:

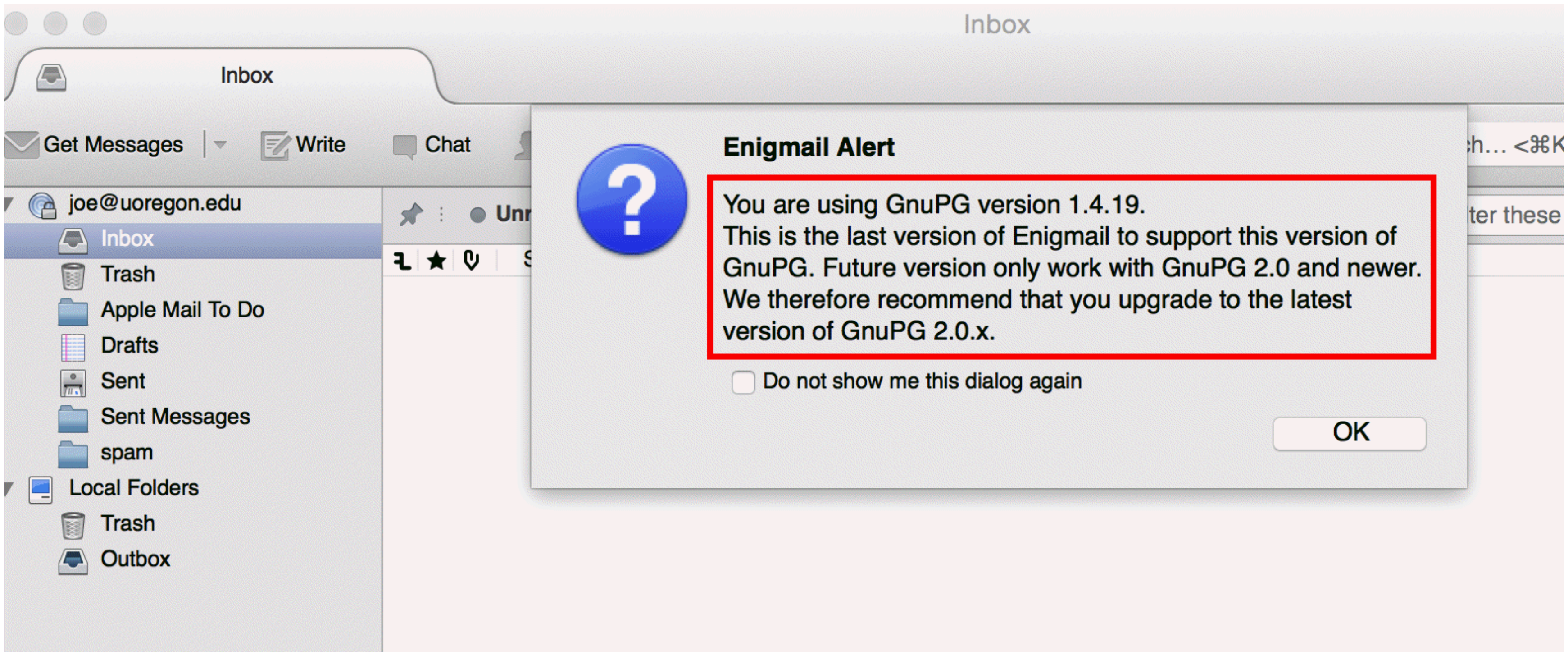
[✓] Automatically install updates (recommended: improved security)

[✓] Warn me if this will disable any of my add-ons

Check for updates, but let me choose whether to install them

Never check for updates (not recommended: security risk)

Caution #3: Last Version to Support Classic GPG



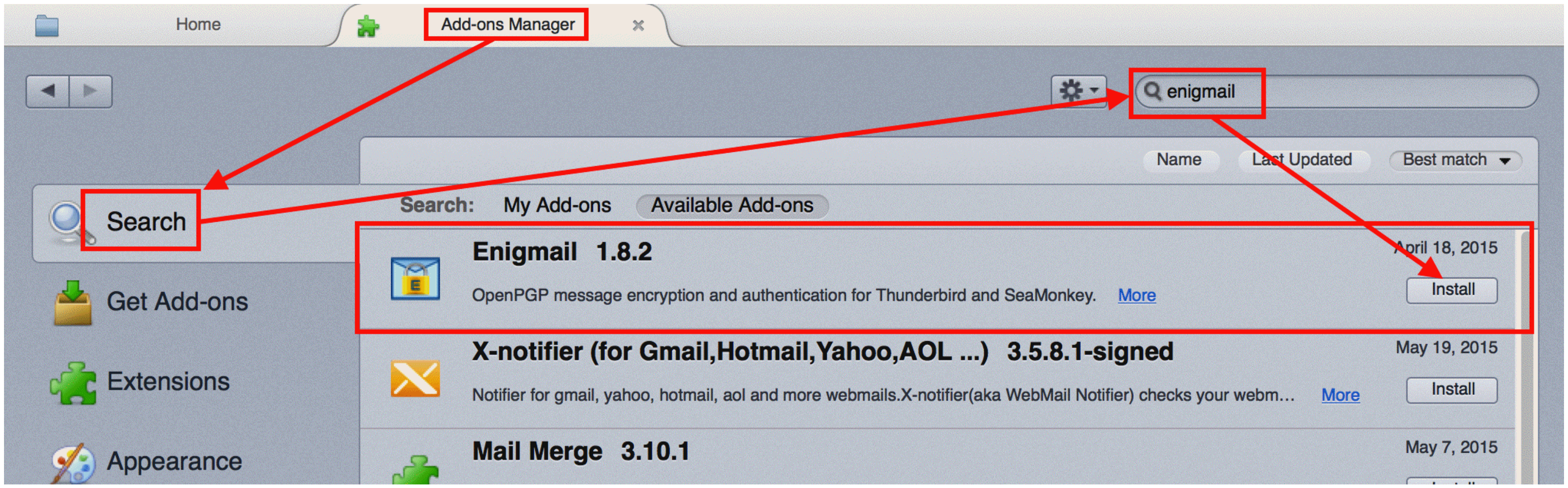
Enigmail Alert

You are using GnuPG version 1.4.19.
This is the last version of Enigmail to support this version of GnuPG. Future version only work with GnuPG 2.0 and newer. We therefore recommend that you upgrade to the latest version of GnuPG 2.0.x.

Note: one Enigmail option is to install GNU Privacy Guard 2.x along side GNU Privacy Guard 1.4.19.

Let's proceed, notwithstanding this...

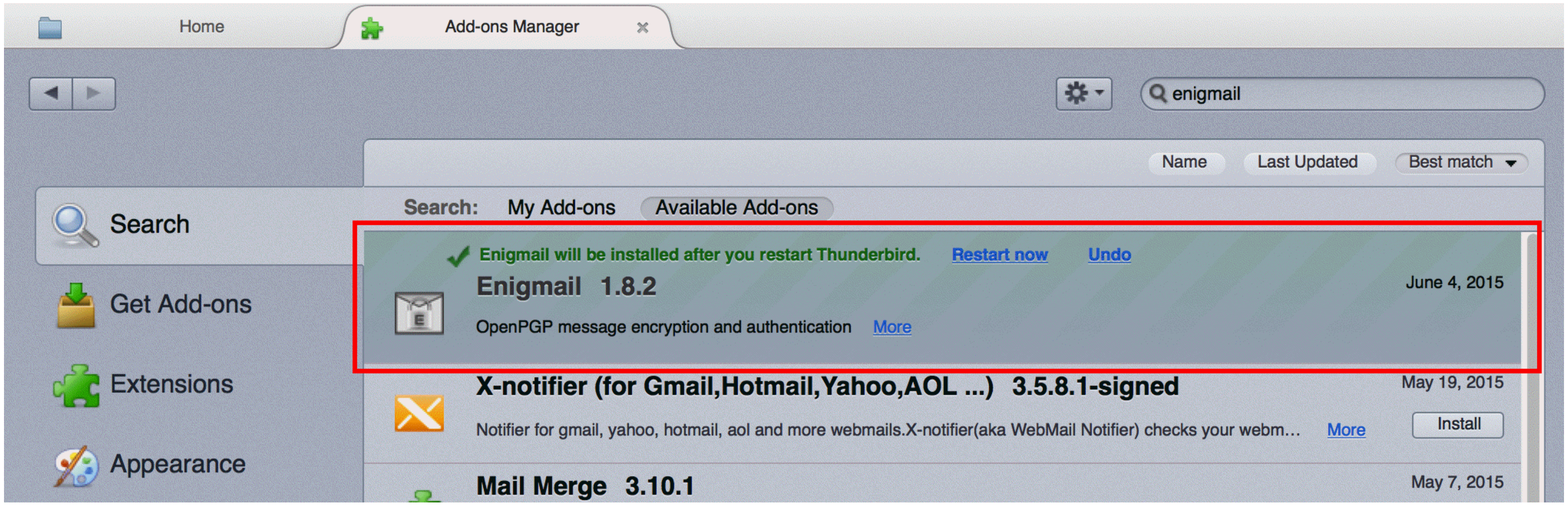
Installing Enigmail From Within Thunderbird



Enigmail 1.8.2 — April 18, 2015
OpenPGP message encryption and authentication for Thunderbird and SeaMonkey.

X-notifier (for Gmail,Hotmail,Yahoo,AOL ...) 3.5.8.1-signed — May 19, 2015
Notifier for gmail, yahoo, hotmail, aol and more webmails.X-notifier(aka WebMail Notifier) checks your webm…

Mail Merge 3.10.1 — May 7, 2015



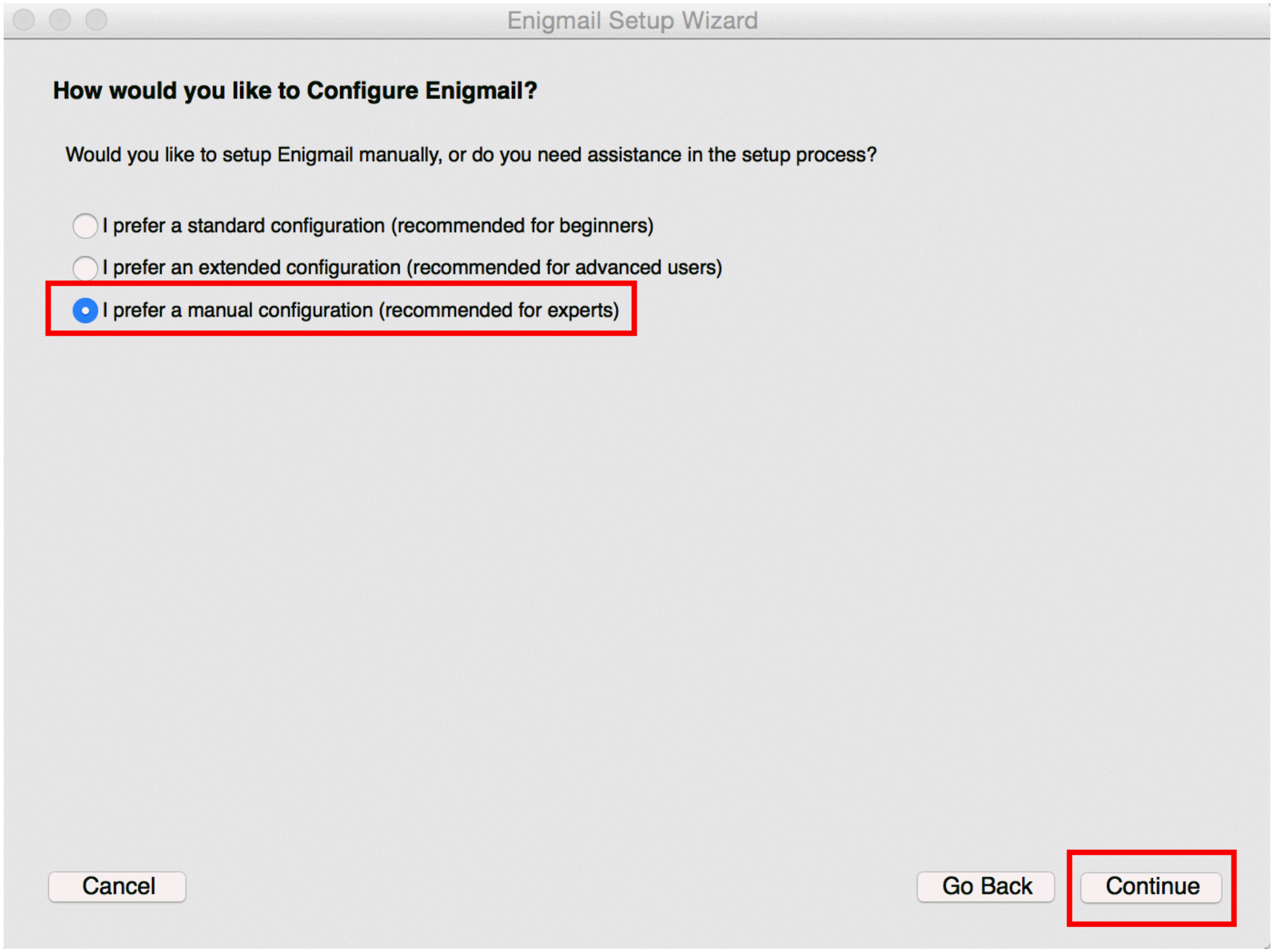
Enigmail will be installed after you restart Thunderbird.

Enigmail 1.8.2 — June 4, 2015
OpenPGP message encryption and authentication

X-notifier (for Gmail,Hotmail,Yahoo,AOL ...) 3.5.8.1-signed — May 19, 2015
Notifier for gmail, yahoo, hotmail, aol and more webmails.X-notifier(aka WebMail Notifier) checks your webm…

Mail Merge 3.10.1 — May 7, 2015

There's a Setup Wizard, But You Don't Need It

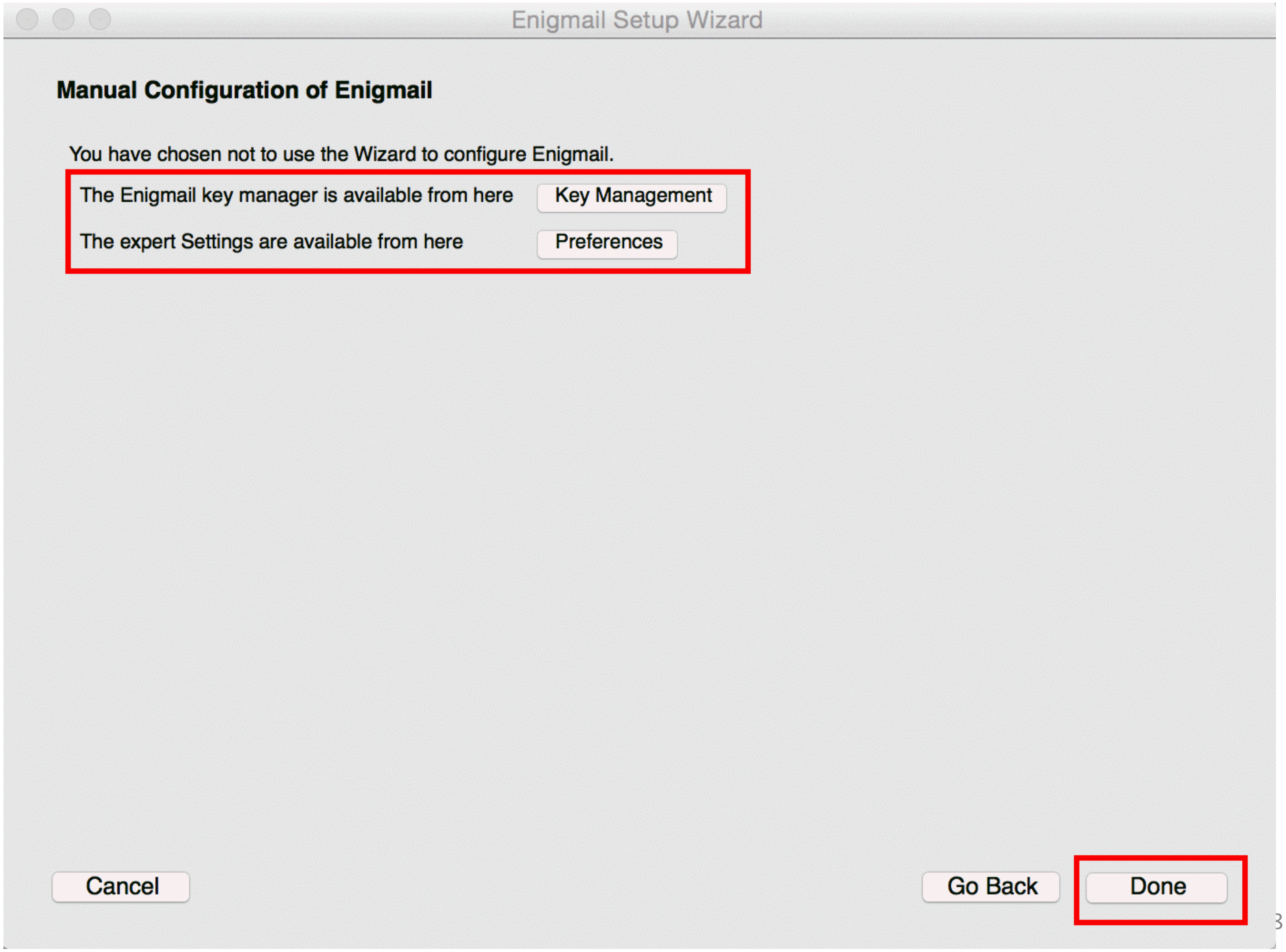


How would you like to Configure Enigmail?

Would you like to setup Enigmail manually, or do you need assistance in the setup process?

- ○ I prefer a standard configuration (recommended for beginners)
- ○ I prefer an extended configuration (recommended for advanced users)
- [✓ I prefer a manual configuration (recommended for experts)]

Basically Just Click Done


Enigmail Setup Wizard

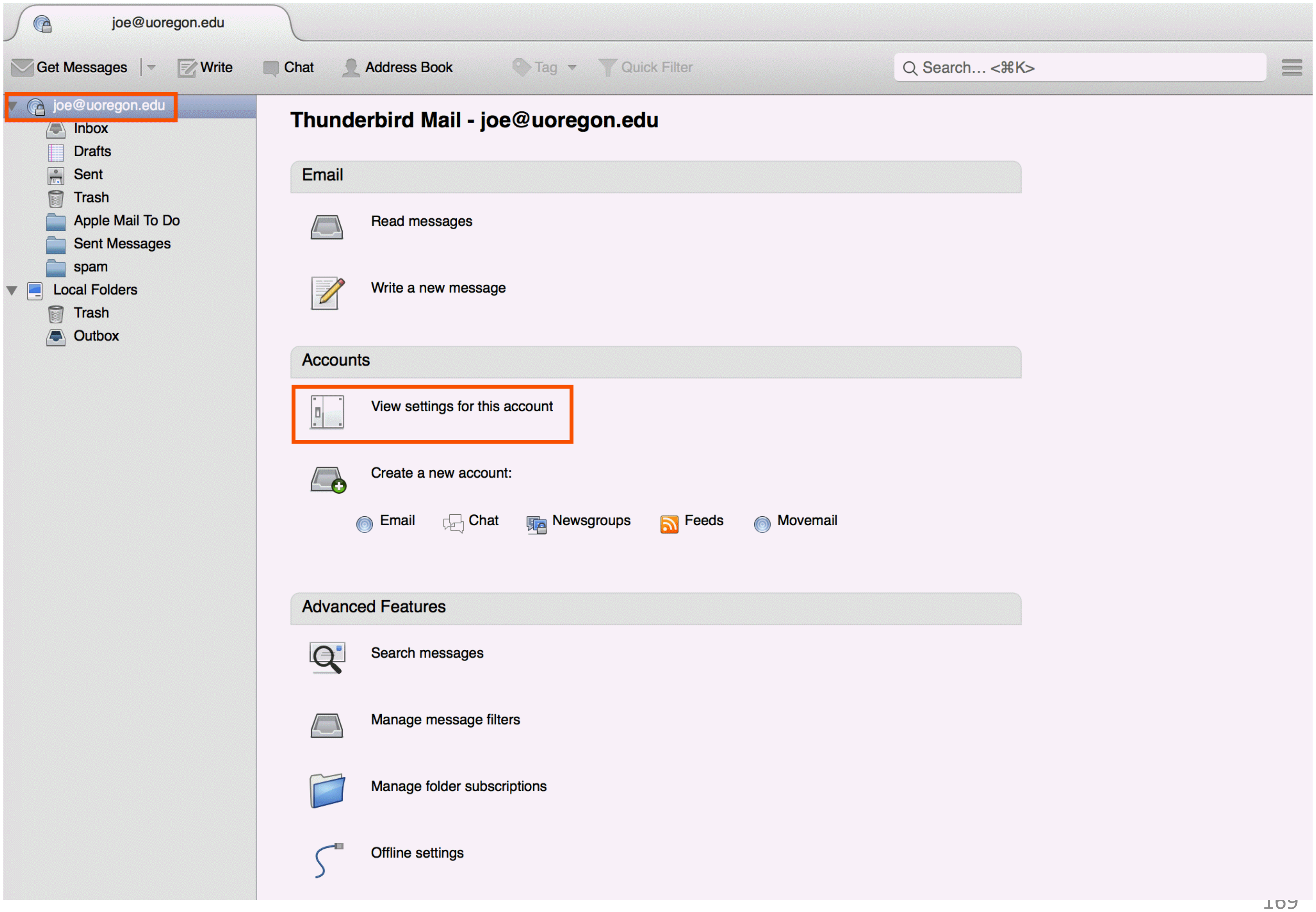
Manual Configuration of Enigmail

You have chosen not to use the Wizard to configure Enigmail.

The Enigmail key manager is available from here

The expert Settings are available from here

Manually Configuring Settings For Your Account



Thunderbird Mail - joe@uoregon.edu

Email

Read messages

Write a new message

Accounts

View settings for this account

Create a new account:

Email Chat Newsgroups Feeds Movemail

Advanced Features

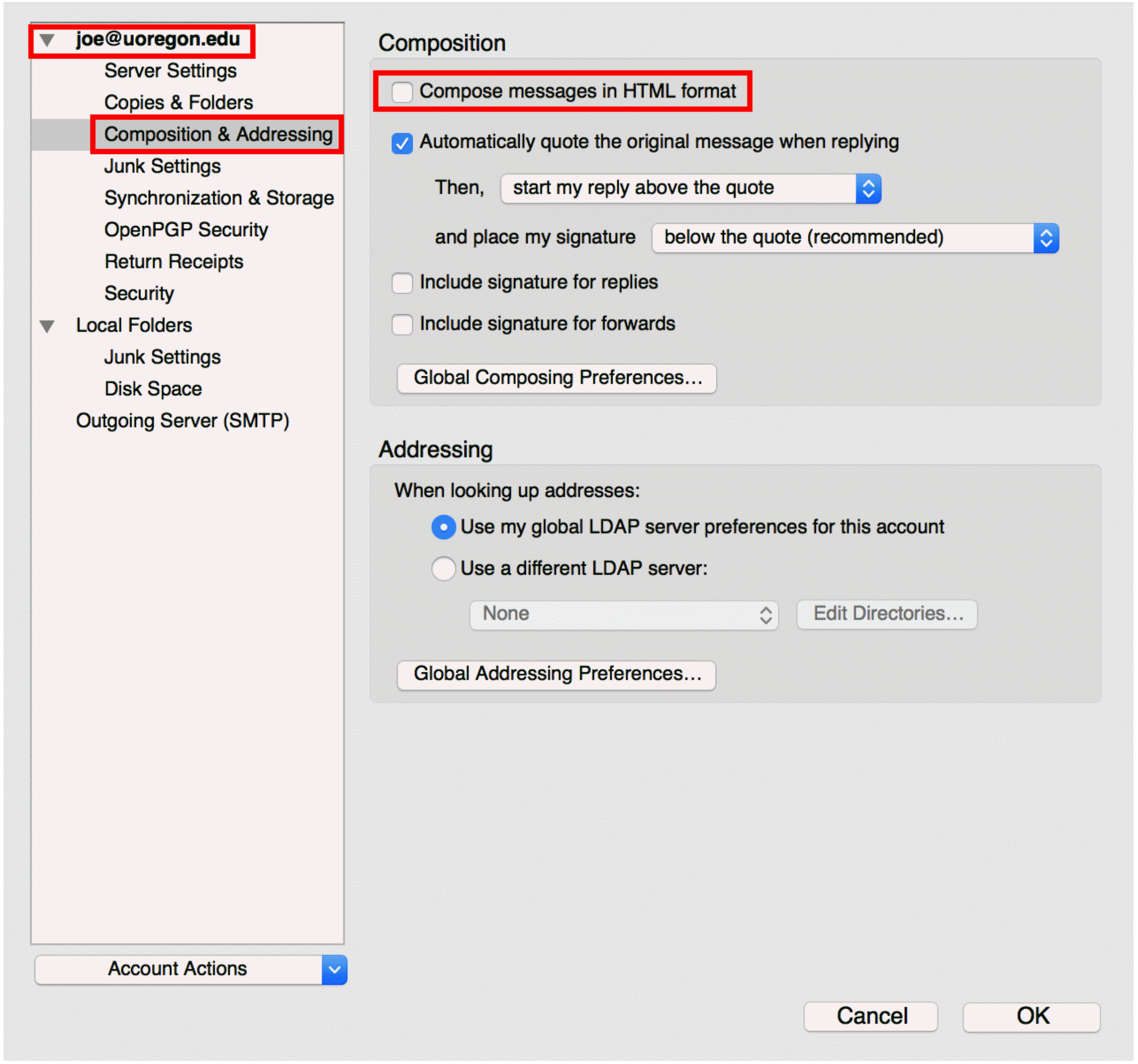
Search messages

Manage message filters

Manage folder subscriptions

Offline settings

NO HTML! Compose in Plain Text ONLY



- joe@uoregon.edu
  - Server Settings
  - Copies & Folders
  - Composition & Addressing
  - Junk Settings
  - Synchronization & Storage
  - OpenPGP Security
  - Return Receipts
  - Security
- Local Folders
  - Junk Settings
  - Disk Space
- Outgoing Server (SMTP)

Account Actions

Composition

☐ Compose messages in HTML format

☑ Automatically quote the original message when replying

Then, start my reply above the quote

and place my signature below the quote (recommended)

☐ Include signature for replies

☐ Include signature for forwards

Global Composing Preferences…

Addressing

When looking up addresses:

[✓ Use my global LDAP server preferences for this account]

Use a different LDAP server:

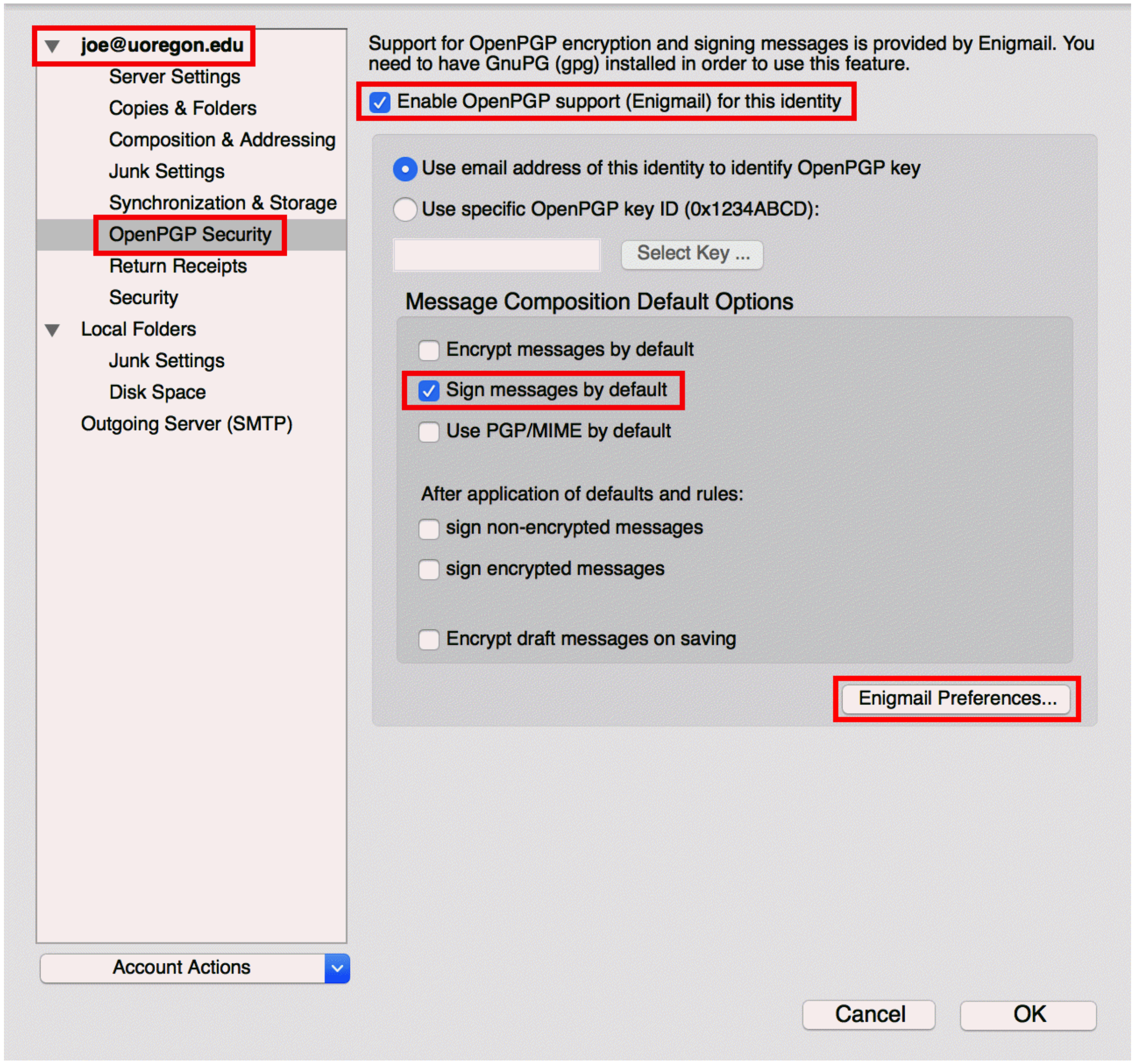
None

Edit Directories…

Global Addressing Preferences…

Cancel OK

Configuring OpenPGP Security



- joe@uoregon.edu
  - Server Settings
  - Copies & Folders
  - Composition & Addressing
  - Junk Settings
  - Synchronization & Storage
  - OpenPGP Security
  - Return Receipts
  - Security
- Local Folders
  - Junk Settings
  - Disk Space
- Outgoing Server (SMTP)

Account Actions

Support for OpenPGP encryption and signing messages is provided by Enigmail. You need to have GnuPG (gpg) installed in order to use this feature.

[✓] Enable OpenPGP support (Enigmail) for this identity

● Use email address of this identity to identify OpenPGP key

○ Use specific OpenPGP key ID (0x1234ABCD):

Select Key ...

Message Composition Default Options

[ ] Encrypt messages by default

[✓] Sign messages by default

[ ] Use PGP/MIME by default

After application of defaults and rules:

[ ] sign non-encrypted messages

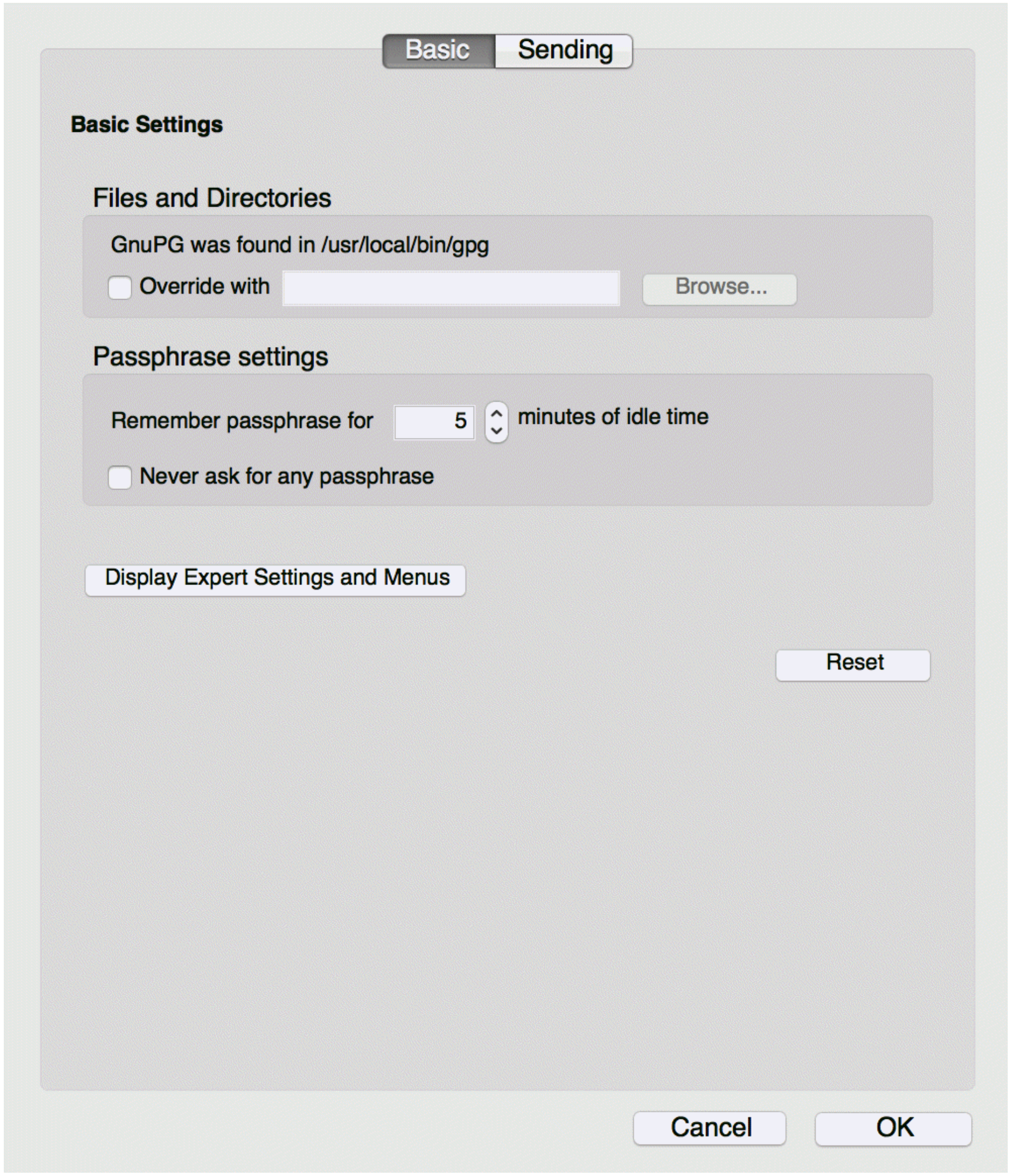
[ ] sign encrypted messages

[ ] Encrypt draft messages on saving

Enigmail Preferences...

Cancel OK

Configuring Enigmail Preferences: Basic Is OK As-Is



Basic Settings

Files and Directories

GnuPG was found in /usr/local/bin/gpg

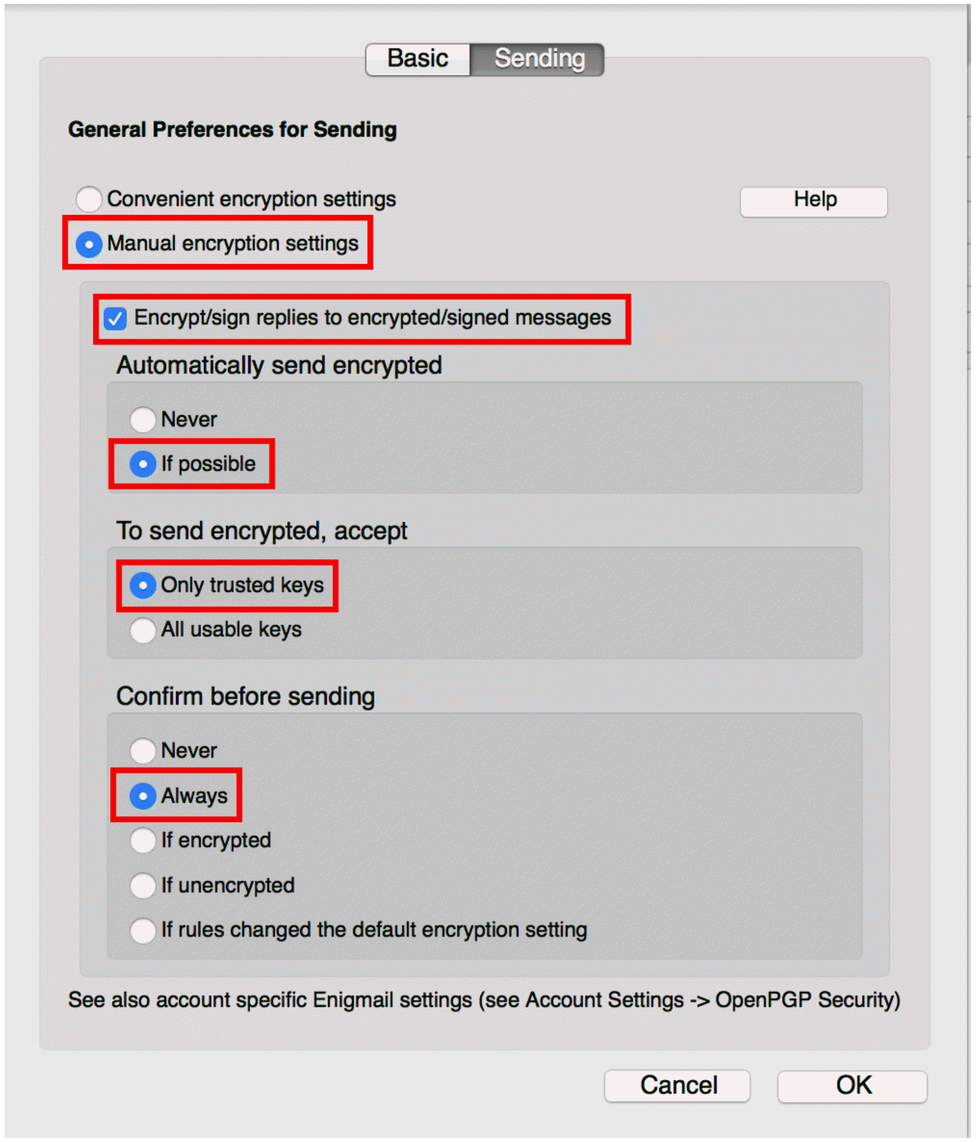
☐ Override with

Passphrase settings

Remember passphrase for 5 minutes of idle time

☐ Never ask for any passphrase

Configuring Enigmail Preferences: Sending Tab Tweaks



General Preferences for Sending

○ Convenient encryption settings
● Manual encryption settings

☑ Encrypt/sign replies to encrypted/signed messages

Automatically send encrypted

○ Never
● If possible

To send encrypted, accept

● Only trusted keys
○ All usable keys

Confirm before sending

○ Never
● Always
○ If encrypted
○ If unencrypted
○ If rules changed the default encryption setting

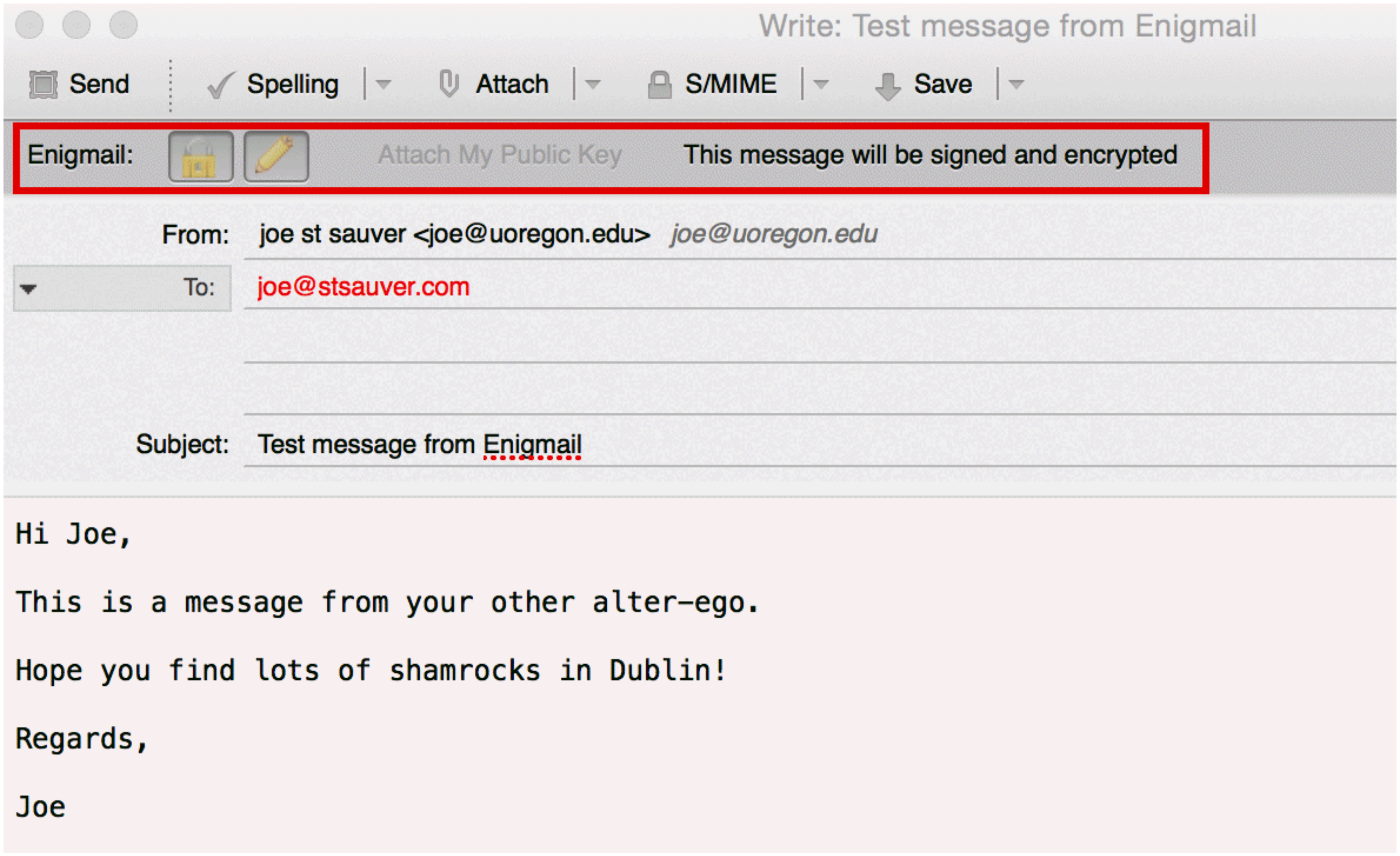
See also account specific Enigmail settings (see Account Settings -> OpenPGP Security)

Notes: Enigmail Can Be Quite Particular

- Enigmail "works best" if your GPG key matches the account you've got configured in Thunderbird, character for character.
- If you want to use an existing keypair (associated with a different userid) for an account you've got configured in Thunderbird, you can go to Enigmail → Key Management and add an additional identity to your existing key pair:

  -- select the key that's going to get the additional identity
  -- right click on that key
  -- click on Manage User IDs
  -- click on Add
  -- provide the new identity
  -- provide your passphrase for the existing ID
  -- select one of the IDs to be "primary"

Write A Message With Thunderbird & Enigmail


Write: Test message from Enigmail
Send
Spelling
Attach
S/MIME
Save
Enigmail:
Attach My Public Key
This message will be signed and encrypted

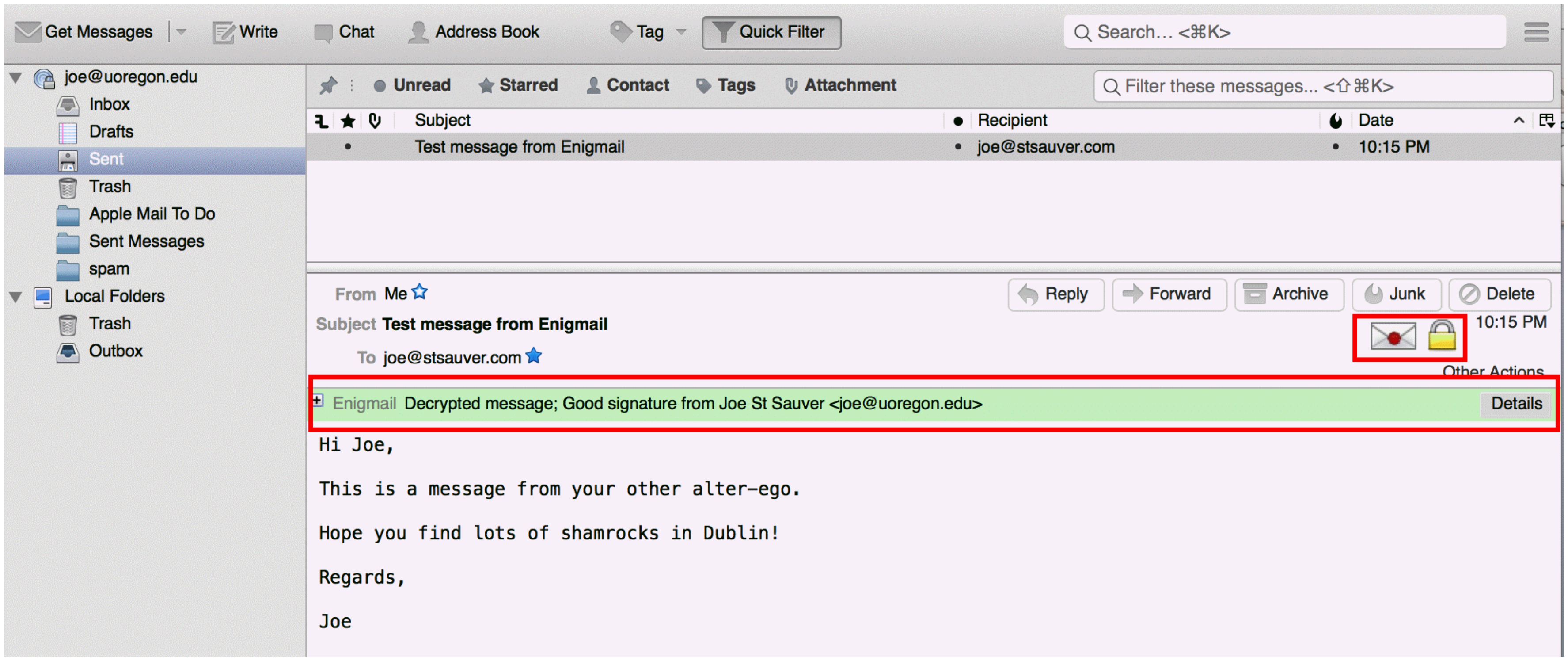
From: joe st sauver <joe@uoregon.edu> *joe@uoregon.edu*

To: joe@stsauver.com

Subject: Test message from Enigmail

```
Hi Joe,

This is a message from your other alter-ego.

Hope you find lots of shamrocks in Dublin!

Regards,

Joe
```

Receive A Message Using Thunderbird & Enigmail



Test message from Enigmail joe@stsauver.com 10:15 PM

From Me
Subject Test message from Enigmail
To joe@stsauver.com
10:15 PM

Enigmail Decrypted message; Good signature from Joe St Sauver <joe@uoregon.edu>

```
Hi Joe,

This is a message from your other alter-ego.

Hope you find lots of shamrocks in Dublin!

Regards,

Joe
```

"But Joe! I Use A <u>Webmail</u> Account!"

- There are solutions for that circumstance, too.
- For example, many popular webmail account providers allow IMAP clients (such as Thunderbird) to connect to the "webmail" account. You don't HAVE to use the web email interface. You can use Thunderbird instead.
- However, if you like using a webmail account, as long as you're using your own laptop with Firefox or Chrome, you can use Mailvelope to add GPG support to most popular webmail interfaces.

  See https://www.mailvelope.com/ for more information

"Any Other Options I Could Consider?"

- Another relatively new PGP/GPG convenience product you might want to experiment with is Mailpile, see https://www.mailpile.is/
- Mailpile is under active development, so be sure you're comfortable working with beta code
- Read the known issues at https://github.com/mailpile/Mailpile/wiki/Release-Notes-201507-Beta-III and the security roadmap at https://github.com/mailpile/Mailpile/wiki/Security-roadmap

KEY SIGNING

PARTY

That's About All The Formal Presentation For Today

- I suspect you're full up to the gills at this point. That's okay. You've learned a lot today! We'll skip doing a summary here...
- By now you may have signed at least one class partner's account.
- If we have time, I'd like to offer the chance for other people to also arrange to have their keys signed.
- This is often done at a "PGP key signing party." See for example

  http://www.cryptnet.net/fdp/crypto/keysigning_party/en/keysigning_party.html

OPTIONAL: <u>IF</u> You'd Like To Participate

- Upload your public key to the keyserver so others can easily find it
- Write your name, email address, and the fingerprint for your key on a slip of paper. If you want one other person to sign your key, make one such slip. If you're hoping to have six other people sign your key, make six such slips, etc. **PRINT *LEGIBLY*, PLEASE!**
- Ask a colleague to sign your key. **IF THEY'RE WILLING:**
  -- give them one of your slips
  -- show them your passport or driver's license
  -- your colleague makes a notation that they've confirmed your identity on the slip they've received from you, ***saving that slip***
- If you've agreed to sign someone's key, sometime in the next day or so, download a copy of their key, check to make sure the name and fingerprint match your slip for them, sign their key, and email it back to them. **PLEASE *DO IT* IF YOU *SAY YOU'RE GOING TO!***

Thanks for Coming To Today's Training!

- Are there any questions?
- Please also remember to fill out the evaluations!
- Copies of this presentation are available online at

  https://www.stsauver.com/joe/pgp-tutorial-sfo/

  and may be freely shared with others who may be interested (even outside of M3AAWG)