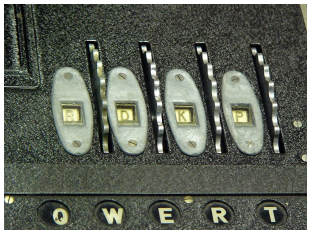


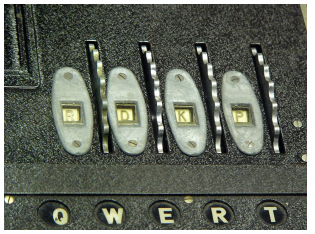
Velkommen til

Cryptoworkshop hvad er det?

Henrik Lund Kramshøj hlk@kramse.org

PDF available kramshoej@Github: crypto-workshop-2015

agenda

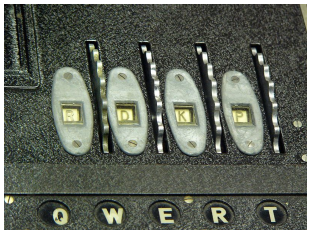


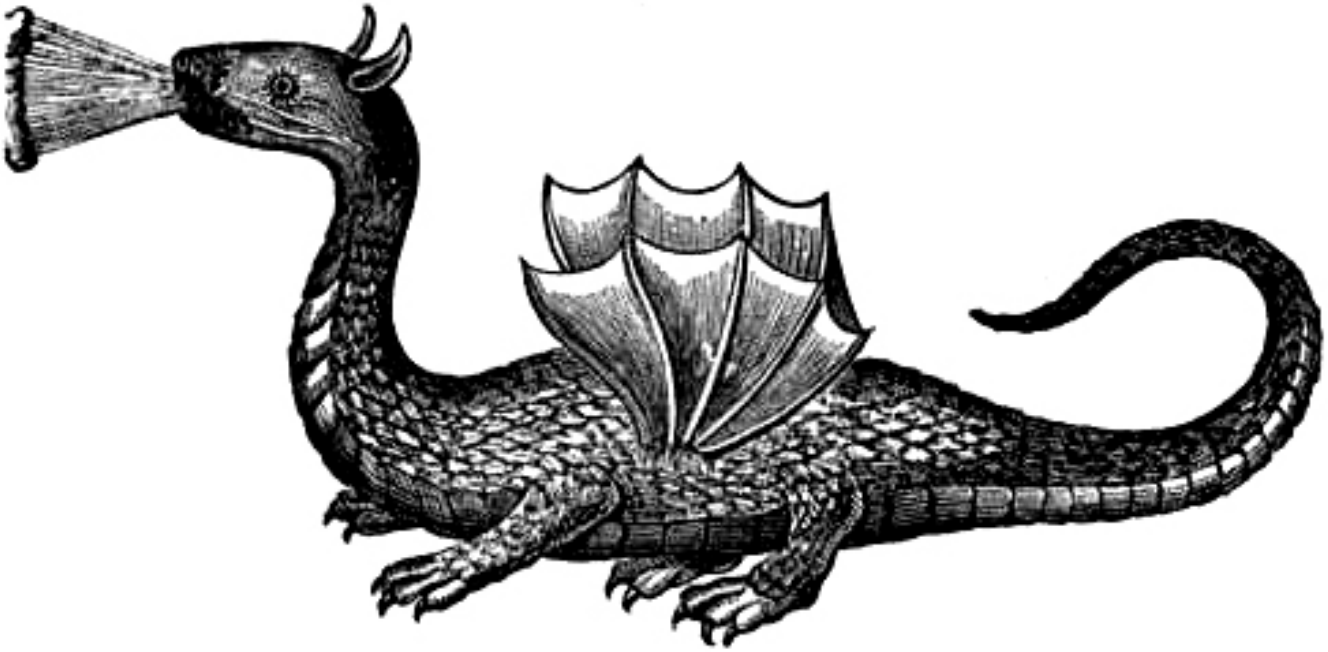
Planen for Cryptoworkshop

- Kort introduktion cryptoworkshop - denne præsentation
- Minicryptoworkshop 10min Textsecure, Red Phone og Whispersystems Signal
- Anonymiseringsværktøjet Tor
- Minicryptoworkshop 10min Torbrowser install
- Sikker email med OpenPGP - PGP/GPG/GPGTools
- Minicryptoworkshop 30min PGP install

Tak for praktiske hjælp fra `https://bitbureauet.dk/` Twitter: @bitbureauet

Advarsel



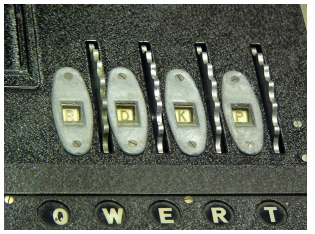


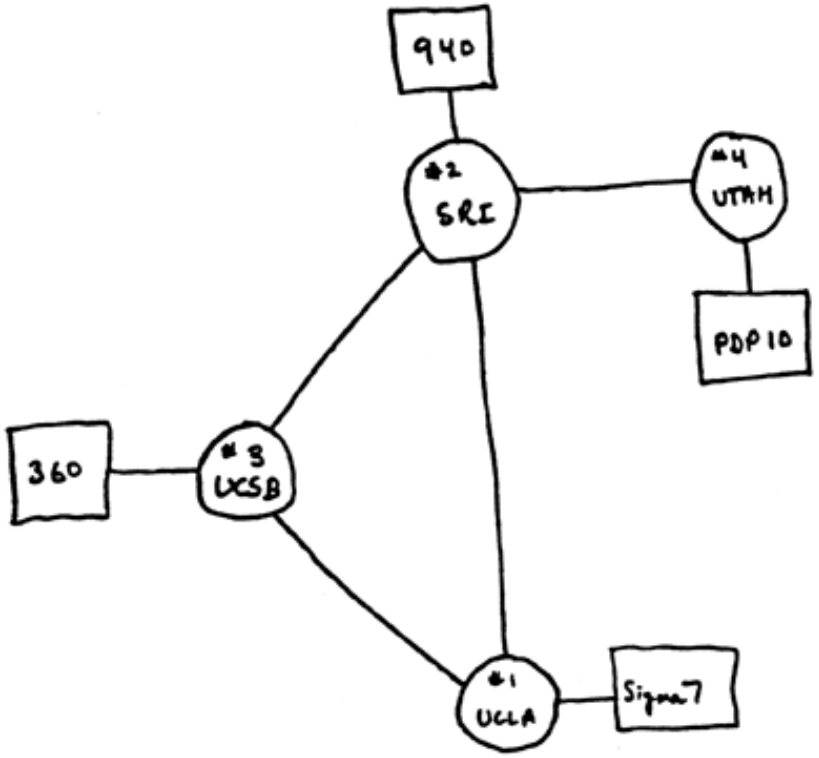
Denne aften er en smagsprøve - introduktion

Du skal ikke føle dig sikker før du forstår programmerne bedre.

Brug, læs og lær - det er vigtigt at lære det at kende før man skal bruge det.

Internet Internals: A short story

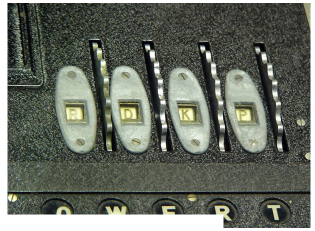


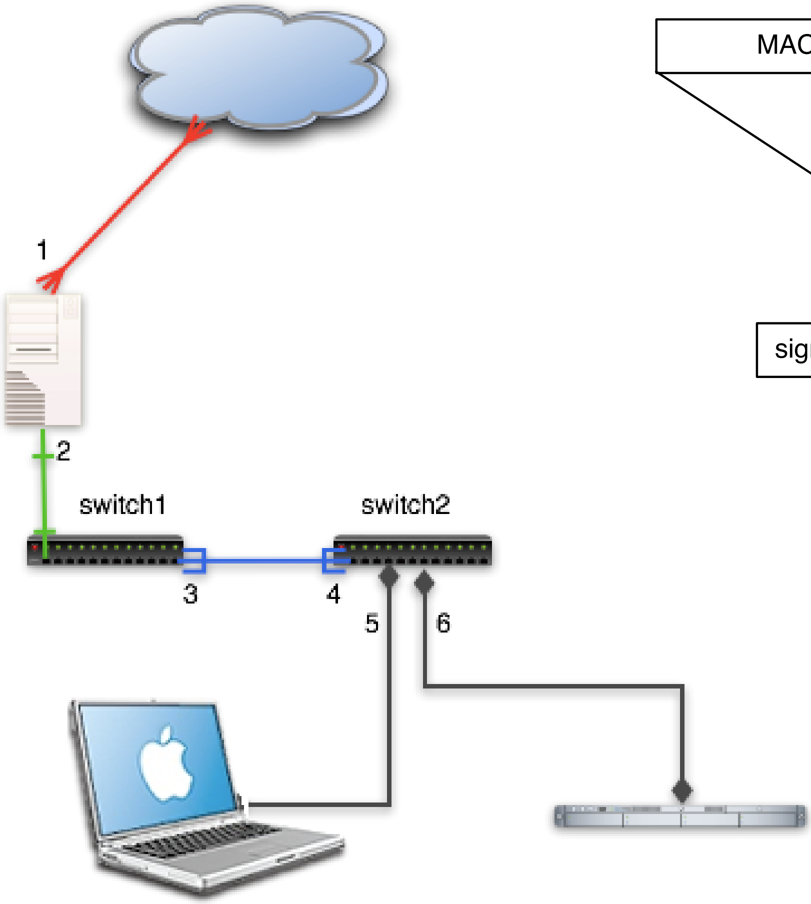


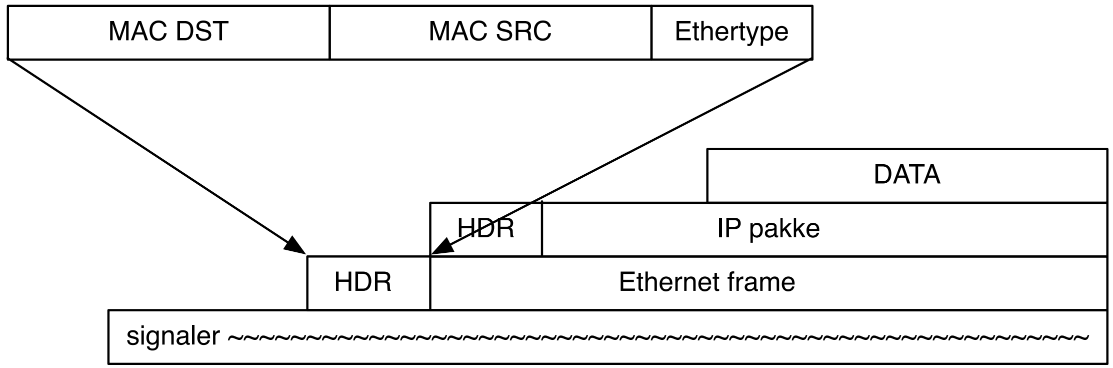
1969: ARPANET 4 nodes

Present some internet internals, what is it?

TCP/IP basics





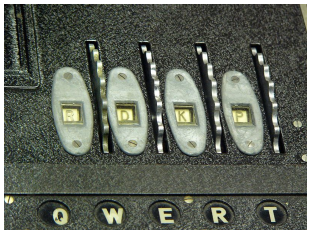


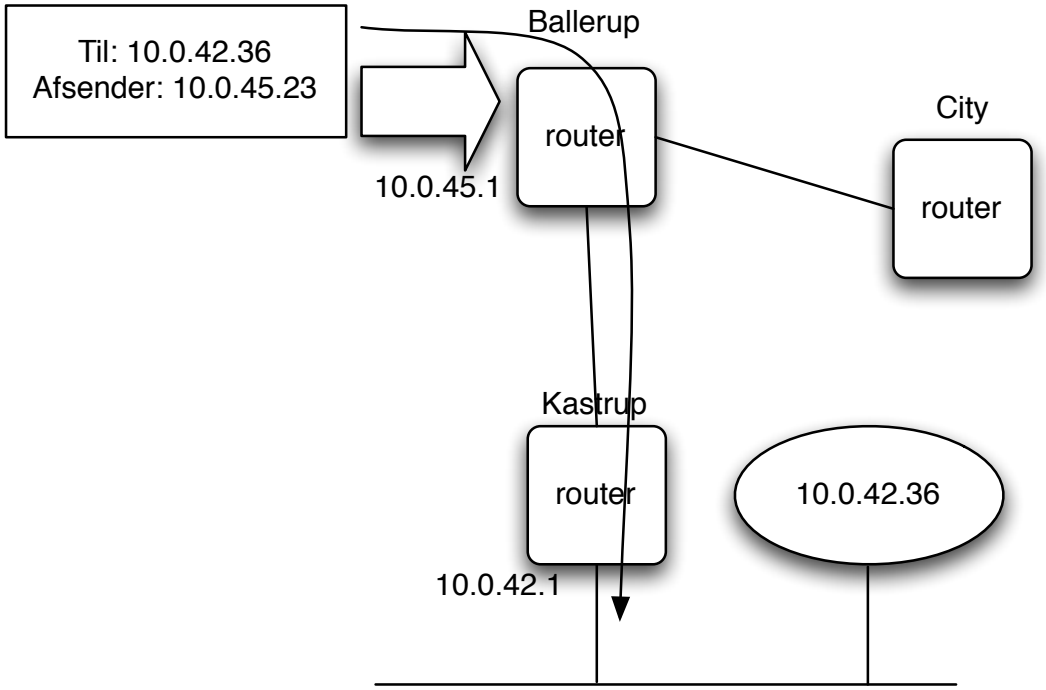

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|Version|  IHL  |Type of Service|          Total Length         |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|         Identification        |Flags|      Fragment Offset    |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|  Time to Live |    Protocol   |         Header Checksum       |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                       Source Address                          |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                    Destination Address                        |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                    Options                    |    Padding    |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+

                  Example Internet Datagram Header
```

Internet Protocols since approx 1983

Routing

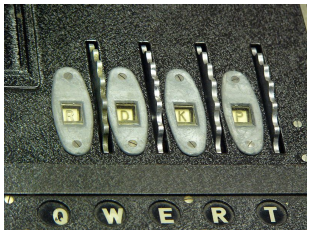


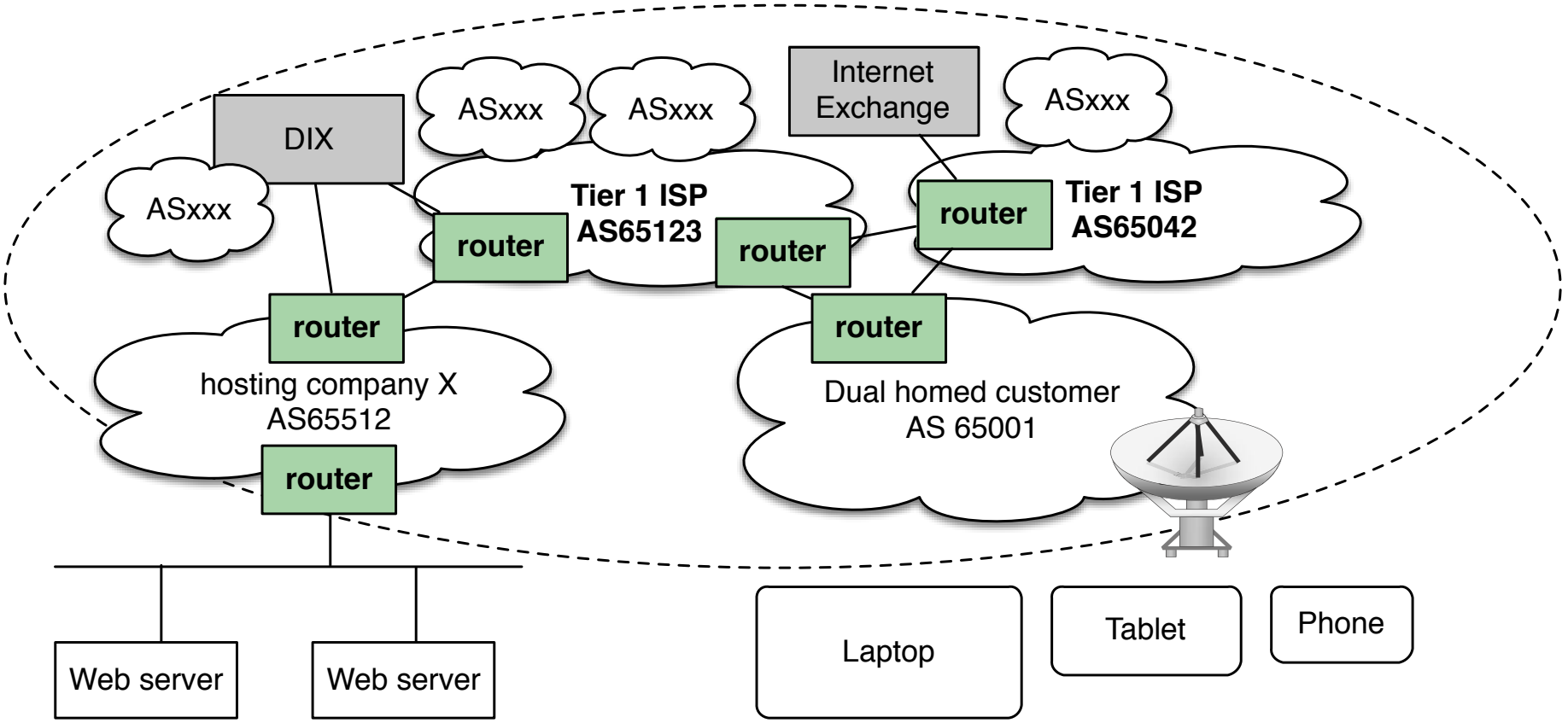


Soo simple ☺

Dont forget IP routing is based on longest match in the routing table

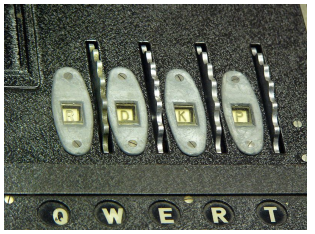
Internet core today AS numbers





Also pretty pictures in *Intercountry BGP As Topology* Martin J. Levy
`http://oldwww.dknog.dk/dknog3/agenda`

BGP changes



> A good analogy for the development of the Internet is that of constantly renewing the individual streets and buildings of a city, rather than razing the city and rebuilding it. The architectural principles therefore aim to provide a framework for creating cooperation and standards, as a small ”spanning set” of rules that generates a large, varied and evolving space of technology.

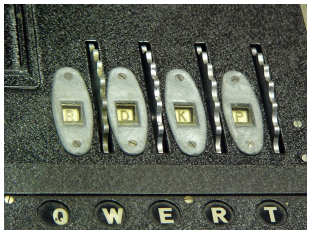
Source: RFC-1958

- Constant change
- Now 50.000 ASNs announced, and 80.000 allocated
- Now 515.000 prefixes - reach 550.000 routes/prefixes in 2015?

Movietime `https://stat.ripe.net/94.126.176.0/21#tabId=routing`

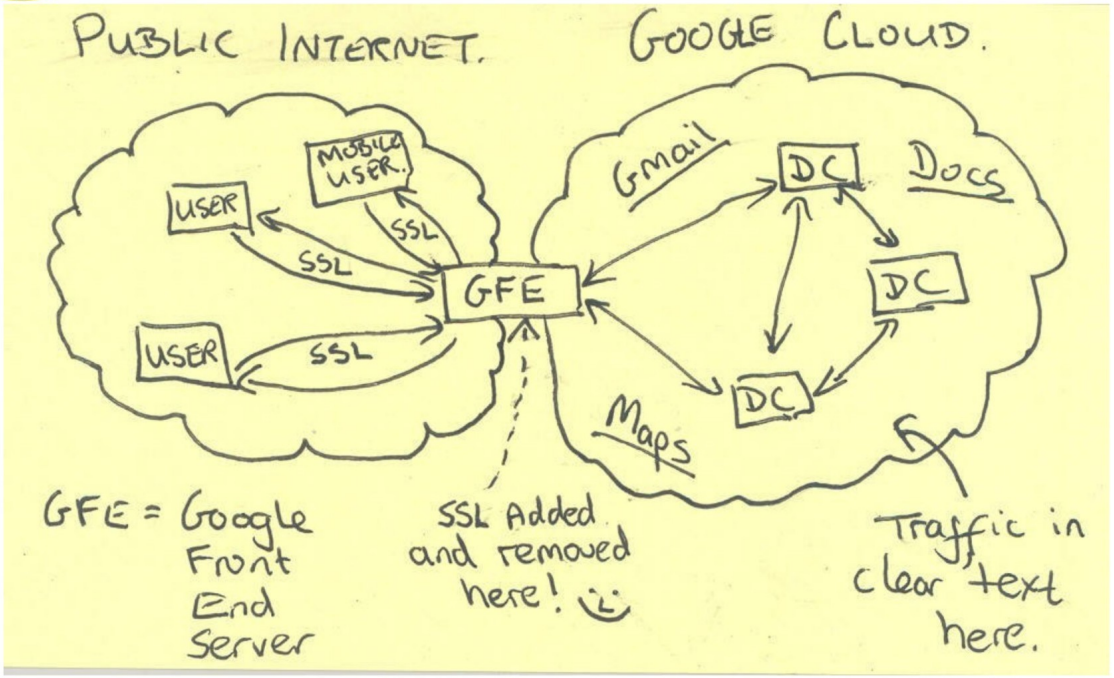
Lots of data to be found at `http://bgp.potaroo.net/`

Passende paranoia



TOP SECRET//SI//NOFORN

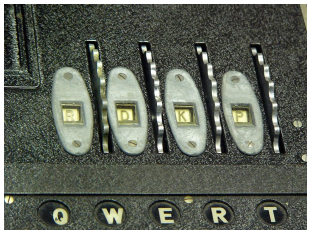
Current Efforts - Google



TOP SECRET//SI//NOFORN

SSL (encryption) added and removed here

Solidaritetskryptering



Hvorfor skal vi kryptere?

Køn

Seksualitet

Tro religion hatecrimes

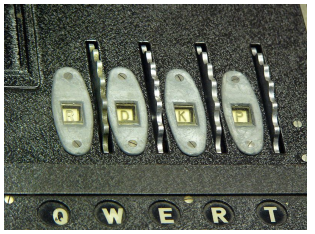
Politisk overbevisning, eller blot aktiv

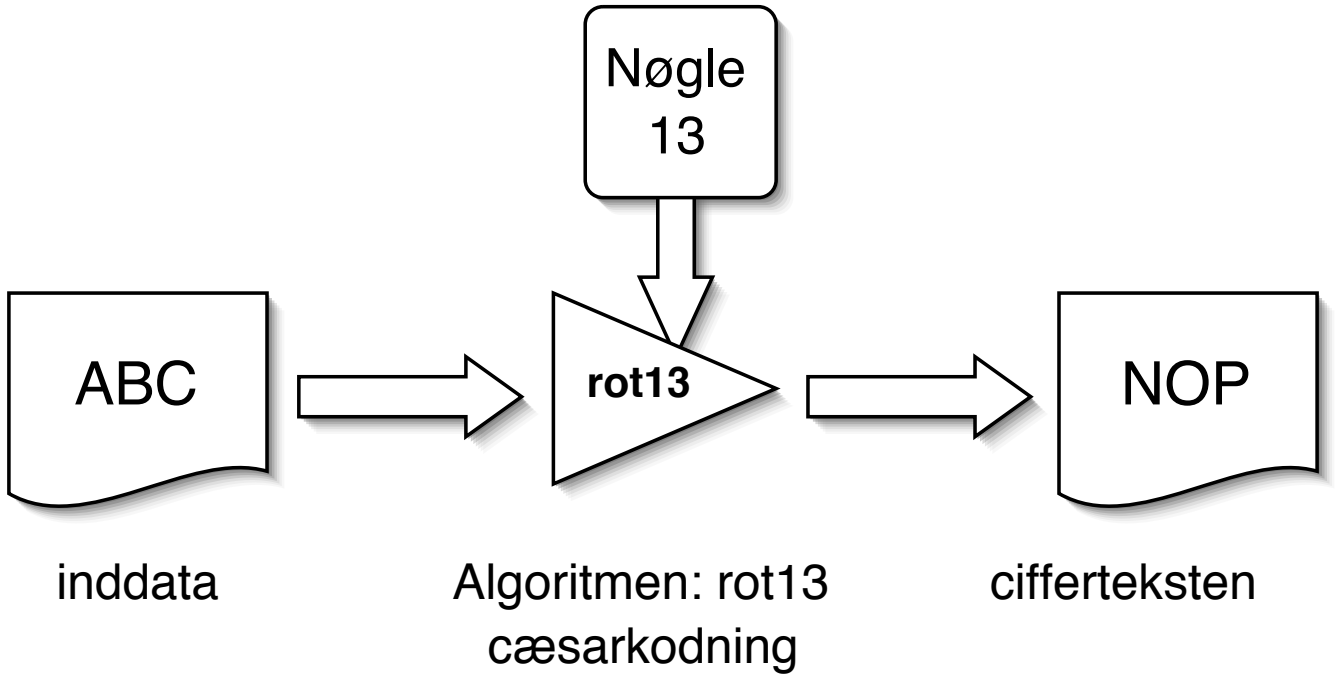
Whistleblowers soldater diplomater

Du bestemmer ikke hvem der diskrimineres eller trues i andre lande

Når vi krypterer hjælper vi andre! **Solidaritetskryptering**

Kryptografi

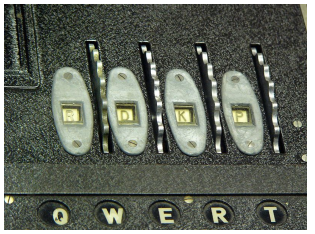


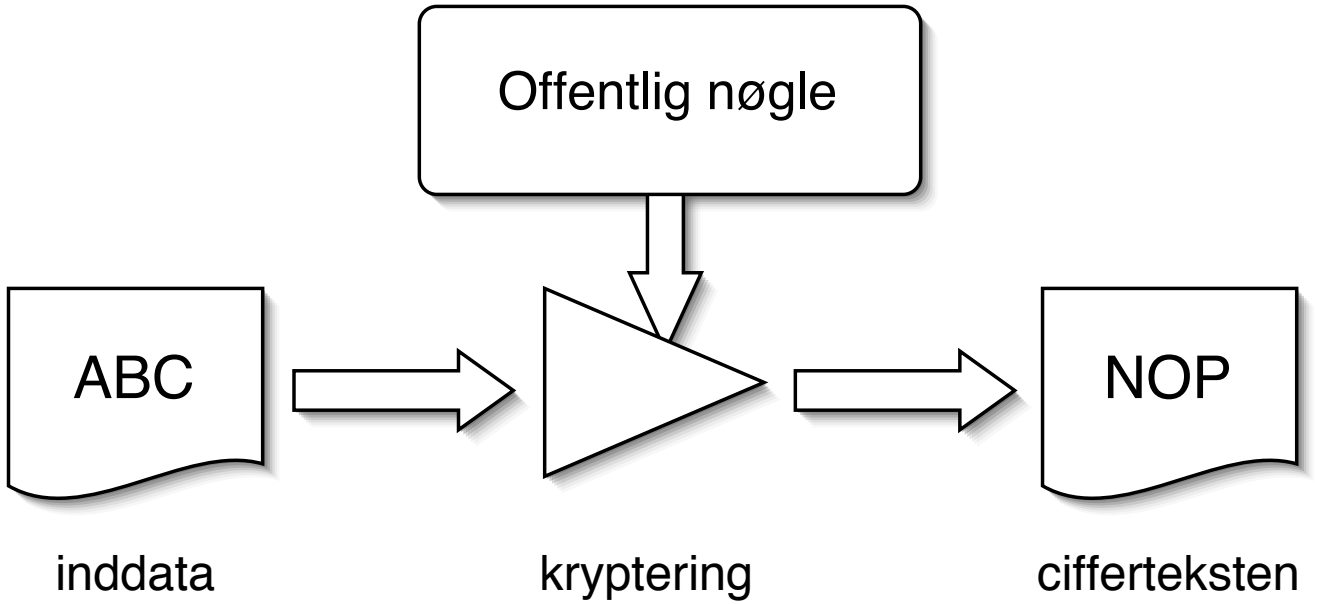


Kryptografi er læren om, hvordan man kan kryptere data

Kryptografi benytter algoritmer som sammen med nøgler giver en ciffertekst - der kun kan læses ved hjælp af den tilhørende nøgle

Public key kryptografi - 1

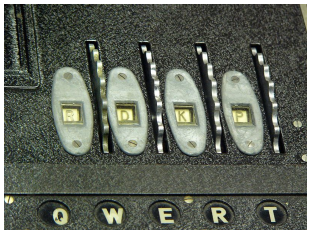


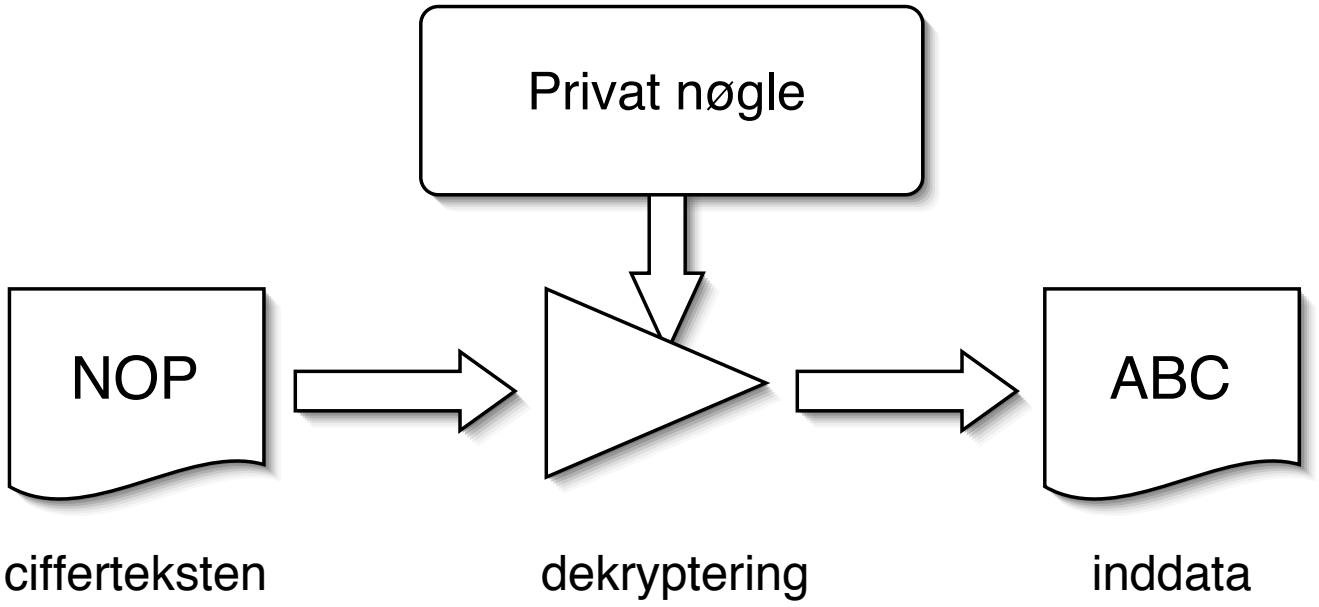


privat-nøgle kryptografi (eksempelvis AES) benyttes den samme nøgle til kryptering og dekryptering

offentlig-nøgle kryptografi (eksempelvis RSA) benytter to separate nøgler til kryptering og dekryptering

Public key kryptografi - 2

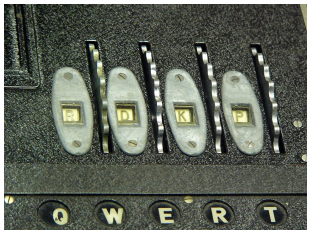


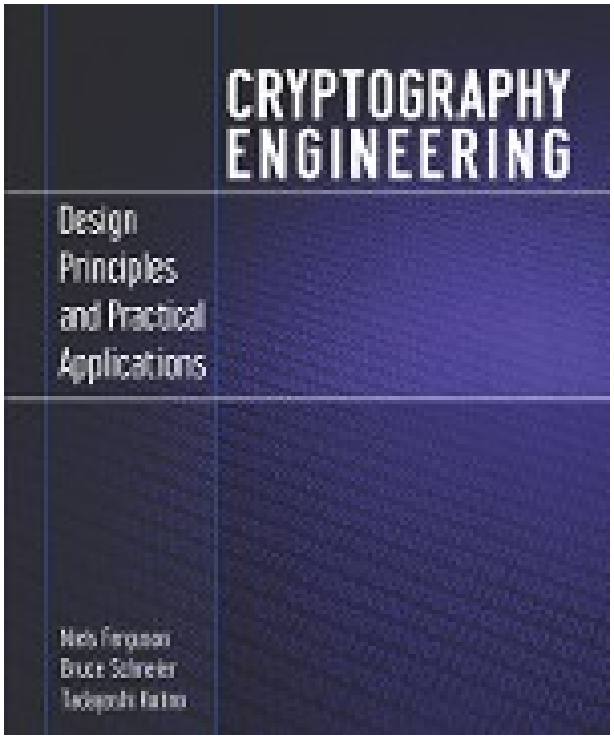


offentlig-nøgle kryptografi (eksempelvis RSA) bruger den private nøgle til at dekryptere

man kan ligeledes bruge offentlig-nøgle kryptografi til at signere dokumenter
- som så verificeres med den offentlige nøgle

Kryptering: Cryptography Engineering



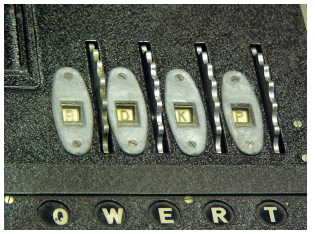


Cryptography Engineering by Niels Ferguson, Bruce Schneier, and Tadayoshi Kohno

https://www.schneier.com/book-ce.html

Kryptering sikrer fortrolighed og integritet af beskederne

Hvad er cryptoworkshop



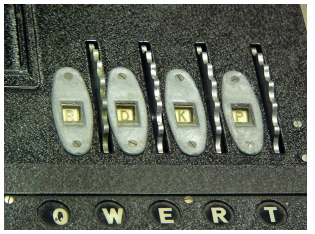
Udspringer af CryptoParty bevægelsen som afholder kryptofester
https://en.wikipedia.org/wiki/CryptoParty

Iaften vil vi fokusere på disse:

- Android: TextSecure og Redphone
- iPhone IOS installer Signal
- Torproject - Tor Browser Bundle
- OpenPGP - PGP/GPG Thunderbird Enigmail eller Mac OS X GPGtools

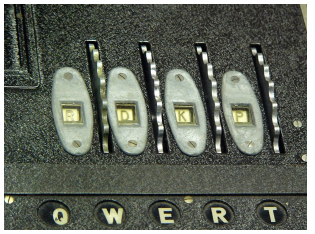
Note: følg også https://cryptoparty.dk/

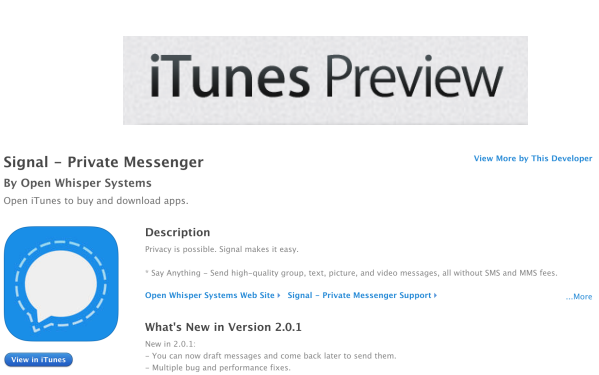
Andre kilder til tools

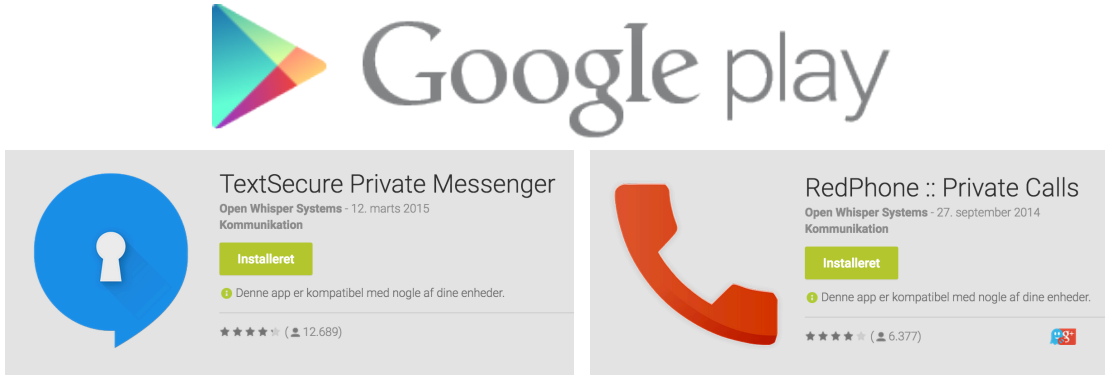


- Surveillance Self-Defense EFF guide `https://ssd.eff.org/`
- The Guardian Project Mobile Apps and Code You Can Trust
  `https://guardianproject.info/`
- Se citizenfour filmen - fik velfortjent Oscar!
  `http://www.wired.com/2014/10/laura-poitras-crypto-tools-made-snowden-film-possible/`
- Information Security for Journalists
  `http://www.tcij.org/resources/handbooks/infosec`

10minute cryptoworkshop







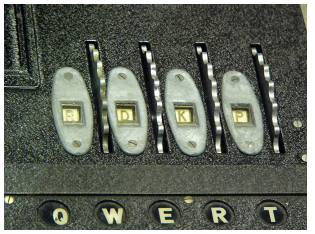
Forsøg, hvor mange kan kommunikere sikkert indenfor 10min?

- Android installer TextSecure og Redphone
- iPhone IOS installer Signal

Send krypteret SMS til en anden herinde og sig YEAH!

og brug så krypteret SMS fremover ☺

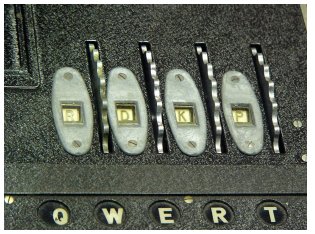
Tor project anonym webbrowsing

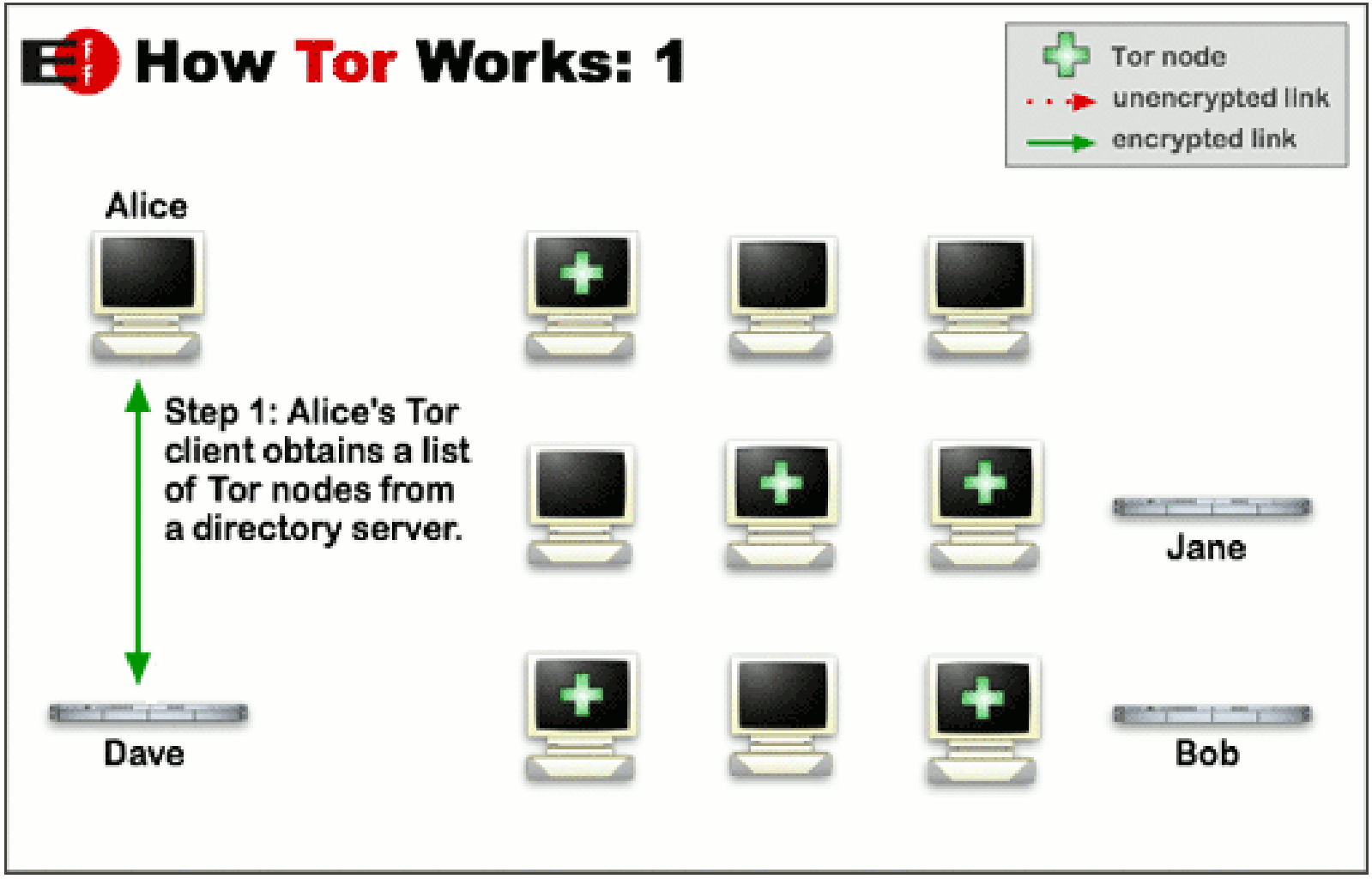


https://www.torproject.org/

Der findes alternativer, men Tor er mest kendt

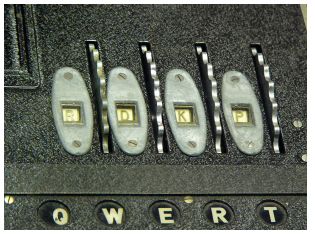
Tor project - how it works 1

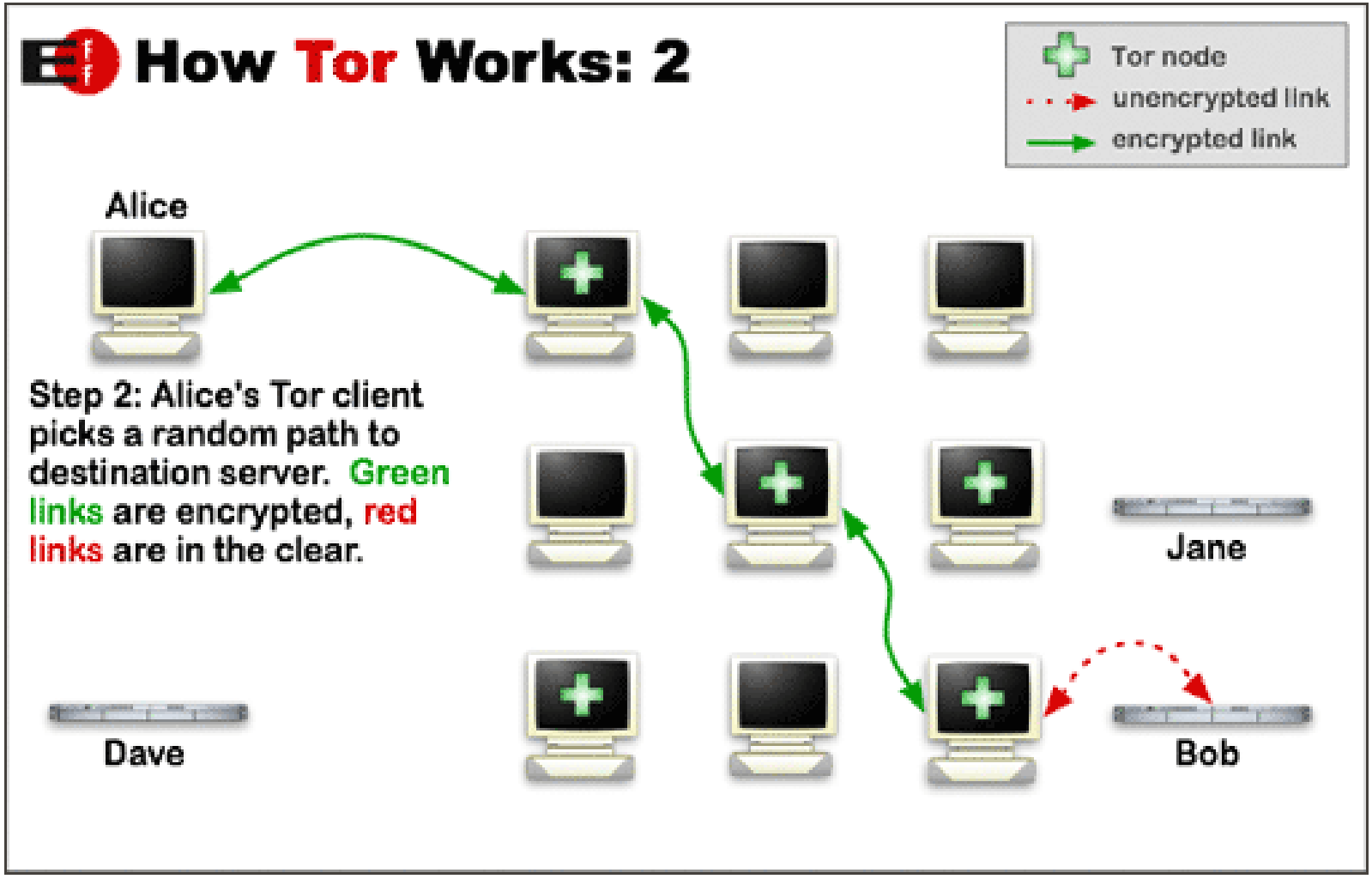




pictures from https://www.torproject.org/about/overview.html.en

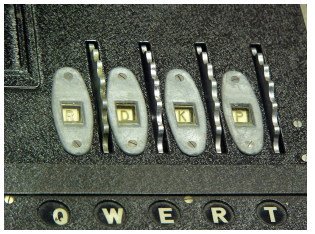
Tor project - how it works 2

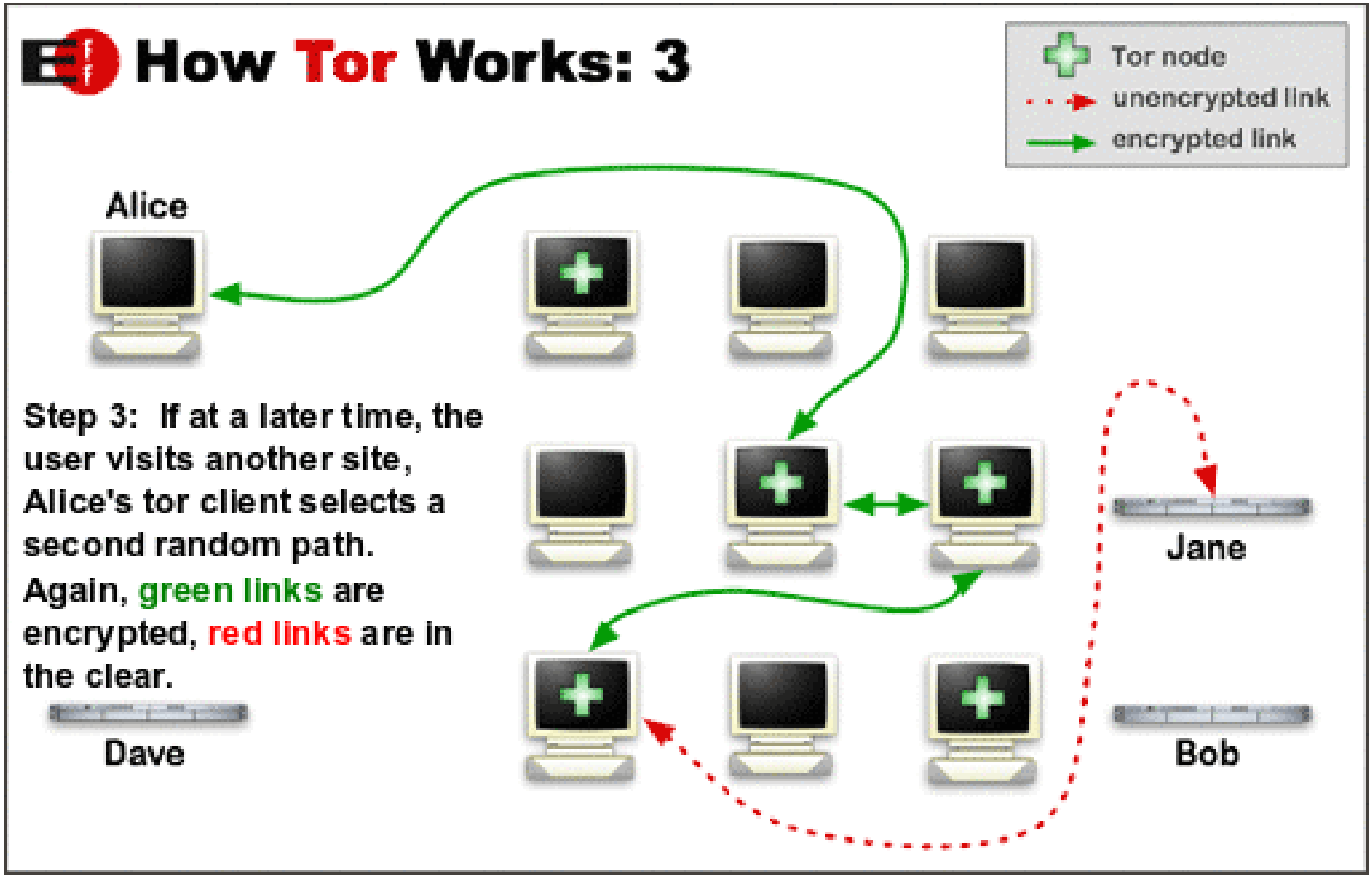




pictures from https://www.torproject.org/about/overview.html.en

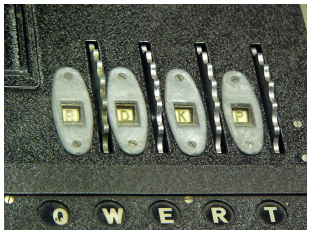
Tor project - how it works 3





pictures from https://www.torproject.org/about/overview.html.en

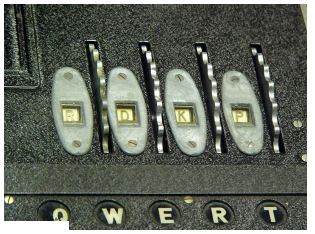
Tor project install



Der findes diverse tools til Tor, Torbutton on/off knap til Firefox osv.

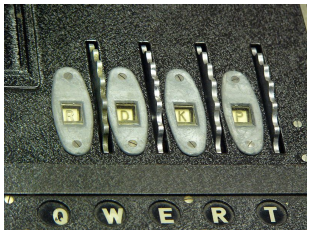
Det anbefales at bruge Torbrowser bundles fra `https://www.torproject.org/`

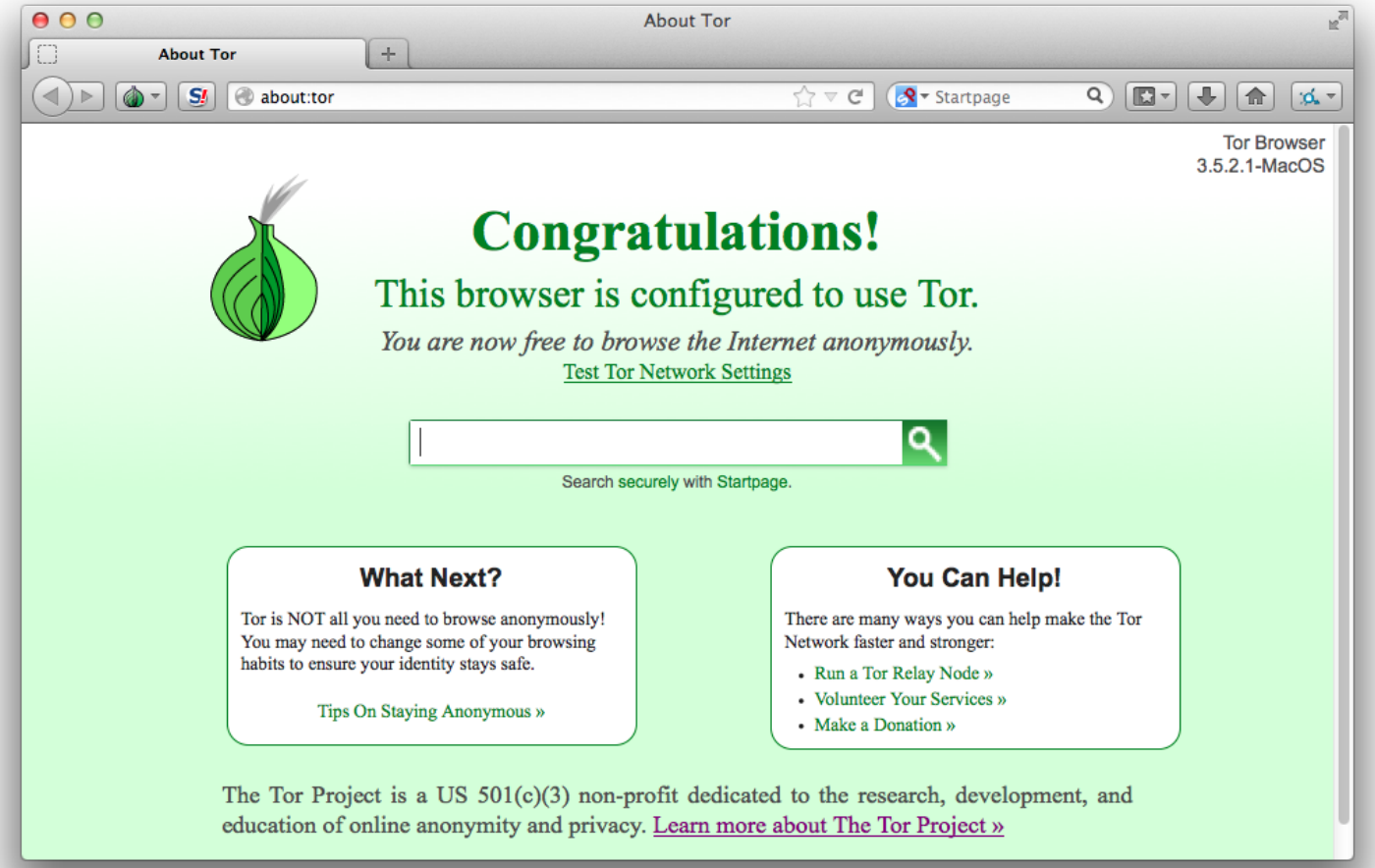
Torbrowser - outdated



Hov den mangler opdatering!

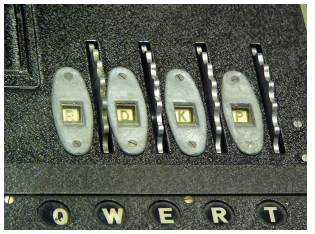
Torbrowser - anonym browser

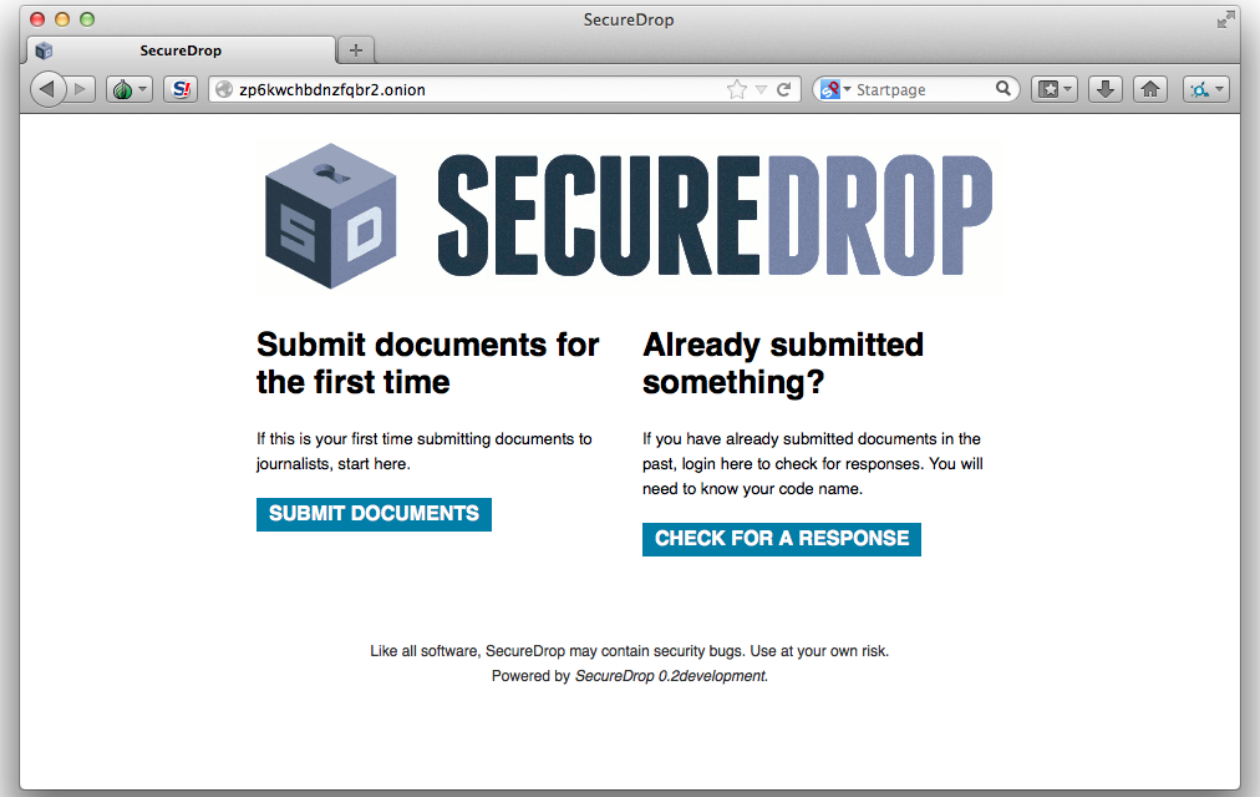




Mere anonym browser - Firefox i forklædning

Torbrowser - hidden service web site

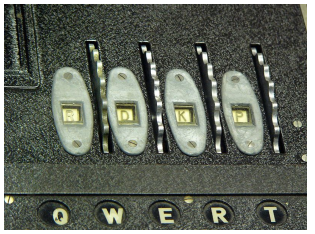


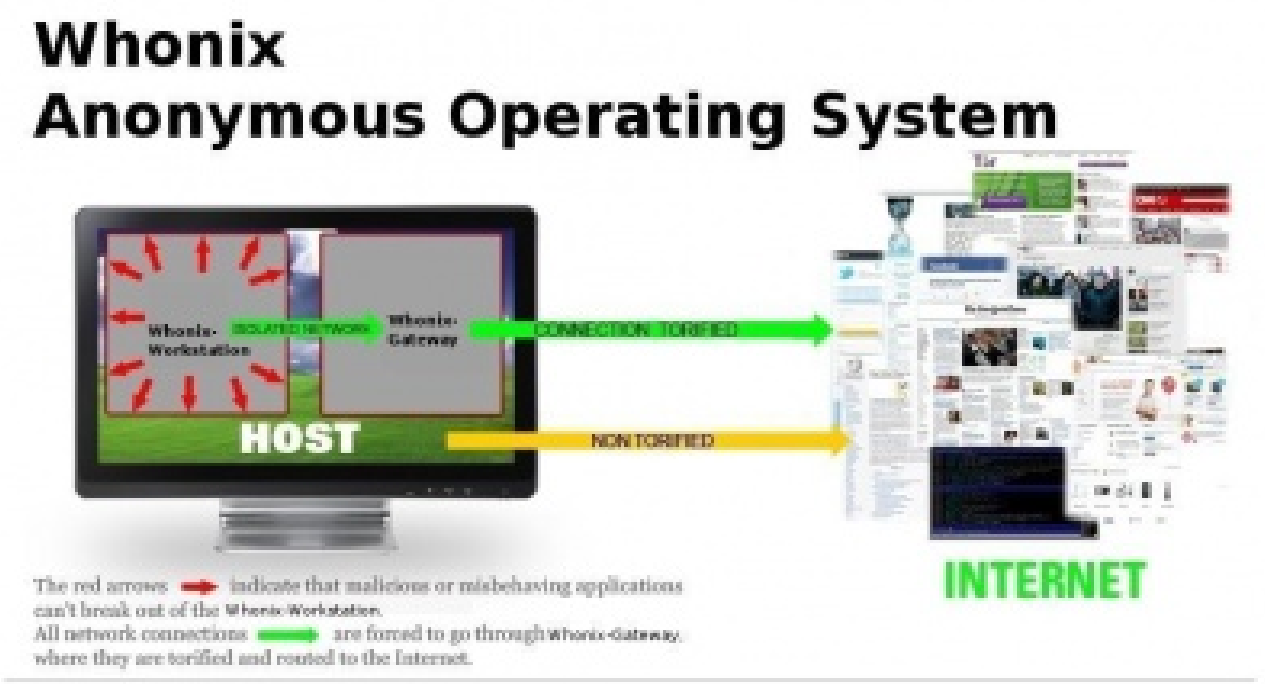


.onion er Tor adresser - hidden sites

`http://www.radio24syv.dk/dig-og-radio24syv/securedrop/`

Whonix - Tor to the max!

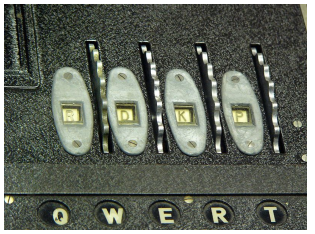


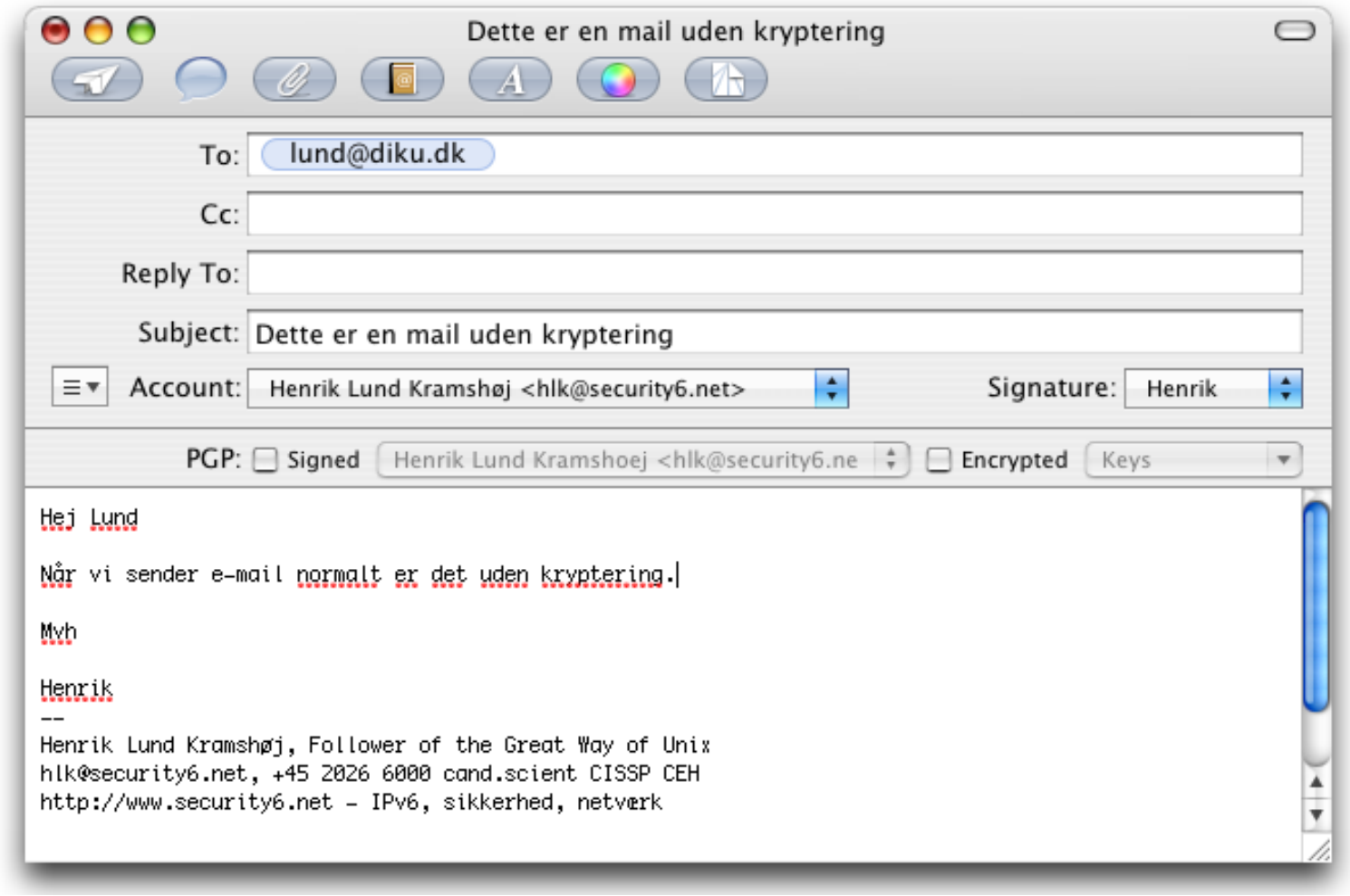


Whonix is an operating system focused on anonymity, privacy and security. It's based on the Tor anonymity network[5], Debian GNU/Linux[6] and security by isolation. DNS leaks are impossible, and not even malware with root privileges can find out the user's real IP. `https://www.whonix.org/`

Torbrowser er godt, Whonix giver lidt ekstra sikkerhed

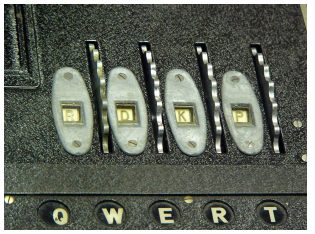
Email er usikkert

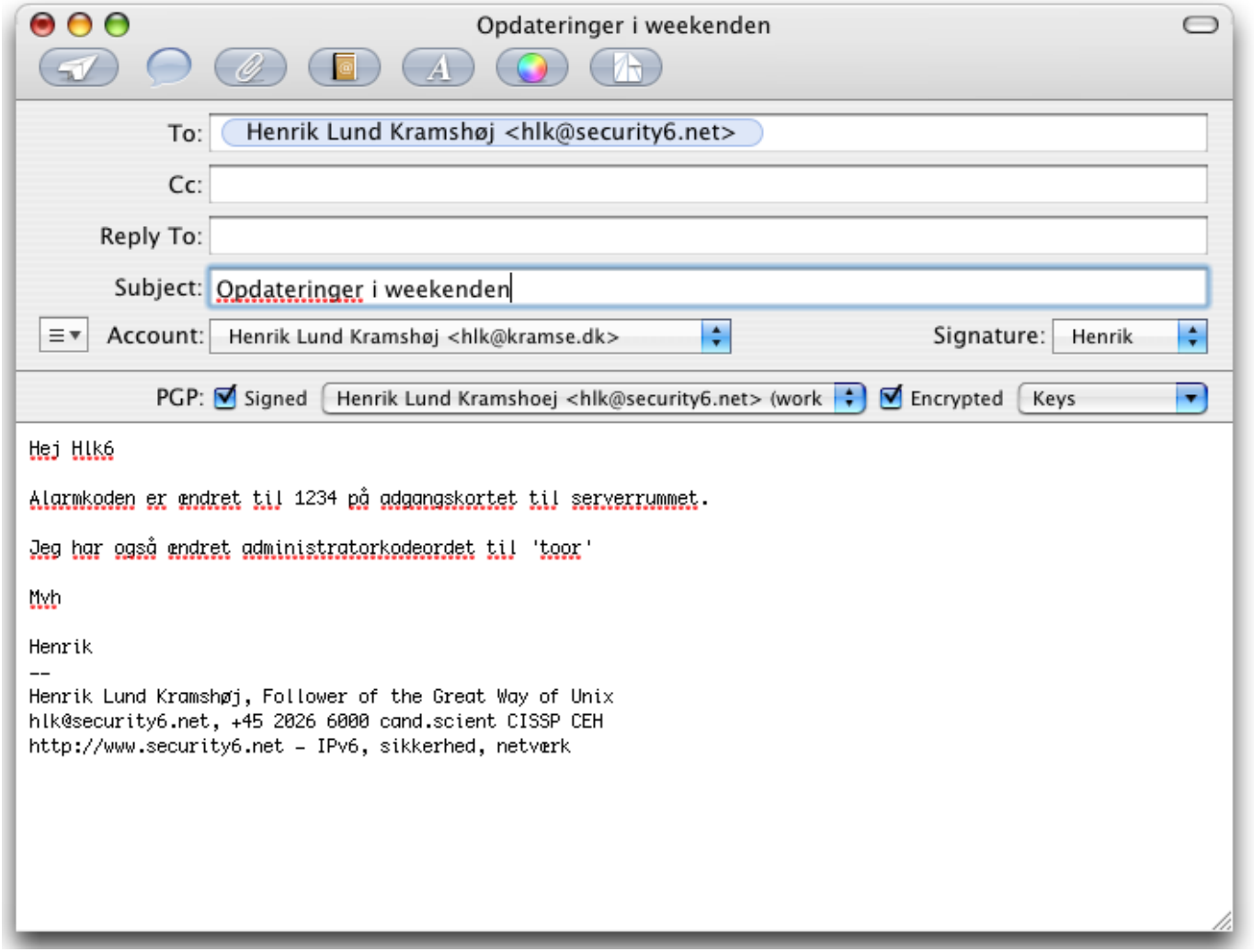




Email uden kryptering - er som et postkort

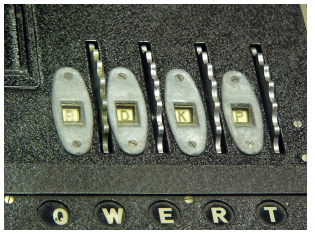
Email med kryptering - afsendelse





En sikker krypteret email er ikke sværere at sende

Krypteret Email under transporten



The message has been encrypted with PGP. Decrypt

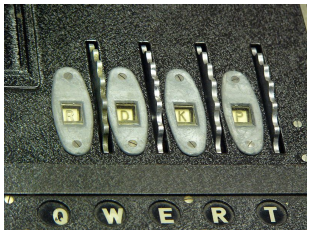
From: Henrik Lund Kramshøj <hlk@kramse.dk>
Subject: **Opdateringer i weekenden**
Date: 24. sep 2007 18.44.17 GMT+02:00
To: Henrik Lund Kramshøj <hlk@security6.net>

```
-----BEGIN PGP MESSAGE-----
Version: GnuPG v1.4.7 (Darwin)

hQIOA/pgHFBtCObmEAf/SdZM18YV6MST6ohCFZED0fsbtSH8t84IZz3+rLG2sYmi
Rdjo1bMsnvwAG84zsyBGk/kAcAcF28uflHC0Or1qq621xSLeDJv16YQBbJhNCxAE
o+ZCsstj6EKJTj5Zhlj5BYK4KyD75AlmJ2VgbbHekglu5noZZpjzL0u3zMJQhMpL
yPtUJNeBW1Cj+taeo/C2aRuqbtbVZBDWcNL8day+MlJ0LWc0ULqd1vRjQgc0oy3l
+ZnZb6QLeprBSTRJiSpFRJZICY/052wuUbyw+Mclxa7CLOHI8EayS4WAuYAaweyX
Hjd101ZRCluuNBsrGZPBiSUGGUNskMkMn4OBCsCjJAgAljeW55nxN6LfBwV9EB75
B1BwqLwcNbvwbF5Qt+ioVo/HYlIB+we4Q0L2ht0BXxHC5DqxtOTkVimLwVkkLrdW
ET5CMvtLpC9rA70xG0YkNlHOZilF7YkBL5eAm1FnU2dLBtUMVijq8Bv6AG9Yl/D8
zH1Rthi2GN2LJtRJRGwEuzpZQbhxJX50EFZoG7tnaxuDYWD+PhwHZ6WmMxfVIoER
4d704HHYPft03Gxa5jnzs0NuS58YAjN4TjfiCohRlRPlQpUsO+n/63caRucgj0FT
sEPkW6ugYRkg4SMETm5p1Vb7Rzk+GFxLv+s6hjJQ0kMkZag3LJ9elW6itEi1PMl4
PdLA0QHCkyy2WVXaJzTAZCNs8L5OHvo1MFKavlqevg4RWILeVVuZ4ix/fAqx4/jD
LCf+xsjEhqP/ctYsZVRJHNP6vP0RaExodm3bDbKk9BYaXnyeuK+t/C54sXOe8L71
9MOe6cn7S+K0Yr+6N2ALAOvTp3VAiUh49pm48N7UtHHUEwxSKohER/inoCafSThm
EJ+b6yjN0GzaTR48lSO3IS2Lu1l8l+Nej0BeqPjMVipsf41cCKPxTE9R0/kmBt1E
nkZIQ5NH6Wisnz8GAu6ZF+DuAMV4/HeXnv3v+ALr4BZD9tsOvYgLd5NWhcbkidme
69UCFqTFDlmqAhJpOUgydiAi6IymZfHgLlU7oJ7++yD1Iozgkd9g+dnx4nO1bTho
DK3ufoQps4hlyBA7q7DUROyPs4ZpTxTbasNEHxw9YZmFzrJtXHSQQXRJNHspZoa6
Hnk4n2lH7cdWxlKZqRoJbHjp9hSEP1nfM4Ij7jwLFdILf6AKe5pE+nONtaM2Av3+
kWZMQJydzDSRRxA6CbrueAlQ0msS
=1N7s
-----END PGP MESSAGE-----
```

En sikker krypteret email er beskyttet undervejs

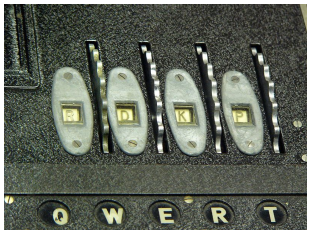
Thunderbird Enigmail

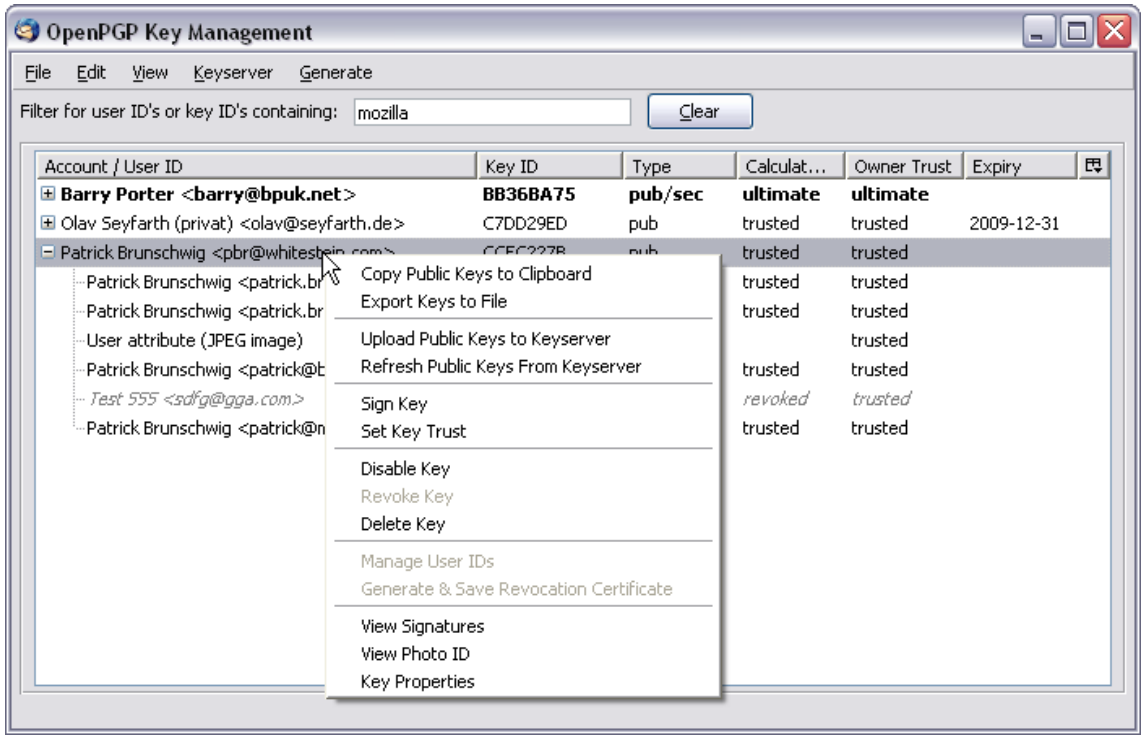


Enigmail er en udvidelse til Thunderbird email programmet

https://www.enigmail.net

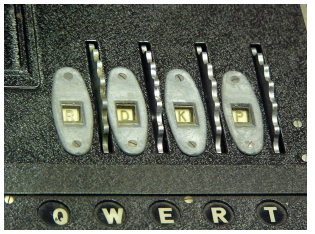
Thunderbird Enigmail: Key management

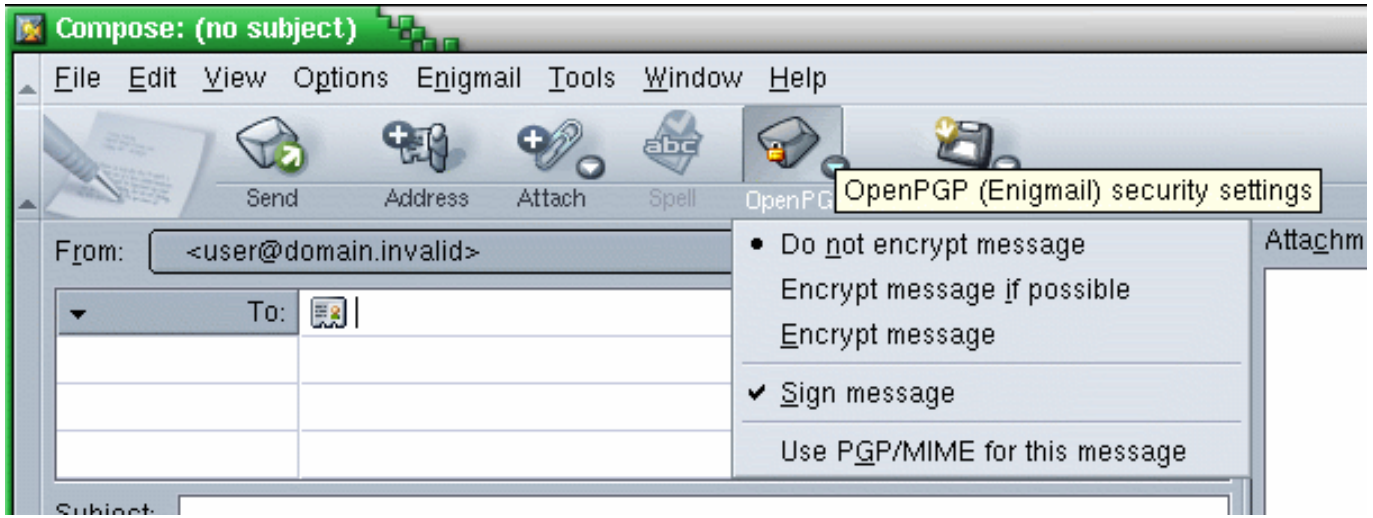




- Indbygget i Enigmail er funktionalitet til at generere nøgler
- følg den *wizard* som kommer frem.
- **Lav din første nøgle med 1 års levetid** - du ved mere om et år ☺

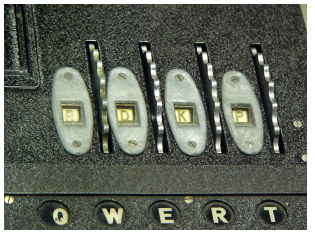
Thunderbird Enigmail: Compose email

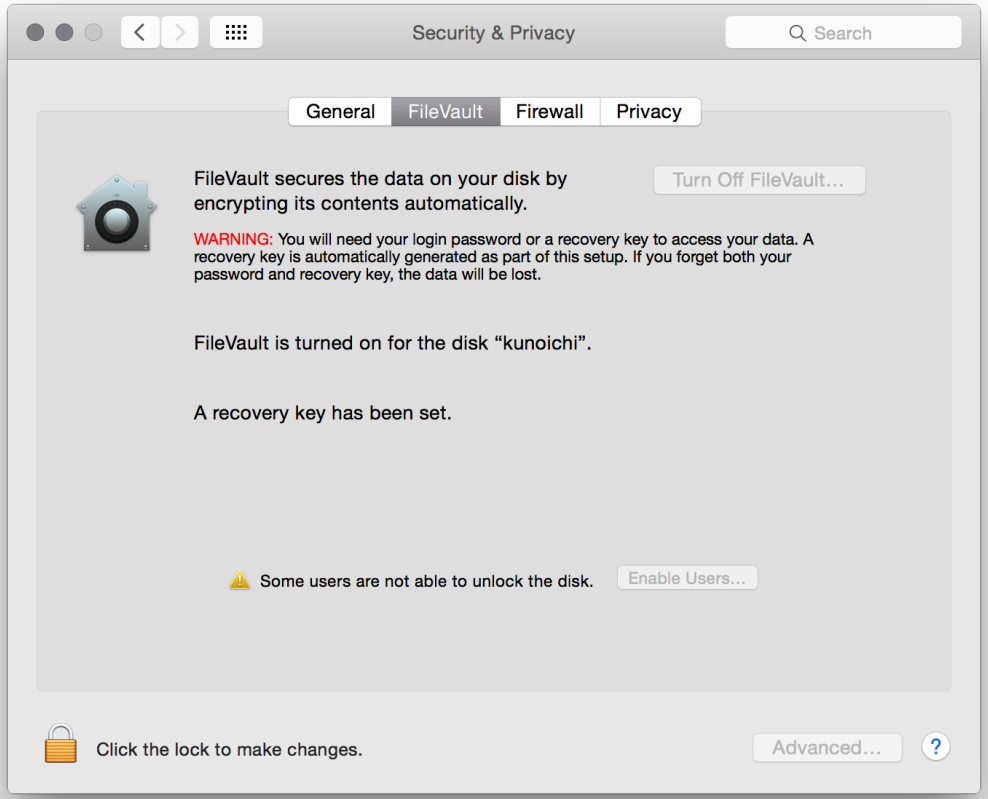




Når du sender vælger du om der skal krypteres og signeres

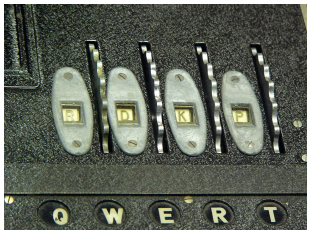
Bonus: Full Disk Encryption Mac OS X





Indbygget, gratis, stærk - slå det til når I kommer hjem

Bonus: DNS censur i Danmark



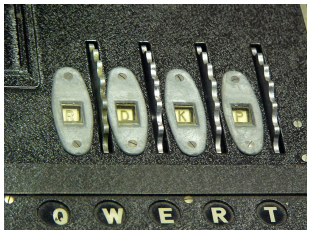
Hvis du er træt af den danske censur på DNS, så kan du skifte til at bruge: Censurfridns.dk UncensoredDNS

- anycast.censurfridns.dk / 91.239.100.100 / 2001:67c:28a4::
- ns1.censurfridns.dk / 89.233.43.71 / 2002:d596:2a92:1:71:53::

Se også `http://www.censurfridns.dk` og `blog.censurfridns.dk` for mere info.

Det er uacceptabelt at pille ved DNS - punktum!

Comments and questions



You are always welcome to send me questions later via email

Henrik Lund Kramshøj hlk@kramse.org