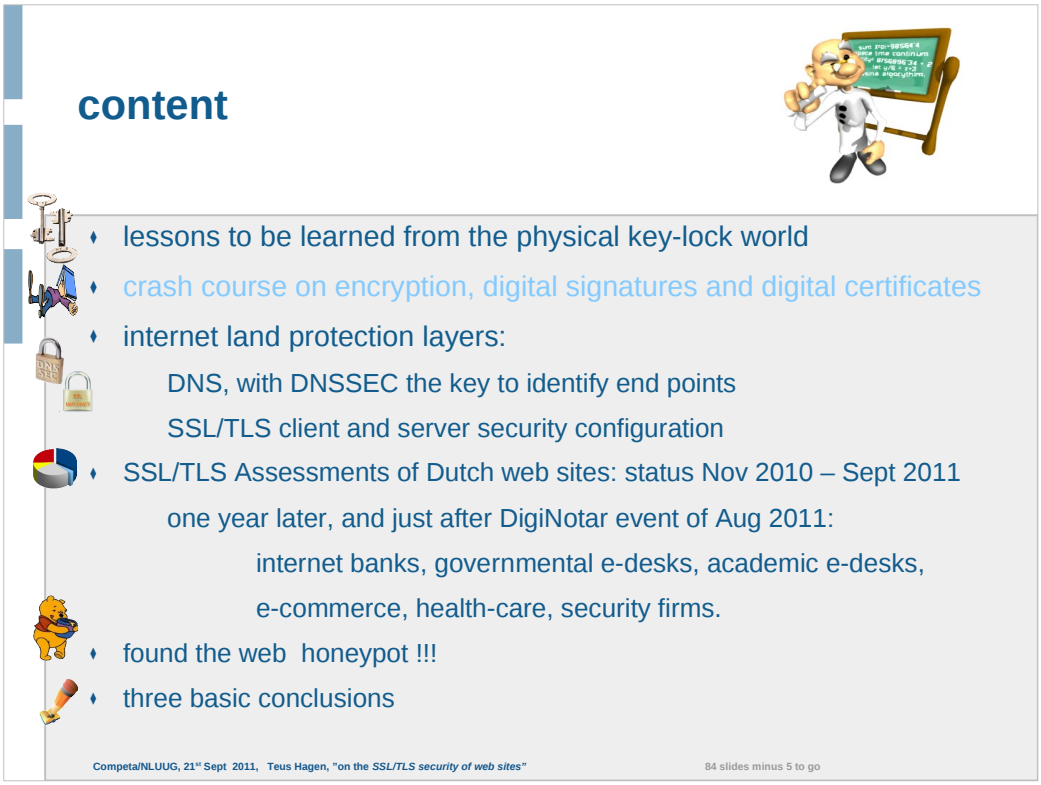
Hate mail to Teus Hagen <noreply@theunis.org> (not joking)



Content

- development of locks in the real world

- encryption, hashing and certificates how they work
  the basic HowTo knowledge, example RSA

- DNSSEC status, statistics

- SSL/TLS what it is about

- amazing statistic figures,
  this does not make you make friends

- three items on the TO DO list
  of Neelie Kroes
  and **you too!**

good books on security within IT

- *theory (math)*:
  - Applied Cryptography, Bruce Schneier (2nd ed. 1996)
- *implementation (techi's)*:
  - Cryptography Engineering, Ferguson, Schneier, Kohno (ed 2010)
  - Modsecurity Handbook, Ivan Ristić (rev 2010)
  - Apache Security (2009), Ivan Ristic
- *history and practice (managers)*:
  - Security Engineering, Ross Anderson, (2nd ed. 2008)
- *non-technicians (you and me)*:
  - Beyond Fear (thinking sensible), Bruce Schneier (2006)
  - Secret & Lies (with post 9/11 info), Bruce Schneier (2000)
  - Liars & Outliers, Bruce Schneier (Feb 2012)

theory book, 15 yrs old book, only if you know howto math?

crypto book is the howto,
a recent book, many detailed algorithms

Ivan Ristic is the Apache security fellow,
books can be ordered as ebooks

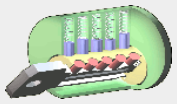
Ross Anderson is prof.
First edition is freely downloadable but is old
ed 1 has 600 pages, ed 2: 1000 pages....

how to live with fear,
remain practical

security in the physical world:
keys and locks, authenticate and disclose

- yr 1778: double lever tumbling locks
  ca 10 bits strength

- yr 1844: cylinder / pin locks
  ca 20 bit strength



- yr 2000: physical locks getting digital
  ca 128 bit strength

Competa/NLUUG, 21st Sept 2011, Teus Hagen, "on the *SSL/TLS security of web sites*" 84 slides minus 7 to go

- 2-levers 4 blades 15 euro lock
  Chubb invented blocking of night lock,
  lock picking, 'runner key', 50 euro via web site order

- cylinder pins 4-6, some more sided, 35 euro lock
  Yale invention
  lock picking is like music, an art to tell a story

  bumping, Chaos conf. (Treffen) Berlin 2004
  95% of locks open easily

- Winkhaus 128 bit digital driven lock, 450 euro lock
  hacking: easy to do with magnet

howto hack locks:
  brute force always the easy way,
    burglar way (Bulgarian Baco trick)
  social engineering a definite go (key below the carpet)
  have good survey done (open window, unlocked door).

- Stichting Kwaliteit Gevels cerificate
  (keurmerk) with stars,
  so there is some form of accreditation

hacking in the physical world

locks of cars are nowadays pretty good,

but.... there is now the

Electronic Control Unit ECU

which allows you

to control your car

from a distance

so your car can be hacked

- locks of cars are better quality as locks of doors

- July 2010
  Experimental Security Analyzes of a Modern Automobile
  Karl Koscher on IEEE Symposium

it gives full remote access to the vehicle
  speed 120 MPH, gear is in R (reverse),
  message notice with title paper

- Black Hat July 2010:
  showed how to make the ATM pay you dollars
  hacked via the remote monitor function
- PIN: with thermal camera you can easily detect (80%) pin codes!
  After 45 secs percentage drops heavily: UCSD (2011) Usenix paper
http://www.usenix.org/events/woot11/tech/final_files/Mowery.pdf

- remote control overlooked most of the time

what can you learn from all this?

- protection arrangements **relate to emotional value** of the goods
- every security technique has **limited time of life**
- **all can be hacked**, usually via unexpected routes
- **security certification is the driving force**, but only with non-commercial interest
- **authentication is too complex**

- locking can break emergency exit arrangements!

- evolution of internet is 100 times faster as physical world

- internet world is big, bigger, biggest
  and mostly anonymous, so w're all dogs

- are the precautions practical,
  can one maintain them?

- 1. IDENTIFY identify computers: client and server

- 2. AUTHENTICATE owner via certificates both ends

- 3. PROTECT COMMUNICATION privacy
  via encryption and integrity control:
  sender (hash function)

Nick Helm: "I needed a password with eight characters, so I picked 'Snow White and the Seven Dwarves'."

encryption needs

- the encryption elements:
  - (pseudo) random numbers
  - primes (1024-4096 bits)
  - hash function (no collisions -> birth date paradox)
- number theory
  - project (1-1 function) number into finite space
  - calculations in finite space

encryption technology

- the encryption elements:
  - (pseudo) random numbers
  - primes (1000-4000 bits)
  - least common multiples of prime minus 1
  - hash function (no collisions -> birth date theorem)
- number theory
  - project (1-1 function) number into finite space
  - calculations in finite space

public and private encryption key

- pub key: **(n,e)** n = *p X q* primes
- private key: **(p,q,t,d)** *t = gcd(p-1,q-1)*
- choose **e** 'random' such that *e X d = 1 (mod **t**)*

hash function

function to map number i to f(i) in N-space

N-space is big enough, say 256 bits

there is no f^{-1} function

no 1-1 function

no collision is allowed

Hash key is usualy encrypted with private key,
So with published pub key you can check if content has been changed

To keep the private key secret and the strength of the encryption and the risk for collisions of the hash are the key factors ofthis technic

Disclosed access to the cert signing engine is the key element to protection

Diginotar event showed again that security m,easements shopuld be taken serously
But also that access to the CA signing key should be protected well en reviewed, and reviewed well.

An encryption engine accessable only eg via serial channel and proprietary protocols is not enough:
Getting access to the management system is enough to get any cert signed by the CA.

digital signature

comments on encryption and hash functions

- hash functions used for signatures
  - MD5 (Ron Rivest) is broken
  - SHA-1 (Secure Hash Algorithm; NSA; banned from 1st of Jan 2011)
  - SAH-224, SHA-256, SHA-384 and SHA-512 (NIST)
- encryption functions to avoid
  - DH (Diffie-Hellman) 1976
    - has Man In The Middle (MITM) problem
  - RSA (Rivest, Shamir, Adleman) 1978 (n > 2048 bits, 20 years)
    - small size problem eg with signatures
    - mathematical structure problem

    with 2 signatures, compute sign. on message 3 as: $s_3 = s_1.s_2 \pmod n$

hash function

no collision allowed, why?

MD5 is harmfull.

a hack was expected and done.

SHA-1 2009 a collision was proofed,

so Jan 2011 no sha1 anymore

So fater one year now …. ni sha1 allowed

DH weaker as RSA

RSA still problem on low numbers

others ciphers:

AES, DSA, and …

elleptic curve

X.509 have no public key service as PGP

X.509 is hierarchical structure via signatures

X.509 rely on one authority
maybe idea of web of trust via agents or users

X.509 info validation is doubtful due to
economics and culture difference
(law, trade, social culture)

how to get a trusted CA list?
e.g. Ubuntu validates Verisign?

what if a CA is becoming distrusted?
(no warning system)

PGP web of trust:
rely on many agents,
there is trust factor

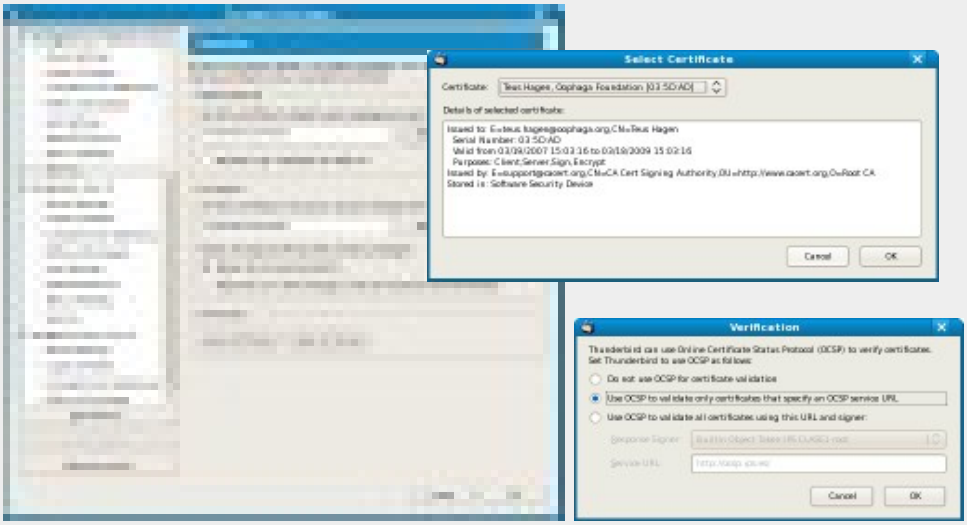
what about server cert fingerprint in DNS(SEC) record?

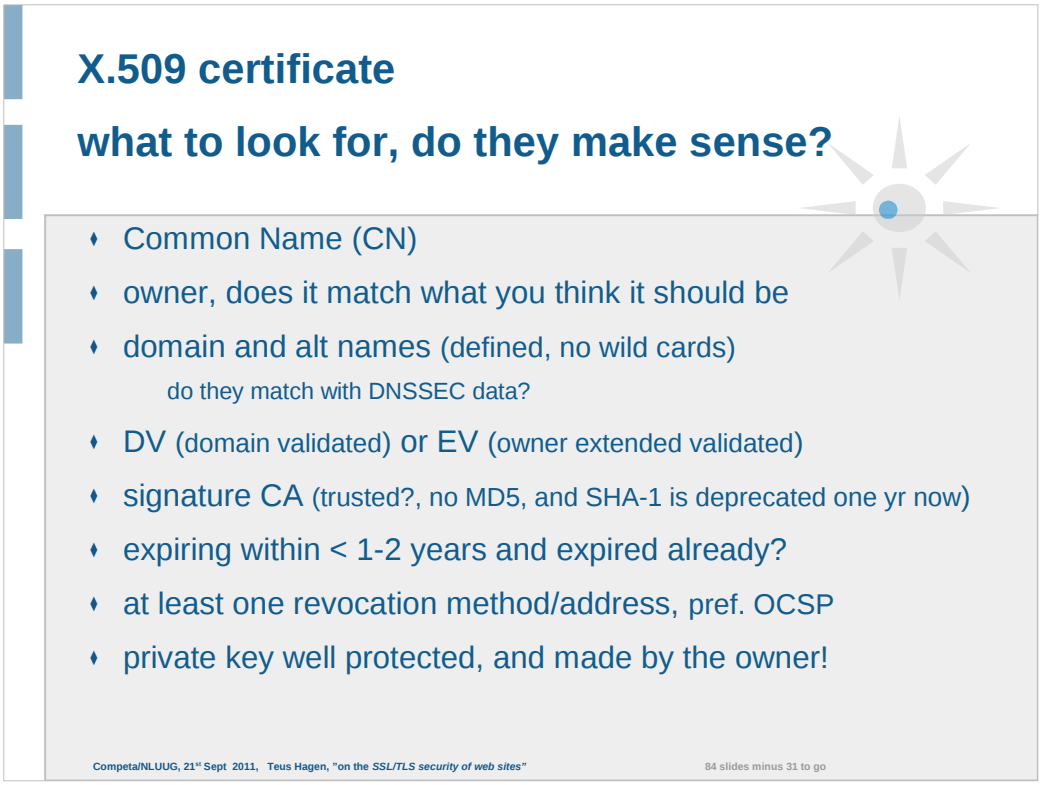
www.startcom.com provides free certs

X.509 client certificate

the How To

Thunderbird Certificate Management





wild card e.g. : *.shell.com (do not accept this!)
server cert should have host name(s)

Common Name (CN)can be:
e.g. Teus Hagen, client cert email teus@site.com
or server cert www.site.com

Organisational Unit (OU) not needed.
usually empty (cannot be validated)
similar for country and address.

check own cert for capabilities:
login, code signing, etc.
the trick to collect a lot of money by the CA

Alt Names: 1 or 2, not 43!

X.509 certs are on the chip of ID
(passport, driver license, etc.)

what we learned so far

- the security practice with locks
  - ease of hacking,
  - dependency of policies
  - enforcement
  - validation and evaluation
- theory of security in digit land
- security tools in digit land
  - use them, configure them
  - server side ***and*** client side

ideally DNSSEC should cover this
However DNBSSEC registrars do not review/validate info!
So only cache poisoning is avoided

signatures are proof to identity information

in practice we should use both,
and it is so more complicated

1st DNSSEC: is the IP address really you?

- July, 2010:
  first firm step with signing the DNS Root;
- DNSSEC statistics October 2010:
  60% had software ready;
- DNSSEC test October 2010:
  but world wide only 3% really uses it;
- one year later, Sept 2011 assessment of ~225 NL web sites:
  only a very very few entries are secured by DNSSEC
  CWI, RIPE, SIDN, CAcert, NLnet Labs,
  none of the banks, gov's, etc. ...

- DNSSEC relies on signatures

- registrars do not validate info up to today
  decisions to validate not yet started

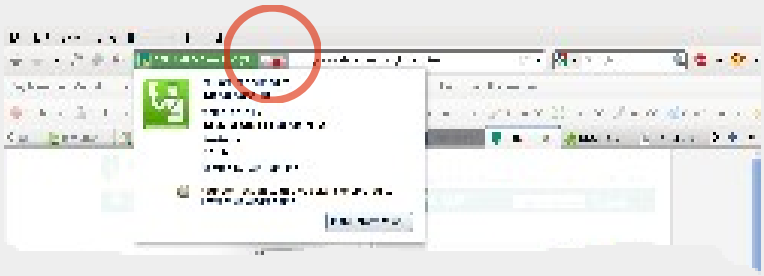
- evaluation which ISP had the software ready:
  about 60%

- RIPE did made available a test:
  Also 60% (one year ago: now not much better)

- however
  what about the ADSL/routers at home.

  BSI study 36 home routers covering
  90% of the market,
  only 4 were ready!

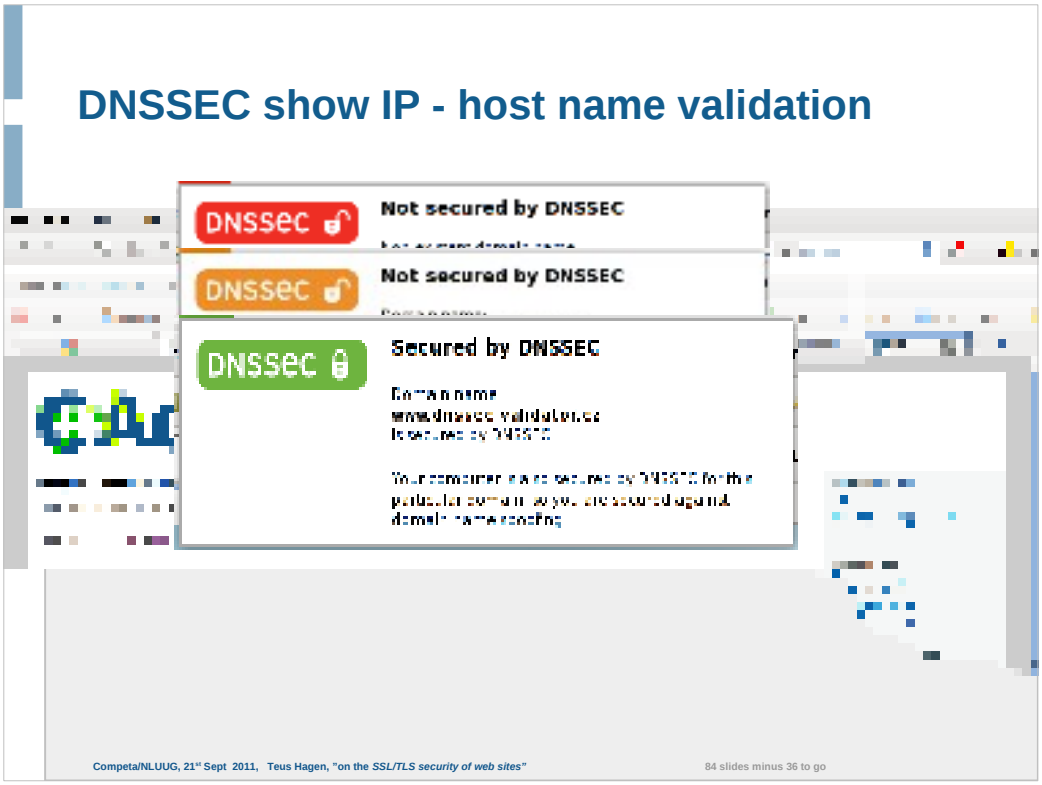
how end users surf: the host name in URL



- does anyone know this?
  what does the key with the stop signal means?

- who has that in their browser?

- it is an Firefox add-on, have a look for it: DNSSEC

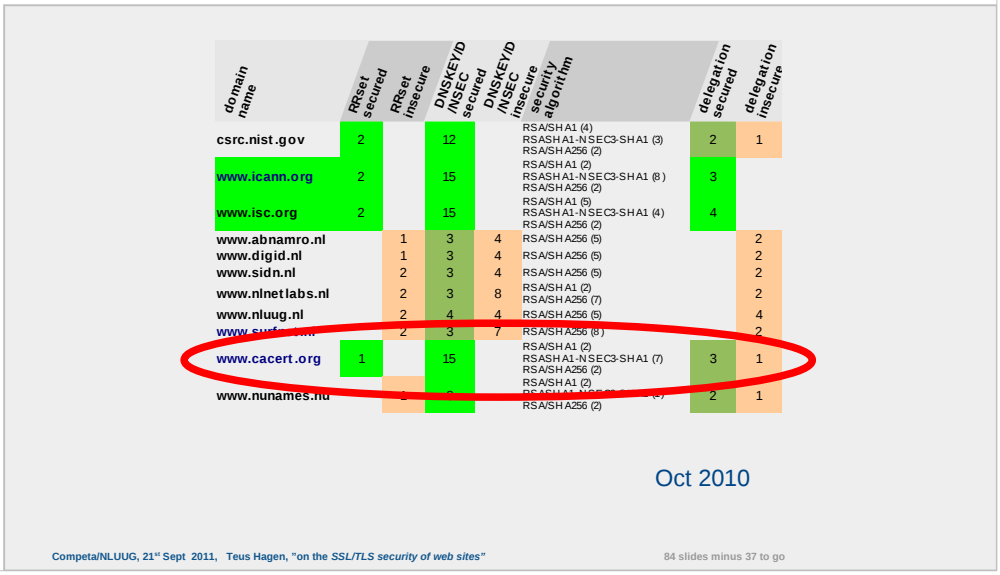


- waiting for validating

- resolver can be adjusted via preference

DNSSEC configuration status in more detail

status three months after DNSSEC initiation



domain name	RRset secured	RRset insecure	DNSKEY/DNSEC secured	DNSKEY/DNSEC insecure	security algorithm	delegation secured	delegation insecure
csrc.nist.gov	2		12		RSA/SHA1 (4) RSASHA1-NSEC3-SHA1 (3) RSA/SHA256 (2)	2	1
www.icann.org	2		15		RSA/SHA1 (2) RSASHA1-NSEC3-SHA1 (8) RSA/SHA256 (2)	3	
www.isc.org	2		15		RSA/SHA1 (5) RSASHA1-NSEC3-SHA1 (4) RSA/SHA256 (2)	4	
www.abnamro.nl		1	3	4	RSA/SHA256 (5)		2
www.digid.nl		1	3	4	RSA/SHA256 (5)		2
www.sidn.nl		2	3	4	RSA/SHA256 (5)		2
www.nlnetlabs.nl		2	3	8	RSA/SHA1 (2) RSA/SHA256 (7)		2
www.nluug.nl		2	4	4	RSA/SHA256 (5)		4
[illegible]		2	3	7	RSA/SHA256 (8)		2
www.cacert.org	1		15		RSA/SHA1 (2) RSASHA1-NSEC3-SHA1 (7) RSA/SHA256 (2)	3	1
www.nunames.nu		2	[illegible]		RSA/SHA1 (2) [illegible] RSA/SHA256 (2)	2	1

Oct 2010

- Sandia DNS Visualization validation tool
  October 2010

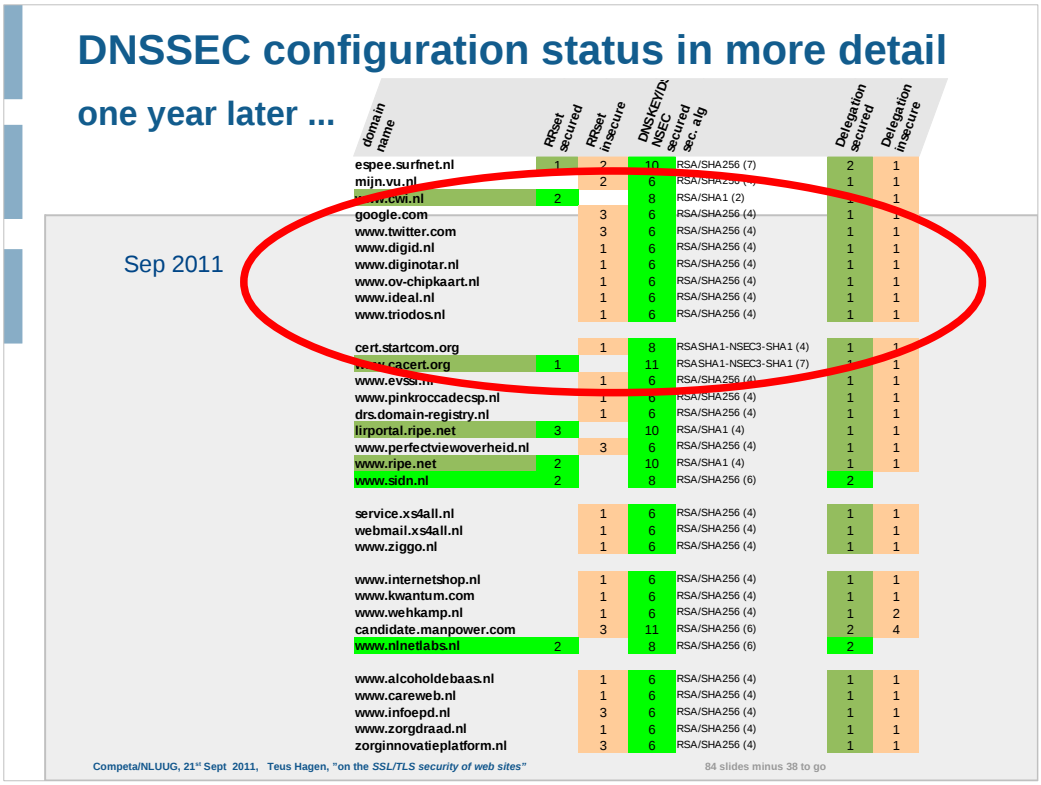
- 6 cipher/hash suites used 4
  should be phased out: **MD5 now**
  and SHA-1

- ICANN and ISC of course,
  but notice the SHA1 use!

- Holland one year ago was far away.

- after some interactions
  CAcert play their own game:
  they use DNSSEC DLV trick
  via ISC consortium.

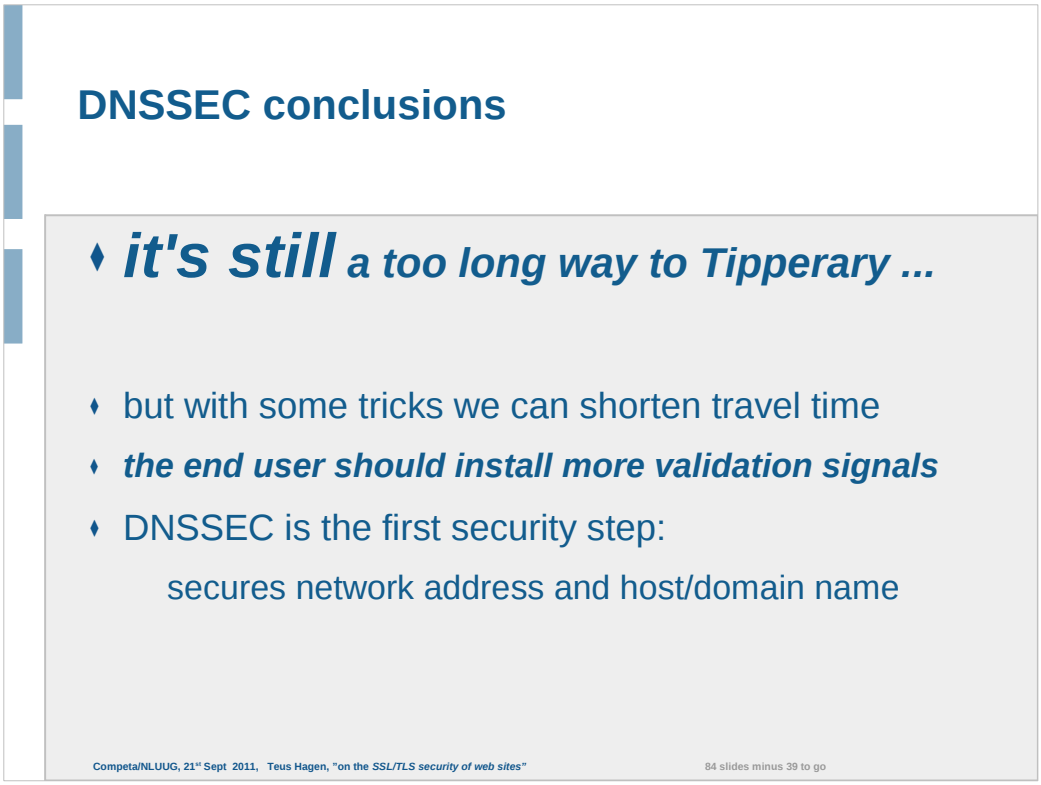
- it's still a long way to Tipperary



Situation after one year is not changed.
Only those added who are familiar with DNSSEC and involved in the operations.

In one year one added: CWI!

Notice that social network web sites are not ready for DNSSEC



it steps silently over

the binding of the end user

to his end point on the network

public wifi's are not well secured? (MITM tactic)

home routers and modems are troublesome

but know your DHCP is not secured by your ISP

who is using IPV6? My experience: it is fast! Due to lack of use

maybe the VDSL2 introduction helps
(new DSL modems streamed in today)

make sure your software is up-to-date

just taken from web server software statistics

160 web sites, 20 had no signature → 140 signatures:

- HTTP servers (mainly on “UNIX”-family OS):
  - 27% **Microsoft-ISS**: rel 5.0 (7%, 2000), 6.0 (79%, 2003) -7.5 (13%, 2008)
  - 50% **Apache**: 1X 1.3 (2004, healthcare), 4 X 2.0 (2005, gov),
    majority 2.2.8 (2008), highest **2.2.20** (2011, NLnetLabs)
  - Apache mod_ssl 2.0 (4), 2.2.3 (majority), **2.2.20** (highest in healthcare!)
- 10% **OpenSS**L (Apache) R 0.9.7 (2003) -0.9.8 (2005), **1.0.1** (2011)

OpenSSL R0.9.8a is from Nov 2005!

PHP 1X 4.4 (2008, finances), 5.2.X (majority), **5.3.8** (2011)

unique example signature of **www.ideal.nl** (checked Sept 2011):

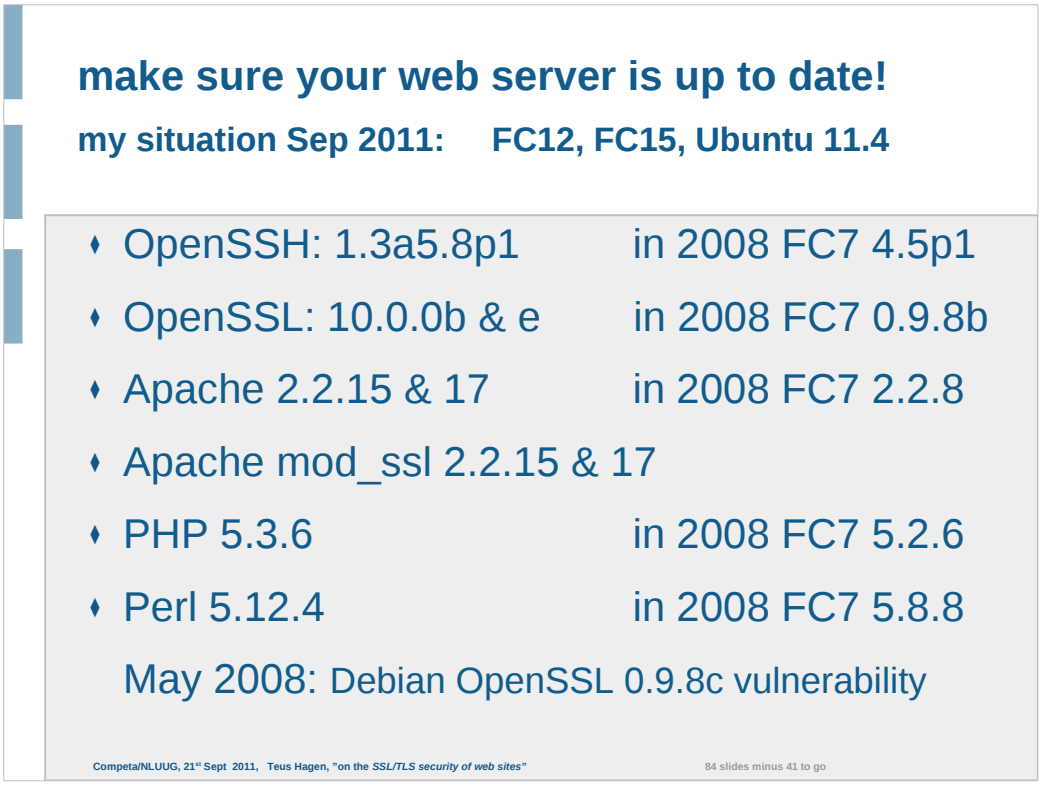
Apache/2.0.55 (Ubuntu); PHP/4.4.2-1build1 mod_ssl/2.0.55 OpenSSL/0.9.8a

release dates via Google search on “XXX relnr”, and ditributors announcements sites

Server softeare seems not much updated today!
sloppyness everywhere...., is security taken seriously?

The big honeypot is www.ideal.nl (honeypot is web security pitfall)
However the site might not do any fin. transactions, but you never know
And: it does not add to trust feeling of customers at all
Is this site really running software dated from 2005?
Lucky the OpenSSL release was before the Debian OpenSSL event in May 2008
Slogan iDeal: based on internet banking, same security measurements …

Keep your name high....



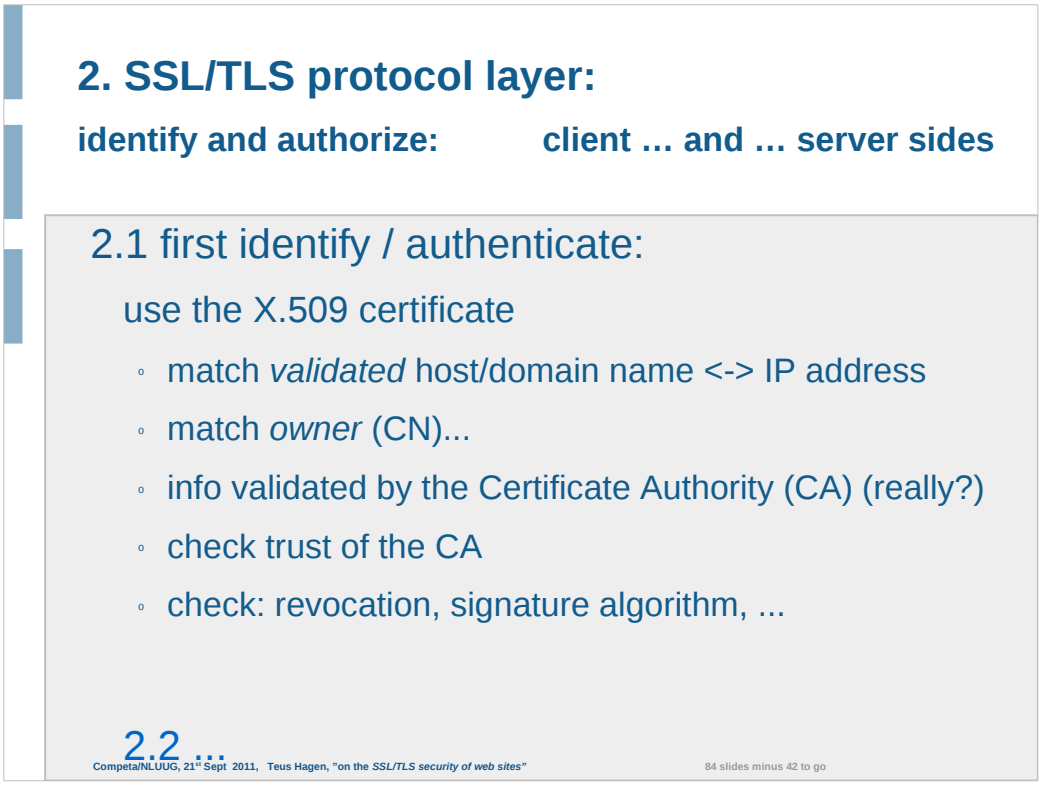
Overview of up to date (6 months delay) of web site server software

one system I have running with FC7 2008 latest update just for reference

Time costs? : 15 minutes per week for 5 machines, mostly automated

Do not show that security is taken not seriously (iDeal case)

Do not hide mistakes



- support needed from DNS
  to know who you say you are,
  and you are talking to

- is this the domain name
  you wanted to talk to?

- host names, domain names
  do not say much
  if they are not on the certificate
  or are wild cards

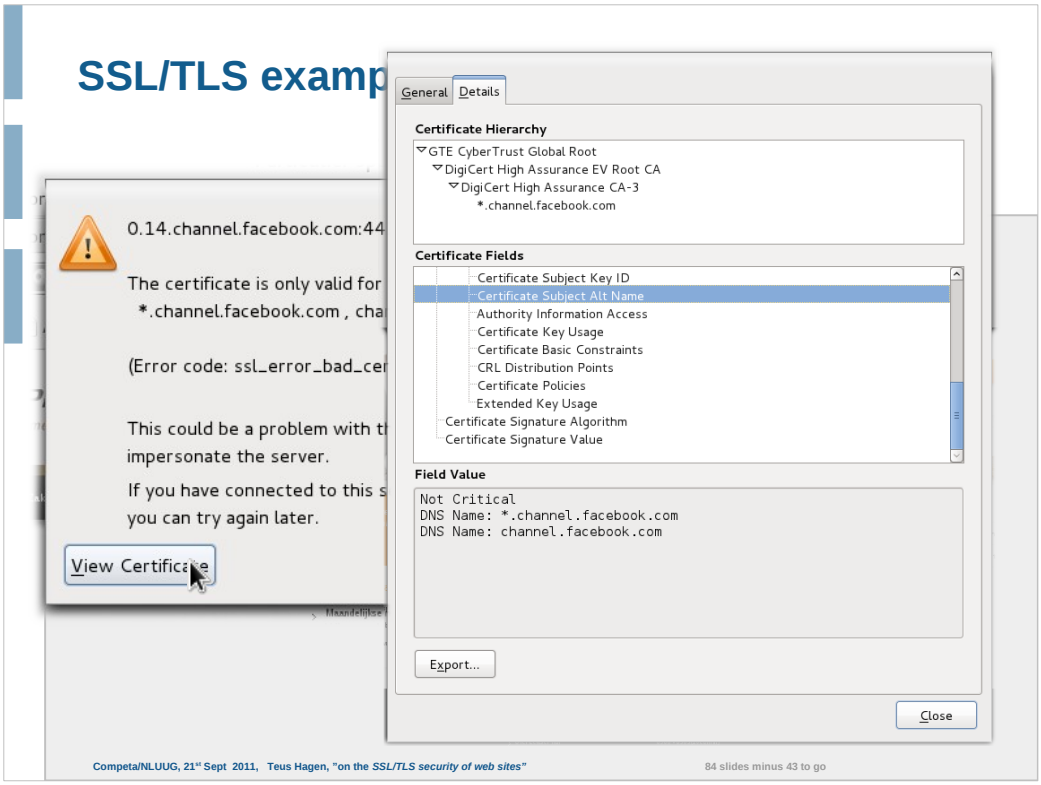
- sloppiness needs proper identification
  from owner

- BUT user should identify himself
  also properly: individual certificates:

- Web ID, OpenID

- be aware of your traceability

- browser fingerprinting can easily be used



Privacy is not a security champ

Facebook is A rated, takes security serious?

Add a friend and you get a facebook channel

But that channel carries a certificate of wrong domain

So your browser says: he friend there is an error and try again later

EVERYBODY does not view the certificate, do you?

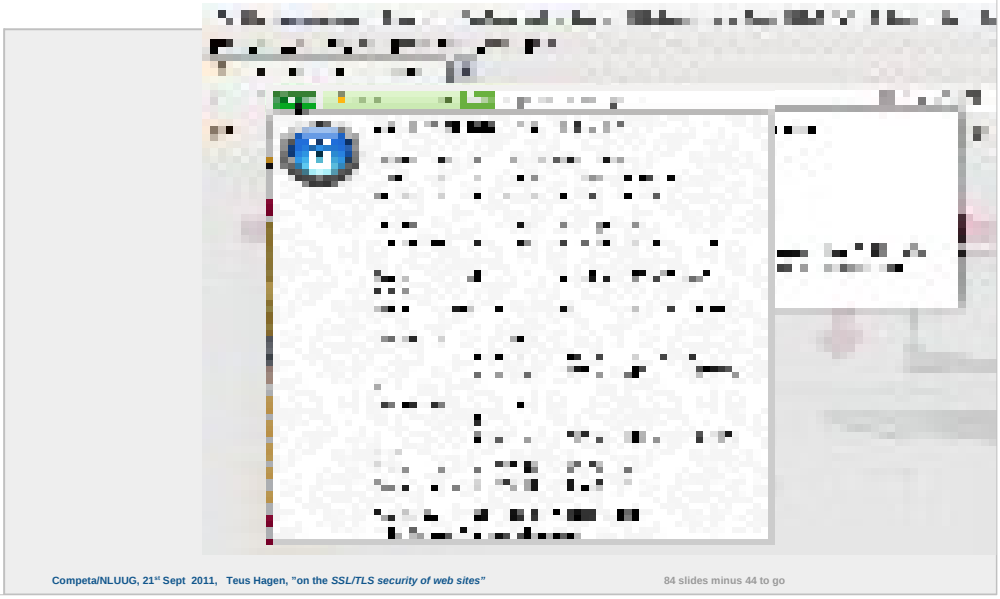
Well let us see what is wrong

The server may or may not be part of facebook
The certificate is not validated at all.... (EV cert in this case)

Depending on reasoning for adding the friend you are trusted or not

browser show: Certificate Authority (CA)

https://www.verisign.com



- who you are, you say you are

- Verisign:

EV certificate,

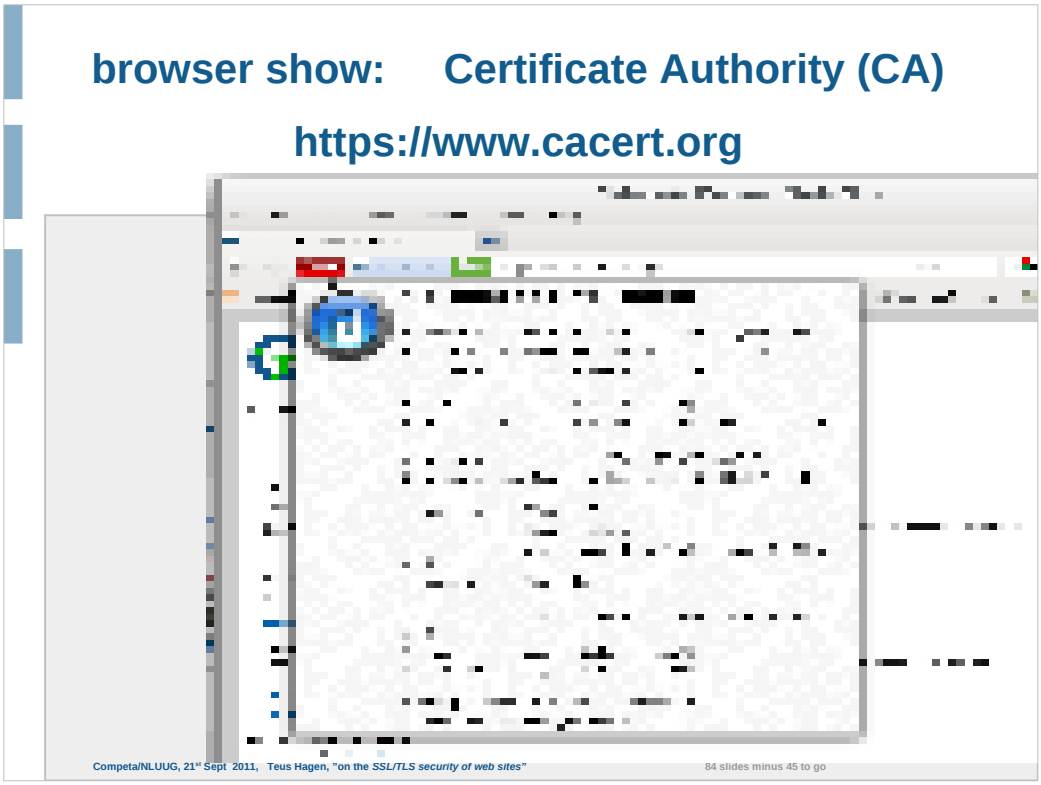
owner known

self signed! All CA's do this, why not cross signing?

- EV certificates are sometimes on sale:

ca 100 euro per year, so expect not much

validation doubtful



- who you are, you say you are

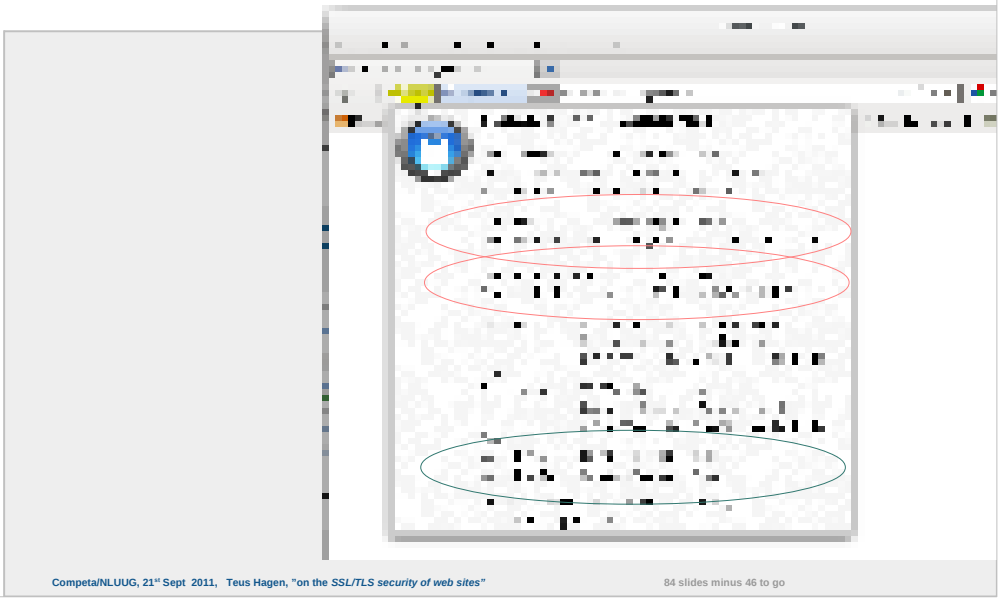
- CAcert:
added on CA accepted list, so blue,
owner unknown

- Venray.nl:
local governement e-desk,
owner unknown,
no EV certificate,
not trusted

- ICANN:
accredited
owner unknown
no EV certificate

browser show: Certificate Authority (CA)

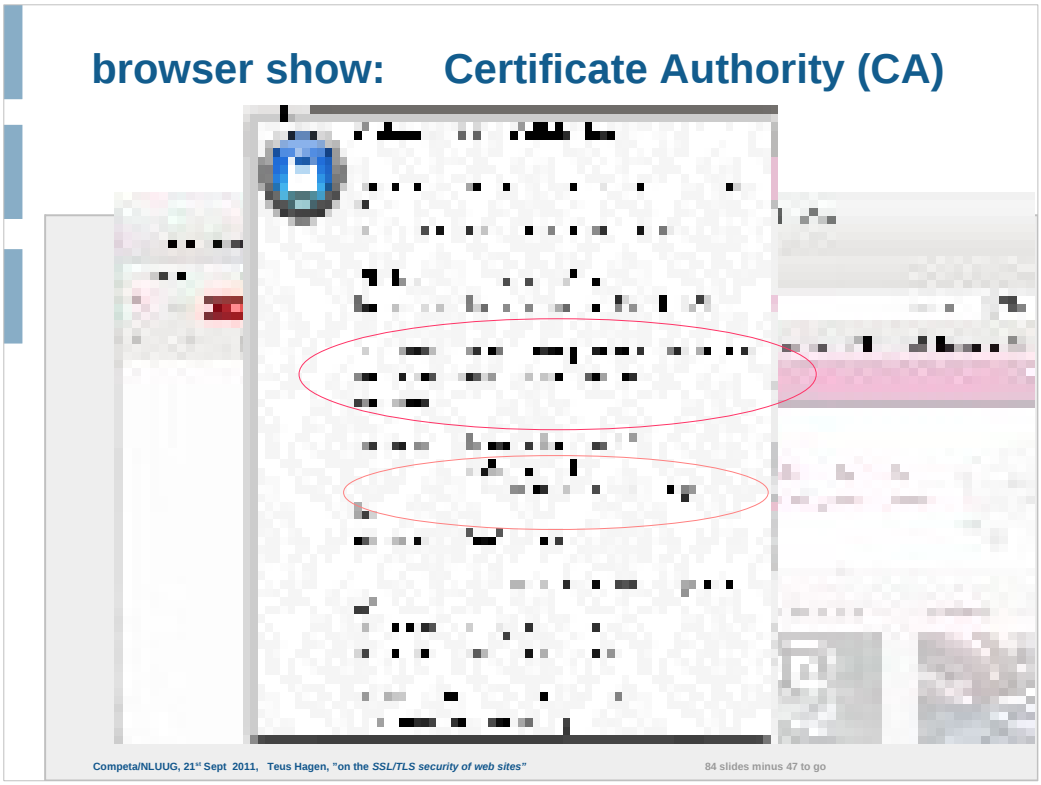
https://www.diginotar.nl



Now an easy one: diginotar

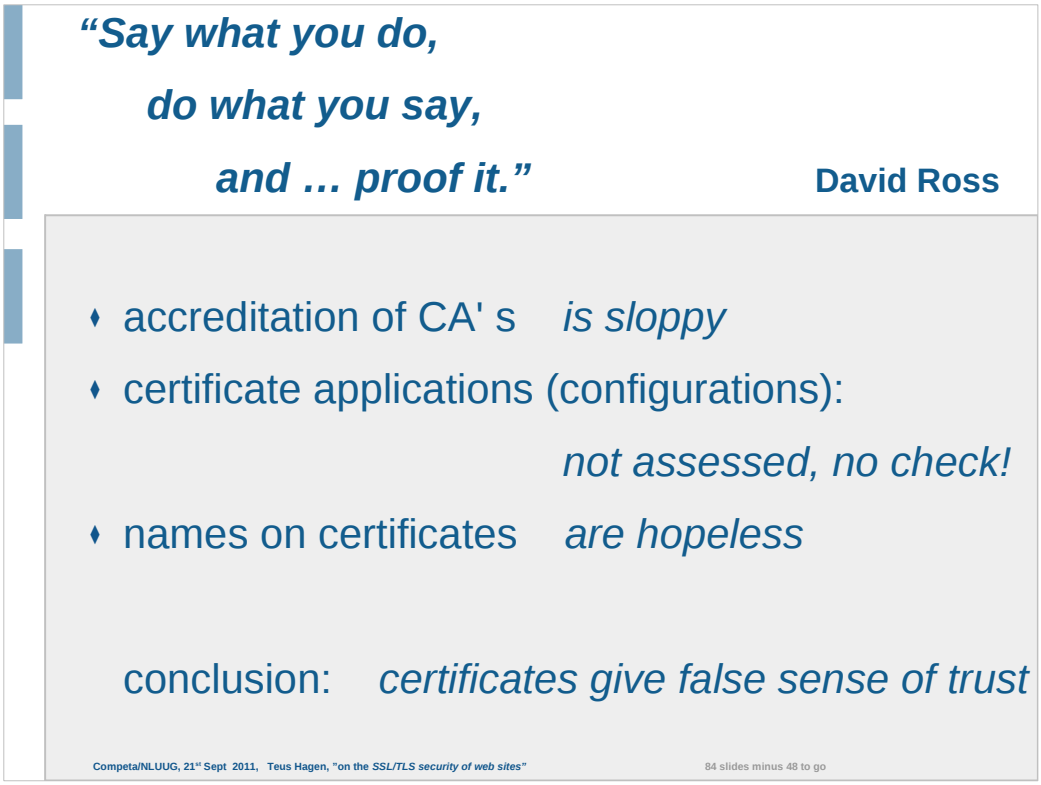
See blank page

Certificate is brand new not from Staat der Nederlanden



Honey pot www.ideal.nl
Servicing web site trade financial actions for dutch banks

A show how reliable one can be



- in commercial hands

– should Ubuntu require
audit for Verisign?

- David Ross criteria

- most CA's are based in the US
and operate from there

far away is a jurisdiction problem
there is a market culture problem:
bought an EV cert:
need entry phone book
or lawyer/bank director
for name validation?

Chambre de Commerce (trade)
KvK Nld is most advanced in EU

do not expect much is done
for your 100 euro

the DigiNotar Sept 2011 show case

just an example, just one of many

- CA accreditation and chain accreditation was sloppy
- lacking was (unacceptable):
  - review of configuration and
  - measurements to secure signing key was lacking
- unacceptable: broken key, political power to delay revocation of signing key
- what to do with all CA signed signatures on notary central archive?
- Nov 2010 presentation showed:
  - hacking could be expected, only question when and
  - how intelligent applied
- wrong mindset: Internet (and so impact) is thought local, but is world wide

after the DigiNotar:

lessons taken, … probably not?

- CA accreditation in hands of independent bodies:
  certify and controlling body for CA's
- certificates for individuals
- more as one CA who signs certificates (PGP dream)
- review and control: measurements enforcement
- who can take action here
  - PCI/IFIPS 140-2 compliant
  - US: there are (unenforced) security measurements bodies
  - EU: Neelie to do list?
    (banks do it silently and disclosed from public?)

2nd SSL/TLS protocol layer: choose encryption

2.1 identification / authentication: X.509 certificate

- match host/domain name <-> IP address
- match owner
- Checked by Certificate Authority (CA)

2.2 negotiate and establish cipher suite:

- **encryption** algorithm (hide) **and**
- **hashing** function (validate)

this needs **a well defined configuration** on **BOTH end points**

- hashing function MD5 is harmful
  already more as a year now
  how many persons needed for birthday collision?
  50% chance of collision

- SHA1 only till end of 2010, that is one year ago...
  statement of Bruce Schneier

- insecure ciphers

- insecure renegotiation (MITM possibility)

- too many self invented algorithms
  are still around

SSL/TLS configuration on both end points

- end-user end: Firefox
- server side configuration, the internet security policy
  - e-banking: PCI DSS-2
  - e-commerce FIPS 140-2

- tools: check and assess it!

  openssl, sslscan, sslsnif, ... www.ssllabs.com

- PCI DSS -2 sloppy requirements:
  Payment Card Industry Data Security Standard
  only strong ciphers
  for banks, initiated credit card companies
  easy to implement

- FIPS 140-2:
  especially for e-commerce
  Federal Information Processing Standard
  much more detail
  MD5 is out, SHA1 is just still in
  but nobody implements them....

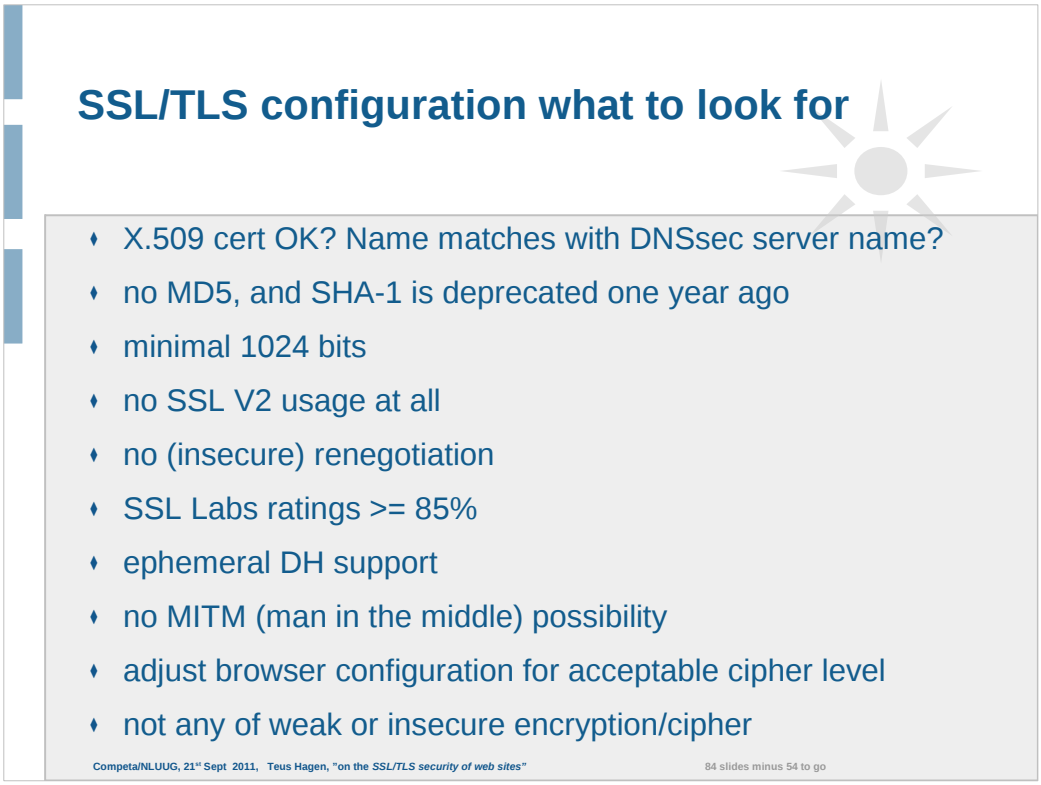
- there is still (one year later) no certifying/marking (waarborg) body
  in Holland who checks/assesses

- paper has full details and suggestions

- it is so easy to get things
  on an acceptable level

reminder: you can arrange:
  null-MD5, the lock shows “locked”.

- use: Apache Security and Modsecurity Handbook, Ivan Ristic publ Feisty Duck



Ephemeral DH:

also when data is recorded and saved

no used encryption key recovery is possible

SSL/TLS assessment

of ca 225 Dutch web sites

categories / branches:

- ~95% of on-line banking sites (37)
- governmental e-desks: central, regional, local (42)
- e-commerce web trade: trade, services (53)
- health care e-desks, chat (41)
- academic e-desks: academics, colleges (25)
- internet security consultancy and services (20)

- values are not statistical solid
  (not random selection and check)

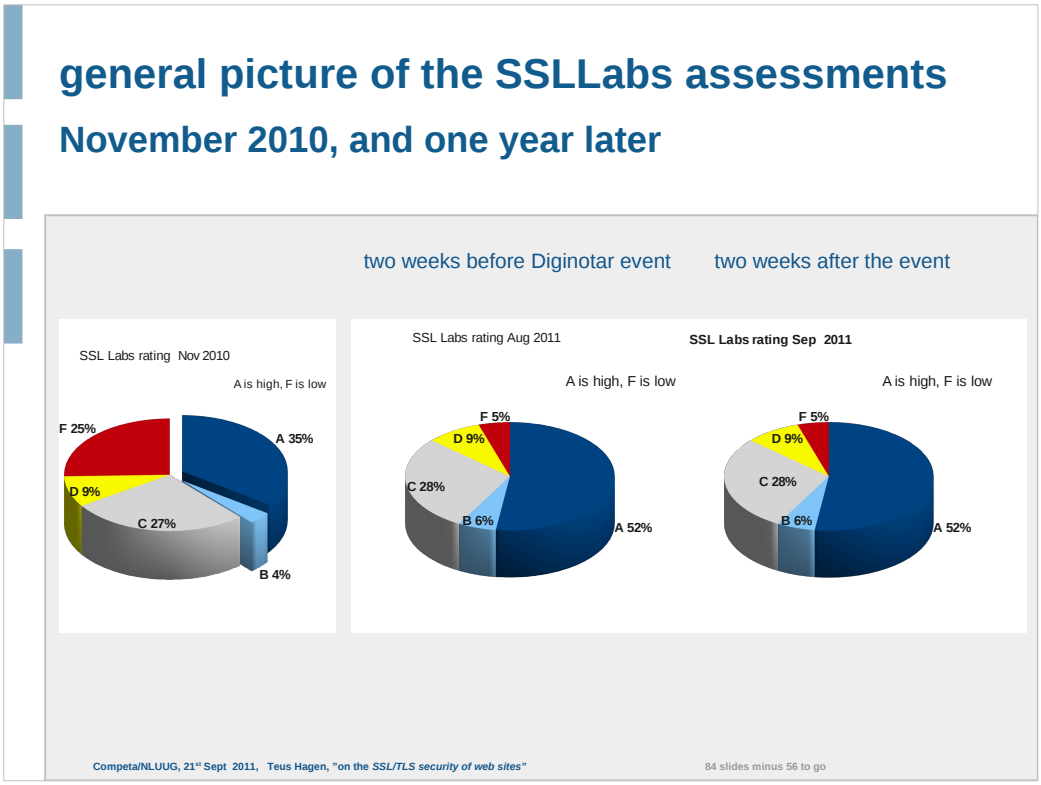
- all assessments figures from SSL Labs (Qualys)

- how: convert HTML SSL Labs data into spreadsheet data/formula

- tried to send all assessment values to web site manager:
  end of July and 31 October 2010, Feb 2011, Aug 2011 and Sep 2011
  Diginotar event showed no diff in last two assessments

  the feedback/response was minor, eg
  email from “postmaster” that
  “user postmaster did not exists”
  “you will get an answer within 24-48 hours, ticket number NNN”
  Volksuniversiteit: antenna.nl anwer: indeed no cert, you can order one with us...
  anyhow those who are personally known to me reacted
  Digid and ING improved due to tweakers.net noise in Nov 2010
  RIPE, VU, CAcert reacted and improved also in Aug 2011

- but nevertheless some did update the config, much improved after one year
  healthcare: thanks to blogs health care
  this shows that it can be done easily
  NLnetLabs and CAcert went so on top DNSSEC AND SSL configs



average ratings

blue color: >80%

- cipher strength

- key exchange

- protocols offered

- server cert is the CA trusted?

- expired cert

- insecure cipher use

- renegotiation (MITM?)

    Cross Site Request Forgery – CSRF
    use only encrypted cookie as parameter

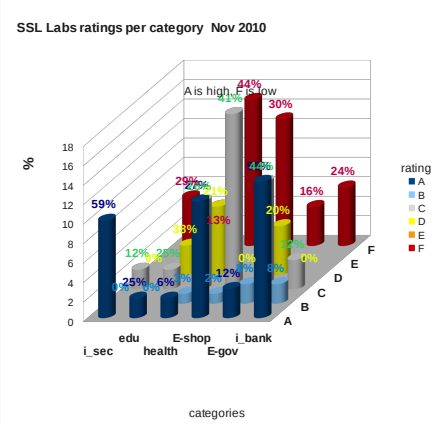
- insecure session resumption

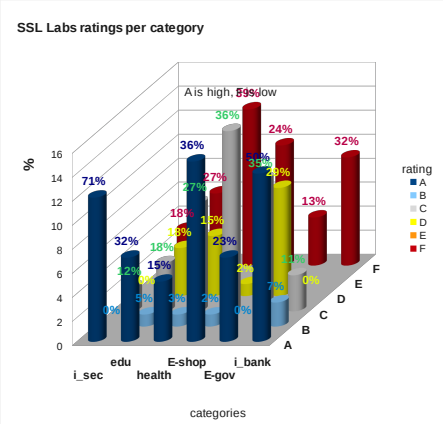
the figures of all categories in more detail

November 2010, and 3 months later ...

statistics of 2010, November

2011, February





- per category

- banks, I-sec differ from rest

- health-care worst

- education worry some

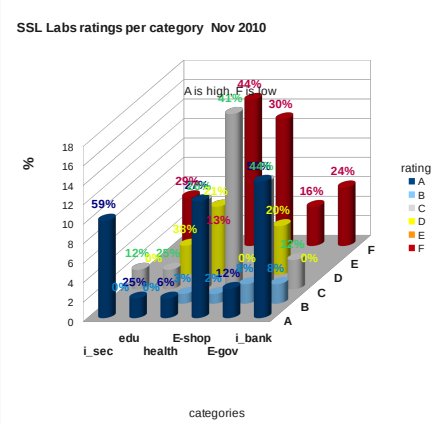
- e-commerce trouble, a mess,
  no technical certification/marking,
  However geared for trade

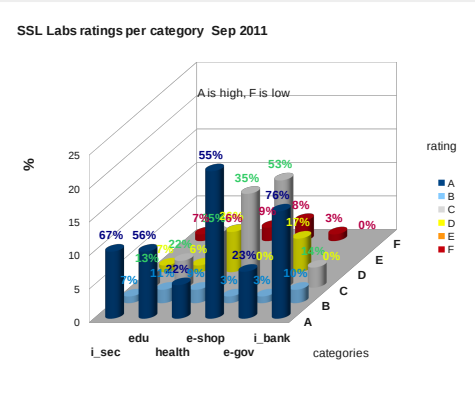
the figures of all categories in more detail

November 2010, and one year later ...

statistics of 2010, 31st October

2011, September





Competa/NLUUG, 21st Sept 2011, Teus Hagen, "on the *SSL/TLS security of web sites*"

84 slides minus 58 to go

- per category

- banks, I-sec differ from rest

- health-care worst

- education worry some

- e-commerce trouble, a mess,
  no technical certification/marking,
  However geared for trade

all categories in much more detail (Oct 2010)

category	av. rating	CA trusted	protocol	key exchange	cipher	MITM?	TLS 1.0	SSL 3.0	SSL 2.0+	SSL 2.0	session resumption	insecure reneg.	PCI compliant	FIPS ready	# weak cyphs	# insec cyphs
i_sec	79%	81%	80%	74%	83%	53%	100%	88%	88%	19%	75%	13%	69%	0%	19%	6%
healthcare	59%	59%	63%	49%	64%	18%	100%	100%	100%	73%	88%	42%	9%	0%	73%	3%
edu	59%	88%	63%	53%	63%	33%	100%	100%	100%	75%	100%	38%	25%	0%	75%	0%
e-shop	69%	76%	73%	57%	71%	42%	100%	100%	100%	36%	83%	21%	31%	0%	60%	5%
e-gov	58%	88%	63%	47%	63%	37%	100%	100%	100%	71%	92%	21%	25%	0%	75%	4%
i_bank	77%	75%	76%	76%	80%	44%	100%	100%	100%	26%	87%	22%	65%	0%	17%	0%
all categories	**69%**	**76%**	**72%**	**62%**	**73%**	**35%**	**100%**	**99%**	**99%**	**46%**	**100%**	**26%**	**40%**	**0%**	**51%**	**4%**

- average rating, all should be >80%

- CA trusted, all >80%

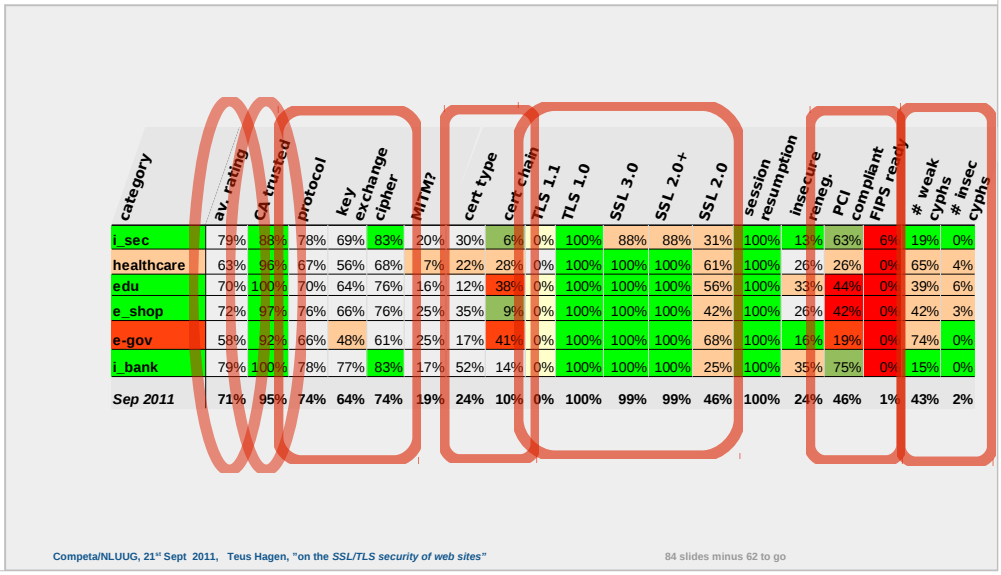
- protocols:
  - protocol rating
  - key exchange rating
  - cipher rating

- protocols
  - SSL2 should be out, zero

- PCI DSS 2 / FIPS 140-2
  - Payment Card Industry Data Security Standard
  - Federal Information Processing Standard

- no weak cipher strength
  - >128 bits, > 10 minutes computer power

all categories in much more detail (Sep 2011)



category	av. rating	CA trusted	protocol	key exchange	cipher	MiTM?	cert type	cert chain	TLS 1.1	TLS 1.0	SSL 3.0	SSL 2.0+	SSL 2.0	session resumption	insecure reneg.	PCI compliant	FIPS ready	# weak cyphs	# insec cyphs
i_sec	79%	88%	78%	69%	83%	20%	30%	6%	0%	100%	88%	88%	31%	100%	13%	63%	6%	19%	0%
healthcare	63%	96%	67%	56%	68%	7%	22%	28%	0%	100%	100%	100%	61%	100%	26%	26%	0%	65%	4%
edu	70%	100%	70%	64%	76%	16%	12%	38%	0%	100%	100%	100%	56%	100%	33%	44%	0%	39%	6%
e_shop	72%	97%	76%	66%	76%	25%	35%	9%	0%	100%	100%	100%	42%	100%	26%	42%	0%	42%	3%
e-gov	58%	92%	66%	48%	61%	25%	17%	41%	0%	100%	100%	100%	68%	100%	16%	19%	0%	74%	0%
i_bank	79%	100%	78%	77%	83%	17%	52%	14%	0%	100%	100%	100%	25%	100%	35%	75%	0%	15%	0%
Sep 2011	**71%**	**95%**	**74%**	**64%**	**74%**	**19%**	**24%**	**10%**	**0%**	**100%**	**99%**	**99%**	**46%**	**100%**	**24%**	**46%**	**1%**	**43%**	**2%**

- average rating, all should be >80%

- CA trusted, all >80%

- protocols:
  - protocol rating
  - key exchange rating
  - cipher rating

- protocols
  - SSL2 should be out, zero

- PCI DSS 2 / FIPS 140-2
  - Payment Card Industry Data Security Standard
  - Federal Information Processing Standard

- no weak cipher strength
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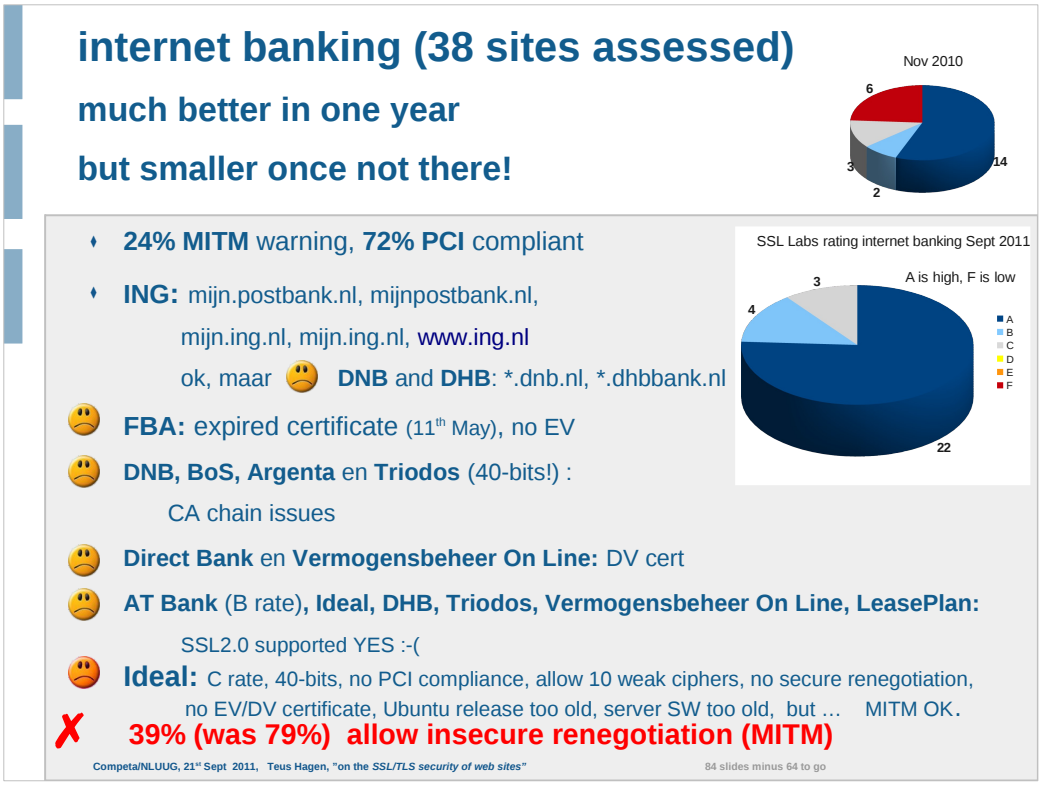


-One year ago:

ING

www.ing.nl, mijn.ing.nl, mijn.postbank.nl

redirect without notice

expired certificate

- NIBC

redirect naar sparen.nibcdirect.nl without notice

gap of 6 weeks from expired and

low level SSL/TLS arrangement

- Fortis, FBA (much improved lately) and Staalbankiers

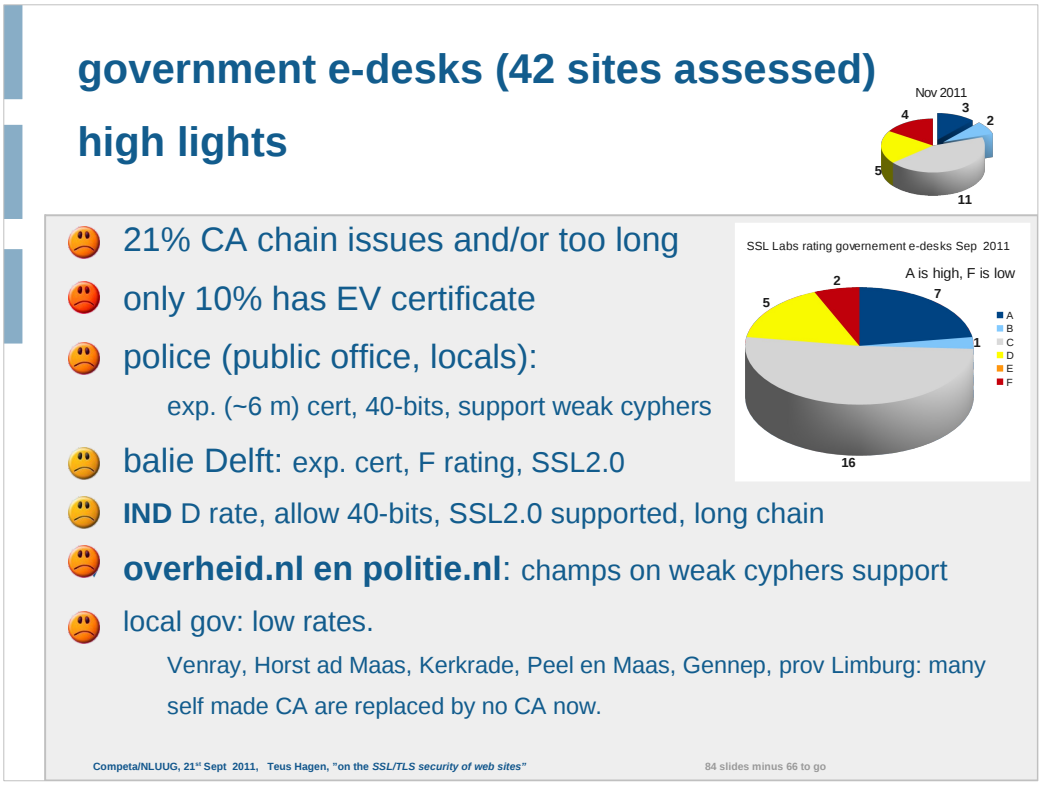
expired certificate, no EV certificate, allow 40 bits

- Ideal

only at C level, no EV/DV certificate

- SNS bank

connection failure, broke communication



-One year ago:

Venray, Horst ad Maas

self signed cert Cavernray

Horst was initially self signed

now Pink Rocade/Getronics week after complain

local gov use all probably

local host provider and web service provider

anecdote: provider was right on corner, “who do you think you are!”

- DigiD

Was F rate, after publication now OK,

And now use Getronincs/Staat (10 Sept issued)

Chain length still 4!

Getronics (KPN PKI bedrijf) voorwaarden(art 6.1) staat:

De Vertrouwende Partij is verplicht om per geval zelfstandig te beoordelen of het gerechtvaardigd is om op een PKIoverheid Certificaat te vertrouwen

- police

Police Rotterdam (no domain name, no DV/EV cert),

Politie onderzoeken (OM) (use 6 ms expired cert)

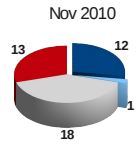
Rotterdam: two web sites: secured and unsecured web site

only 52% average, 40 bit, insecure ciphers (with 10-12 on top)

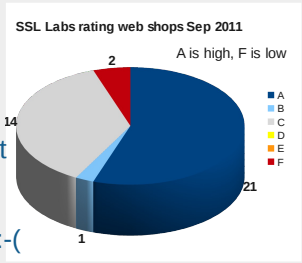
21% PCI compliant:

tax, local Eemsmond, government, DigiD, Diginotar, land registry

e-commerce / web shops (44 sites) high lights



- **providers**:
  - only Tele2 has A rating;
  - have (DV) CA cert:
    - only Xs4all, UPC (lowest 44% rating), BrabantNet
  - 25% have CA chain issues or chain too long
- 13 of 38 with **host/domain name** on cert use **wild card** :-(
  - have EV CA cert: Wehkamp, Coolblue, Kwantum
  - Pixmania (no security at all)
- **expired cert** only one: Ttec (Feb 2011) with lowest SSLLabs rating
- 35% **validated CA certs**: only 3% uses Ext. V, 9% Domain V, 38% no rating ie no SSL.
- 42% support 40-bits, 42% support SSL2.0
- best (rating 88%, no issues): Wehkamp, Kwantum



- None is FIPS 140 compliant,
  13 (23%) PCI compliant
- 35% use validated cert, only 8% EV cert

- 41% SSL2.0 supported

TTEC: lowest rating, expired cert

10% has chain issues or too long (pro0viders 25%!)

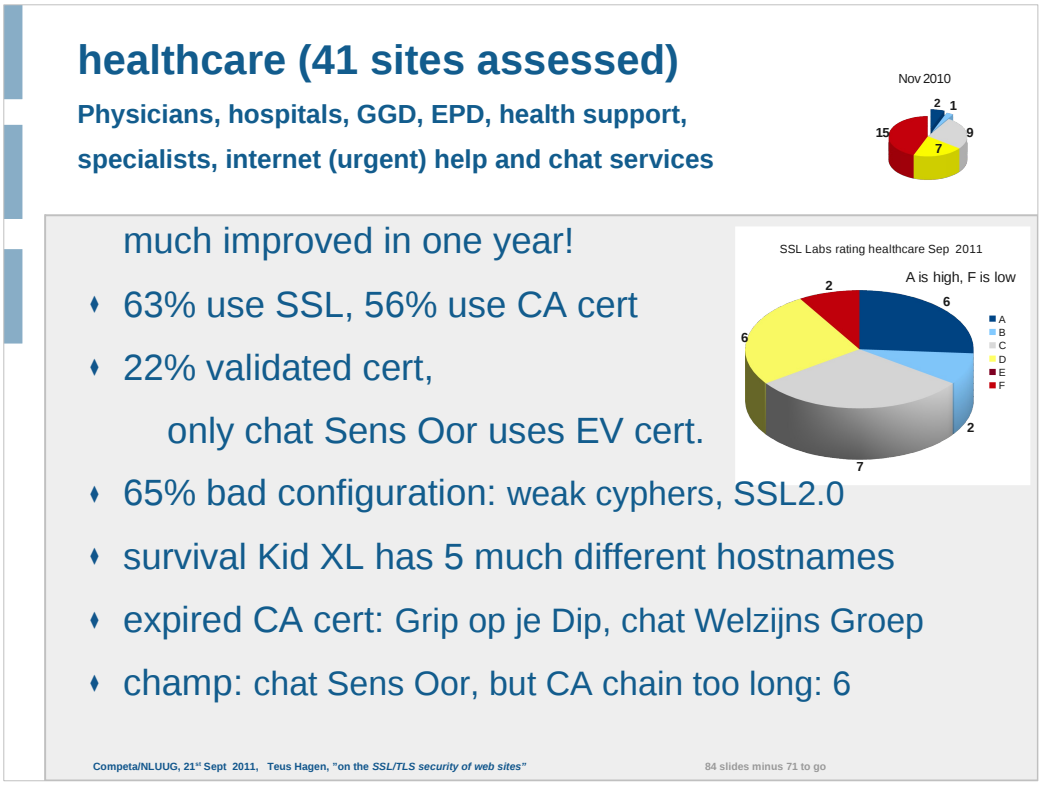
Data from one year ago:
- 16 web shop certification organisations

- 2 have applied for certification to
  Council of Accreditation (ConsuWijzer)

- only Thuiswinkel reacted in 2010
  but did not know what SSL/TLS is about
  however Google showed discussions in 2007
  to do: techn. Assessments

- ICTRecht in some way the only honest one?:
  advise/help to adjust to all legal aspects

- all web sites searched for
  techn security policies/requirements
  none had them
  approached all of them to ask
  for correctness of omissions



-Slideshow much better status now) One year ago:
- Hard to find SSL/TLS protected web sites.

- 50% still use old fashioned login/password
without any protection

- Health care is the category to show
how bad it can be made
some extra push done and it helped

- only a very few with A grading (with EV cert),
most had no hostname/domain name on cert

Improved: chat, digipolis, physician site, hulpmix
Most chat have now DV/EV cert
50% no name on cert
25% improved due to publications

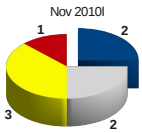
- self manufactured certificates easy to find

- looking at RR host name record
one sees a lot of good willing help sites

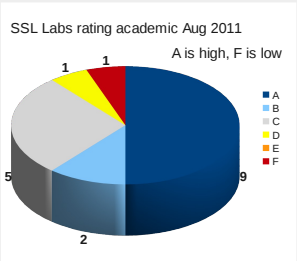
- conclusion: money is better protected as privacy

academic e-desks (25 web sites)

high lights



- **CA chain issues:** 38%, 56% SSL2.0 support,
- **CWI:** use wild card, CA chain issue + too long
- **TUE, TUD, VU, Nijmegen**
  40 bits, Terena CA
- only 12% have **DV CA cert**, none EV CA cert.
- best is **webmail.hva.nl** and **intra.hva.nl**: DV CA cert
  CA chain, PCI compliant, webmail: no secure renegotiation support (MITM)
- 72% use **Terena** as CA cert provider



-Slide status now, One year ago:

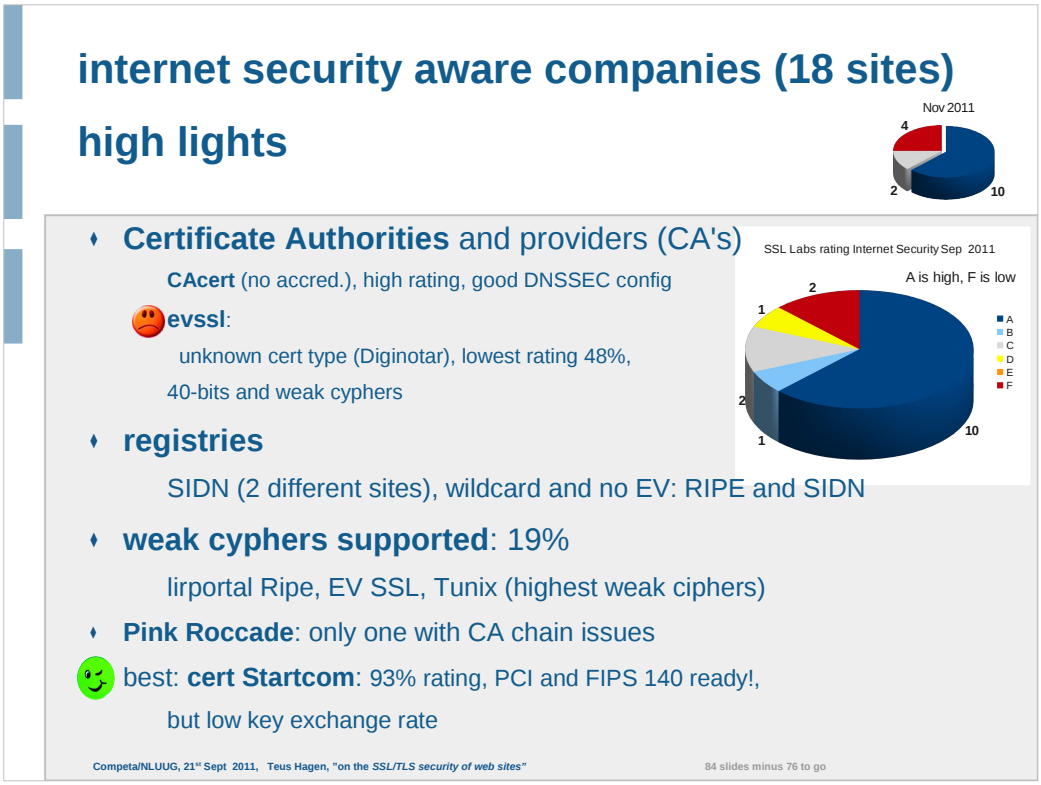
- Universiteit van Amsterdam:
  employee site, A 84%,
  128 bits, no SSL 2

- CWI: A 88%,
  wild card, no SSL2

- all others had 40 bits,
  Terena has high market share in edu land.

- uni's: highest D 48%,
  TUE 45 alt names

- high tech:
  InHolland one of the two site not secured,
  NOVI no name on certificate
  Fontys Venlo: own brewn, one expired, one no name on cert, rating too low



Slide status now, one year ago it was:
- mentioned
    CA StartCom: provider, CA, highest score ever seen:
    A 93%,
    But still have insecure renegotiation

- SIDN:
    two sites: WWW is weak but improved now, registry is OK

- NLNet Labs, CAcert:
    got to F 91%, they clearly know ho

- either EV (30%) or not known, none with DV cert
  70% support ephemeral DH (forwrad encryption)

- Tunix: only 52% rate, due to use insecure ciphers

red color:
CAcert, Perfect Overheid, Quovadis Global, Nlnet Labs, 2Reclame, Nul77
Protocol issues with Quovadis Global, Nul77

gray color (C): Pink Roccade, Tunix

comments on SSL/TLS configurations of Dutch web sites

- **much is improved in one year! Well done, but still loose ends**
- **only ~0.4% is FIPS 140 ready**
  - it ain't hard, OpenSSL certification for 30K US$ only
- **end-user**:
  - Is still unable to require acceptable security level
  - browser lock only says: “maybe” secured to something
  - CA coloring only says “maybe” accredited CA at some point in time
  - lesson learned from Diginotar event: revocation is doubted
- once you have HTTPS, support SSL also on HTTP port
- have a look at the other applications: email-server, vpn, ssh, chat, etc.
- accreditation of CA's is doubtful, there is lack of reviewing and certification
- good **SSL/TLS configurations** is still far away

Neelie: three basic things to do

my to-do list for Neelie Kroes

1. **DNSSEC:**
   host identification and validation
   not much progress in one year
2. **X.509 CERT:** *owner identification / validation*
   lack of independent certified CA's procedure/review for end user and service provider
3. **HTTP: SSL/TLS cipher suites policy**
   security policies defined, checked and maintained
   configurations fixed, checked and maintained
   validated -> certification procedures?

ASSESS all work done in a open and public way

Chock effects are the only tool to improve things...
Lucky enough: internet land is full of earth quakes

Ross Anderson 2008

phrase from his book

“We worried about crooks hacking bank smartcards, and put in lots of back-end protection for early electronic purses;
the attack came on pay-TV smartcards instead, while the bank fraud folks concentrated om mag-stripe fall-back and on phishing.”