IT-security: User Authentication
Access control
Identity and Access Management
Passwords and SSO
Biometrics
Social engineering

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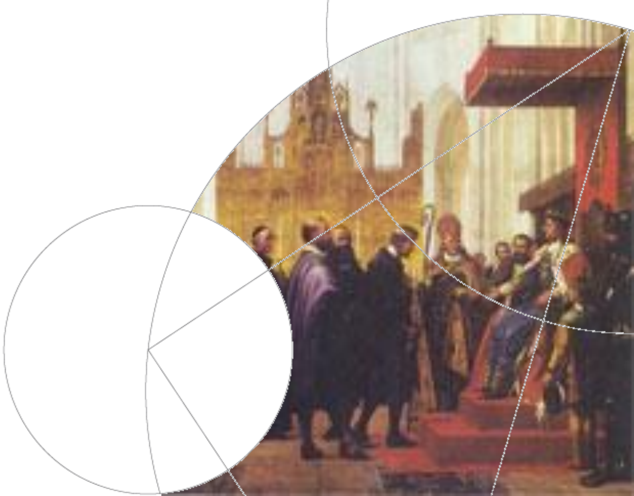
DIKU 13. september 2019



IAM - ACL

An access control list (ACL) is a list of permissions attached to an object.

An ACL specifies which users or system processes are granted access to objects, as well as what operations are allowed on given objects

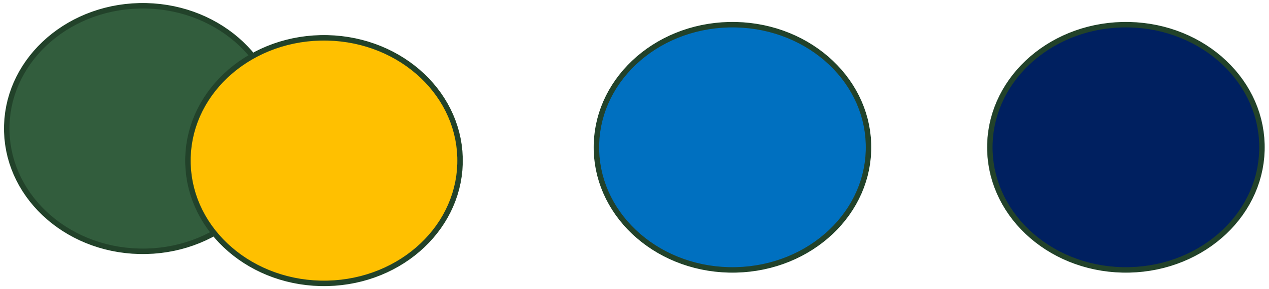
Alice: read,write; Bob: read

IAM

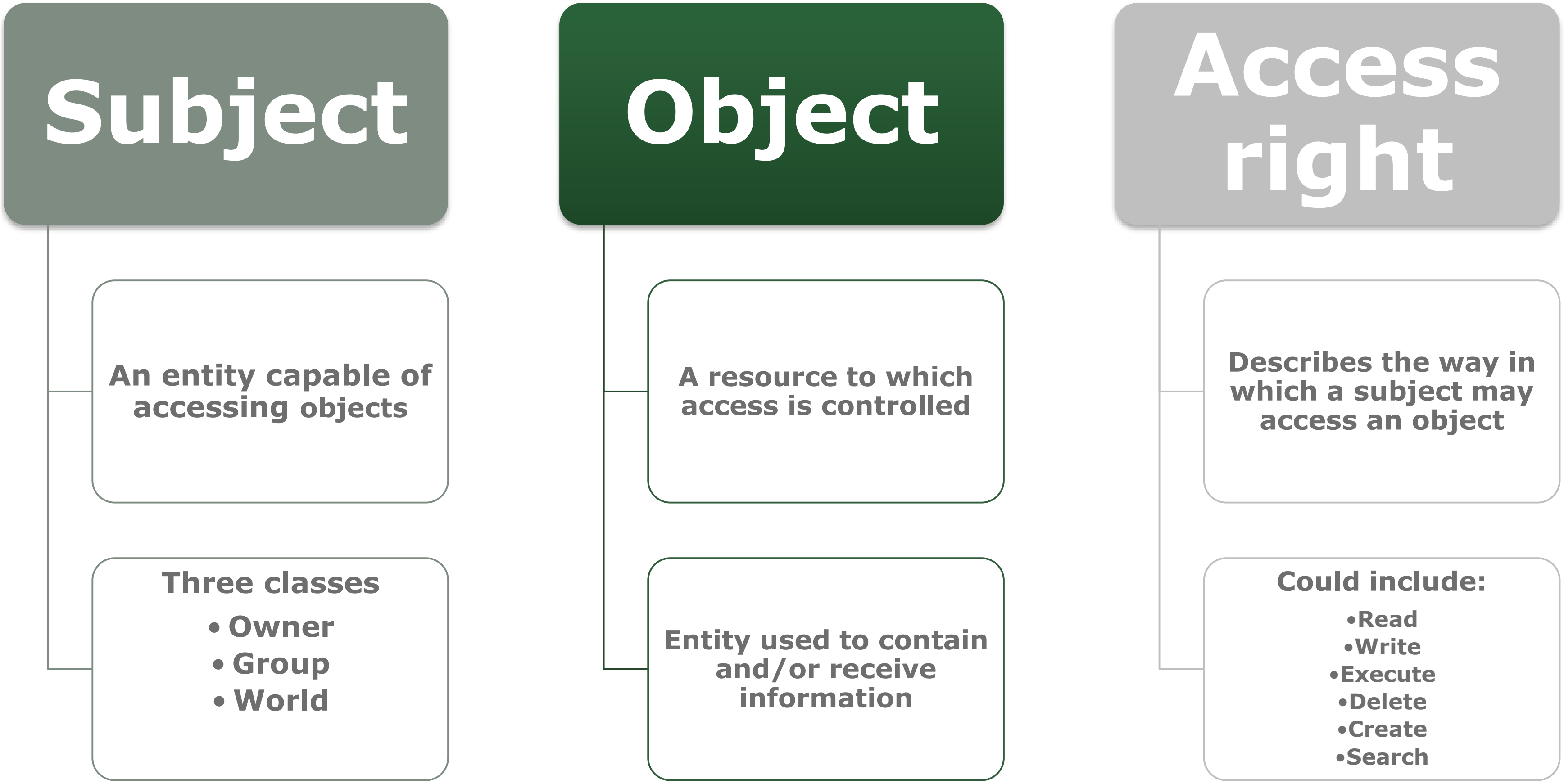
Role Based Access Control (RBAC)

Peter er ansat, Peter er Administrator
Mia er er ansat, Mia har adgang til Navision
Hans er ikke ansat, Hans har Guest-adgang

Jens har sagt op, han var ansat som administrator, har han stadig adgang?



Subjects, Objects, and Access Rights



Subject

An entity capable of accessing objects

Three classes

- Owner
- Group
- World

Object

A resource to which access is controlled

Entity used to contain and/or receive information

Access right

Describes the way in which a subject may access an object

Could include:

- Read
- Write
- Execute
- Delete
- Create
- Search

Access Control Policies

Discretionary access control (DAC)

- Controls access based on the identity of the requestor and on access rules (authorizations) stating what requestors are (or are not) allowed to do

Mandatory access control (MAC)

- Controls access based on comparing security labels with security clearances

Role-based access control (RBAC)

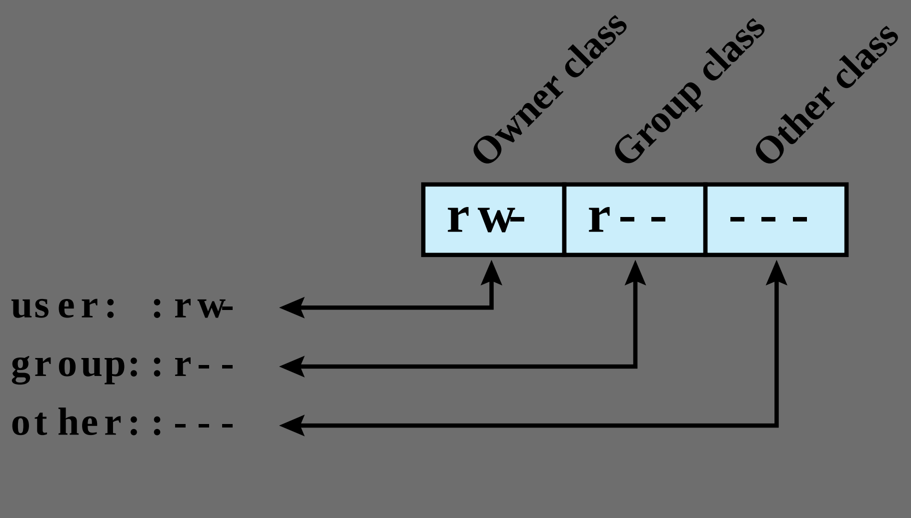
- Controls access based on the roles that users have within the system and on rules stating what accesses are allowed to users in given roles

Attribute-based access control (ABAC)

- Controls access based on attributes of the user, the resource to be accessed, and current environmental conditions

UNIX - File Access Control

- Unique user identification number (user ID)
- Member of a primary group identified by a group ID
- Belongs to a specific group
- 12 protection bits
  - Specify read, write, and execute permission for the owner of the file, members of the group and all other users
- The owner ID, group ID, and protection bits are part of the file’s inode



(a) Traditional UNIX approach (minimal access control list)

Figure 4.5 UNIX File Access Control

Traditional UNIX - File Access Control

- “Set user ID”(SetUID)
- “Set group ID”(SetGID)
  - System temporarily uses rights of the file owner/group in addition to the real user’s rights when making access control decisions
  - Enables privileged programs to access files/resources not generally accessible
- Sticky bit
  - When applied to a directory it specifies that only the owner of any file in the directory can rename, move, or delete that file

- Superuser
  - Is exempt from usual access control restrictions
  - Has system-wide access

  - AWS Roles

IAM

An administrative process coupled with a technological solution which validates the identity of individuals and allows owners of data, applications, and systems to either maintain centrally or distribute responsibility for granting access to their respective resources to anyone participating within the IAM framework.

IAM refers to the processes, technologies and policies for managing digital identities and controlling how identities can be used to access resources

IAM – Identity Life Cycle Management

Identity, Authentication and Authorization
Principle of Least Access
Groups and Roles
Administration
Auditing, Logging and Reporting
Segregation of Duties/Funktionsadskillelse

IAM

Identity: Who are you (you or a computer): UserIDs, Certificates, cards…

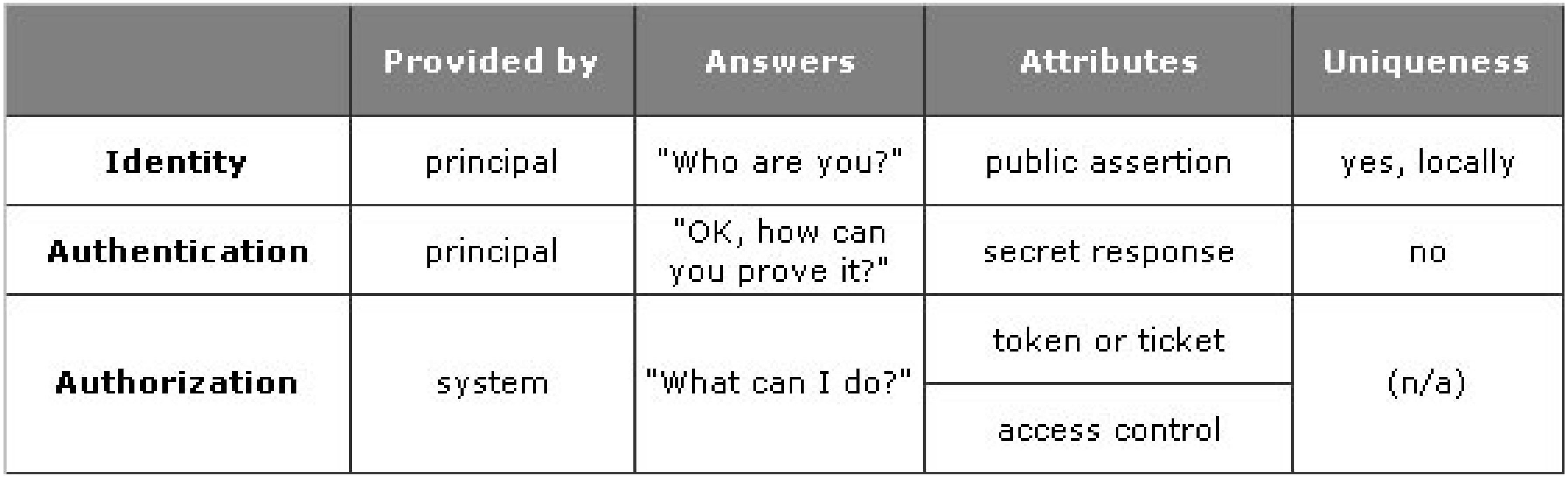
Authentication: Prove your identity: challenge-response: Passwords, Private keys, PINs…
Your possession of the secret proves you are who you claim to be.

Authorization: the system controls which resources you're allowed to access. Typically through the use of a token or ticket mechanism. allows you to access only that which the administrators have determined is necessary, thus enforcing the *principle of least privilege*.

IAM

Password

Password is used by another user

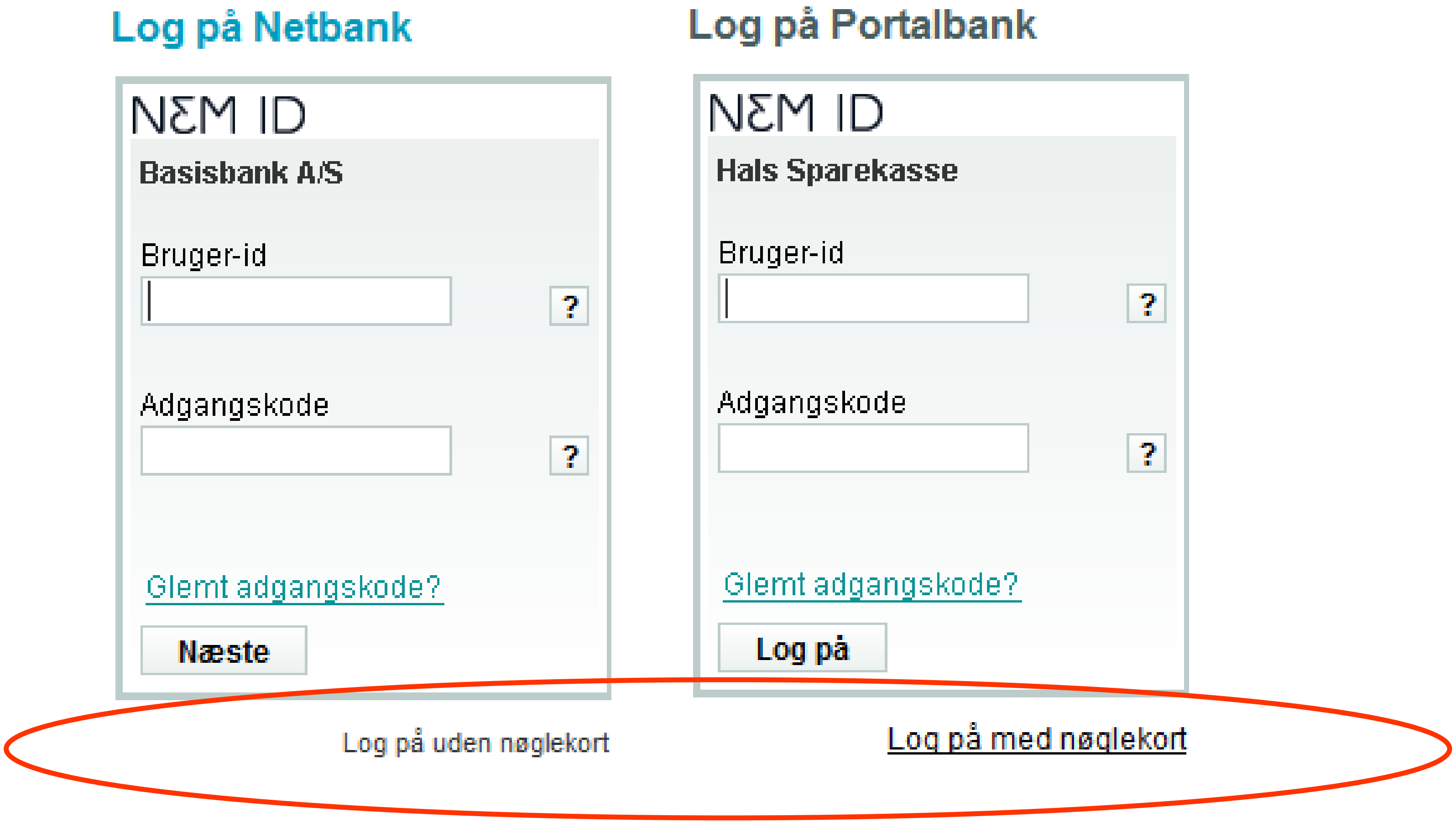


	Provided by	Answers	Attributes	Uniqueness
Identity	principal	"Who are you?"	public assertion	yes, locally
Authentication	principal	"OK, how can you prove it?"	secret response	no
Authorization	system	"What can I do?"	token or ticket	(n/a)
			access control	

Netflix, Google, Facebook…

NemID – identities and auth?

Identity, authentication, authorization



Log på Netbank

NEM ID

Basisbank A/S

Bruger-id

Adgangskode

Glemt adgangskode?

Næste

Log på uden nøglekort

Log på Portalbank

NEM ID

Hals Sparekasse

Bruger-id

Adgangskode

Glemt adgangskode?

Log på

Log på med nøglekort

Service Provider provides access to services based on their own risk assessment

IAM - Case

Du arbejder på et internt projekt til udvikling af nyt økonomisystem til din virksomhed.

Projektlederne fortæller, at for at overholde tidsplanen skal der ikke bruges bruger-id'er.
Systemet skal i stedet have et stærkt hardcodet password (17 tegn incl. specialtegn)
Alle der skal have adgang til økonomisystemet vil få oplyst koden hvis de har brug for adgangen.

Hvad siger du til projektlederen?

IAM - Case

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IAM – Case

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Tre faktorer+ til autentificering

Noget man **ved**, noget man **har** og noget man **ér**

Noget man **har glemt**, noget man **har tabt** og noget man **har været**

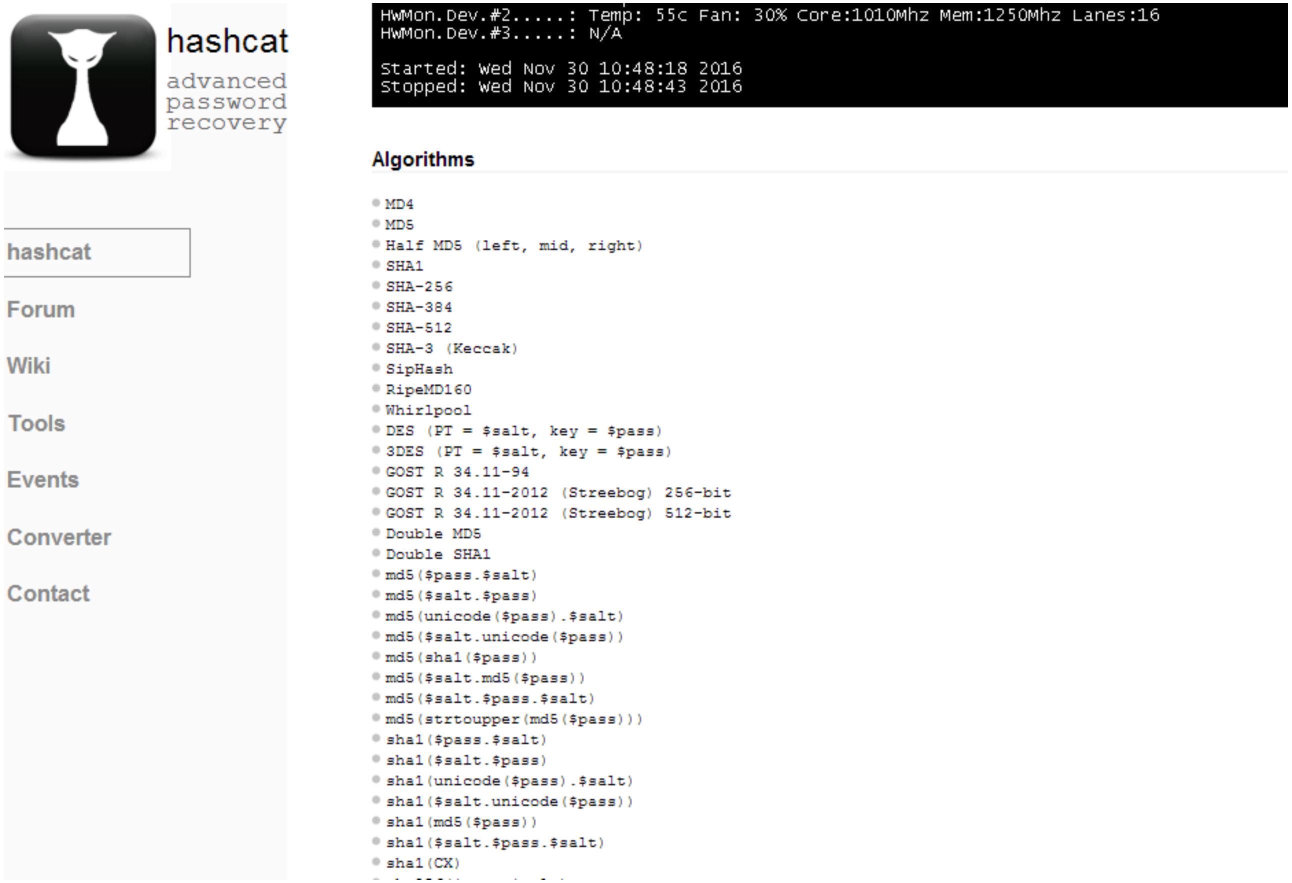
Noget man **gør**, **hvor** man er

Angreb imod brugerens passwords

1. Hvad er dit password? (spørge)
2. Gætte / default passwords
3. Dictionary Attack
4. Brute Force (f.eks. imod LanMan hash)
5. Rainbow Tables

Password cracking

Hashcat: https://hashcat.net



hashcat

advanced password recovery

- hashcat
- Forum
- Wiki
- Tools
- Events
- Converter
- Contact

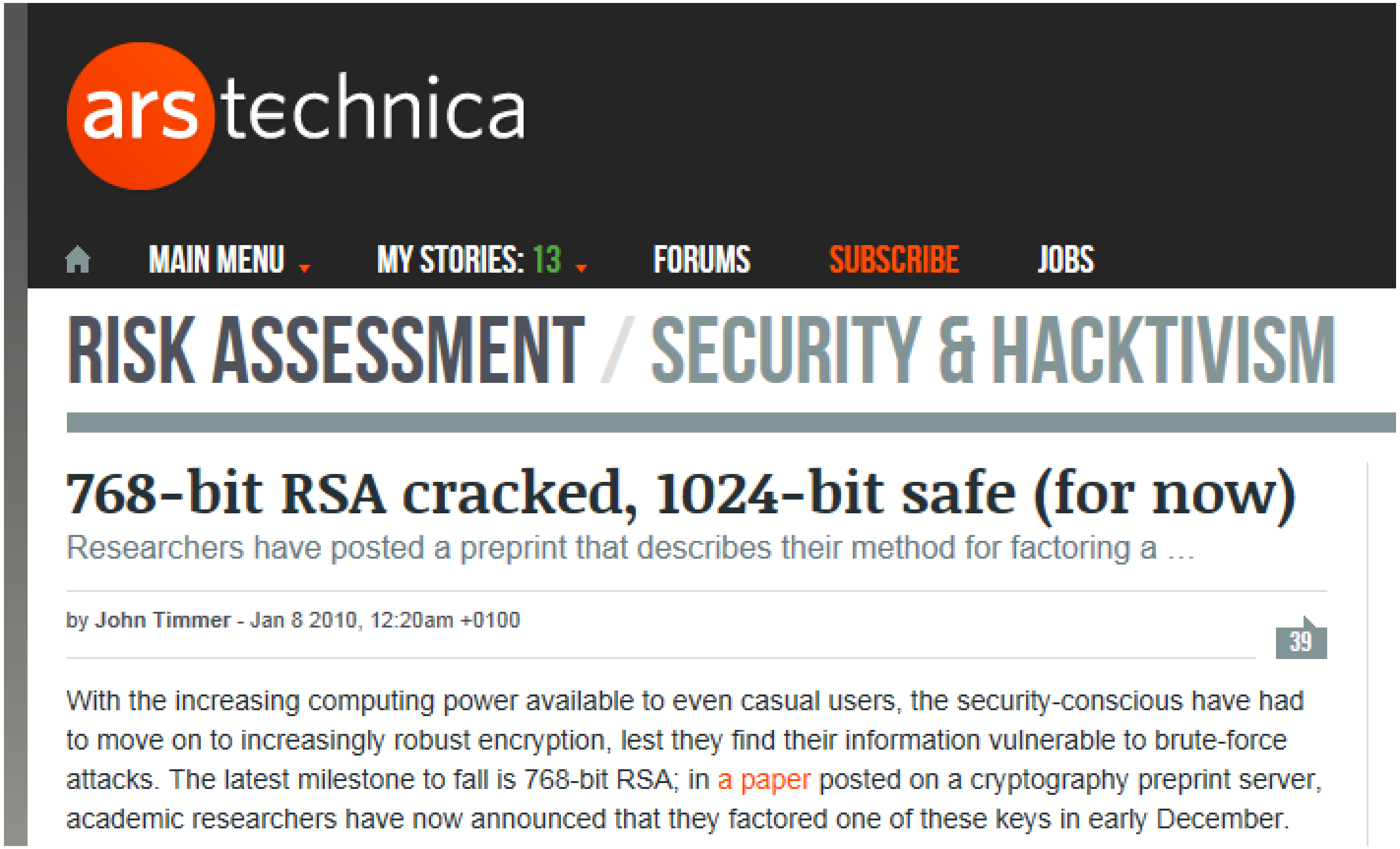
```
HwMon.Dev.#2.....: Temp: 55c Fan: 30% Core:1010Mhz Mem:1250Mhz Lanes:16
HwMon.Dev.#3.....: N/A

Started: Wed Nov 30 10:48:18 2016
Stopped: Wed Nov 30 10:48:43 2016
```

Algorithms

- MD4
- MD5
- Half MD5 (left, mid, right)
- SHA1
- SHA-256
- SHA-384
- SHA-512
- SHA-3 (Keccak)
- SipHash
- RipeMD160
- Whirlpool
- DES (PT = $salt, key = $pass)
- 3DES (PT = $salt, key = $pass)
- GOST R 34.11-94
- GOST R 34.11-2012 (Streebog) 256-bit
- GOST R 34.11-2012 (Streebog) 512-bit
- Double MD5
- Double SHA1
- md5($pass.$salt)
- md5($salt.$pass)
- md5(unicode($pass).$salt)
- md5($salt.unicode($pass))
- md5(sha1($pass))
- md5($salt.md5($pass))
- md5($salt.$pass.$salt)
- md5(strtoupper(md5($pass)))
- sha1($pass.$salt)
- sha1($salt.$pass)
- sha1(unicode($pass).$salt)
- sha1($salt.unicode($pass))
- sha1(md5($pass))
- sha1($salt.$pass.$salt)
- sha1(CX)

Password cracking

2009: “most people aren't going to have access to these sorts of clusters”
2014: AWS G3 1,536-core GPU: $0.26/time



768-bit RSA cracked, 1024-bit safe (for now)

Researchers have posted a preprint that describes their method for factoring a ...

by John Timmer - Jan 8 2010, 12:20am +0100

With the increasing computing power available to even casual users, the security-conscious have had to move on to increasingly robust encryption, lest they find their information vulnerable to brute-force attacks. The latest milestone to fall is 768-bit RSA; in a paper posted on a cryptography preprint server, academic researchers have now announced that they factored one of these keys in early December.

Baggrund

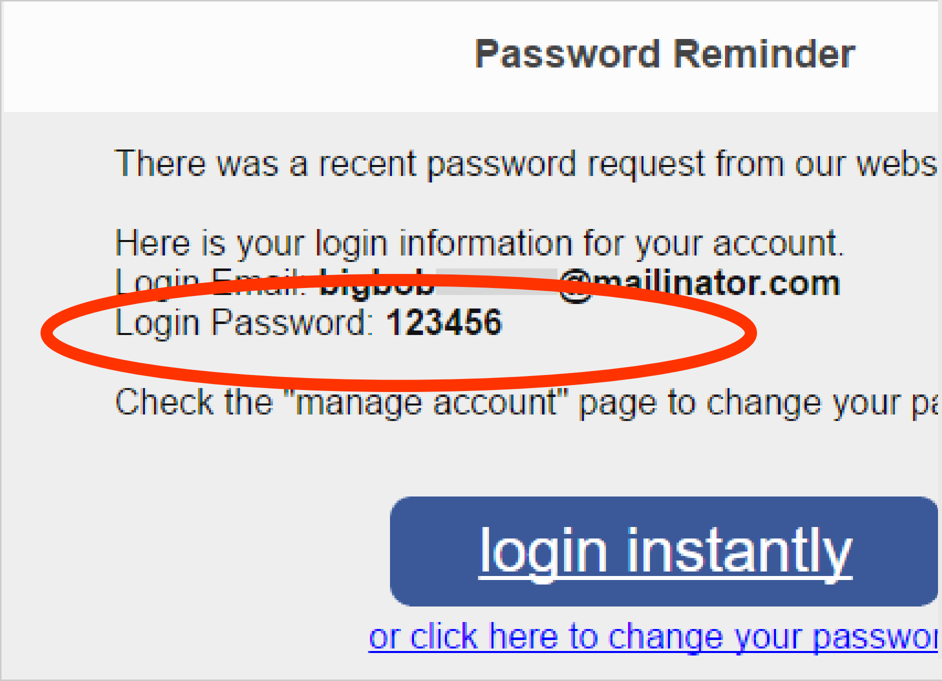
Passwords er den nye firewall – risikovurdering

Tokens, smart cards, biometrics

Password hash,
hash og salt,
scrypt/bcrypt

Baggrund

Password hash
hash og salt,
scrypt/bcrypt

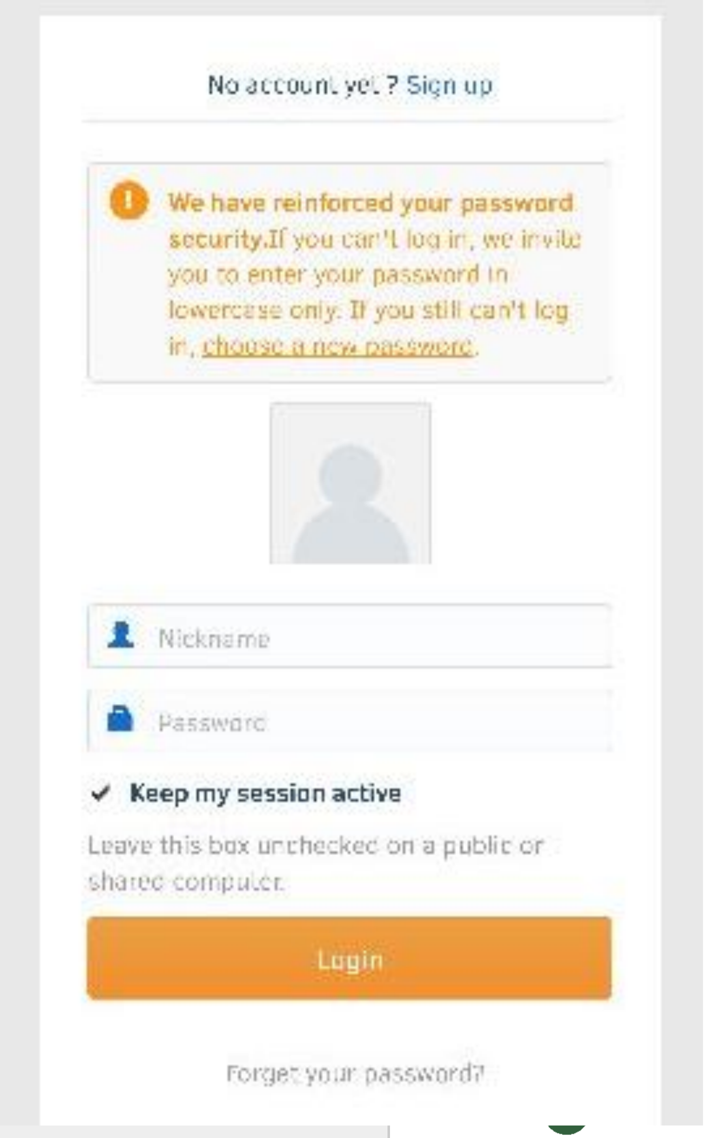


Password Reminder

There was a recent password request from our webs

Here is your login information for your account.
Login Email: **bigbob**[redacted]**@mailinator.com**
Login Password: **123456**

Check the "manage account" page to change your pa



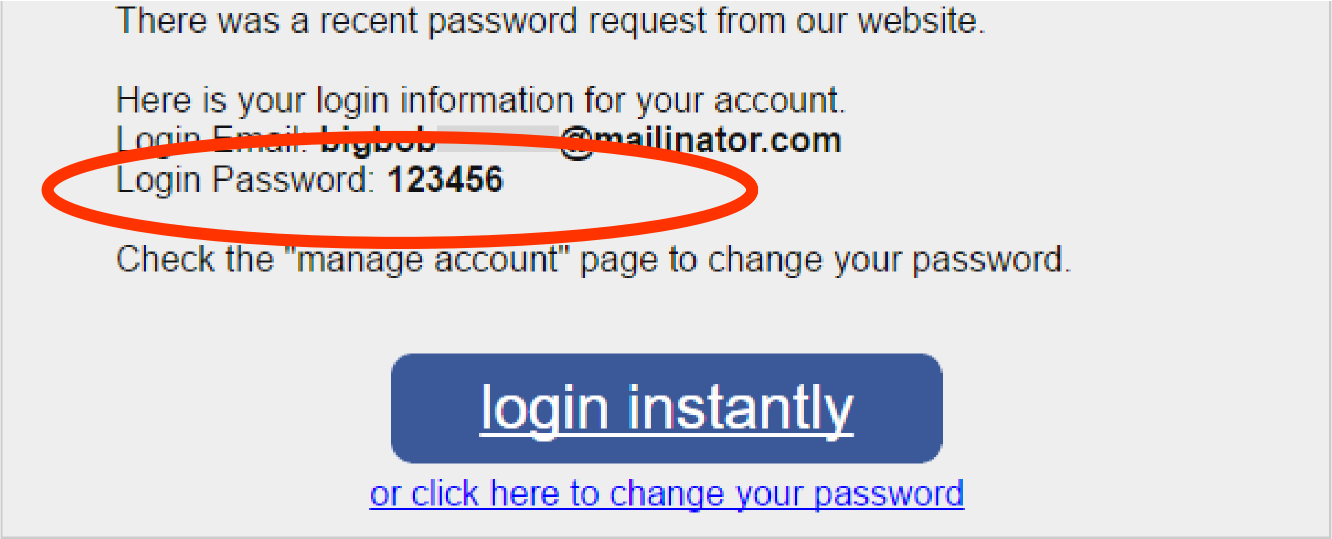
We have reinforced your password security.If you can't log in, we invite you to enter your password in lowercase only. If you still can't log in, choose a new password.

Leave this box unchecked on a public or shared computer.

Baggrund

Password hash,
hash og salt,
scrypt/bcrypt

Don't store the password, store a hash of the password



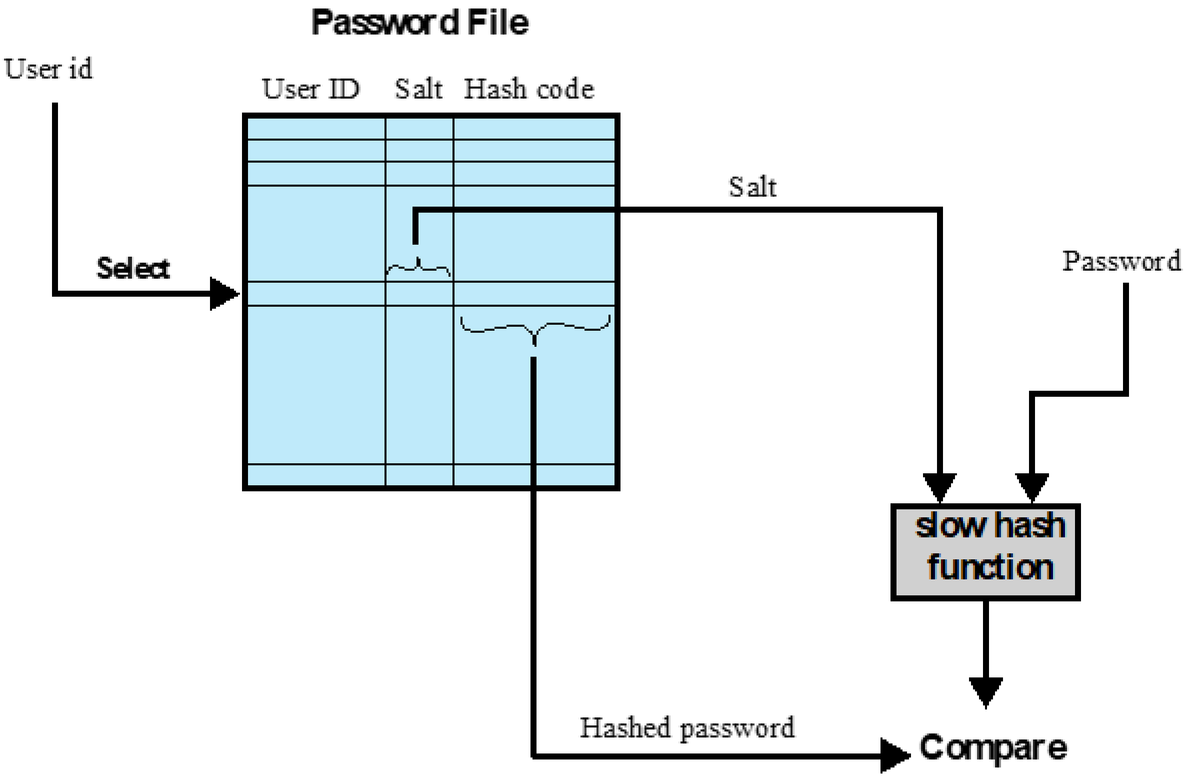
There was a recent password request from our website.

Here is your login information for your account.
Login Email: **bigbob**[redacted]**@mailinator.com**
Login Password: **123456**

Check the "manage account" page to change your password.

Salt

aaa



(b) Verifying a password

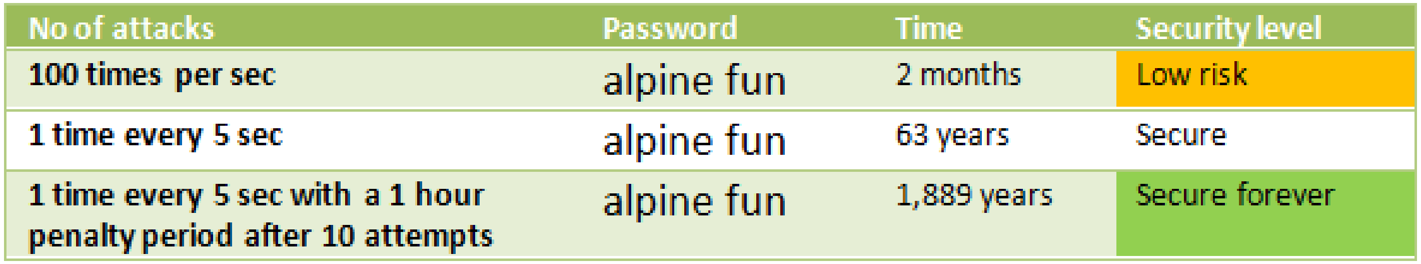
Password hash?

Direkte off-line adgang til password hash
eller
Online - forbinde til serveren hver gang?

- Begrænsninger på antallet af forsøg?
- Time-delay mellem sign-in attempts, brug af penalty period (f.eks. 1 time) hvis forkert password er indtastet for mange gange
  - f.eks. 10 gange

Password hash?

A hacker can hack the password "alpine fun" in only 2 months if he is able to attack your server 100 times per second. But, with the penalty period and the 5 second delay, the same password can suddenly sustain an attack for 1,889 years.



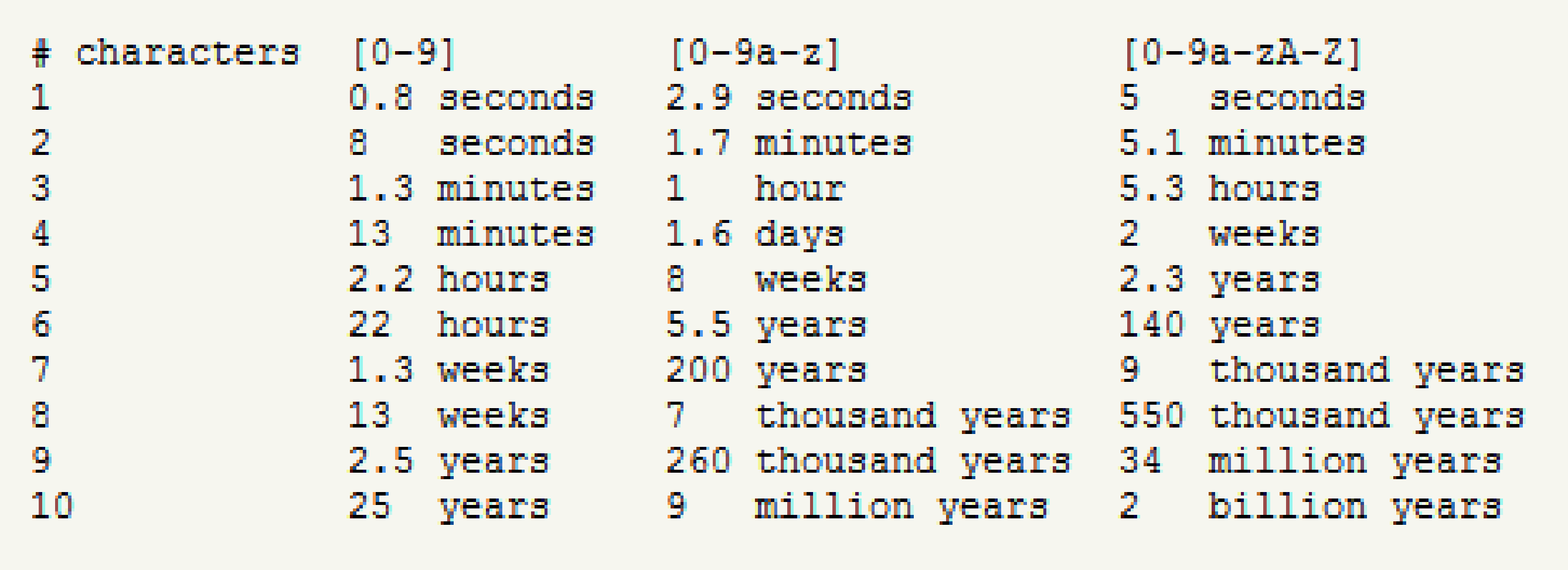
No of attacks	Password	Time	Security level
100 times per sec	alpine fun	2 months	Low risk
1 time every 5 sec	alpine fun	63 years	Secure
1 time every 5 sec with a 1 hour penalty period after 10 attempts	alpine fun	1,889 years	Secure forever

Se f.eks. ”The Usability of Passwords” http://www.baekdal.com/tips/password-security-usability og ”The Usability of Passwords FAQ”: http://www.baekdal.com/tips/the-usability-of-passwords-faq

Apple

Apple default: 80ms per password attempt delay
Enforced by tamper resistant hardware

Exponential growth:



```
# characters  [0-9]         [0-9a-z]              [0-9a-zA-Z]
1             0.8 seconds   2.9 seconds           5   seconds
2             8   seconds   1.7 minutes           5.1 minutes
3             1.3 minutes   1   hour              5.3 hours
4             13  minutes   1.6 days              2   weeks
5             2.2 hours     8   weeks             2.3 years
6             22  hours     5.5 years             140 years
7             1.3 weeks     200 years             9   thousand years
8             13  weeks     7   thousand years    550 thousand years
9             2.5 years     260 thousand years    34  million years
10            25  years     9   million years     2   billion years
```

Hvad er et godt password?

Hvad er et godt password?

Brugernes passwords er altid dårlige

Opfylder kun lige akkurat de tekniske krav der stilles

Dvs. password regler styrker passwords, men kun op til den tekniske grænse løsningen tvinger brugerne til

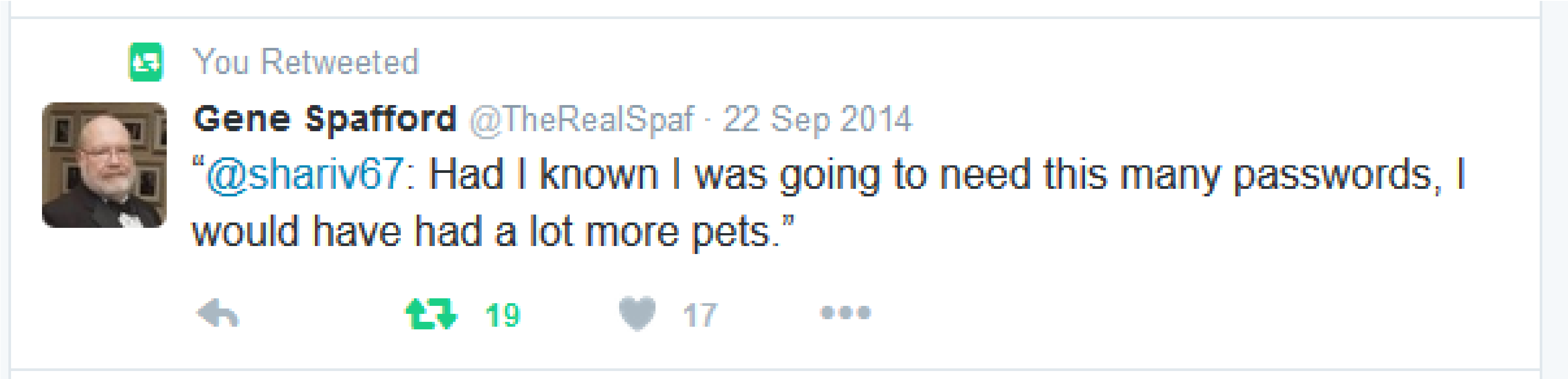
Med mindre vi bliver tvunget - eller undervist - i andet, så vælger vi alle password efter dette mønster:

Hvad er et godt password?

1. **Ingen koder**
   Hvis man giver en bruger frit valg vil alle brugere selvfølgelig, alt andet lige, vælge at ikke bruge passwords, fordi det er det mest brugervenlige (dvs. letteste)

2. **Almindelige ord**
   Hvis systemet tvinger til at bruge et kodeord, er første problem hvordan man selv husker sin kode.
   Så man vælger i første omgang sin kode ud fra, om man tror man kan huske den, ikke fordi man tænker på ”sikkerhed”
   – brugerens risikovurdering

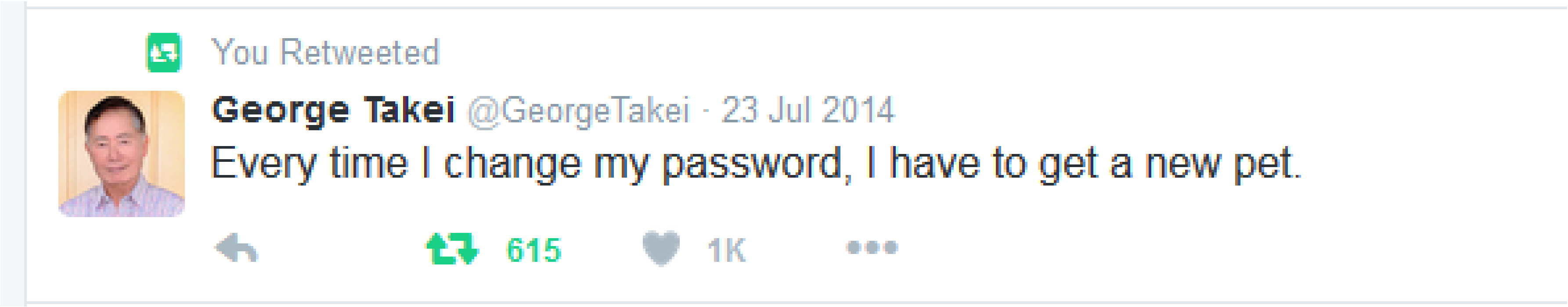
Mental models – ”noget man tit tænker på”



You Retweeted

Gene Spafford @TheRealSpaf · 22 Sep 2014

“@shariv67: Had I known I was going to need this many passwords, I would have had a lot more pets.”

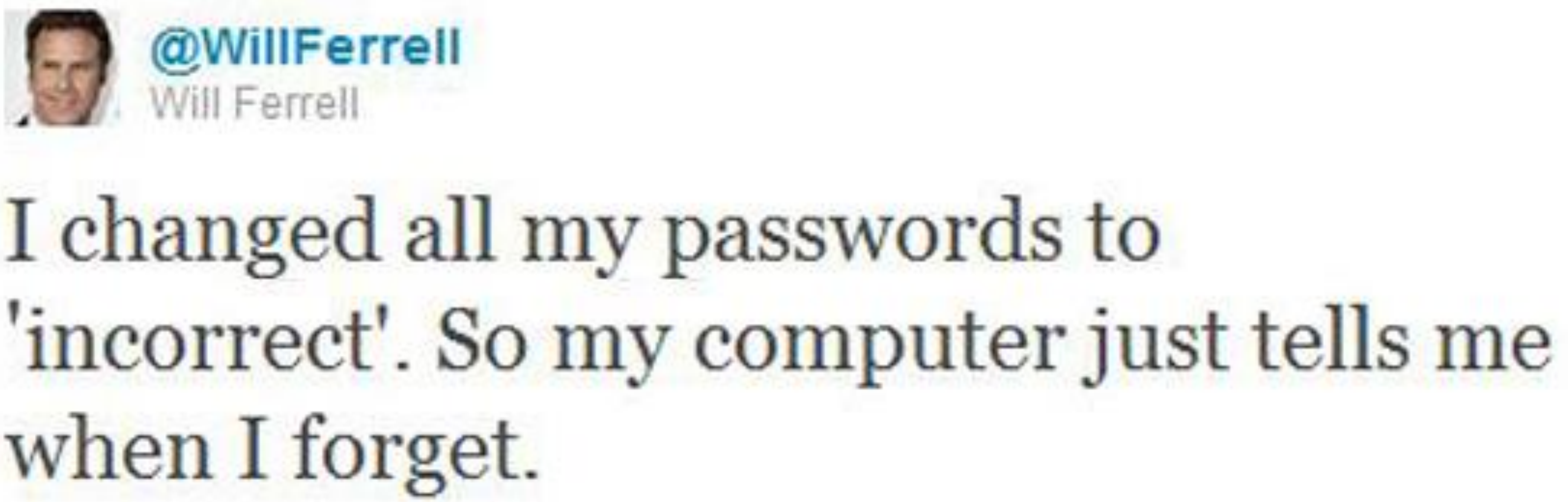


You Retweeted

George Takei @GeorgeTakei · 23 Jul 2014

Every time I change my password, I have to get a new pet.

Hvad er et godt password?



@WillFerrell
Will Ferrell

I changed all my passwords to 'incorrect'. So my computer just tells me when I forget.

The user name or password is incorrect.

Hvad er et godt password?

Systems:
But we use the same systems – otherwise we cannot remember the passwords:

- If both upper-case and lower-case letters are required people only use one upper-case letter – and it is always first:
  The password becomes ”Password”, not ”pAssword”

- If numbers are also required, they are always last: ”Password12”

- Non-alfabetic are the very last part, if they are required.
  So the ”super-strong” password would be ”Password12!”

- On smartphones we make patterns, such as "1234", "1122", "1111" or years/dates such as "1945", the PIN should be at least 8 characters – and consider biometrics

Two passwords

Password123dec **hY6%%#2873GH/GtAQ?08-dPe2>S**

- Guessing the first PW means all future PWs can be guessed
- The user can remember the first password - no.2 will be written down somewhere because of password change rules
- Nr.2 is impossible to break, no.2 is not

- Which password is best now?
- Which password is best next month?

Hvad er et godt password?

"The password must be impossible to remember and nowhere written down"

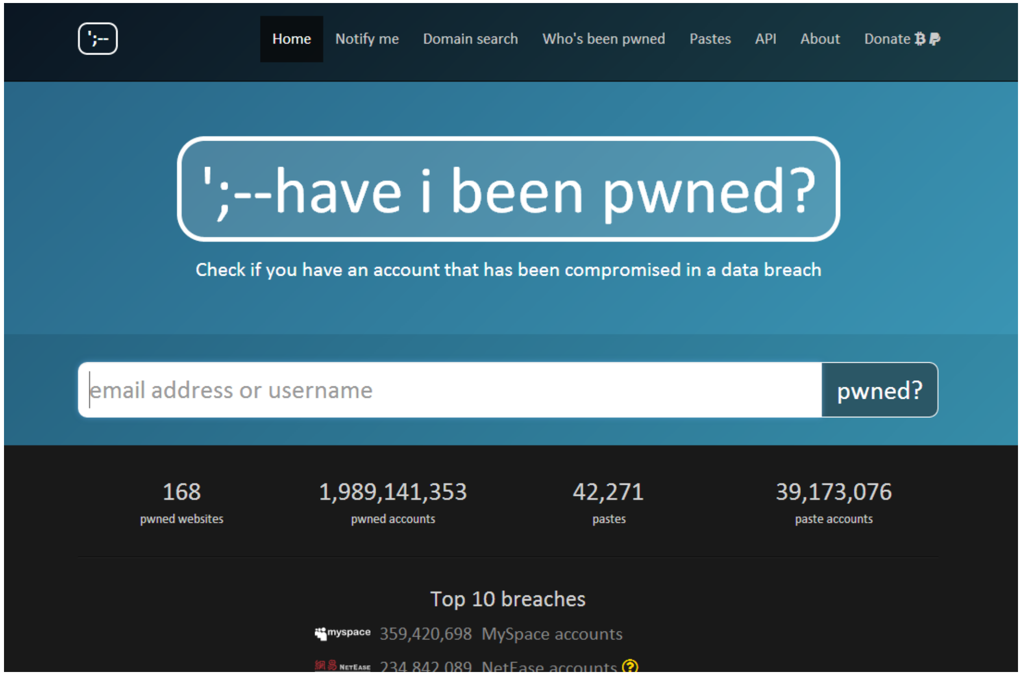
Peter Gutmann

Må man skrive sine passwords ned?

https://www.youtube.com/watch?v=Srh_TV_J144

Password reuse

Model2: samme password på mange sites
Er det et problem?



';--have i been pwned?

Check if you have an account that has been compromised in a data breach

168 pwned websites

1,989,141,353 pwned accounts

42,271 pastes

39,173,076 paste accounts

Top 10 breaches

359,420,698 MySpace accounts

234,842,089 NetEase accounts ?

Password reuse:

https://haveibeenpwned.com

Hvor langt skal et password være?
Hvad med special tegn?

http://howsecureismypassword.net

intel Security

HOW PASSWORD LENGTH WINS THE INTERNET

Passwords 102

Hvad er et godt password?

Password huskere

Overvej password managers som 1password, Roboform, og Password Safe.
Kan beskytte koderne og kan give adgang til de gemte koder med et "super-password".

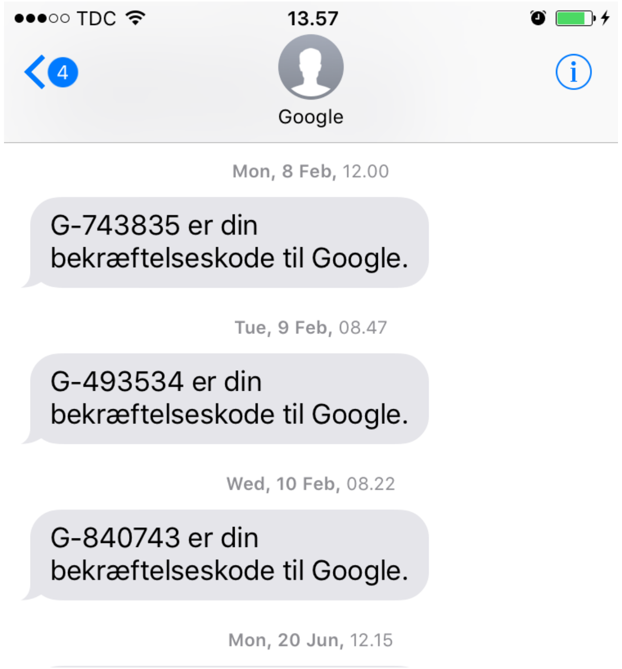
Autogenere stærke koder. Genbruger aldrig vigtige passwords på forskellige sider.
Selv stærke passwords kan mistes på sites med sikkerhedsproblemer.

Password managers

Undgår password genbrug
Stærke passwords over det hele

Problemer?

Two Factor Authentication (2FA)



Mon, 8 Feb, 12.00

G-743835 er din bekræftelseskode til Google.

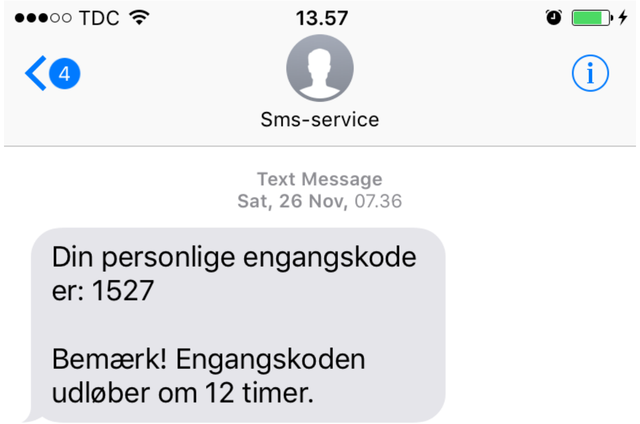
Tue, 9 Feb, 08.47

G-493534 er din bekræftelseskode til Google.

Wed, 10 Feb, 08.22

G-840743 er din bekræftelseskode til Google.

Mon, 20 Jun, 12.15



Text Message
Sat, 26 Nov, 07.36

Din personlige engangskode er: 1527

Bemærk! Engangskoden udløber om 12 timer.

Se f.eks.:
https://www.yubico.com
https://duo.com

Two Factor Authentication (2FA) – nogle termer

Push notification
Verify identity by approving a push notification, for instance in an app

Phone callback
Require you to pick-up a phone call and for instance press a specific key, or any key, before you are provided access

Challenge-response
Requires you to enter data back to the system to verify a transaction is correct

Token
A hardware device, after pushing a button to generate a code, the code is then typed into the password prompt

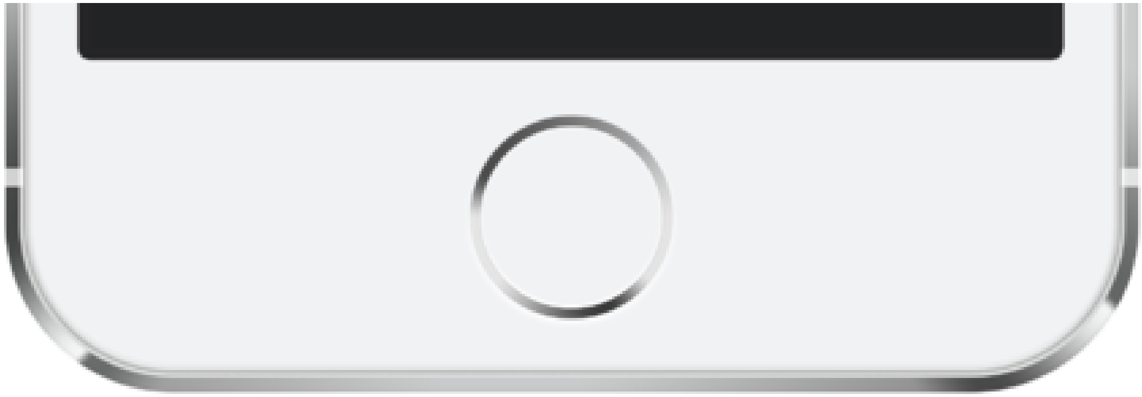
Two Factor Authentication (2FA) – nogle termer

SMS passcode
A code is sent to your phone via SMS and must be typed into the two-factor prompt

One-Time Password/One-Time Pad (OTP)
Can only be used one time

Hvad er et godt password?

Biometri?



Hvad er et godt password?

Hvor tit skal password skiftes?

Ikke kritisk – afhængig af hvor man indtaster passwords

Krav om skift f.eks. hver 90 dage kan være et problem fordi folk så typisk vælger svage passwords.
=> ”Password06” eller ”PasswordJuni”

Hvad er et godt password?

Overvej det hvis det er muligt at bruge 2-faktor authentication på en site

Næsten altid en forbedring af sikkerheden

- Support er dyrt

Pas på "secret questions"

Backup systemet for glemte passwords må ikke være svagere end dit password.

Meget lavere sikkerhed

Pick a secure password:

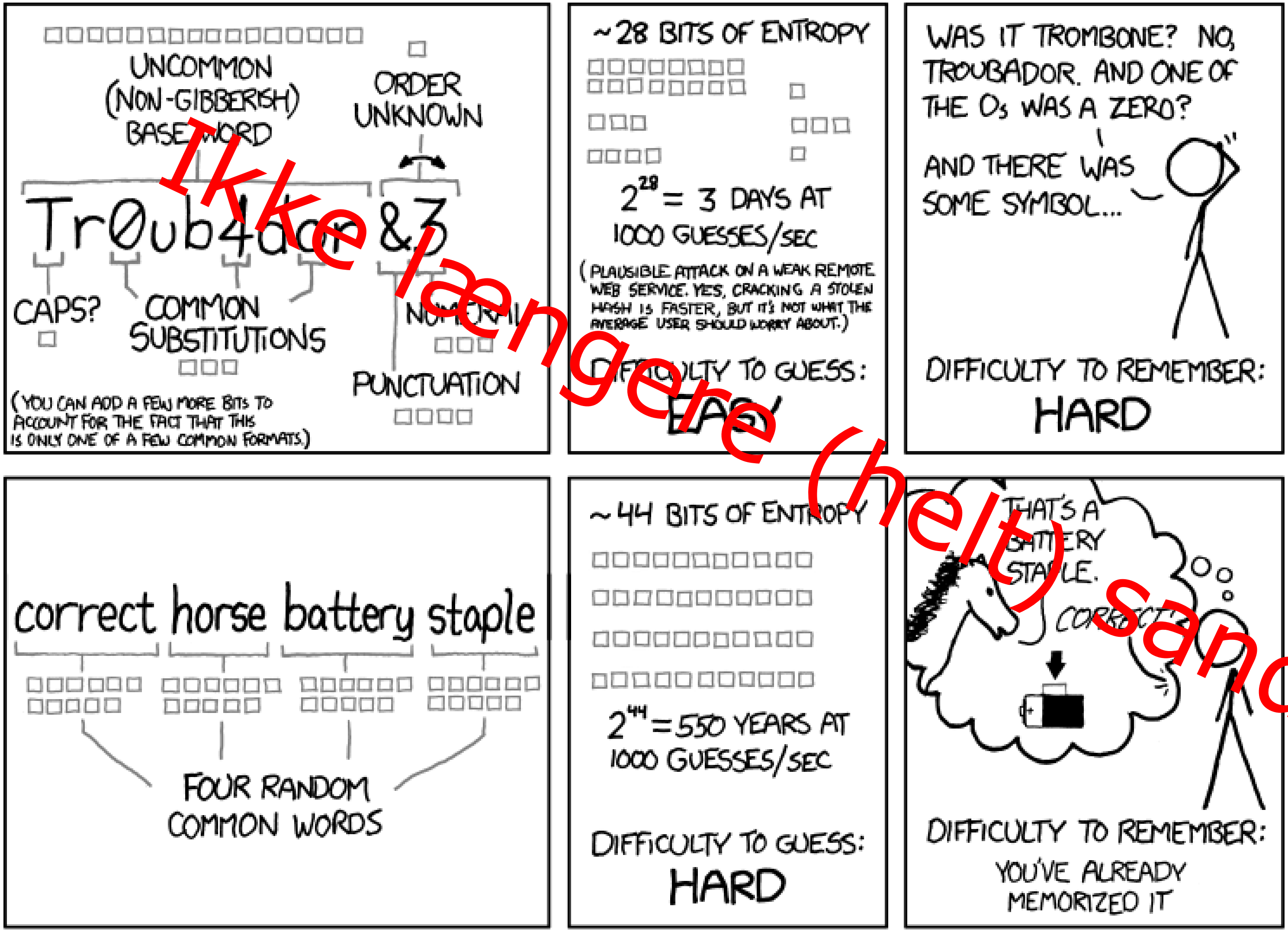
"0k5ijU)=2w8VAiqxozKyB‟

Now, in case you forget it, what's your favorite color?

"Blue”

Hvad er et godt password? (længde > kompleksitet)

Ikke længere (helt) sandt


UNCOMMON (NON-GIBBERISH) BASE WORD
ORDER UNKNOWN
Tr0ub4dor &3
CAPS?
COMMON SUBSTITUTIONS
NUMERAL
PUNCTUATION
(YOU CAN ADD A FEW MORE BITS TO ACCOUNT FOR THE FACT THAT THIS IS ONLY ONE OF A FEW COMMON FORMATS.)
~28 BITS OF ENTROPY
2^28 = 3 DAYS AT 1000 GUESSES/SEC
(PLAUSIBLE ATTACK ON A WEAK REMOTE WEB SERVICE. YES, CRACKING A STOLEN HASH IS FASTER, BUT IT'S NOT WHAT THE AVERAGE USER SHOULD WORRY ABOUT.)
DIFFICULTY TO GUESS: EASY
WAS IT TROMBONE? NO, TROUBADOR. AND ONE OF THE Os WAS A ZERO?
AND THERE WAS SOME SYMBOL...
DIFFICULTY TO REMEMBER: HARD
correct horse battery staple
FOUR RANDOM COMMON WORDS
~44 BITS OF ENTROPY
2^44 = 550 YEARS AT 1000 GUESSES/SEC
DIFFICULTY TO GUESS: HARD
THAT'S A BATTERY STAPLE.
CORRECT!
DIFFICULTY TO REMEMBER: YOU'VE ALREADY MEMORIZED IT

THROUGH 20 YEARS OF EFFORT, WE'VE SUCCESSFULLY TRAINED EVERYONE TO USE PASSWORDS THAT ARE HARD FOR HUMANS TO REMEMBER, BUT EASY FOR COMPUTERS TO GUESS.

Eksempel på dårlige passwords: Amerikanske Dankort maskiner

Amerikanske ATM/Dankortmaskiner hacket med default password

ATM hacket, tror indeholder 5$ sedler i stedet for $20 => udbetaler 3x for meget

Pre Paid Card

9 dage før kunder rapporterede

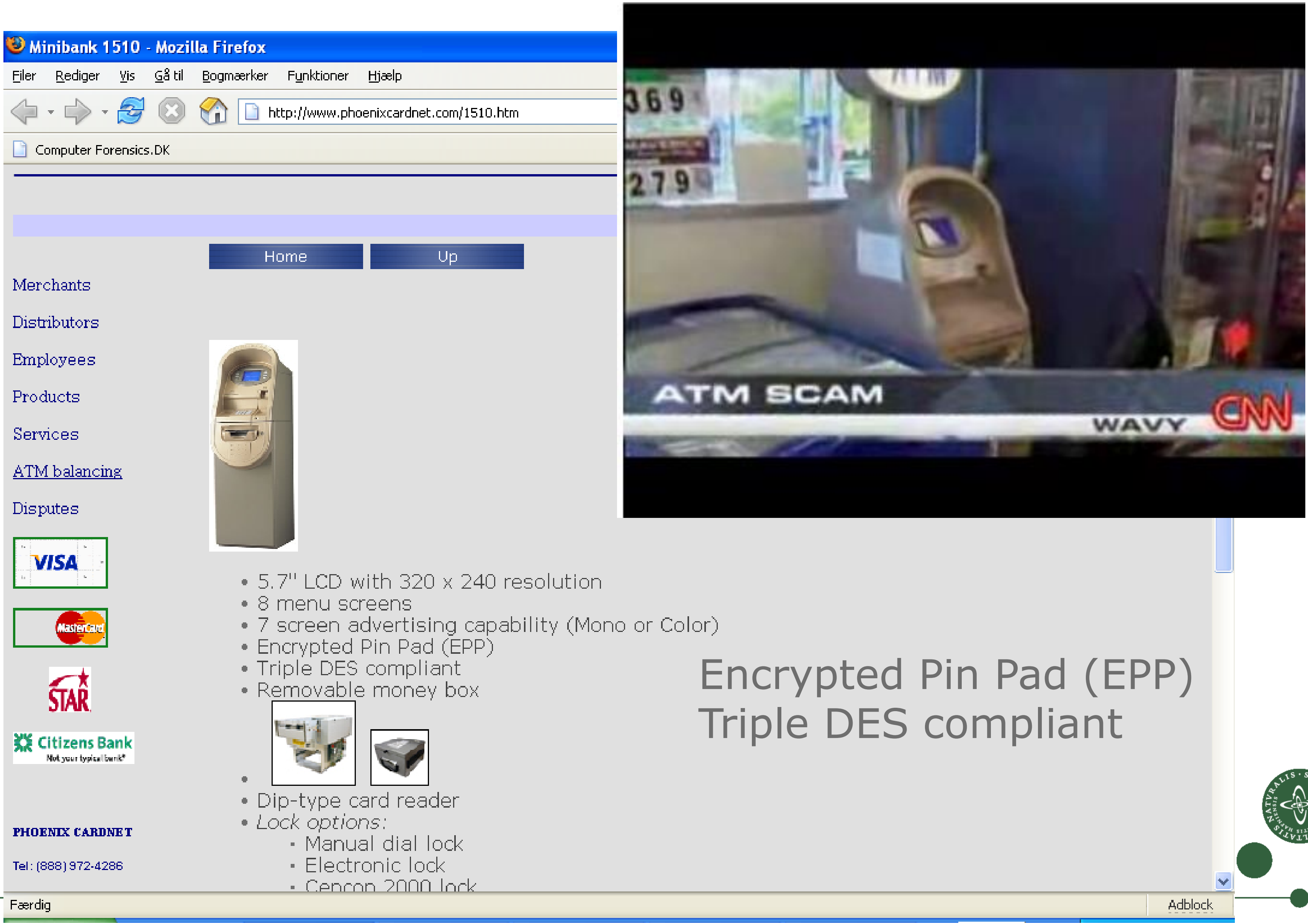
Amerikanske ATM/Dankortmaskiner hacket med default password

http://www.youtube.com/watch?v=cmW_4R81jVU

CNN Report: Robber Tricks ATM machine

CNN Report: Robber Tricks ATM machine

Amerikanske ATM/Dankortmaskiner hacket med default password



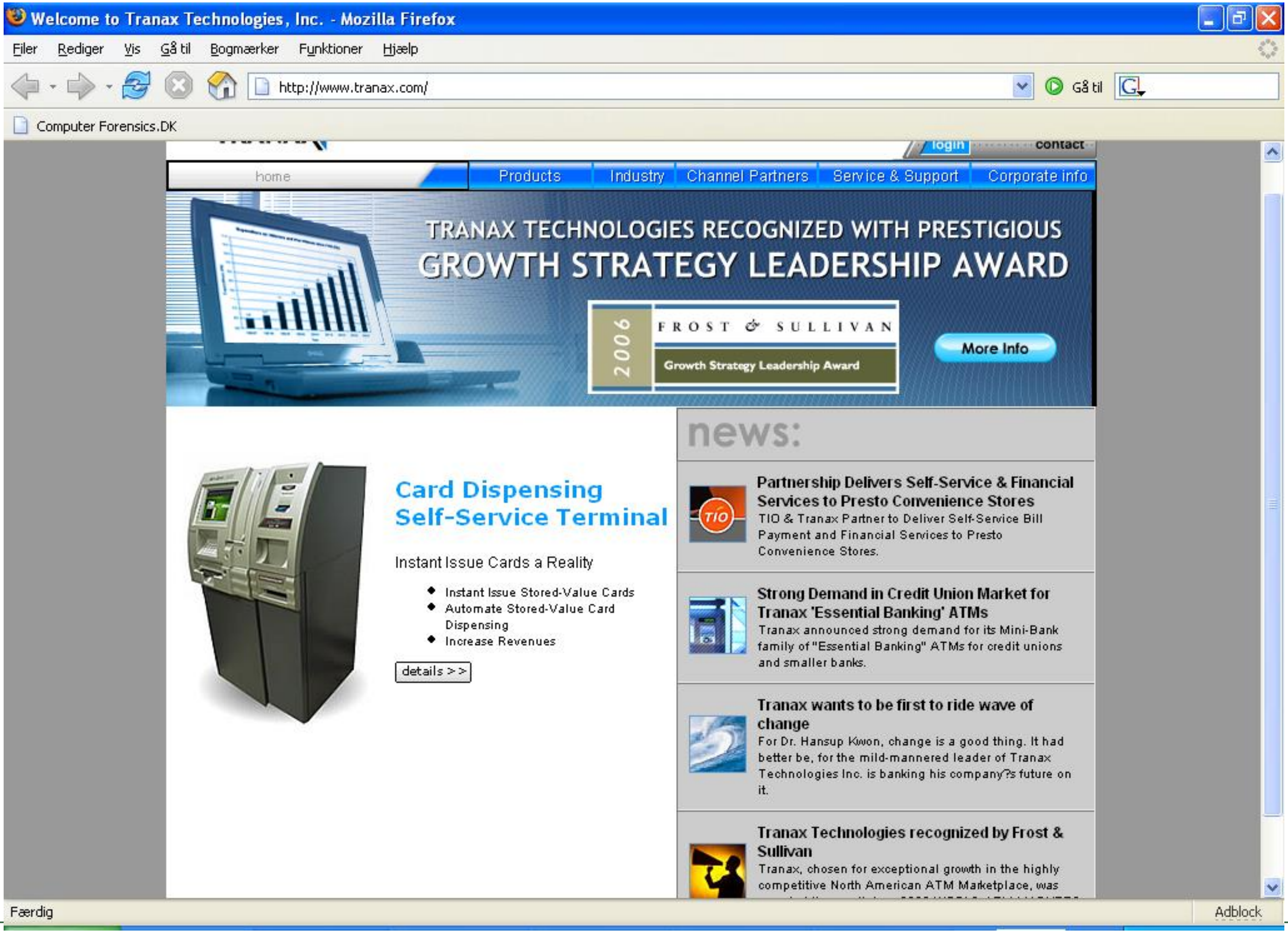
- 5.7" LCD with 320 x 240 resolution
- 8 menu screens
- 7 screen advertising capability (Mono or Color)
- Encrypted Pin Pad (EPP)
- Triple DES compliant
- Removable money box
-
- Dip-type card reader
- *Lock options:*
  - Manual dial lock
  - Electronic lock
  - Cencon 2000 lock

PHOENIX CARDNET

Tel: (888) 972-4286

Encrypted Pin Pad (EPP)
Triple DES compliant

Amerikanske ATM/Dankortmaskiner hacket med default password



TRANAX TECHNOLOGIES RECOGNIZED WITH PRESTIGIOUS GROWTH STRATEGY LEADERSHIP AWARD

2006 FROST & SULLIVAN Growth Strategy Leadership Award

Card Dispensing Self-Service Terminal

Instant Issue Cards a Reality

- Instant Issue Stored-Value Cards
- Automate Stored-Value Card Dispensing
- Increase Revenues

news:

Partnership Delivers Self-Service & Financial Services to Presto Convenience Stores
TIO & Tranax Partner to Deliver Self-Service Bill Payment and Financial Services to Presto Convenience Stores.

Strong Demand in Credit Union Market for Tranax 'Essential Banking' ATMs
Tranax announced strong demand for its Mini-Bank family of "Essential Banking" ATMs for credit unions and smaller banks.

Tranax wants to be first to ride wave of change
For Dr. Hansup Kwon, change is a good thing. It had better be, for the mild-mannered leader of Tranax Technologies Inc. is banking his company?s future on it.

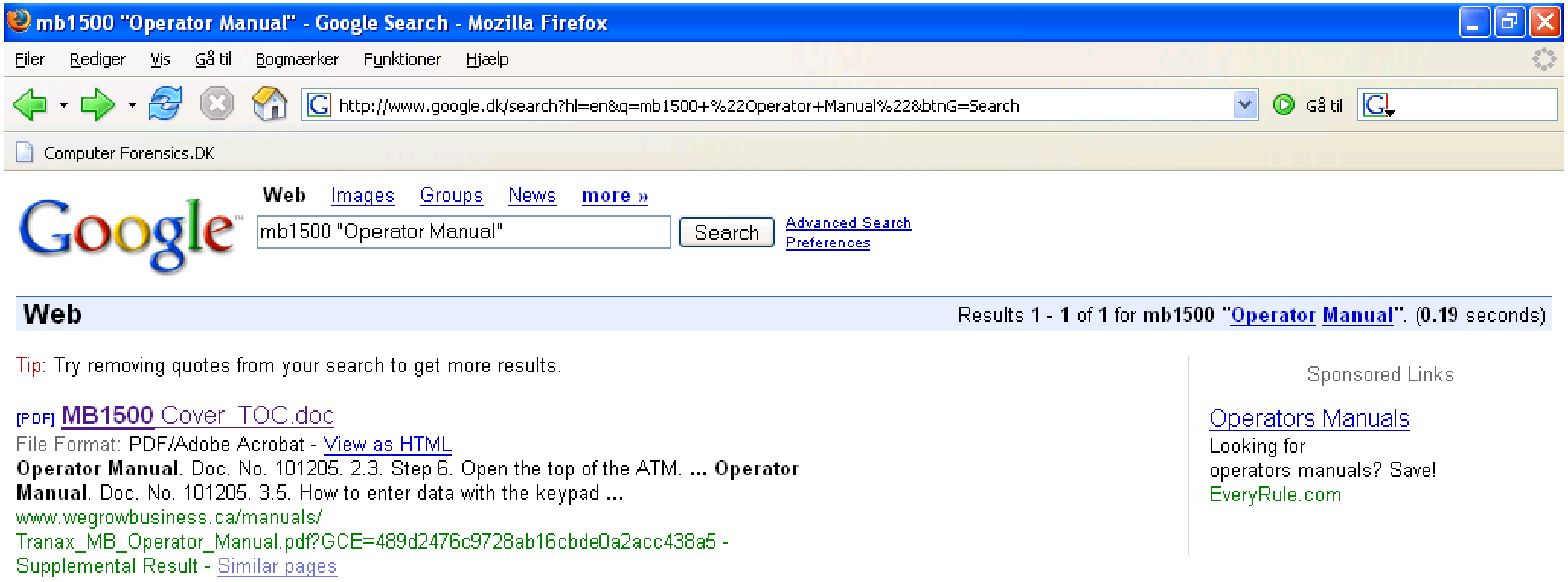
Tranax Technologies recognized by Frost & Sullivan
Tranax, chosen for exceptional growth in the highly competitive North American ATM Marketplace, was

Amerikanske ATM/Dankortmaskiner hacket med default password

Knowledgebase:

The ATM is programmed with the passwords that the distributor requests when the order is placed to program a new ATM. *When special passwords are not requested they are left at the factory default (see your mini-bank operators manual)* Every new ATM that is shipped from Tranax has a copy of the print setup included in the “open me first” box or envelope. The master password is hand written at the top of the print setup for the convienence of the installer.

Amerikanske ATM/Dankortmaskiner hacket med default password


mb1500 "Operator Manual" - Google Search - Mozilla Firefox
Filer Rediger Vis Gå til Bogmærker Funktioner Hjælp
http://www.google.dk/search?hl=en&q=mb1500+%22Operator+Manual%22&btnG=Search
Gå til
Computer Forensics.DK
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Advanced Search
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mb1500 "Operator Manual"

Web Results **1** - **1** of **1** for **mb1500** "**Operator Manual**". (**0.19** seconds)

Tip: Try removing quotes from your search to get more results.

[PDF] MB1500 Cover TOC.doc
File Format: PDF/Adobe Acrobat - View as HTML
Operator Manual. Doc. No. 101205. 2.3. Step 6. Open the top of the ATM. ... **Operator Manual**. Doc. No. 101205. 3.5. How to enter data with the keypad ...
www.wegrowbusiness.ca/manuals/
Tranax_MB_Operator_Manual.pdf?GCE=489d2476c9728ab16cbde0a2acc438a5 -
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Looking for
operators manuals? Save!
EveryRule.com

Tranax manual inurl:pdf

Amerikanske ATM/Dankortmaskiner hacket med default password

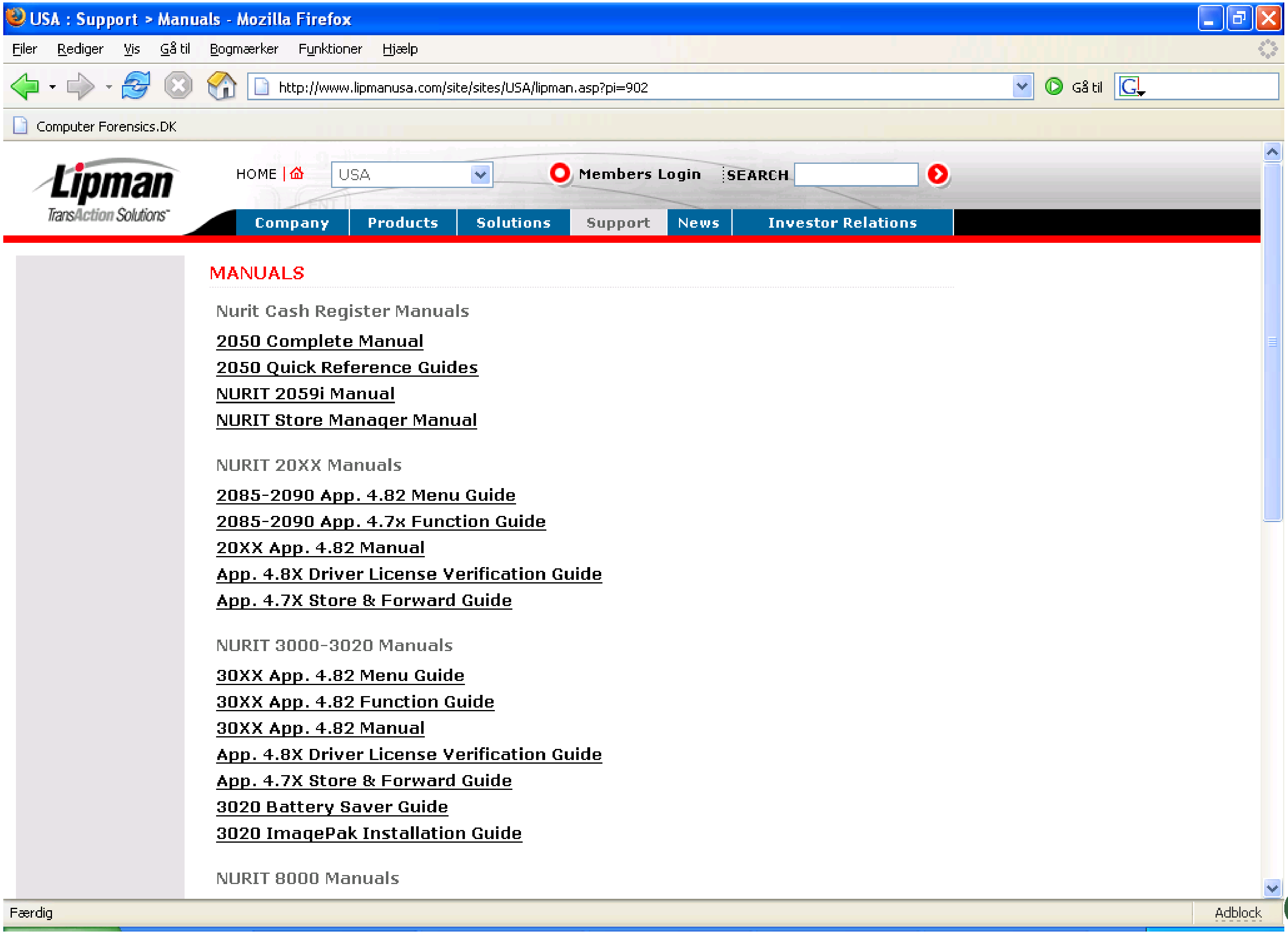
Thranax:
Master = 555555
Service = 222222
Operator = 111111

Triton:
12345

Lipman:
Merchant = 2222222
Technician = 1111111

GTI:
1234

Amerikanske ATM/Dankortmaskiner hacket med default password



USA : Support > Manuals - Mozilla Firefox
Filer Rediger Vis Gå til Bogmærker Funktioner Hjælp
http://www.lipmanusa.com/site/sites/USA/lipman.asp?pi=902
Gå til
Computer Forensics.DK
Lipman TransAction Solutions
HOME
USA
Members Login
SEARCH
Company
Products
Solutions
Support
News
Investor Relations
Færdig
Adblock

MANUALS

Nurit Cash Register Manuals

2050 Complete Manual
2050 Quick Reference Guides
NURIT 2059i Manual
NURIT Store Manager Manual

NURIT 20XX Manuals

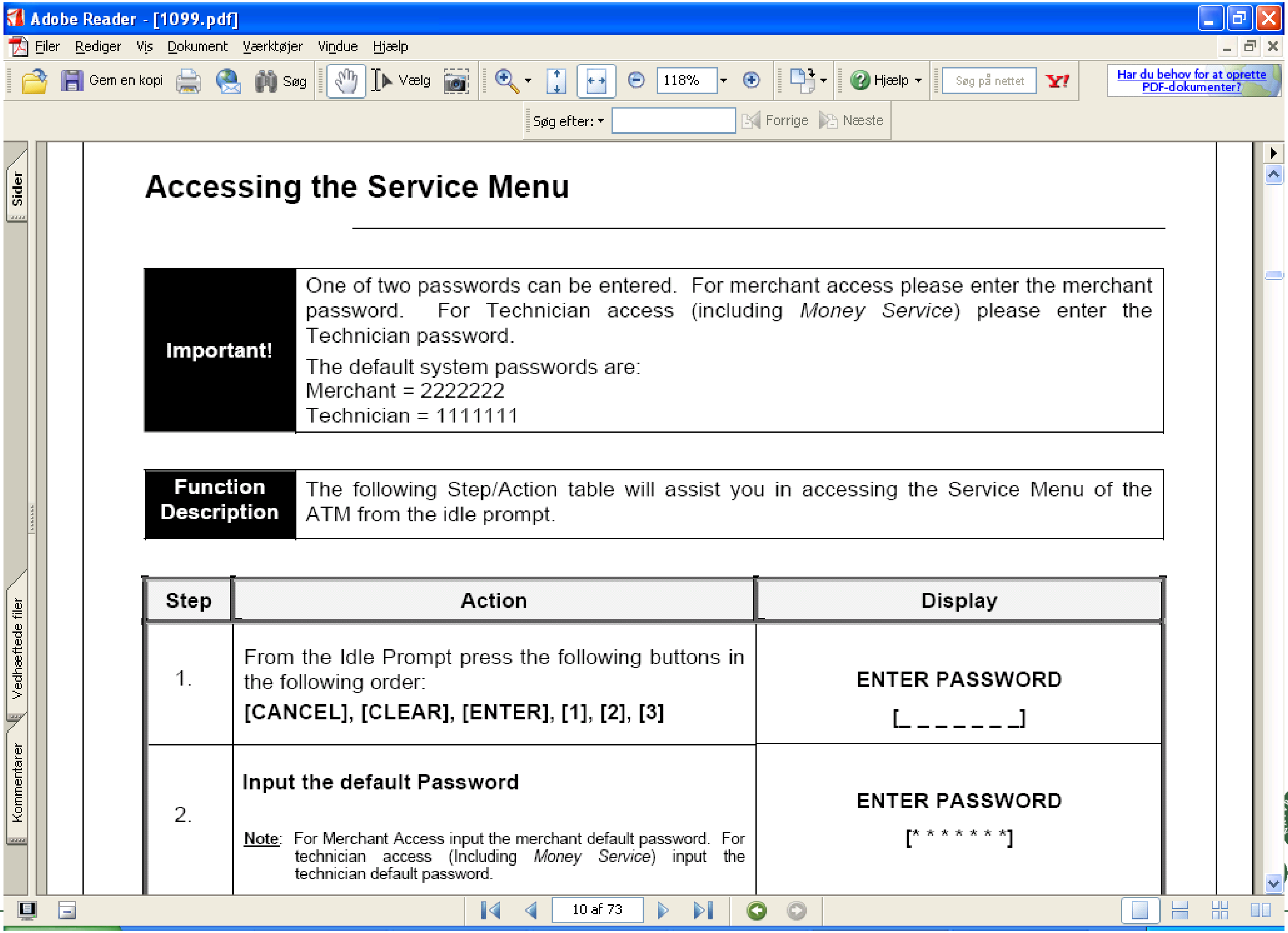
2085-2090 App. 4.82 Menu Guide
2085-2090 App. 4.7x Function Guide
20XX App. 4.82 Manual
App. 4.8X Driver License Verification Guide
App. 4.7X Store & Forward Guide

NURIT 3000-3020 Manuals

30XX App. 4.82 Menu Guide
30XX App. 4.82 Function Guide
30XX App. 4.82 Manual
App. 4.8X Driver License Verification Guide
App. 4.7X Store & Forward Guide
3020 Battery Saver Guide
3020 ImagePak Installation Guide

NURIT 8000 Manuals

Amerikanske ATM/Dankortmaskiner hacket med default password



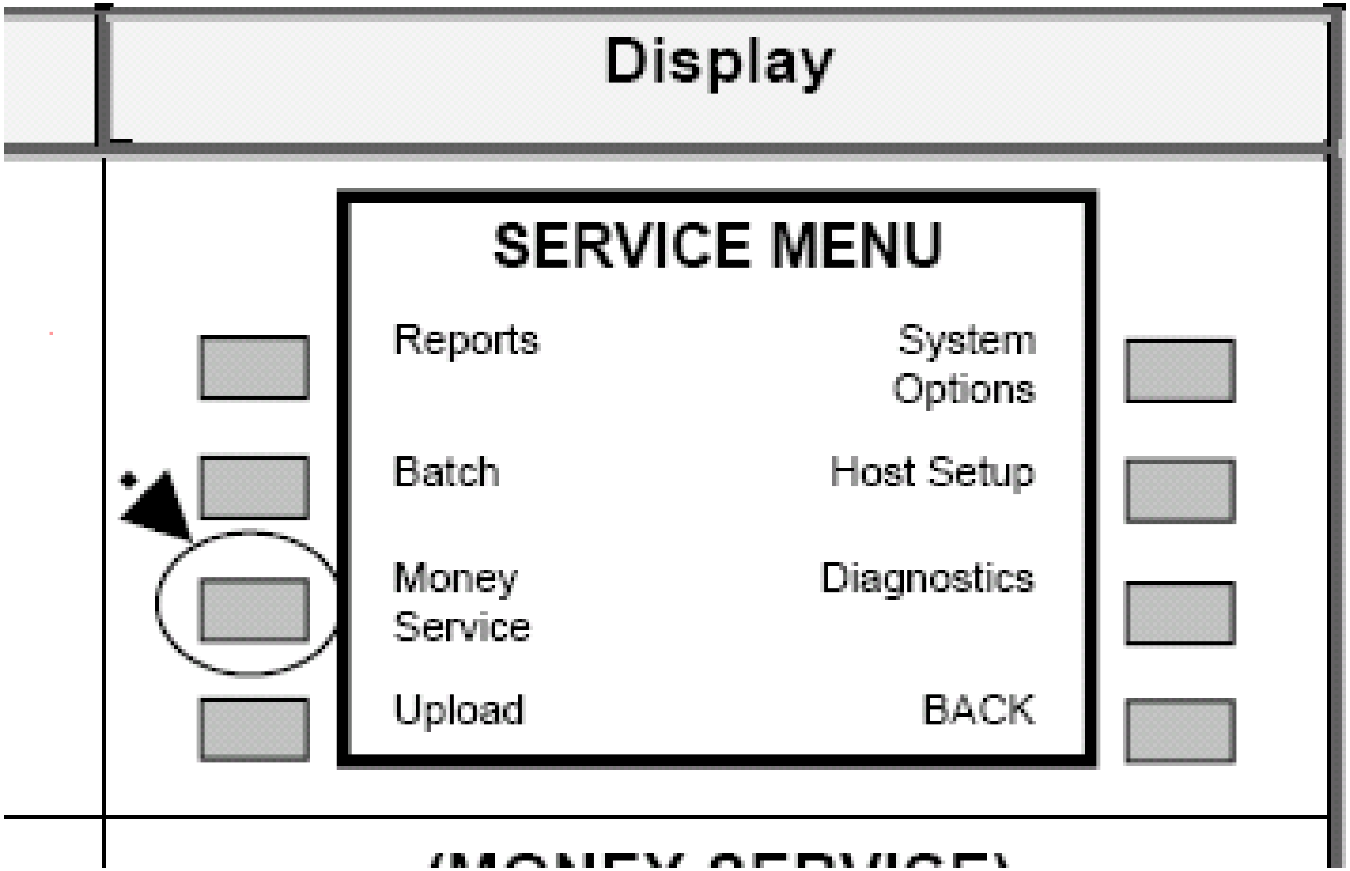
Accessing the Service Menu

Important!	One of two passwords can be entered. For merchant access please enter the merchant password. For Technician access (including *Money Service*) please enter the Technician password.
	The default system passwords are:
	Merchant = 2222222
	Technician = 1111111

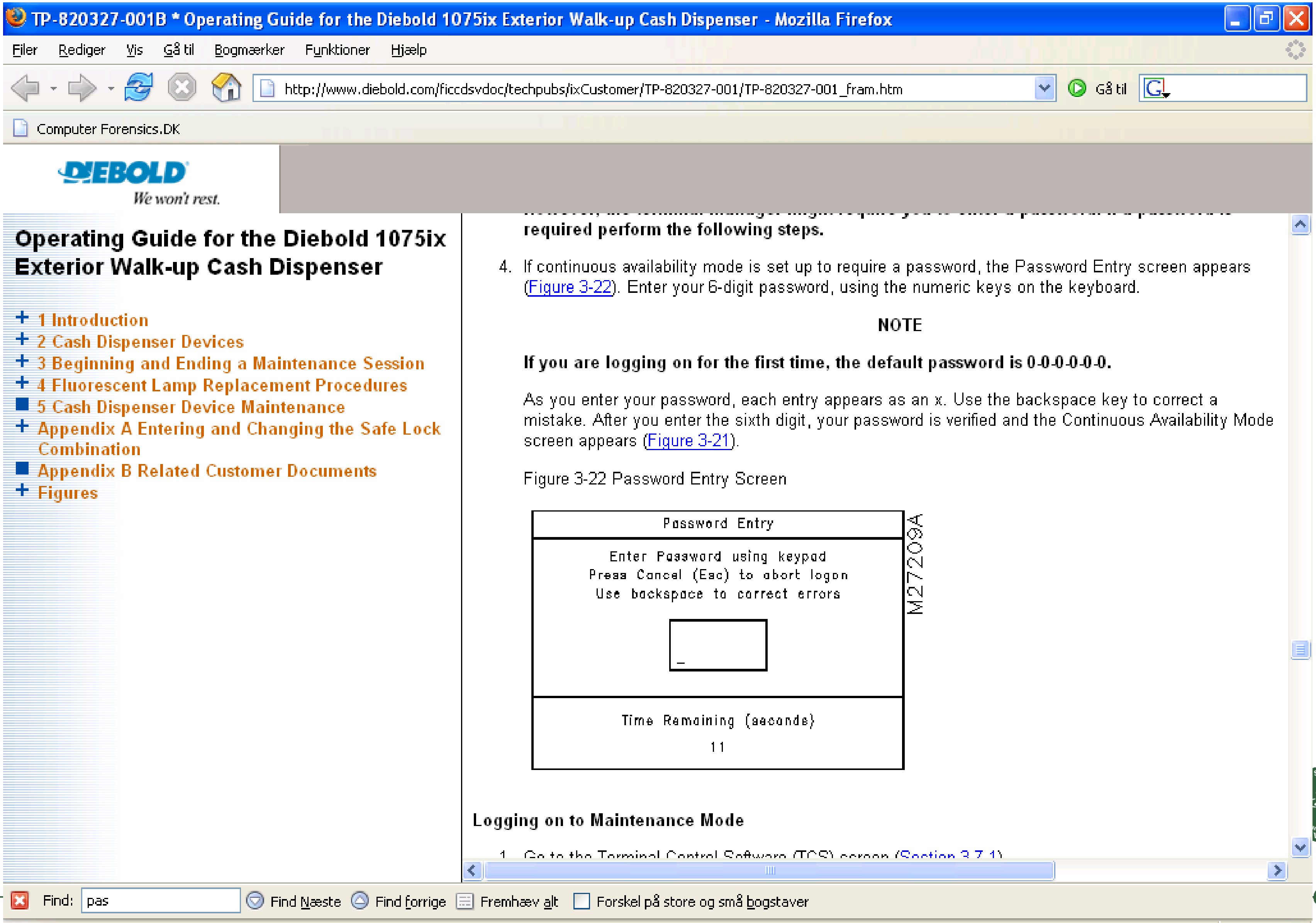
Function Description	The following Step/Action table will assist you in accessing the Service Menu of the ATM from the idle prompt.

Step	Action	Display
1.	From the Idle Prompt press the following buttons in the following order: **[CANCEL], [CLEAR], [ENTER], [1], [2], [3]**	**ENTER PASSWORD** **[_ _ _ _ _ _ _]**
2.	**Input the default Password** Note: For Merchant Access input the merchant default password. For technician access (Including *Money Service*) input the technician default password.	**ENTER PASSWORD** **[* * * * * * *]**

Amerikanske ATM/Dankortmaskiner hacket med default password



Amerikanske ATM/Dankortmaskiner hacket med default password


TP-820327-001B * Operating Guide for the Diebold 1075ix Exterior Walk-up Cash Dispenser - Mozilla Firefox
Filer Rediger Vis Gå til Bogmærker Funktioner Hjælp
http://www.diebold.com/ficcdsvdoc/techpubs/ixCustomer/TP-820327-001/TP-820327-001_fram.htm
Gå til
Computer Forensics.DK
DIEBOLD
We won't rest.
Find: pas
Find Næste
Find forrige
Fremhæv alt
□ Forskel på store og små bogstaver

Operating Guide for the Diebold 1075ix Exterior Walk-up Cash Dispenser

required perform the following steps.

4. If continuous availability mode is set up to require a password, the Password Entry screen appears (Figure 3-22). Enter your 6-digit password, using the numeric keys on the keyboard.

NOTE

If you are logging on for the first time, the default password is 0-0-0-0-0-0.

As you enter your password, each entry appears as an x. Use the backspace key to correct a mistake. After you enter the sixth digit, your password is verified and the Continuous Availability Mode screen appears (Figure 3-21).

Figure 3-22 Password Entry Screen

```
Password Entry

Enter Password using keypad
Press Cancel (Esc) to abort logon
Use backspace to correct errors

_

Time Remaining (seconds)
11
```

M27209A

Logging on to Maintenance Mode

1. Go to the Terminal Control Software (TCS) screen (Section 3.7.1).

Strong passwords

Kort sagt:

2FA er næsten altid bedre

Brug en password manager

Lange passwords er bedre end komplekse passwords (passphrases over 14 tegn)

Brug mange forskellige passwords

Back dine passwords op

Lange passwords er bedre end hyppige skift - med mindre der har været risiko for aflytning

Passwords

Strong passwords is a combination on length and complexity - that is how difficult it is for someone to guess your password.

You can test various types of passwords at http://howsecureismypassword.net

The most important tips for choosing strong passwords are:

- Make it long, not just a single word
- Make it hard to guess
- Don’t re-use your passwords

Consider a password manager, such as https://www.dashlane.com, 1Password or Falck password manager to create and remember your passwords.

The advice

- Long passwords are – everything else equal – better than complex passwords. But do not just use a single word (for instance “DIKU") or lazy combinations, such as “DIKU12”
- Strong passwords are better than frequent password changes, unless there is a risk the password has been compromised (hotels, airports etc)
- Use many different password, never the same password on different services
- Use a password manager
- 2-factor is almost always better than your password today, use it when you can

Pause

Biometrics

Biometri

Noget man ved
Noget man har
Noget man er

Biometri bør altid kombineres med BrugerID/password

ID samles typisk i en hash

Biometri

Er biometri identity eller authentication ?

Public or private?
Man efterlader biometri-data over alt

AI/Deep-fakes (stemme, ansigt osv)

Biometri som authentication – uden andre faktorer – er potentielt et problem
(risiko vurdering!)

Biometri

Husk threat-model

Biometri

To biometriske målinger er aldrig helt ens, derfor er der altid element af usikkerhed:

False Acceptance Rate:
Rate at which someone other than the actual person is falsely recognized.

False Rejection Rate:
Rate at which the actual person is not recognized accurately.

Biometri

Fingeraftryk og håndscanner
Optical scanner med lys (klassisk)
Træk fingrene over pladen, ellers efterlades fingeraftrykket

Capacative (semiconductor), finger bryder delvis isoleringen mellem to ledende materialer, derved tages billedet
Spyt, opvarmet vingummibamse eller ballon med varmt vand

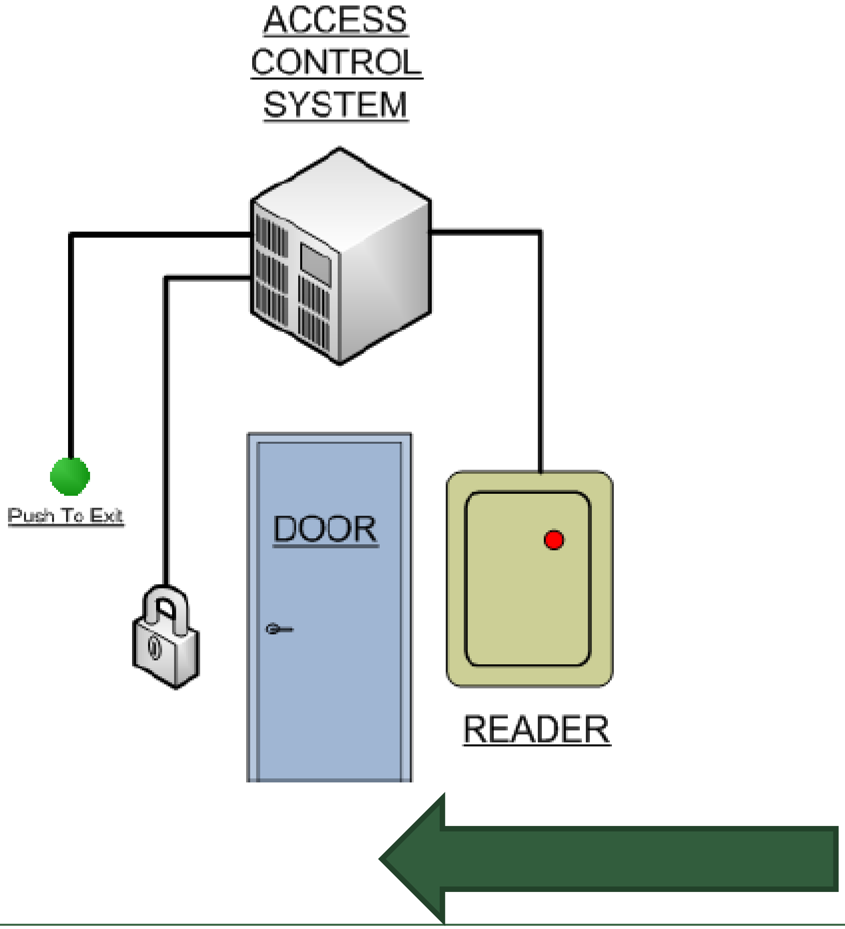
Biometri

Iris scan
Potential for walk by capture
Høj opløsning, HDTV osv.

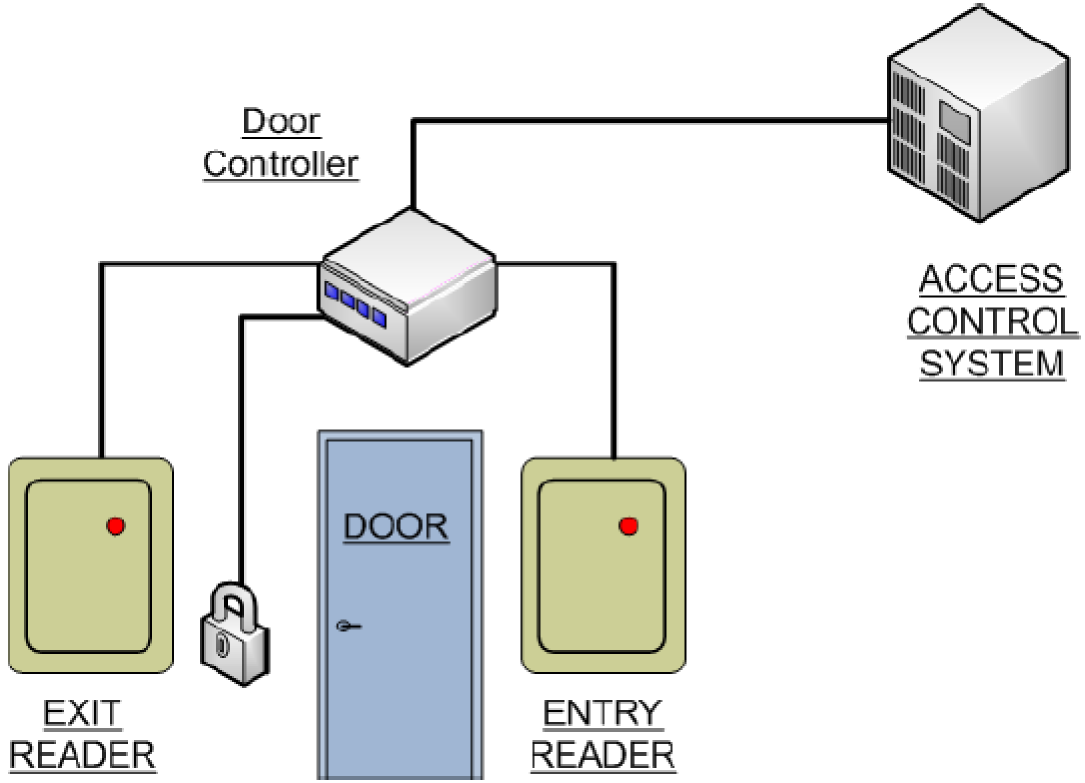
Retina scan
Svært at stjæle - men også svær at bruge
(allignment kræver træning og øvelse)

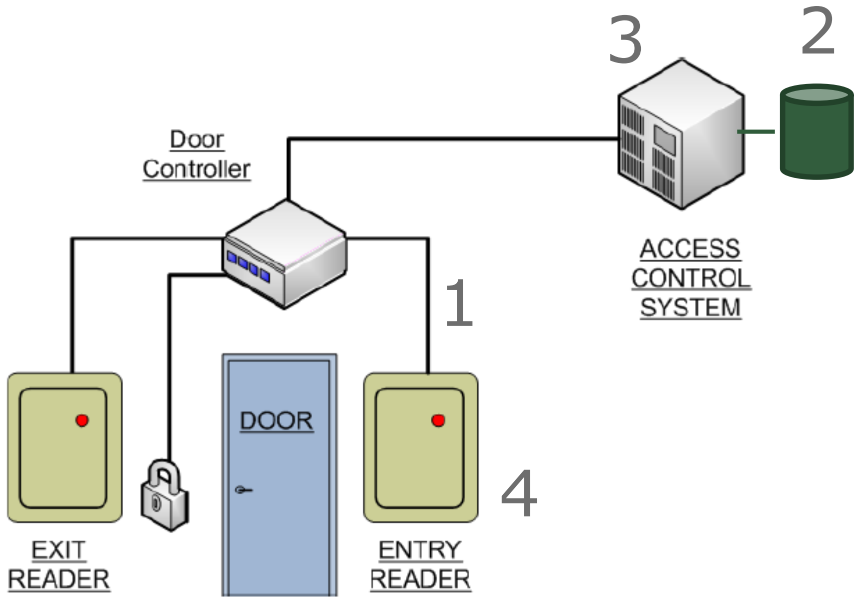
Basic system

Placering af "request to exit" knapper er vigtig, kan de aktiveres ude fra?



Anti-Passback system





1. Angreb imod data og kommunikation
2. Angreb imod templates
3. Angreb imod software
4. Angreb med sensoren

Biometri

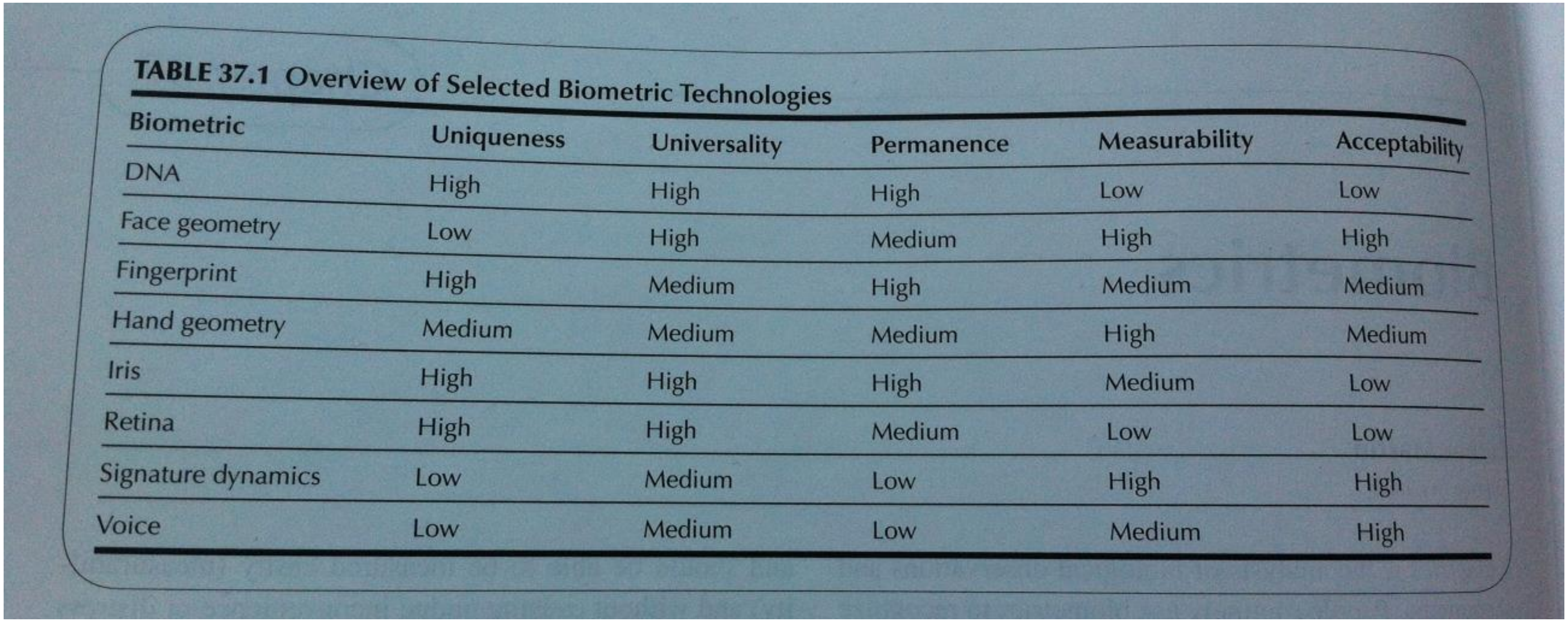


TABLE 37.1 Overview of Selected Biometric Technologies

Biometric	Uniqueness	Universality	Permanence	Measurability	Acceptability
DNA	High	High	High	Low	Low
Face geometry	Low	High	Medium	High	High
Fingerprint	High	Medium	High	Medium	Medium
Hand geometry	Medium	Medium	Medium	High	Medium
Iris	High	High	High	Medium	Low
Retina	High	High	Medium	Low	Low
Signature dynamics	Low	Medium	Low	High	High
Voice	Low	Medium	Low	Medium	High

Hvor let er det at stjæle credentials ?

Credential revocation

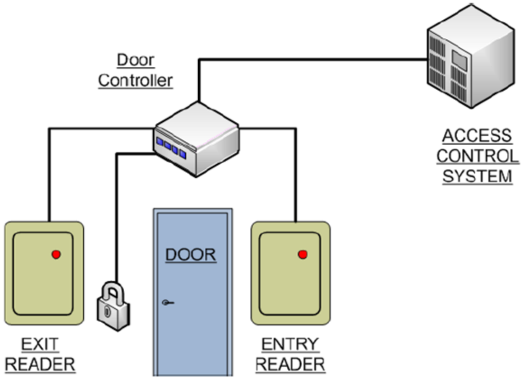
Fingeraftryk / hånd revokering

Beskyttelse af biometri-data

Defeating Facial Recognition Systems
doesn't have to be Hi-Tech
facebook.com/OneTruth4Life

Anti-Passback system

Biometri



Der findes også default access nøgler til smart cards.

F.eks. kan en MD5 hash af UID og master nøglen give adgang til smartcardet/administrator kortet

Biometri er også hardware, software og brugervenlighed

Hvor stort er keyspace for hash af templaten?
Kan man "bare" forsøge at brute-force - eller sende templates til backend serverne?

Hvor god er match algoritmen, hvem skrev den, hvad bygger den på?
Hvor stor del af finger aftrykket scannes egentlig (er det kun center) ?
For meget lys kan ødelægge kameraets billede (dos/angreb)

Bagud kompatabilitet

Single Sign On (SSO)

Authentication/authorization

- Huske brugernavn/PW til mange sites
- Sites skal gemme og administrere id/pw
- Devices, computers, partners, cloud-providers
- Bruger afgiver alle informationer

SAML
Oauth
OpenID
OpenID Connect
WS-*

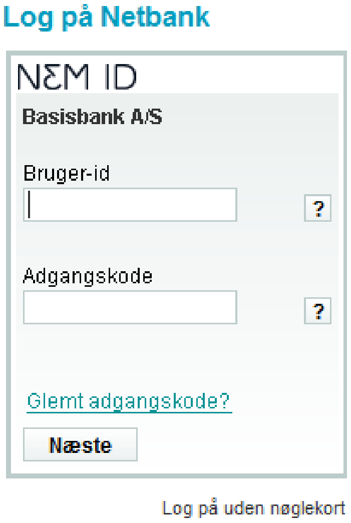
Identitet og privacy - termer

Silomodeller – Federation (Føderation)

Identity Provider – Udsteder af akkreditiver
Service Provider – Serviceudbyder
Identity - Bruger

Tokens , assertions eller ”billetter”

Traditionel fødereret sikkerhed



Log på Netbank

NEM ID

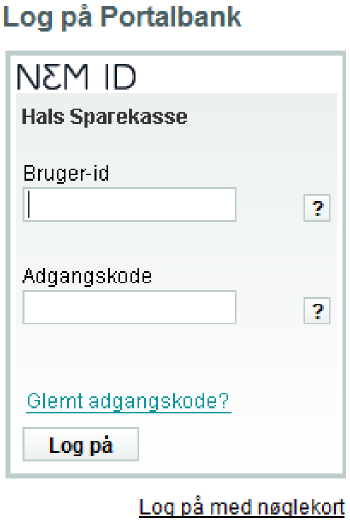
Basisbank A/S

Bruger-id

Adgangskode

Glemt adgangskode?

Log på uden nøglekort



Log på Portalbank

NEM ID

Hals Sparekasse

Bruger-id

Adgangskode

Glemt adgangskode?

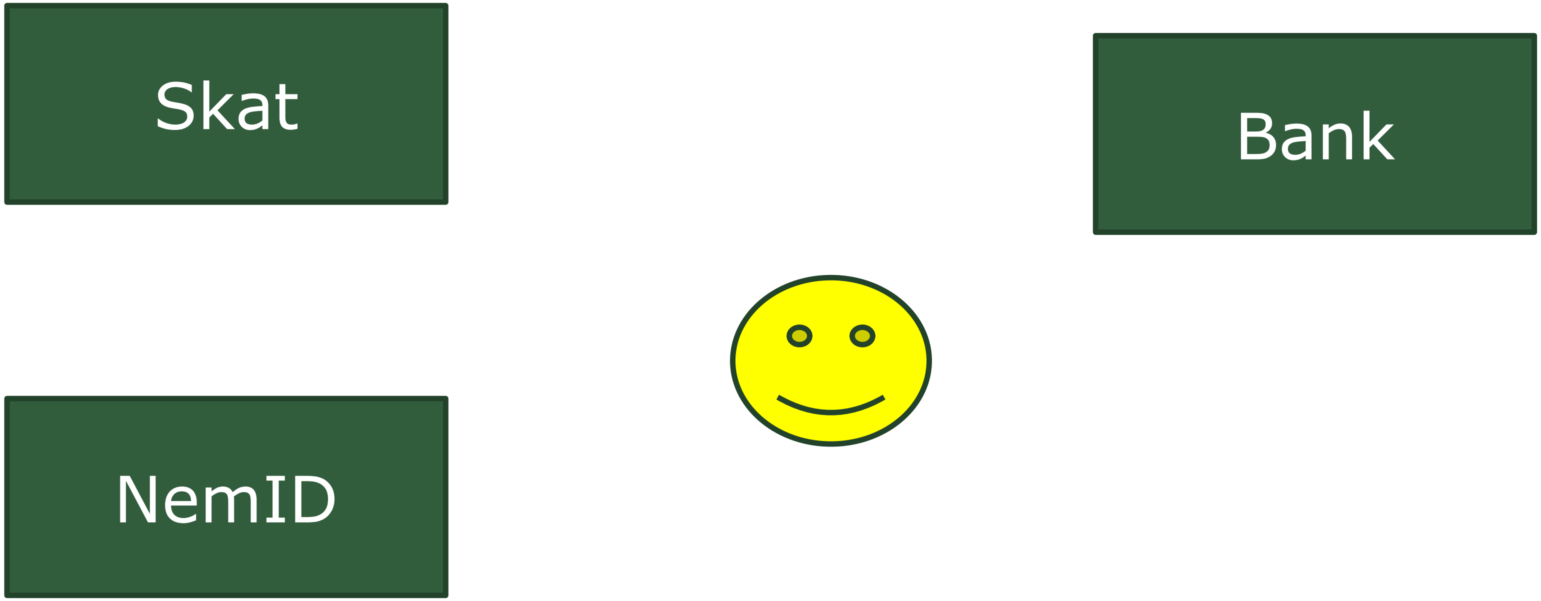
Log på med nøglekort

Akkreditiver: tokens/assertations/billetter (SAML Assertation, x509 certifikater, Kerberos tickets osv)

PKI: certifikatudstedere
SAML: Identity Providers
WS-*: Security Token Service
Attributtjenester

Identitet og privacy

Hvordan får man et tilbud på et lån?

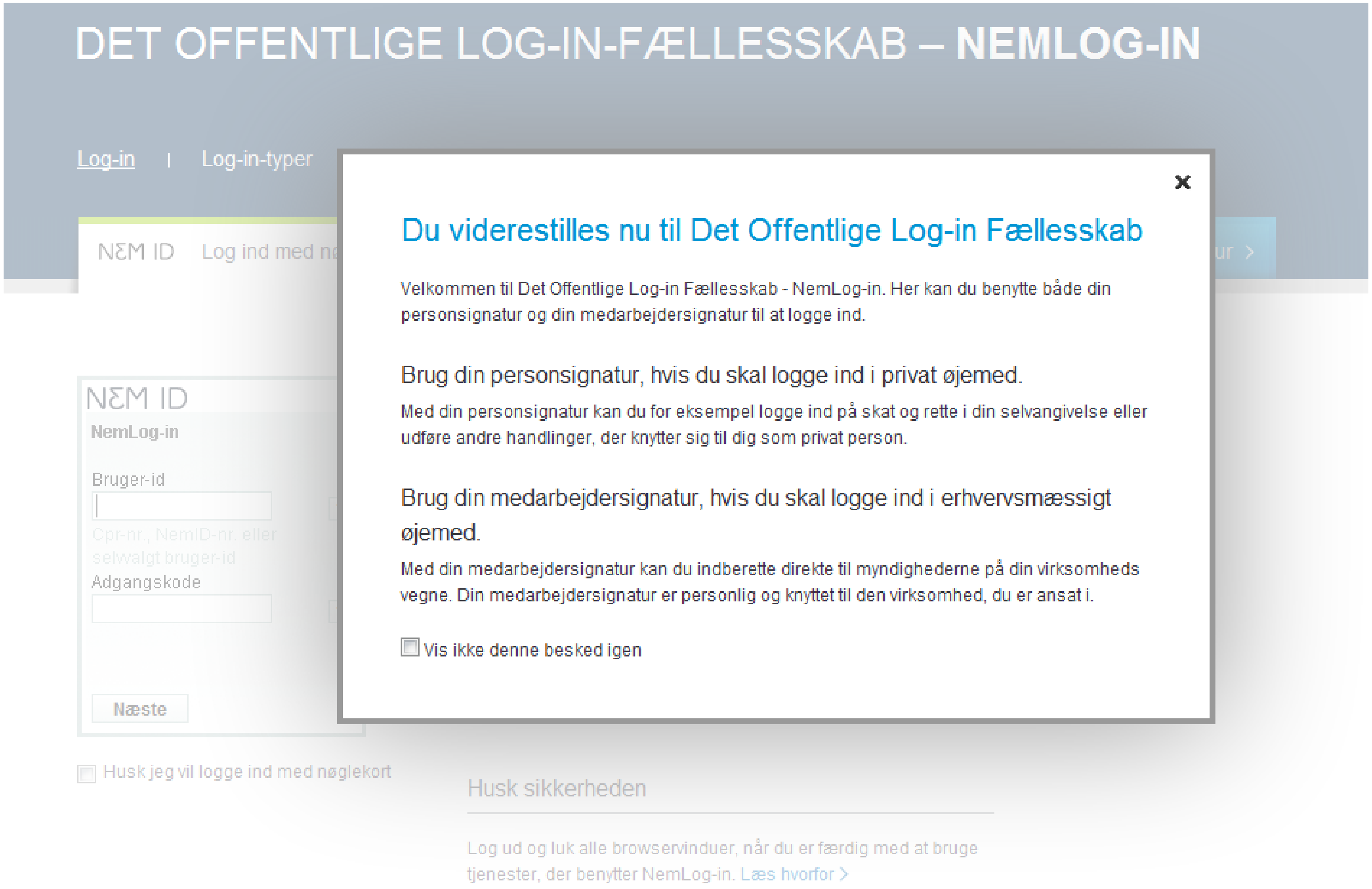


Skat

Bank

NemID

Identitet og privacy – Nemlog-in (SAML) - NemID



DET OFFENTLIGE LOG-IN-FÆLLESSKAB – NEMLOG-IN
Log-in
Log-in-typer
NEM ID
Log ind med n
ur
NEM ID
NemLog-in
Bruger-id
Cpr-nr., NemID-nr. eller selvalgt bruger-id
Adgangskode
Næste
×

Du viderestilles nu til Det Offentlige Log-in Fællesskab

Velkommen til Det Offentlige Log-in Fællesskab - NemLog-in. Her kan du benytte både din personsignatur og din medarbejdersignatur til at logge ind.

Brug din personsignatur, hvis du skal logge ind i privat øjemed.

Med din personsignatur kan du for eksempel logge ind på skat og rette i din selvangivelse eller udføre andre handlinger, der knytter sig til dig som privat person.

Brug din medarbejdersignatur, hvis du skal logge ind i erhvervsmæssigt øjemed.

Med din medarbejdersignatur kan du indberette direkte til myndighederne på din virksomheds vegne. Din medarbejdersignatur er personlig og knyttet til den virksomhed, du er ansat i.

☐ Vis ikke denne besked igen

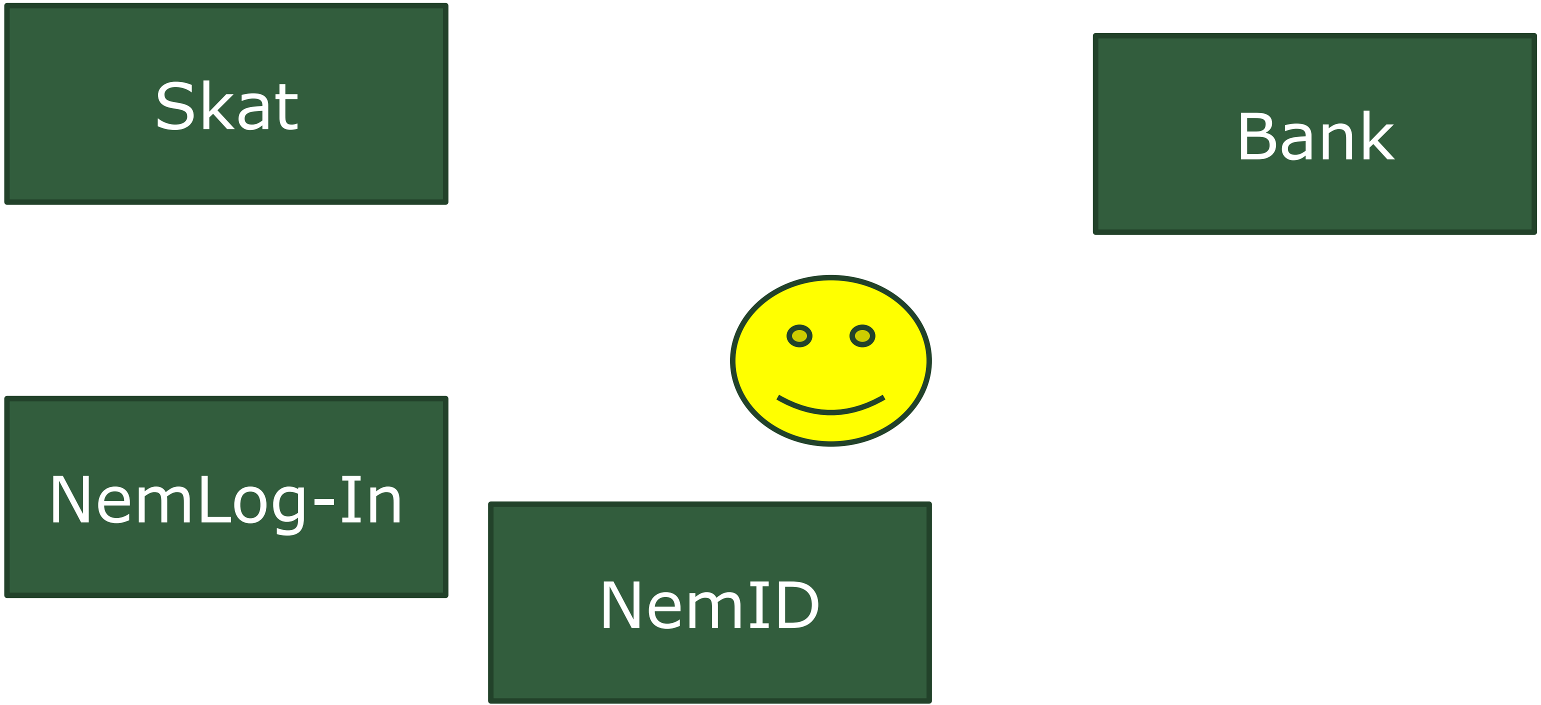
☐ Husk jeg vil logge ind med nøglekort

Husk sikkerheden

Log ud og luk alle browservinduer, når du er færdig med at bruge tjenester, der benytter NemLog-in. Læs hvorfor >

Identitet og privacy

Hvordan får man et tilbud på et lån?



Skat

Bank

NemLog-In

NemID

Authentication – SAML er mest udbredt i virksomhederne

Security Assertion Markup Language (SAML) is an XML-based open standard protocol for exchanging authentication and authorization data between parties/two security domains, in particular, between an identity provider and a service provider.

Federated identity, f.eks. cloud single sign-on (SSO).

Standard protocol til at kommunikerer identiteter over internettet.

Authentication – SAML er mest udbredt i virksomhederne

Two federation partners can choose to share whatever identity attributes they want in a SAML assertion (message) payload as long as those attributes can be represented in XML.

Enterprise SAML identity federation use cases often sharing identity between an existing IdM system and web applications.

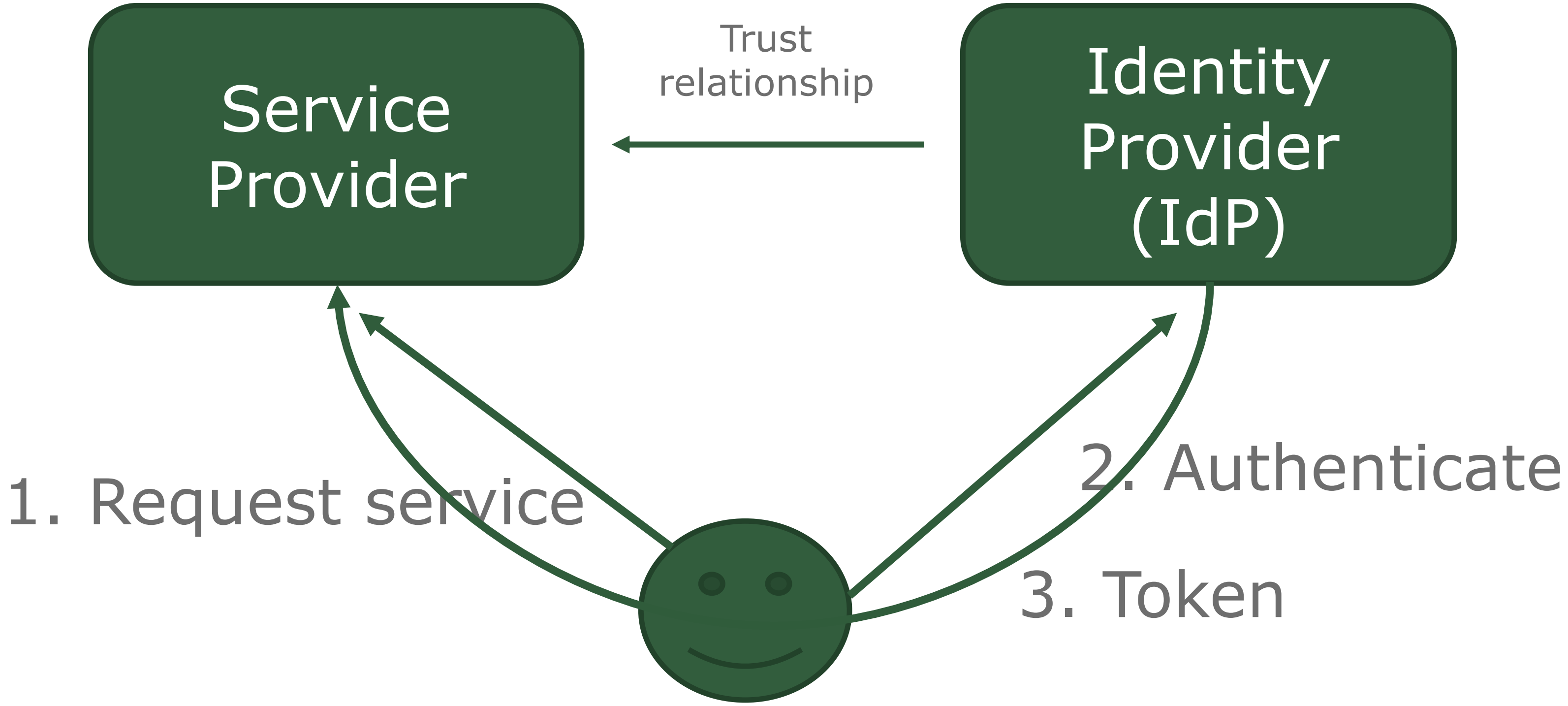
Authentication – SAML er mest udbredt i virksomhederne

Tokens i stedet for passwords.

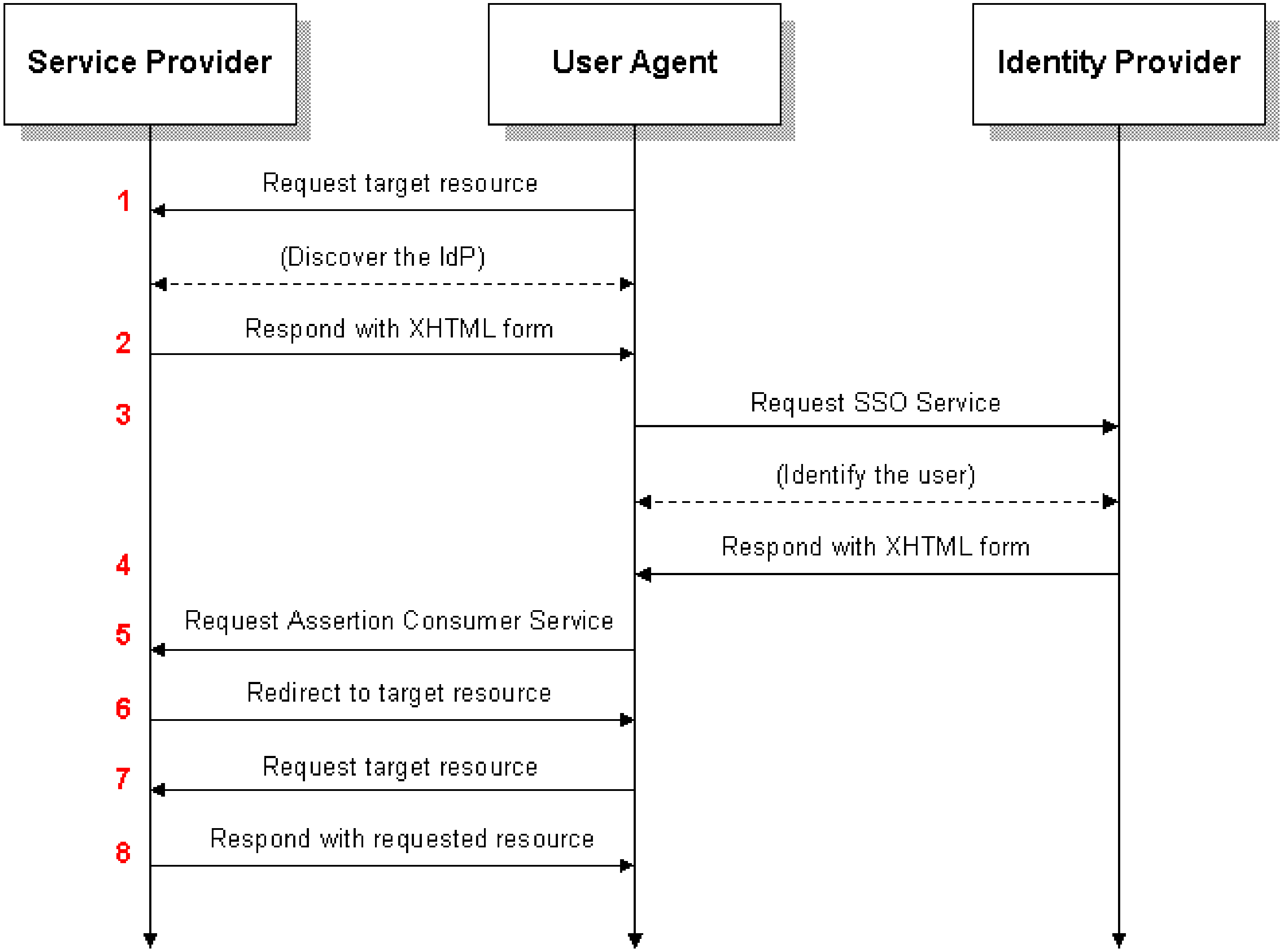
Tre entities:
1. Identity provider
2. Service provider (kan være ekstern, som SalesForce)
3. Brugeren, har en konto hos Identity Provider

Bruger autentificerer hos Identity Provider, der udsteder en SAML-token, sendes tilbage til brugeren, der sender videre til Service Provider

Authentication – SAML er mest udbredt i virksomhederne



Authentication – SAML er mest udbredt i virksomhederne



Authentication – OAuth 2.0

OAuth (Open Authorization) er en standard for authorization af adgang til ressourcer.

V2.0 dækker både authentication og authorization (Kan outsource authentication til f.eks. Google, Facebook for en applikation (se OpenID Connect)

Standard method for web, mobile and desktop applications

Oauth tokens can be binary, JSON or SAML

HTTP (SSL)

Authentication – OAuth 2.0

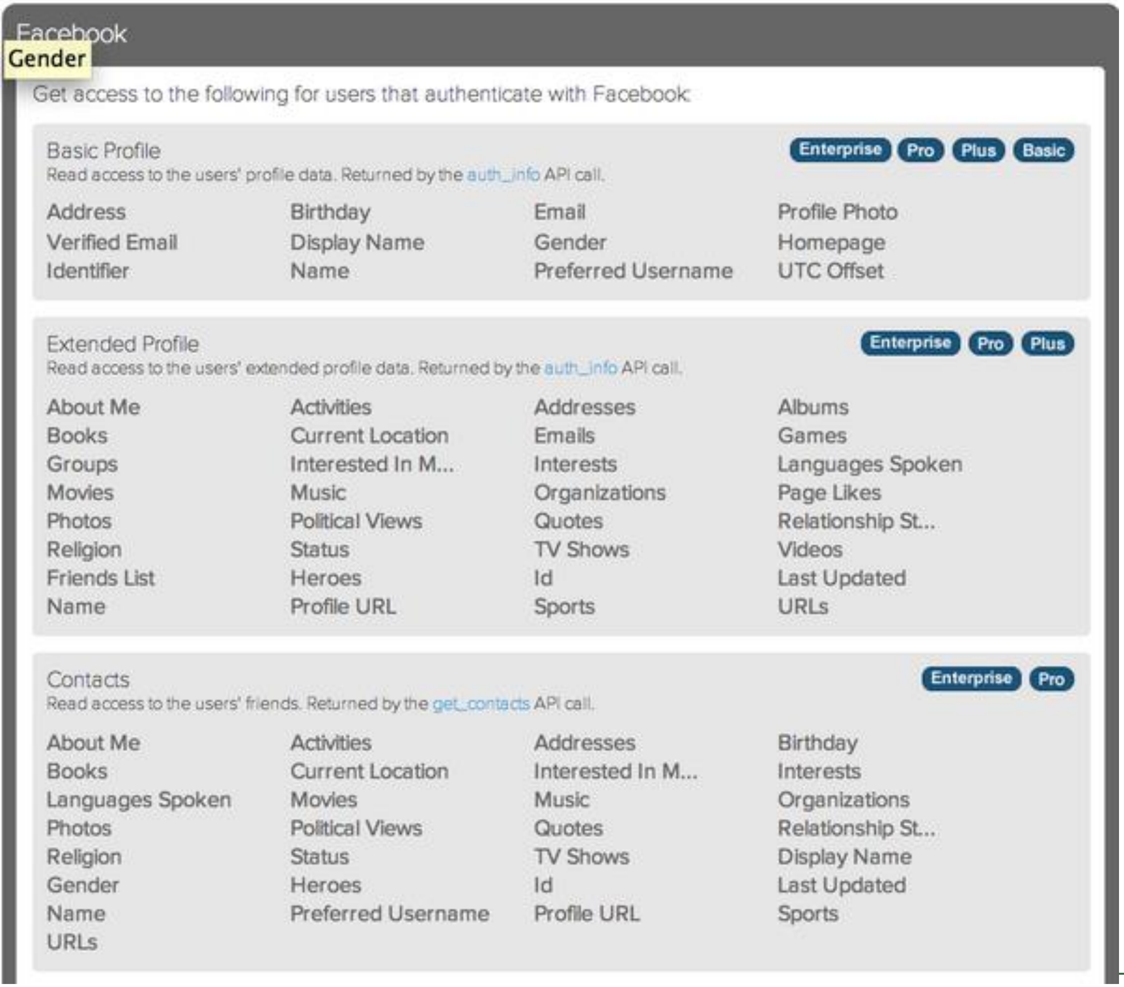
OAuth is a framework to allow one application access to one account without giving your account login information.

Sign in with
facebook
Sign in with
Google
Sign in with
Microsoft
Sign in with
Linked in

Brugervenlighed, mindre administration osv…

Social login

Hvad (kan) modtageren få at vide om dig når man laver "social login" via Facebook login:



Facebook

Get access to the following for users that authenticate with Facebook

Basic Profile — Enterprise · Pro · Plus · Basic

Read access to the users' profile data. Returned by the auth_info API call.

Address	Birthday	Email	Profile Photo
Verified Email	Display Name	Gender	Homepage
Identifier	Name	Preferred Username	UTC Offset

Extended Profile — Enterprise · Pro · Plus

Read access to the users' extended profile data. Returned by the auth_info API call.

About Me	Activities	Addresses	Albums
Books	Current Location	Emails	Games
Groups	Interested In M...	Interests	Languages Spoken
Movies	Music	Organizations	Page Likes
Photos	Political Views	Quotes	Relationship St...
Religion	Status	TV Shows	Videos
Friends List	Heroes	Id	Last Updated
Name	Profile URL	Sports	URLs

Contacts — Enterprise · Pro

Read access to the users' friends. Returned by the get_contacts API call.

About Me	Activities	Addresses	Birthday
Books	Current Location	Interested In M...	Interests
Languages Spoken	Movies	Music	Organizations
Photos	Political Views	Quotes	Relationship St...
Religion	Status	TV Shows	Display Name
Gender	Heroes	Id	Last Updated
Name	Preferred Username	Profile URL	Sports
URLs			

Oauth 2.0 vs SAML 2.0 – sammenfald i principper

SAML typically used in Enterprise SSO scenarios (inside the enterprise, enterprise to partner, enterpise to cloud)
Enterprise SSO = SAML
Partner, or Customer app, access to portal = SAML
Centralized identity source = SAML (OpenID Connect)

Oauth designed for use with applications on the internet: Provide access to ressources (accounts, pictures, files…) = Oauth
Mobile devices typisk = OAuth

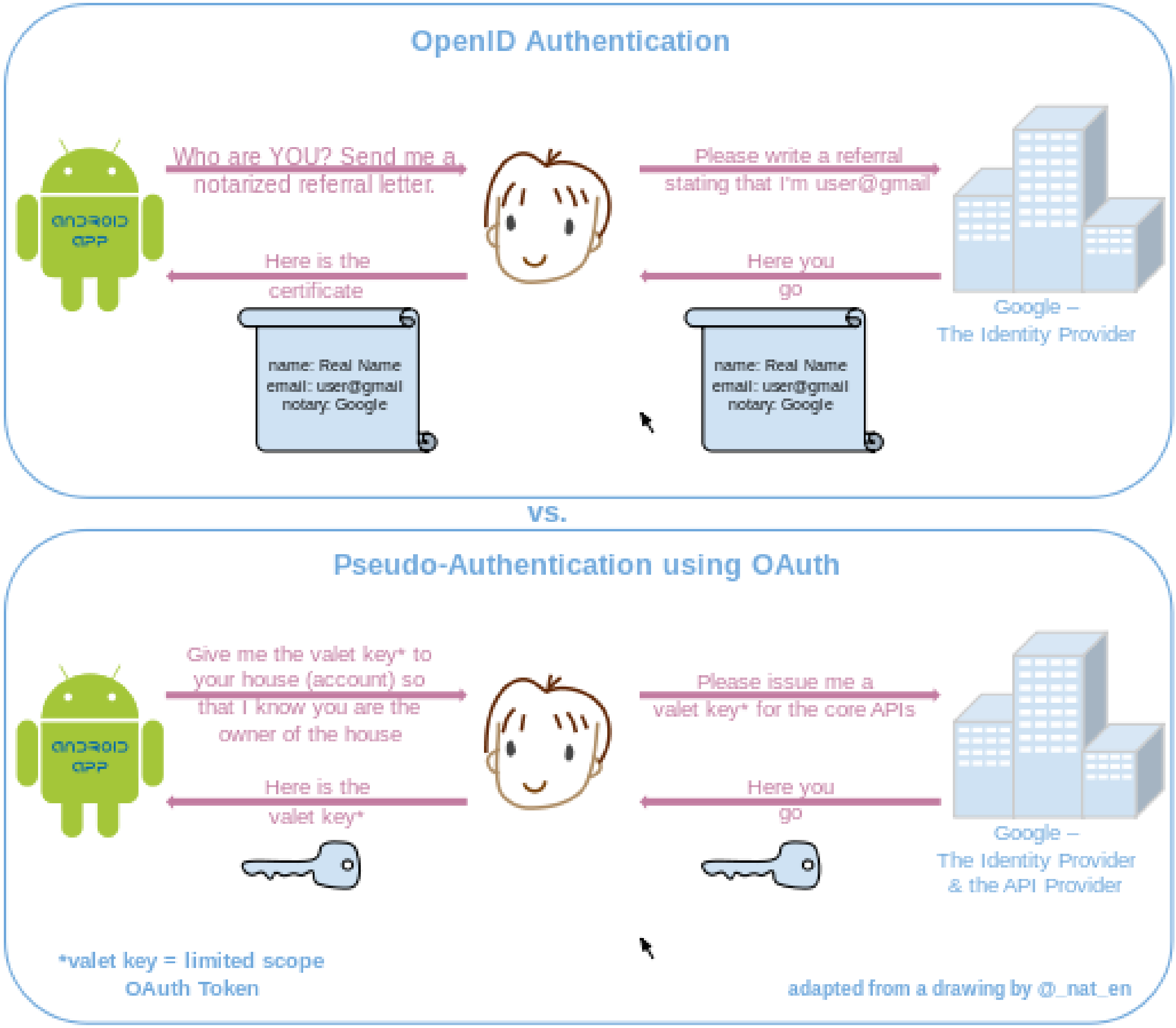
Authentication – OpenID Connect

OpenID Connect is a way to specify one identity for multiple sites so you don't need to register over and over again.
You can log in into multiple websites with a unique account, using OpenID Connect.

Trust the specific OpenID Connect Identity Provider?

Sometimes OAuth and OpenID together

Authentication – OpenID Connect vs. Oauth 2.0

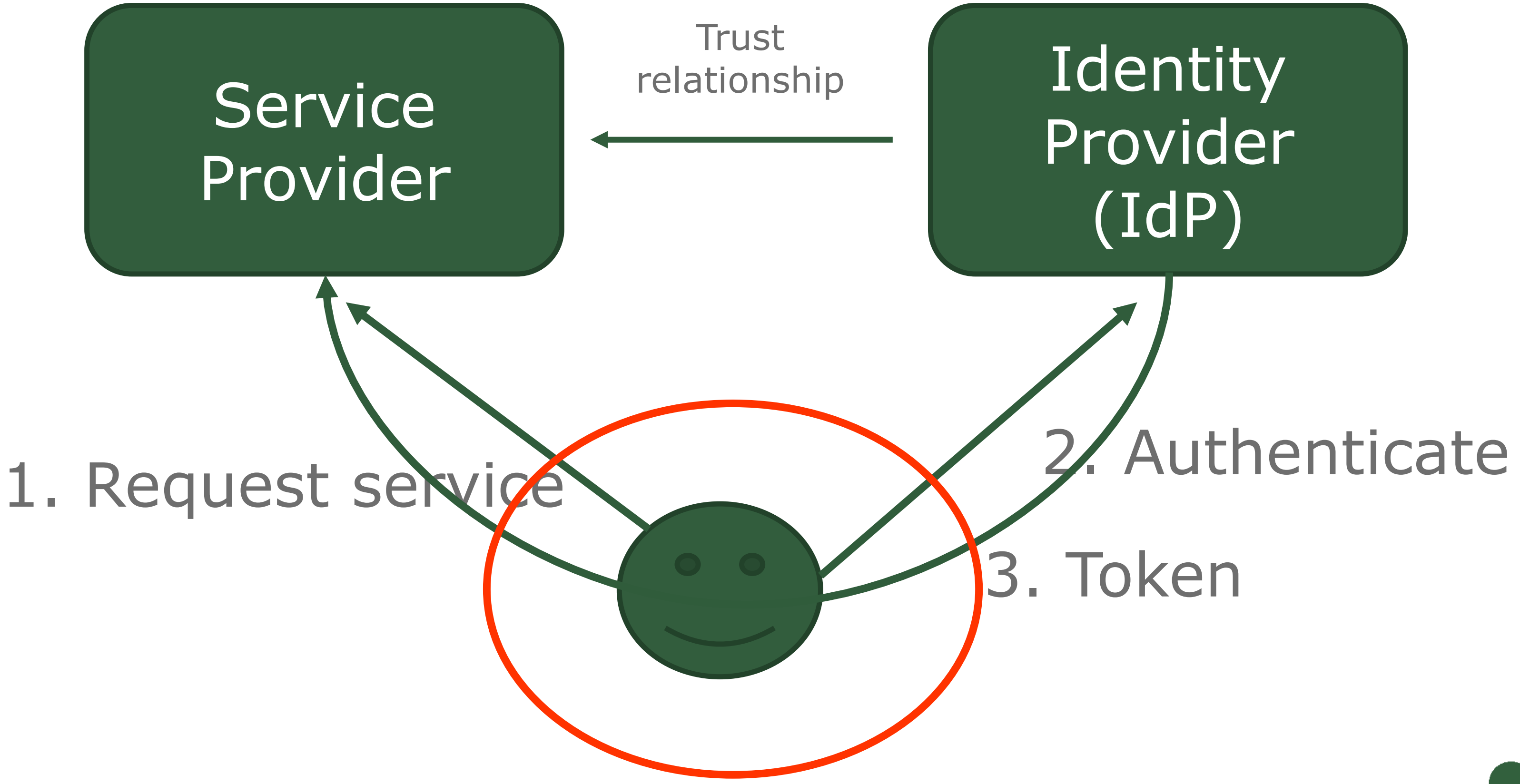

OpenID Authentication
Who are YOU? Send me a notarized referral letter.
Please write a referral stating that I'm user@gmail
Here is the certificate
Here you go
name: Real Name
email: user@gmail
notary: Google
name: Real Name
email: user@gmail
notary: Google
Google –
The Identity Provider
vs.
Pseudo-Authentication using OAuth
Give me the valet key* to your house (account) so that I know you are the owner of the house
Please issue me a valet key* for the core APIs
Here is the valet key*
Here you go
Google –
The Identity Provider
& the API Provider
*valet key = limited scope
OAuth Token
adapted from a drawing by @_nat_en

Giver navn og mail til mange sites

Opnår adgang uden nødvendigvis at give sites dine id-oplysninger

Identitet og sikkerhed

Brugeren er i centrum



Identitet og sikkerhed

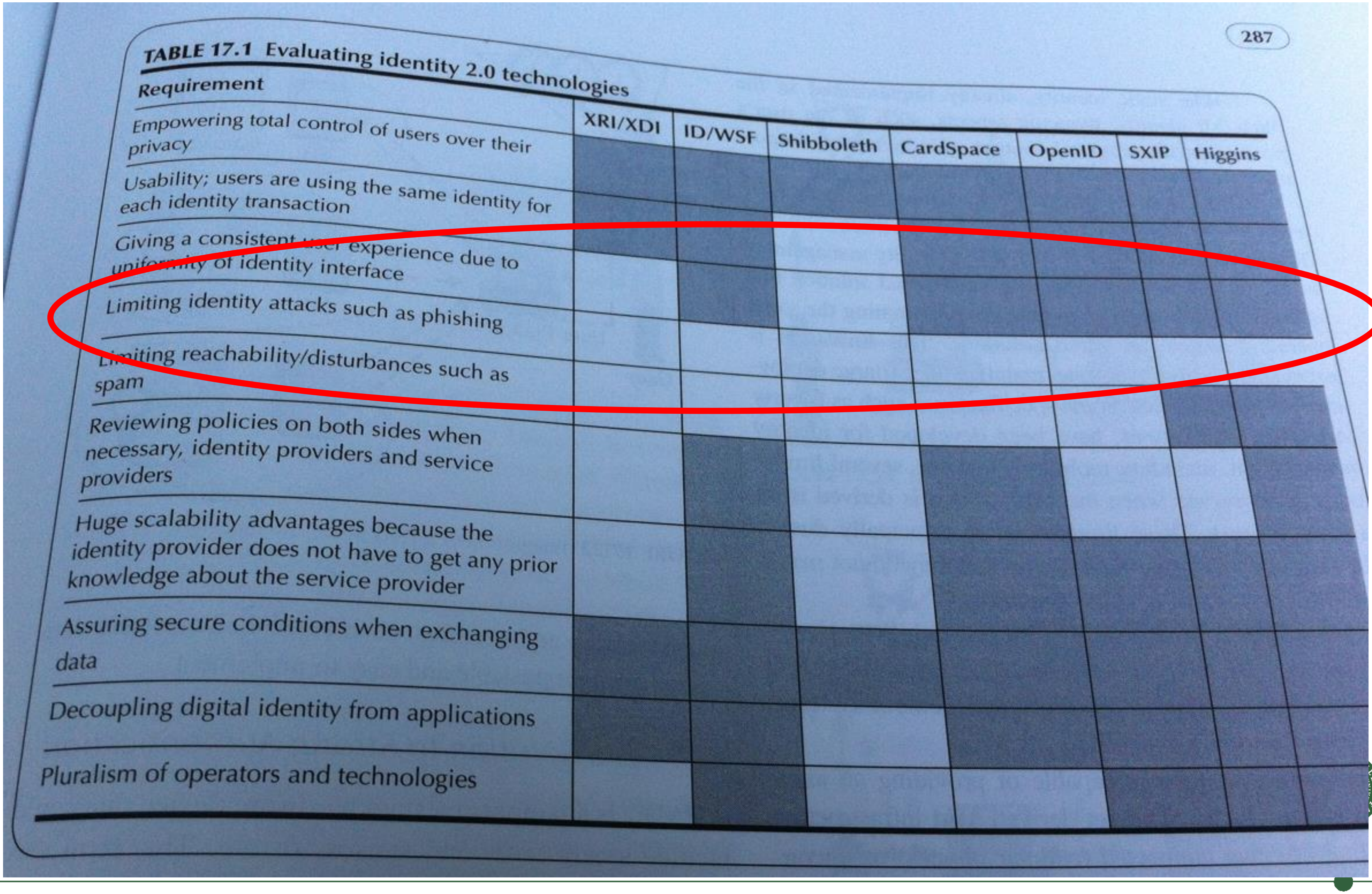
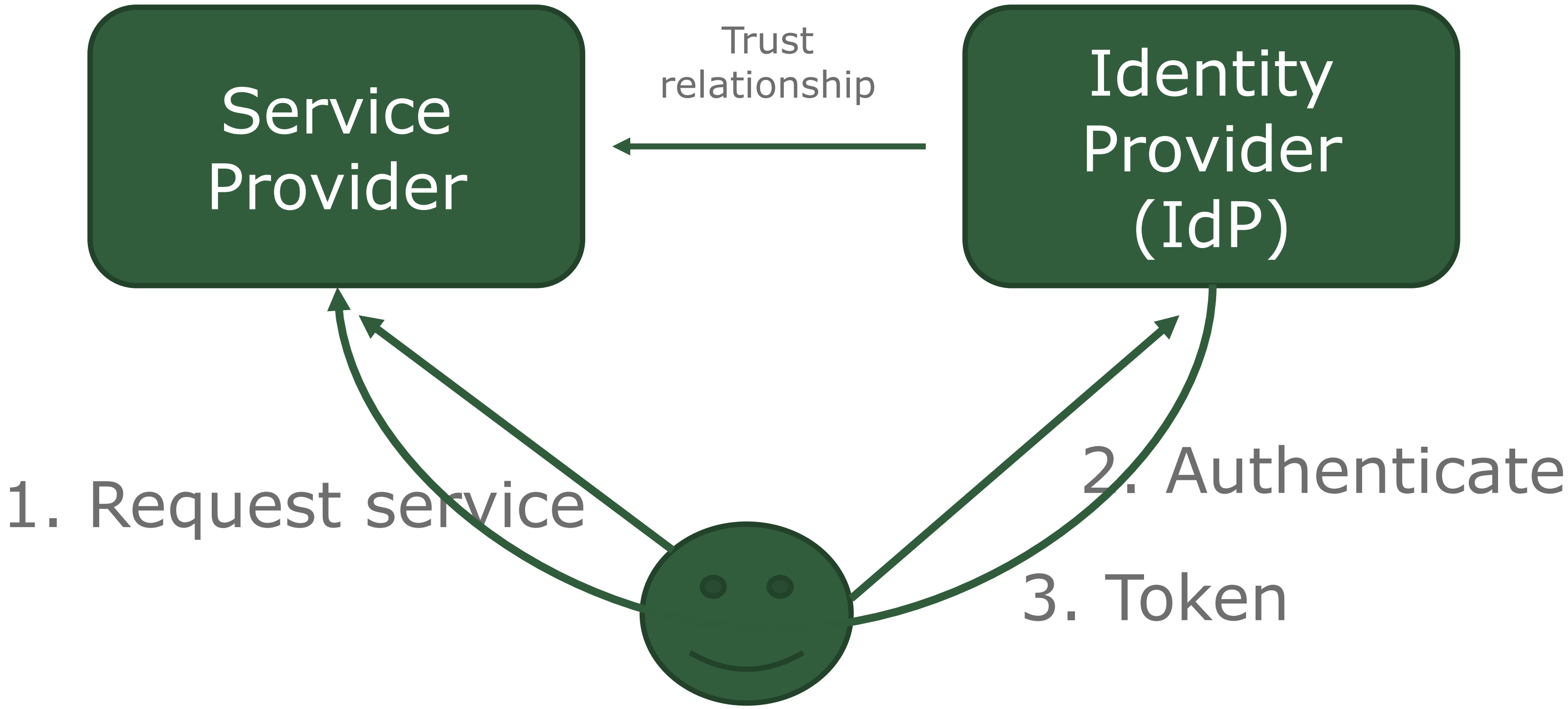


TABLE 17.1 Evaluating identity 2.0 technologies

Requirement	XRI/XDI	ID/WSF	Shibboleth	CardSpace	OpenID	SXIP	Higgins
Empowering total control of users over their privacy	■	■	■	■	■	■	■
Usability; users are using the same identity for each identity transaction	■	■		■	■	■	■
Giving a consistent user experience due to uniformity of identity interface		■		■	■	■	■
Limiting identity attacks such as phishing							
Limiting reachability/disturbances such as spam						■	■
Reviewing policies on both sides when necessary, identity providers and service providers		■		■			■
Huge scalability advantages because the identity provider does not have to get any prior knowledge about the service provider		■		■	■	■	■
Assuring secure conditions when exchanging data	■	■	■	■	■	■	■
Decoupling digital identity from applications	■	■		■	■	■	■
Pluralism of operators and technologies		■			■	■	■

Identitet og sikkerhed

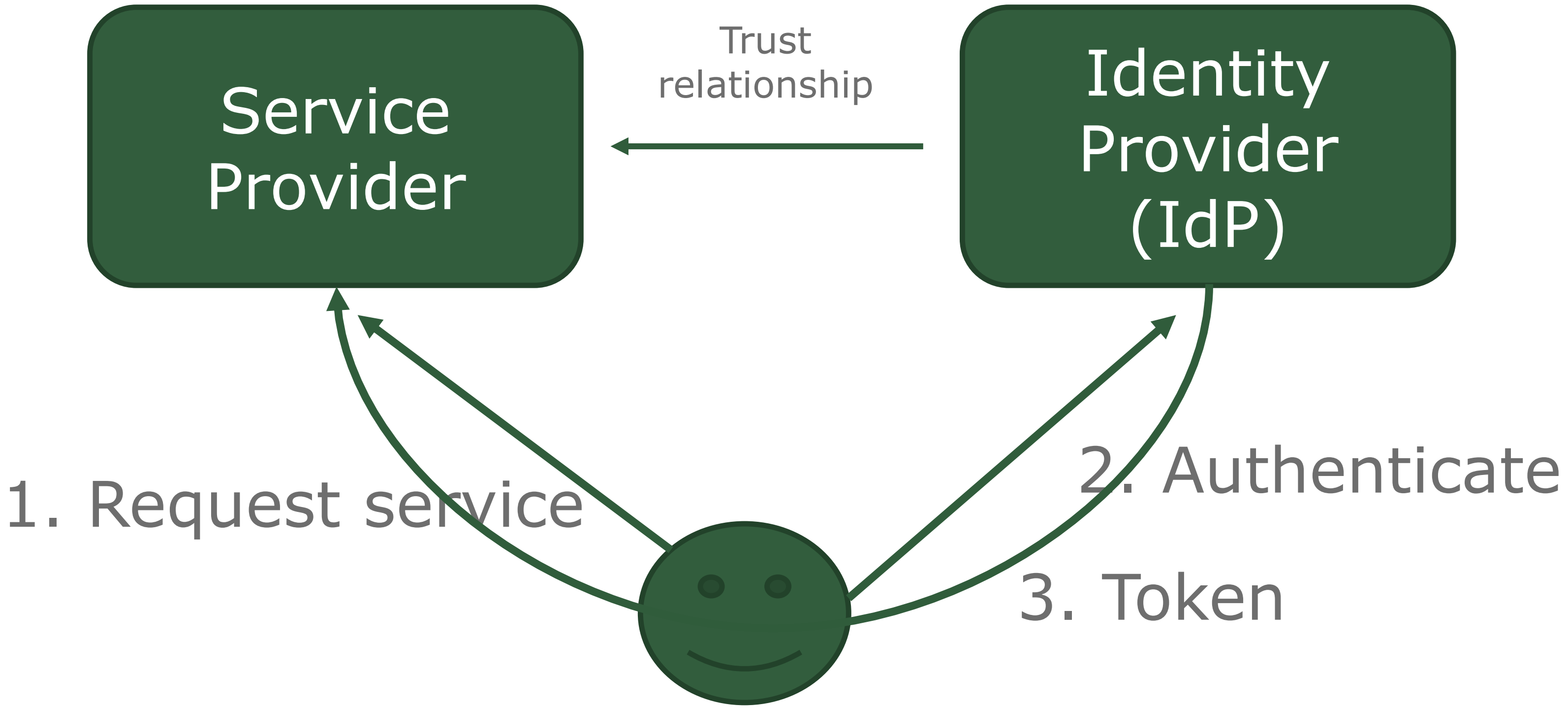
Hvem er det vi vil/skal beskytte – bruger, SP eller IdP?
Hvad er NemID’s focus?



Identitet og Privacy

Privacy by Design

Identity Provider / OpenID Provider osv ved hvor og hvornår du logger ind hos alle Service Providers



Summary

Digital user authentication principles

- A model for digital user authentication
- Means of authentication
- Risk assessment for user authentication

Password-based authentication

- The vulnerability of passwords
- Password selection strategies
- The use of hashed passwords
- Password cracking of user-chosen passwords
- Password file access control

Token-based authentication

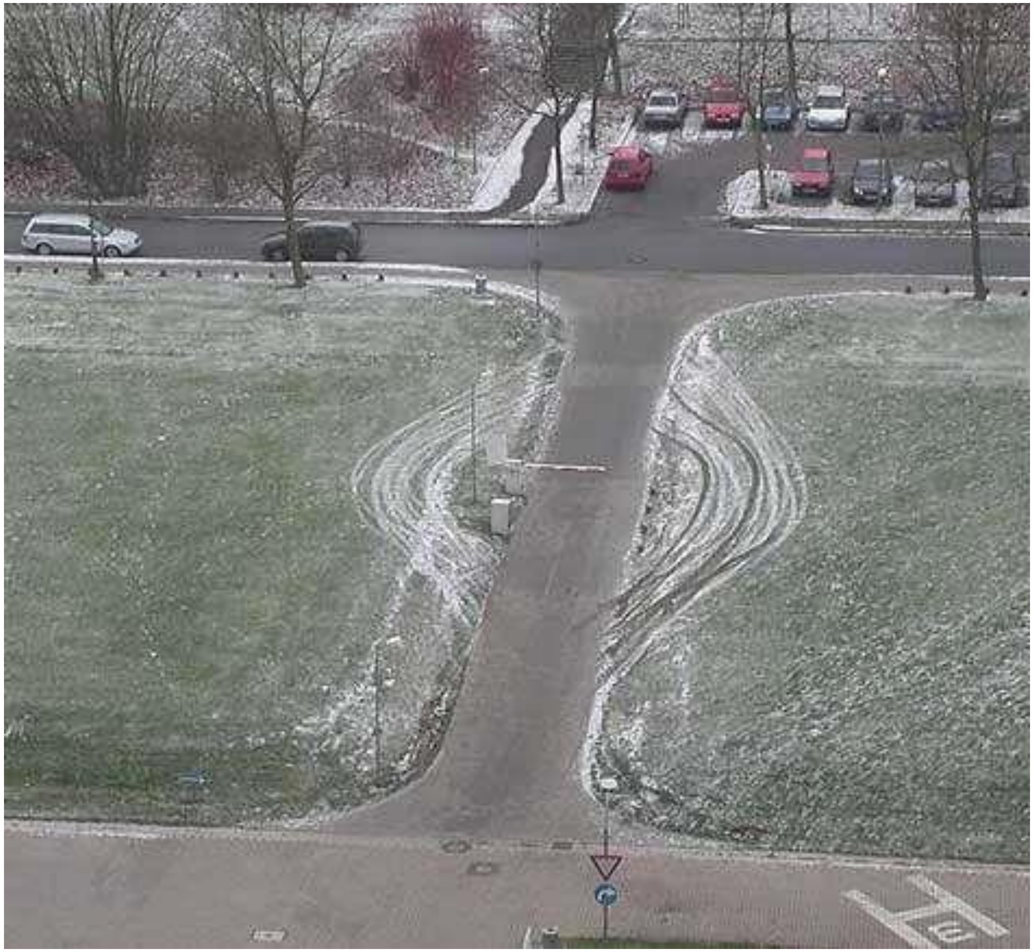
- Memory cards
- Smart cards
- Electronic identity cards

- Biometric authentication
  - Physical characteristics used in biometric applications
  - Operation of a biometric authentication system
  - Biometric accuracy
- Remote user authentication
  - Password protocol
  - Token protocol
  - Static biometric protocol
  - Dynamic biometric protocol
- Security issues for user authentication

”Cheating”: Social engineering

IT Security is difficult

Intelligent adversaries



Kompromittering via Social Engineering

- At narre mennesker til at gøre ting de ellers ikke ville gøre eller udlevere fortrolige oplysninger.
- Kan fører til hacking og identitetstyveri.
- F.eks. ved at optræde som insider med afsæt i viden om virksomheden.

Hvordan kan en angriber få viden om en virksomhed?

Hvad sker der ?

Nysgerrighed
Hjælpsomhed
Undgå konflikter
Stress

"No matter how low an opinion you have of your users, they will figure out a way to disappoint you."
-Stamos' Law

"We have dumb monkeys who clicks on buttons"
- Chris Hoff

Fremgangsmåden

Informationsindsamling
Opbygning af tillid
Scenariet
Pres for en løsning - ”hvad kan vi gøre?”

Bagrundsviden

0. Indformationsindsamling
Internet, sociale netværk, dumpster diving, besøg, opsøge medarbejdere, webmail, linkedin, jobannoncer osv, osv.

Hej, hvad er dit password?

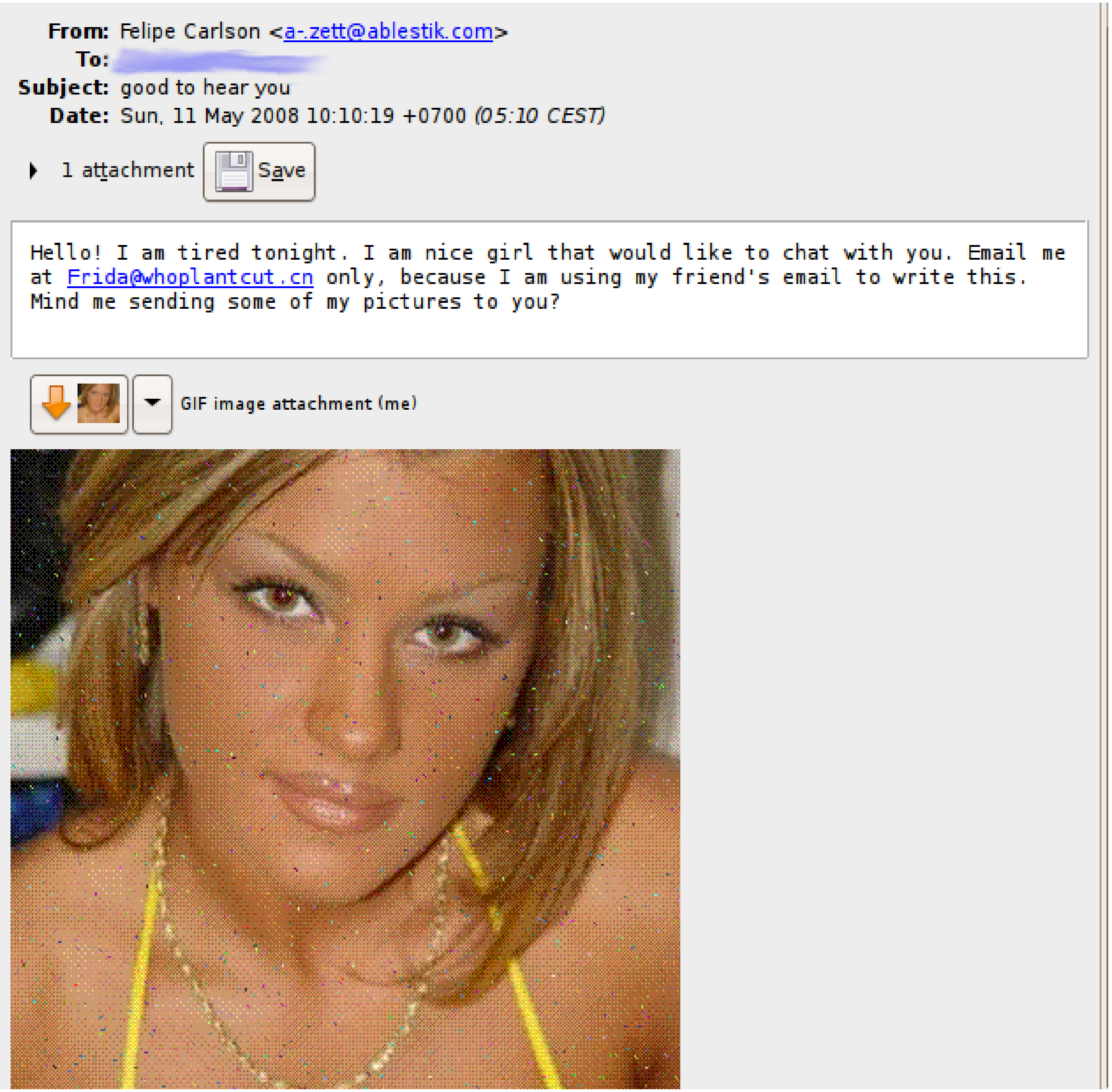
1. Opbygning af tillid
Det er sjældent nok at sige
”Hej, hvad er dit password?” eller
”Hallo – det er din chef, giv mig Admin passwordet eller du er fyret”

En række venlige, trivielle spørgsmål først (opbygger tillid)

Hej, hvad er dit password?

2. Baggrundsscenariet (pretexting)
Ramme for angreb, kan være en hel identitet (baseret på indledende research)

”Her er mit billede”



From: Felipe Carlson <a-.zett@ablestik.com>
To: [redacted]
Subject: good to hear you
Date: Sun, 11 May 2008 10:10:19 +0700 *(05:10 CEST)*

Hello! I am tired tonight. I am nice girl that would like to chat with you. Email me at Frida@whoplantcut.cn only, because I am using my friend's email to write this. Mind me sending some of my pictures to you?

Hej, hvad er dit password?

3. Pres

”Hvordan løser vi det her?”

Kropssprog, stemmeføring, høflig/vred/travl/autoritær osv

Han er ”en af vores”

Samme sprog og jargon
Det rigtige tøj

Overbevise folk om man ”hører til”

Påklædning er vigtig

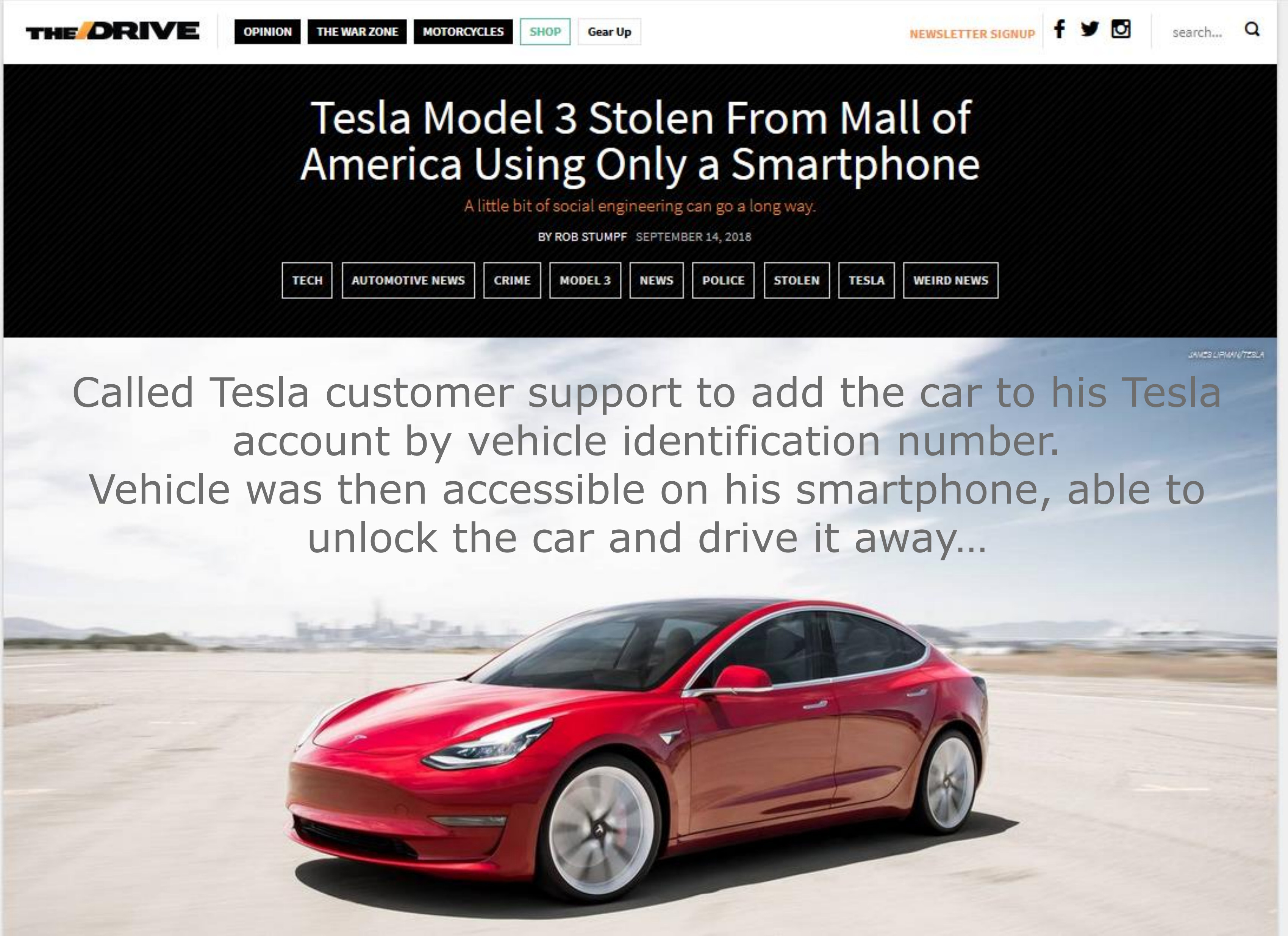
Dress as a DJ:
https://www.youtube.com/watch?v=uoIL2x6slC8

Hvad ville have virket i bussen?

Man er usynlig i en neon-vest

https://www.youtube.com/watch?v=tFur1-i6BpA

Praktisk eksempel (September 2018)



Tesla Model 3 Stolen From Mall of America Using Only a Smartphone

A little bit of social engineering can go a long way.

BY ROB STUMPF SEPTEMBER 14, 2018

TECH | AUTOMOTIVE NEWS | CRIME | MODEL 3 | NEWS | POLICE | STOLEN | TESLA | WEIRD NEWS

JAMES LIPMAN/TESLA

Called Tesla customer support to add the car to his Tesla account by vehicle identification number.
Vehicle was then accessible on his smartphone, able to unlock the car and drive it away…

”Pre-loading”

Mange, mange teknikker

Påvirke inden faktiske møde/hændelse

Verifikation af identitet

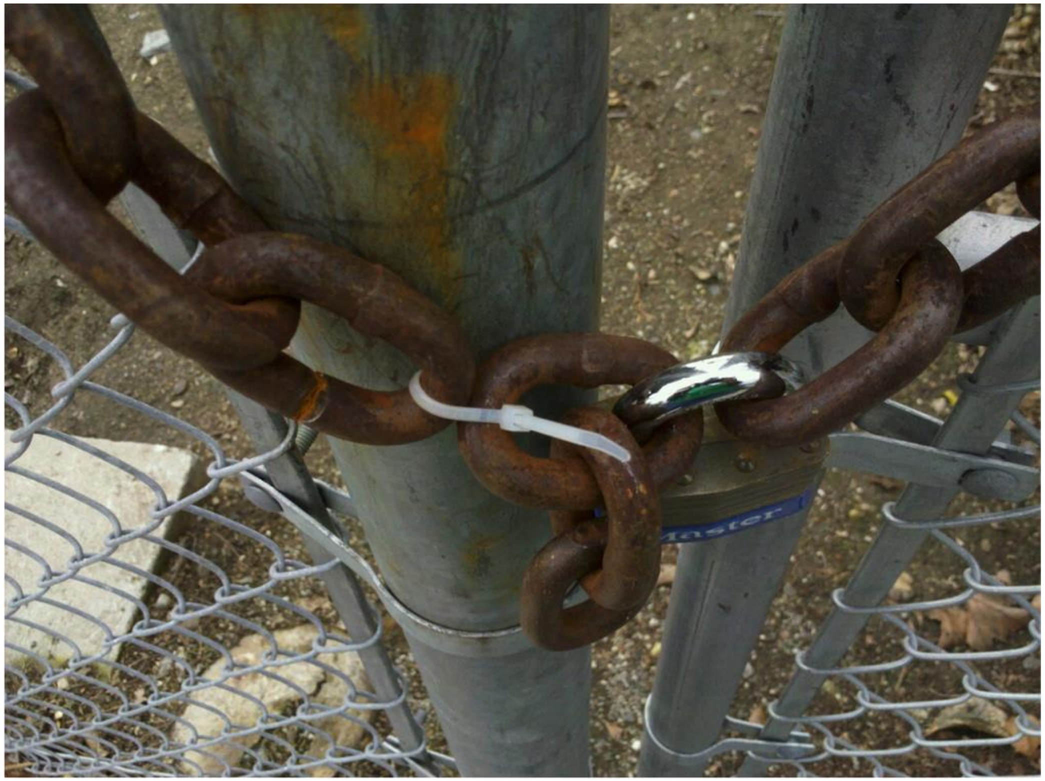
Fysisk adgang

ID-kort
Piggybacking/tailgating
Telefoner, kopper og pakker
Bude, reparatører, revisorer, journalister
Rygere og andre grupper
Pre-loading

Tyveri, informationsindsamling, trådløse accesspoints, netværksadgang, serverrum
…

Det svageste led i sikkerhedskæden

Telefon, personlig fremmøde,
USB, CD, websider, pdf-filer, hacke
e-mail, vinde gaver, voice beskeder



Don’t click it – and don’t pick it up either!

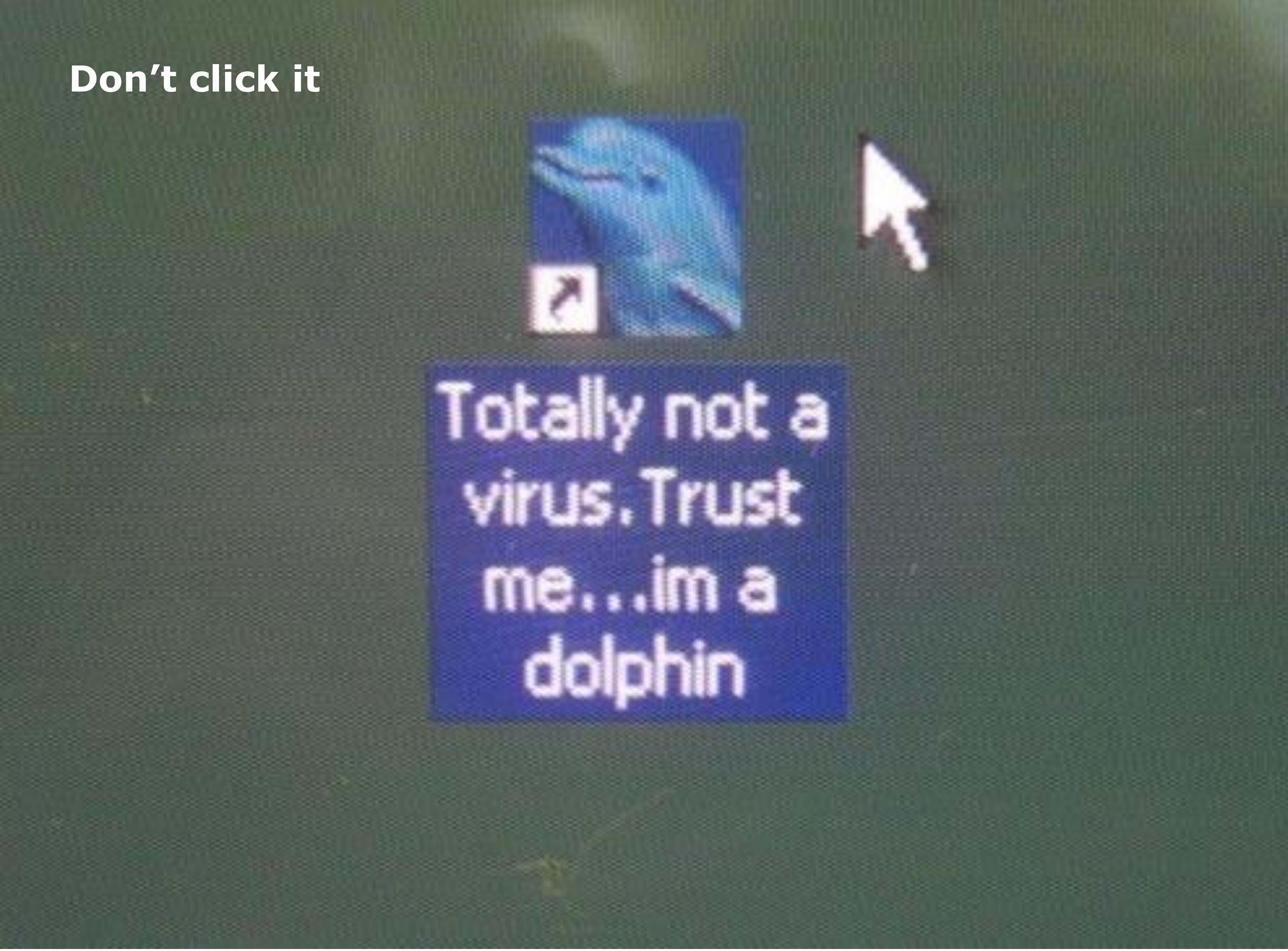
Ah – og hvis du finder en USB-nøgle på jorden: lad være med at teste den !

Phishing

A phishing attack usually comes in the form of a message meant to convince you to:

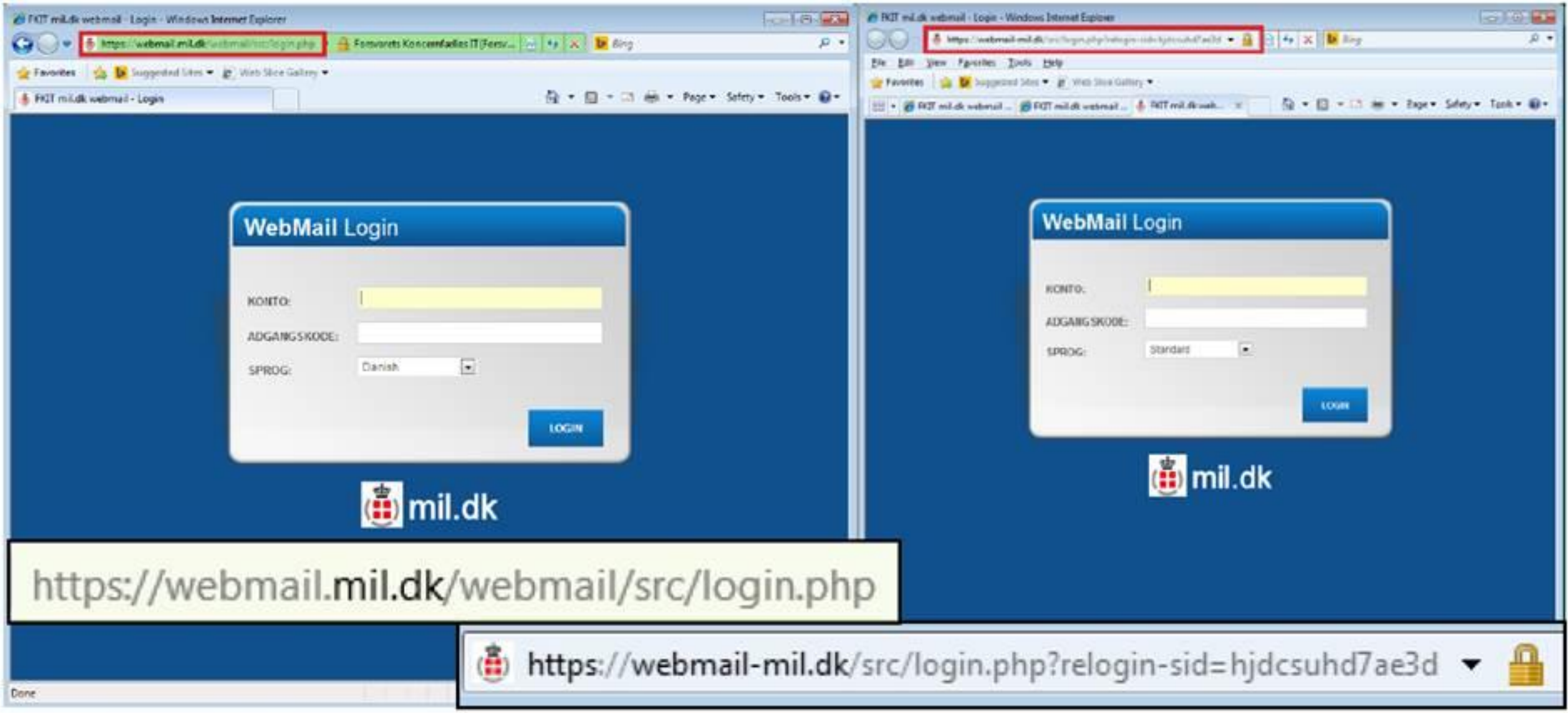
- **click on a link**
- **open a document**
- **install software on your device**
- **enter your username and password into a website that’s made to look legitimate.**

Don’t click it



Totally not a virus.Trust me...im a dolphin

Don’t click it



KONTO:

ADGANGSKODE:

SPROG: Danish

KONTO:

ADGANGSKODE:

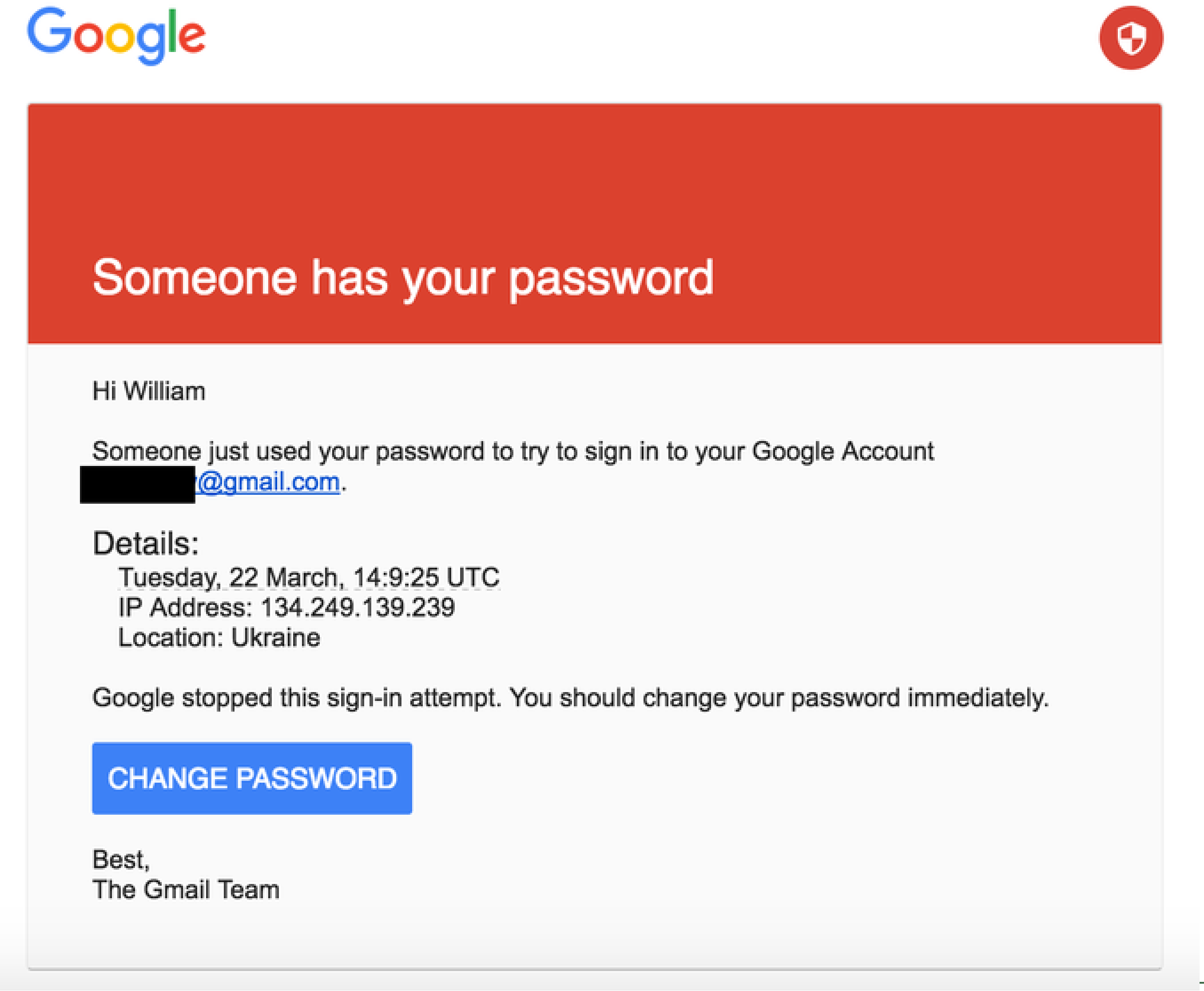
SPROG: Standard

https://webmail.mil.dk/webmail/src/login.php

https://webmail-mil.dk/src/login.php?relogin-sid=hjdcsuhd7ae3d

Billede 1: Den falske e-mail-login-side sidestillet med den legitime side. De to URL’er er fremhævet nedenunder.

Don’t click it



Google

Someone has your password

Hi William

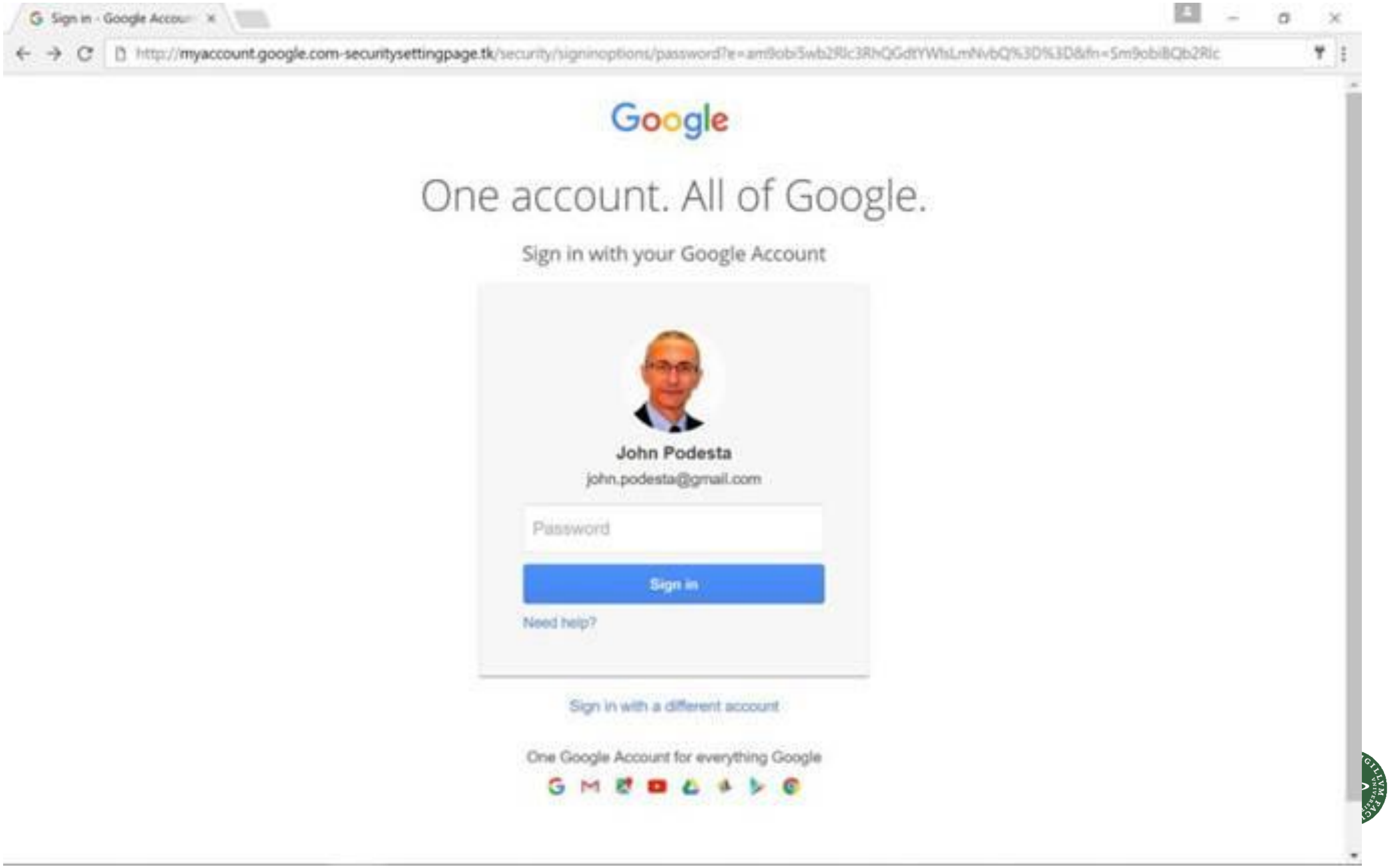
Someone just used your password to try to sign in to your Google Account [redacted]@gmail.com.

Details:
Tuesday, 22 March, 14:9:25 UTC
IP Address: 134.249.139.239
Location: Ukraine

Google stopped this sign-in attempt. You should change your password immediately.

Best,
The Gmail Team

Don’t click it



http://myaccount.google.com-securitysettingpage.tk/security/signinoptions/password?e=am9obi5wb2Rlc3RhQGdtYWlsLmNvbQ%3D%3D&fn=Sm9obiBQb2Rlc

One account. All of Google.

Sign in with your Google Account

John Podesta

john.podesta@gmail.com

One Google Account for everything Google

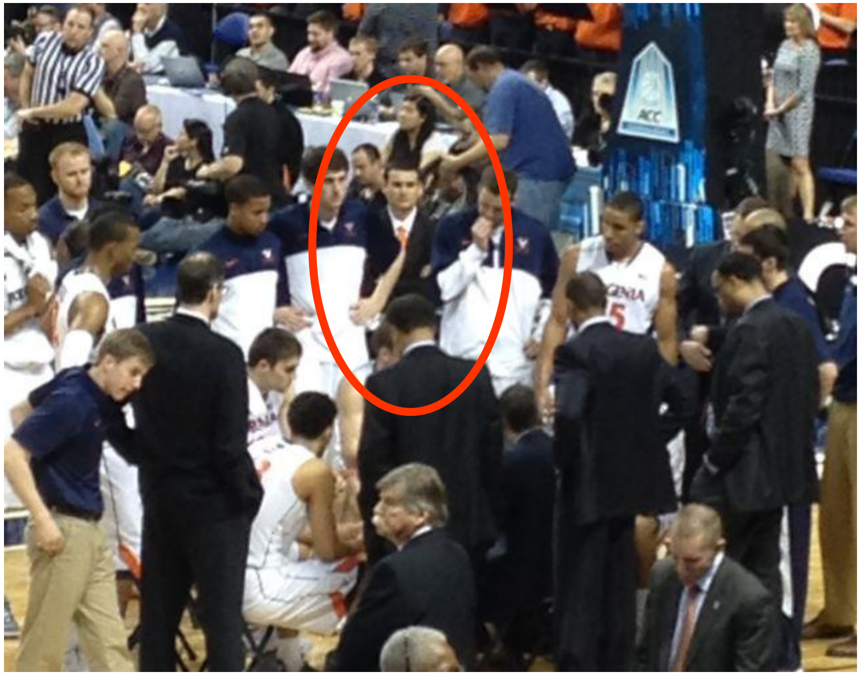
Don’t click it

Be suspicious of all **links** that ask you to log in, regardless of the sender.
And be very careful of all **attached files** – regardless of the sender

Totally not a virus.Trust me...im a dolphin

By the way - do not “*enable content*” on documents with macros (.docm)

Er det svært for dem?



http://deadspin.com/uva-fan-bluffs-his-way-through-the-perfect-acc-title-ga-1547386713

70 dollars i Walmart…

Hvad gør man imod Social Engineering?

Forstå truslerne

Jo højere sikkerhed, jo mere sandsynlig er social engineering

Træning og understøttende procedurer – hvad er advarselssignalerne -procedure gør det svært for angriber

Ikke kun telefonen - også mail, chat, hjemmesider og fysisk fremmøde m.m.

”Hvordan kan vi forbedre vores procedurer?”

Ikke det samme for alle

Rette niveau af paranoia !

Hvis man føler sig *usikker* – ”der er et eller andet, der ikke føles rigtigt”

Forstå truslerne

O. Informationsindsamling
Makuler dokumenter
Forsigtig i offentlige rum
Information over telefonen, mail o.lign., særligt ved uventede henvendelser

1. Opbygge tillid
Meget snakkende
Hvorfor taler han om det?
Spørg ind ved fejl, hvis fejl fortsætter -> afslut

Forstå truslerne

2. Scenariet
Hvis usikker: gencheck, gencheck, gencheck
Tag dig tid og følg proceduren

3. Pres
Teknikker der benyttes (awareness)
Giv ikke efter
Henvis til politikker og procedurer
Tilkald en leder hvis usikker (overfør risiko), tag ikke beslutningen selv

Mulige tiltag

Anden kanal til at overdrage info, end den der spørges fra, f.eks.

- telefon til voicemail/SMS
- email til leder
- give fysisk til anden person fra afdelingen

Ring tilbage/send mail tilbage
(men ikke reply-to)

Mulige tiltag

Check og bekræft id, også selvom det er svært
(eller måske særligt hvis det er svært)

Passwordbeskyttelse af information

Fysisk sikring, f.eks imod tail-gating

Kultur, ”Hvorfor har du ikke skilt på?”

Mulige tiltag

- **Awareness**
- **Opdateret software**
- **Brug 2FA (og/eller password manager)**
- **Bekræft med afsender (vha andre kanaler)**
- **Åben attachments på en sikker måde**
- **Backup**

A sense of urgency is always the first big clue

Giver pretext'en engetlig mening – ville et firma virkelig ringe til dig, eller bede dig om at ringe til dem?
Ville dét firma virkelig bede om den information?

Social engineering teknikker virker i praksis

Makollig Jezvahted and Levdaroum DeBahzted

My colleague just farted, and left the room, the bastard

(.wav)

Spørgsmål

?