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Mind Over Matter: The Pragmatic, Strong, and Smart Approach to Security

SESSION ID: SPO1-T09

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Bundesdruckerei GmbH
Berlin, Germany

In This Presentation, we will motivate

- That mass application of current IT security approaches will only lead to a hamster wheel
  - We need a smart approach, that fundamentally addresses the threats
  - We need a pragmatic approach as IT security is not expected to change user experience
  - We need a strong approach as threats today are backed by profitable business models
- And thus, IT security is just before an innovation leap

Agenda

- Part 1: Expolit-Protection: Pro-Active Security (Ammar Alkassar, Sirrix)
- Part 2: Authentication and Identity (Kim Nguyen, Bundesdruckerei/D-Trust)

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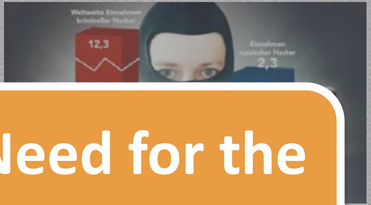
Exploit-Protection
Pro-Active Security

Ammar Alkassar
Sirrix AG

Driver of Threats


Weltweite Einnahmen krimineller Hacker
12,3
Einnahmen russischer Hacker
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Cyber-
Crime

Need for the
SMART

Need for the
STRONG

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Threa
(APT)

Collateral
Cyber-
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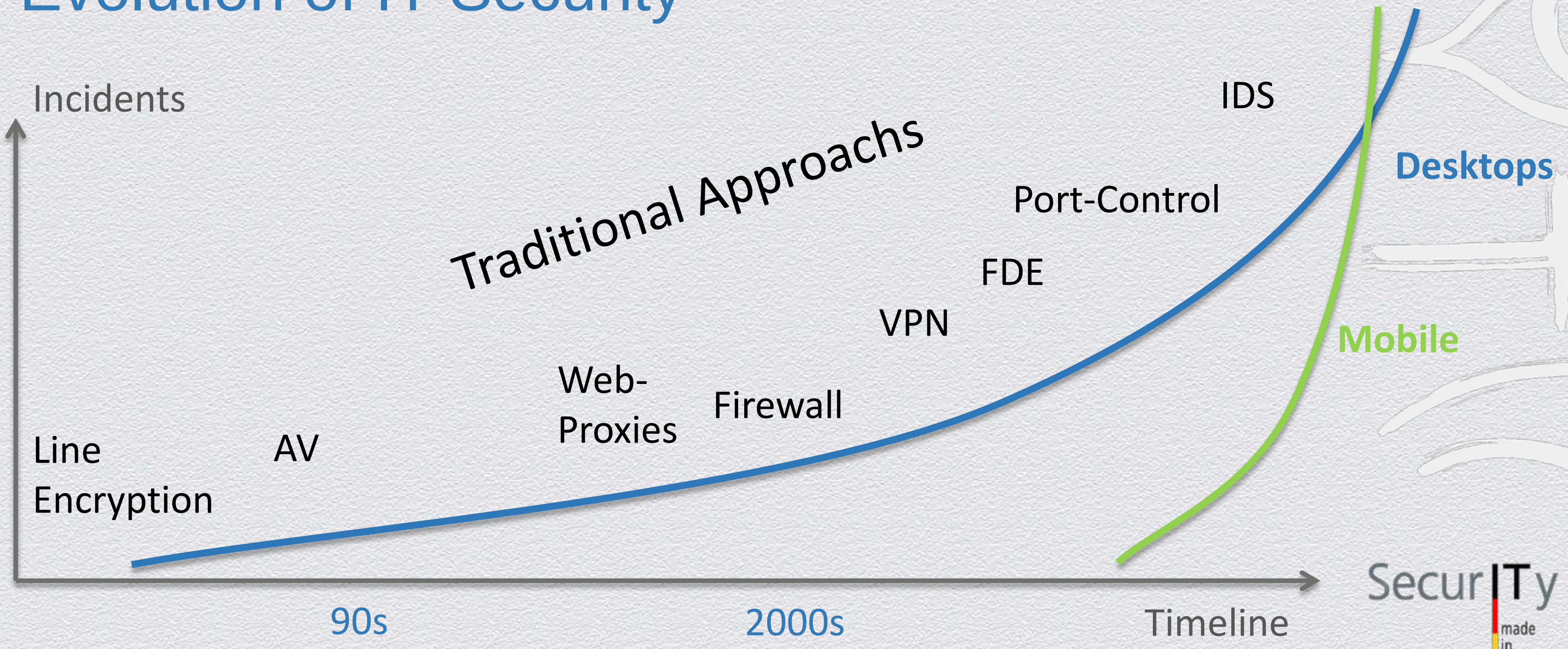
Need for the
PRAGMATIC

Evolution of IT Security



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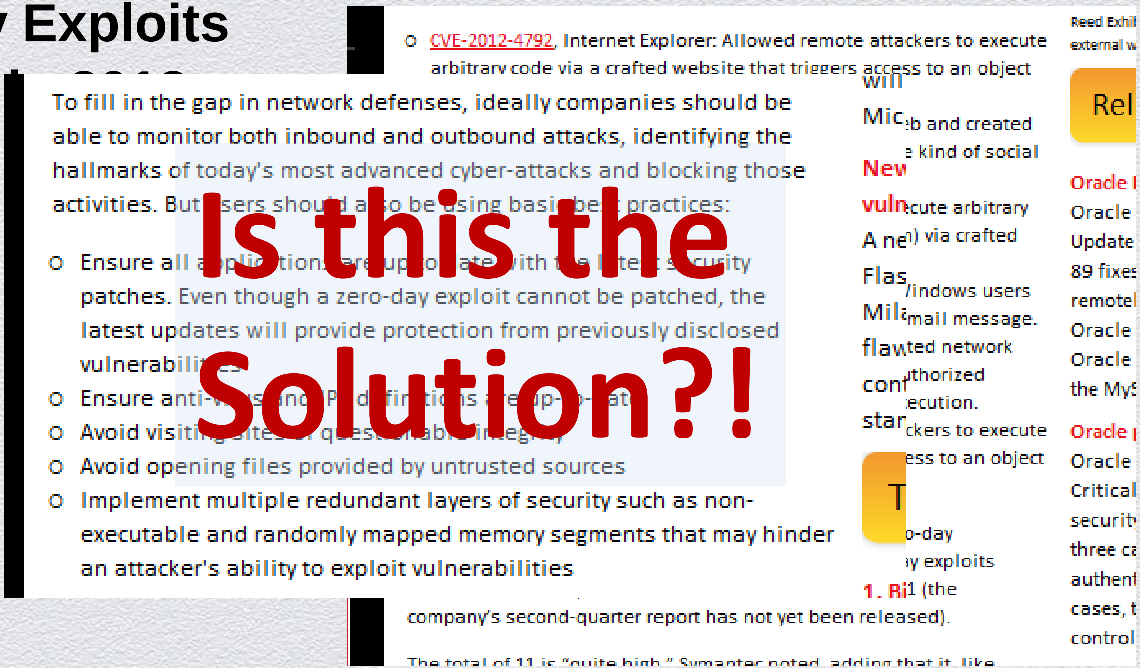
Threat, Dominating the Future

- **Zero-Day Exploits Escalate**



- CVE-2012-4792, Internet Explorer: Allowed remote attackers to execute arbitrary code via a crafted website that triggers access to an object

will

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company's second-quarter report has not yet been released).

The total of 11 is "quite high," Symantec noted, adding that it, like

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To fill in the gap in network defenses, ideally companies should be able to monitor both inbound and outbound attacks, identifying the hallmarks of today's most advanced cyber-attacks and blocking those activities. But users should also be using basic best practices:

- Ensure all applications are up to date with the latest security patches. Even though a zero-day exploit cannot be patched, the latest updates will provide protection from previously disclosed vulnerabilities
- Ensure anti-virus and IPS definitions are up-to-date
- Avoid visiting sites of questionable integrity
- Avoid opening files provided by untrusted sources
- Implement multiple redundant layers of security such as non-executable and randomly mapped memory segments that may hinder an attacker's ability to exploit vulnerabilities

Is this the Solution?!

The Proactive Approach

- Today’s approaches fail in providing sustainable security

Still applied approaches

- „Airbag approach“:
  If it happens, it should hurt less.

Required approach :

- „ESP strategy“:
  Avoid skidding,
  before it happens.

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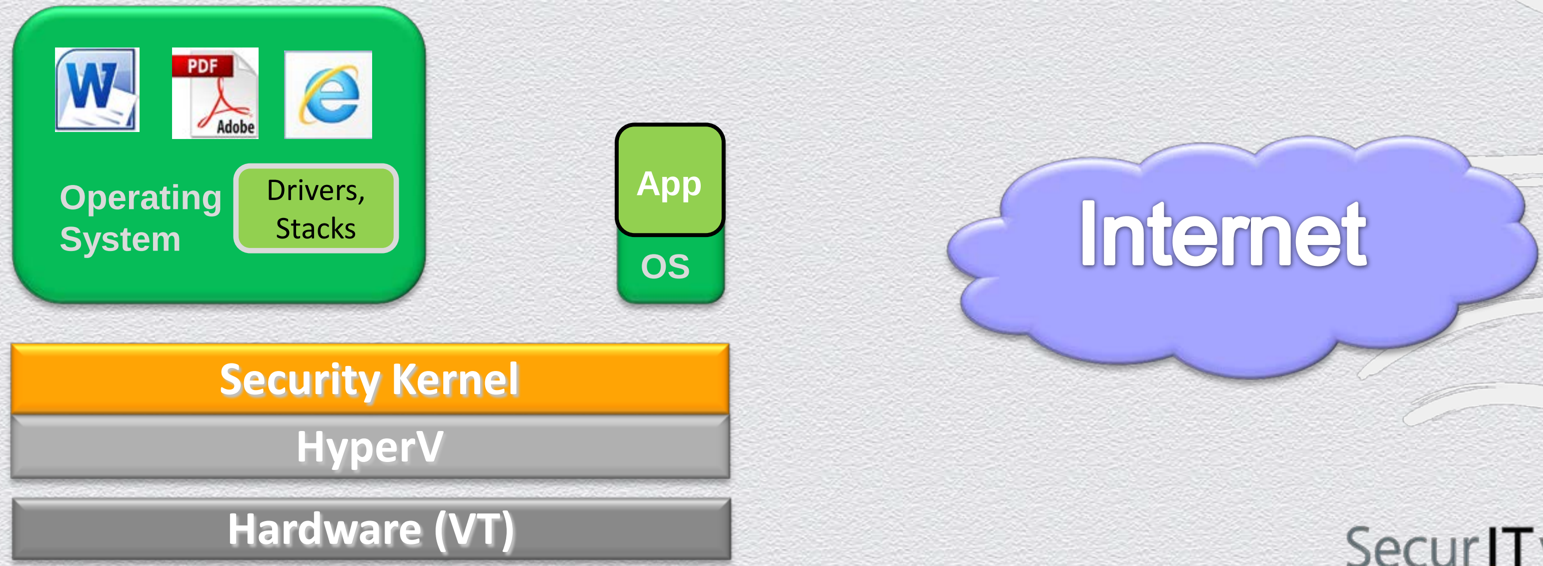
Approaches to Next Generation

- Sandboxing-Techniques
  - App-Level, e.g., as Adobe Reader, Google Chrome
  - OS-Level, e.g., Invincea, Sandboxie, Trustware Bufferzone, ZeroVulnerabilityLabs
- (Execution on Remote Server)
- Full Desktop-Virtualization with Security Kernel
  - E.g., SINA VW, GeneralDynamics TVE, TrustedDesktop
- Game-changer: Micro-Virtualization with Security Kernel

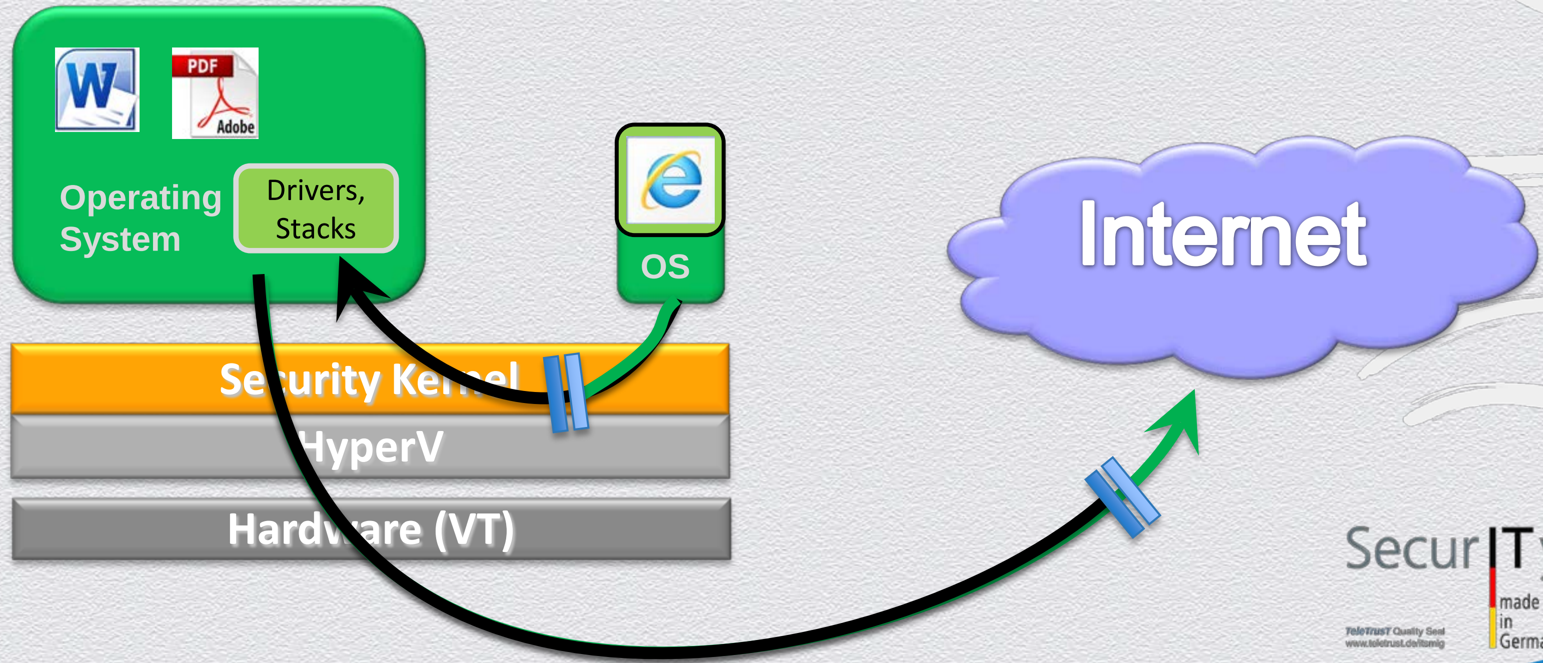
Requirements

- Don´t change the user‘s experience (Pragmatic)
- Provide pro-active protection (Strong)
- Keep the solution lightweight (Smart)

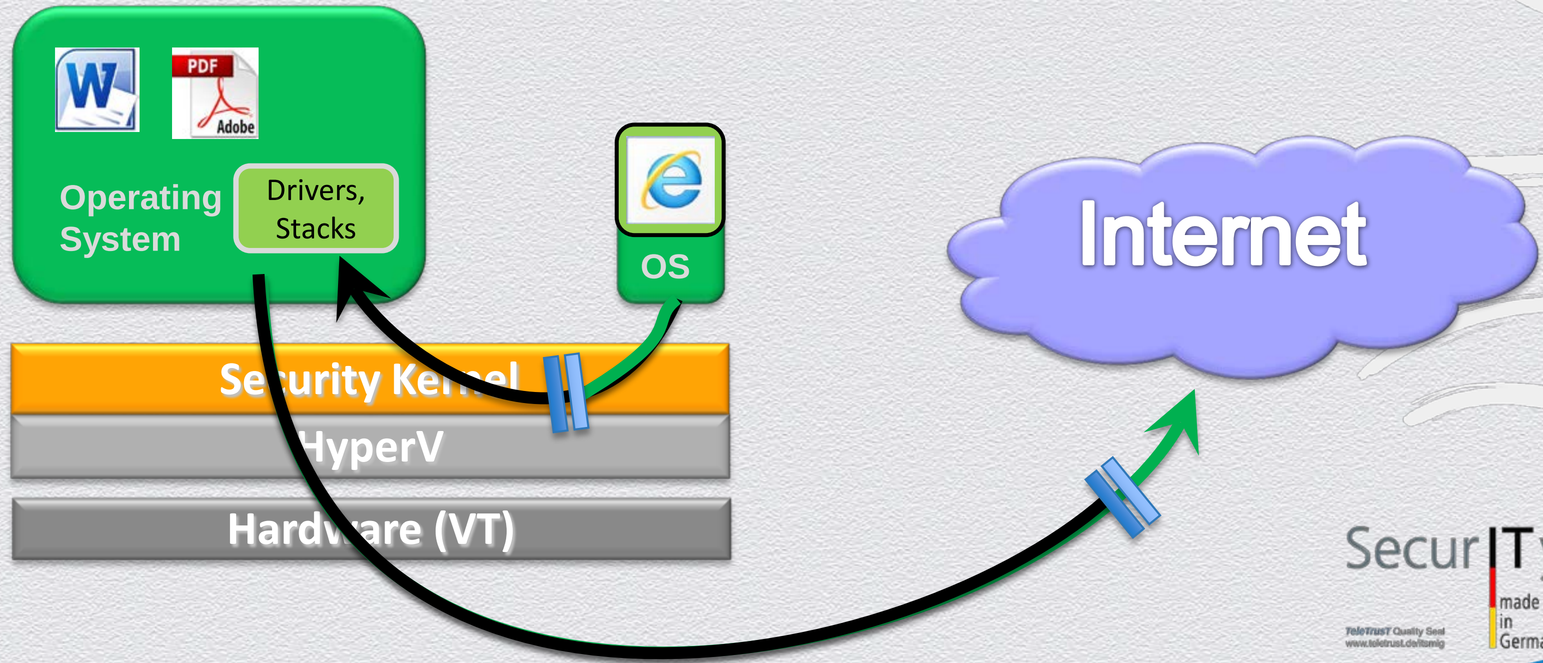
Web-Access Protection



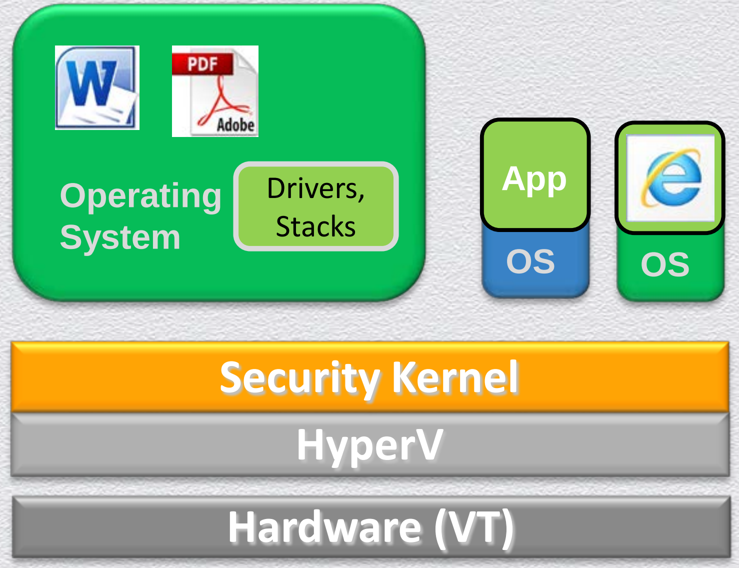
Web-Access Protection



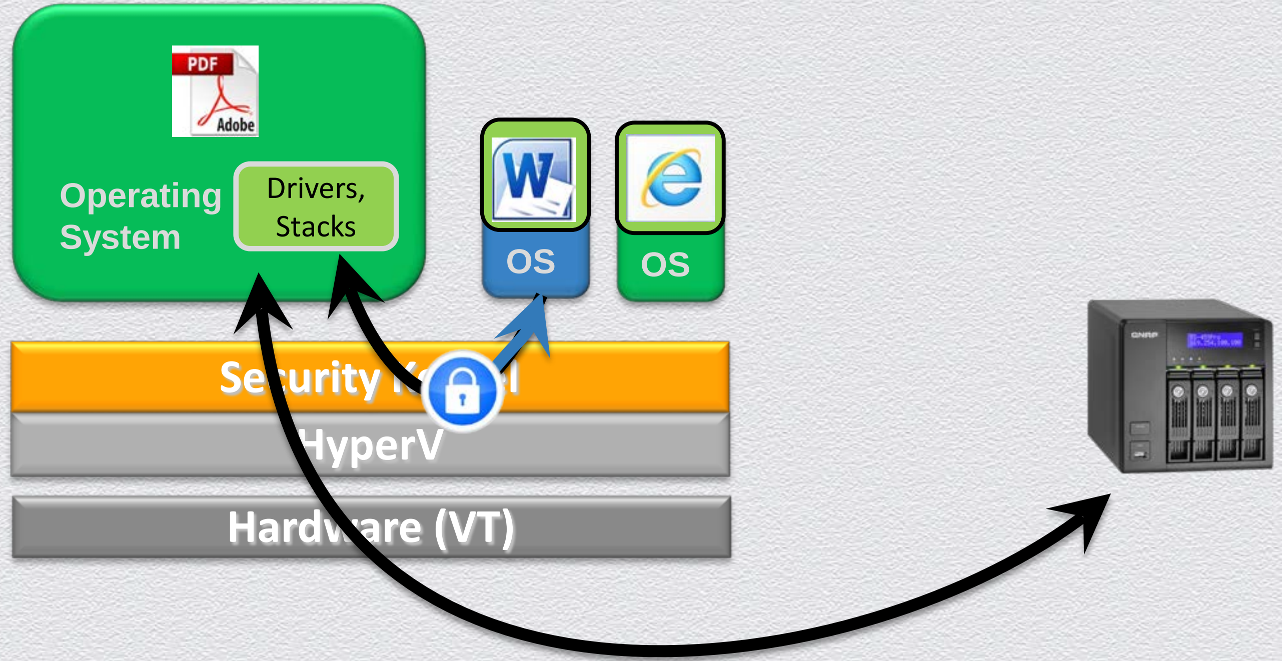
Internet-Access



Micro-Virtualization



Micro-Virtualization



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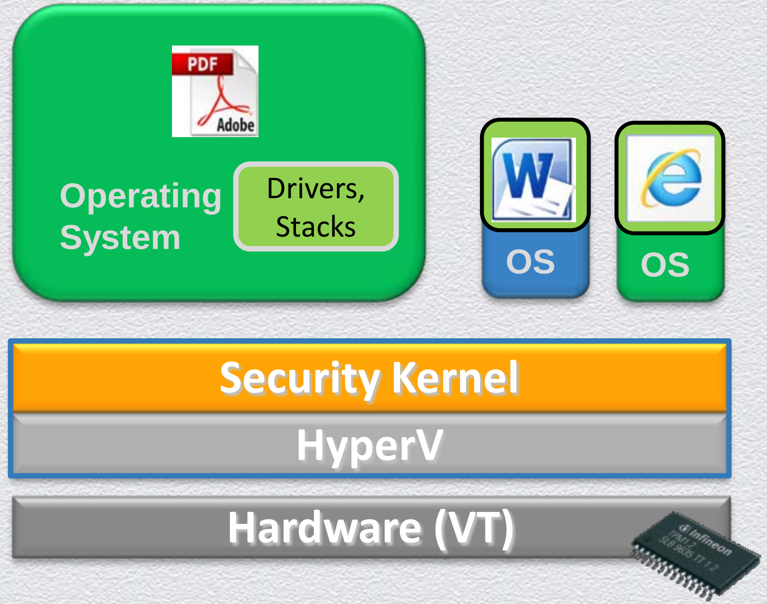
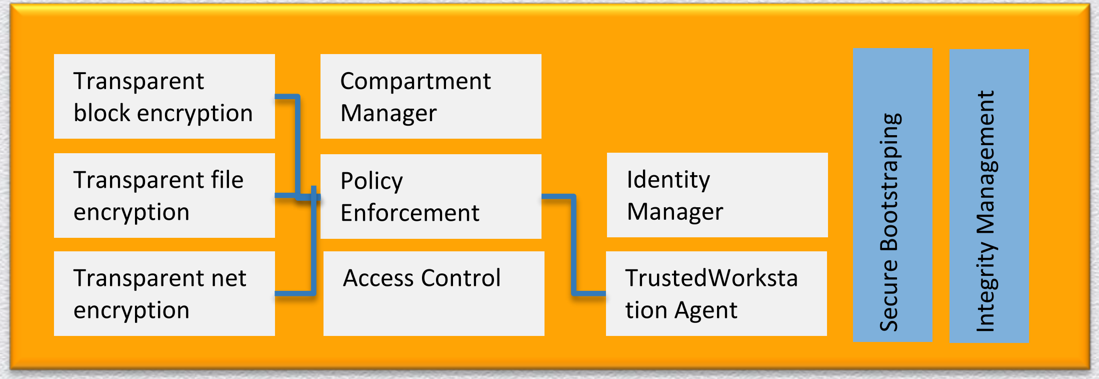
Micro-Virtualization



Security Kernel



Challenges, Exemplary

- Lightweight, secure and dynamic full-virtualization (including Kernel)
- Defining and preserving the integrity of OS and Apps
  - Throw-Away Write-Cache
- Efficient separation lines and labeling
  - Trusted Virtual Domains (TVDs, EU FP7-TClouds)
- Trusted Computing Based is significantly reduced
  - But still "doors" need to be evaluated

Increasing Number of Vendors

- Desktop Full-Virtualization:
  Secunet SINA Virtual Workstation, Sirrix TrustedDesktop, GD TVE, …

- Sandboxing and Micro-Virtualization
  Bromium (vSentry), Invincea (Containment), Sirrix (BitBox, TrustedApp)

Approach works for Mobiles

- E.g., BizzTrust
  - Enables strict separation between business and personal apps and data
  - Prevents from malware infection and APT attacks , even in the presence of exploits in android framework or in any app.
  - Provides information-flow control and includes strong encryption for stored data and communication data.
  - Uses TURAYA™ Type-Enforcement Security Kernel
  - Fully manageable with TOM

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Authentication and Identity made easy

Kim Nguyen
Bundesdruckerei GmbH
D-Trust GmbH

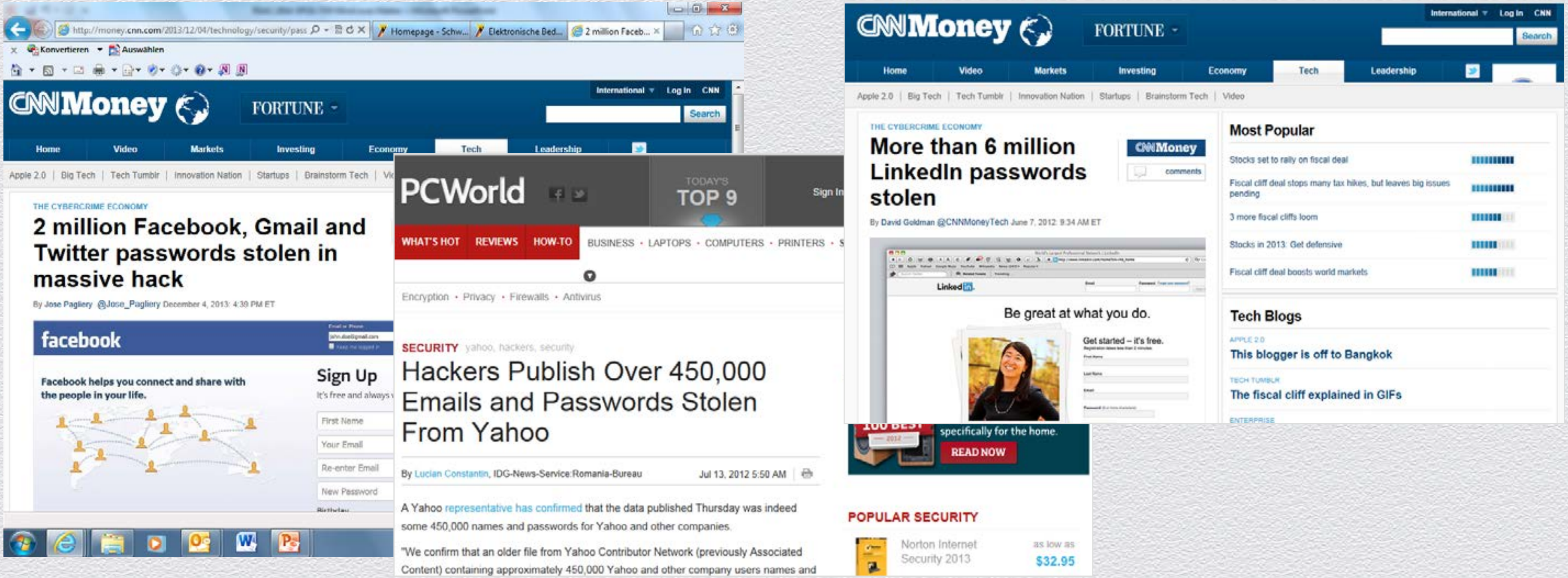
Agenda

- Authentication, security and user experience
- FIDO Alliance approach
- A layered authentication and identification model
- Bridging the gap between different worlds:
  private and governmental ID

"On the Internet, nobody knows you're a dog."

© The New Yorker

Identity in the Internet … is a hot and critical topic!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Homepage - Schw...
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2 million Faceb...
Konvertieren
Auswählen
CNNMoney
FORTUNE
International
Log In
CNN
Search
Home
Video
Markets
Investing
Economy
Tech
Leadership
Apple 2.0 | Big Tech | Tech Tumblr | Innovation Nation | Startups | Brainstorm Tech | Video
facebook
Facebook helps you connect and share with the people in your life.
Sign Up
It's free and always
First Name
Your Email
Re-enter Email
New Password
Birthday
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THE CYBERCRIME ECONOMY

2 million Facebook, Gmail and Twitter passwords stolen in massive hack

By Jose Pagliery @Jose_Pagliery December 4, 2013: 4:39 PM ET

SECURITY

Hackers Publish Over 450,000 Emails and Passwords Stolen From Yahoo

By Lucian Constantin, IDG-News-Service:Romania-Bureau Jul 13, 2012 5:50 AM

A Yahoo representative has confirmed that the data published Thursday was indeed some 450,000 names and passwords for Yahoo and other companies.

"We confirm that an older file from Yahoo Contributor Network (previously Associated Content) containing approximately 450,000 Yahoo and other company users names and

THE CYBERCRIME ECONOMY

More than 6 million LinkedIn passwords stolen

By David Goldman @CNNMoneyTech June 7, 2012: 9:34 AM ET

Do we need to make things more secure …? Yes we do!

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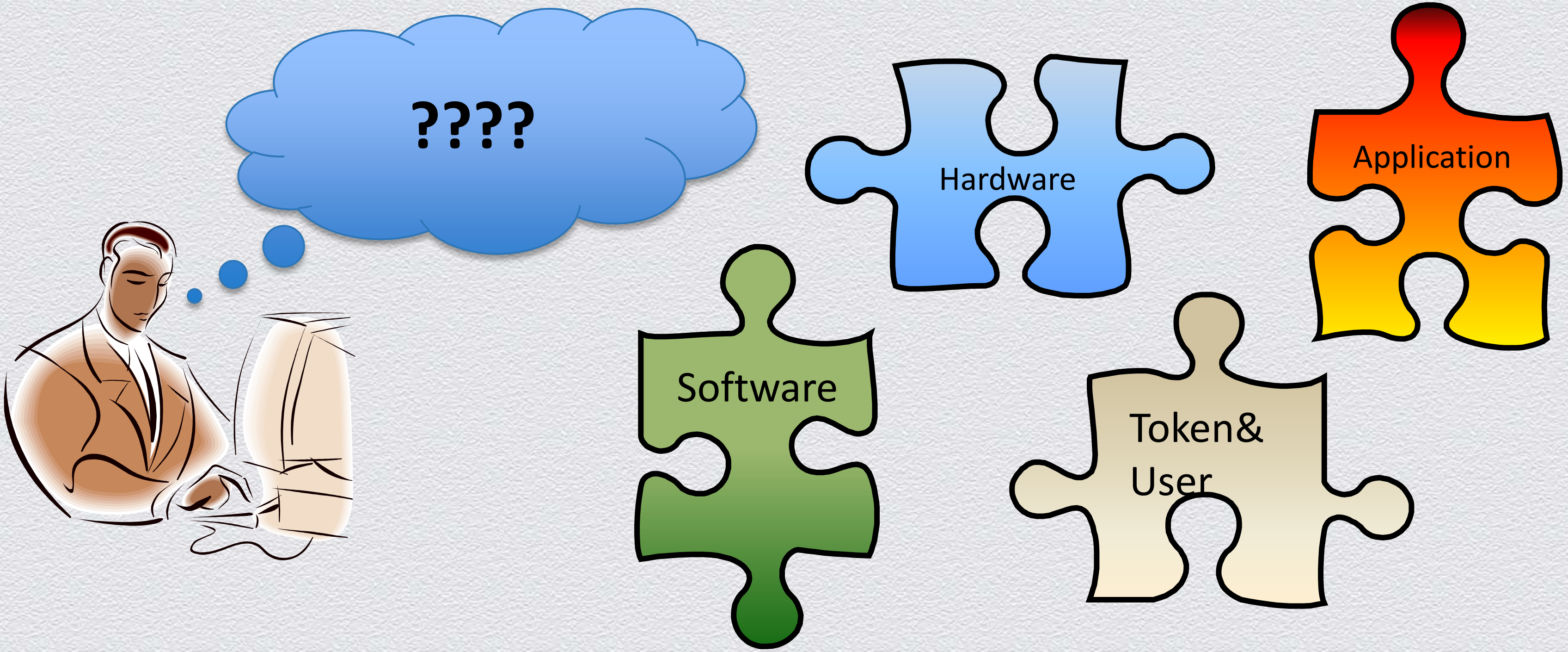


????

Hardware

Application

Software

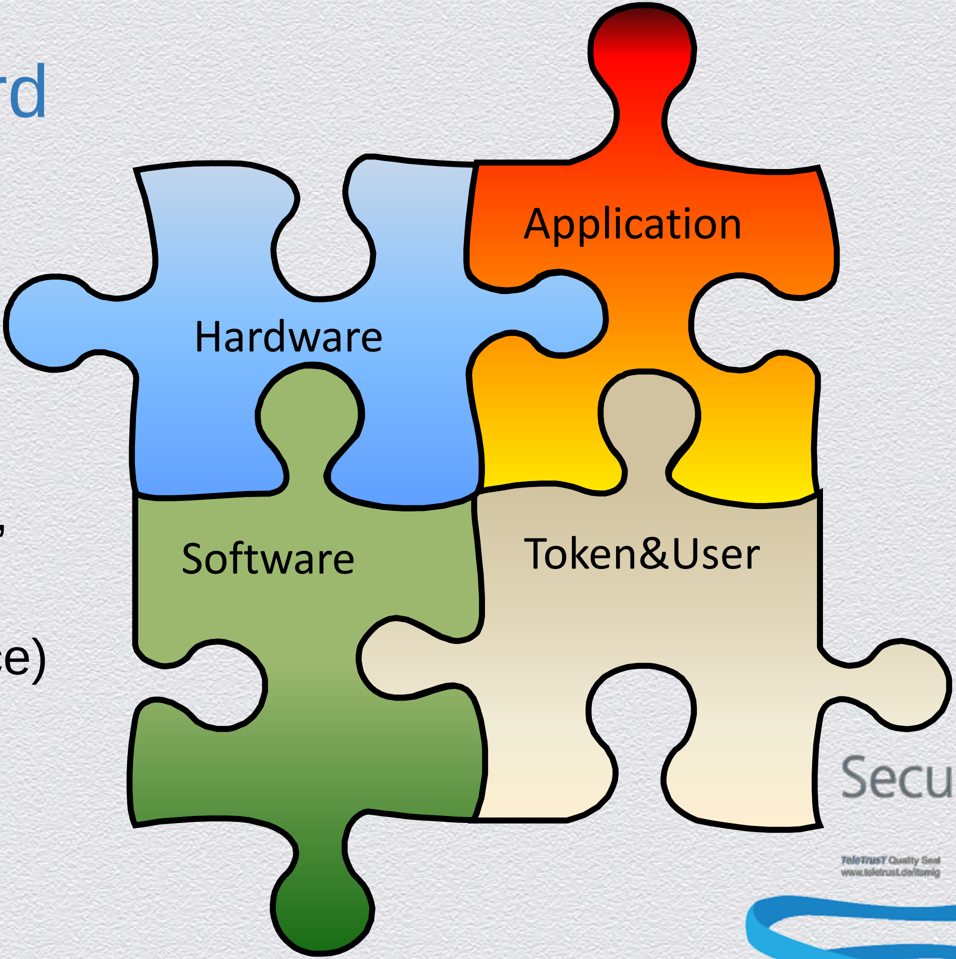
Token&
User

Why are existing technologies not easily adopted?

Our technology, your problem!!! The pieces of the puzzle do not fit together…

A possible way forward

- Bringing together the pieces of the puzzle
- Deep integration in hardware, software and solutions
- PRAGMATIC (user experience)
- SMART (application)
- STRONG (HW, SW, crypto)



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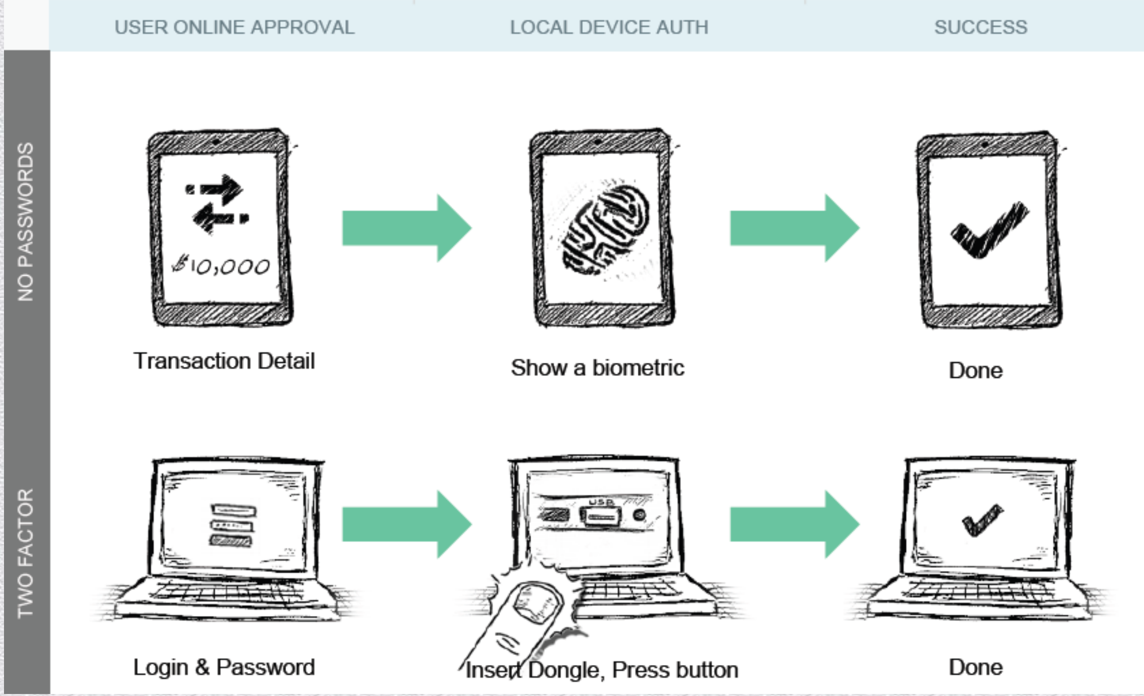
FIDO Experiences



USER ONLINE APPROVAL | LOCAL DEVICE AUTH | SUCCESS

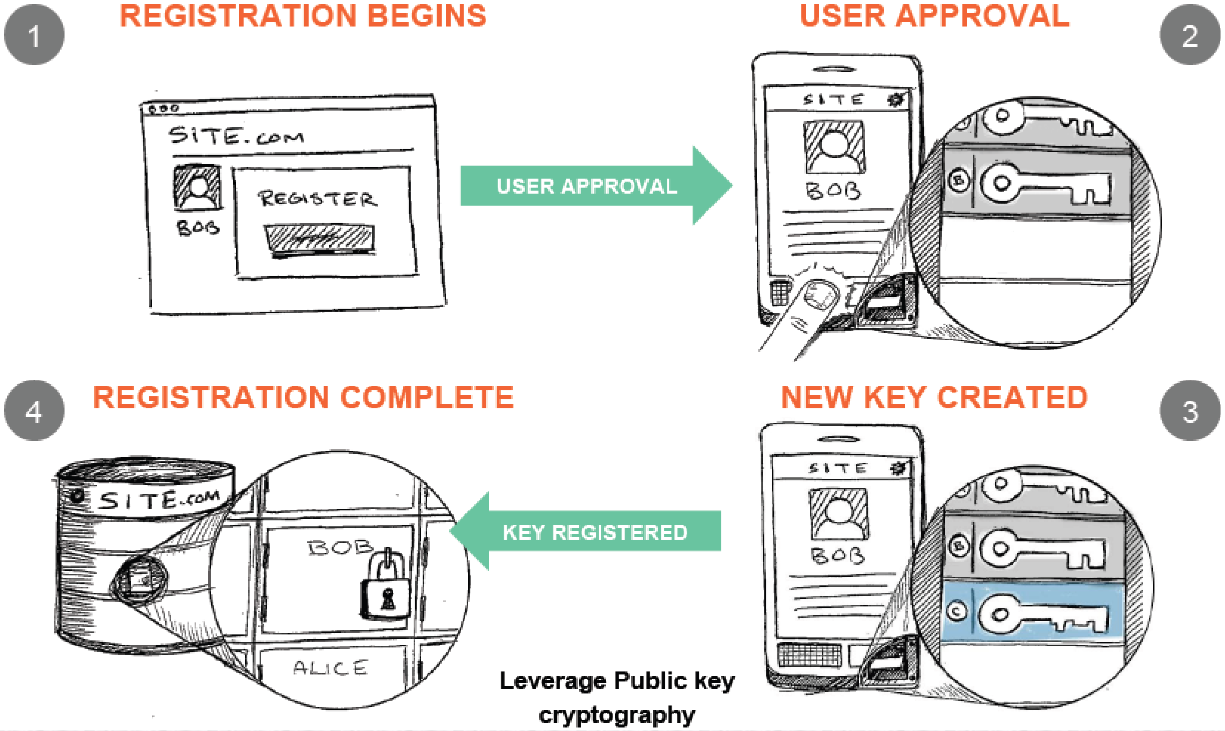
NO PASSWORDS

Transaction Detail → Show a biometric → Done

TWO FACTOR

Login & Password → Insert Dongle, Press button → Done

FIDO Registration



1 REGISTRATION BEGINS

USER APPROVAL

2 USER APPROVAL

3 NEW KEY CREATED

KEY REGISTERED

4 REGISTRATION COMPLETE

Leverage Public key cryptography

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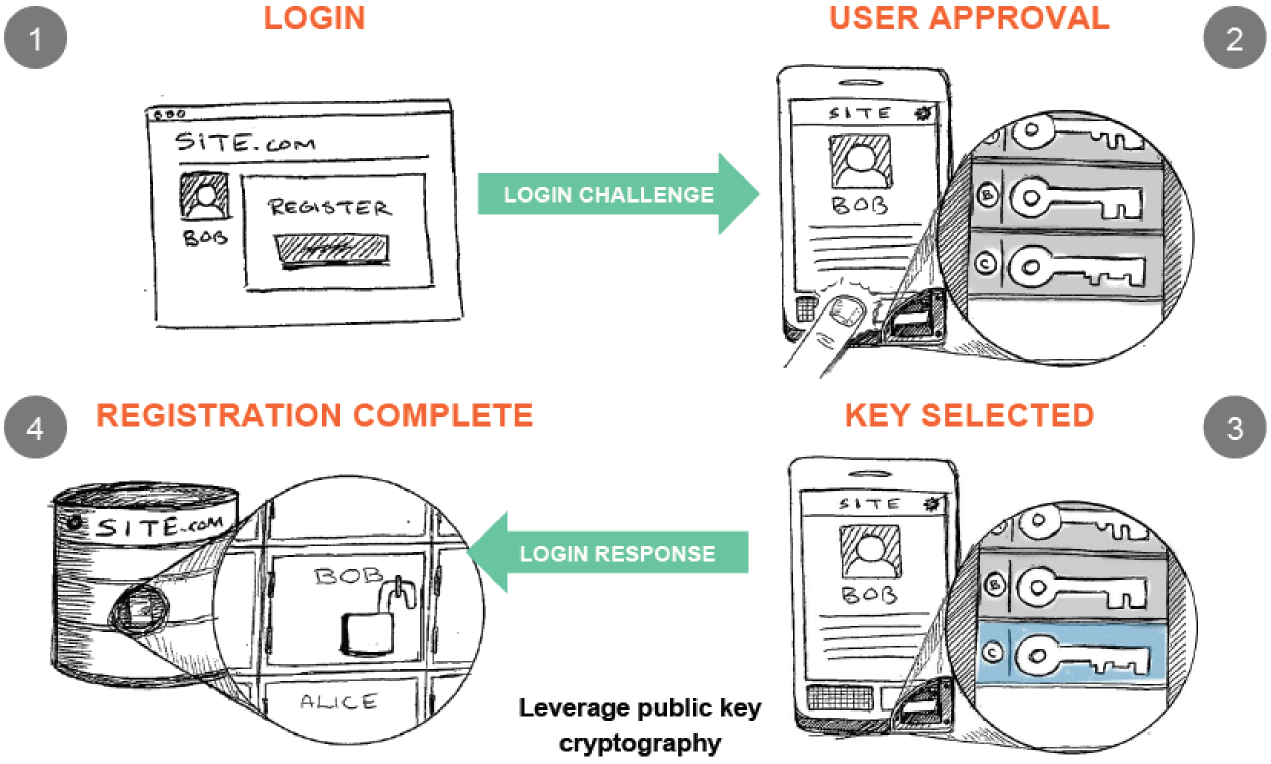
FIDO Login



1 LOGIN

2 USER APPROVAL

3 KEY SELECTED

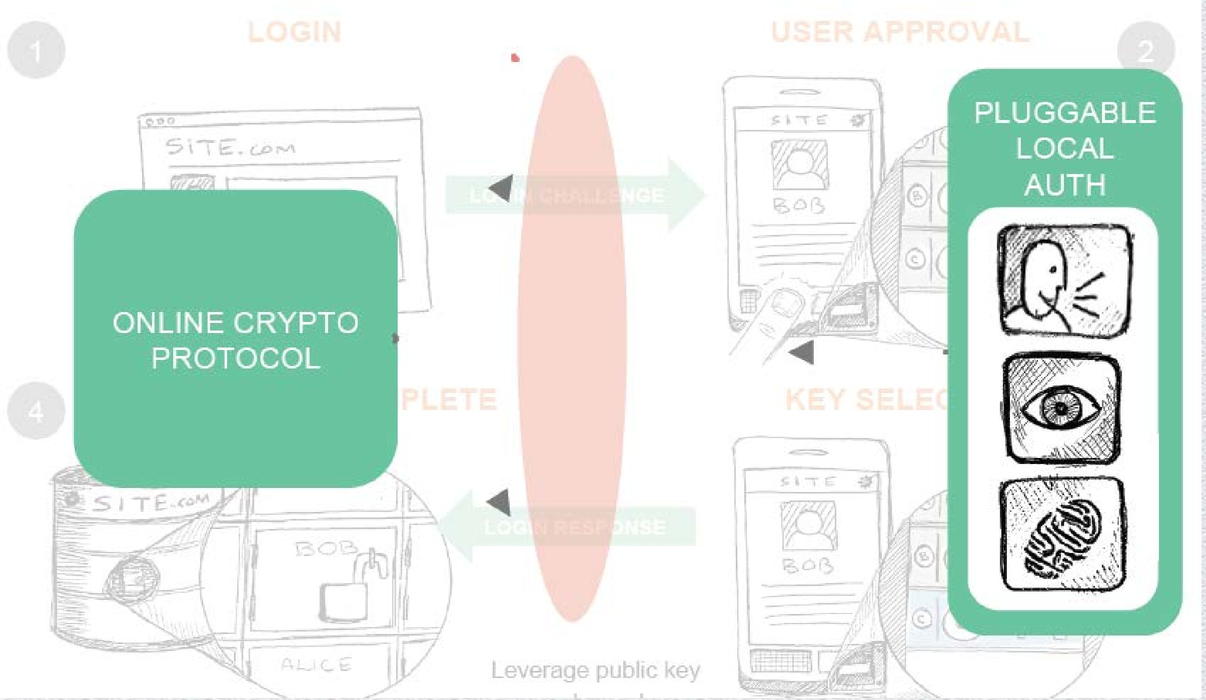
4 REGISTRATION COMPLETE

LOGIN CHALLENGE

LOGIN RESPONSE

Leverage public key cryptography

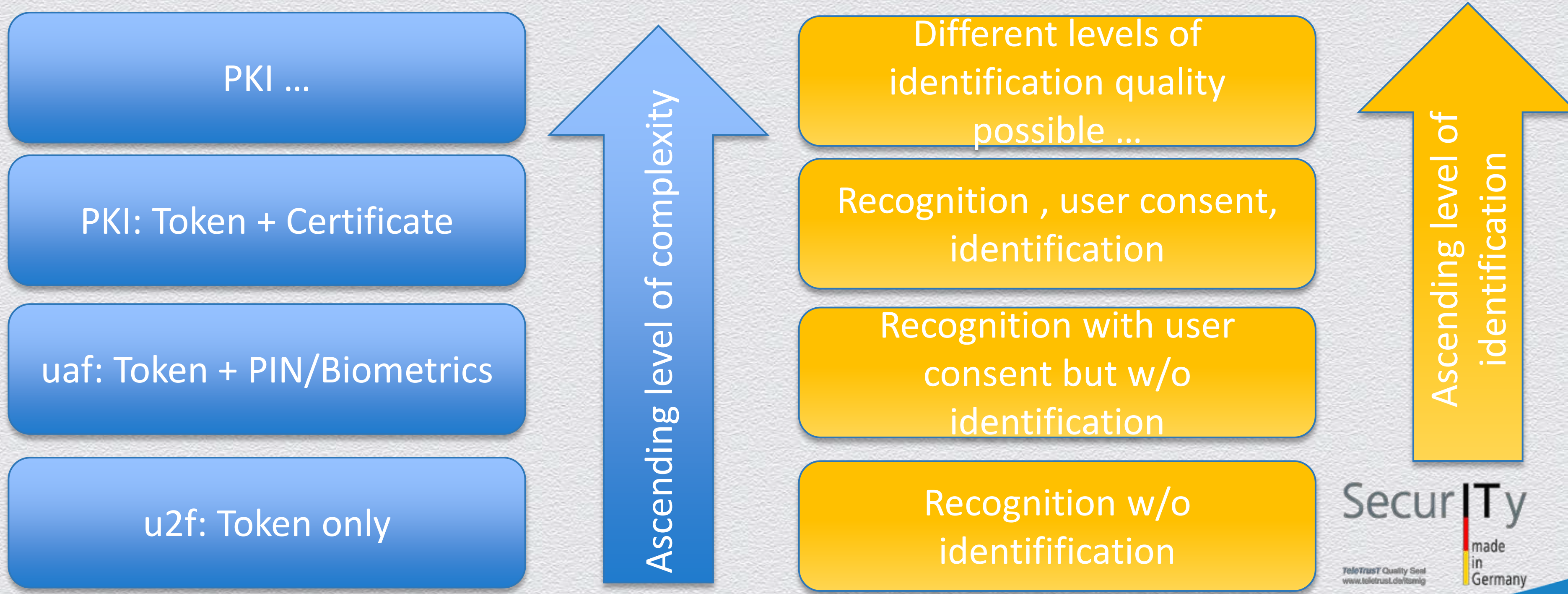
FIDO Standardization



ONLINE CRYPTO PROTOCOL

PLUGGABLE LOCAL AUTH

Layered Authentication/identification model



PKI …

PKI: Token + Certificate

uaf: Token + PIN/Biometrics

u2f: Token only

Ascending level of complexity

Different levels of identification quality possible …

Recognition , user consent, identification

Recognition with user consent but w/o identification

Recognition w/o identifification

Ascending level of identification

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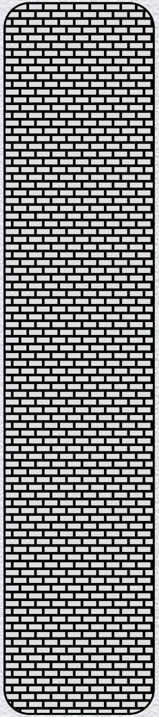
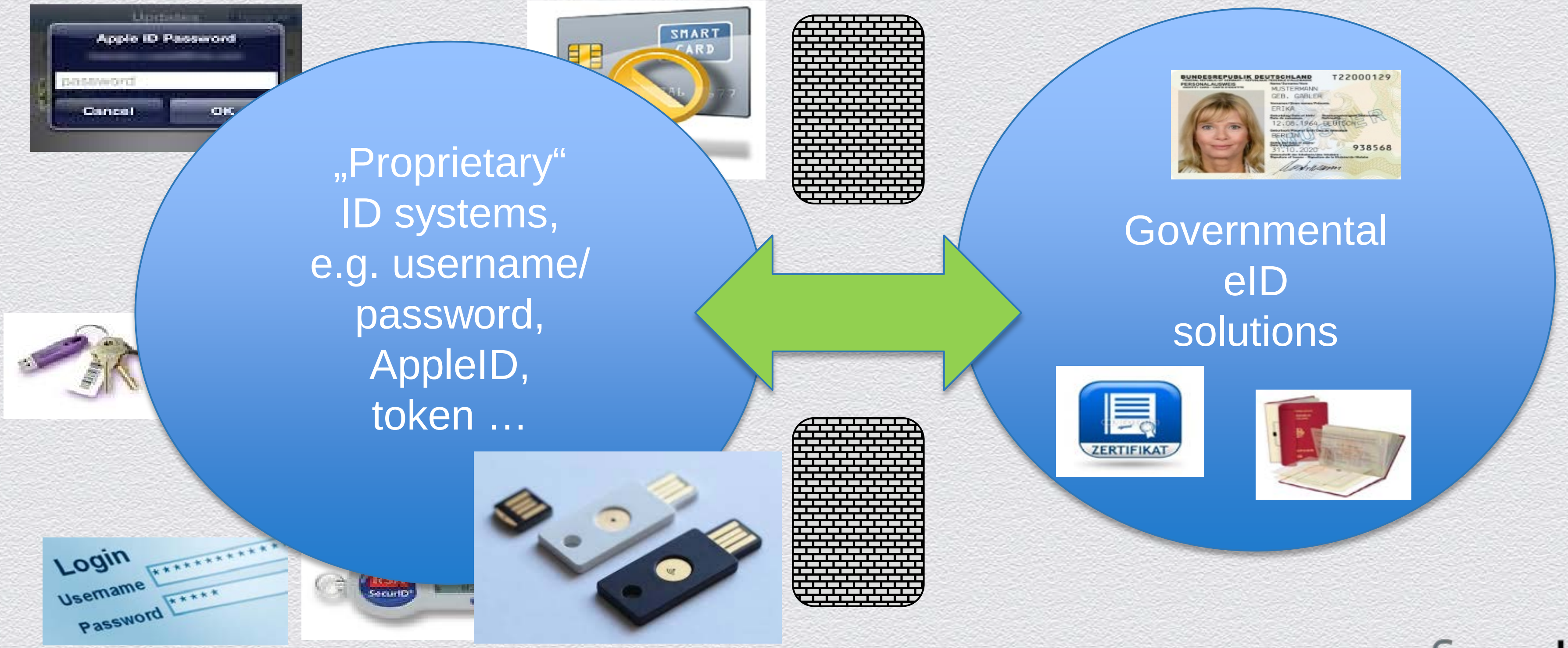
„Proprietary“
ID systems,
e.g. username/
password,
AppleID,
token …



Governmental
eID
solutions

Bridging the ID worlds

Typically, NO interaction between these two worlds exist for the user…



„Proprietary“
ID systems,
e.g. username/
password,
AppleID,
token …

Governmental
eID
solutions

Bridging the ID worlds

The future of eID lies within the controlled interaction of both ID worlds

Transformation of token in the field

- User experience today:
  access functionality/app in the moment you need it (PRAGMATIC)
- Consequence for token:
  update of functionality/increase of reliability is also needed instantaneous, not on basis of complicated paper based processes (PRAGMATIC)
- Therefore:
  Post-personalization of token in the field is necessary (SMART)

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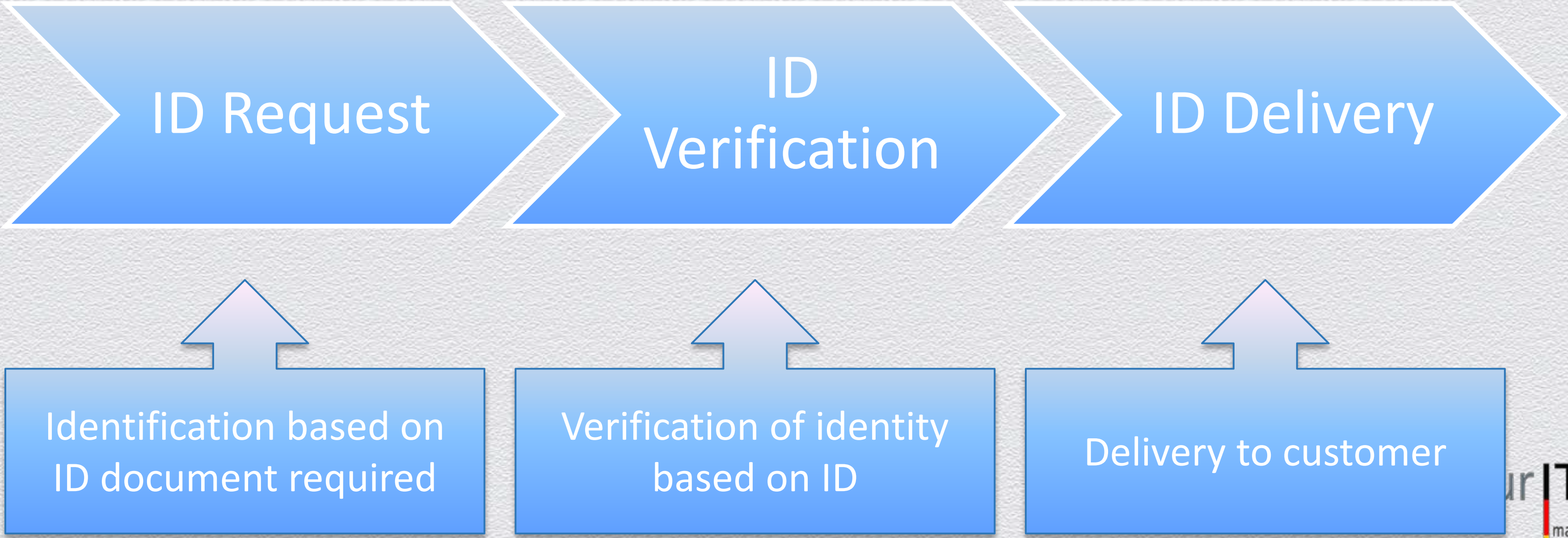
Trust Service Provider



ID Request

ID Verification

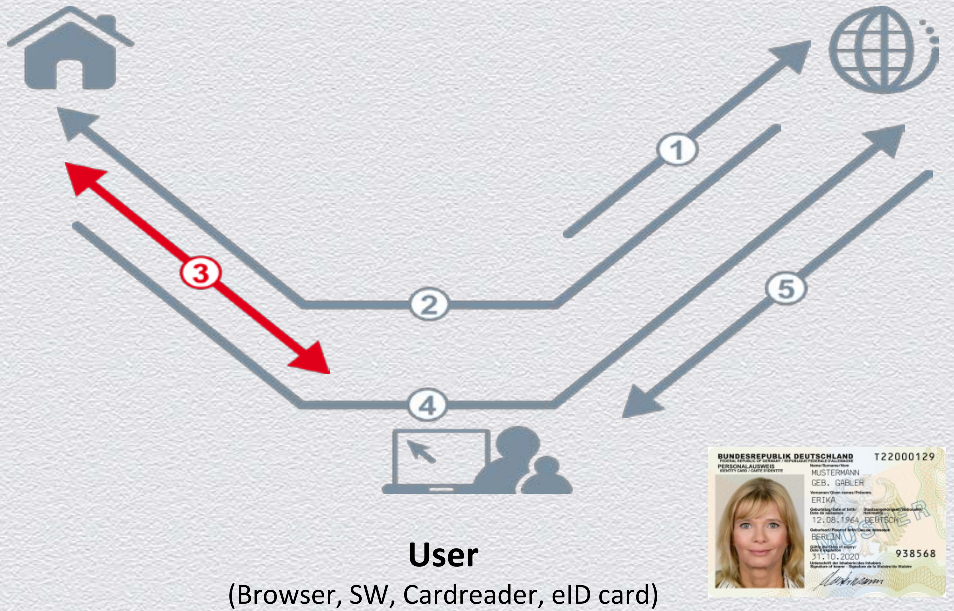
ID Delivery

Identification based on ID document required

Verification of identity based on ID

Delivery to customer

1: User requests Service
2: ID request redirected to eID-Service
3: Mutual strong authentication and access to data
4: Requested ID returned
5: Service provided



eID-Service

Serviceprovider
(Web-Application using eID-Connector)

User
(Browser, SW, Cardreader, eID card)

Example: Identification using German eID

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1: User requests Certificate based on eID identification

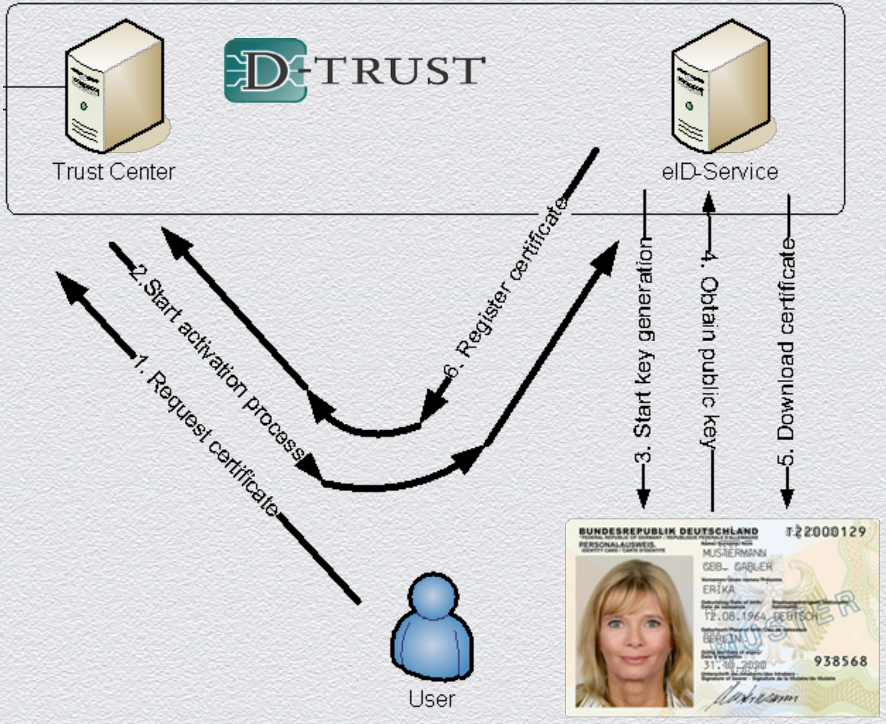
2: activiation process startes

3: Key generation on the eID card

4: Public key send to CA

5: Load certificate on eID card

6: certificate registered with CA

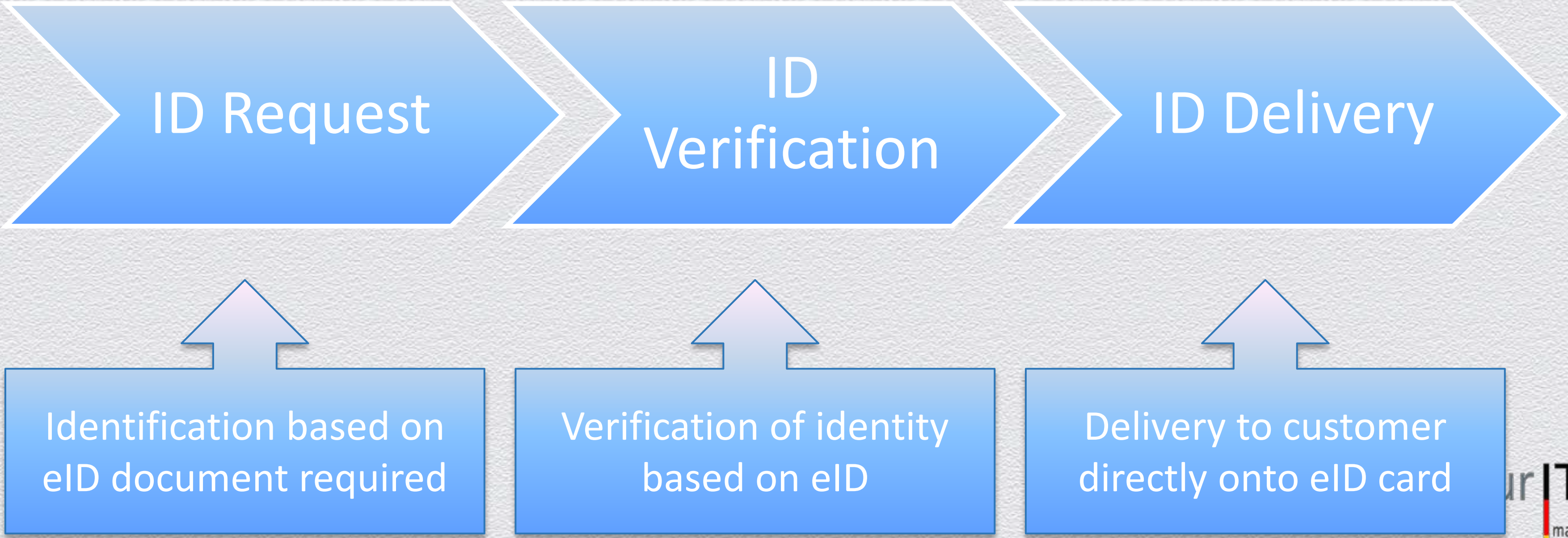


sign-me

Postissuance of certificates based on eID identification

German eID card is basis of identification as well as carrier of key and certificate

Trust Service Provider: based on eID



ID Request

ID Verification

ID Delivery

Identification based on eID document required

Verification of identity based on eID

Delivery to customer directly onto eID card

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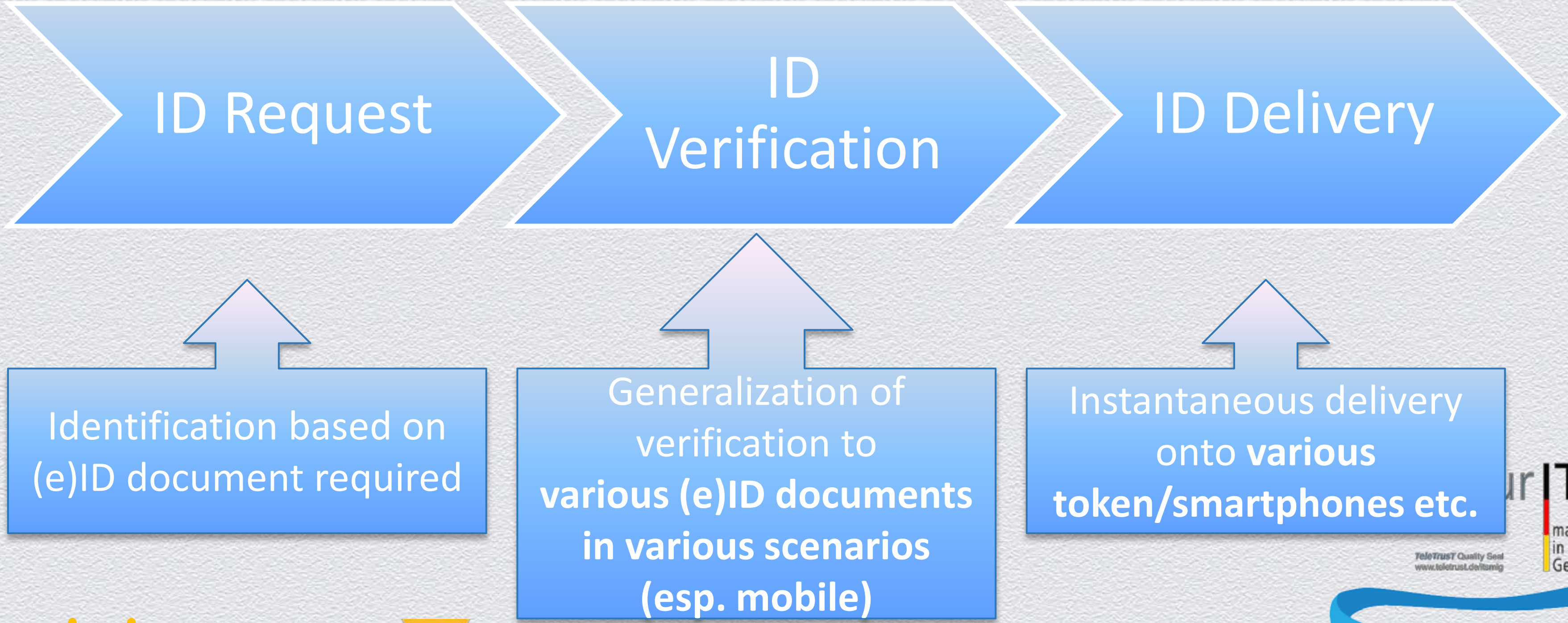
Trust Service Provider: generalizations



ID Request

ID Verification

ID Delivery

Identification based on (e)ID document required

Generalization of verification to **various (e)ID documents in various scenarios (esp. mobile)**

Instantaneous delivery onto **various token/smartphones etc.**

The situation

Service Provider

Apple ID Password

password

Cancel

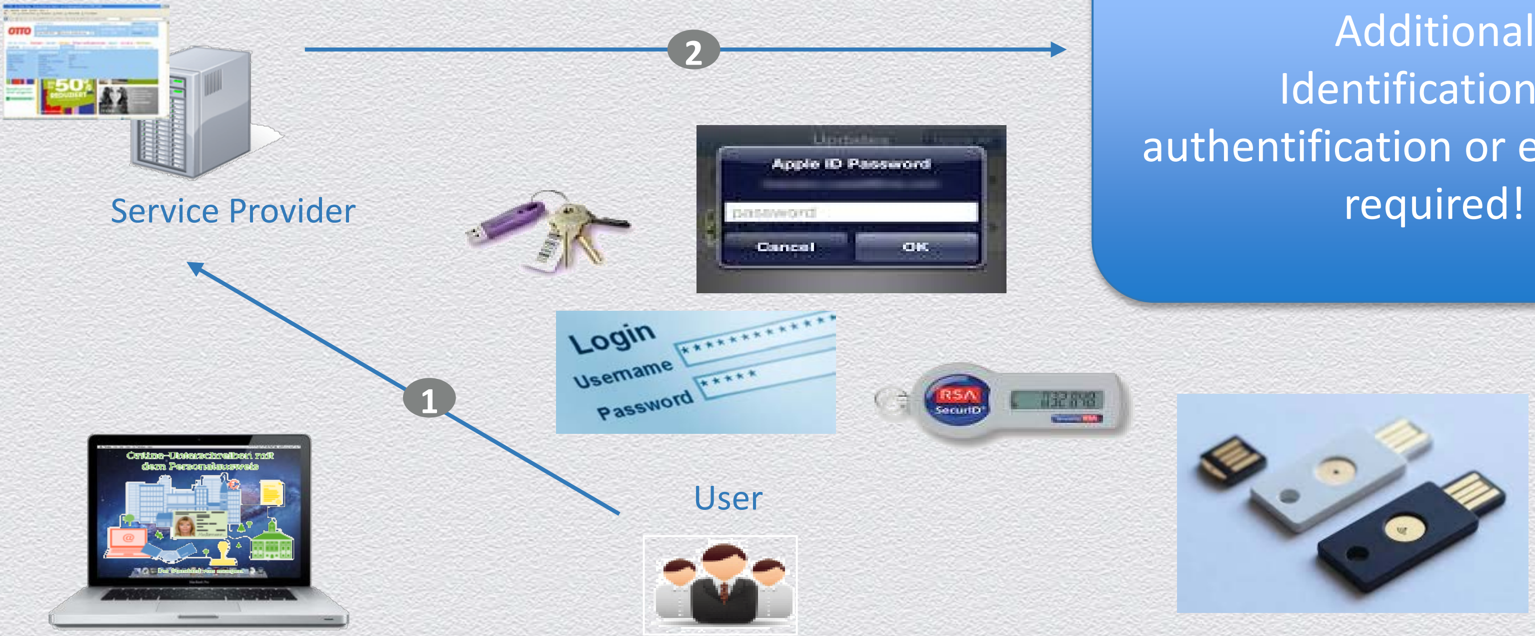
OK

Additional Identification or authentification or encryption required!

USER

1. Service request:
Using conventional authentification methods

The situation



Service Provider

User

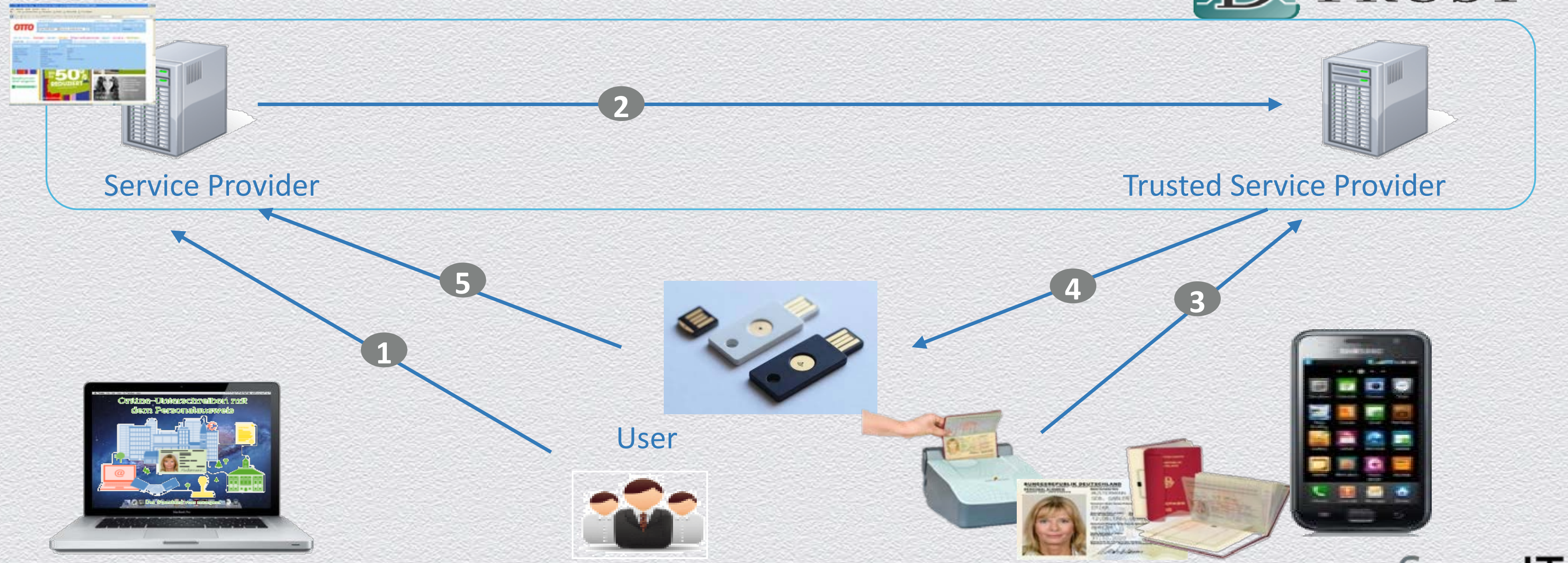
Additional Identification or authentification or encryption required!

1 Service request with conventional login

2 Specific identification needed!

The solution

D-TRUST



Service Provider

Trusted Service Provider

User

1 Service request with conventional login

2 Specific identification request

3 Verify ID (mobile scenario etc)

4 Postissuance of token/vertificate

5 Fulfill aditional request (verified ID)

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Conclusion

- Reliable and flexible authentication and identification mechanisms are required to enhance security in the web: STRONG
- User requirements need to be stronger taken into account to achieve user acceptance: PRAGMATIC
- A layered approach (as appropriate for different use cases) needs to be taken into account: SMART
- Post-issuance is an important (SMART) mechanism especially if combined with mobile verification and delivery

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