Virtueller Trust

Die digitale Disruption in der Prüfwelt

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Smart Service World

Internet of Things

- ITS
- Smart Supply Chain
- IIoT / I4.0
- Smart Devices
- Smart Grid
- Smart City / Home
IoT and Smart Services
Localization of Func’s

Where are the Functionalities?
Inspecting – Testing – Cheating

Mode Switching

2 Modes:
Aip — All is possible
TÜV — legal
New Legislative Framework (EC 765/2008)

What about IoT?

1. Toy Safety
2. Transportable pressure equipment
3. Restriction of Hazardous Substances in Electrical and Electronic Equipment
4. Construction products
5. Pyrotechnic Articles
6. Recreational craft and personal watercraft
7. Civil Explosives
8. Simple Pressure Vessels
9. Electromagnetic Compatibility
10. Non-automatic Weighing Instruments
11. Measuring Instruments
12. Lifts
13. ATEX
14. Radio Equipment
15. Low Voltage Pressure Equipment
16. Marine Equipment
17. Cableway Installations
18. Personal Protective Equipment
19. Gas Appliances
20. Medical Devices
21. In Vitro Diagnostic (IVD) devices
22. Where are the Func’s?
How to prevent mode switching?
Example: Condition Monitoring - Energy

Customer Satisfaction
- Privacy
- Web-Services
- In-Home Display
- HAN
- Energy Pattern

3 Years
- Smart Home
- Access Management
- Smart Sensors
- Network Automation
- Outage Management
- Theft of Power Detection
- Cyber Security
- Self Healing Grid
- Communication Fault Indicators

3 – 10 Years
- Smart Appliances
- Dynamic Billing
- Automated Read-out
- Real Time Simulation
- Phase Balancing
- Real Time Condition based Maintenance
- Network Automation
- Smart Meter Infrastructure
- Network Optimization
- Power Quality Management
- WAN
- Vault Monitoring

10 – 25 Years
- Prosumer Role
- Distribution Energy Management System
- Decentralized Energy and Intelligence
- Microgrid
- Fault Anticipation
- Network Minimization
- V2G
- BEV
- More Renewables
- Distributed Energy Supply
- Bidirectional Power Flow
- Line Loss Minimization

Energy Security
- Identity Management
- Asset Management
- Feeder Automation
- Smart Meters

Climate Protection
- Cyber Security
- Self Healing Grid
- Communication Fault Indicators
- Vault Monitoring
- Network Automation
- Smart Meter Infrastructure

Distributed Energy and Intelligence
- 100% Electrified Transportation
- Bidirectional Power Flow
- Line Loss Minimization
- More Renewables
- Distributed Energy Supply
- BEV
- V2G
- Network Minimization
- Fault Anticipation

Energy Security
- Cyber Security
- Self Healing Grid
- Communication Fault Indicators
- Vault Monitoring
- Network Automation
- Smart Meter Infrastructure

Climate Protection
- Cyber Security
- Self Healing Grid
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- Smart Meter Infrastructure
Example: Condition Monitoring – Automotive
Extended Vehicle / NEVADA

Ad hoc communication under responsibility of the VM

OBD
Only for regulated emissions, diagnosis, repair and maintenance

ISO 20078 Extended Vehicle – Web Service (draft)
Access for service providers & neutral server(s)

VM server
Extended Vehicle
ISO 20077-1

B2B
Neutral Server(s)
Tier 1 supplier
service provider
Solution: Energy
The German Smart Meter Gateway: The Calibration Log
Solution: Banking
ATM: Clearing Process
Possible Solution: Automotive Automotive Platform

Secure Element or HSM
Secure Elements

- Attacks
  - Electrical Stimulation
  - Energy & Particle Exposure
  - Inspection & Reverse Engineering
  - Physical manipulation
  - Electro-Magnetic Interaction / Radiation
  - Electrical Measurement
  - Communication

- Embedded

- Secure Elements

- Secure Zone

- CPU

- Peripherals

- Applikation
  - Operating System
  - Hardware
  - Secure Zone

- Logical Modules
IoT and Smart Services

Smart Service → Condition Monitoring

IIoT / IoT

IoT-App

Gateway

Secure Element

https://youtu.be/hbYUhMabPFo
Persistent Automated Inspection
Virtualized Inspections

- **ViT: Virtual** *(conformity)* inspection and **Trust Service** for IoT / IIoT acc. to
  - Safety
  - Security
  - Quality

- "**Security-Verifier"**:  
  - Fully Automated Inspection (operated by Control Center)
  - Semi automated Inspection (Smartphone based)

**Pre Condition**: Rollout and Usage of IT Security Technologies *(Security Anchors)*
Persistent Automated Inspection

PAI Platform

Integration

Vendor Service Provider

IIoT / IoT

SecureElement (Embedded)

UI

Monitor(-App)
**Persistent Automated Inspection**
real Example for PAI: **Smart Meter Gateway**
Persistent Automated Inspection
possible Example for PAI: Automotive Platform
PAI: Architecture Overview

- Anchor
- Backend
- Analytics
- Vendor Service Provider

Usage

Public

Toolbox
- App
- Control Center
Security-Anchor / Virtualization as Key Technology

- Highly secured (Device-) Identities
- Trustworthy end2end Communication
- Signed Information (non repudiation)

→ Virtualization (usage of same Hardware)
  - Usage of Vendor Hardware
  - Own Hardware not necessary

Platform
- Connectivity of Smart Services
- Modularized / agile Architecture
- Online

→ Trust: Trustworthy
→ Report: Reported
→ Repeat: Reproducible
→ no Fraud: Fraud resistant
→ Persistent: permanent and stable
→ Agile: flexible
→ Module: Modular
→ Chain: combinable

Test Results
Test Results
Test Results
Test Results
Test Results
Test Results
Test Service
Test Service
Test Service
Security-Anchor / Virtualization as Key Technology

- Highly secured (Device-) Identities
- Trustworthy end2end Communication
- Signed Information (non repudiation)
- Virtualization (usage of same Hardware)
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Where are the Func’s? – not important
How to prevent mode switching? – direct control and reaction

Platform
- Connectivity of Smart Services
- Modularized / agile Architecture
- Online
New Legislative Framework (EC 765/2008)

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IoT: Security

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Persistent Automated Inspection 
ViiT
Persistent Automated Inspection
ViT
Persistent Automated Inspection
Vi{T - Virtual Inspections ➔ Trust

Modularized:
ONE Platform
ONE Solution
for all inspections

Permanent Inspection
• Based on Source Data
• Highly secured
• Conform to GDPR
TÜV Informationstechnik GmbH
Member of TÜV NORD Group

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IT Security

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