

# 1st German-Japanese Digitalization Dialogue

## **Semiconductors**

**– a crucial link between real and digital world**

Carsten Loschinsky, VP Chip Card & Security, Sales and Marketing  
Infineon Technologies AG, Germany  
November 28 2017



# Agenda Overview

1

The rise of IoT / I4.0

2

Security risk

3

Semiconductors are the crucial link between the real and digital worlds

4

HW (Hardware) Security

5

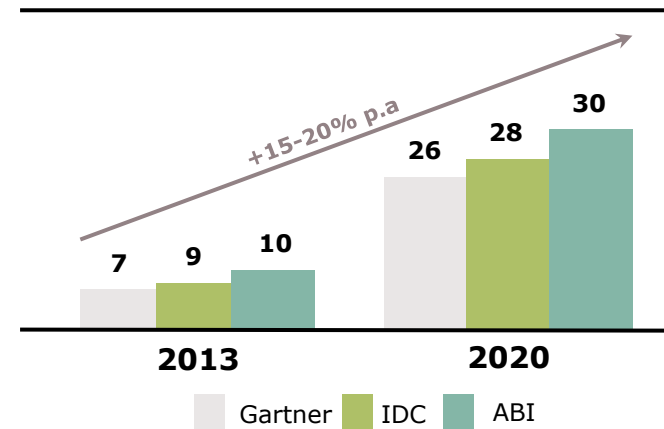
Summary

# The Internet of Things is already reality, although still in its infancy



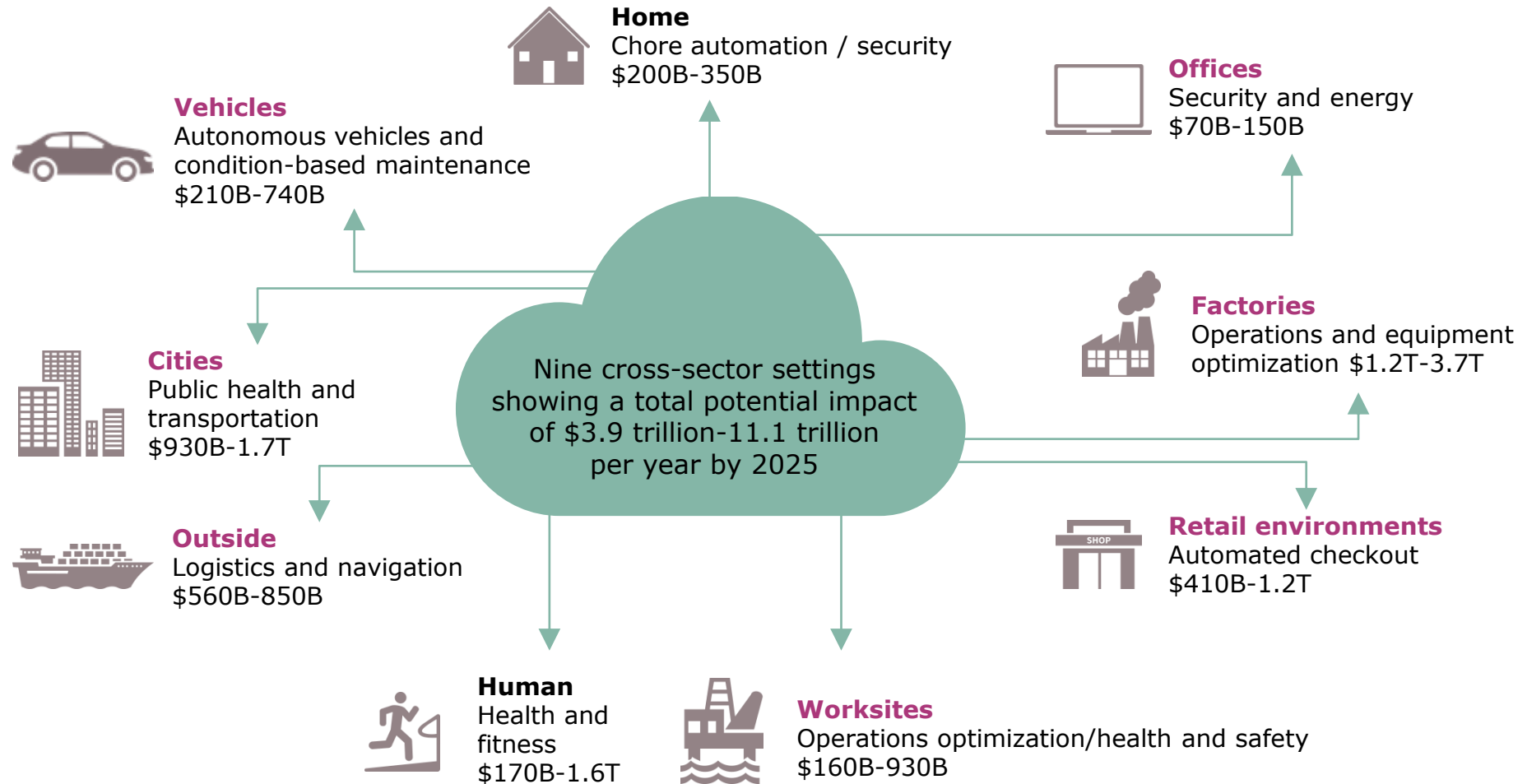
- › Network of **cyber-physical objects** that contain embedded electronics to **sense, compute, actuate and communicate**
- › Aim is to achieve **greater value and service** by exchanging data

IoT installed base  
Connected devices, billions



**The IoT is expected to create significant value across industries**

# The IoT will have a significant impact across multiple markets



**Roughly 70% of total value outside consumer applications**



# IoT Trend Affects All Markets

## Smart Vehicles



## Smart Cities & Energy



## Smart ICT



## Smart Industry & Business



## Smart Home & Consumer



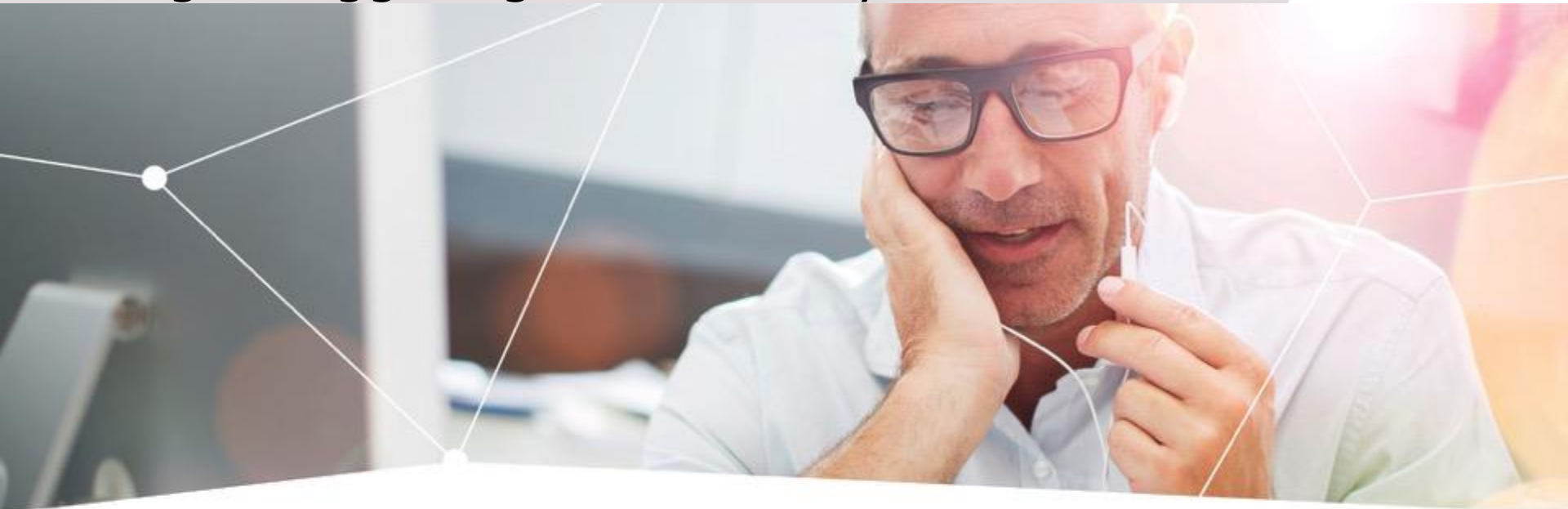
# The IoT creates value across industries, opening up new opportunities



## Creating value through business model transformation

- › Industry 4.0
  - › More efficient & more customized manufacturing, faster adaption to demand changes (eg. down to lot size one)
  - › Real-time connectivity of value chains provides huge benefits
  - › Higher productivity through optimal capacity utilization
- › Usage-based services, e.g. insurance, cloud services, pay per use
- › Automotive: Over-the-air provisioning of key data for rental cars, software-controlled performance upgrades
- › Healthcare: Monitoring and managing

# Key markets are undergoing significant changes triggering new security needs



## Smart cars

Cars are becoming increasingly **connected/computerized** and thus **autonomous** to **enhance safety and comfort**

One essential requirement is **data integrity** – to **provide safety and security** ✓

## Smart home

In smart homes, a broad range of **devices are getting connected and smart** to **increase comfort** and **save energy**

Connected devices need to be **adequately secured** ✓

## Industry 4.0

The smart factory adds **connectivity** to **digitally-supported production**, which will increase efficiency

Operations, business models and IP need **reliable protection** ✓

## ICT

Complex communication infrastructure is the **backbone** of IoT and therefore **sets the pace for its deployment**

**Security requirements** for all network components **increase** ✓



# Cars get smart, connected – and autonomous

**new cars  
must have  
eCall**

by April 2018

EU Legislation  
Internet Connection  
via cell phone

**152  
million**

connected  
vehicles  
by 2020

IHS Automotive

**1/4 of a  
billion**

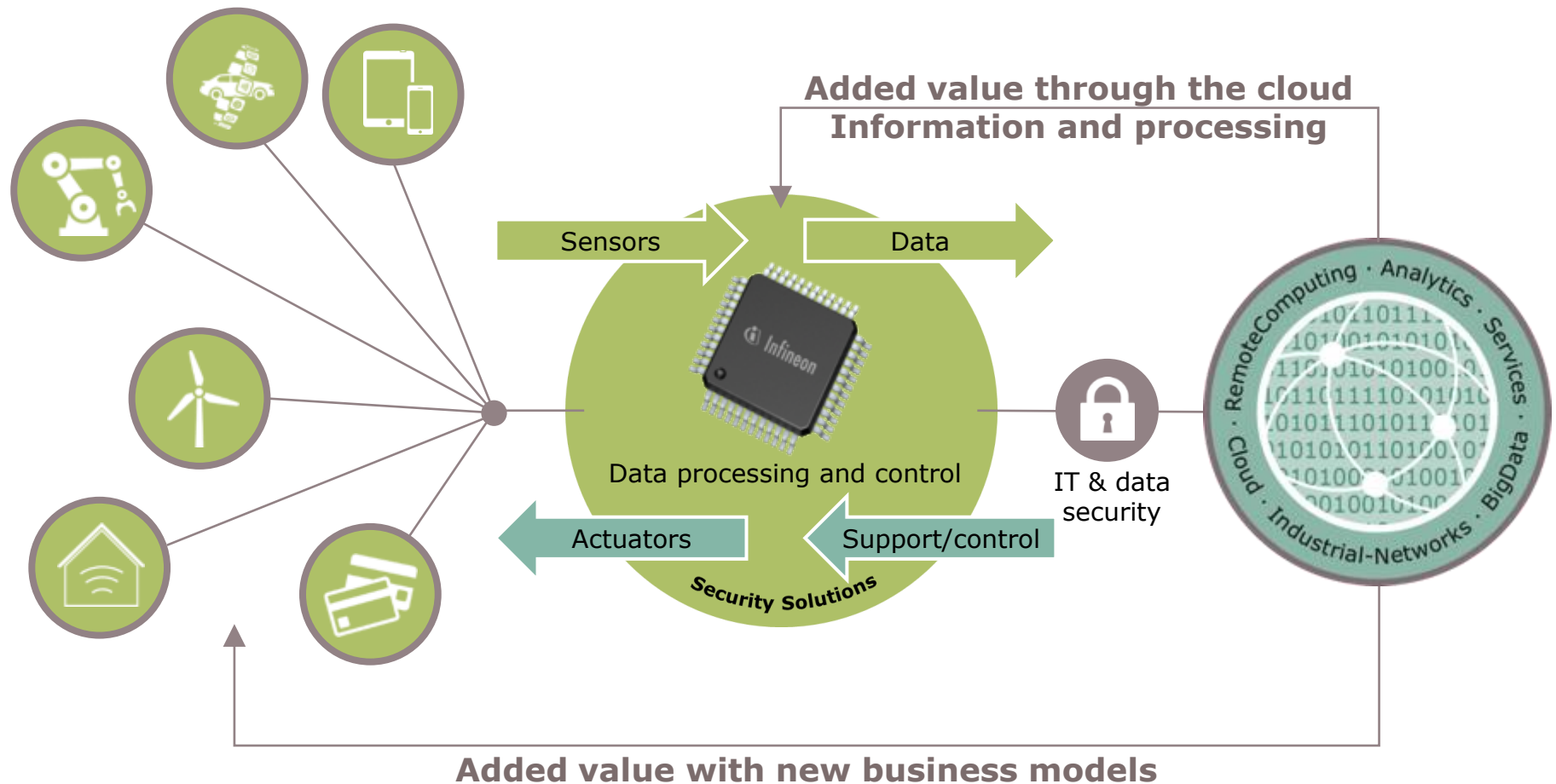
connected  
vehicles  
by 2020

Gartner

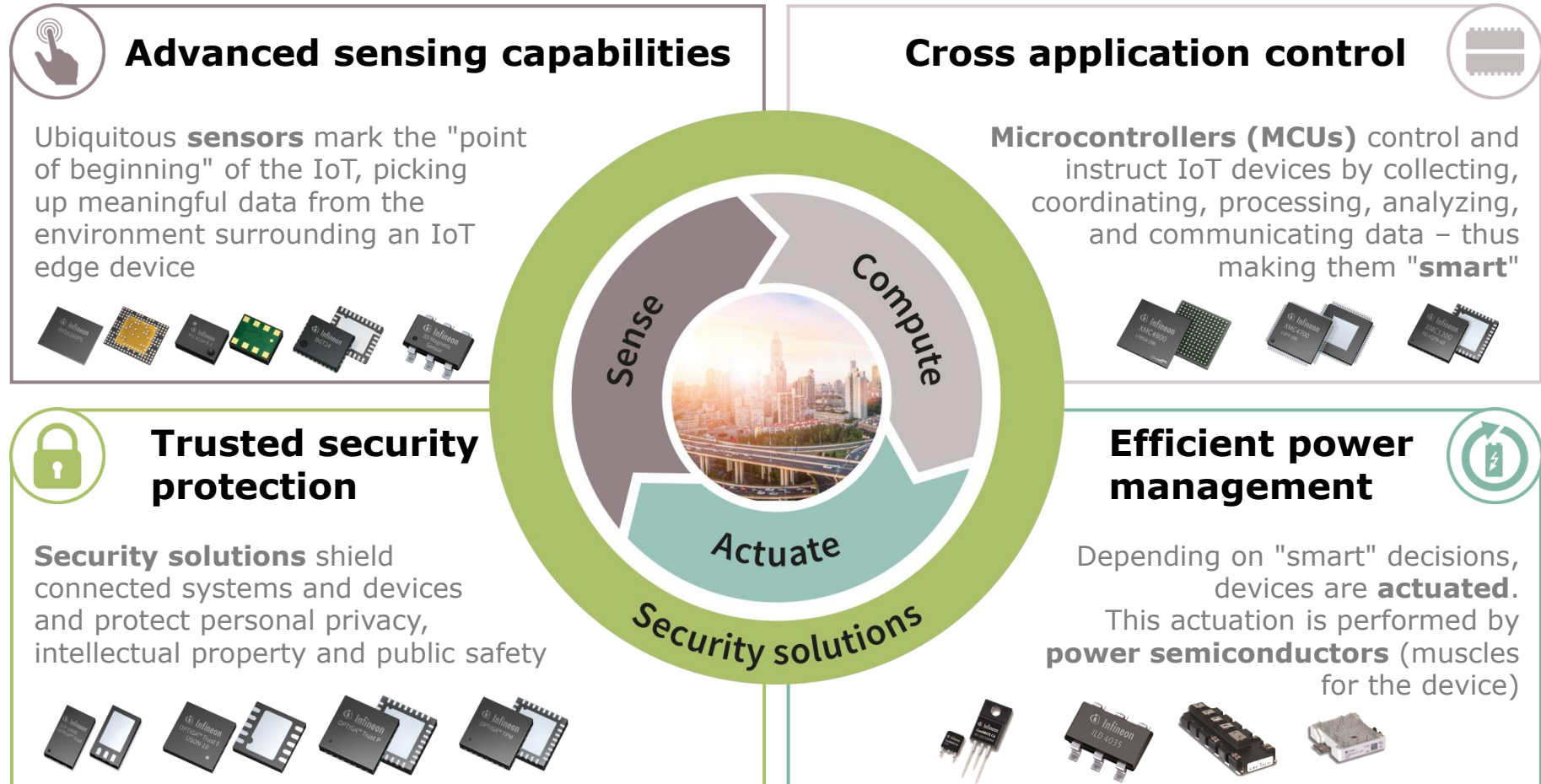




# Semiconductors are the crucial link between the real and digital worlds



# Infineon helps to create sustainable IoT success for its customers



Making the Internet of Things smart, secure and power-efficient – based on our understanding of connected systems

# Advanced sensing capabilities



## Magnetic sensors

- › Portfolio of Hall switches and GMR angle sensors
- › Applications include: motor position measurement, transmission control



## Pressure sensors

- › **Sensors for pressure**
- › Applications include: **navigation**, health & sports, side crash/pedestrian detection



## Radar 24/60GHz

- › **Motion sensors**
- › Applications include: lighting, door opener, intruder alarm and 60GHz **gesture control**



## Radar 24/77GHz

- › Motion detection
- › Applications include: blind spot detection, adaptive cruise control, autonomous braking



## Silicon microphone

- › Sound sensors
- › Applications include: microphone MEMS targeting key mobile phone suppliers



## Optical sensors e.g. 3D ToF imager

- › **Image sensor family**
- › Applications include: **indoor navigation**, **virtual reality**, driver monitoring, gesture control



## Tire pressure sensors

- › Tire pressure sensors
- › Applications include: ultra-low-power sensor system IC w/ lowest power consumption



# IoT Attacks Growing - Security breaches increased in both number and impact

**BBC** Sign in News Sport Weather Shop Earth

## NEWS

Home Video World US & Canada UK Business Tech Science Magazine

### Technology

#### Hack attack causes 'massive damage' at steel works

22 December 2014 | Technology

**The Economist** World politics Business & finance Economics Science


Special report: Cyber-security

### The internet of things

#### Home, hacked home

The perils of connected devices  
Jul 12th 2014 | From the print edition







YouTube Suchen



#### Talking doll 'Cayla' is hacked

shainee lover

Abonnieren 22

**NETWORKWORLD** Most read:      

### Expert: Basic hacks can compromise industrial control systems

Threat of such attacks is up, but defenses lag

Home > Security

ANDY GREENBERG SECURITY 07.21.15 6:00 AM

## HACKERS REMOTELY KILL A JEEP ON THE HIGHWAY—WITH ME IN IT



### WannaCry in May'17

"More than 230,000 computers impacted by WannaCry ransomware in 150 countries"

**RE** are t their she

HOME BUSINESS

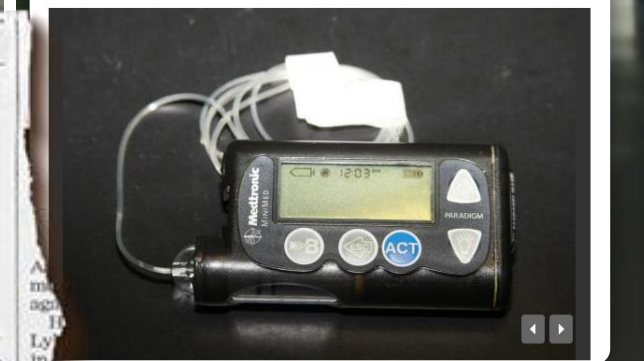
### Dyn Attack in Oct'16

"Major DDoS attack on Dyn DNS knocks Spotify, Twitter, Github, PayPal, and more offline"

### U.S. government probes medical devices for possible cyber flaws

BY JIM FINKLE  
BOSTON | Wed Oct 22, 2014 7:11am EDT

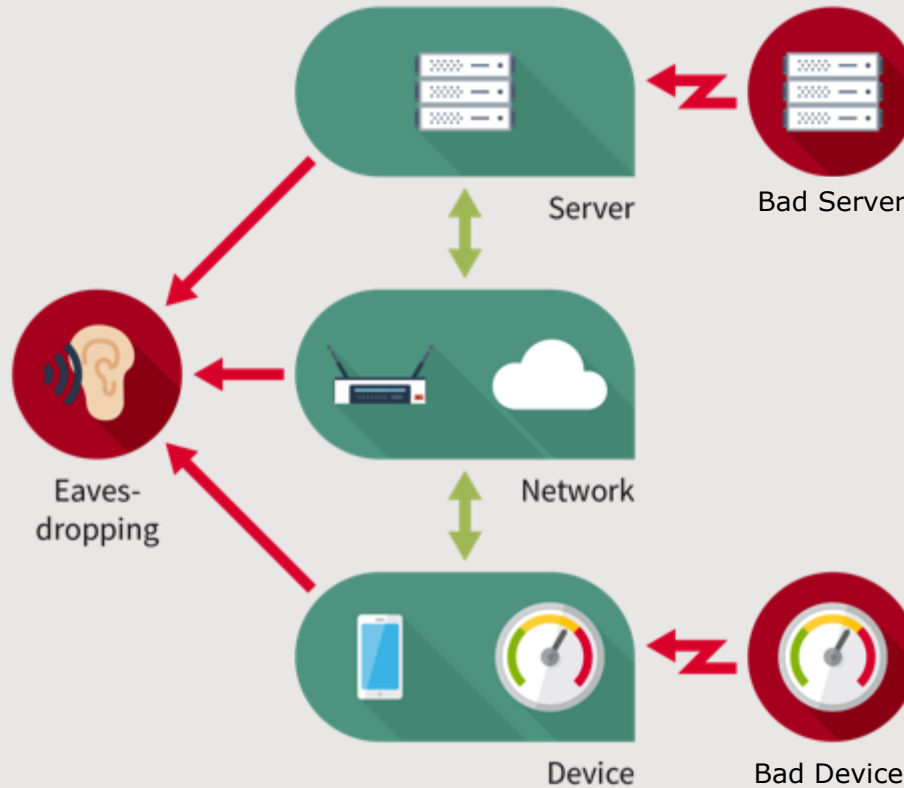
 452  358  Share this  Email 



# Each layer of the Internet of Things can be attacked

## Security threats for IoT

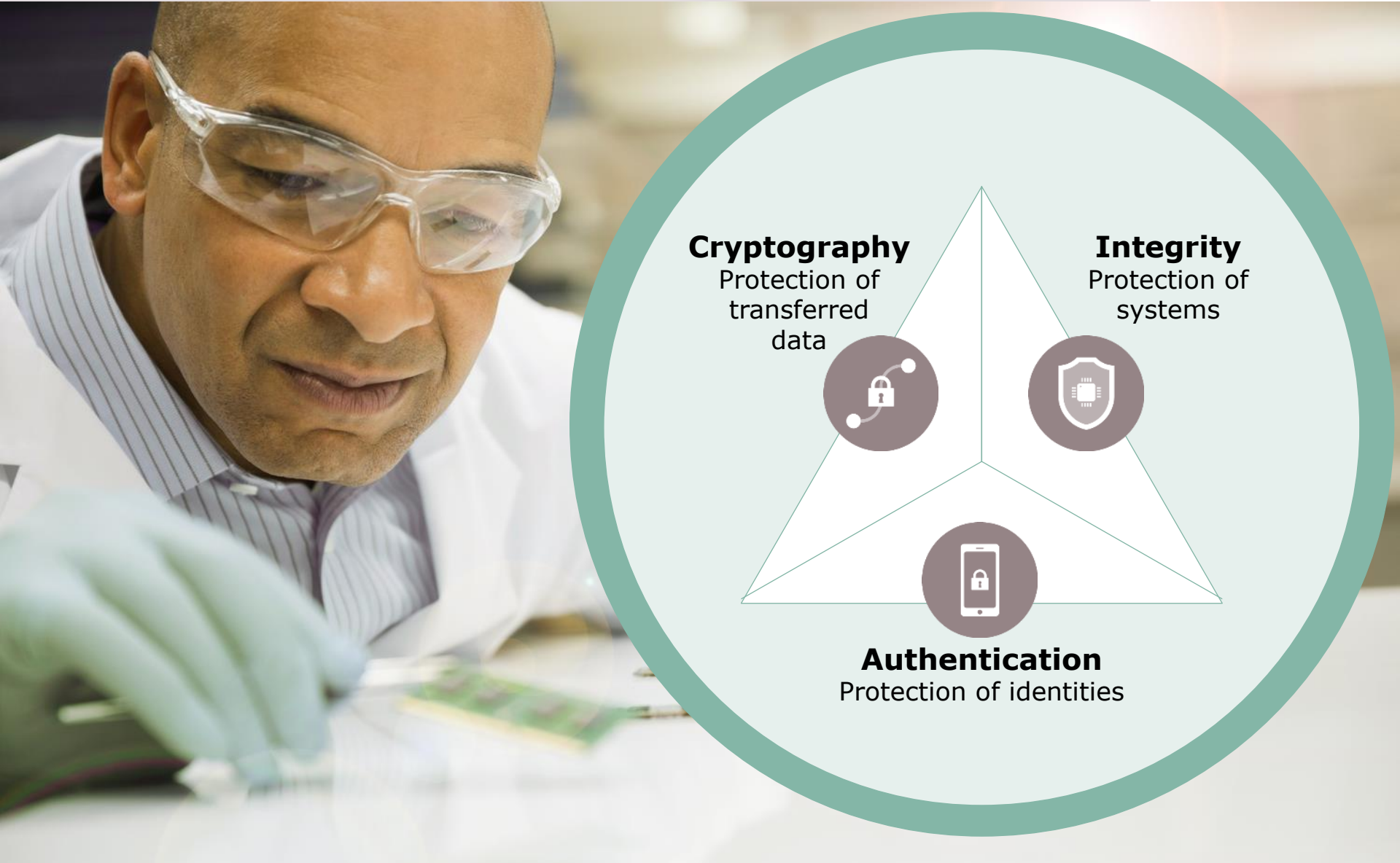
An **eavesdropper** listening in on data or commands can reveal confidential information about the operation of the infrastructure.



A **bad server** sending incorrect commands can be used to trigger unplanned events, to send some physical resource (water, oil, electricity, etc.) to an unplanned destination, and so forth.

A **bad device** injecting fake measurements can disrupt the control processes and cause them to react inappropriately or dangerously, or can be used to mask physical attacks.

# Security mechanisms are built on three cornerstones



## **Cryptography**

Protection of  
transferred  
data



## **Integrity**

Protection of  
systems



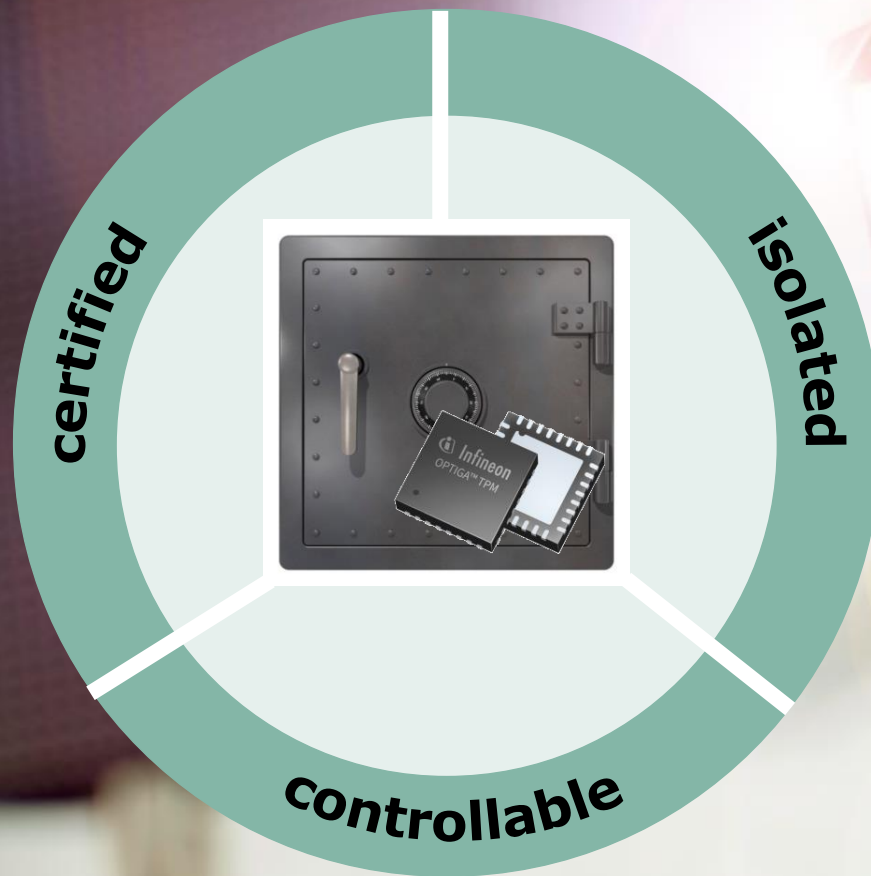
## **Authentication**

Protection of identities





# Hardware-based security – the root of trust



# Discrete hardware based security offers unique benefits even beyond strong security





# Infineon Technologies – leading the security industry for more than 30 years



**Infineon TPM used by leading PC manufacturers**

(IHS 2016)



**#1 TPM**

(IHS 2016)

**Infineon eSE used by leading handset manufacturers**



**#1 embedded security**

(IHS 2016)

**#1 eSIM Automotive**

(own estimation)

**Leading IoT security vendor**

(Technavio 2016)

**Joint Smart Home Lab**



Tencent 腾讯



中国电子技术标准化研究院  
China Electronics Standardization Institute

**Reference project Street lighting**



eluminocity

**Leading car manufacturers trust Infineons eSIM**



# Infineon at a glance

- › **Semiconductors portfolio** for Automotive, Industrial Power Control, Power Management & Multimarket and Chip Card & Security
- › Revenue **of €6.5 billion** in Infineon 2016 fiscal year
- › About **36,000 employees worldwide** (as of Nov 2017)
- › Strong technology portfolio with more than **25,000** patents and patent applications (as of Sep. 2015)
- › **34** R&D locations, **20** manufacturing locations
- › **Strong & long-lasting** footprint in **Japan**



## Contact Details

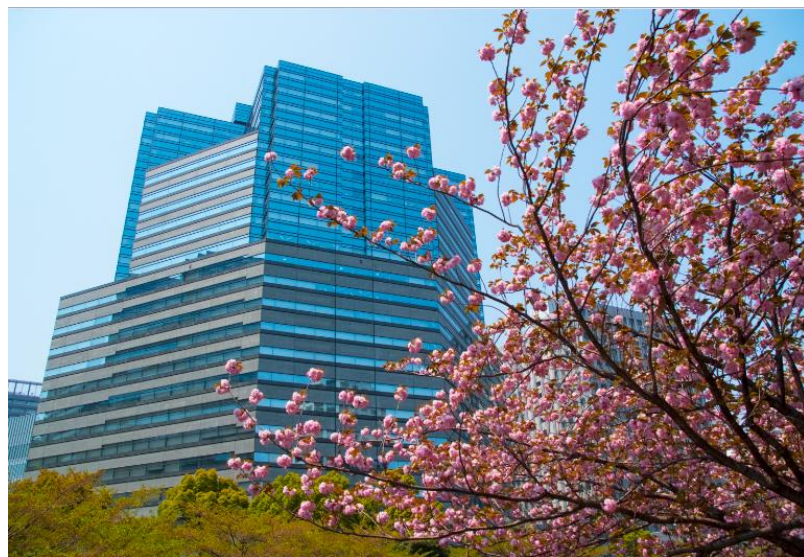
# Infineon Technologies Japan K.K.

Gate City Osaki East Tower 21F, 1-11-2 Osaki, Shinagawa-ku  
Tokyo 141-0032, Japan

TEL 03-5745-7100      **[www.infineon.com/jp](http://www.infineon.com/jp)**

## Carsten Loschinsky

VP Chip Card & Security, Sales and Marketing  
Infineon Technologies AG, Germany  
[carsten.loschinsky@infineon.com](mailto:carsten.loschinsky@infineon.com)





Part of your life. Part of tomorrow.

