CSI: VIDEO SURVEILLANCE

CONVERTING THE JUGGERNAUT

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CSI: Video Surveillance - Converting the Juggernaut
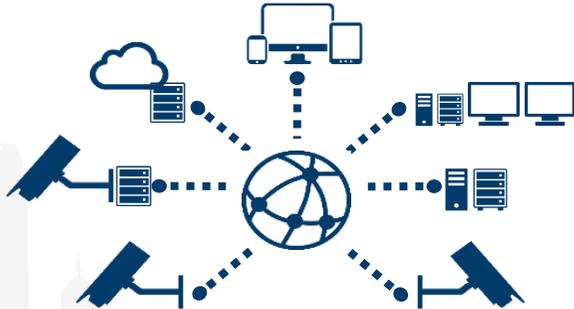## The Market and the Trend

Cyber security market (2020):
USD 170.21 billion,
CAGR ~10%

Storage market (2020):
USD 18.28 billion,
CAGR 22%

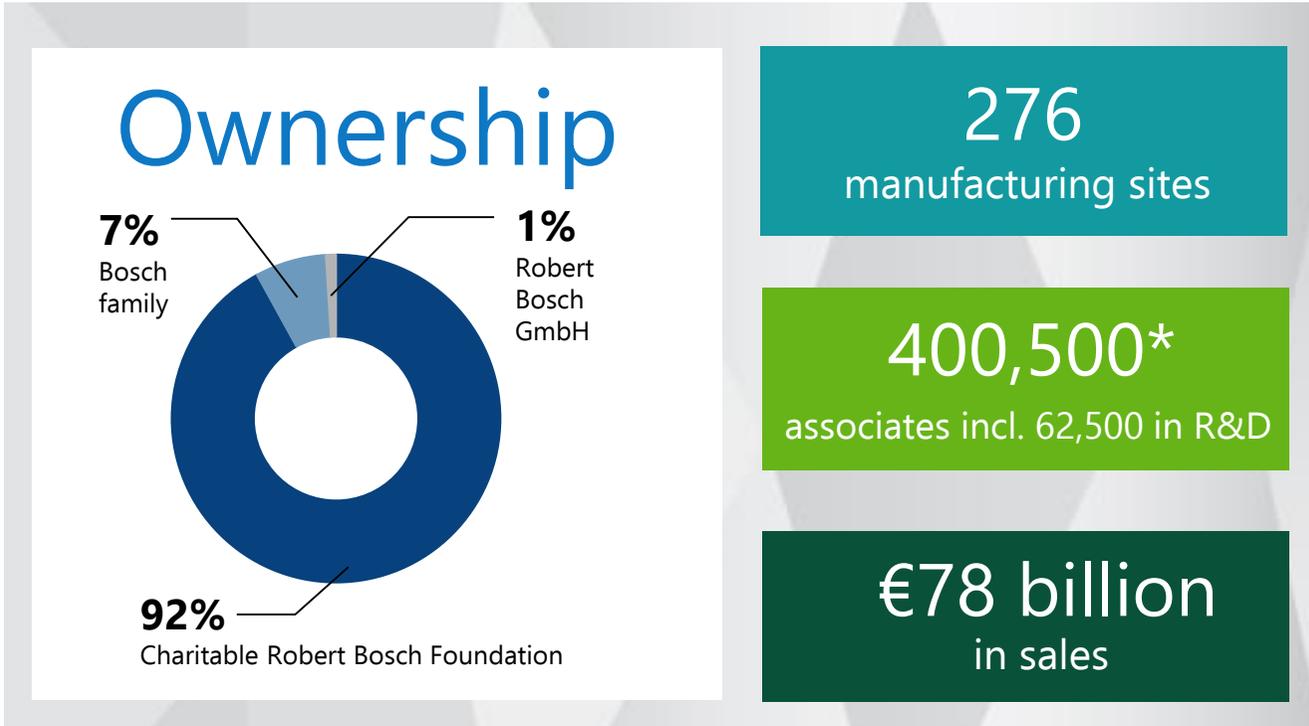**Tons of data to be processed - Skyrocketing video data**

Global market for
IP cameras
CAGR 20%+

Video data more connected

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Introducing Bosch Group - Key facts for 2017

Ownership

7%
Bosch family

1%
Robert Bosch GmbH

92%
Charitable Robert Bosch Foundation

276
manufacturing sites

400,500*
associates incl. 62,500 in R&D

€78 billion
in sales

We have **invested** more than **€30 billion** in **R&D** in the last 6 years

Leadership in diverse sectors

Energy and Building Technology
Leading manufacturer of security, safety and communications solutions and thermo technology

Mobility Solutions
One of the world's largest suppliers of cutting-edge automotive technology

Industrial Technology
Leading in drive and control technology, packaging and process technology

Consumer Goods
World's largest power tool manufacturer and leading manufacturer in household appliances

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Introducing Bosch Security Systems

Bosch Building Technologies

Security and Safety Systems	Energy and Building Solutions
Security	Security & Life Safety
Fire	Energy Services
Communi-cations	Building Automation

Key facts and figures 2017

Manufacturing sites
5 locations

Americas
Mexico, USA

Europe
Germany, Portugal

Asia
China

Distribution Partners
worldwide

€1.9 billion
total sales*

9,000
associates*

Worldwide projects over the five years

>260 Airports

>290 Railway/Metro

>970 Government

>790 Manufacturing

>780 Retail

Worldwide vertical areas with our engineered solutions and products

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## Digital Transformation Opportunities

Deep Learning
MegaPixel
Ultra HD
Analytics
Multiple Sensors
Data Security
Intelligence
Higher Resolutions
Authentication
Remote Access
Multiple Streams
IoT Connectivity
Artificial Intelligence
Metadata
Manageability

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Challenges from history

▶ Analogue past

▶ Slow and late digitization

▶ Decade-long lifecycles
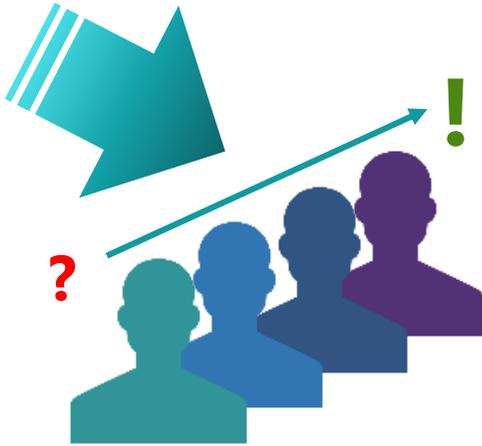
▶ Short-funded public/governmental operators

▶ Mentality

Analogue video

IP video

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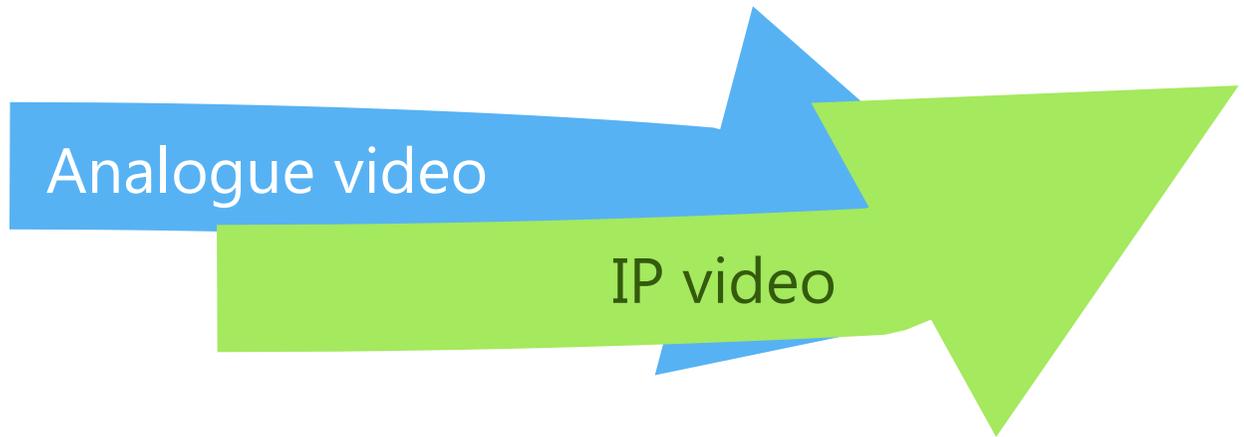
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Shifting our own paradigm

SEP Engineering

PSIRT

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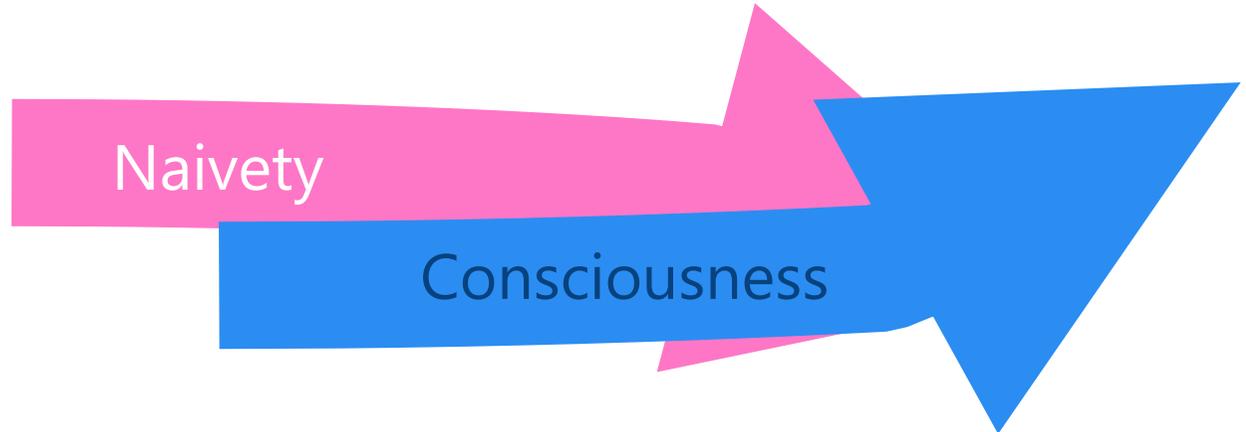
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Challenges from IP conversion

▶ The biggest problem is the mental one

▶ The second biggest problem is education

▶ The impact is bigger for Industrial Video Surveillance

Naivety

Consciousness

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Keep your video data secure
Bosch four-step approach considering complete infrastructure

1: Create trust

2: Secure data
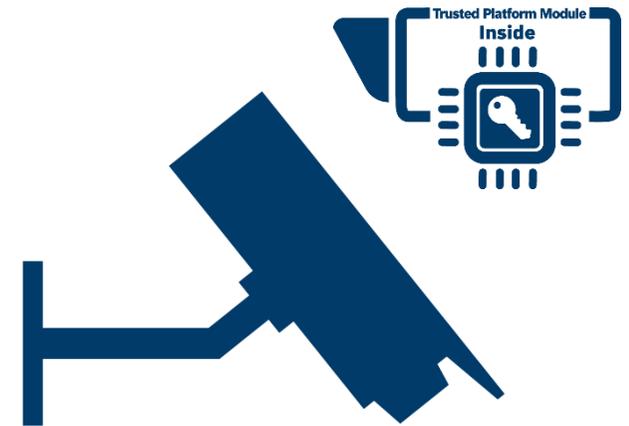
3: User access rights

4: Meet IT industry standards

Cameras

Storage devices

PKI

Public Key Infrastructure (PKI)

Clients
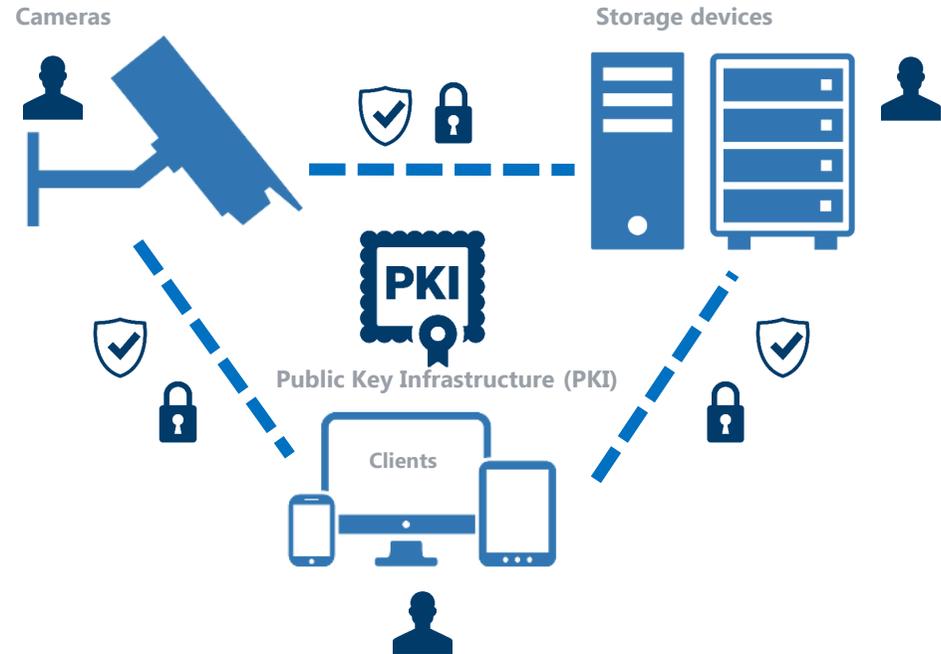
Even a single weak link in the surveillance set-up can jeopardize the entire system

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Keep your video data secure
Our system approach: How we secure our cameras?

▶ Only secure connections are possible (HTTPS)

▶ Password enforcement at initial set up

▶ Unsecure ports for automatic discovery disabled

▶ Unsecure remote communication disabled

▶ Uploading of 3rd party software not possible

▶ Firmware updates by Bosch signed and encrypted files only

▶ Unique built-in Trusted Platform Module (TPM) safely stores private keys

▶ Embedded Login Firewall improves robustness against DoS attacks
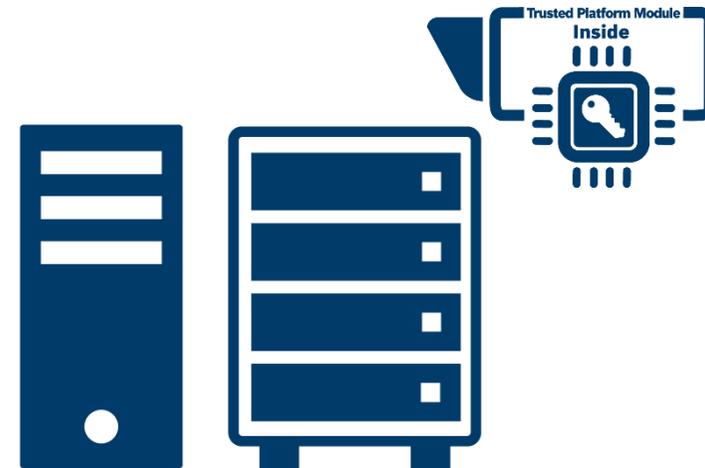
▶ Software sealing for camera configuration

Cameras

(edge devices)

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Keep your video data secure
Our system approach: How we secure our core devices?

▶ Support of Microsoft Active Directory for safe management of user access rights

▶ Digest access authentication only

▶ Regular updates via security patches

Trusted Platform Module Inside
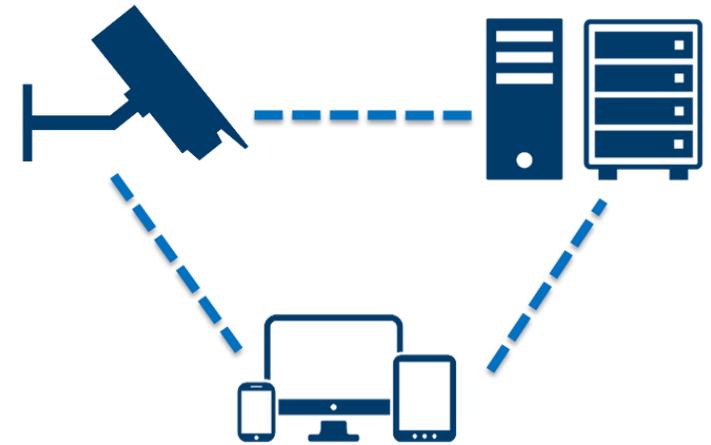
Servers, clients & storage devices

(core devices)

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Keep your video data secure
Our system approach: How we secure communication

▶ "Unsecure" ports disabled by default

▶ Unsecure remote communication disabled

▶ Password enforcement on set up

▶ Network authentication using the 802.1x protocol

▶ Secure renegotiation in TLS

▶ Supports up to 256 bit keys for AES encryption (Advanced Encryption Standard)

Network protocols
(communication)

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Keep your video data secure
### Our system approach: Protecting the infrastructure

▶ Factory-loaded unique Bosch-signed certificates on all cameras

  ▶ Issued by in-house Certificate Authority (Escrypt)

  ▶ Stored in built-in secure crypto-coprocessor (TPM)

▶ Supports customer specific certificates

▶ Supports 3rd party PKI solutions

PKI

Certificates
(security infrastructure)

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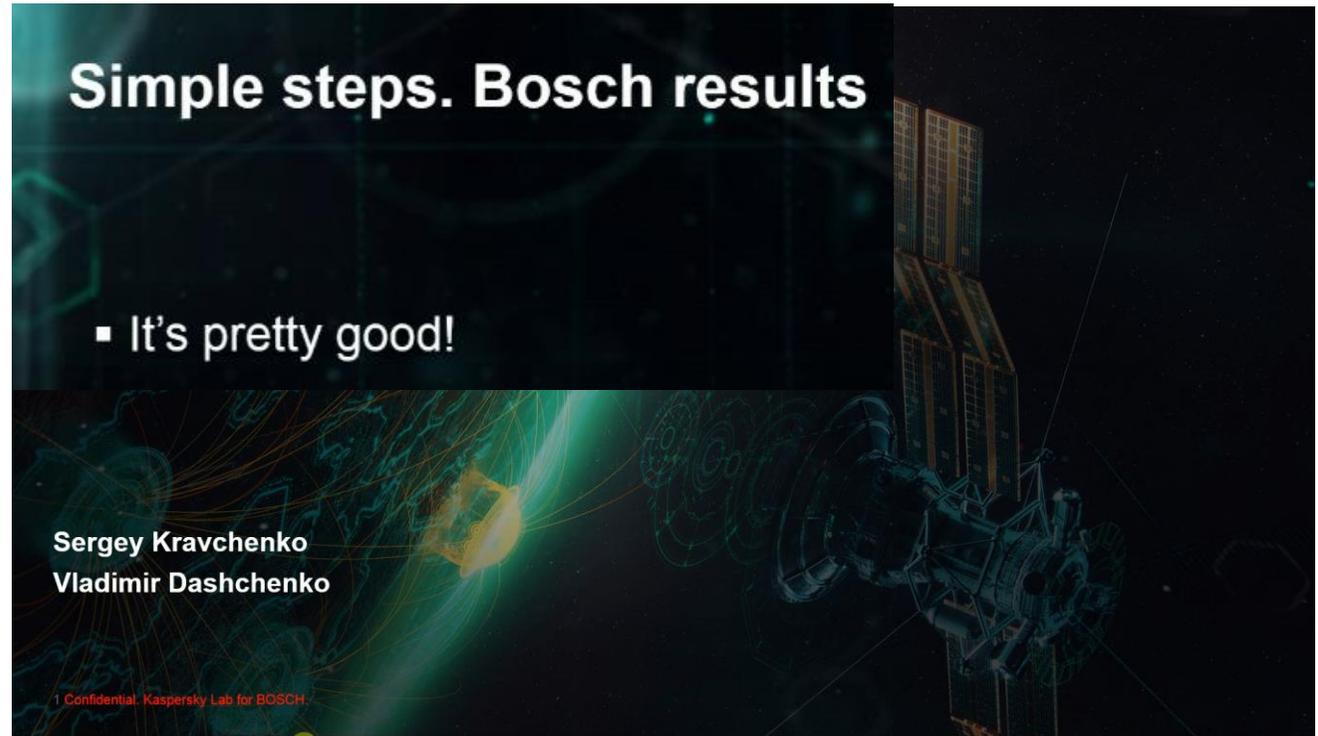## Keep your video data secure
What to expect? And our measures:

► Uploading of 3rd party software not possible

► Firmware updates by Bosch signed files only

► User access management in the cameras, recording solutions and software

► Tamper protection standard on all Bosch network video security cameras

► Unique built-in Trusted Platform Module

► Embedded Login Firewall

► Support of Microsoft Active Directory

► Support of token-based authentication

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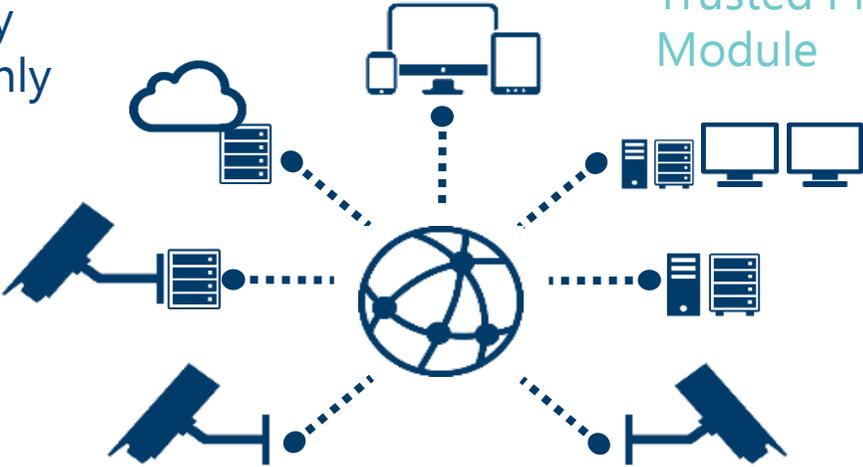
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How we prove to keep video data secure

▶ "Security by Design" due to embedded Secure Engineering Process (SEP)

▶ Continuous vulnerability testing

▶ External penetration testing

▶ Official certification (pending)

Simple steps. Bosch results

- It's pretty good!

Sergey Kravchenko
Vladimir Dashchenko

1 Confidential. Kaspersky Lab for BOSCH.

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THANK YOU