HOW SECURE IS THE HYPER-CONNECTED CAR?

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Car hacking is real, 1.4 million cars recall real!
Presentation Overview

- DXC and GuardKnox – the German connection
- Introduction to the modern car
- The hyper-connected car
- How to secure the hyper-connected car?
- Summary and Way Forward
DXC AND GUARDKNOX – THE GERMAN CONNECTION
Startup Autobahn – bringing automotive startups and corporates together
DXC and GuardKnox demonstration – end-to-end solution in 3 months
Guard KNOX
Cyber Technologies

Israeli F-16I Program

Iron Dome Missile Defense System

Arrow 3 Anti Ballistic Missile Defense System

Israeli F-35 Program
INTRODUCTION TO THE MODERN CAR
Not only with Jeeps...
And not only with passenger cars...
It can also be big business
Things become more scary with autonomous driving – LIDAR hacking
Things become more scary with autonomous driving – Radar hacking
How many computers (ECUs) are there in a modern passenger car?

- 15
- 40
- 80
- 150
How many lines of code are there in the modern car?

- 145,000 lines of code
- 100,000,000 lines of code
- 40,000,000 lines of code
- 300,000,000 lines of code
THE HYPER CONNECTED CAR
Beyond complexity, cars are becoming increasingly connected.
Hottest new features in 2018 cars

- Noise Level Adjustment
- Semi-Autonomous Driving
- Advanced Safety
- Augmented Reality
- Smarter Smart Keys
- Finding Parking
- In-Vehicle Wellness
- Rich Video/Audio Streaming
- Advanced Rear-seat Infotainment
- Feature Rich Bluetooth
- Finding Parking
Future connectivity will integrate shopping, monitoring, insurance and the dealership.
“Cars in the future will run on **DATA** and not Gasoline”
With autonomous capabilities becoming mainstream, vehicle usage model will change.
The rise of the connected, autonomous on-demand fleets
The US is leading adoption of connected and autonomous vehicles

Source: Grand View Research

Global Autonomous Cars/Driverless Cars Market, 2017 - 2024 (Units)
HOW TO SECURE A HYPER-CONNECTED CAR?
Automotive cyber ≠ Enterprise cyber

Prevent Data Theft
Business Continuity
99% reliability with false positives

Passenger Safety
Vehicle Reliability
99.999%
Key requirements for an automotive security solution – challenging paradigms

- Standalone Operation
- No human interaction
- No constant connectivity required
- Security from the ground up
The connected car requires multiple security layers according to functional domain.

- **Direct impact on safety of passengers**
- **Major inputs into safety critical systems**
- **Data monetization, Telematics, FMS**
- **General vehicle systems, environment**
- **Infotainment, Applications, Convenience**
Discrete security domains – the “connectivity” domain and the “driving” domain

Connectivity

- Infotainment
- Telematics
- UI/UX

Driving

- Engine Management
- Active Safety
- Breaks
The “driving” domain requires positive, formal, certifiable and verifiable security.
Defense in Depth

Secure Data Handling + Privacy

Telematics Gateway

Isolate Safety Critical ECUs

Verification of Sensor Data

RKE ECU

ADAS ECU

Root of Trust

V2X Gateway

Certificate Management

3rd Party Application Sandboxing

INFOTAINMENT ECU

4G
Connected fleet operations center and SOC will become key in fleet management
Regulation and standardization are playing a major role in cybersecurity for automotive

Automotive security standards – ISO 21434

S. 680

To protect consumers from security and privacy threats to their motor vehicles, and for other purposes.

Legislation – SPY CAR act

Future thought:
Consumer Security Rating
SUMMARY AND WAY FORWARD
The threat is real! And it will get worse...
Automotive architecture will need to incorporate robust security from the ground up

Defense-In-Depth approach

Incorporate security into communication and sensors (incl. V2X)

Automotive-ready operations center
Where do we start? Secure Separation!

Secure Data Handling + Privacy

Isolate Safety Critical ECUs

Verification of Sensor Data

Root of Trust

Certificate Management

3rd Party Application Sandboxing

RKE ECU

Telematics Gateway

V2X Gateway

INFOTAINMENT ECU

3G/4G
What can we do as consumers? (Apply Slide)

- **BE AWARE** that modern cars are connected and thus vulnerable

- **Security research on your next car** – make security a part of your buying decision

- **Join** the automotive cyber security community – need for security professionals in the automotive industry is growing

- Be weary of plugging things into the **OBD port**, especially while driving!
Practical user guide for buying a secure car

Carburetors for Security

Buy track ready

More cylinders for added resilience
THANK YOU!

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