

RSA Conference 2018

San Francisco | April 16–20 | Moscone Center

SESSION ID: SBX3-R1

HOW SECURE IS THE HYPER-CONNECTED CAR?

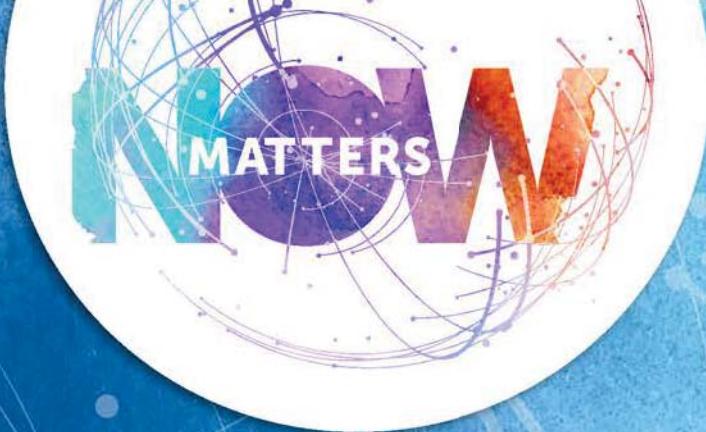
Andreas Wuchner

CTO Security Innovation
DXC Technology



Dionis Teshler

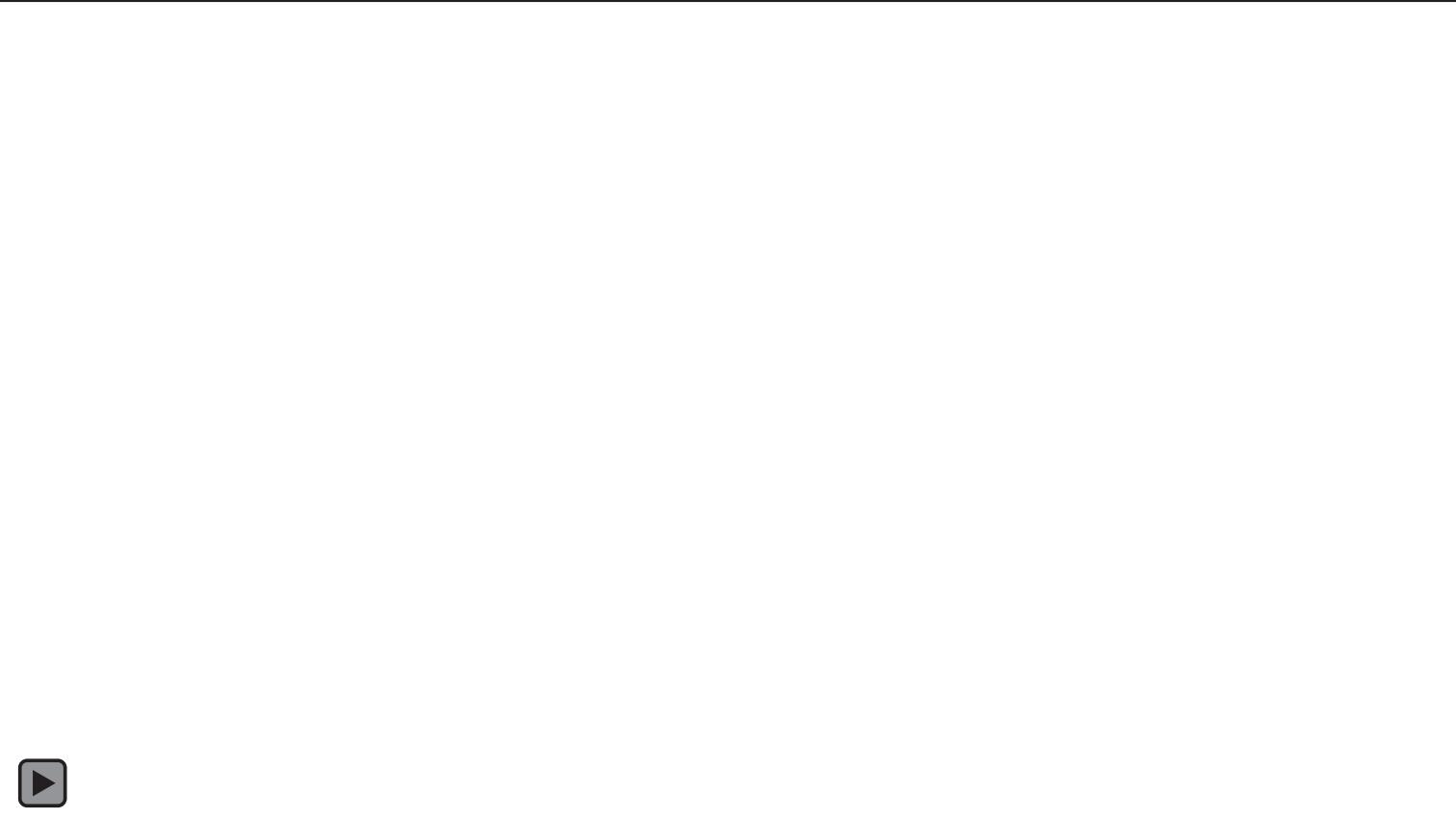
CTO, Co-Founder
GuardKnox



Car hacking is real, 1.4 million cars recall real!



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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

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DXC AND GUARDKNOX – THE GERMAN CONNECTION

Startup Autobahn – bringing automotive startups and corporates together



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DAIMLER



Webasto

Linde

ARENA2036

 BASF
We create chemistry muRata
INNOVATOR IN ELECTRONICS

Jardines

 University of Stuttgart
Germany

PORSCHE

 BENTELER ▽
makes it happen

postnl

PLUGANDPLAY

Deutsche Post DHL
Group

HELL

Hewlett Packard
Enterprise

DXC.technology

AGC

WIELAND I VENTURES

DXC and GuardKnox demonstration – end-to-end solution in 3 months



The screenshot displays the GuardKnox software interface, which includes the following sections:

- Events:** A dashboard showing "Security Events by Severity" (with a bar chart) and "Security Events by Event Name" (with a bar chart). It also includes a map of Europe with specific locations marked.
- Vehicle:** A detailed view for "Vehicle0016" showing information such as Vendor (Pigier), Product (GSE), Model (1.2.5.7), and various status indicators like "Status: Stable" and "Last Update: 00:00:00 - 00".
- Map:** A map of Central Europe (Germany, Austria, Switzerland) with red dots indicating vehicle locations and event markers.
- Related Events:** A table listing recent events with columns for Time, Severity, Event Name, Event Description, Event Company, Source Process Name, and Destination Process Name.

Time	Severity	Event Name	Event Description	Event Company	Source Process Name	Destination Process Name
30.05.17, 16:44	3	Vehicle chassis reference	Warning: This happens more often than please go for a check to the garage	Chassis		Component Chassis S
12.07.17, 20:08	8	Chassis safety return	Safety system started ABS S	Brake	safety-can	Safety Systems
24.08.17, 14:44	8	Chassis safety return	Safety system started ABS S	Brake	safety-can	Safety Systems
16.08.17, 07:31	8	Chassis safety return	Safety system started ABS S	Brake	safety-can	Safety Systems

Israeli F-16I Program



Israeli F-35 Program



Iron Dome Missile Defense System



Arrow 3 Anti Ballistic Missile Defense System



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INTRODUCTION TO THE MODERN CAR

Not only with Jeeps...



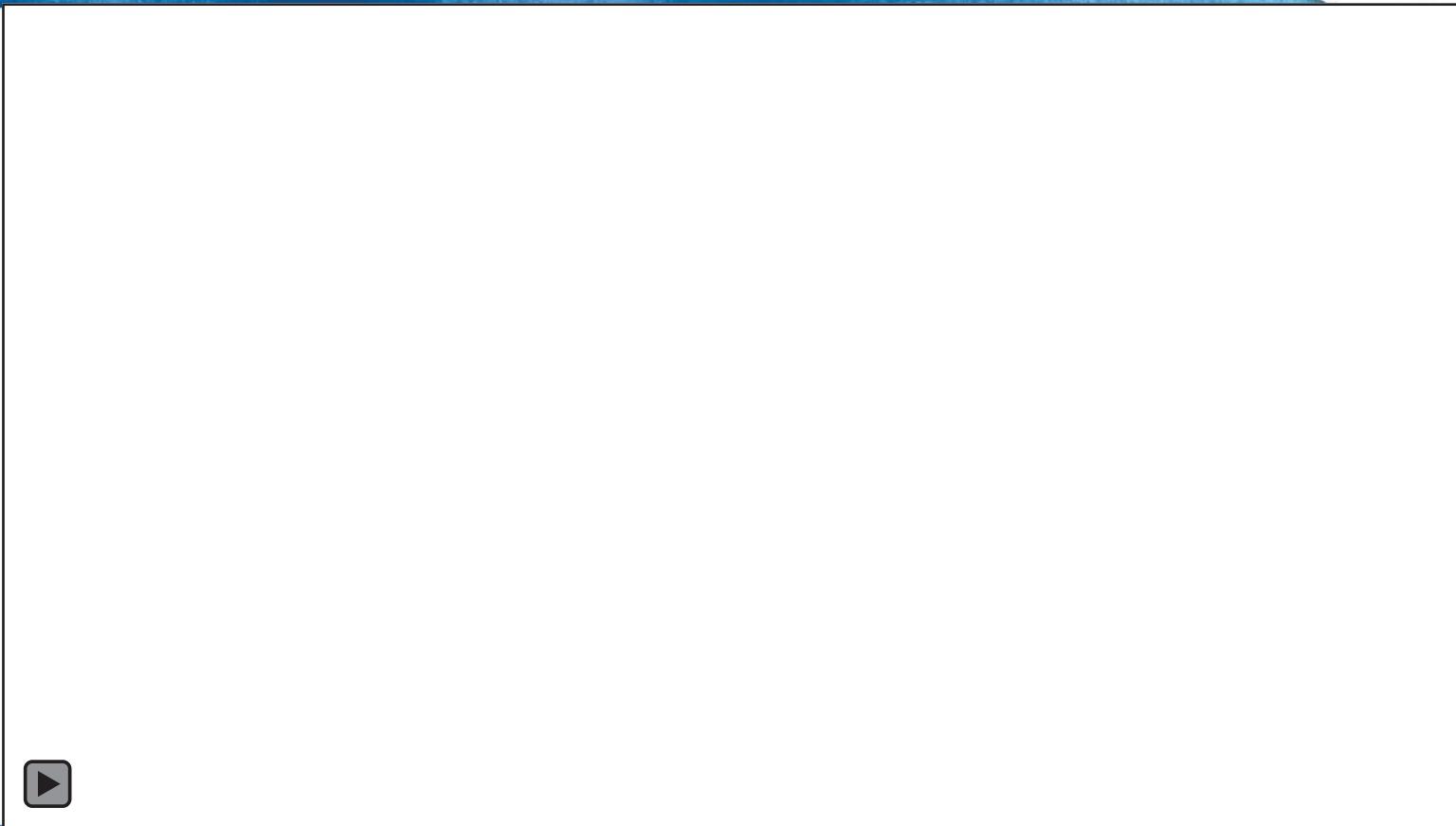
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And not only with passenger cars...



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It can also be big business



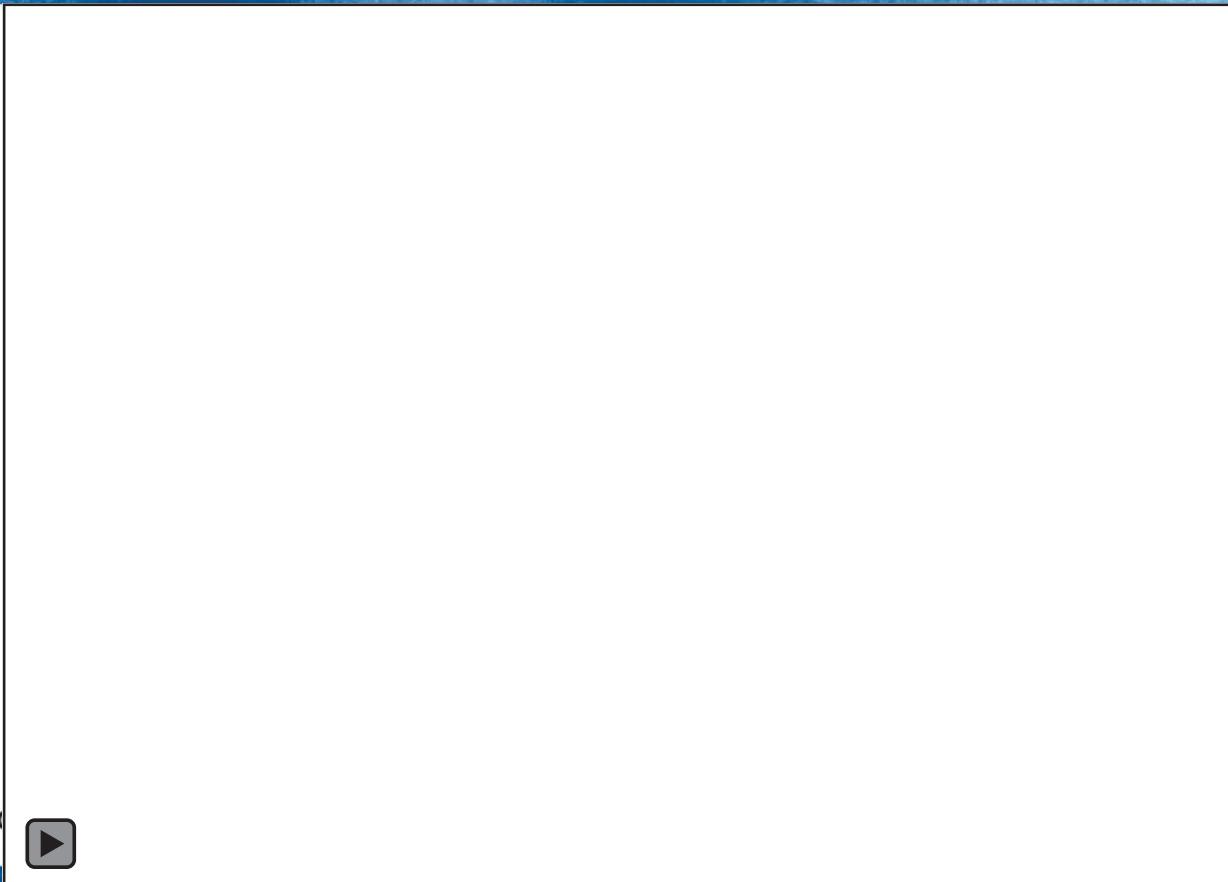
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Things become more scary with autonomous driving – LIDAR hacking



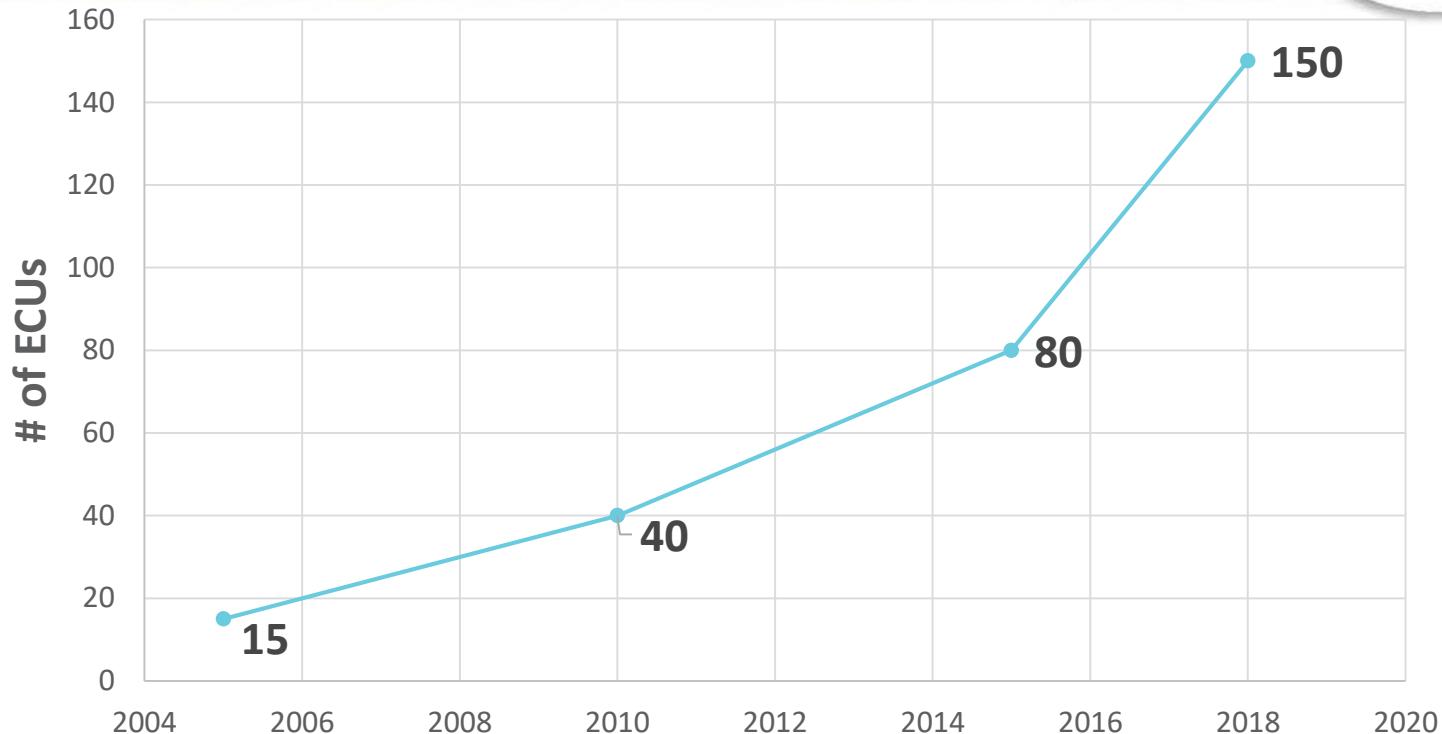
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Things become more scary with autonomous driving – Radar hacking



How many computers (ECUs) are there in a modern passenger car?



Model Year

14

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



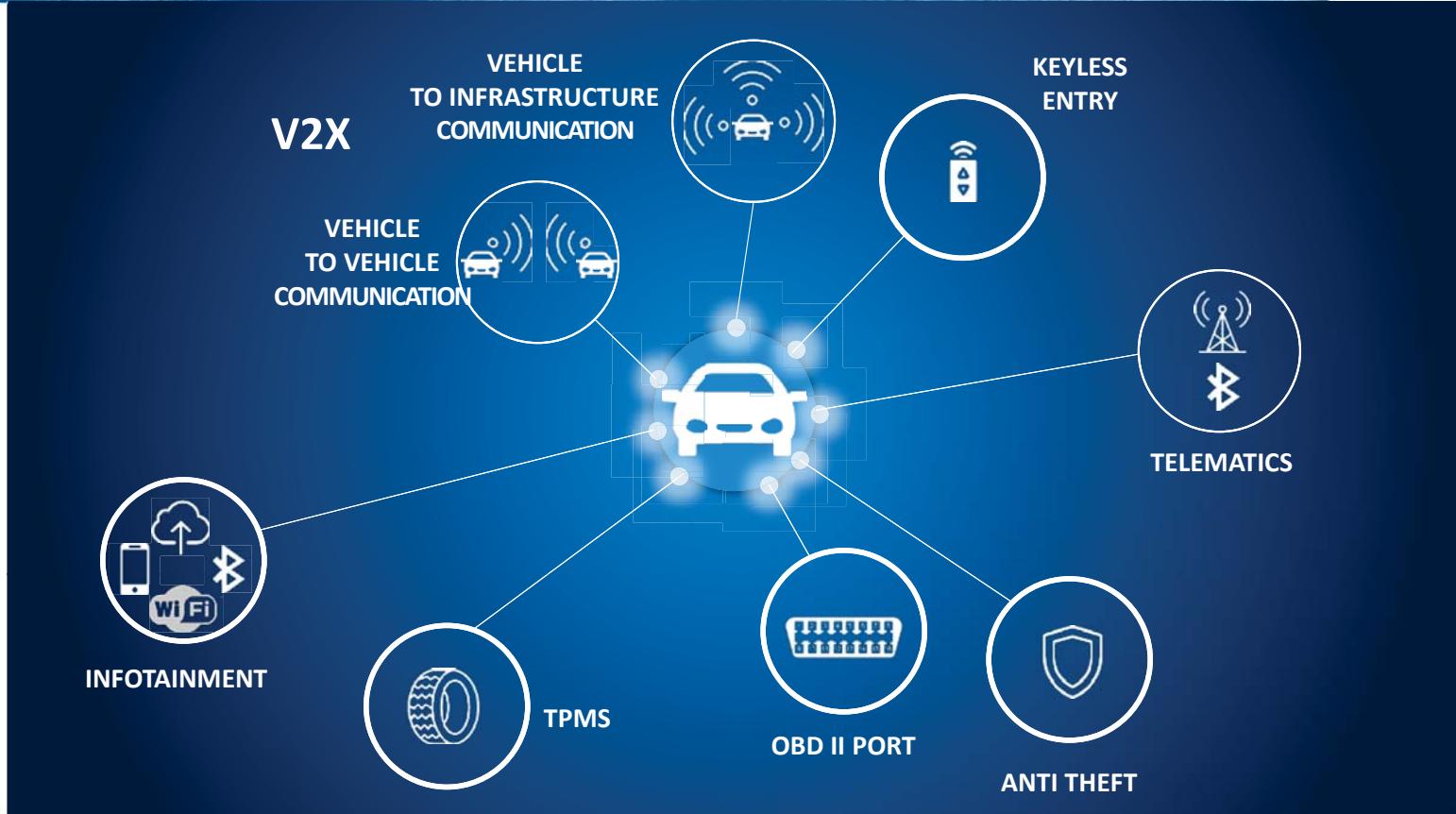
300,000,000
lines of code

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THE HYPER CONNECTED CAR

Beyond complexity, cars are becoming increasingly connected



Hottest new features in 2018 cars



**Semi-Autonomous
Driving**

Noise Level Adjustment

In-Vehicle Wellness

Finding Parking

Rich Video/Audio Streaming

Smarter Smart Keys

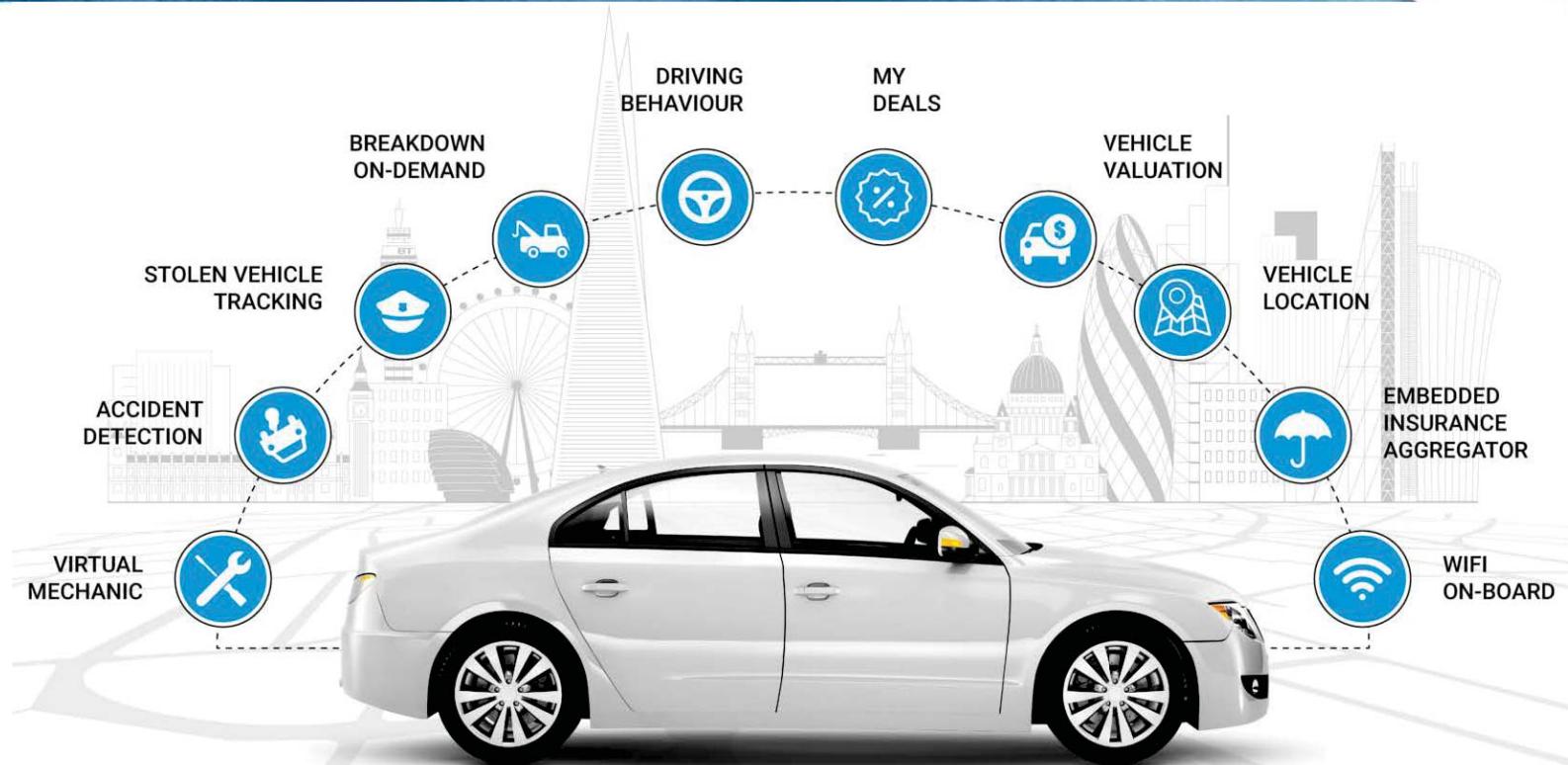
**Advanced Rear-seat
Infotainment**

Augmented Reality

Advanced Safety

Feature Rich Bluetooth

Future connectivity will integrate shopping, monitoring, insurance and the dealership

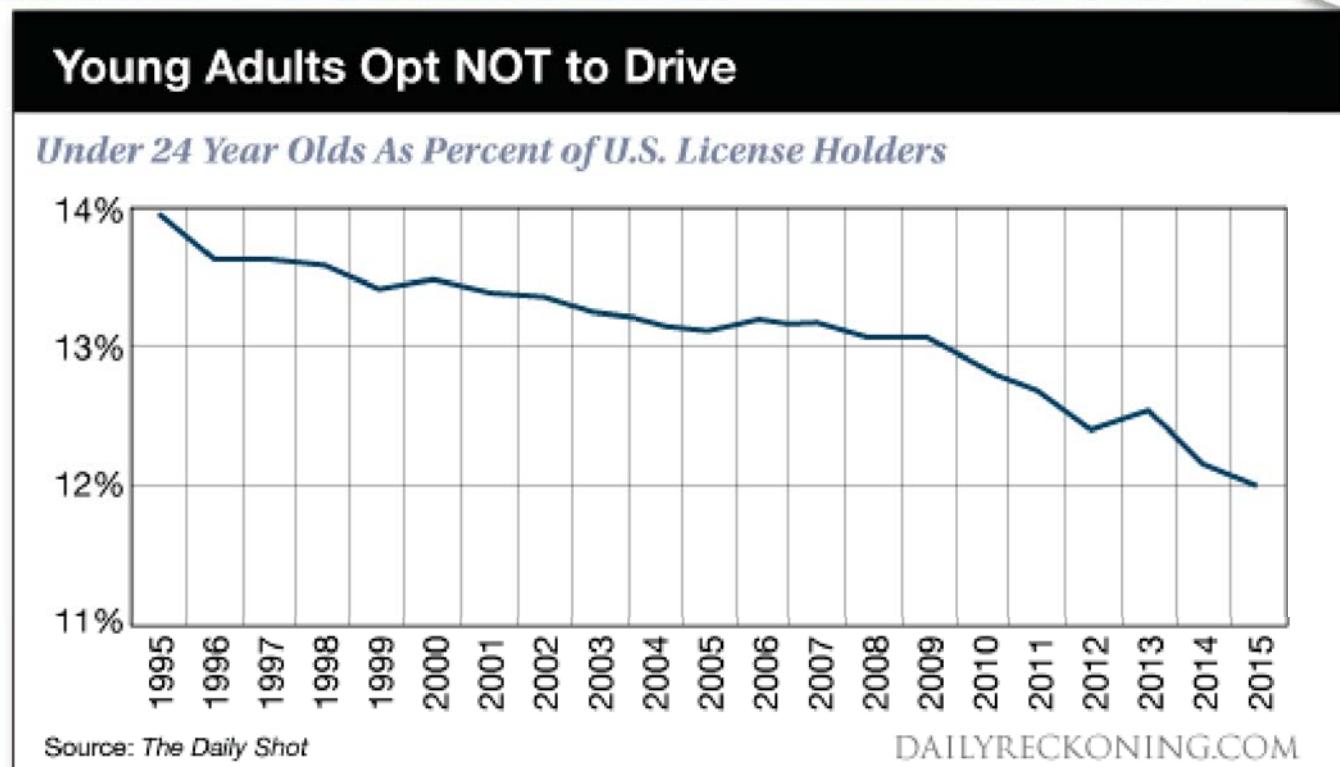


*“Cars in the future will run on **DATA** and not Gasoline”*



Photo: Mercedes Benz

With autonomous capabilities becoming mainstream, vehicle usage model will change



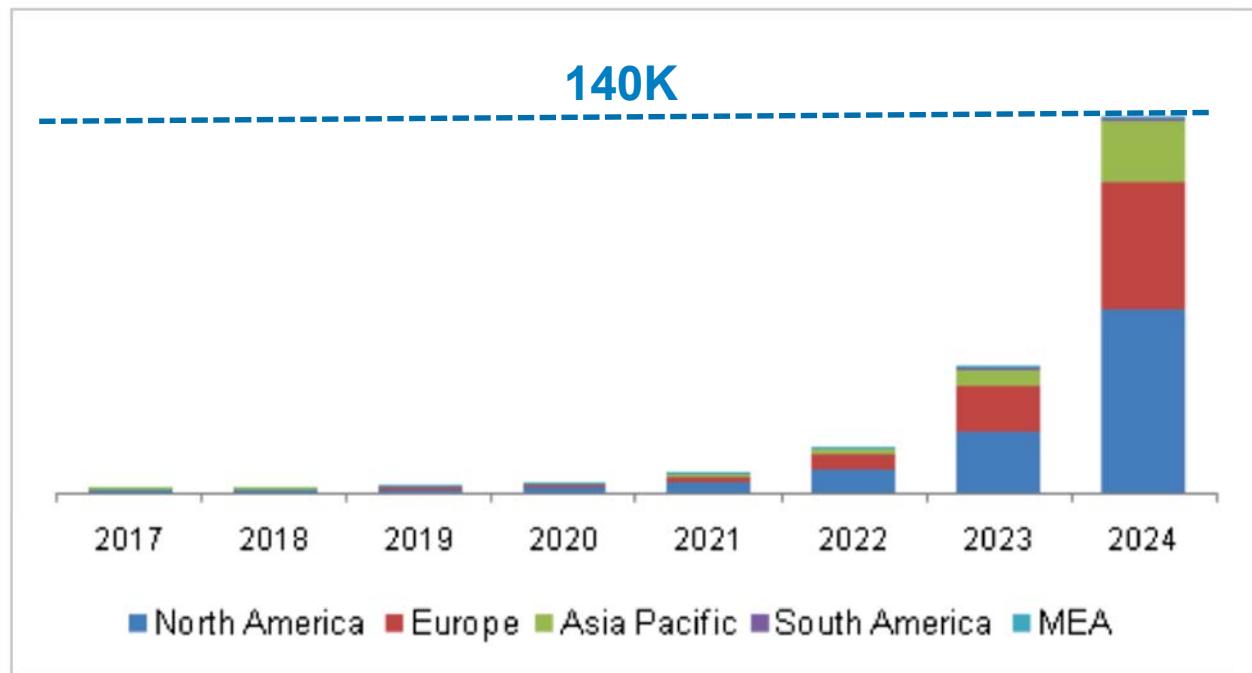
The rise of the connected, autonomous on-demand fleets



The US is leading adoption of connected and autonomous vehicles



Global Autonomous Cars/Driverless Cars Market, 2017 - 2024 (Units)



Source: Grand View
Research

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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%

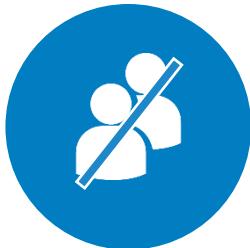
Key requirements for an automotive security solution – challenging paradigms



Standalone
Operation



No human
interaction



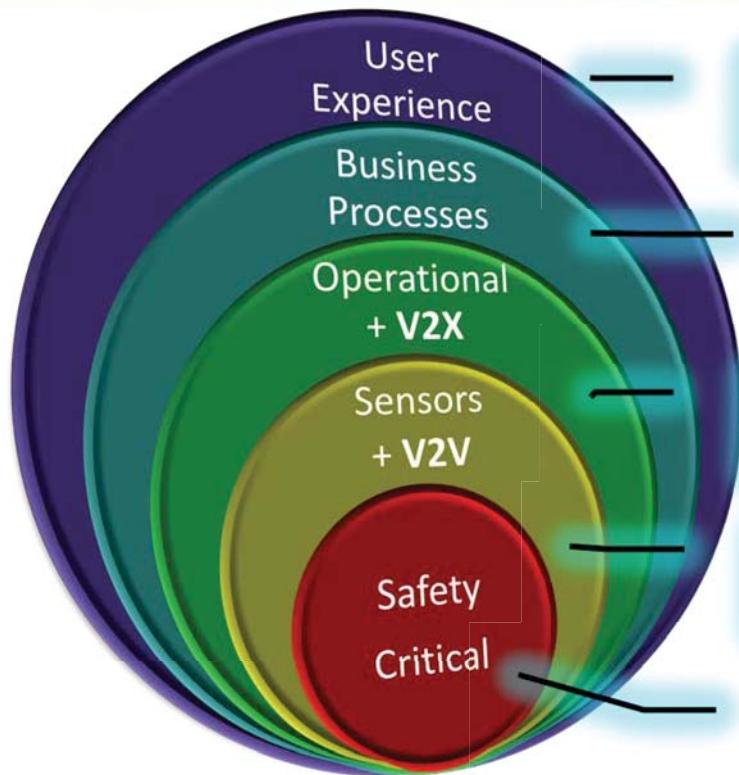
No constant
connectivity
required



Security from
the ground up



The connected car requires multiple security layers according to functional domain



Infotainment, Applications, Convenience

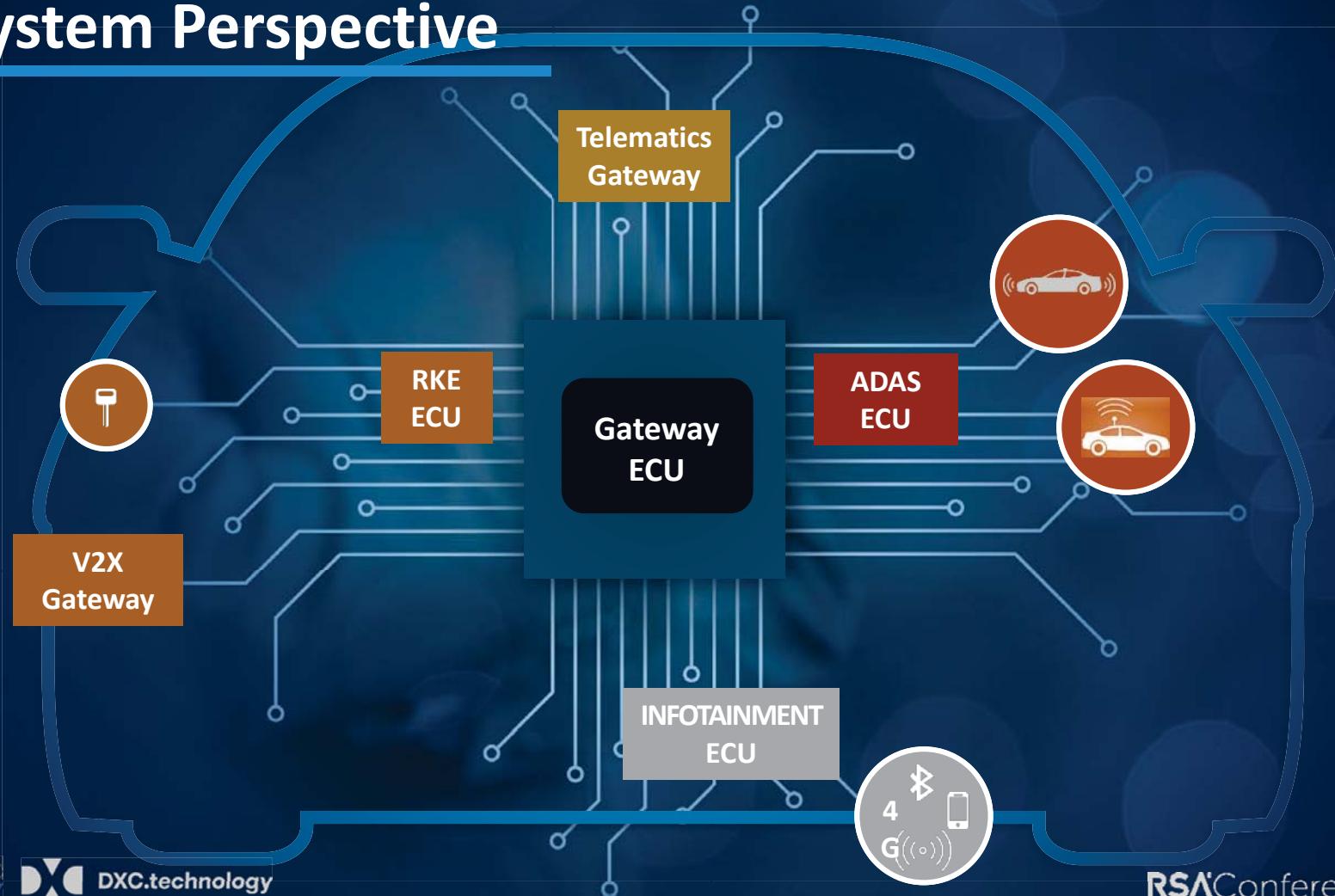
Data monetization, Telematics, FMS

General vehicle systems, environment

Major inputs into safety critical systems

Direct impact on safety of passengers

System Perspective



Discrete security domains – the “connectivity” domain and the “driving” domain



Connectivity

Infotainment



Telematics



UI/UX

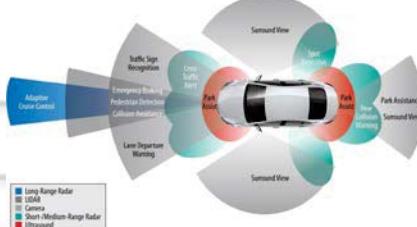


Driving

Engine Management



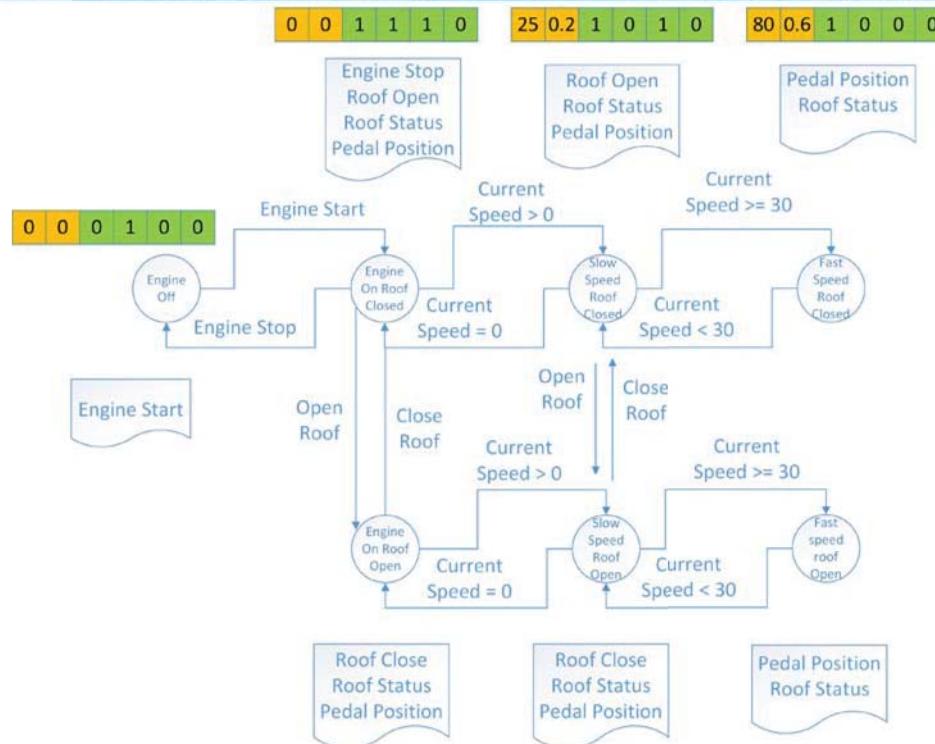
Active Safety



Breaks

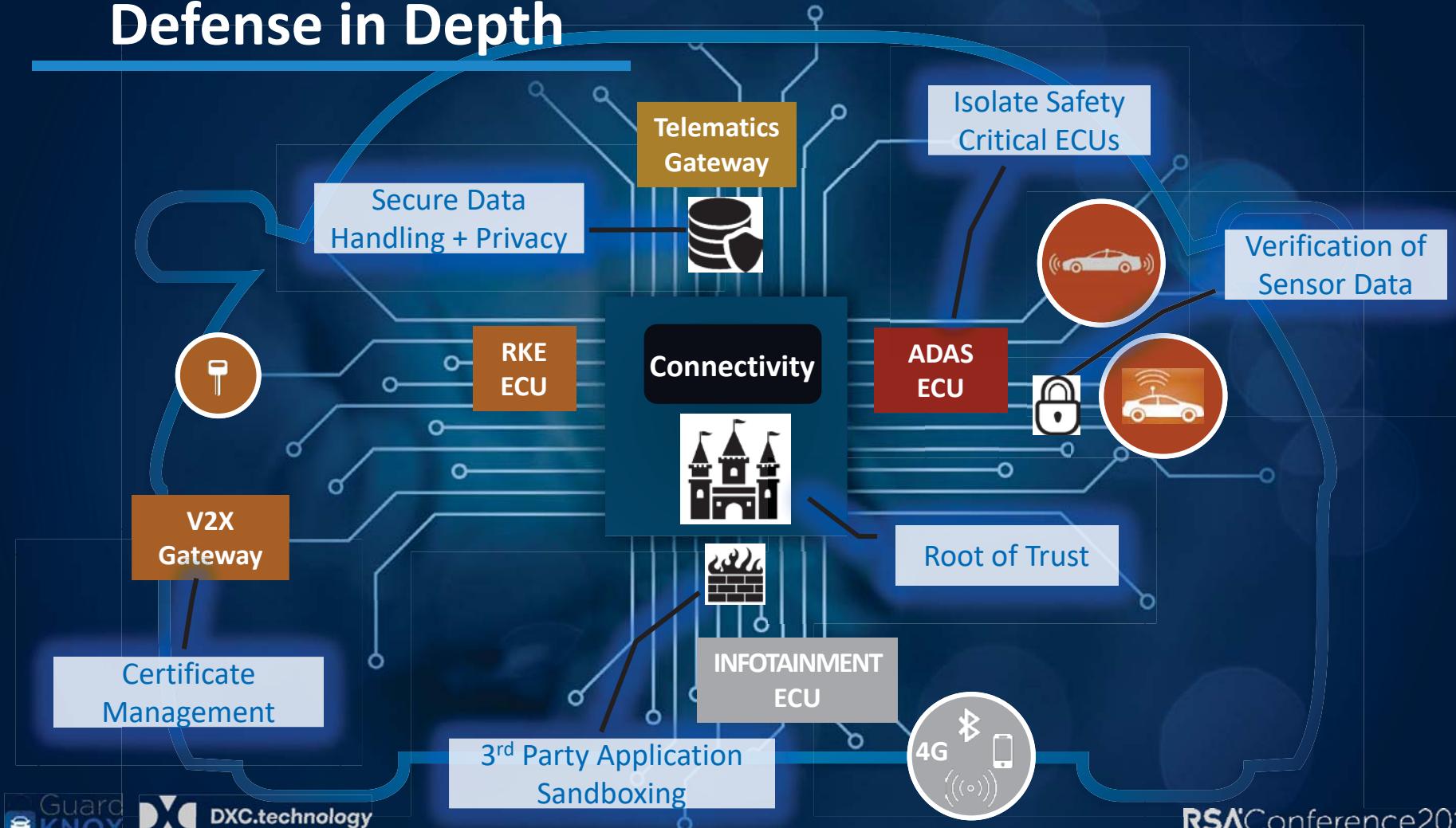


The “driving” domain requires positive, formal, certifiable and verifiable security

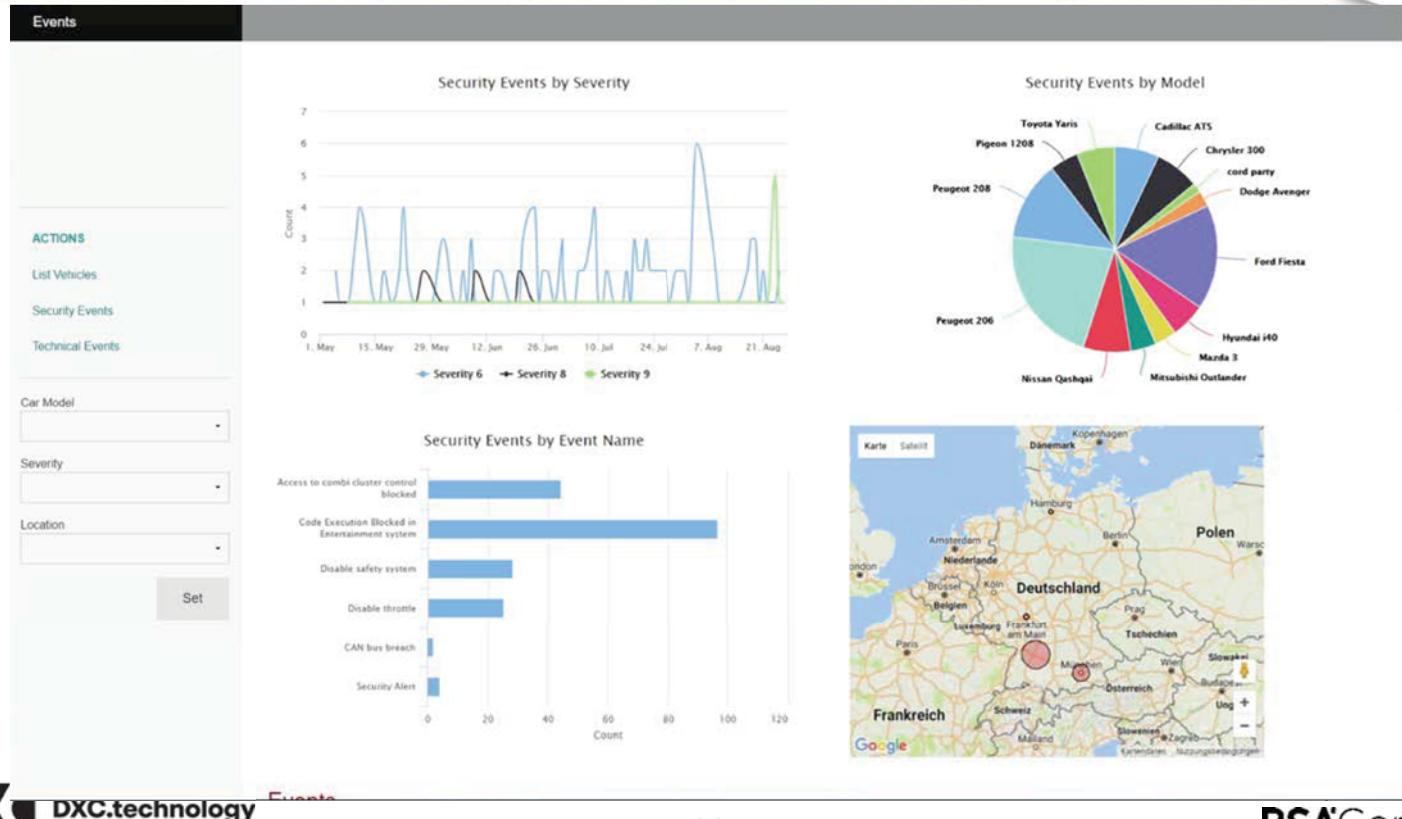


0 0 1 1 1 0 20 0.1 1 0 1 1 50 0.3 1 0 0 1

Defense in Depth



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

115TH CONGRESS
1ST SESSION

S. 680

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

Legislation – SPY CAR act



www.euroncap.com
★★★★★

Security Level



Future thought:
Consumer Security Rating

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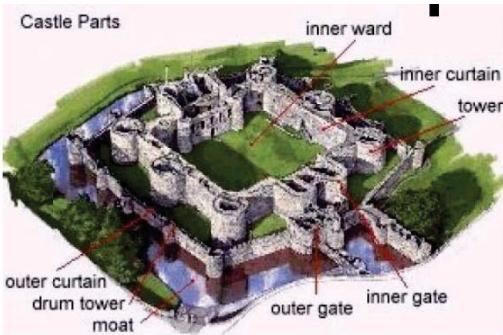
SUMMARY AND WAY FORWARD

The threat is real! And it will get worse...



CAR HACKING JUST GOT REAL

Automotive architecture will need to incorporate robust security from the ground up



Defense-In-Depth approach



Incorporate security into communication and sensors (incl. V2X)

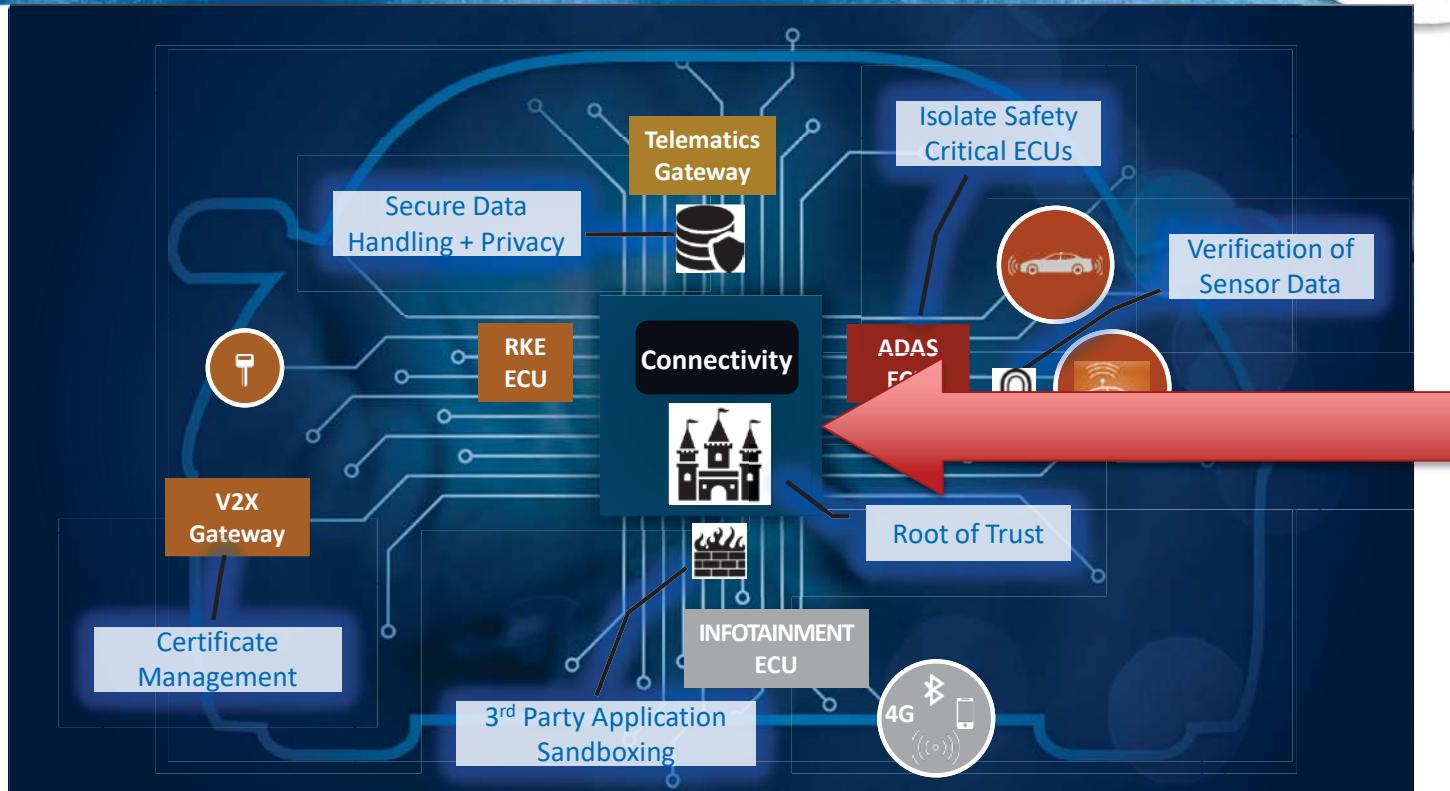


Automotive-ready operations center

Where do we start? Secure Separation!



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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



SPEEDHUNTERS.com
Photo: Dino Dalla Carbonara

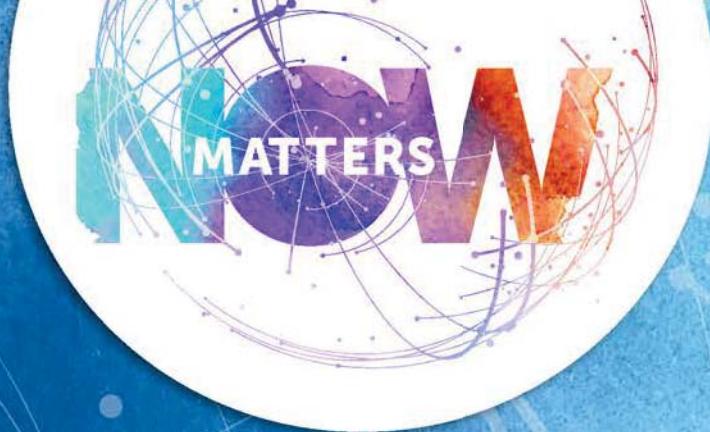
More cylinders for
added resilience

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THANK YOU!



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