

Opening slide

# ‘Secure by design is crucial for mobility and transport applications’

Mobiliteit en Transport | Subject System Security

Leo Warmerdam, NXP

# Strategische doelen MU Mobiliteit en Transport vs System Security

- Autonomous transport
  - Connected systems (Operationele veiligheid)
- Safety and security systems
- Navigation
- Cooperative Intelligent Transport Systems (C-ITS)
  - System architecture of secure systems



# Mobile systems are vulnerable to attacks



- Jeep Cherokee – 2015: over the air; brakes, steering, transmission
- 2015: OnStar hack remotely starts cars
- 2015: Researchers Hacked a Model S: plug laptop into car network, drive it, insert Trojan

ANDY GREENBERG SECURITY 04.24.17 01:34 PM

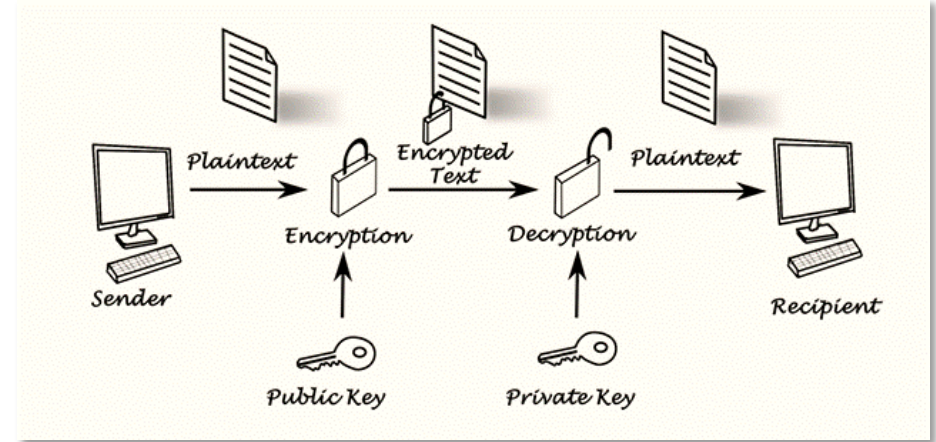
**JUST A PAIR OF THESE \$11  
RADIO GADGETS CAN STEAL A  
CAR**



# In all cases:

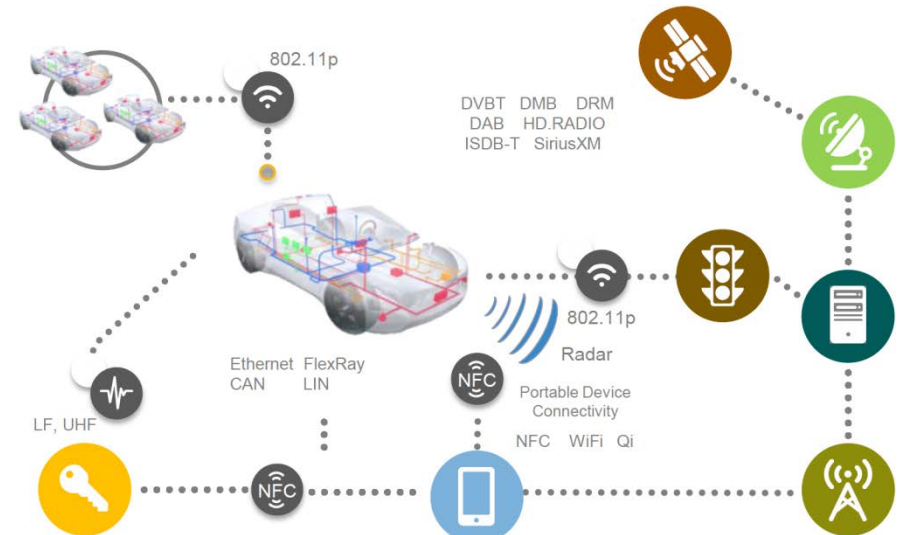
- Basic security technology was applied:

- Encryption
- Firewalls
- Secure key exchange mechanisms



- So, what is up?

- Look at the system as a whole
- Specific challenges for system design



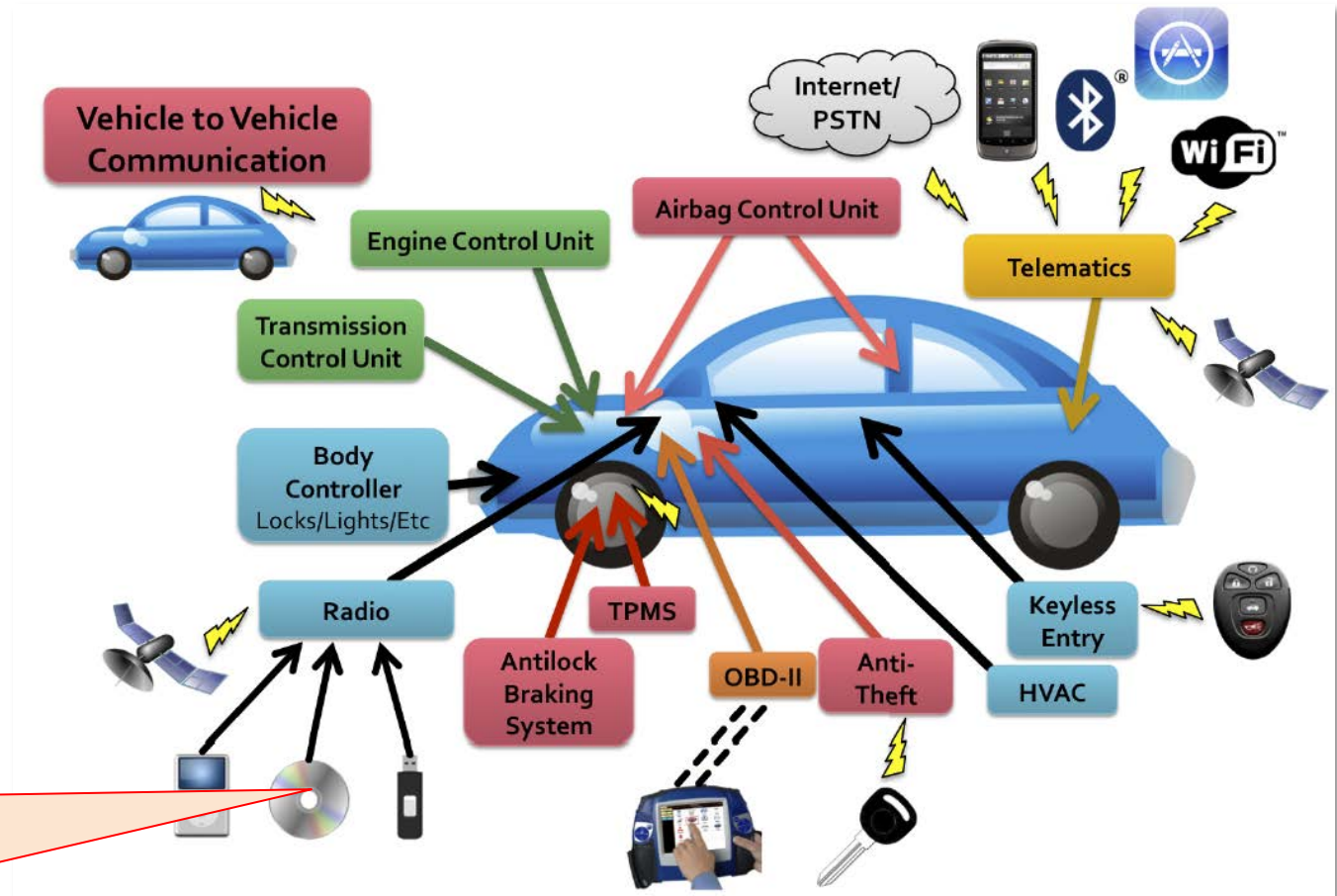
# Architectural view on security in automotive

USENIX Security, August 10–12, 2011

Comprehensive Experimental Analyses of Automotive Attack Surfaces

Stephen Checkoway, Damon McCoy, Brian Kantor,  
Danny Anderson, Hovav Shacham, and Stefan Savage  
*University of California, San Diego*

Karl Koscher, Alexei Czeskis, Franziska Roesner, and Tadayoshi Kohno  
*University of Washington*

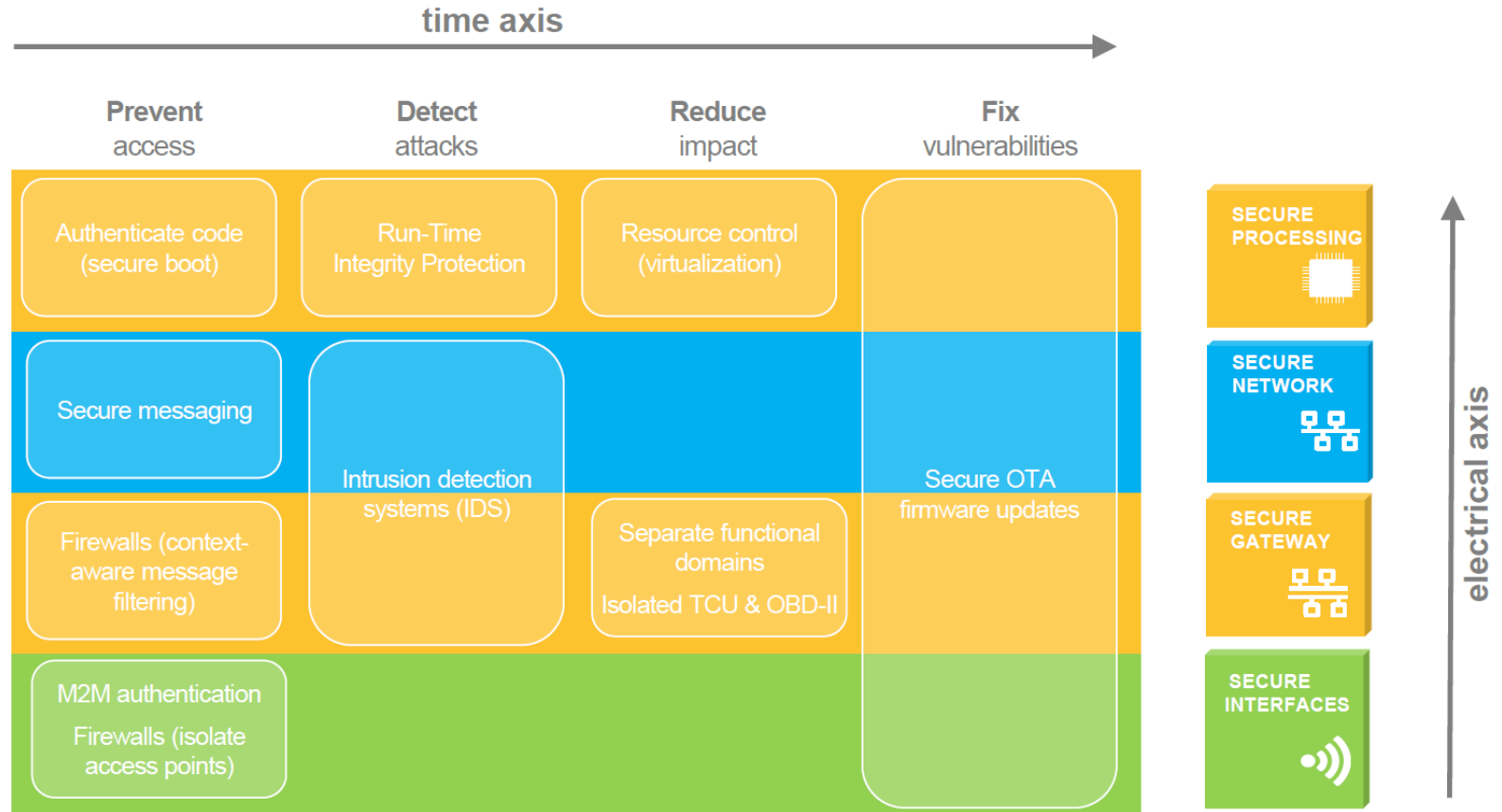


“We modified a WMA audio file such that, when burned onto a CD, plays perfectly on a PC but sends arbitrary CAN packets of our choosing when played by our car’s media player.”

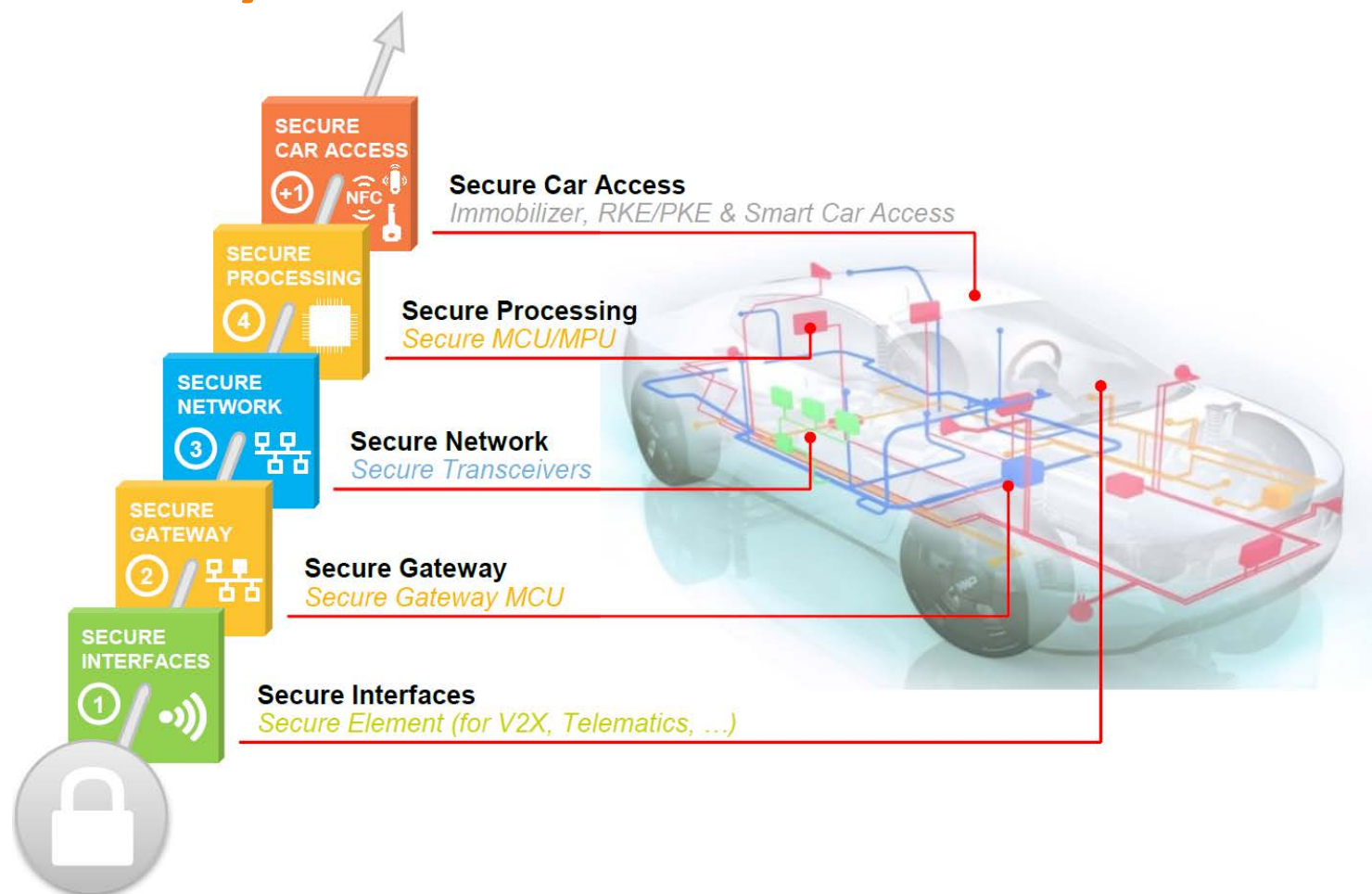


# Challenge: dependencies between architectural views

- Security vs safety
- Security vs performance
- Security versus functionality
- Security vs maintainability



# 4+1 Vehicle Security Framework



Closing slide

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