OVERSEE

An open and secure application and communication platform

oversee
Open Vehicular Secure Platform
OVERSEE - Open Vehicular Secure Platform

Project facts

The mission:
Providing a standardized generic communication and application platform for vehicles, ensuring security, reliability and trust of external communication and simultaneous running applications.

- Project start date: 01/01/2010
- Project duration: 30 months
- Total costs: 3,91 M€
- EC contribution: 2,83 M€
- Project coordination: escrypt GmbH - Embedded Security
- Project consortium: 8 participants from 4 countries
OVERSEE Consortium

- escrypt GmbH – Embedded Security, Germany
- Fraunhofer-Institut FOKUS
  Institut für offene Kommunikationssysteme, Germany
- TRIALOG, France
- Technische Universität Berlin, Germany
- Universidad Politécnica de Valencia, Spain
- Universität Siegen, Germany
- VOLKSWAGEN AG, Germany
- OpenTech EDV Research GmbH, Austria
OVERSEE Advisory board

- Porsche AG, Germany
- Audi AG, Germany
- Daimler AG, Germany
- Continental Automotive GmbH, Germany
- EFKON AG, Austria
- NXP Semiconductors, Belgium
- Siemens AG, Germany
- Deutsche Telekom Laboratories, Germany
- Ruhr Universität Bochum, Germany
- Bundesamt für Sicherheit in der Informationstechnik, Germany
- Bundesanstalt für Straßenwesen, Germany
- Toll Collect GmbH, Germany
Motivation

- Modern vehicles are mobile computer networks
- New automotive applications need access to vehicle internal networks and external networks
  - Pay as you drive, road charge, remote diagnosis, V2X...
- Access to vehicle internal networks must be secured
  - Only authorized parties within the access policies
  - Protection against spoofing of identities
  - Ensure the reliability of vehicle internal communication
- The amount of ECUs in vehicles should be reduced
  - Reduce costs, weight and time to market by the use of only a few powerful ECUs running different applications in parallel
Main goals
Communication

- Single point of access to vehicle networks
- Generic communication over multiple communication interfaces
- User specific rules for communication
OVERSEE provides protected runtime environments for the simultaneous and secure execution of applications (like Apps for the iPhone)

This allows the development of platform and vehicle independent automotive applications (e.g. Open source projects)

Open and standardized API offers potential for new automotive and non-automotive applications
Security

- Secure and dependable runtime environment
- Restriction to only one access point enforces security policy and reduces potential security lacks and backdoors
- User and application specific rules for communication ensure privacy and restricted access to in-car and external networks
- Capabilities for secure and non-deniable recording
- Validation support capabilities and tools
- Provision of HSM-based security services over a standardized API
Use cases
Use cases
Road charge / eToll

☒ New models for road charging will be oriented on the real usage of vehicles, e.g.
  ▪ German lorry toll depends on the driven distance on motorways and selected federal roads
  ▪ New Dutch vehicle tax (proposed for 2012 for lorry, later on cars) will depend on the driven distance in the Netherlands, the vehicle type as well as the time of driving and will be charged monthly. (Additionally there are some additional cost for heavy used roads.)

☒ Common requirements of these road charge applications
  ▪ Collection and transmission of route information (e.g., GPS data) in a secure way that respects the privacy of the driver

☒ Today: a new device for every new road charge model
Use cases

**eCall**

- eCall is a project of the European Union that aims to reduce the amount of fatalities on the road by automatically calling emergency service.

- eCall application needs access to:
  - Vehicle internal sensors (Airbag, etc.)
  - Positioning information (e.g., GPS data)
  - Vehicle external communication networks (e.g., GSM or UMTS)

- eCall has strong security requirements and privacy issues.
Use cases

V2V and V2I

- innovative automotive applications improving safety and efficiency of transport will be mainly cooperative applications

- Common requirements of V2X applications
  - Access to vehicle internal networks and sensors (maybe in the future also actuators – Drive by wire)
  - Access to vehicle external networks, e.g., DSRC or WiFi
  - Security and reliability of communication and information
  - Identity management
  - Privacy issues

- Today: every new (also prototypical) V2X application needs its own ECU that will impede the development
System design

Application Layer
- App 1
- App 2
- App 3
- App 4

Virtualized Services API
- Secure storage
- Secure communications
- Secure mechanisms

System Layer
- Memory manager
- IP communications
- Scheduler
- Clock & Timer management
- Interrupt management
- Health monitor

Virtualization Sub Layer

Hardware Layer
- CPU
- Security Module
Road map

- Proof of concept
- Validation support
- Platform implementation

- Platform design
- Requirements documents
- Project start

Time:
- 2010
- 2011
- 2012

Months:
- 01
- 02
- 03
- 04
- 05
- 06
- 07
- 08
- 09
- 10
- 11
- 12
Relation to other projects

- **IEEE VTS**: 09/2009
- **PRE-DRIVE**: 06/2006 - 12/2009
- **ETSI ITS**: Standards on the move
- **SEVECAMS**: 01/2006 - 12/2008
- **CVIS**: 01/2006 - 12/2008
- **evlta**: 07/2008 - 06/2011
- **PRECISA**: 03/2008 - 02/2011
- **simTD**: Sichere Intelligente Mobilität Testfeld Deutschland
  - 09/2008 - 08/2012
Focus and benefits

OVERSEE project focuses on ...
- securely interfacing vehicular and environmental networks
- providing secure runtime environments for applications

OVERSEE offers ...
- ability to securely download (open source) applications to your vehicle
- creation of a new market for vehicle independent automotive applications
- security enhancements for automotive applications and hence improvements for vehicle safety and efficiency
- a basis for new services and products
- hosting of applications with security issues inside of the vehicle
- faster, cheaper and easier development of innovative automotive applications
Thank you for your attention!

For further information visit our project homepage

www.oversee-project.com