Course offer

CAN Hack! Hands-On Automotive Security

Introduction

Assured AB (Assured) offers an automotive security workshop, “CAN Hack!”, aimed at anyone interested in the security of connected vehicles. The course combines theoretical lectures with hands-on challenges against a physical, simulated car.

Participants will learn how a modern vehicle communicates internally (between components) as well as externally with the driver, passengers and remote services and how to exploit vulnerable or weak implementations of security concepts.

The course is designed to be delivered as a one-day workshop with theoretical and practical parts in an interactive fashion.

Participants will be given a virtual machine with all the necessary tools and configuration needed to connect to the challenge platform, named “CyCar”. This device tries to simulate a vehicle infotainment and telematics system, often available in modern vehicles.

Target audience

This course mainly targets developers, architects and students working with automotive solutions but fits anyone with an interest in automotive security, hacking and embedded system security.

Attendee prerequisites

Participants are required to possess a basic to good understanding of networking and basic Linux commands.

A basic understanding of binary and hexadecimal notation is recommended.

A basic understanding of cryptography is helpful but not mandatory.

A basic understanding of embedded systems is helpful but not mandatory.

Required material (not included)

All participants need a **laptop** (per team) with adequate specifications and administrative rights in order to launch a Virtual Machine with the lab environment.

Corporate laptops with mandatory VPN settings are **not recommended** since they often subvert the lab network.

Assured AB
info@assured.se

The CyCar challenge platform

Our challenge platform “CyCar” consists of readily available components that are assembled into a small but realistic vehicle infotainment and telematics unit. An ECU controls vehicle characteristics such as speedometer, blinkers, locks and engine state. It is connected via the CAN bus to a single-board computer that runs a Linux OS with connectivity such as Bluetooth and WiFi as well as higher-level applications and services.

The CyCar platform hardware setup is open source for anyone interested in building their own. The firmware and software required for this course is restricted to purchasers of the course.

Course syllabus

Gear N (1h)

- Introduction
- Handouts
- Lab setup

Gear 1 (1h)

- Theory module 1
  - Security concepts
  - CAN and serial bus communication
  - ECUs and the BusGoat
  - Embedded security
  - Cryptography
- Understanding and constructing CAN frames
- Pop-quiz and a short break

Gear 2 (1h)

- Theory module 2
  - Connectivity and the OBD-II interface
  - Bluetooth
  - WiFi
  - GSM, 4G
  - Telematics
- Connecting to the CyCar
- Pop-quiz and a short break

Gear 3 (1h)

- Theory module 3
  - API and application security
  - Tools and commands
  - Attack vectors
- Lab overview
- Trying the different tools
- Break for lunch

Gear 4 (2,5h)

- CTF-style hands-on lab
- Instructor-assisted challenges

Gear 5 (1h)

- Racing the CyCars
- Show and tell
- Price ceremony

Gear R (0,5h)

- Recap
- Evaluation

Location and number of participants

The course may be held remotely via video conference, but we recommend an on-site experience. The location could be Assured offices in Gothenburg or a location anywhere in the world (with certain limitations, at the discernment of the instructors).

Number of participants depends on the location and availability of CyCars. Participants may be grouped into teams to share a CyCar.

Contact information

Jonas Magazinius, Security Specialist.
Jonas.Magazinius@assured.se