University of Pisa
School of Engineering

Formal Methods for Secure Systems

An ADVISE model for attacks on autonomous vehicles back-end servers

Supervisors
Prof. Cinzia Bernardeschi
Ing. Maurizio Palmieri

Students
Yuri Mazzuoli
Francesco Iemma
Marco Pinna

July 8, 2021

Contents

Chapter 1

Introduction

In what follows the study of different adversaries trying to attack the back-end servers related to autonomous vehicles is carried out.

The work is organized as follows:

- Firstly, chapter 2 gives an initial overview and a presentation of the scenarios.
- Secondly, in chapter 3 the complete attack tree is presented.
- In chapter 4 the development of the Mobius simulation is described and its results are presented.

The entire codebase is available at `https://github.com/YuriMzz/vehiclesADVISE` .

Chapter 2

Overview

In this chapter a general overview of the scenarios and the involved actors is given.

2.1 Actors

In our model we have three different types of actors:

- Hacker

  (S)he is a malicious person with an in-depth knowledge of the most important and widespread technologies and attacks. For this reasons he is the most skilled user.

- Insider

  (S)he is a person who is inside the organization and so he has more accesses w.r.t. an outsider attacker and in particular he has a lot of knowledges, on the other side he has not the same skill level of the hacker.

- Physical Intruder

  (S)he is a person who is able to have physical access to the infrastructures under analysis. The physical intruder can be an insider with particular privileges (e.g. access to the server room) or also an hacker who was able to retrieve in a malicious way the physical access to the infrastructures.

TODO: mettere una tabella con le skill, le conoscenze e gli accessi a disposizione di ogni attaccante

Chapter 3

Attack tree

Chapter 4

Simulation