

UNIVERSITY OF AMSTERDAM

RESEARCH PROJECT I PROPOSAL

PROTECTING AGAINST RELAY ATTACKS

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1 Introduction

As technology progresses, many traditional devices are improved with wireless features, aimed to improve user's comfort. Examples of these improvements can be found in access control (car keys, company IDs, public transportation cards) or credit card payment systems, among others.

Most of these systems are vulnerable to relay attacks, in which an attacker simply forwards messages between parties. These are specially dangerous in some cases, as they can provide unauthorized access even if the communication is fully encrypted and protected. A typical and well-documented example of this kind of attack are cars with PKES, in which an attacker can get into a victim's car by relaying the transmission between the car and the key at a longer distance than it is supposed to work. Some non-wireless platforms and services are also vulnerable to this kind of attacks, although they tend to be more difficult to perform.

This project will attempt to provide recommendations on how to make those systems more secure, either by making the systems less predictable or by proposing features that can block partially or totally some of the attacks.

2 Related work

There are many research projects studying relay attacks on different services and applications, such as [1, 2]. There is a large number of systems vulnerable to these attacks, and due to the limited time available for this project we will have to focus on some of them, aiming for the most relevant and/or commonly used.

Another interesting source of information will be studies on how location systems can be secured, as in [3]. Using this as an starting point we will attempt to provide practical solutions to the presented problems.

3 Project scope

4 Research Questions

Research Questions here.

5 Approach

Approach and methodology here.

6 Planning

Planing here.

7 Expected results

Expected results here.

8 Ethical considerations

Ethical paragraph here. Bonus stage!

9 References

References

- [1] A. Francillon, B. Danev, S. Capkun, *Relay Attacks on Passive Keyless Entry and Start Systems in Modern Cars*
- [2] J. van den Breekel, *A Security Evaluation and Proof-of-Concept Relay Attack on Dutch EMV Contactless Transactions*, October 2014
- [3] S. Capkun, J. Hubaux, *Secure Positioning in Wireless Networks*