



## Security from a tool perspective

Vector UK Conference 2019

## Overview

- ▶ **Tools without security**

What happens to a tool which does not support security

- ▶ **Challenges**

Challenges for a tool which has to support security

- ▶ **Replay recorded data to test ECUs**

How the replay can work although it is prevented by security

## Tools without security







### Message Authentication Code

- ▶ Ensures sender authenticity
- ▶ Ensures data integrity



### Freshness

- ▶ Prevents data replay

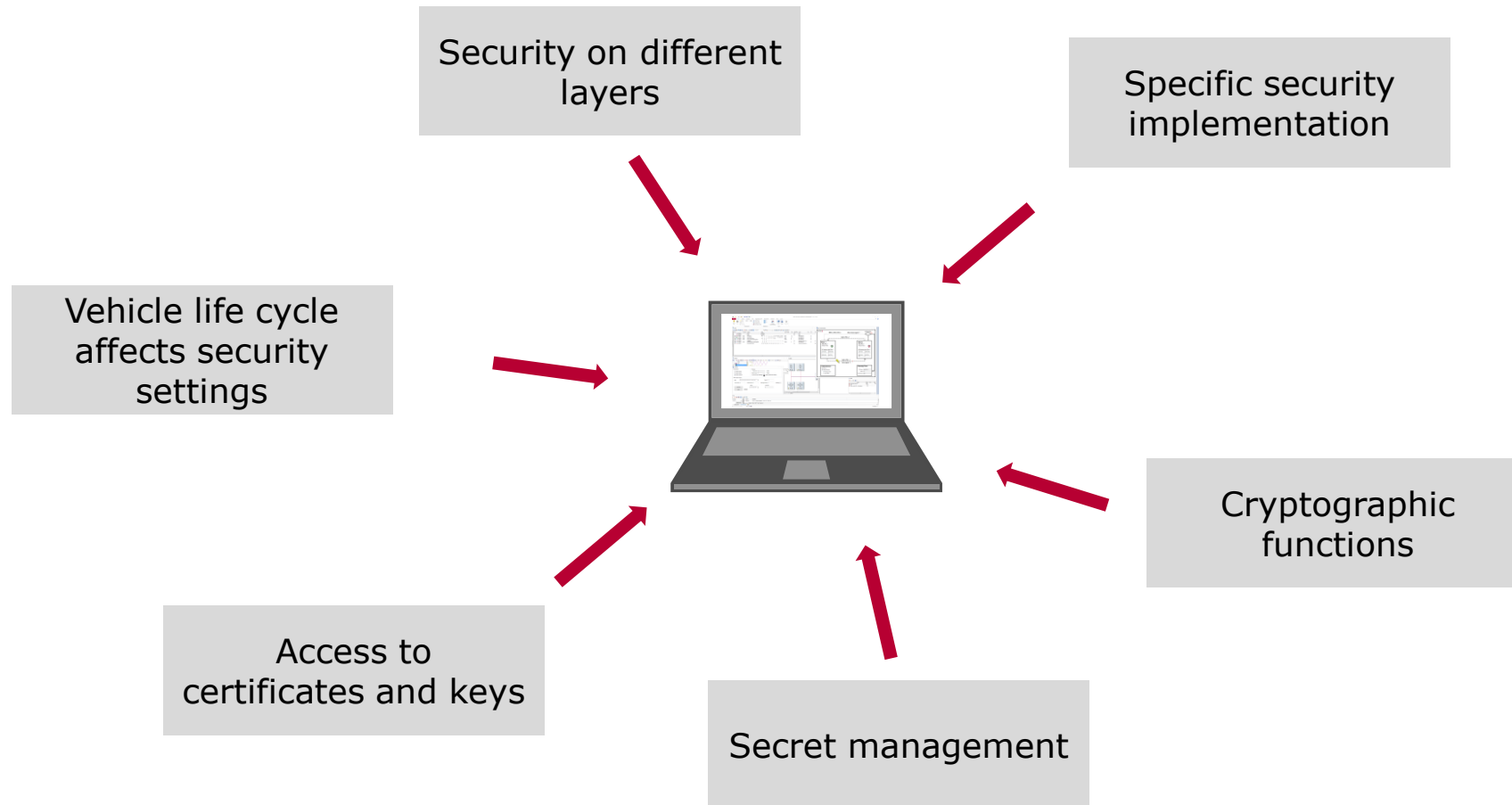
### Communication analysis

-  Reading data
-  Verification of authentication information
-  Check data integrity
-  Detection of old / replayed data

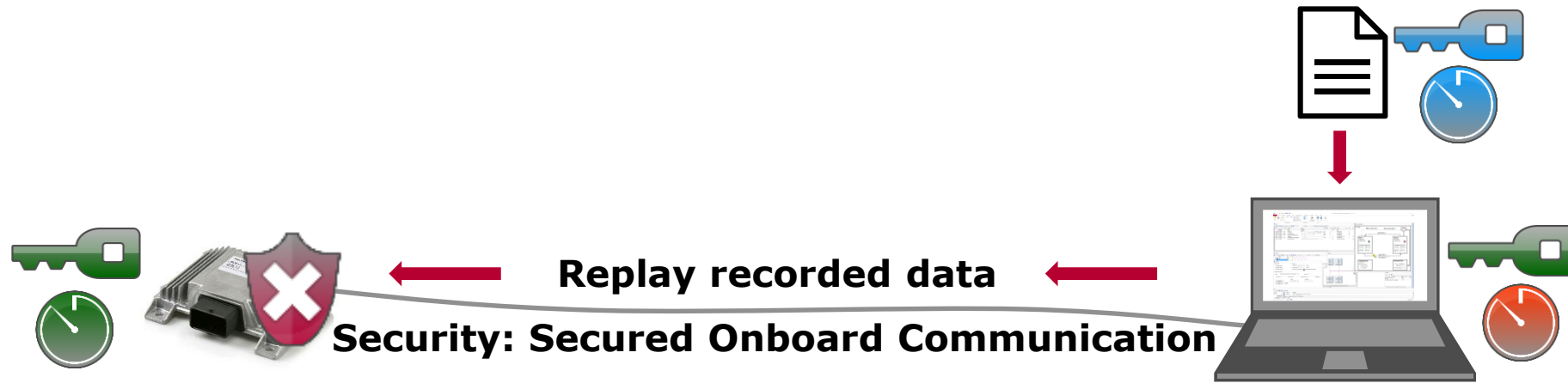
### Remaining bus simulation / Stimulation

-  Authenticator calculation
-  Freshness management

## Tool challenges to support security



## Data Replay



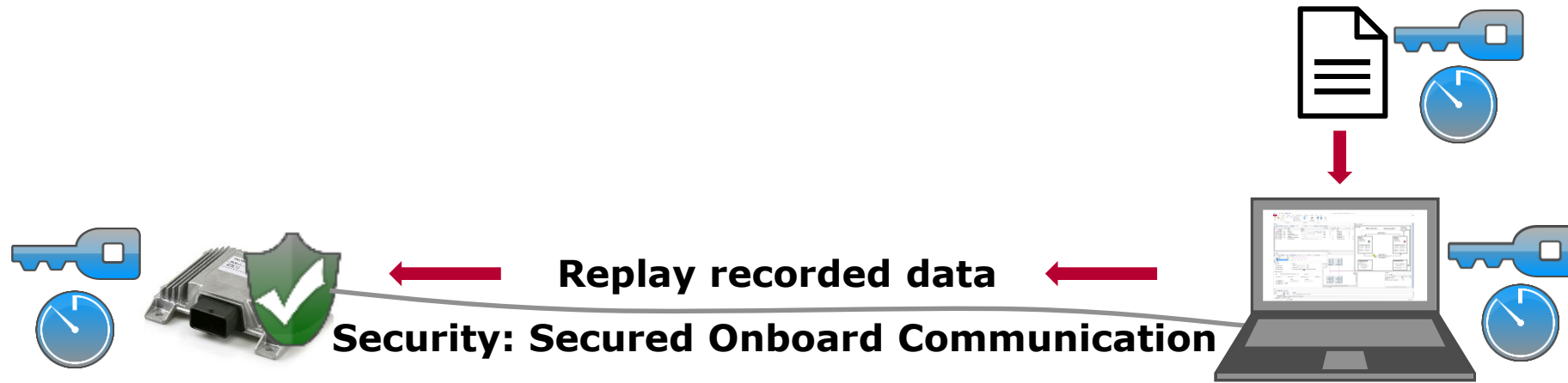
▶ **Task: Frame based replay of recorded bus data**

- ▶ No recalculation of security information
- ▶ Exact timing

▶ **Typical result: ECU rejects the replayed data**

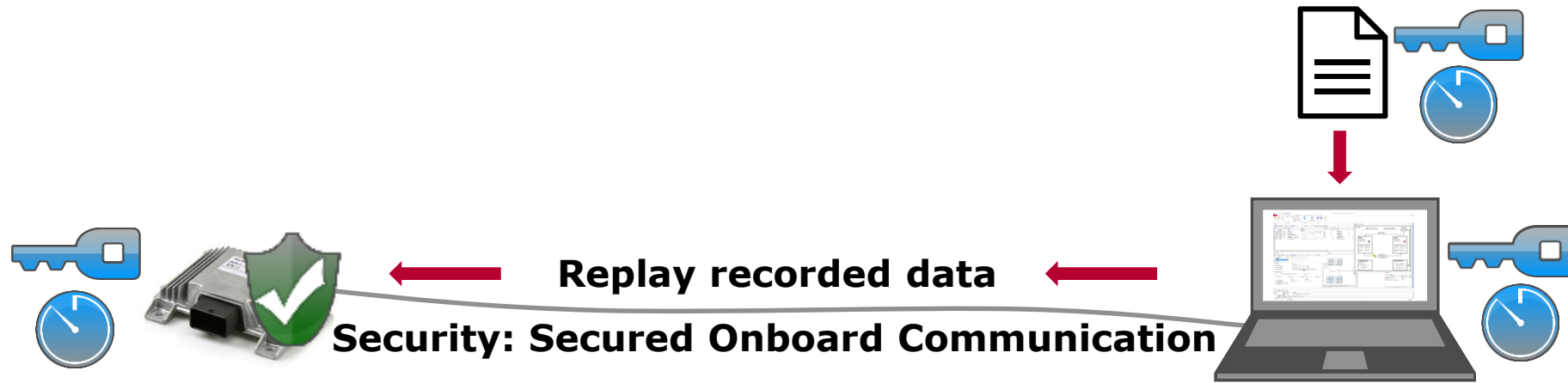
▶ **Reason: There is no shared security understanding between tool, ECU and replay data**

## Data Replay



- ▶ **Synchronize key and freshness between tool, ECU and replay data**
  - ▶ Adjust ECU settings manually
  - ▶ Use development keys
  - ▶ Tool acts as freshness provider

## Data Replay



- ▶ **The security concept has to define tool access interfaces**
  - ▶ Backend access to secrets
  - ▶ Trigger or participate in key generation / key exchange
  - ▶ Read or write ECU freshness

## Summary

- ▶ **Tools have to support security**
- ▶ **Security is different and a tool has to support variants of security to be generic**
- ▶ **Use cases i.e. replay of recorded data will only work if tool access was part of the security concept**



Security from a tool perspective

Don't forget the tools when you think about security!



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