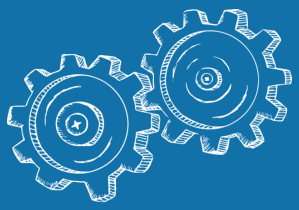


Side-Channel Attacks on Confidential Virtual Machines

Advisor: **Fabian Rauscher**

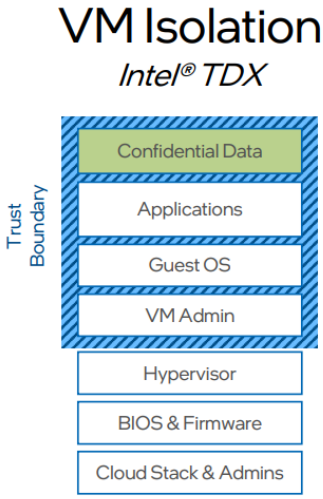
Motivation

Confidential virtual machines (CVMs) are new trusted execution environments (TEEs) that allow for the execution of entire virtual machines inside a trusted environment that is protected from a potentially malicious host. CVMs are starting to be introduced on more and more CPU architectures by a variety of CPU vendors (AMD SEV-SNP, Intel TDX, ARM CCA, RISC-V CoVE).

In this thesis, you will perform side-channel attacks on CVMs. In the threat model of a malicious/compromised host an attacker has a significant amount of power which can be abused to perform previously unviable attacks.

Goals and Tasks

- Get familiar with CVMs and side-channel attacks
- Analyze potential attack primitives
- Implement an attack on a CVM to leak secret information



Literature

- F. Rauscher et al.
  TDXploit: Novel Techniques for Single-Stepping and Cache Attacks on Intel TDX
  USENIX Security
- E. Aktas et al.
  Intel trust domain extensions (TDX) security review
  Tech. rep.
  Google, 2023

Courses & Deliverables

- ☑ **Introduction to Scientific Working**
  Short report on background
  Short presentation
- ☑ **Bachelor Project**
  Project code and documentation
- ☑ **Bachelor's Thesis**
  Project code
  Thesis
  Final presentation

Recommended if you're studying

☑ CS ☑ ICE ☑ SEM

Prerequisites

- understanding of low level code and operating systems (SLP/OS)
- low level programming skills (C/C++)
- not being scared of assembly

Advisor Contact

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