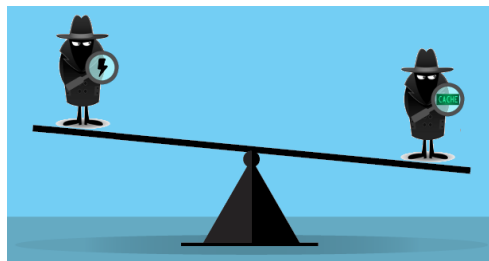


Semester Thesis:

How bad is that security leak?

Today's Laptops, Servers and mobile devices (smartphones, tablets, ...) are often used for sensitive applications (bank, health, ...) as well as non-sensitive applications (games) or are even shared among multiple users at the same time. While various sandboxing and segregation techniques exist to ensure the security of sensitive application and information, the applications still share the system. The coexistence on the same system allows the leak information, for example through covert channels. In recent time, covert channels have been a very popular research topic, but the classification of their threat potential and a comparison of different covert channels are still very hard. In this thesis, we will



try to establish a framework which allows researchers and application developers to easily exploit and benchmark covert channels in their systems, to make covert channels comparable and allow an easy classification of the threat potential.

Tasks

The student will extend our work on the evaluation of covert channels. It mainly focuses on covert channels which are established through physical characteristics of the CPU cores. The main tasks to complete the thesis will be:

- Get to know the existing measurement framework for known covert channels
- Optimize the current data analysis framework
- Find and apply methodologies to find the capacity bounds for known covert channel
- Case Study: Evaluate the channels achievable maximum throughput and the robustness under laboratory conditions as well as realistic attack scenarios on different target devices.
- Compare all examined covert channels and classify their threat potential.

Requirements / Skills

- Knowledge in ...
 - Application development (C / C++ / Java)
 - Data Analysis (MATLAB / Python)
 - UNIX Shell (Scripting)
 - Software Development Paradigms
 - System Security, Signal Processing
 - Classification, Neural Networks
- Curiosity, ability to work independently and interest in security and in systems research

Interested? Please have a look at <http://www.tec.ethz.ch/research.html> and contact us for more details!

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