TU Graz

Different Topics related to Rowhammer

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Motivation

In DRAM, data is stored in cells consisting of capacitors and transistors. In 2014, Kim et al. showed that DRAM is susceptible to disturbance errors. By frequently accessing DRAM cells, it is possible to leak charge from or into DRAM cells nearby. Depending on the data stored in the cells that flipped, it is possible to escape sandboxes or perform local privilege escalation. Additionally, it was also shown that Rowhammer works from JavaScript in the browser, over the network, across VMs on the same host, etc.

There are multiple projects based on Rowhammer. However, these projects are current research and some of them are part of running projects. Therefore, the projects are not publically announced on the website. If you are interested in any Rowhammer related topic, feel free to contact me.

In addition to some topics I wrote out, you can also suggests own topics you are interested in and we can discuss them. Just write a mail when you are interested in the general area of Rowhammer.

Goals and Tasks

In general, the different topics consists of the following parts:

📕 Get familiar with Rowhammer in general [2 Weeks]

📕 Get familiar with concepts related to the topic [1 Week]

🔧 Implement something related to the topic [1.5 Month]

🔧 Perform an experimental evaluation [2 Weeks]

💡 Analyze the results [2 Weeks]

Literature

> Y. Kim et al.
> Flipping Bits in Memory Without Accessing Them: An Experimental Study of DRAM Disturbance Errors
> ISCA

> M. Seaborn and T. Dullien
> Exploiting the DRAM rowhammer bug to gain kernel privileges
> Black Hat 2015

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

> Interest in the topic area

> Programming (C/C++, Python)

Advisor Contact

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