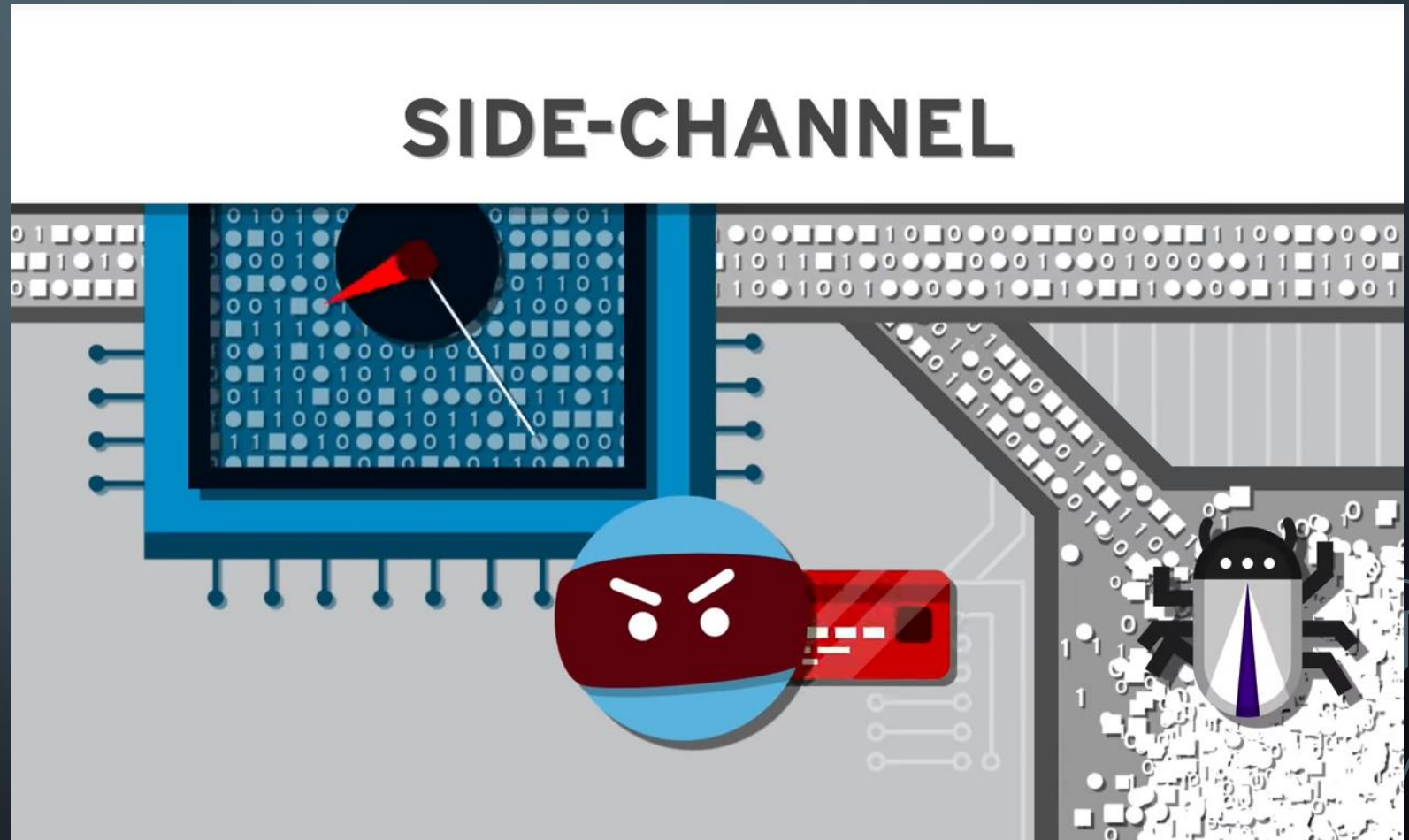


BY FREE KNOWLEDGE MISSION

WHAT IS MELTDOWN & SPECTRE?

Analogy

- Let's say your friend typically order coffee in the morning
- You buy your friend coffee
- If friend does want coffee, you've saved time
- Your friend is sick and wants juice instead
- The coffee is not used



SPECIFICS

- CPU Design Architecture for speculative execution or branch execution
- Designed when computers were centralized
 - Discovered last summer but kept secure to build fixes – Some fixes released early
 - No known security breaches
- CPU Prediction speeds up processing nearly 30% for repetitive tasks
- Bad predictions are not used but left in shared memory and left unsecure

SECURITY DESIGN

- Intended Security Design – Program predicts the next CPU tasks such as video decoding but cannot access secure information such as passwords
- With reverse engineering, hackers have coded ways around it read secure information in the thrown away memory

WHO IS EFFECTED?

- Nearly all CPUs including Intel, Qualcomm, ARM, Intel
- All operating system including Window, Mac, Linux
- Nearly all Tablets, Smartphones, Desktops, & Servers

Summary of major CPUs effected

Company	Spectre 1	Spectre 2	Meltdown
AMD	71 Server CPUs 31 Workstation CPUs 100 Desktop CPUs 72 Mobile CPUs	71 Server CPUs 31 Workstation CPUs 100 Desktop CPUs 72 Mobile CPUs	None
Apple	13 Mobile SoCs	13 Mobile SoCs	13 Mobile SoCs
ARM	11 Mobile CPUs 3 Server SoCs	11 Mobile CPUs 3 Server SoCs	4 Mobile CPUs 3 Server SoCs
Intel	209 Server / Workstation CPUs 344 Desktop CPUs 427 Mobile CPUs	209 Server / Workstation CPUs 344 Desktop CPUs 427 Mobile CPUs	209 Server / Workstation CPUs 344 Desktop CPUs 427 Mobile CPUs
Total	1281 CPUs	1281 CPUs	1000 CPUs

WHAT'S THE DISTINCTION?

- Meltdown

- Operating system – Individual programs effected
- Single program accessing more memory than allowed causing meltdown
- Can be patched with operating system software – limit memory sharing

- Spectre

- Named after speculative execution
- Can get access to other programs memory
- Requires hardware fixes – Intel releasing firmware update – It will most likely require new hardware redesign.

RESOURCES

- [Find patches for your OS, Browser, and Antivirus](#)
- [CPU's effected](#)