

Security bulletin TN1474-ST-PSIRT: Information on software-based microarchitectural timing side-channel attacks on MCUs with TrustZone for Armv8-M

Overview

An article entitled *Software-based Microarchitectural Timing Side-channels Attacks on TrustZone-M MCUs* was disclosed on May 11 - 12, 2023 at the *Black Hat Asia* conference. It identifies a potential vulnerability of an application running on an Arm® Cortex®-M33 processor with TrustZone® for Armv8-M. The vulnerability only concerns applications implementing **secret-dependent control flow** or **secret-dependent memory access**.

STMicroelectronics does not promote or claim protection against this type of side-channel attack. That is, against a side-channel attack targeting applications that implement **secret-dependent control flow** or **secret-dependent memory access**. Nevertheless, users concerned by this type of side-channel attack can find additional information in the article <https://developer.arm.com/documentation/ka005578/latest> by Arm and in this document.

Description

The confidentiality of a secret managed by an application could be compromised when the following conditions are all met:

- The integrated circuit (an STMicroelectronics product inclusive) has an architecture that separates Non-secure and Secure zones (such as TrustZone for Armv8-M).
- The Non-secure and Secure zones on the integrated circuit share some of the resources, such as memories.
- The application on the Secure side implements **secret-dependent control flow** or **secret-dependent memory access**.

When these conditions are met, the user must consider the impact and risk of an attack to the Secure zone case by case in their application context.

To include a **secret-dependent control flow** or **secret-dependent memory access** in the Secure zone, the application developer should apply relevant applicative countermeasures against side-channel attacks.

This is a complex attack that requires the knowledge of the code on the Secure side and the rights to execute a malicious code on the Non-secure side.

Credit

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Contact information

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Revision history

Table 1. Document revision history

Date	Version	Changes
05-June-2023	1	Initial version.

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