**# Title:**

AArch64 SME support

**# Status:**

Draft

**# Document:**

UEFI Specification 2.10

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**# Summary of the change**

The Arm A class v9.0 architecture introduces the optional Scalable Matrix Extension (SME). When SME is implemented the AArch64 execution environment can be in a mode called Streaming SVE mode.

The execution of a subset of the floating point (FP) instructions is illegal when the core is in the Streaming SVE mode.

This change ensures that the UEFI RT services are never called while the core is in the Streaming SVE mode.

**# Benefits of the change**

The introduced changes ensure that the execution of the UEFI RT services is not aborted due to an illegal instruction exception when executing an FP instruction while the core is in the Streaming SVE mode.

**# Impact of the change**

* **Platform FW:**
  + No impact
* **Operating Systems:**
  + OSs that make use of the SME functionality must ensure that the core is not in the Streaming SVE mode prior to calling UEFI RT services.

**# Detailed description of the change [normative updates]**

* Insertions highlighted
* Removals in ~~red~~

2.3.6 AArch64 Platforms

…  
  
For an operating system to use any runtime services, it must:

…

* If the core implements the Scalable Matrix Extension, the OS must ensure that the per-core Streaming SVE mode is disabled before the core calls a runtime service.

…

2.3.6.4 Detailed Calling Convention

The base calling convention for the AArch64 binding is defined in the document *Procedure Call Standard  
for the ARM 64-bit Architecture Version A-0.06 (or later):*See “Links to UEFI-Related Documents” (http://uefi.org/uefi) under the heading “ARM 64-bit Base Calling  
Convention”  
This binding further constrains the calling convention in these ways:

* The AArch64 execution state must not be modified by the callee.
* All code exits, normal and exceptional, must be from the A64 instruction set.
* Floating point and SIMD instructions may be used.
* Optional vector and matrix operations and other instruction set extensions may only be used:  
  + After dynamically checking for their existence.
  + Saving and then later restoring any additional execution state context