



## HASH internal peripheral



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## 1 Article purpose

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The purpose of this article is to:

- briefly introduce the HASH peripheral and its main features
- indicate the level of security supported by this hardware block
- explain how each instance can be allocated to the three runtime contexts and linked to the corresponding software components
- explain, when necessary, how to configure the HASH peripheral.



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## 2 Peripheral overview

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The **HASH** peripheral is used to compute a message digest.

Digest algorithms could be:

- MD5<sup>[1]</sup>
- SHA<sup>[2]</sup> (1, 224, 256)

The **HASH** peripheral is also able to give the HMAC<sup>[3]</sup> used for authentication using the same algorithm support.

### 2.1 Features

Refer to the [STM32MP15 reference manuals](#) for the complete list of features, and to the software components, introduced below, to see which features are implemented.

### 2.2 Security support

HASH1 is a **secure** peripheral (under ETZPC control)

HASH2 is a **non secure** peripheral .



## 3 Peripheral usage and associated software

### 3.1 Boot time

HASH1 instance is used as boot device to support binary authentication.  
HASH2 is not used at boot time.

### 3.2 Runtime

#### 3.2.1 Overview

HASH1 instance can be allocated to:

- the Arm<sup>®</sup>Cortex<sup>®</sup>-A7 secure core to be controlled in OP-TEE by the OP-TEE HASH driver
- or
- the Arm<sup>®</sup>Cortex<sup>®</sup>-A7 non-secure core to be controlled in Linux<sup>®</sup> by the Linux Crypto framework

HASH2 instance can be allocated to:

- the Arm<sup>®</sup>Cortex<sup>®</sup>-M4 to be controlled in STM32Cube MPU Package by STM32Cube HASH driver

Chapter [Peripheral assignment](#) describes which peripheral instance can be assigned to which context.

#### 3.2.2 Software frameworks

Domain	Peripheral	Software components			Comment
OP-TEE	Linux	STM32Cube			
Security	HASH	OP-TEE HASH driver	Linux Crypto framework	STM32Cube HASH driver	

#### 3.2.3 Peripheral configuration

The configuration is applied by the firmware running in the context to which the peripheral is assigned. The configuration can be done alone via the [STM32CubeMX](#) tool for all internal peripherals, and then manually completed (particularly for external peripherals), according to the information given in the corresponding software framework article.

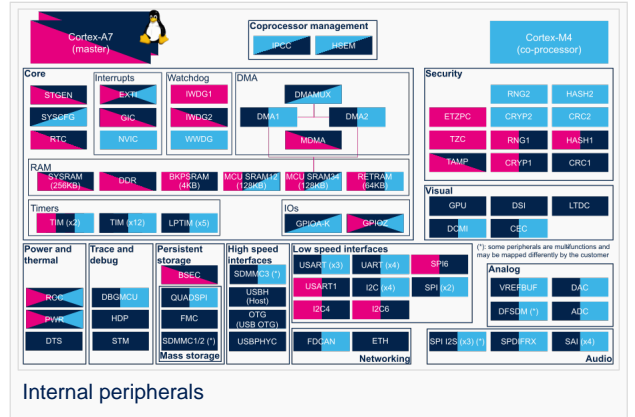
#### 3.2.4 Peripheral assignment

**Check boxes** illustrate the possible peripheral allocations supported by STM32 MPU Embedded Software:

- means that the peripheral can be assigned ( ) to the given runtime context.
- is used for system peripherals that cannot be unchecked because they are statically connected in the device.

Refer to [How to assign an internal peripheral to a runtime context](#) for more information on how to assign peripherals manually or via [STM32CubeMX](#).

The present chapter describes STMicroelectronics recommendations or choice of implementation. Additional possibilities might be described in [STM32MP15 reference manuals](#).



Domain	Peripheral	Runtime allocation		Comment
Instance	Cortex-A7 secure (OP-TEE)	Cortex-A7 non-secure (Linux)	Cortex-M4 (STM32Cube)	
Security	HASH	HASH1		Assignment (single choice)
		HASH2		



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## 4 How to go further

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Not applicable.



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## 5 References

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- <https://en.wikipedia.org/wiki/MD5>
- [https://en.wikipedia.org/wiki/Secure\\_Hash\\_Algorithms](https://en.wikipedia.org/wiki/Secure_Hash_Algorithms)
- <https://en.wikipedia.org/wiki/HMAC>

Message Digest 5

Secure Hash Algorithm

Hash-based Message Authentication Code

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