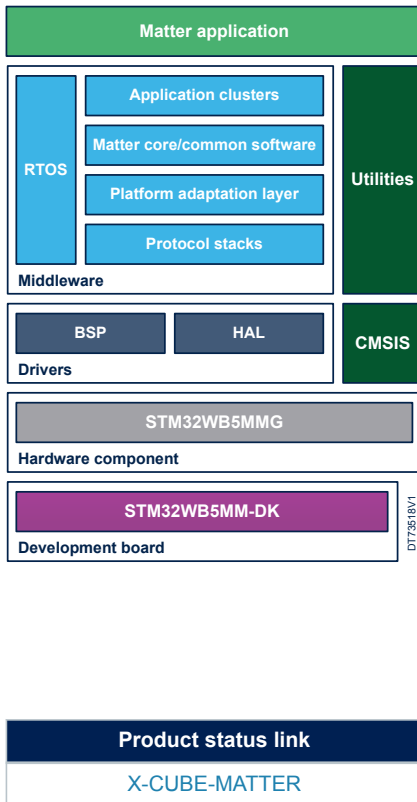


Matter software expansion for STM32Cube



Features

- Integration of Matter on compatible STM32 microcontrollers with examples of application
- Support for Bluetooth® Low Energy protocol stack for device commissioning
- Support for the Thread® operational network
- Certified Bluetooth® Low Energy protocol stack
- Certified Thread® 1.3 protocol stack
- Concurrent operational mode with Thread® and Bluetooth® Low Energy
- FreeRTOS™ kernel
- Ready for CSA certification
- Support for on-demand provisioning service to install factory data including device attestation certificate (DAC)
 - During Matter device manufacturing
 - On the field
- Low power capable
- Security component (cryptographic library)
- Secure Boot and Secure Firmware Update over-the-air
- Drivers and libraries
- Project binary files provided for immediate demonstration
- Compatible with the various STM32Cube environments: Linux®, macOS®, and Windows®

Description

The X-CUBE-MATTER Expansion Package features Matter support preintegrated on compatible STM32 microcontrollers. It is a reference implementation for the demonstration of Matter on STM32. It is ready for prototyping a Matter end-device on a reference development platform. Refer to STMicroelectronics Matter wiki articles at wiki.st.com/stm32mcu for the supported STM32 platforms.

X-CUBE-MATTER is ready for CSA certification with the default dimmable light cluster. However, it also provides other clusters.

The Matter application project stores the device credentials and keys in the STM32 embedded flash memory, or in an external flash memory for which X-CUBE-MATTER provides a driver. Once provisioned, the security-sensitive data and operations remain in a secure partition, where they are not exposed to the user application. The Secure Boot process acts as a Root of Trust for the application before launching it. It takes care of the Secure Firmware Update once the user application has downloaded a new image.



The X-CUBE-MATTER Expansion Package embeds different sorts of open-source components:

- Some components from CSA (such as application clusters, utility clusters, or common) are reused without modification
- Some other third-party components selected by STMicroelectronics (such as FreeRTOS™ kernel, mbedTLS, and LwIP) are reintegrated
- Some components defined by CSA are modified or implemented by STMicroelectronics (such as the Bluetooth® Low Energy platform adaptation and the OpenThread platform adaptation)

The OpenThread and Bluetooth® Low Energy stacks can be located on the application microcontroller in the case of a chipset solution. They can also be located on the coprocessor dedicated to the wireless stack. Refer to the wiki site for the software partitioning of each target platform.

The delivered application examples are part of the project. They are available as precompiled binaries for an out-of-the-box experience. The source codes are also available. They can be compiled with the supported IDEs. Refer to the wiki site for the detailed list of supported applications.

The power manager framework, when embedded, is implemented in the utilities component.

1 General information

The STM32WB microcontrollers are based on the Arm® Cortex®-M4 and Cortex®-M0 processors.

Note: Arm is a registered trademark of Arm Limited (or its subsidiaries) in the US and/or elsewhere.



1.1 Ordering information

X-CUBE-MATTER is available for free for OEMs. Contact the local STMicroelectronics sales representative to obtain the required software package.

1.2 What is STM32Cube?

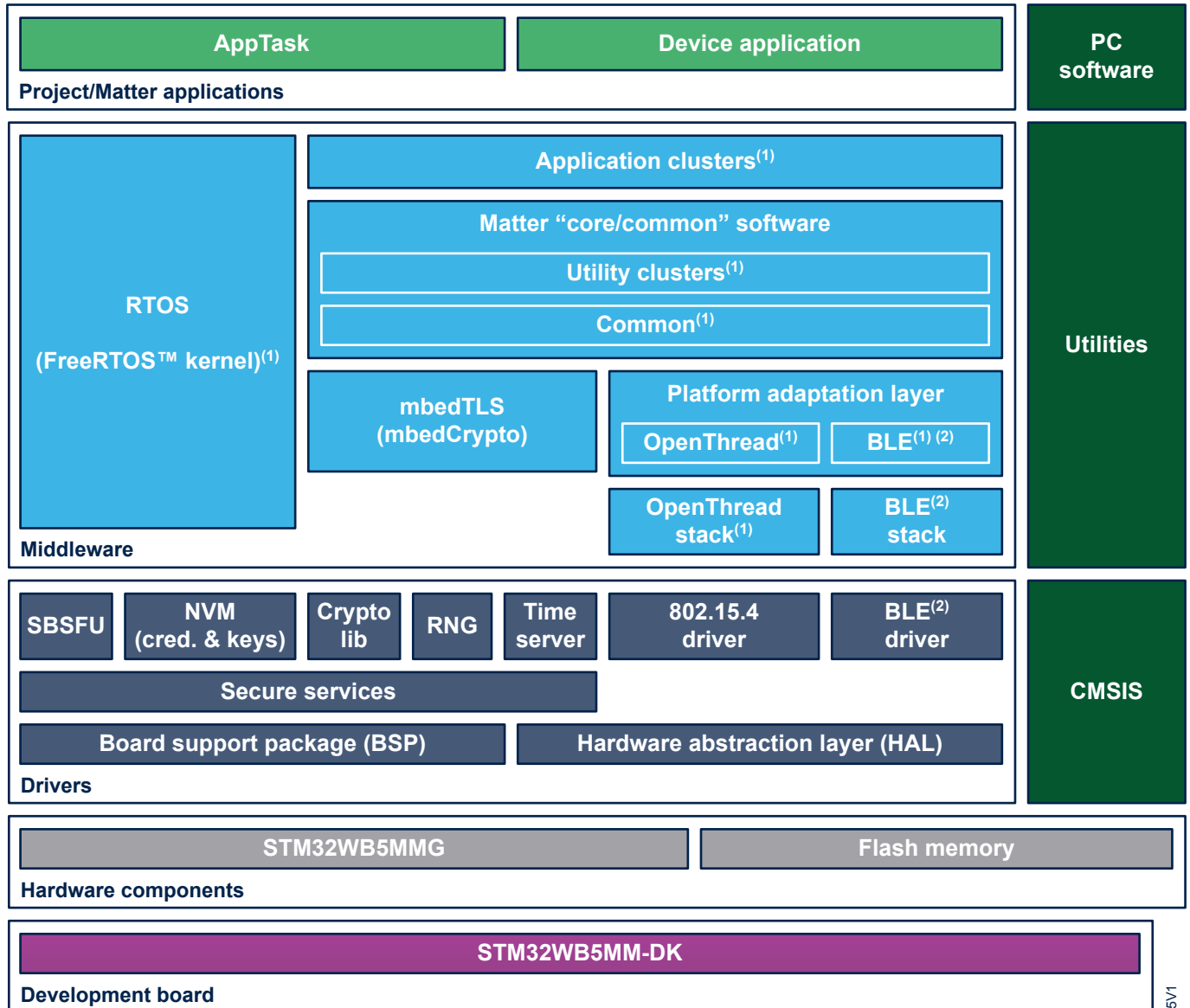
STM32Cube is an STMicroelectronics original initiative to improve designer productivity significantly by reducing development effort, time, and cost. STM32Cube covers the whole STM32 portfolio.

STM32Cube includes:

- A set of user-friendly software development tools to cover project development from conception to realization, among which are:
 - [STM32CubeMX](#), a graphical software configuration tool that allows the automatic generation of C initialization code using graphical wizards
 - [STM32CubeIDE](#), an all-in-one development tool with peripheral configuration, code generation, code compilation, and debug features
 - [STM32CubeCLT](#), an all-in-one command-line development toolset with code compilation, board programming, and debug features
 - [STM32CubeProgrammer \(STM32CubeProg\)](#), a programming tool available in graphical and command-line versions
 - [STM32CubeMonitor \(STM32CubeMonitor, STM32CubeMonPwr, STM32CubeMonRF, STM32CubeMonUCPD\)](#), powerful monitoring tools to fine-tune the behavior and performance of STM32 applications in real time
- [STM32Cube MCU and MPU Packages](#), comprehensive embedded-software platforms specific to each microcontroller and microprocessor series (such as STM32CubeWB for the STM32WB series), which include:
 - STM32Cube hardware abstraction layer (HAL), ensuring maximized portability across the STM32 portfolio
 - STM32Cube low-layer APIs, ensuring the best performance and footprints with a high degree of user control over hardware
 - A consistent set of middleware components such as RTOS, USB Device, touch library, FAT file system, and STM32_WPAN (Bluetooth®, Mesh V1.0, Zigbee®, OpenThread, and 802.15.4 MAC layer)
 - All embedded software utilities with full sets of peripheral and applicative examples
- [STM32Cube Expansion Packages](#), which contain embedded software components that complement the functionalities of the STM32Cube MCU and MPU Packages with:
 - Middleware extensions and applicative layers
 - Examples running on some specific STMicroelectronics development boards

2 Software architecture

Figure 1. X-CUBE-MATTER architecture view



(1) Open-source component.

(2) BLE stands for Bluetooth® Low Energy.

Note: For the STM32WB55xx devices, the OpenThread stack and Bluetooth® Low Energy stack run in a dedicated coprocessor.

3 License

X-CUBE-MATTER is delivered under the *Mix Ultimate Liberty+OSS+3rd-party V1* software license agreement (SLA0048).

Acknowledgments

- Matter is a protocol of the Connectivity Standards Alliance.
- Thread is a protocol of the Thread Group Alliance.
- The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc.



Revision history

Table 1. Document revision history

Date	Revision	Changes
14-Feb-2024	1	Initial release.

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