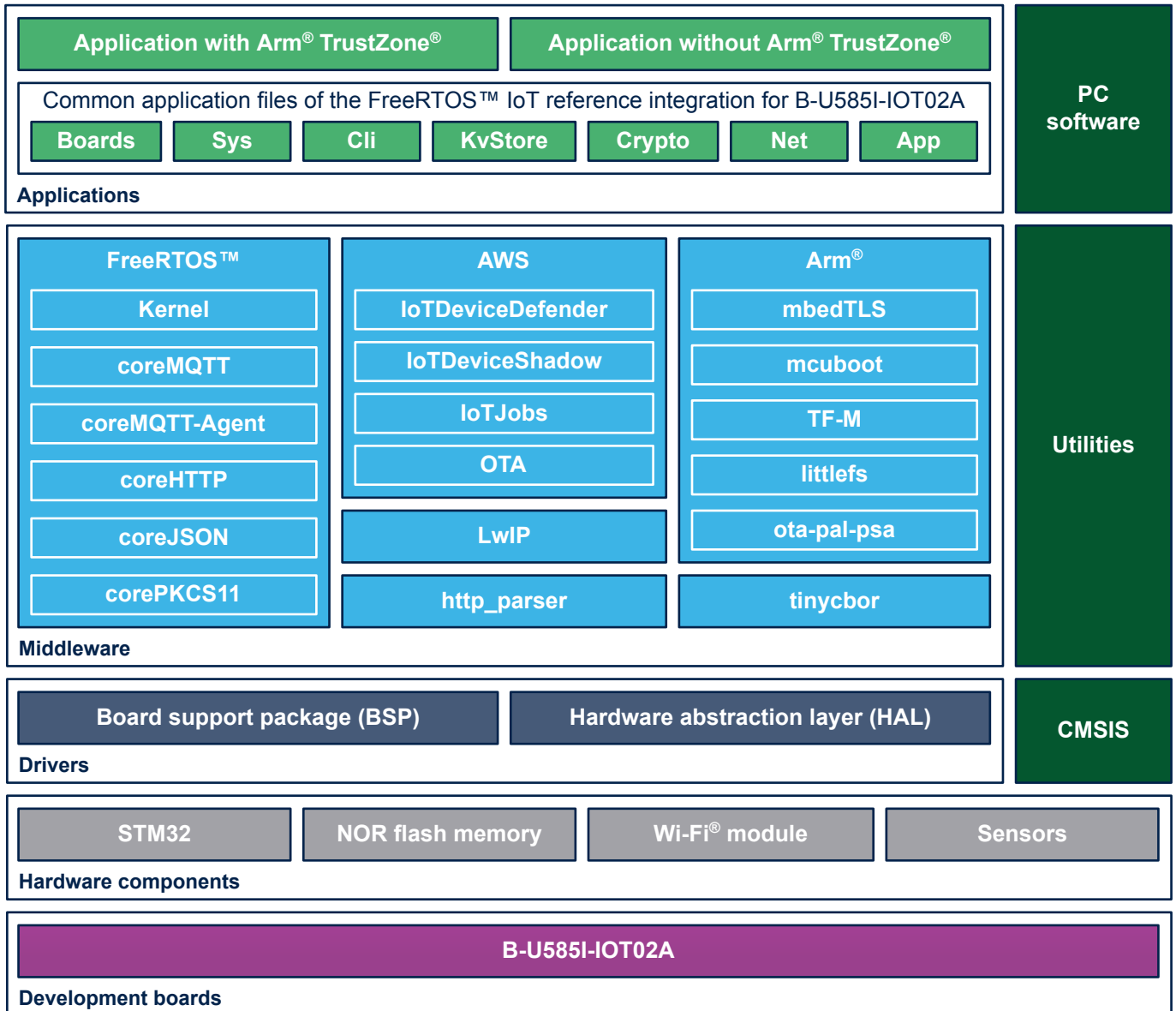


STM32 Amazon Web Services® IoT software expansion for STM32Cube



Product status link

[X-CUBE-AWS](#)



Features

- Amazon FreeRTOS™ IoT reference integration for the B-U585I-IOT02A Discovery kit
- Wi-Fi®
- Configurable TCP/IP stack
- TLS encryption
- Firmware update
- AWS IoT Core™ multi-account registration
- AWS IoT Core™ connection, device shadow, jobs, defender
- AWS IoT Core™ OTA firmware update
- Telemetry with on-board environmental and movement sensors
- Command-line interface:
 - Device provisioning
 - Configuration saving to NVM
 - Monitoring of the FreeRTOS™ kernel tasks and their memory usage
- Easy step-in project, without Arm® TrustZone®
- Arm® TrustZone® for Cortex®-M (TF-M) enabled project:
 - Secure boot
 - Private key and secrets storage
 - Sensitive operations executed in an isolated environment

Description

The X-CUBE-AWS Expansion Package consists of a marginally adapted snapshot of the Amazon FreeRTOS™ IoT reference integration demonstration, running on a B-U585I-IOT02A Discovery kit as an end device.

Refer to the *readme* and to the *Getting Started Guide* available from GitHub at github.com in the *FreeRTOS/iot-reference-stm32u5 project*.

X-CUBE-AWS proposes two projects that expose the same functionalities to the user: runtime device provisioning, telemetry, device defender, and over-the-air firmware update. The telemetry data is provided by the variety of environmental and movement sensors featured by the B-U585I-IOT02A Discovery kit.

The first project, NTZ (no-TrustZone®), saves the device credentials and settings in the external NOR flash memory of the B-U585I-IOT02A Discovery kit.

The second project, TF-M (Trusted Firmware-M), saves the device credentials and settings encrypted in the TF-M protected storage. 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 a new image has been downloaded by the user application.

The B-U585I-IOT02A Discovery kit, which supports Wi-Fi® connectivity with an on-board MXCHIP module, has passed the FreeRTOS™ qualification process.

1 General information

The X-CUBE-AWS Expansion Package is demonstrated on an STM32U5 32-bit microcontroller based on the Arm® Cortex®-M33 processor with Arm® TrustZone®.

Note: Arm and TrustZone are registered trademarks of Arm Limited (or its subsidiaries) in the US and/or elsewhere.



1.1 Ordering information

X-CUBE-AWS is available for free download from the www.st.com website.

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
 - 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 STM32CubeU5 for the STM32U5 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 ThreadX, FileX / LevelX, NetX Duo, USBX, USB-PD, touch library, network library, mbed-crypto, TFM, and OpenBL
 - 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 License

X-CUBE-AWS is delivered under the [SLA0048](#) software license agreement and its Additional License Terms.

Revision history

Table 1. Document revision history

Date	Revision	Changes
29-Mar-2017	1	Initial release.
16-Oct-2017	2	Updated B-L475E-IOT01 item in <i>Features</i> . Updated <i>Description</i> . Updated <i>License</i> .
2-Jul-2019	3	Updated the entire document for the addition of AWS job support, dedicated online dashboard, cellular connectivity, and Secure Boot and Secure Firmware Update. Added <i>What is STM32Cube?</i>
13-Jul-2020	4	Scope changed to the FreeRTOS™ port on B-L4S5I-IOT01A: updated the cover page, <i>Features</i> , <i>Description</i> and <i>License</i> .
24-Sep-2020	5	Updated the figure on the cover page.
19-Apr-2021	6	Added the NUCLEO-H755ZI-Q target: updated <i>Features</i> , <i>Description</i> , <i>License</i> , and the cover picture.
7-Jun-2021	7	Added the STM32WB5MM-DK target: updated <i>Features</i> , <i>Description</i> , <i>License</i> , and the cover picture.
16-Jun-2022	8	Scope changed to the <i>FreeRTOS™ IoT Integration</i> demonstration, released by Amazon: <ul style="list-style-type: none"> • Updated the cover picture • Updated Features and Description • Updated What is STM32Cube? • Updated License

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