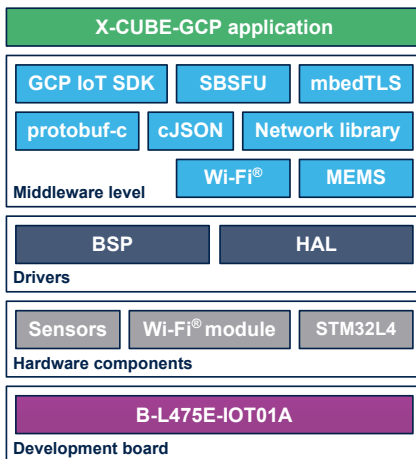


Google Cloud Platform™ software expansion for STM32Cube



Features

- Quick evaluation and development of IoT Core service for the Google Cloud Platform™
- Ready-to-run firmware example
- Based on Google Cloud™ IoT Device SDK for Embedded C
- MQTT cloud connection
- JWT secure connection
- TLS encryption
- Wi-Fi® connectivity
- Telemetry data reporting

Description

The X-CUBE-GCP Expansion Package provides the porting of the Google Cloud™ IoT Device SDK for STM32L4 Series microcontroller acting as end device. X-CUBE-GCP runs on the B-L475E-IOT01A Discovery kit using Wi-Fi® connectivity with an on-board Inventek module. For this platform, a sample application configures the network connectivity parameters, and illustrate various ways for a device to interact with the cloud. The application shows how a simple client application can connect to the IoT Core service of Google Cloud Platform™ to publish device state and telemetry data, and receive device configuration from the cloud. Device authentication through JWT (Json Web Token), TLS encryption, and authentication are supported. The B-L475E-IOT01A board reports telemetry data such as measurement of humidity, temperature, and atmospheric pressure.

Product status link

[X-CUBE-GCP](#)



1 General information

The X-CUBE-GCP Expansion Package runs on STM32 microcontrollers based on Arm® cores.

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



1.1 Ordering information

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

1.2 What is STM32Cube?

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

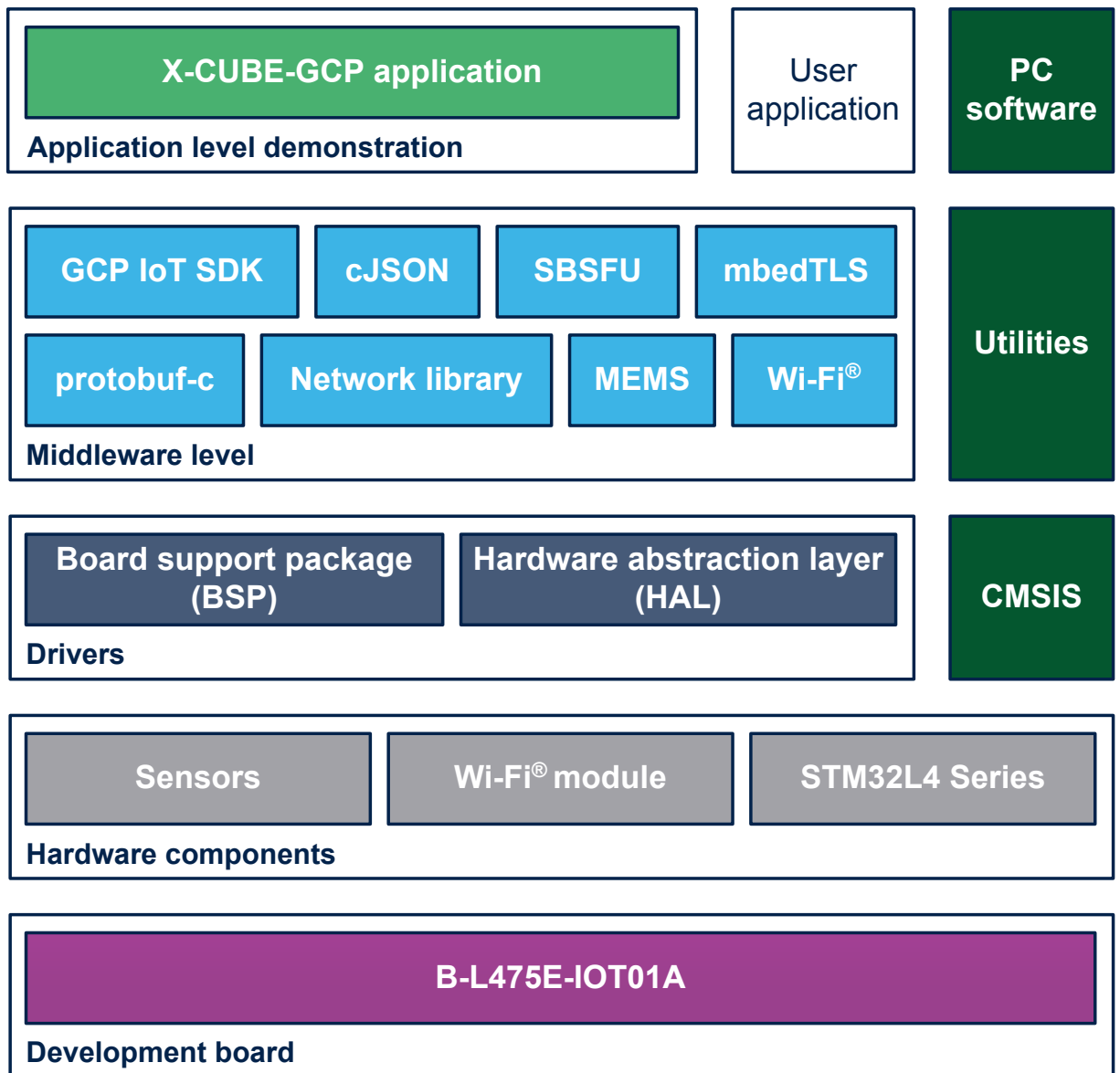
STM32Cube includes:

- A set of user-friendly software development tools to cover project development from the conception to the 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 & MPU Packages, comprehensive embedded-software platforms specific to each microcontroller and microprocessor series (such as STM32CubeL4 for the STM32L4 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 the HW
 - A consistent set of middleware components such as FAT file system, RTOS, USB Host and Device, TCP/IP, Touch library, and Graphics
 - 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 & MPU Packages with:
 - Middleware extensions and applicative layers
 - Examples running on some specific STMicroelectronics development boards

2 Software architecture

The top-level architecture of the X-CUBE-GCP Expansion Package is shown in Figure 1.

Figure 1. X-CUBE-GCP architecture



3 License

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

The software components provided in this package come with different license schemes as shown in Table 1.

Table 1. Software component license agreements

Software component	Owner	License
Google Cloud™ IoT Device SDK for Embedded C	Google LLC	BSD-3-Clause
cJSON	Dave Gamble and Cjson contributors	The MIT License
Board Support Package (BSP)	STMicroelectronics	BSD-3-Clause
Cortex®-M CMSIS	Arm Limited	Apache License 2.0
FreeRTOS™	Amazon Web Services, Inc.	The MIT License
STM32L4xx_HAL_Driver	STMicroelectronics	BSD-3-Clause
Inventek driver	STMicroelectronics	Ultimate Liberty (source release)
LwIP	2001-2004 Swedish Institute of Computer Science	BSD-3-Clause
mbedtls	Arm Limited	Apache License 2.0
STM32_Network_Library	STMicroelectronics	Ultimate Liberty (source release)
STM32_Secure_Engine	STMicroelectronics	Ultimate Liberty (source release)
Project examples	STMicroelectronics	Ultimate Liberty (source release)

Revision history

Table 2. Document revision history

Date	Version	Changes
6-Sep-2018	1	Initial release.
10-Aug-2020	2	Focused on Google Cloud™ IoT Device SDK for Embedded C using the B-L475E-IOT01A sensor Discovery kit with Wi-Fi® connectivity: <ul style="list-style-type: none"> • Updated Features and Description • Updated Software architecture and License Added What is STM32Cube?

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