

## 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
- Google Cloud Platform™ support
- MQTT cloud connection
- JWT secure connection
- TLS encryption
- Cellular, Ethernet, and Wi-Fi® connectivity
- Telemetry data reporting

### Description

The X-CUBE-GCP Expansion Package consists of a set of libraries and application examples for STM32L4 Series, STM32F4 Series, and STM32F7 Series microcontrollers acting as end devices. X-CUBE-GCP runs on five platforms. The B-L475E-IOT01A and 32F413HDISCOVERY boards support Wi-Fi® connectivity with an on-board Inventek module. The 32F769IDISCOVERY board provides a native Ethernet interface. The P-L496G-CELL01 and P-L496G-CELL02 packs include an STM32L496AGI6-based low-power Discovery board equipped with Quectel's UG96 modem (2G/3G) and BG96 modem (LTE Cat M1/NB/2G fallback) respectively for cellular connectivity. For the five platforms, a sample application configures the network connectivity parameters, and illustrates the 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™ in order 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-IOT01 board reports telemetry data such as measurement of humidity, temperature, and atmospheric pressure.



Product status link

[X-CUBE-GCP](#)

## **1**      **Ordering information**

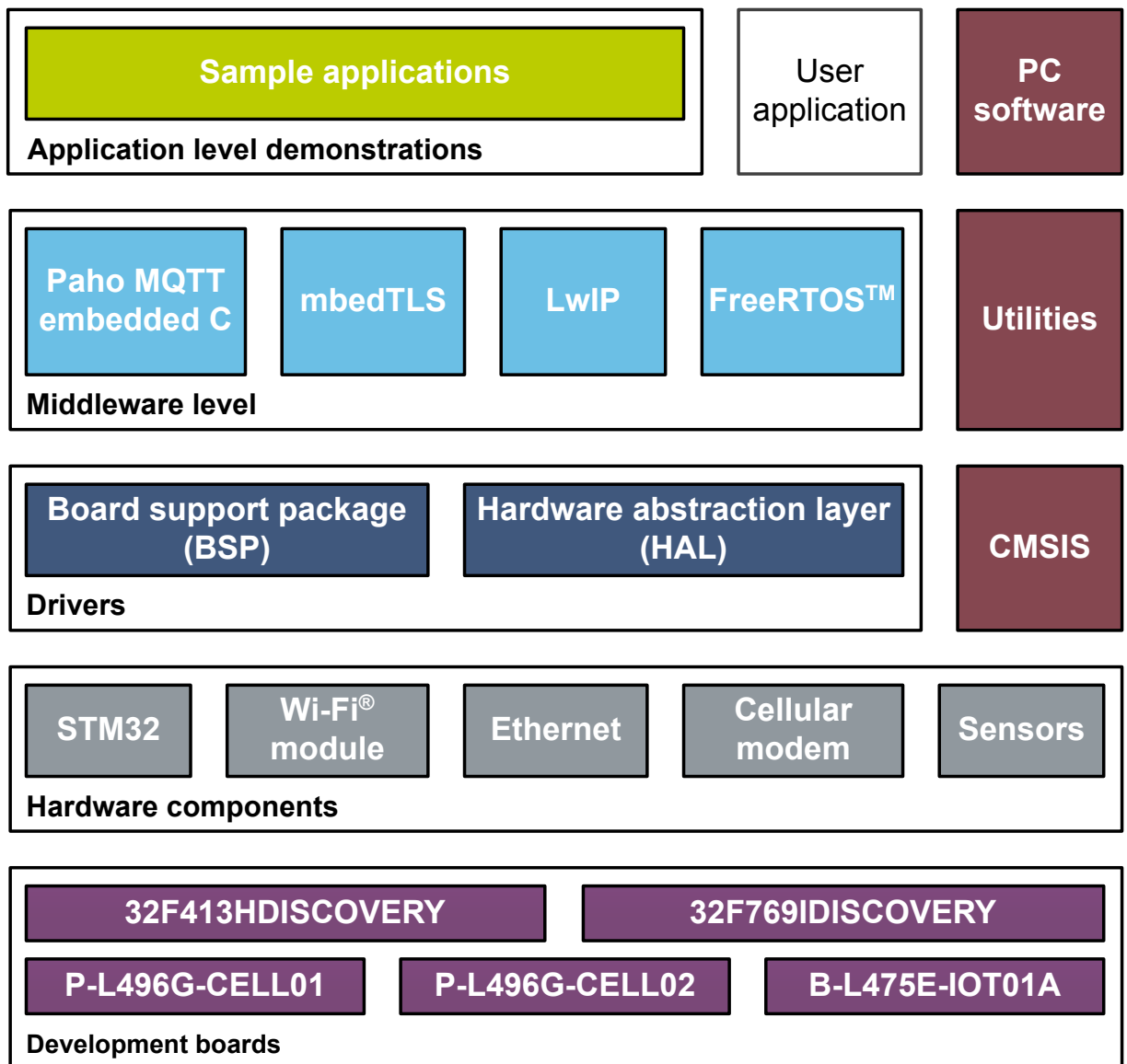
---

X-CUBE-GCP is available for free download from the [www.st.com](http://www.st.com) website.

## 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
cJSON	Dave Gamble and Cjson contributors	MIT
Paho mqtt embedded C	IBM	Eclipse™ Public License - v 1.0
Board Support Package (BSP)	STMicroelectronics	Open source BSD
Cortex®-M CMSIS	Arm®	Open source BSD
FreeRTOS™	2016 Real Time Engineers Ltd	Modified GNU GPL <sup>(1)</sup>
HAL STM32 L4/F4/F7	STMicroelectronics	Open source BSD
Inventek driver	STMicroelectronics	Ultimate Liberty (source release)
LwIP	2001-2004 Swedish Institute of Computer Science	Open source BSD
mbedTLS	Arm®	Apache® License - Version 2.0
Project examples	STMicroelectronics	Ultimate Liberty (source release)

1. The FreeRTOS™ source code is licensed by a modified GNU General Public License, the modification taking the form of an exception. The exception permits the source code of applications that use FreeRTOS™ and are distributed as executables to remain closed source, thus permitting the use of FreeRTOS™ in commercial applications without necessitating that the whole application to be open sourced.

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



## Revision history

**Table 2. Document revision history**

Date	Version	Changes
6-Sep-2018	1	Initial release.

**IMPORTANT NOTICE – PLEASE READ CAREFULLY**

STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST’s terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers’ products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2018 STMicroelectronics – All rights reserved