#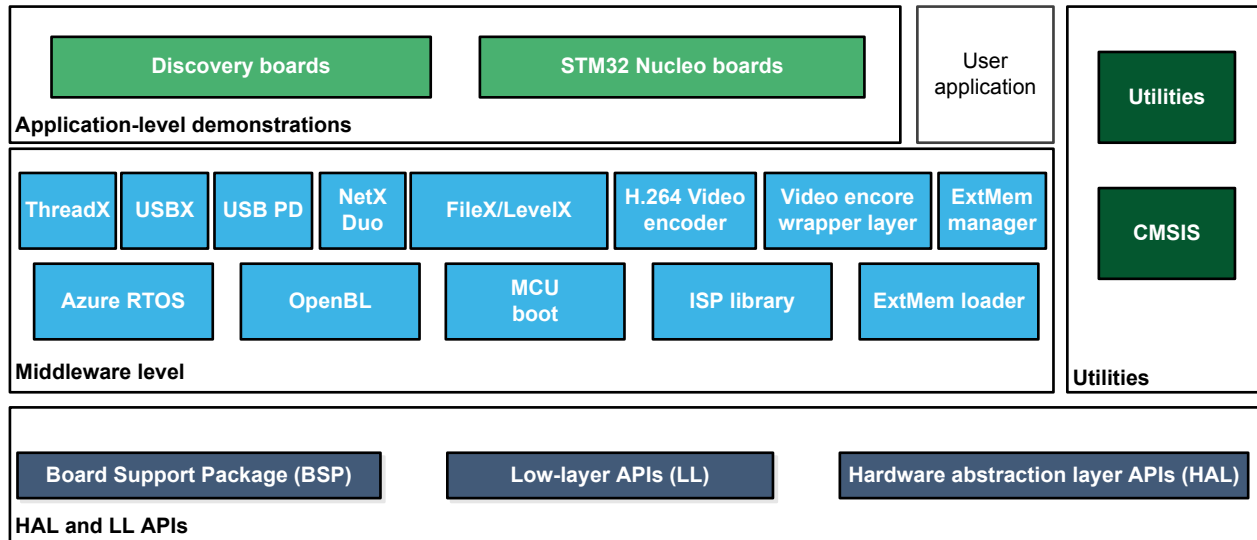 STM32Cube embedded software for STM32N6 series including LL/HAL drivers, USB, H.264 video encoder, image signal processing library, Azure® RTOS, OpenBootloader, external memory manager and loader

Application-level demonstrations

- Discovery boards
- STM32 Nucleo boards
- User application

Middleware level

- ThreadX
- USBX
- USB PD
- NetX Duo
- FileX/LevelX
- H.264 Video encoder
- Video encore wrapper layer
- ExtMem manager
- Azure RTOS
- OpenBL
- MCU boot
- ISP library
- ExtMem loader

Utilities

- Utilities
- CMSIS

HAL and LL APIs

- Board Support Package (BSP)
- Low-layer APIs (LL)
- Hardware abstraction layer APIs (HAL)

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Product status link
STM32CubeN6

Features

- Consistent and complete embedded software that provides hardware abstraction to easily develop end-user firmware
- Maximized portability across all STM32 series supported by STM32Cube
- Up to 180 examples and applications for easy understanding, all compatible with STM32CubeMX to facilitate the configuration through a graphical tool
- HAL and LL APIs, developed in compliance with MISRA C®: 2012 guidelines, elimination of possible runtime errors with Synopsys® Coverity® static analysis tool, and code coverage by running tests on STM32 hardware with the LDRA® dynamic analysis tool (on new drivers or with recent significant updates).
- CMSIS CORE, DSP, and RTOS software components
- STM32N6 comprehensive middleware offer built around Microsoft® Azure® RTOS middleware and other in-house (H.264 video encoder, OpenBootloader, external memory manager and loader, image signal processing)

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- Free-of-charge, user-friendly license terms
- Update mechanism with new-release notification capability

Description

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

STM32Cube includes STM32CubeMX, a graphical software configuration tool that allows the generation of C initialization code using graphical wizards.

It also comprises the STM32CubeN6 MCU Package composed of the STM32Cube hardware abstraction layer (HAL) and the low-layer (LL) APIs, plus a consistent set of middleware components (Azure$^{®}$ RTOS USBX, FileX/LevelX, ThreadX, NetX Duo, USB Power Delivery, H.264 video encoder API, OpenBootloader, MCUboot, external memory manager and loader, image signal processing (ISP) library). All embedded software utilities are delivered with a full set of examples running on STMicroelectronics boards.

The STM32Cube HAL is an STM32 embedded software layer that ensures maximized portability across the STM32 portfolio, while the LL APIs make up a fast, light-weight, expert-oriented layer which is closer to the hardware than the HAL. HAL and LL APIs can be used simultaneously with a few restrictions.

Both the HAL and LL drivers have been developed in compliance with V-Model requirements for design, implementation, and tests. Furthermore, the STMicroelectronics specific validation process adds a deeper qualification level, such as compliance with MISRA C$^{®}$: 2012 guidelines, elimination of possible runtime errors with the Synopsys$^{®}$ Coverity$^{®}$ static analysis tool, and code coverage by running tests on STM32 hardware with the LDRA$^{®}$ dynamic analysis tool (on new drivers or with recent significant updates). Reports are available on demand.

STM32CubeN6 gathers in one single package all the generic embedded software components required to develop an application on STM32CubeN6 microcontrollers. Following STM32Cube initiative, this set of components is highly portable to other STM32 series. In addition, the low-layer APIs provide an alternative, high-performance, low-footprint solution to the STM32CubeN6 HAL at the cost of portability and simplicity.

HAL and LL APIs are available in open-source BSD license for user convenience.

1 General information

1.1 Ordering information

STM32CubeN6 is available for free download from the *www.st.com* website.

1.2 License

The STM32CubeN6 MCU Package runs on STM32N6 32-bit microcontrollers based on the Arm® Cortex®-M55 processor with Arm® TrustZone®.

STM32CubeN6 is delivered under the SLA0048 software license agreement and its Additional License Terms.

Revision history

Table 1. Document revision history

Date	Revision	Changes
13-Nov-2024	1	Initial release
02-Dec-2024	2	Clarifications of HAL and LL drivers quality artefacts.

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