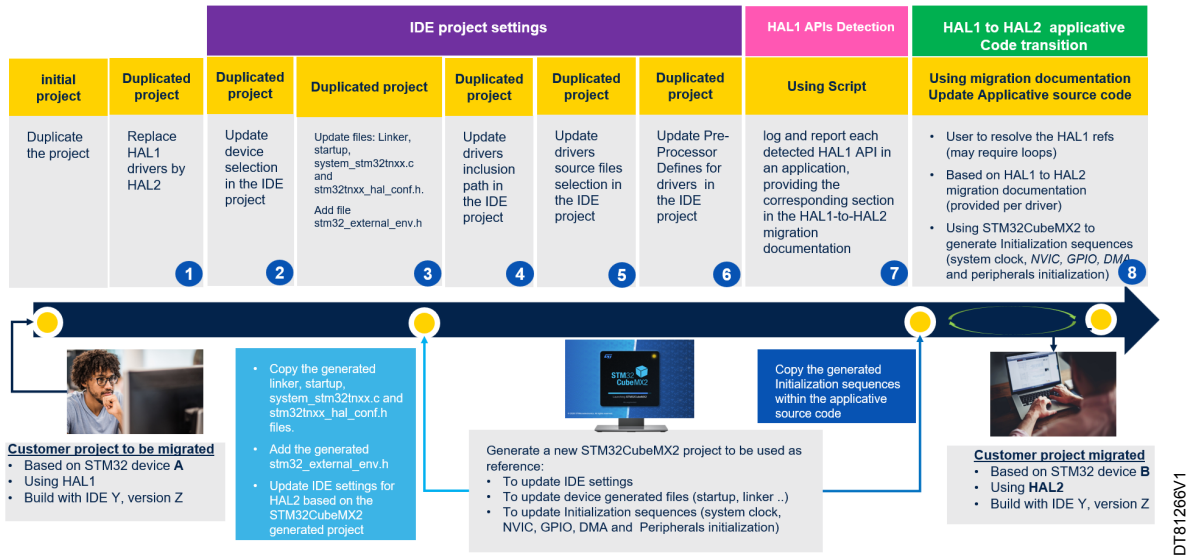
HAL2_MIGRATOR

Data brief

STM32Cube HAL1 to HAL2 migration tool and guide



Product status
HAL2_MIGRATOR

Features

HAL1 automatic detection script:

- Helps identify parts of the code in an application that have changed between HAL1 and HAL2 and therefore need to be updated. A script is provided to analyze the application and perform the actions in the list below
- Scans user application files to detect all HAL1 APIs, defines, types, functions, and macros
- Generates detailed logs and reports, linking each detected API to the relevant migration documentation
- The HAL1 Automatic Detection Script comes in two versions
  - An executable format for Windows® 11.
  - A Python script to run on multiple platforms, providing insights into the script operations.

HAL1 to HAL2 migration user guide:

- Provides all information required to perform a successful migration, while also explaining why these changes are made to HAL and the improvements they bring.
  - Explains HAL2 architectural concepts
  - Provides exhaustive driver-specific migration rules
  - Includes code snippets and concrete use cases for rapid and accurate migration

Migration example:

- Illustrate how a successful migration looks and how other elements of the STM32Cube ecosystem are leveraged, an example is provided that consists of the following two points:
  - Step-by-step guide to migrating a real project, including IDE settings updates
  - Demonstrates leveraging STM32CubeMX2 for initialization sequence generation

HAL migration checklist:

- Provides guidance and ensures all steps are completed, the HAL Migration Checklist enables users to track their migration progress effectively

Description

With the continuous development of the STM32Cube ecosystem, a new major version of the embedded software drivers, HAL2, is now available. HAL2 brings several improvements, especially in terms of usability and performance, while preserving the fundamental principles of the STM32Cube HAL drivers. To achieve these improvements, some breaking changes between HAL1 and HAL2 have been introduced.

To assist with the transition and migration of projects from HAL1 to HAL2, the STM32Cube HAL1 to HAL2 migration tool and guide offers a comprehensive set of tools and documentation. These resources accelerate the transition, address breaking changes, and provide an API detection script, practical examples, and step-by-step guidance to ensure a smooth, efficient, and error-free upgrade path.

1 General information

HAL2_MIGRATOR supports STM32 products based on the Arm® Cortex® processor.

arm

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

The Arm word and logo are trademarks of Arm Limited (or its subsidiaries) in the US and/or elsewhere. All rights reserved.

Note: Windows is a trademark of the Microsoft group of companies.

1.1 Ordering information

HAL2_MIGRATOR is available for free download from the *www.st.com* website.

1.2 License

HAL2_MIGRATOR is delivered under the SLA0048 software license agreement and its Additional License Terms.

2 Migration workflow

The following is a brief description of the general workflow, providing an overview of how to work with the STM32Cube HAL1 to HAL2 migration tool and guide and how the STM32Cube ecosystem supports migration from HAL1 to HAL2:

1. Project duplication: Duplicate a project and replace HAL1 drivers with HAL2 equivalents.
2. IDE update: Update device selection, linker/startup files, and include paths for HAL2.
3. API detection: Use the automatic detection script to identify all HAL1 references in the code.
4. Stubbing feature: Optionally stub detected HAL1 APIs for controlled migration and error-free compilation.
5. Documentation reference: For each detected API, refer to the migration documentation and follow the instructions that are provided.
6. Initialization sequence: Use STM32CubeMX2 to generate HAL2 initialization code and update IDE/project settings.
7. Iterative migration: Repeat detection and migration steps as needed, using the checklist to monitor progress.

The migration flow is illustrated in the cover image.

3 Requirements

The following lists the requirements needed for the HAL2_MIGRATOR:

- Python™ 3.8.0 or later is used to edit and run the scripts
- Windows® 11 64-bit is used to execute the code
- STM32CubeMX2 is used to create and configure the project

Revision history

Table 1. **Document revision history**

Date	Version	Changes
12-Mar-2026	1	Initial release.

Contents