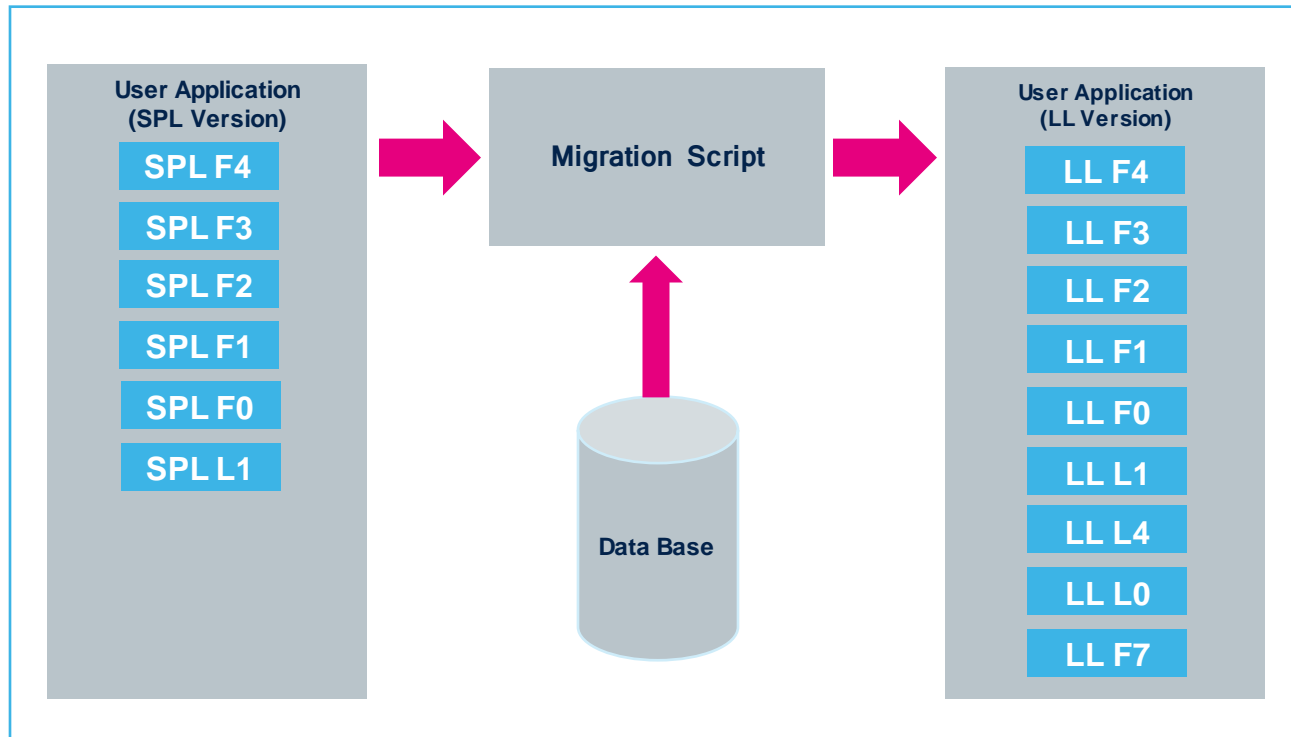# STM32 standard peripheral library to STM32Cube low-layer APIs migration tool

Overview

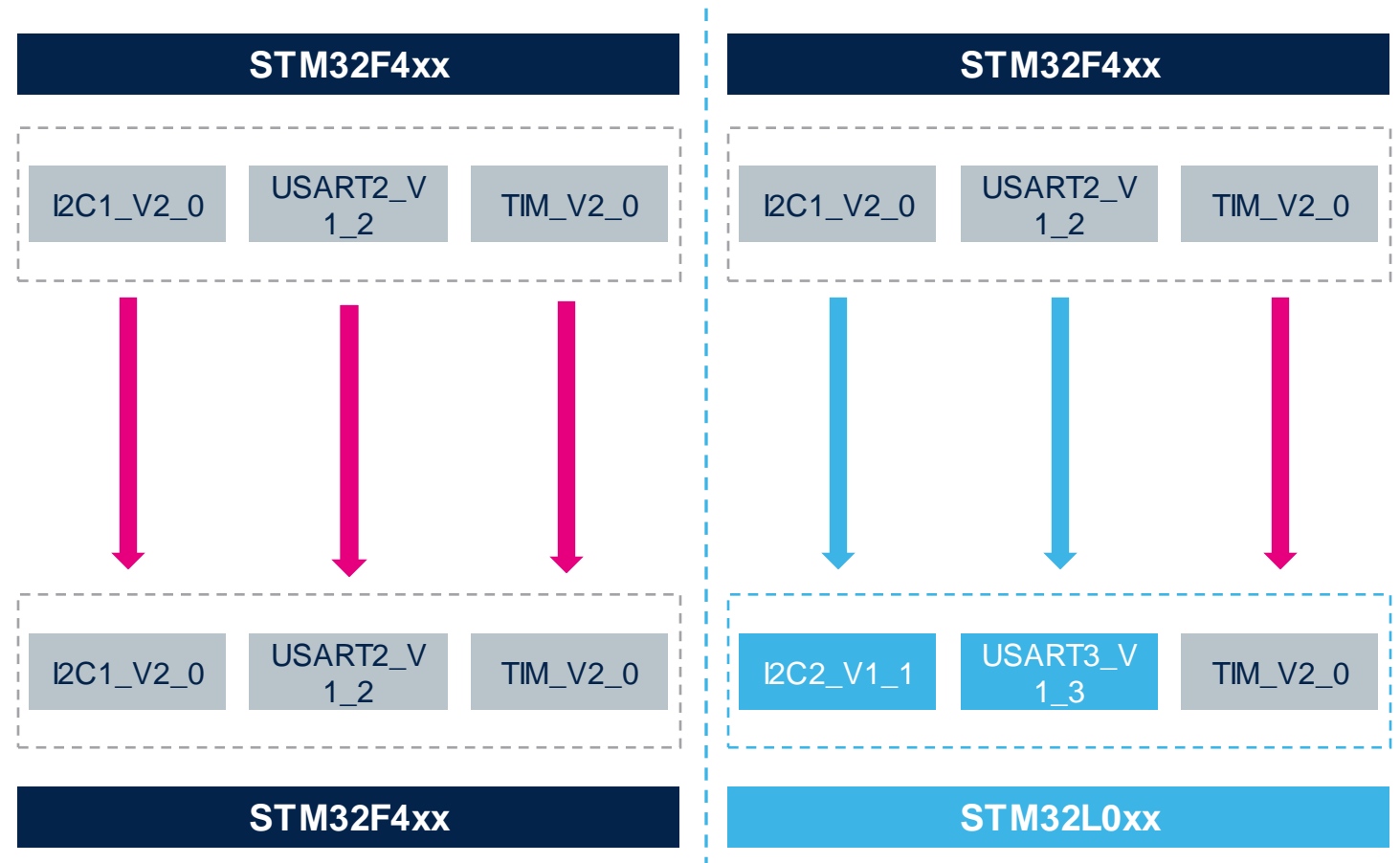## What to expect from the STM32 SPL to STM32Cube LL APIs migration tool?

- Full or partial automated migration from STM32 SPL-based code to STM32Cube LL code depending on use case

- 54 possible migration use cases
  - 6 in single family, ex: SPL F4 to LL F4
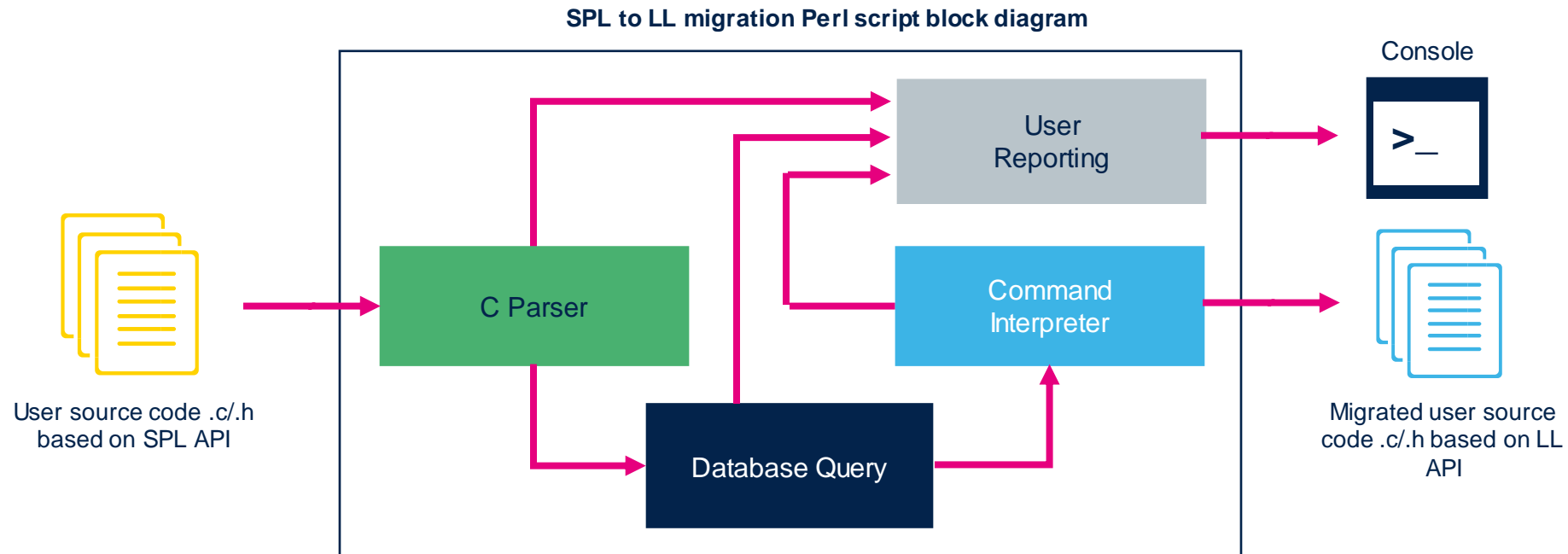 - 48 cross-families, ex: SPL F4 to LL L4

- Available at https://www.st.com/

Full migration vs partial migration depending on IP versioning and feature compatibility

- Full migration is ensured if migrating within the same family
  - Except in case of IP version discrepancy

- Only common features are migrated cross-families

STM32F4xx		
I2C1_V2_0	USART2_V1_2	TIM_V2_0
I2C1_V2_0	USART2_V1_2	TIM_V2_0
STM32F4xx		

STM32F4xx		
I2C1_V2_0	USART2_V1_2	TIM_V2_0
I2C2_V1_1	USART3_V1_3	TIM_V2_0
STM32L0xx		

Migration script overview

SPL to LL migration Perl script block diagram

Console

C Parser

User Reporting

Command Interpreter

Database Query

User source code .c/.h based on SPL API

Migrated user source code .c/.h based on LL API

| C Parser	Database Query	Command Interpreter	User Reporting
Parses source code line by line, identifies C syntaxes (includes, comments …) then passes found expression to database query module.	Search LL equivalence from database. It returns LL expression w/ their parameter commands, message user, feature series availability…	Execute commands provided from database in order to migrate functions correctly.	Provides user all information regarding migration process. Types can be file migration status, expression warnings and errors, statistics…

life.augmented

Migration script overview

A simple and intuitive GUI is available to pass the required arguments to the script and run it
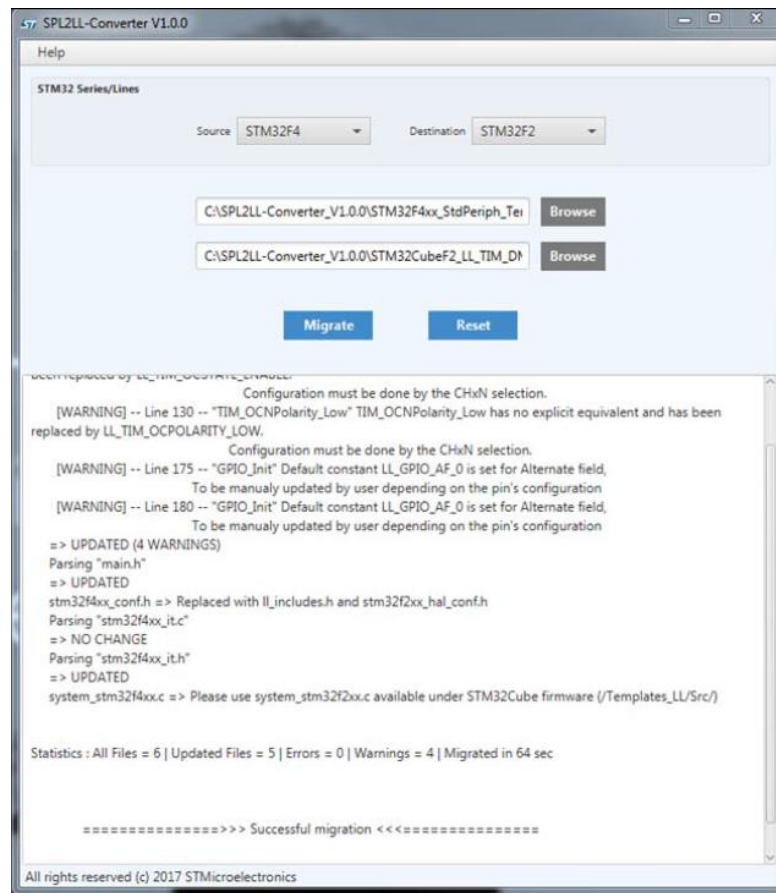
- Perl environment is required for the GUI and migration script
  - You can download it from Activestate website

- https://www.activestate.com/activeperl/downloads

Alternatively, only a simple command line is enough to run the script to ease automation of the process

Command line arguments:

perl SourceFilesMigration.pl --fsrc=<STM32_Source_Family> --fdst=<STM32_Destination_Family>
--psrc=<STM32_Source_Directory> --pdst=<STM32_Destination_Directory>

--fsrc : STM32 family/device target source
--fdst : STM32 family/device target destination
--psrc : user source code directory path (based on SPL)
--pdst : user destination code directory path (based on LL)

Example:

```
Administrator: C:\cmd.exe

Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation.  All rights reserved.

C:\>perl SourceFilesMigration.pl --fsrc=STM32F4 --fdst=STM32F4 --psrc=".\SRC_TEST" --pdst=".\DST_TEST"
```

For more details, execute the script with option --help

Migration script overview

Exhaustive reporting mechanism reflecting the conversion process outcome

File migration status

User file

Warning line number

```
==================================================================
    MIGRATION TOOL V0.1.0 (BETA)
==================================================================

FAMILY              : from STM32F4 to STM32F4
SOURCE DIRECTORY    : .\SPL_SRC_TEST
DESTINATION DIRECTORY : .\LL_SRC_TEST


Updating user files ...
    adc.c => UPDATED
    crc.c => UPDATED
    gpio.c => UPDATED
    main.c => NO CHANGE
    main.h => UPDATED
    [WARNING] -- Line 69 -- "NVIC_Init" User needs to maintain manually this code, HAL API is used !
    [WARNING] -- Line 73 -- "NVIC_SetVectorTable" No LL API exist, migration is ensured by using direct access register
    [WARNING] -- Line 76 -- "NVIC_SetVectorTable" No LL API exist, migration is ensured by using direct access register
    misc.c => UPDATED (0 ERRORS : 3 WARNINGS)
    [WARNING] -- Line 80 -- "RTC_CalibOutputCmd" No LL API exist, migration is ensured by using direct access register
    [WARNING] -- Line 84 -- "RTC_SetTime" Can't upgrade directly to LL framework, need an implementation for that
    [WARNING] -- Line 92 -- "RTC_GetTime" Can't upgrade directly to LL framework, need an implementation for that
    rtc.c => UPDATED (0 ERRORS : 3 WARNINGS)
    [WARNING] -- Line 107 -- "SPI_SSOutputCmd" No LL API exist, migration is ensured by using direct access register
    [WARNING] -- Line 110 -- "SPI_SSOutputCmd" No LL API exist, migration is ensured by using direct access register
    spi.c => UPDATED (0 ERRORS : 2 WARNINGS)
    tim.c => UPDATED
    usart.c => UPDATED
    [WARNING] -- Line 262 -- "SPI_SSOutputCmd" No LL API exist, migration is ensured by using direct access register
    [WARNING] -- Line 265 -- "SPI_SSOutputCmd" No LL API exist, migration is ensured by using direct access register
    [WARNING] -- Line 270 -- "SPI_SSOutputCmd" No LL API exist, migration is ensured by using direct access register
    user.c => UPDATED (0 ERRORS : 3 WARNINGS)


Statistics : All Files = 11 : Updated Files = 10 : Errors = 0 : Warnings = 11



        ===============>>> Successful migration <<<===============
```

Upgrading options

Warns user regarding the update

Overall process status

Warning message

Our technology starts with You

🌐 Find out more at www.st.com/STM32

life.augmented