AC6 System Workbench
A new free IDE for STM32

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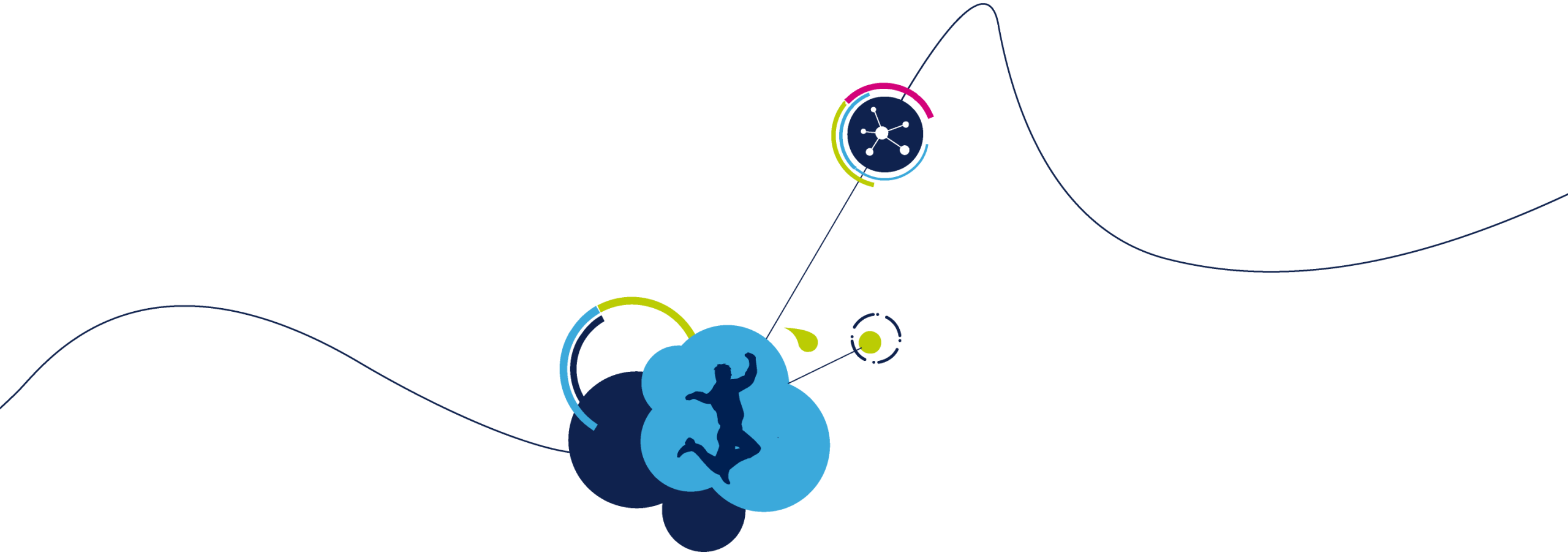

Overview

System Workbench for MCU

- System Workbench for STM32 is an embedded systems IDE developed by Ac6 for programming STM32 micro-controllers

- It is a set of Eclipse plug-ins
  - It can run under Windows or Linux
  - It can be installed either
    - Using a stand-alone installer
    - In an existing Eclipse platform (Juno or Kepler)

- It is designed to integrate all project activities in ONE environment
- It can also easily cooperate with other Eclipse plugins
  - For example, with System Workbench for Linux, it can help developing distributed applications running on micro-controllers and Linux processors
  - It will support programming multi-core asymetric SoCs - For example Cortex-A + Cortex-M

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System Workbench for MCU

- System Workbench for STM32 fully supports the STM32 microcontroller family
- When creating a project you just define
  - The MCU you will use
  - The board on which the program will run, either
    - A supported evaluation board
    - A user-defined board
- Then system Workbench for STM32 will automatically:
  - Retrieve the board- and mcu-specific firmware and definitions
    - Either at the StdPeriph format or the new HAL format
  - Configure the firmware
  - Provide startup code for your C or C++ programs
  - Optionally provide an example main program
- You are then able to immediately insert, compile and debug your code

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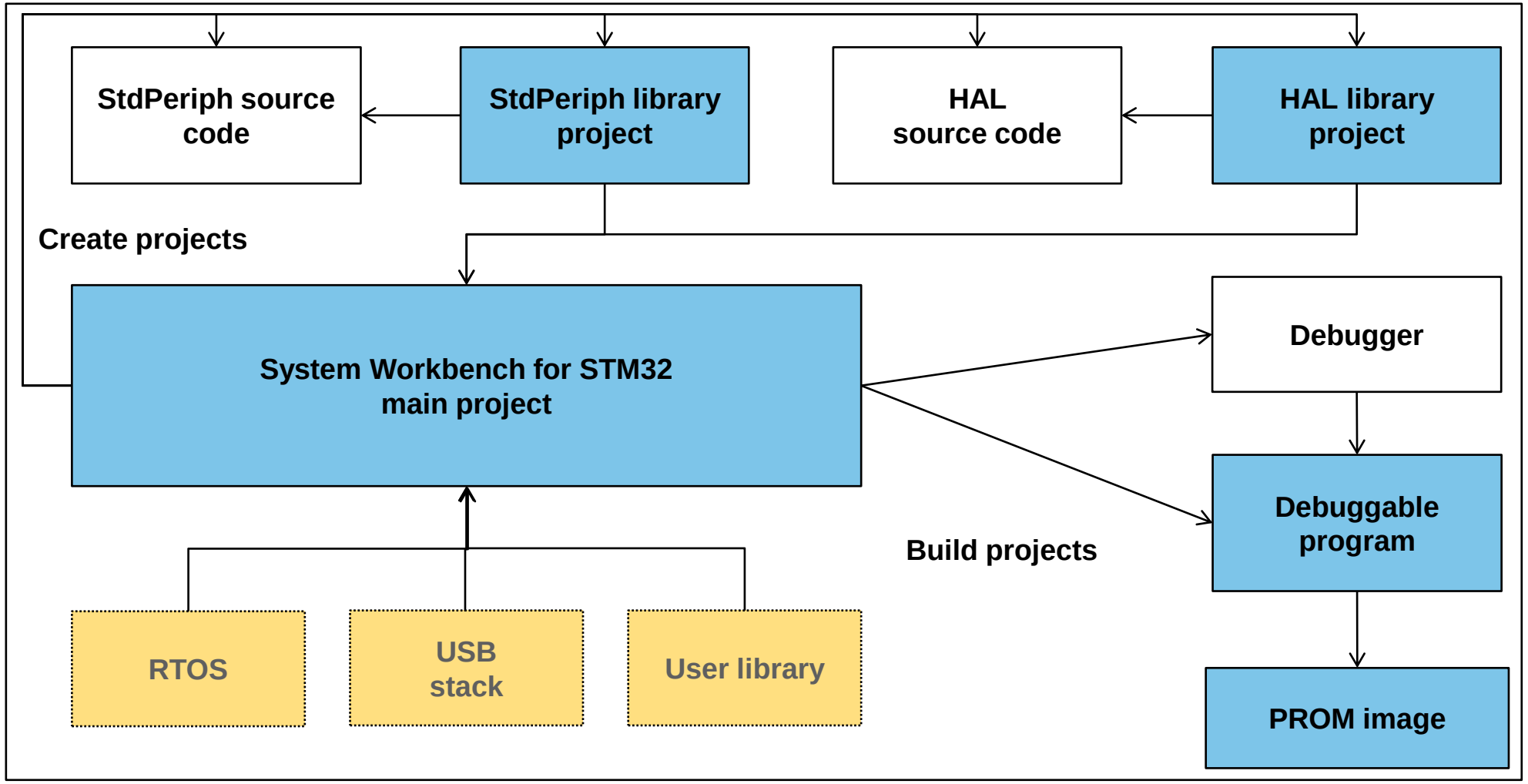
System Workbench for MCU Architecture



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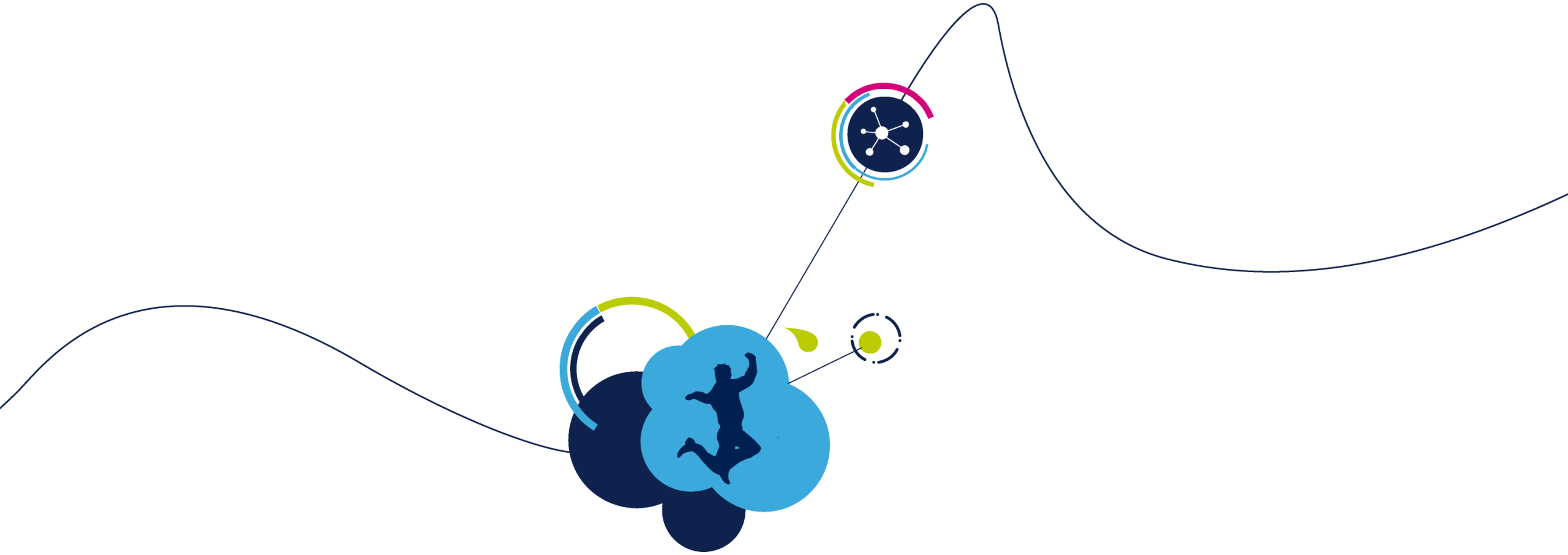
Main elements

- Main project
  - Main project of the embedded system
  - It contains the main source code for the system
  - It references external libraries
    - Standard libraries (StdPeriph or HAL)
    - Extensions (RTOS, USB stack, …)
    - User-provided libraries
  - It is linked to an executable program
- HAL source code
  - It contains the official Cube HAL source code
- HAL library
  - It references (part of) the Cube HAL library, depending on the selected board
  - It compiles this source code creating a library, usable by all projects running on the same board
- StdPeriph source code and library
  - These projects are used in case the firmware for the board was provided using the legacy (Std_Periph) format
- RTOS, stacks and user libraries
  - Depending on the needs, Ac6 will provide support for various RTOSes (FreeRTOS…), protocol stacks (USB, TCP/IP…), middlewares…
  - Users can also create their own libraries



Creating a program

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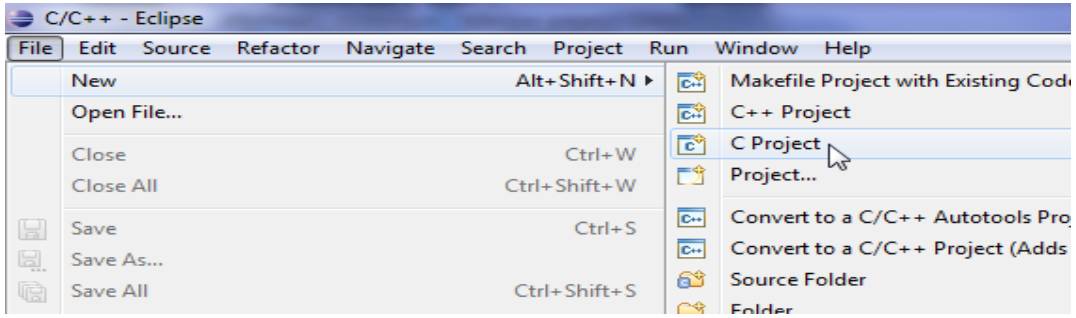
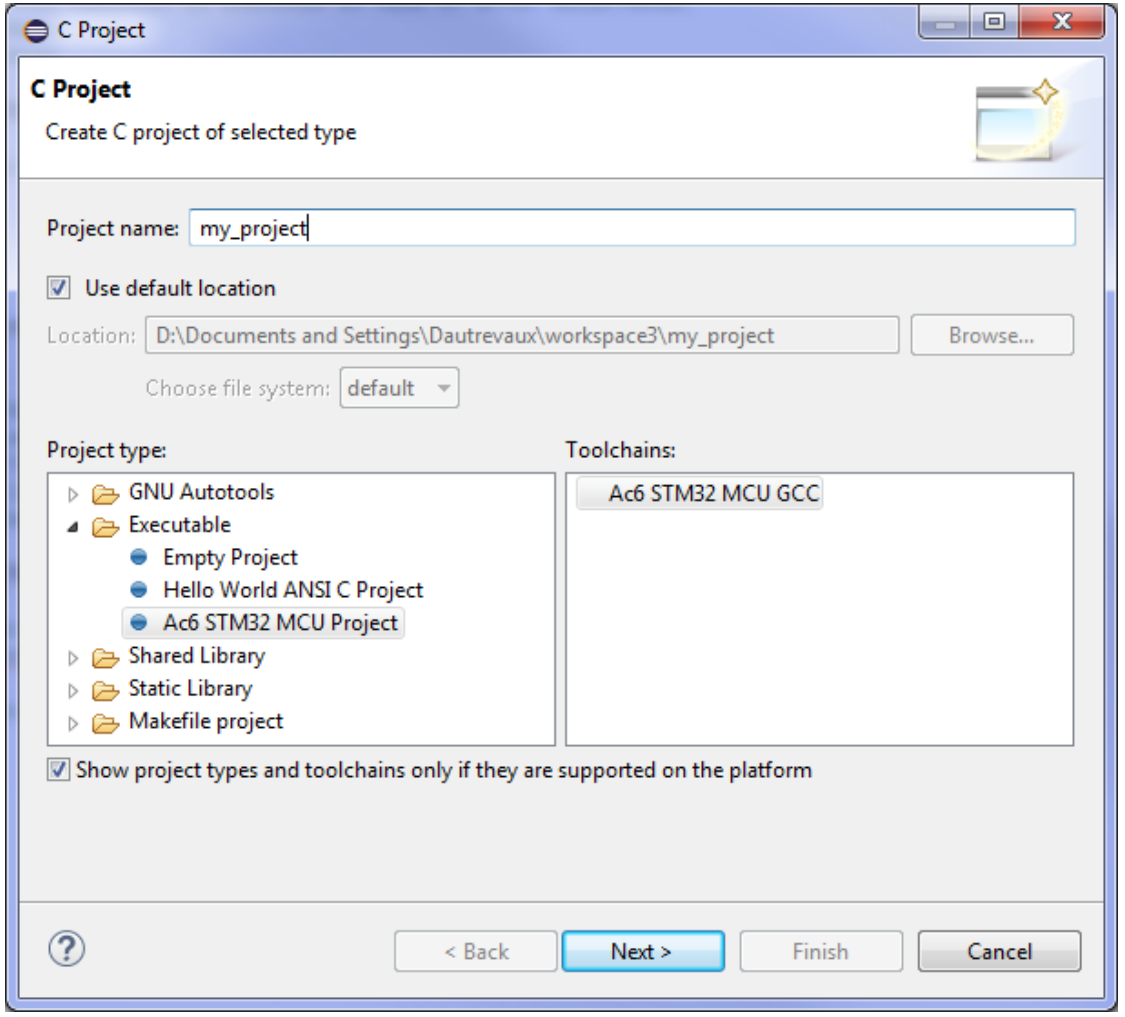
Creating a program (1/4)



- To create a program with System Workbench for STM32 you must first create a project
  - Choose a C or a C++ Project
  - Give it a name
  - Create an Ac6 MCU Project
    - Executable or Static Library
    - May also be an simple Empty project
  - Select the Ac6 MCU GCC toolchain



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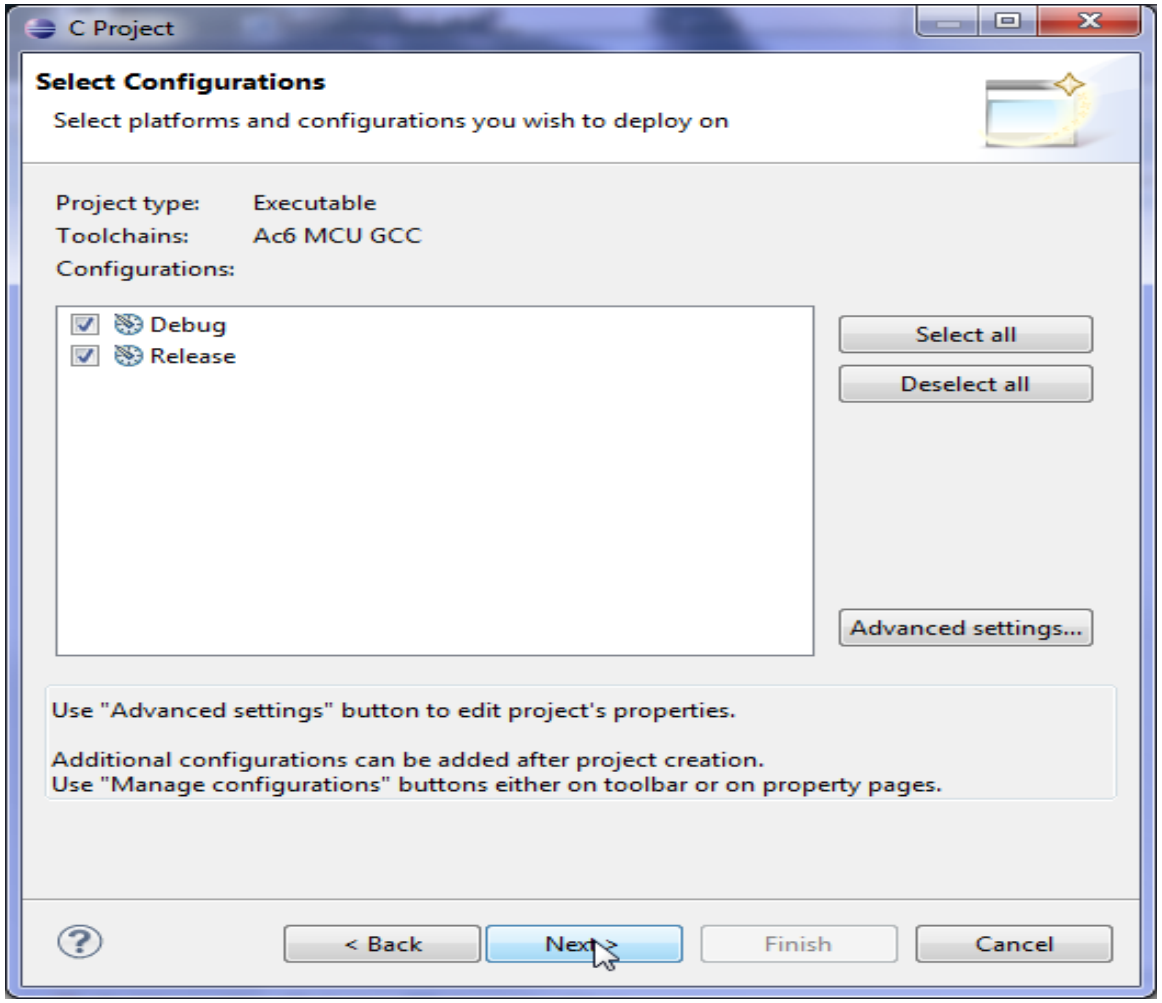
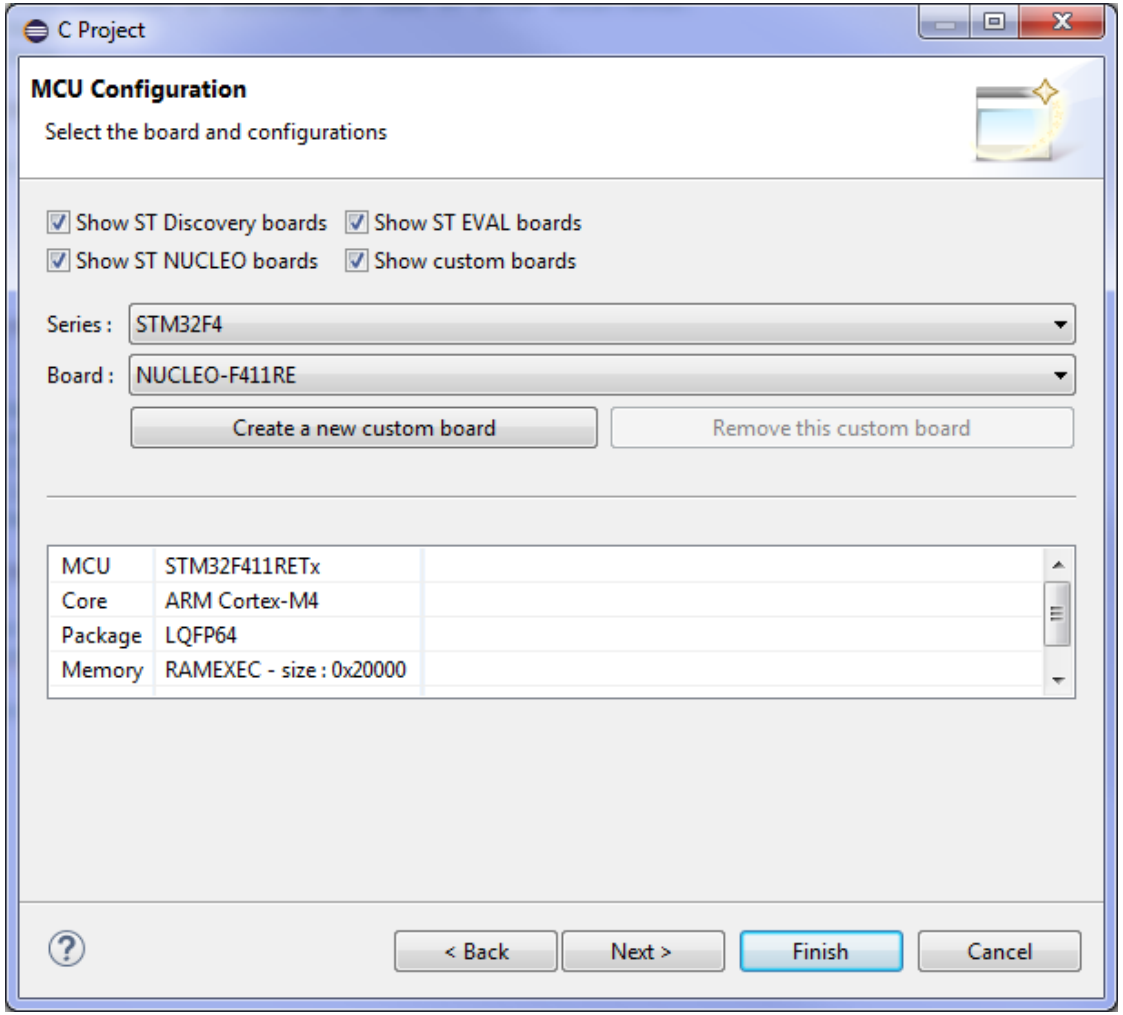
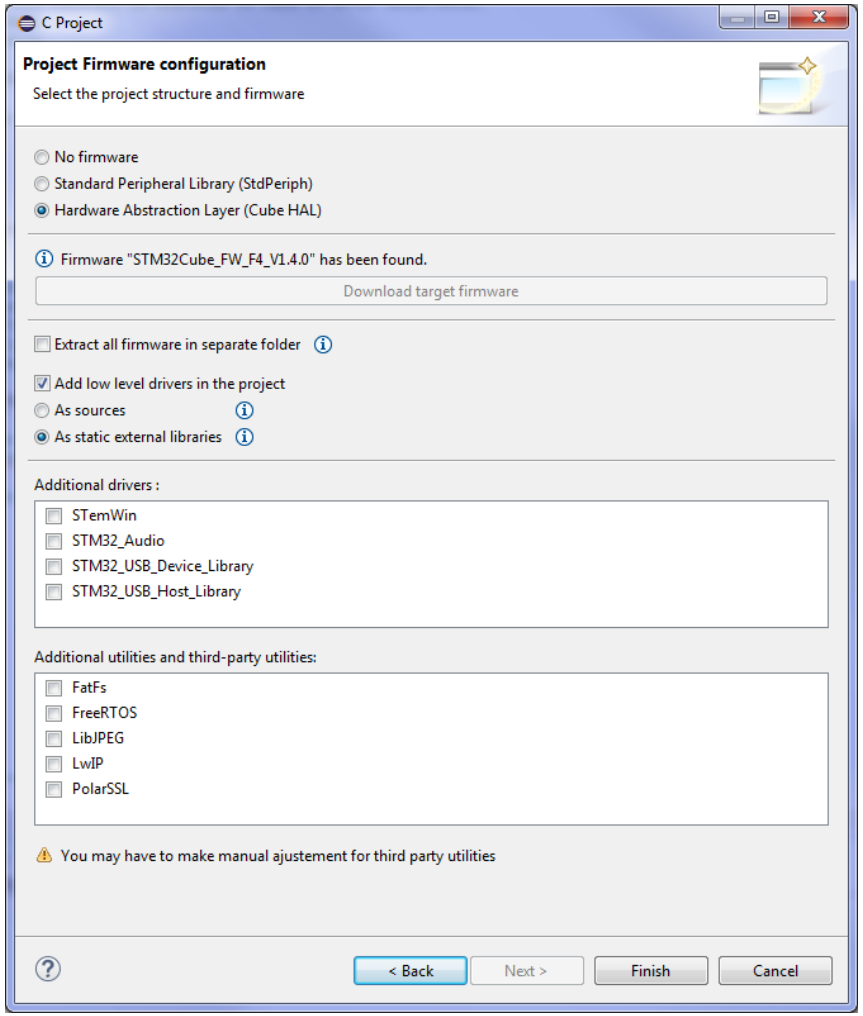
Creating a program (2/4)





You should then select your evaluation board (select first the family to filter out unneeded references); you can also manage custom boards here.

Creating a program (3/4)



- You will have to select the firmware components you need in your project
  - First you can choose which kind of firmware to use (if any)
  - Only available firmwares will be proposed.
- If you choose to import firmware for your board
  - You may have to download the firmware
    - You will have to accept the firmware license agreement
    - Some firmware may have a more complex installer…
  - You have the choice to import the firmware either:
    - As separate library projects (recommended)
    - Directly in the application project
  - CMSIS, peripherals and utilities are automatically imported
  - You may choose to import more libraries
    - However you may then have to make manual configuration and adjustments

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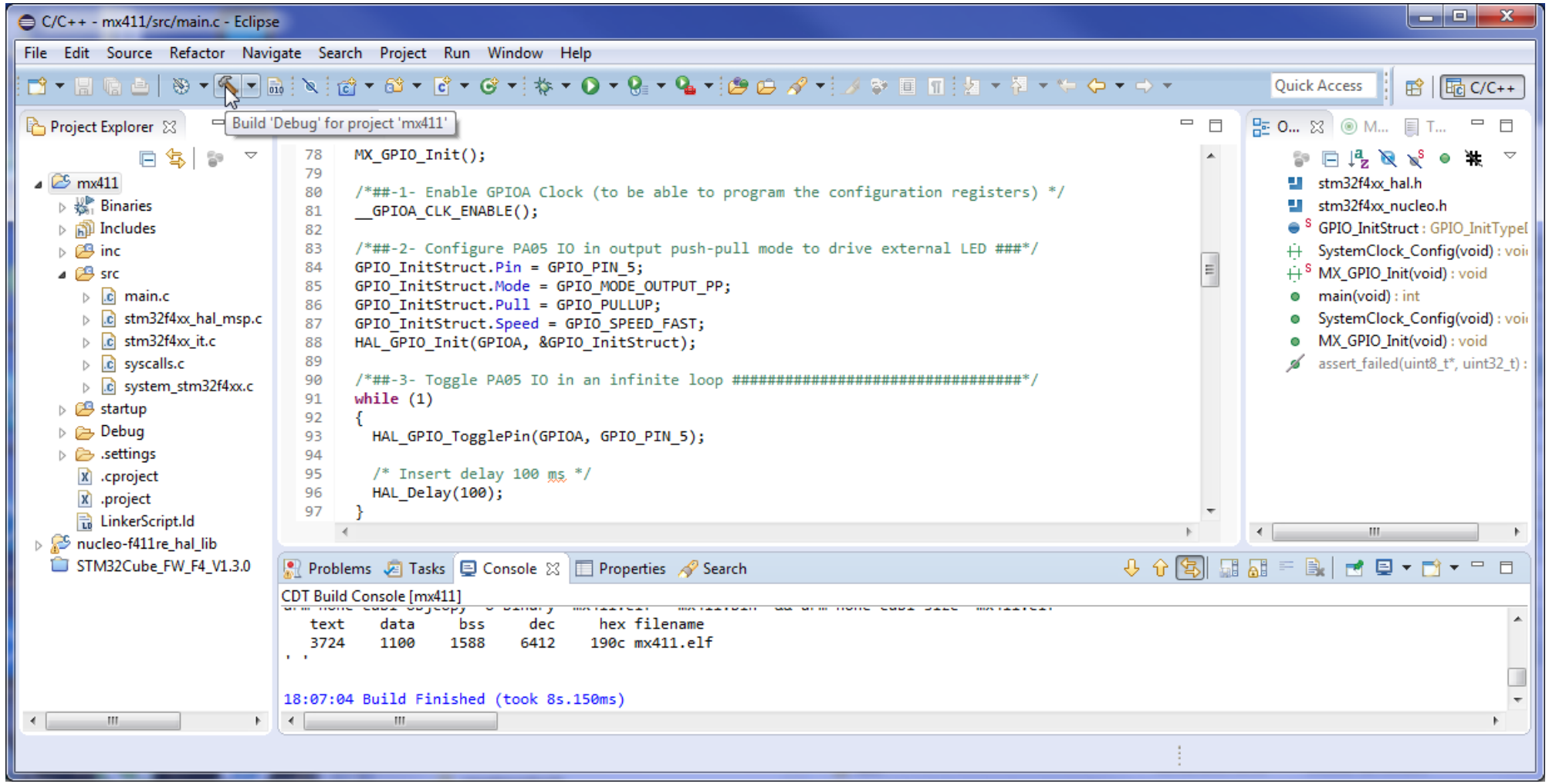
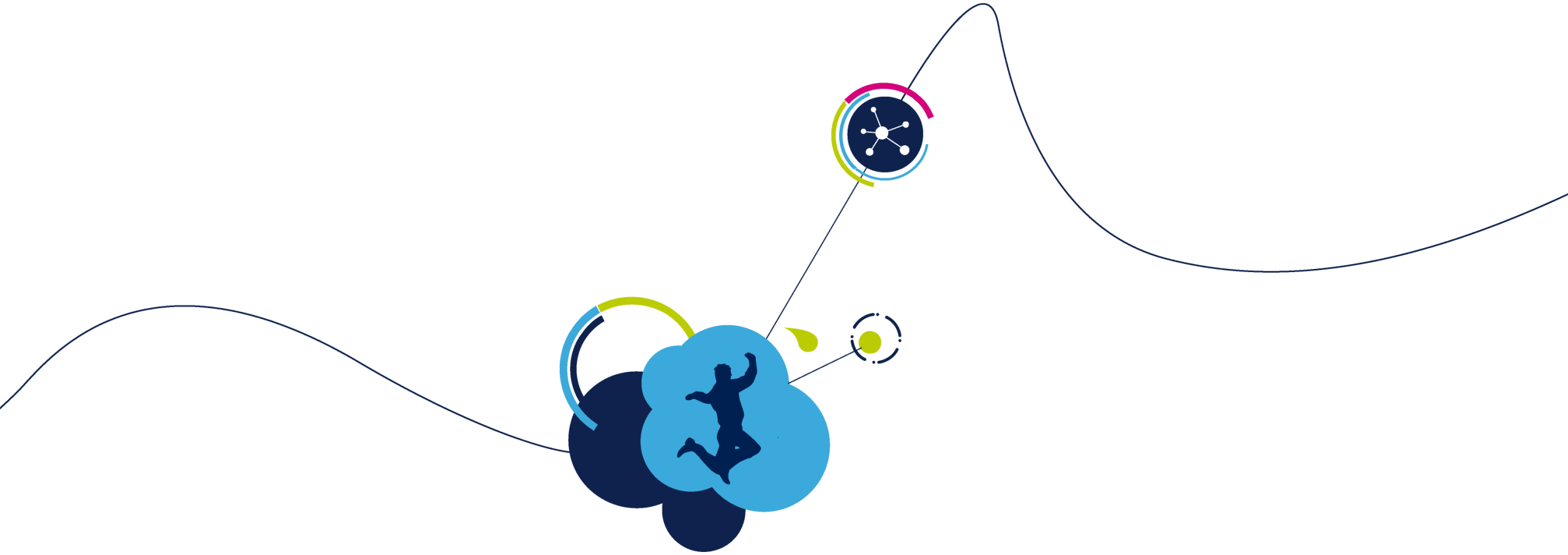
Creating a program (3/4)



Then clicking "Build" will build your project; then you are ready to debug it.



Debugging

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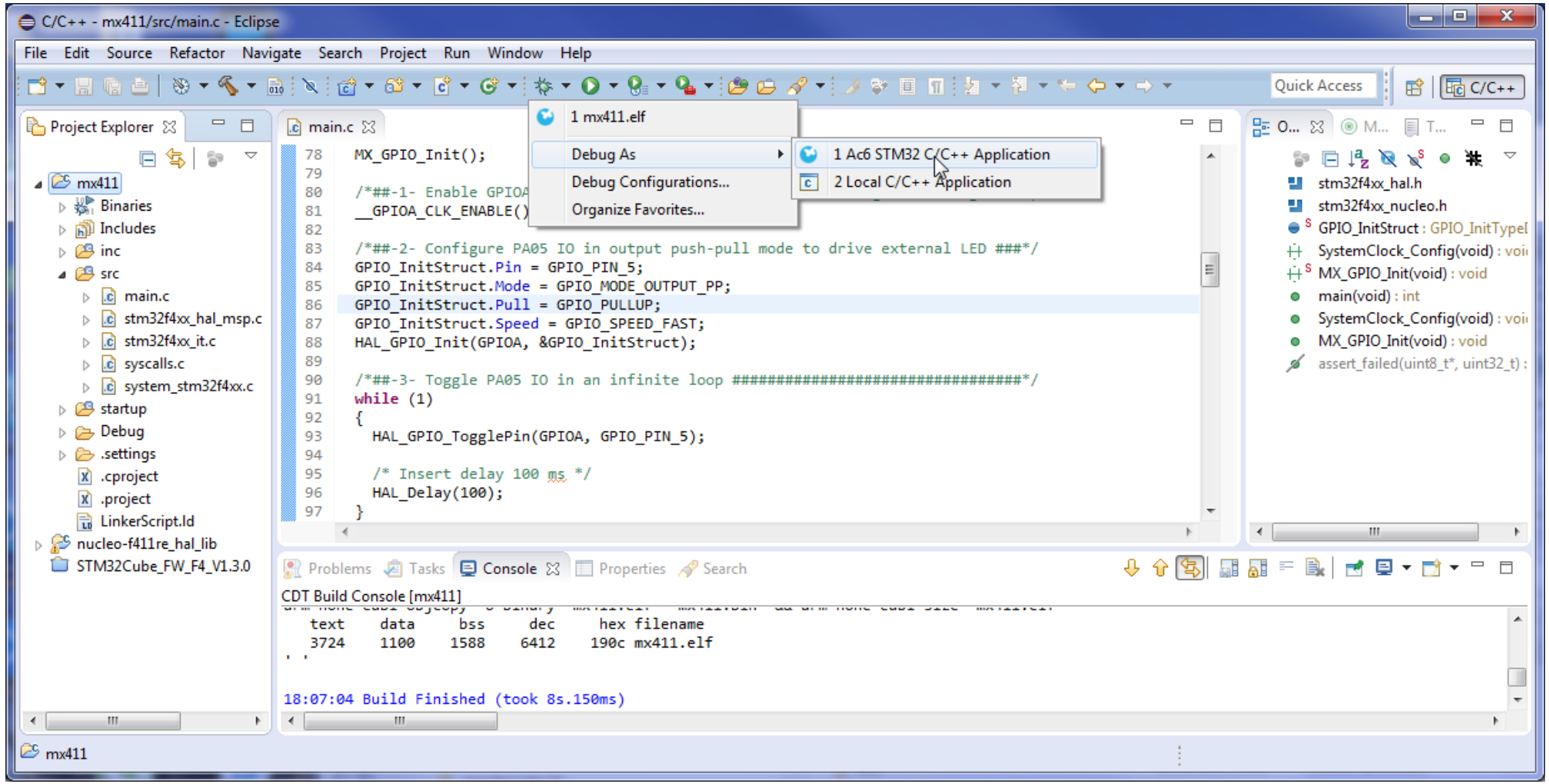
Debugging - Fast track



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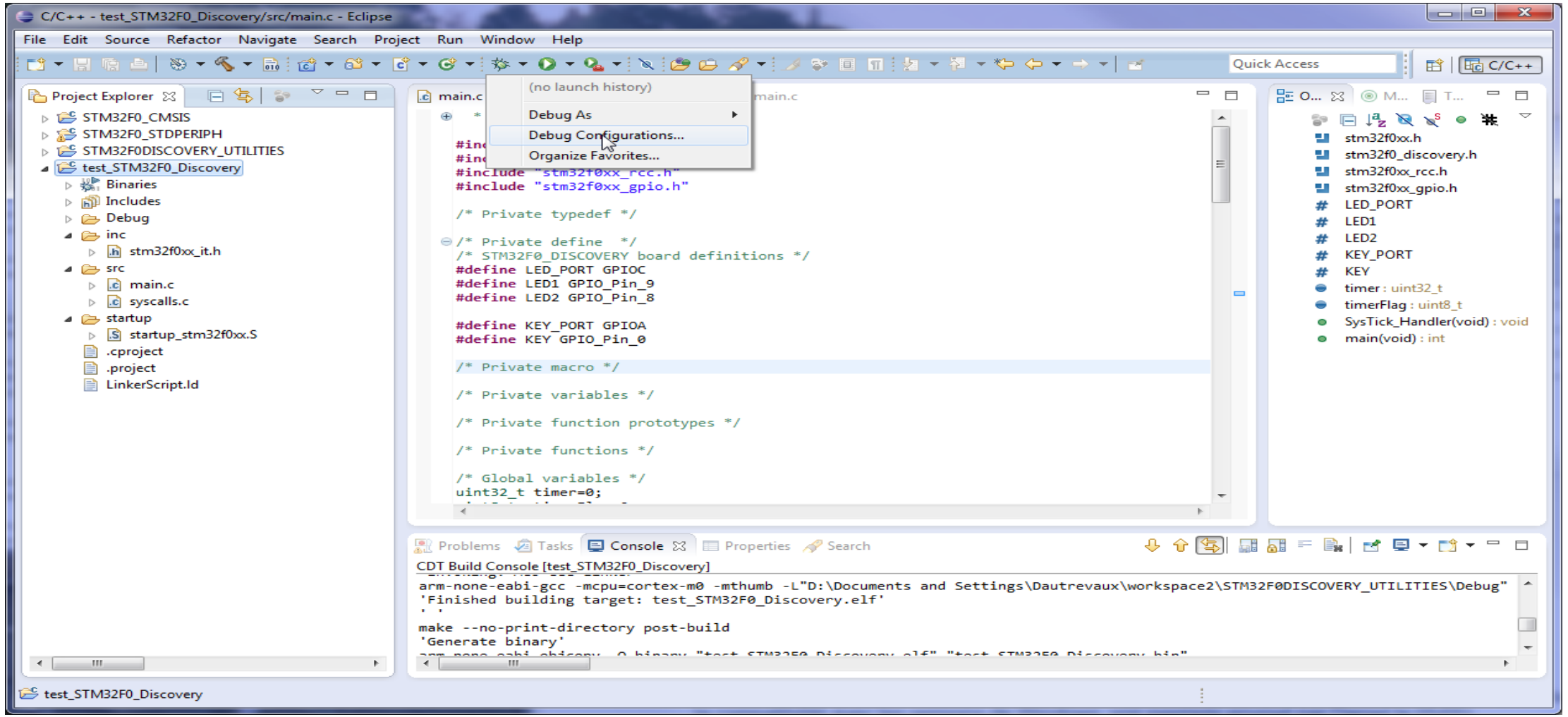
Debugging - Custom track (1/3)



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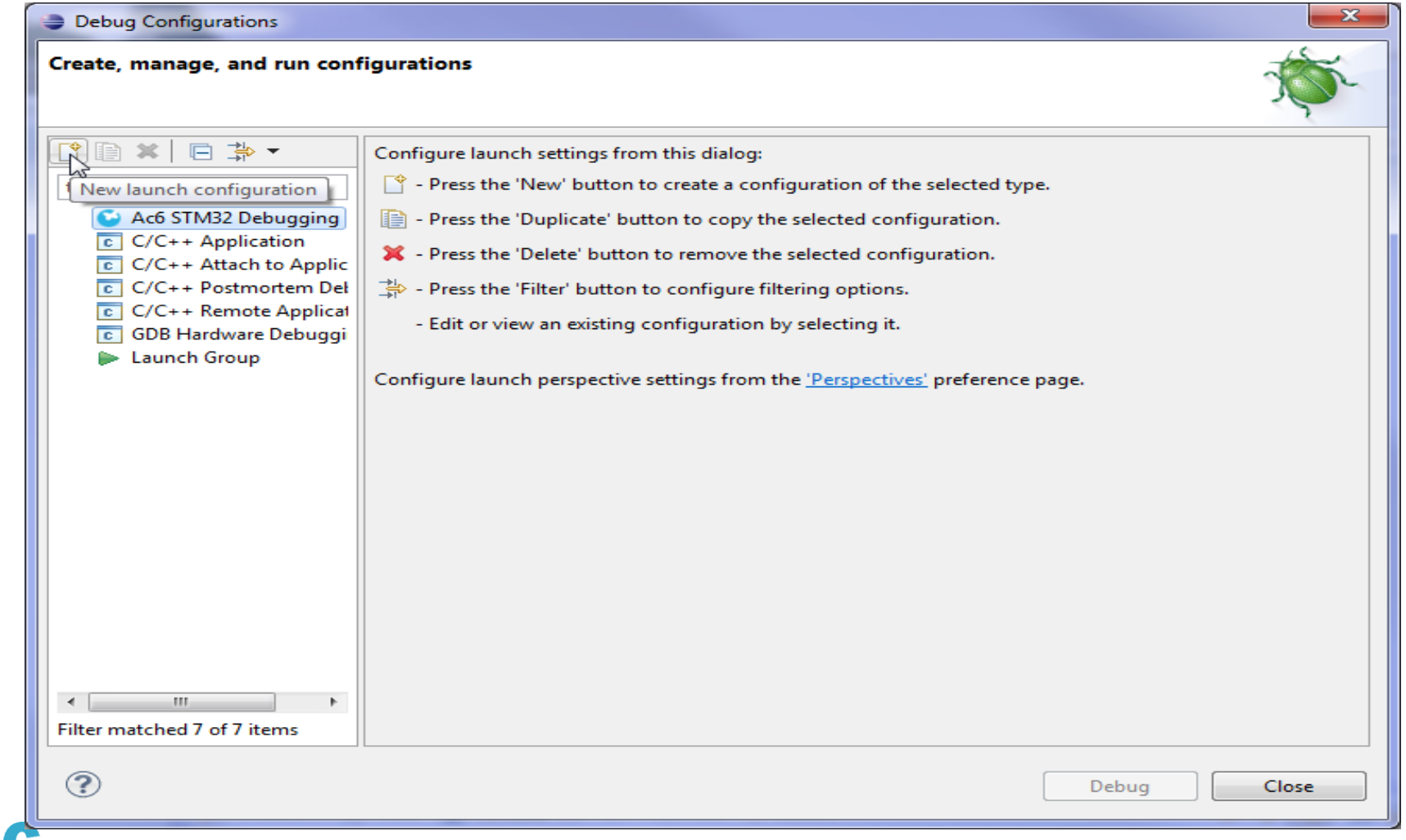
Debugging - Custom track (2/3)



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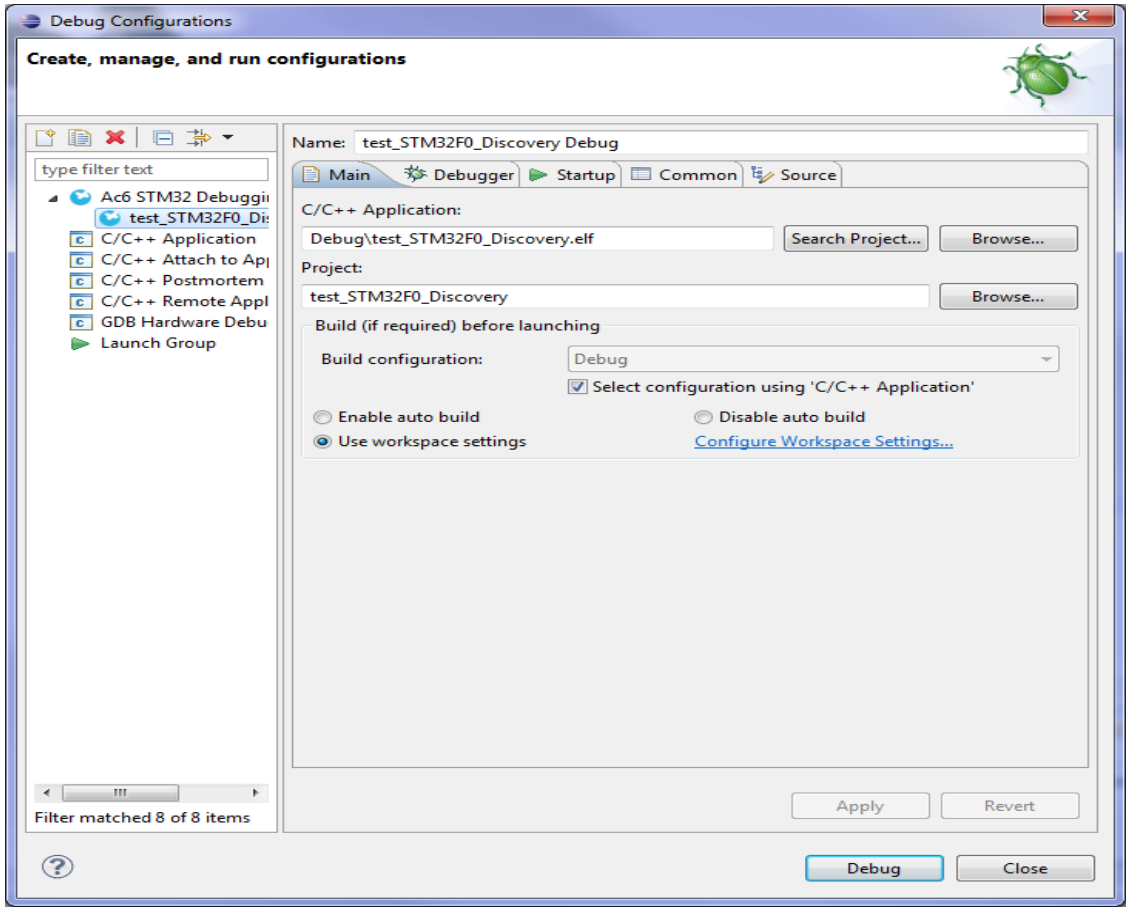
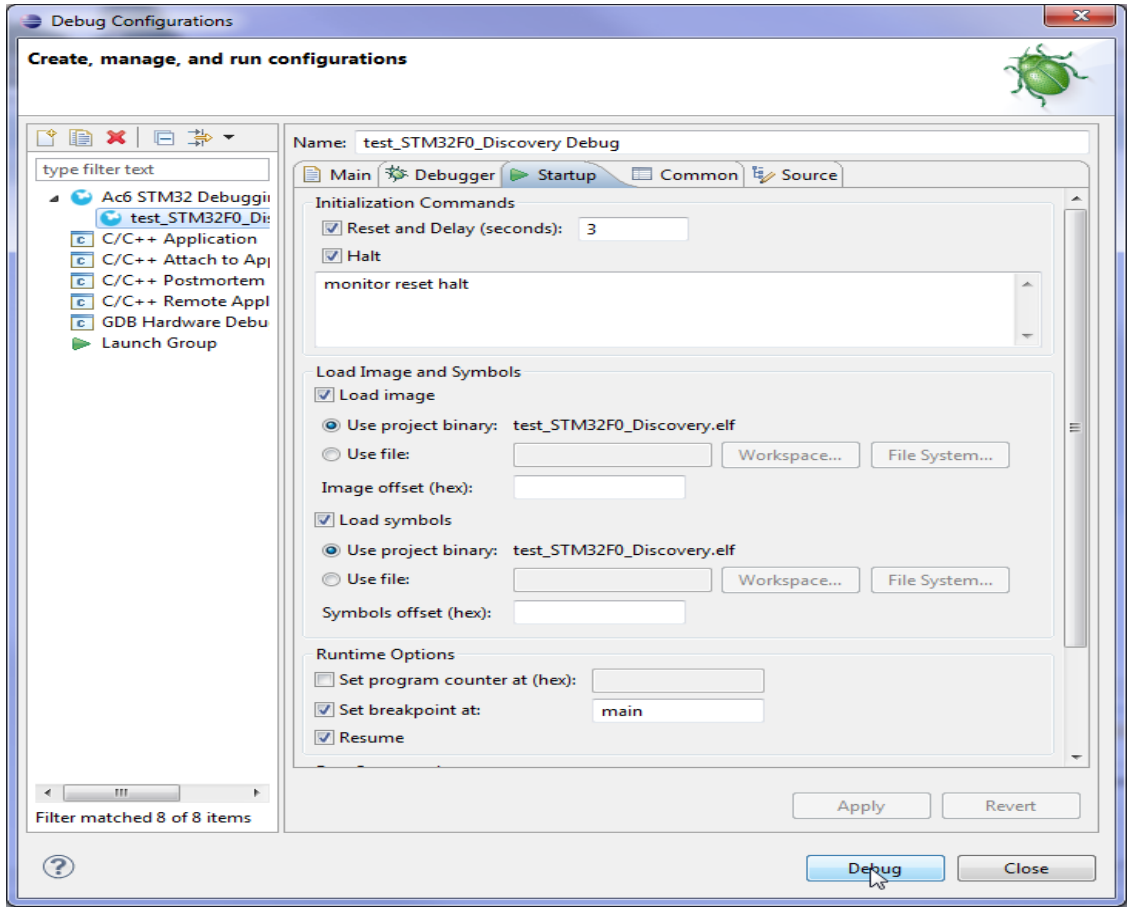
Debugging - Custom track (3/3)





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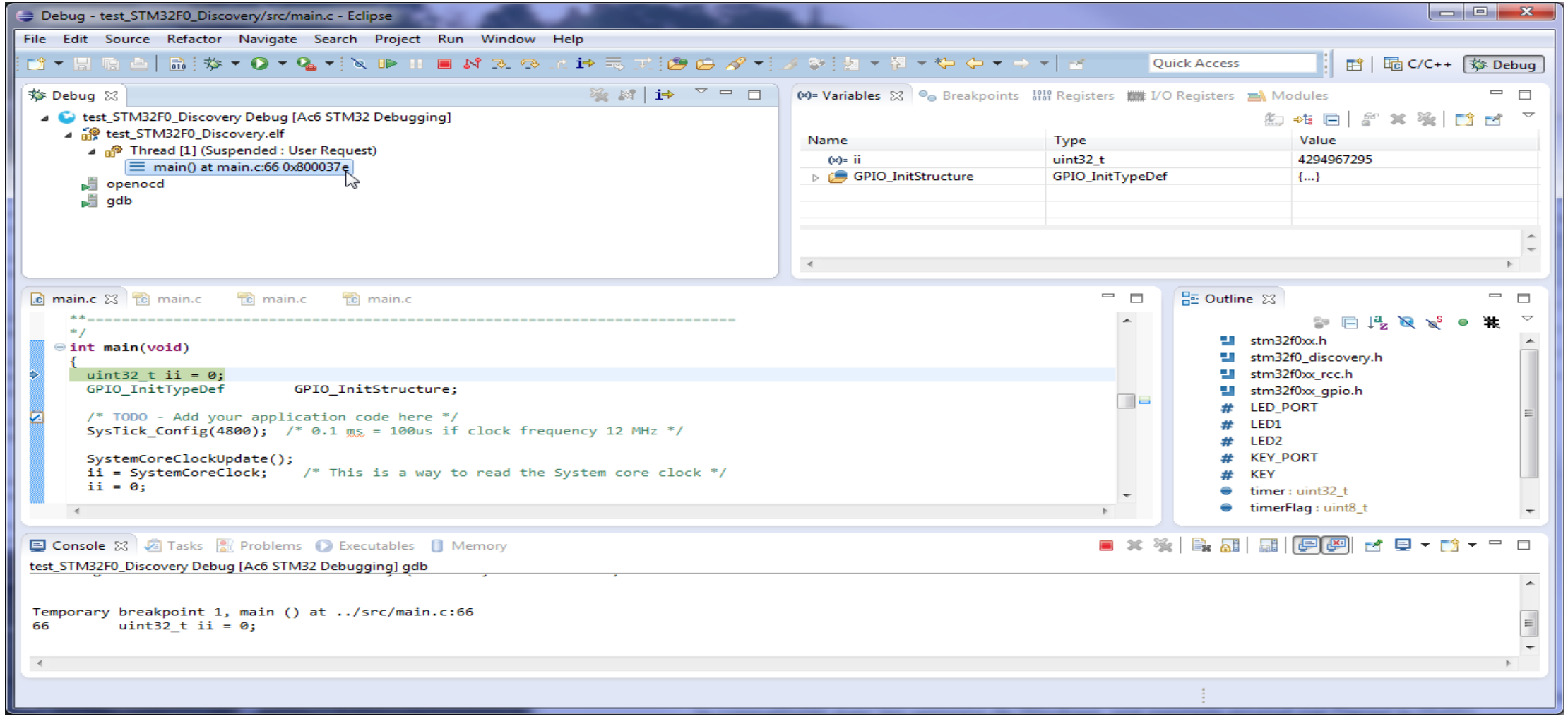
Debugging



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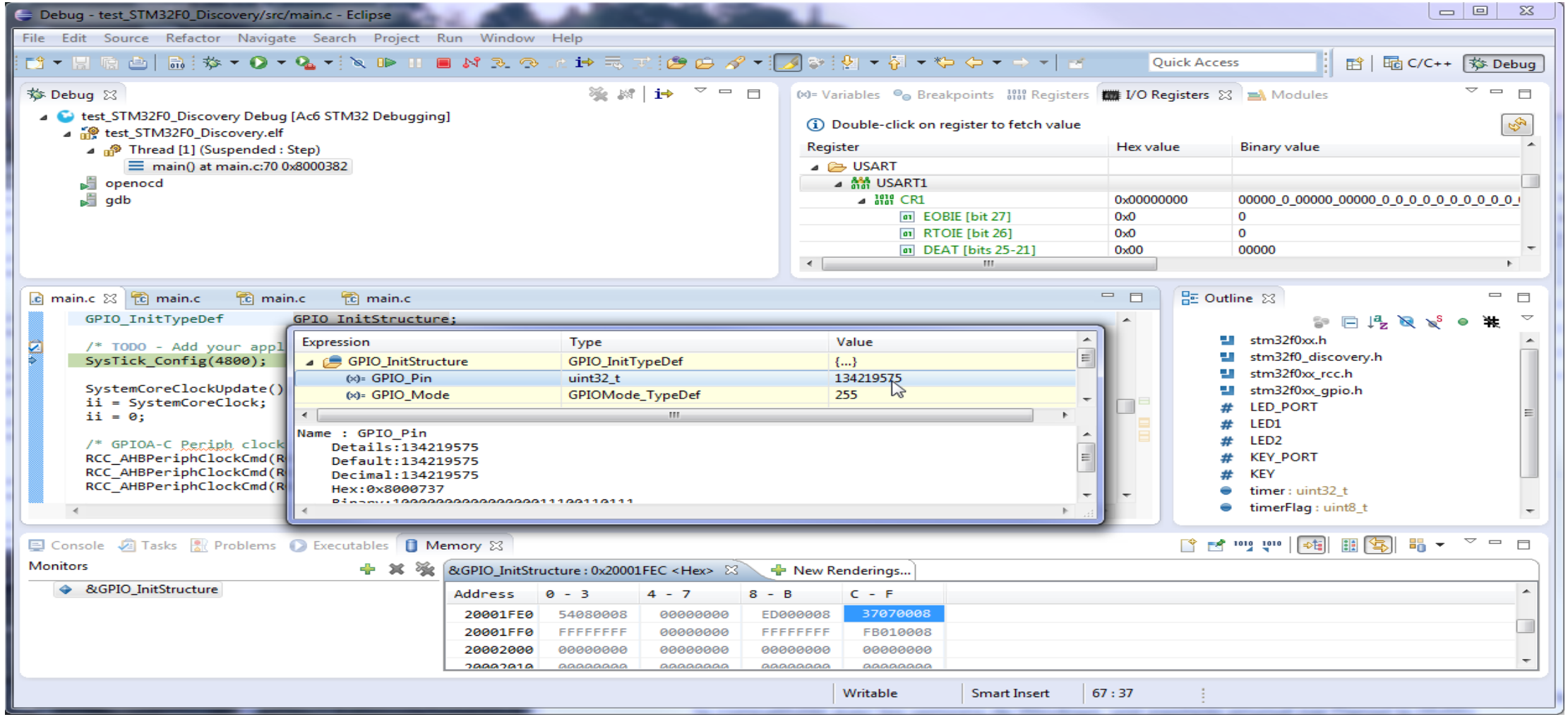

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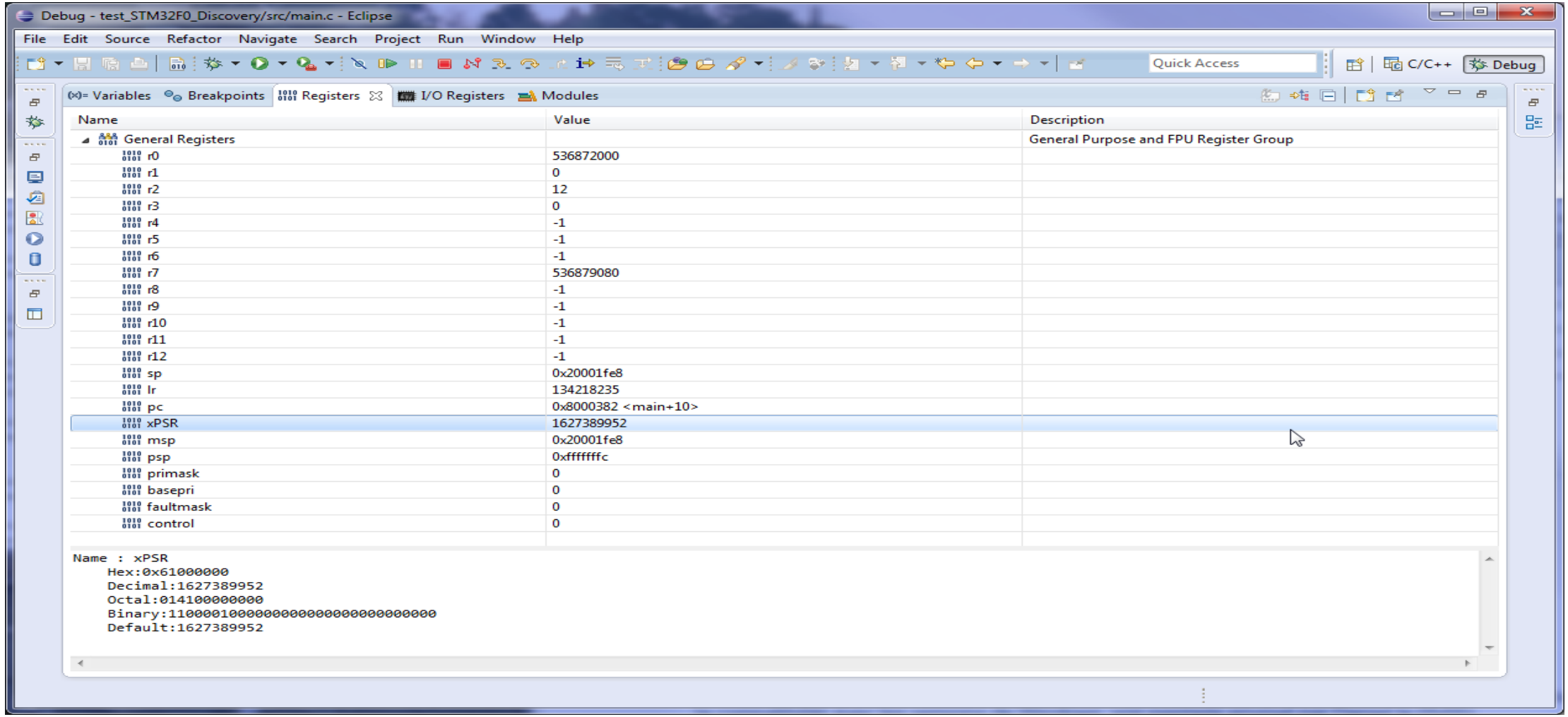
Debugging



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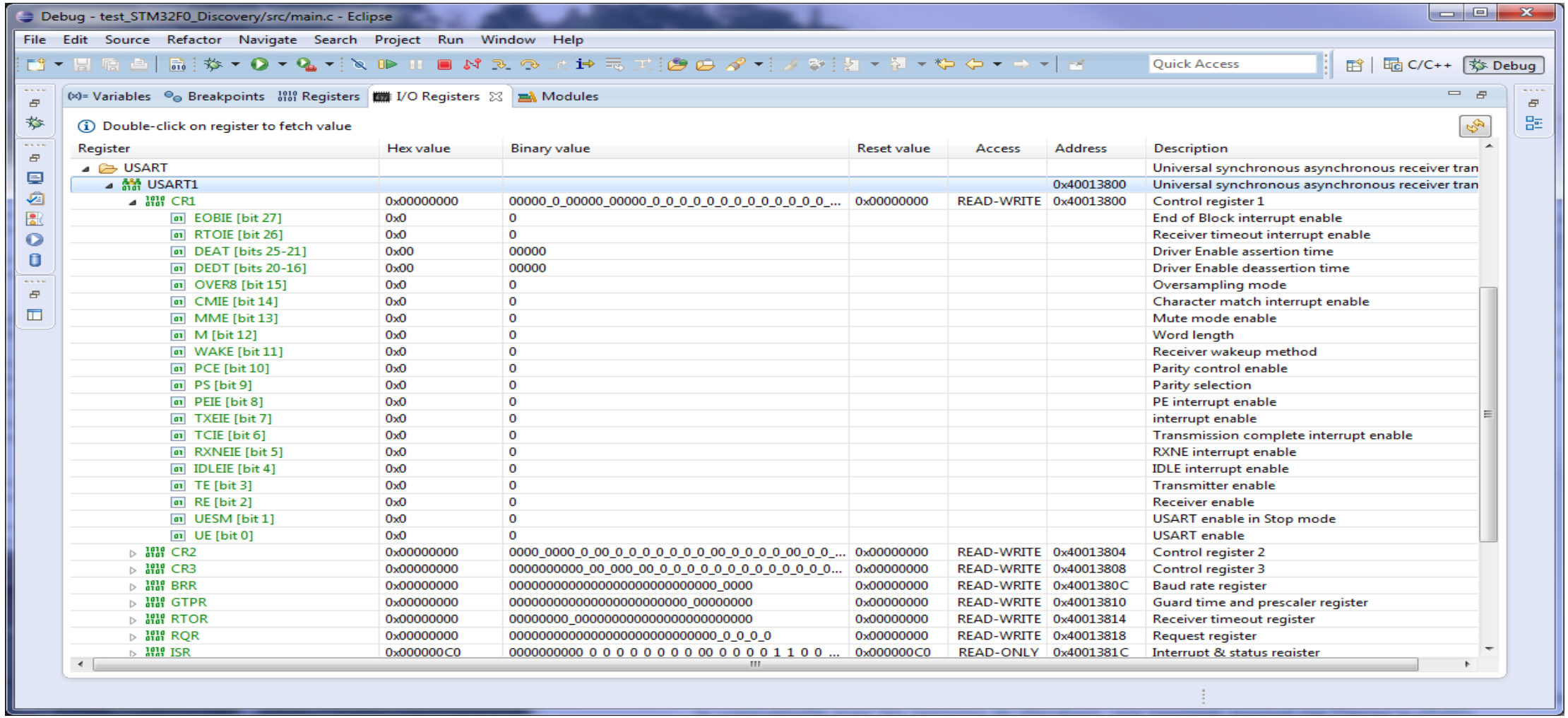
Debugging



Register	Hex value	Binary value	Reset value	Access	Address	Description
USART						Universal synchronous asynchronous receiver tran
USART1					0x40013800	Universal synchronous asynchronous receiver tran
CR1	0x00000000	00000_0_00000_00000_0_0_0_0_0_0_0_0_0_0_0_0_...	0x00000000	READ-WRITE	0x40013800	Control register 1
EOBIE [bit 27]	0x0	0				End of Block interrupt enable
RTOIE [bit 26]	0x0	0				Receiver timeout interrupt enable
DEAT [bits 25-21]	0x00	00000				Driver Enable assertion time
DEDT [bits 20-16]	0x00	00000				Driver Enable deassertion time
OVER8 [bit 15]	0x0	0				Oversampling mode
CMIE [bit 14]	0x0	0				Character match interrupt enable
MME [bit 13]	0x0	0				Mute mode enable
M [bit 12]	0x0	0				Word length
WAKE [bit 11]	0x0	0				Receiver wakeup method
PCE [bit 10]	0x0	0				Parity control enable
PS [bit 9]	0x0	0				Parity selection
PEIE [bit 8]	0x0	0				PE interrupt enable
TXEIE [bit 7]	0x0	0				interrupt enable
TCIE [bit 6]	0x0	0				Transmission complete interrupt enable
RXNEIE [bit 5]	0x0	0				RXNE interrupt enable
IDLEIE [bit 4]	0x0	0				IDLE interrupt enable
TE [bit 3]	0x0	0				Transmitter enable
RE [bit 2]	0x0	0				Receiver enable
UESM [bit 1]	0x0	0				USART enable in Stop mode
UE [bit 0]	0x0	0				USART enable
CR2	0x00000000	0000_0000_0_00_0_0_0_0_0_0_0_00_0_0_0_0_00_0_0_...	0x00000000	READ-WRITE	0x40013804	Control register 2
CR3	0x00000000	0000000000_00_000_00_0_0_0_0_0_0_0_0_0_0_0_0_0...	0x00000000	READ-WRITE	0x40013808	Control register 3
BRR	0x00000000	00000000000000000000000000000000_0000	0x00000000	READ-WRITE	0x4001380C	Baud rate register
GTPR	0x00000000	00000000000000000000000000_00000000	0x00000000	READ-WRITE	0x40013810	Guard time and prescaler register
RTOR	0x00000000	00000000_00000000000000000000000000	0x00000000	READ-WRITE	0x40013814	Receiver timeout register
RQR	0x00000000	00000000000000000000000000000000_0_0_0_0	0x00000000	READ-WRITE	0x40013818	Request register
ISR	0x000000C0	0000000000 0 0 0 0 0 0 0 0 00 0 0 0 0 1 1 0 0 ...	0x000000C0	READ-ONLY	0x4001381C	Interrupt & status register

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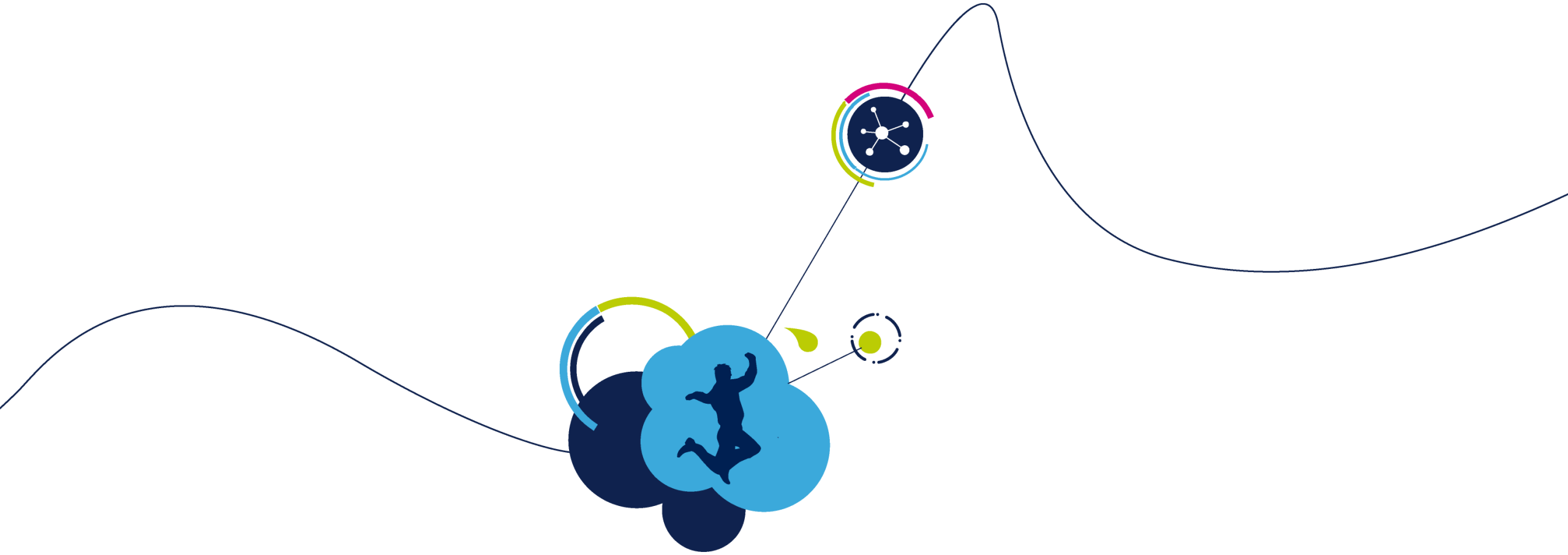

The OpenSTM32.org community site

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OpenSTM32.org

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OpenSTM32.org

- The OpenSTM32.org website (http://www.openstm32.org) is the focal point for STM32 embedded system development with System Workbench for STM32
- This is the place where to download System Workbench for STM32
  - It is a fully free functional development tool
    - No size limitation
    - No time limitation
  - The only limit is your imagination!
- You will also find there:
  - Documentation for System Workbench for STM32
  - Forums to discuss STM32 development
  - FAQs and Blogs with
    - insight in STM32 development,
    - tips and tricks on System Workbench for STM32 use

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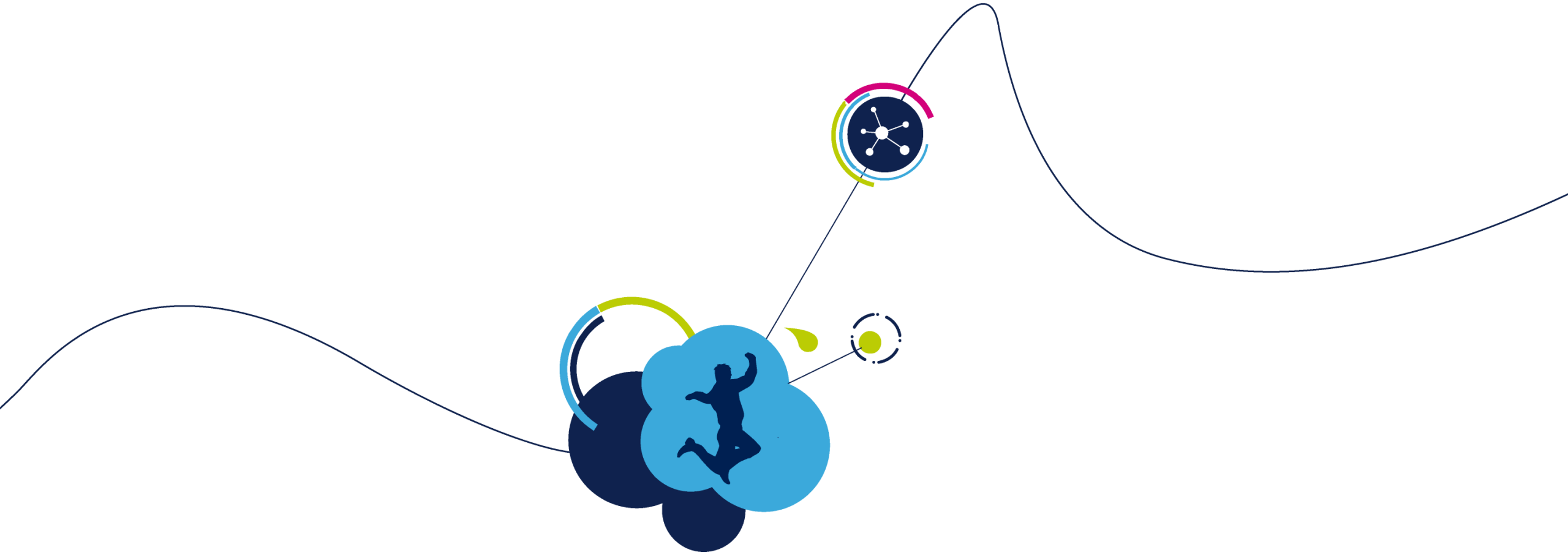
OpenSTM32.org

- You are welcome to participate in the OpenSTM32 adventure
  - Registration is free
  - Once registered you have access to all the content of the community:
    - Browse Wiki pages, Blogs and FAQs
    - Read on-line documentation
    - Post questions on the Forums or answer other members questions
    - And, of course, download System Workbench for STM32
  - Gaining the status of "Author" to be able to submit content in the Blogs and Wiki sections of the site is simple:
    - You just have to send a mail to a site admin explaining what kind of content you would like to submit on the web site
- The OpenSTM32.org Website is live now, with the Windows-based version of System Workbench for STM32
  - The Linux version is currently in the last beta phase (Release Candidate)
  - The MacOS/X version will be ready Q2 2015



Roadmap

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System Workbench for STM32

Preliminary Roadmap

Release 1.0 (available)

- This release is the first official release
  - It supports all chips and evaluation boards available at this date
  - It supports firmware at the StdPeriph and HAL format wherever appropriate
  - It runs exclusively on Windows

Release 1.1 (expected end of Q1 2015)

- This release will be a minor release
  - It will support new devices from the STM32 product line
  - It will support Linux as development environment
    - We test and will support it on Ubuntu 12.04 and 14.04 LTS releases

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System Workbench for STM32

Preliminary Roadmap

Release 1.2 (expected Q2 2015)

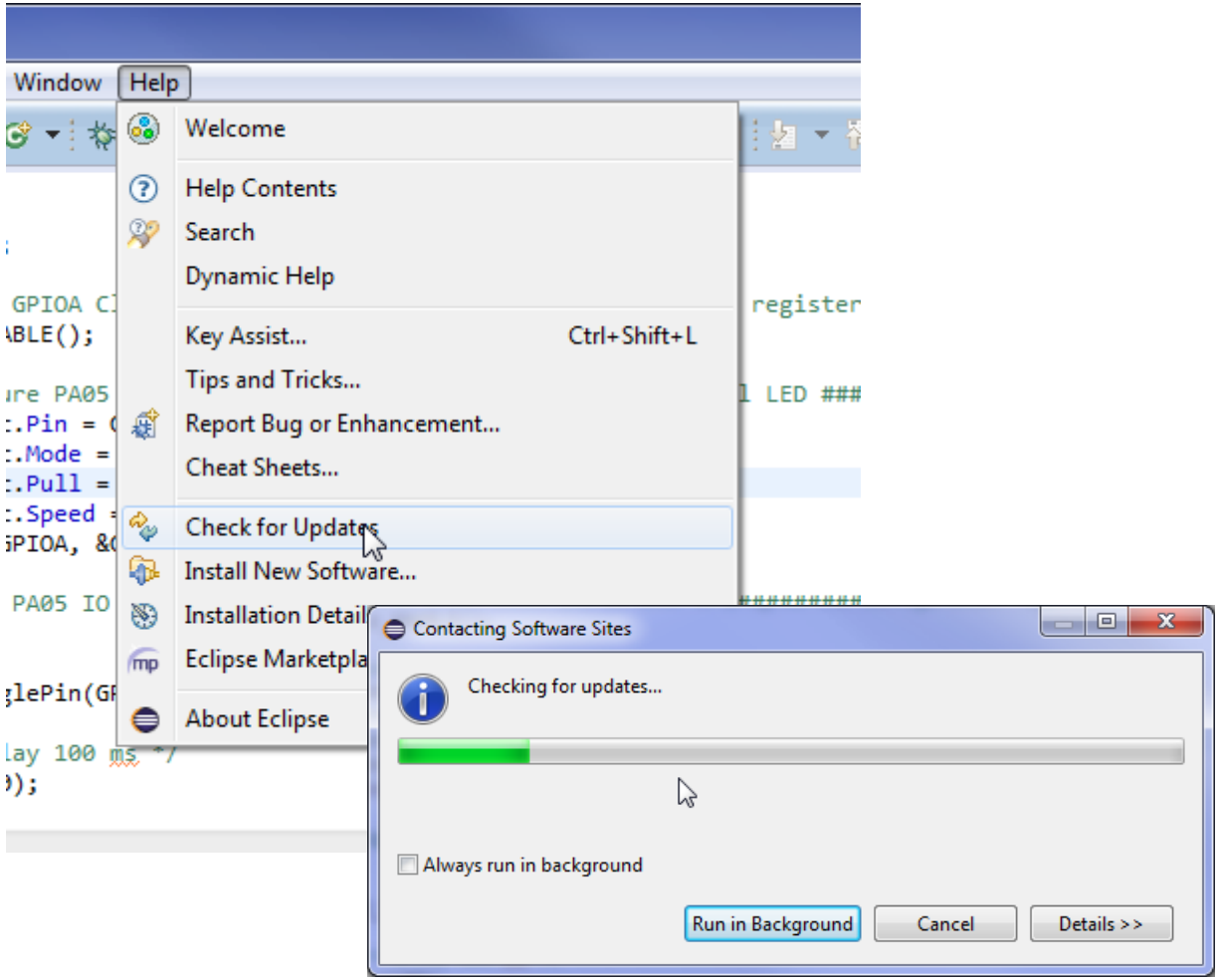
- This release will be a minor release
  - It will support new devices from the STM32 product line
  - It will support MacOS/X as development environment
    - We test and will support it on OS/X 10.10 Yosemite

Release 2.0 (expected Q3 2015)

- This release is expected to be a major release

Regular Updates

- Independently from scheduled updates, System Workbench for STM32 will be regularly updated
  - To correct bugs
  - To provide updated versions of some external tools (like GCC)
  - To enhance user experience
  - To support newly released STM32 chips
- These releases will be available through the standard Eclipse update mechanism



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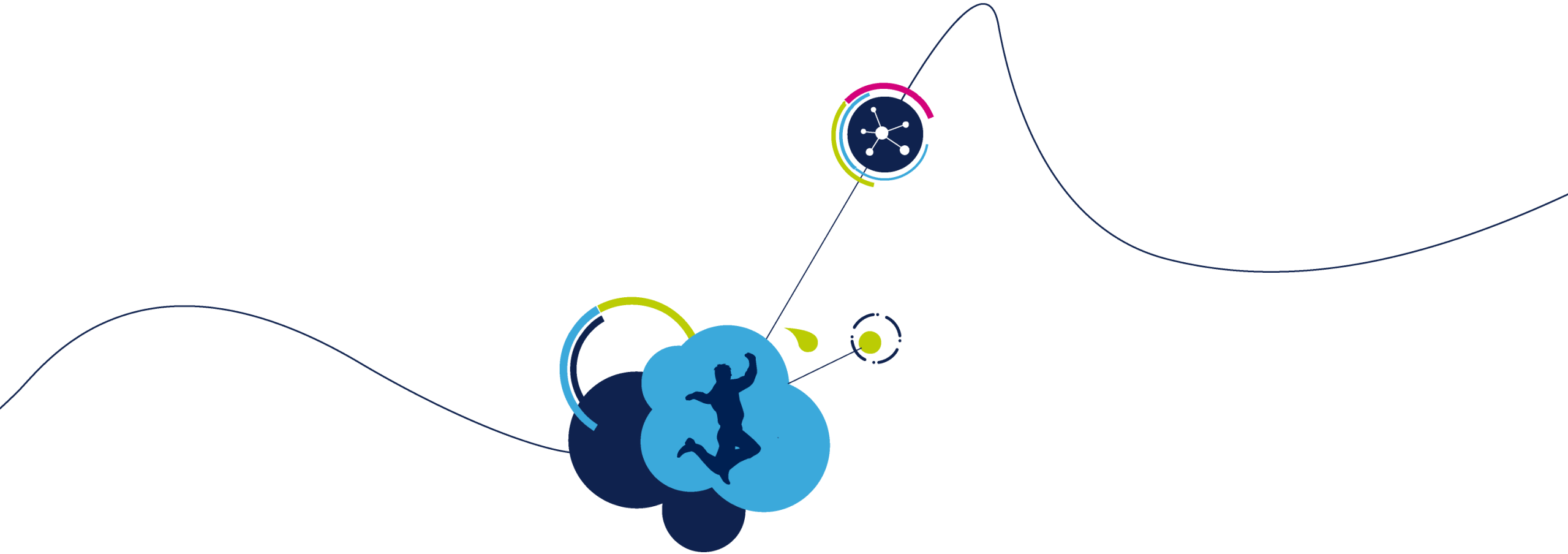

Thank you

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