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STM32Trust

STM32H5 Security Secure Manager - Part 4

Hands On: NS Application using Secure Manager services

Presenter: Massimo Panzica

Agenda

I Introduction

II Hands-On: NS Application Compile and Debug

III Hands-On: NS Application and Secure Manager services

IV Resources

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Introduction

STM32 Trust TEE

Secure Manager Ecosystem

Simplify developer's experience

SMAK
To develop applications using security services

Downloaded from **STM32CubeH5** license SLA0048

- Documentation
- **Application** examples (demonstrating PSA APIs)

Downloaded from **STM32TRUSTEE-SM** (encrypted binary) license SLA0044

- Secure Manager for prod.

SMDK
To develop module inside TrustZone®

- Documentation
- **Secure module** examples (demonstrating SM core APIs)
- Secure Manager for **development**

X-CUBE-SMDK-H5
Available on demand
(encrypted binary)

Signed LLA

Only for development

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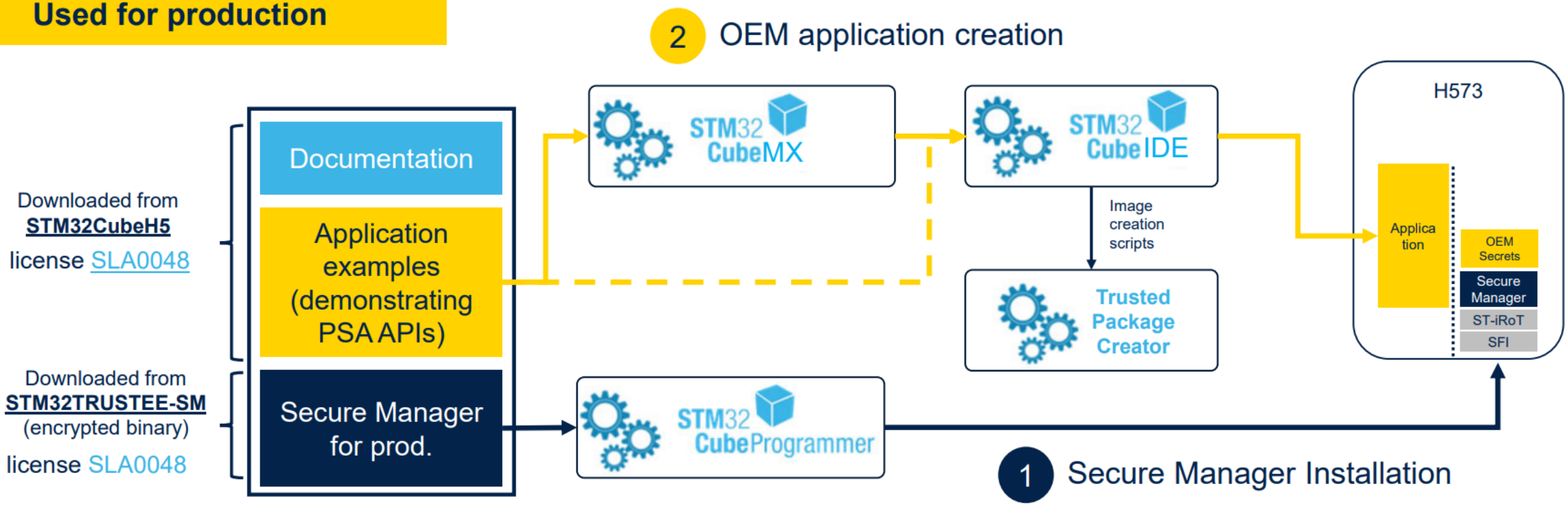
Secure Manager Access Kit
SMAK

Development kit to develop NS applications using security services

SMAK license SLA0048
Used for production



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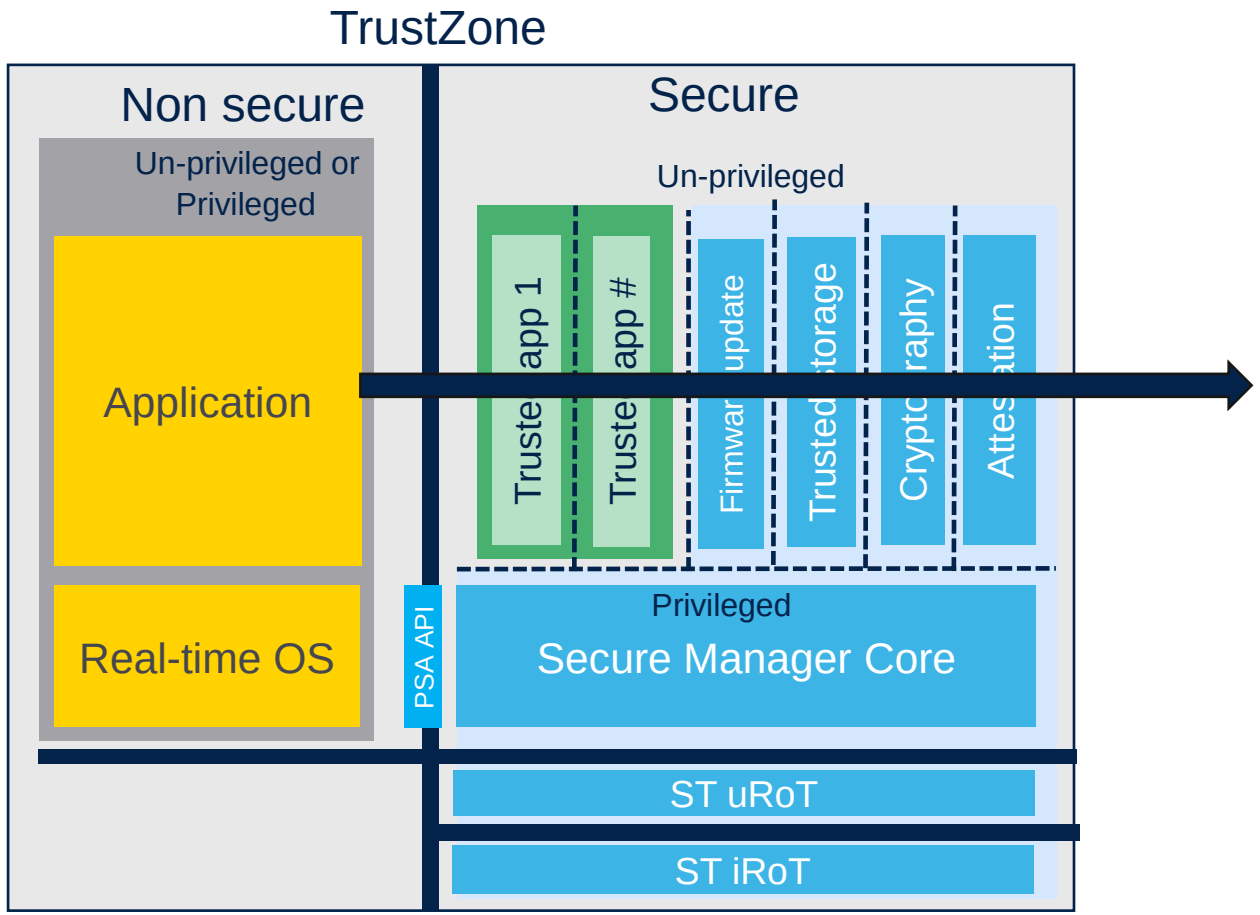
Secure Manager Access Kit
NS and S partitioning

Simplify security customer journey



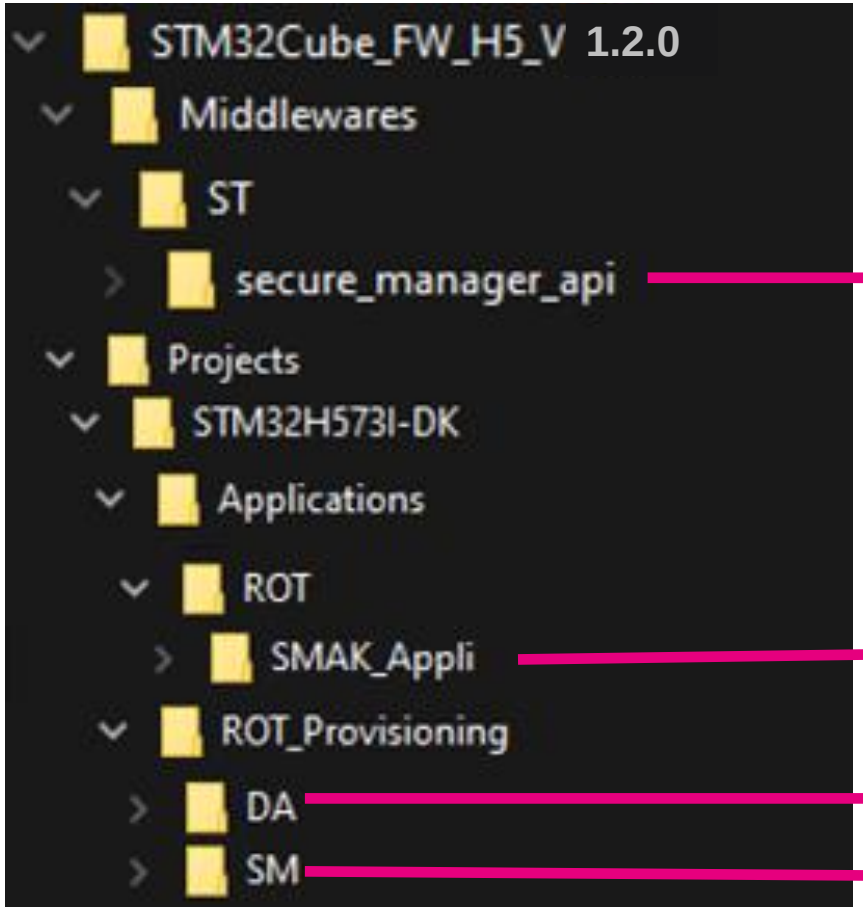
OEM scope

Non-Secure Application

- securely & independently updatable
- optionally encrypted

SMAK Delivery overview

Main resources



Secure Manager API Middleware provides callable standard PSA Services

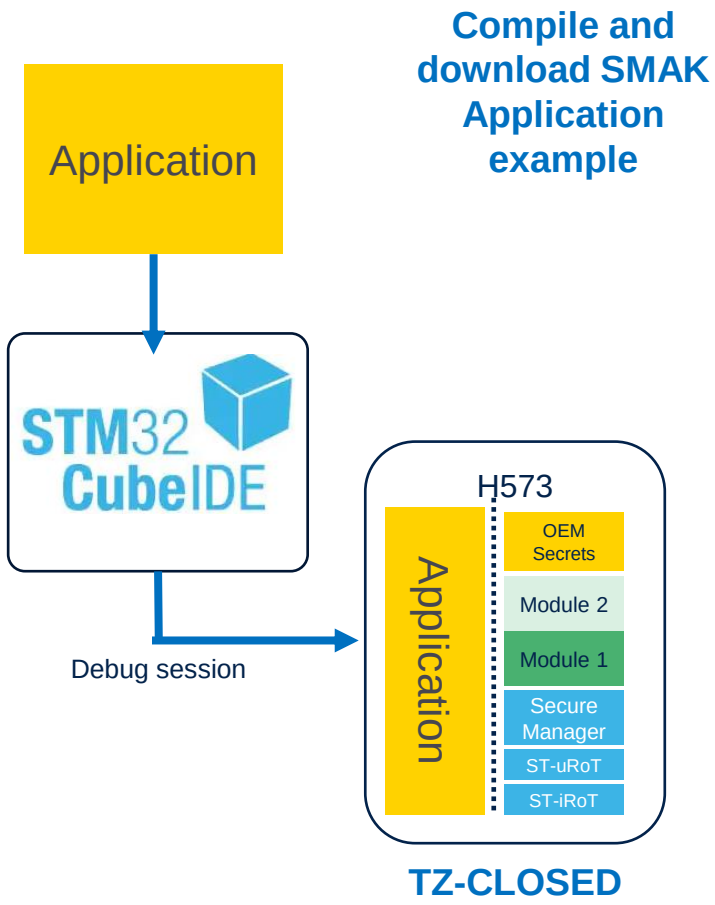
Application example with usage of the PSA API

Debug Authentication : all the scripts and resource associated

Secure Manager : all the scripts and resource associated

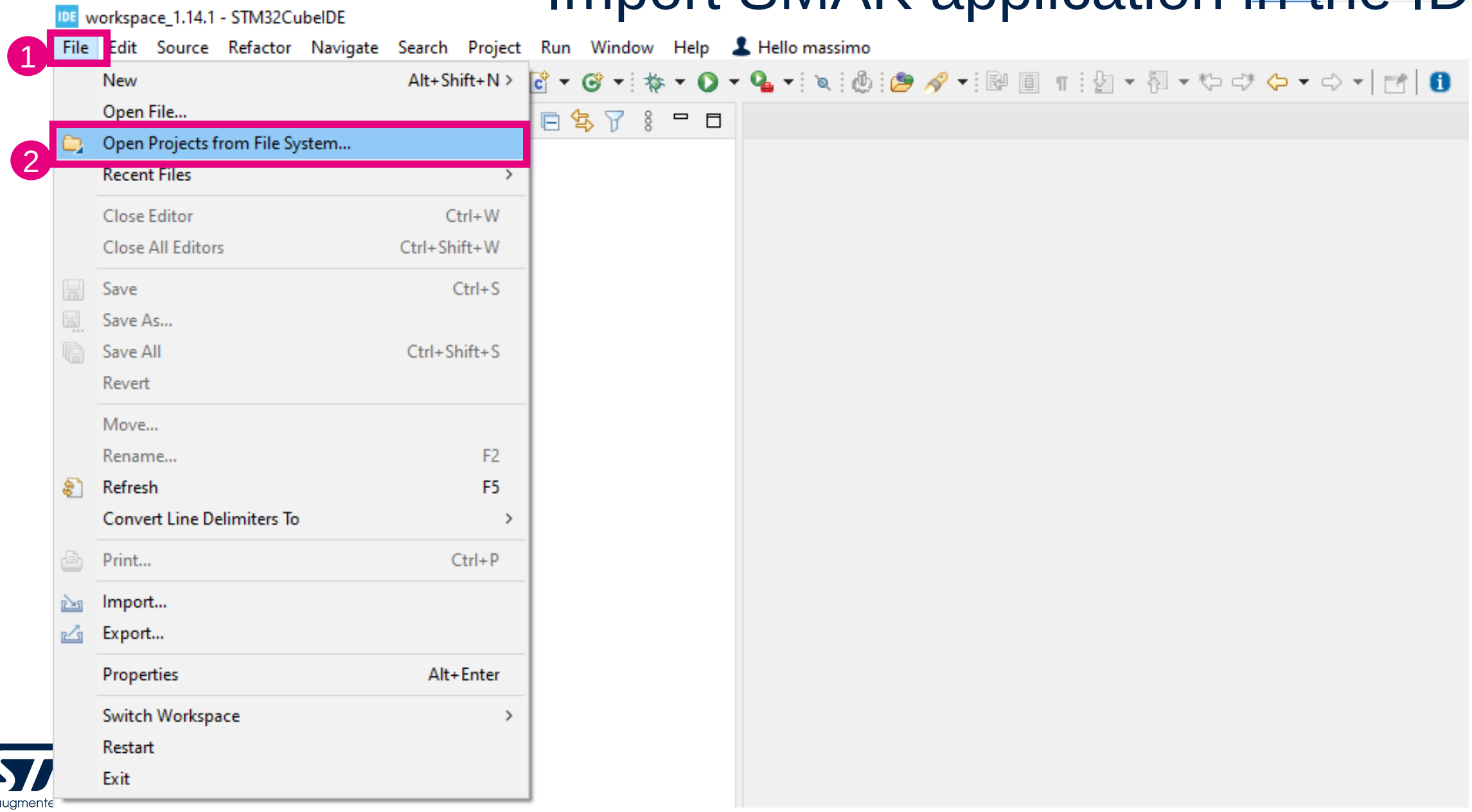
SMAK Development Flow

Application Development Flow



Hands-on: NS Application Compile and Debug

Import SMAK application in the IDE



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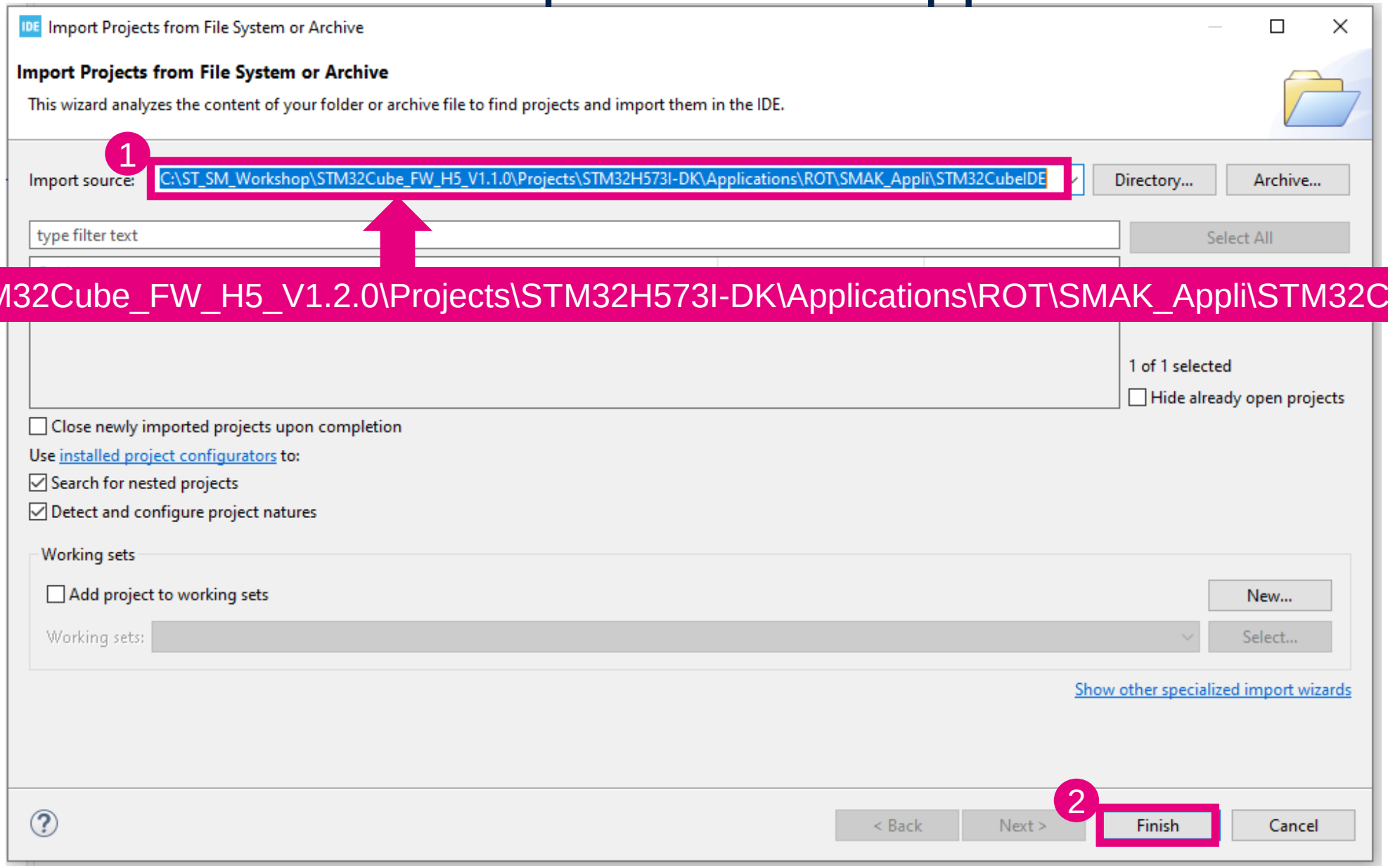

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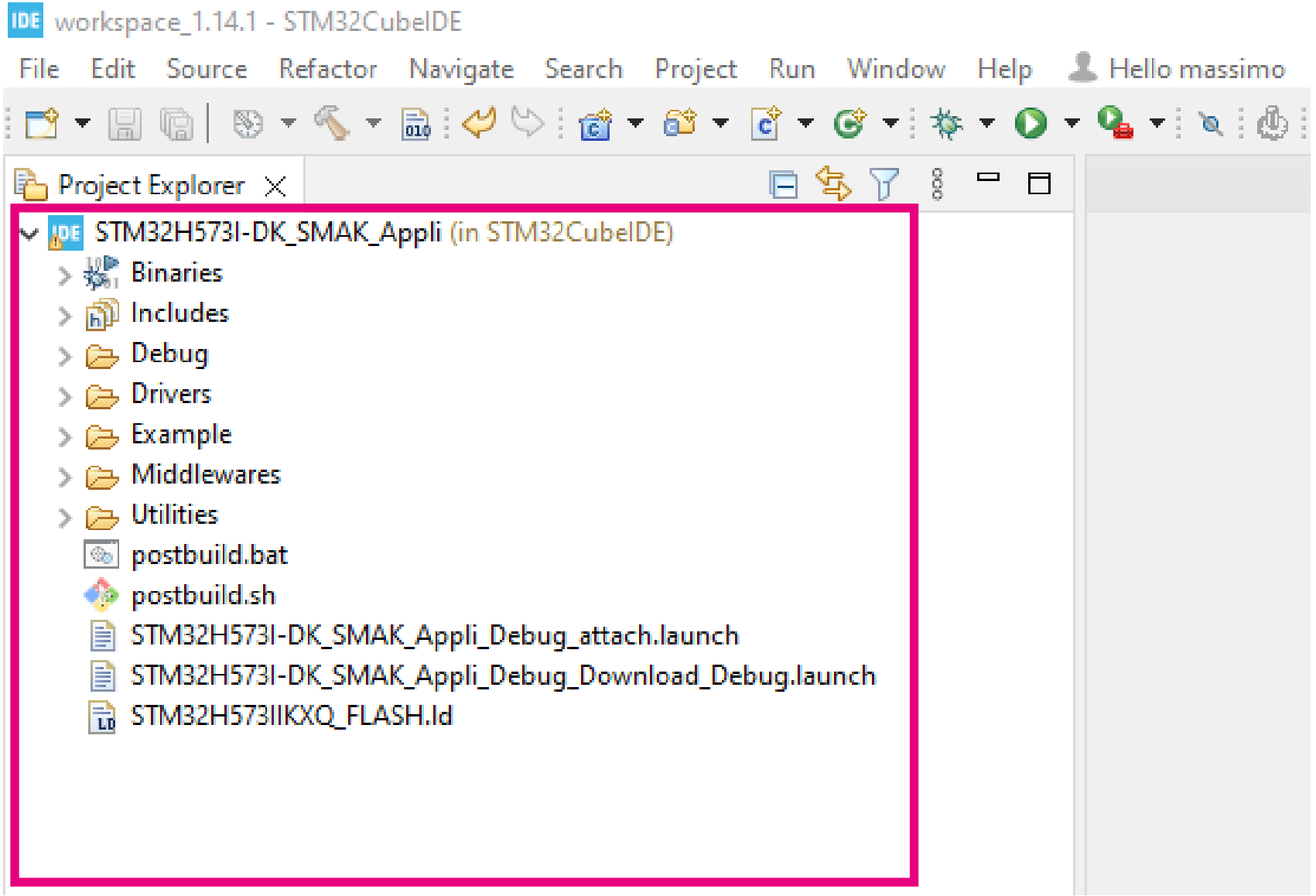
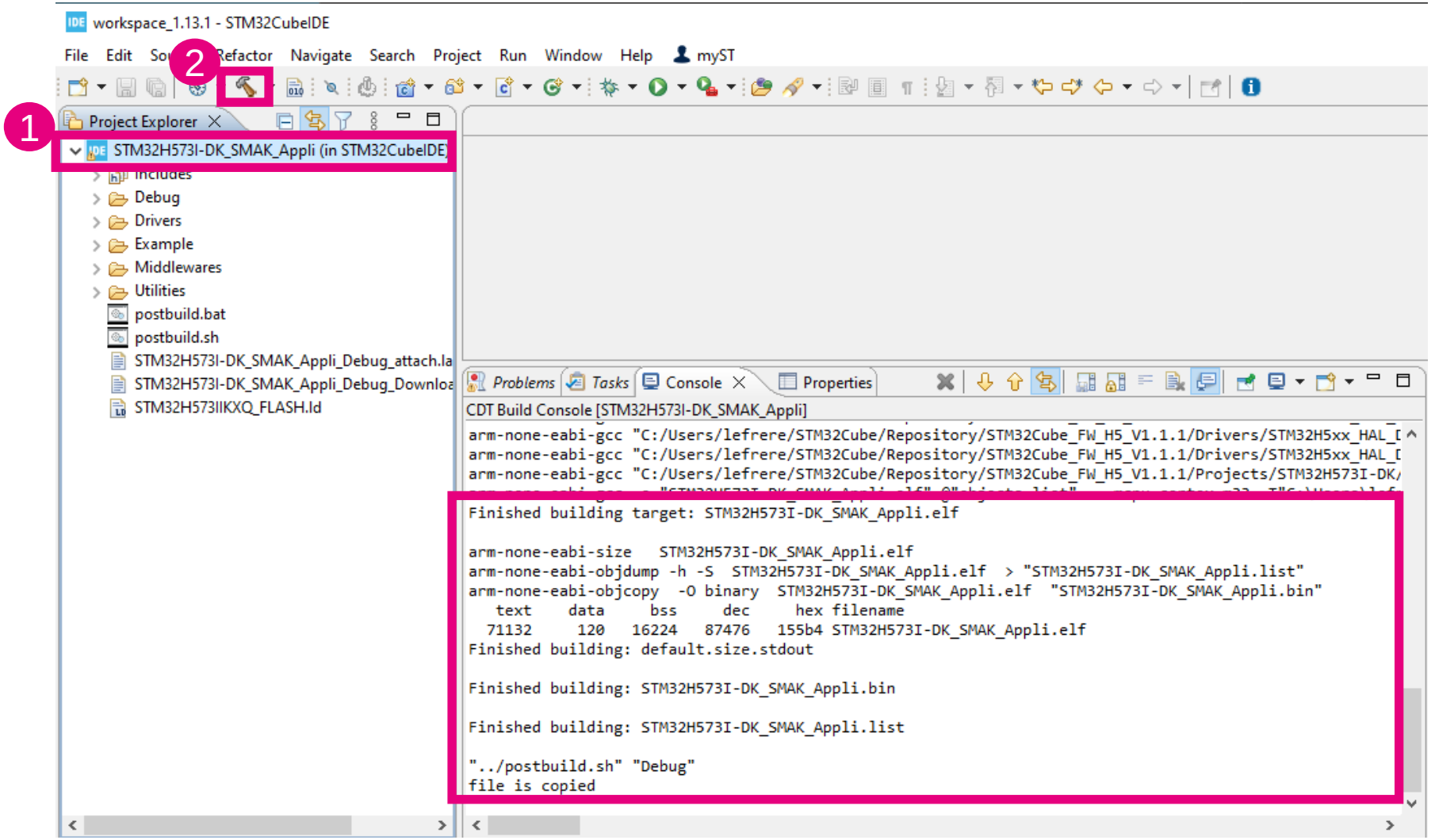


Compile SMAK application



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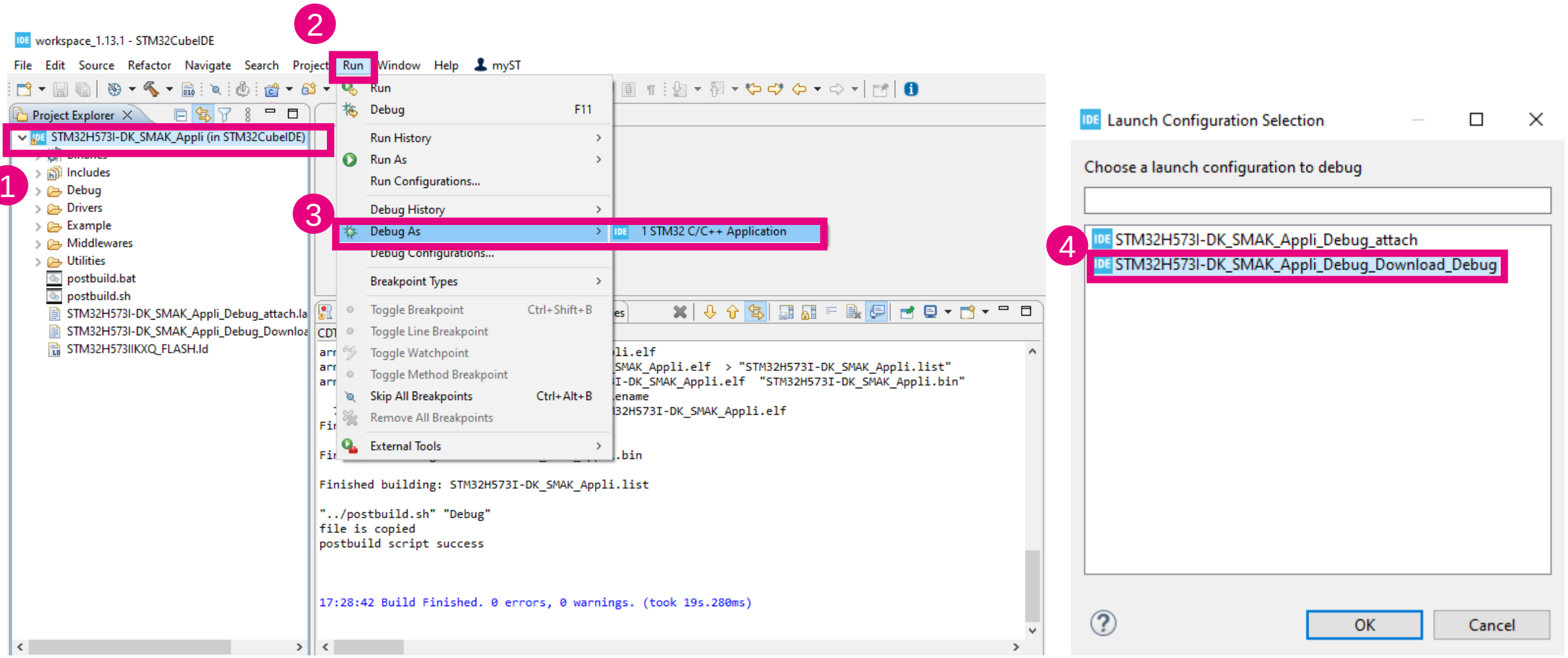
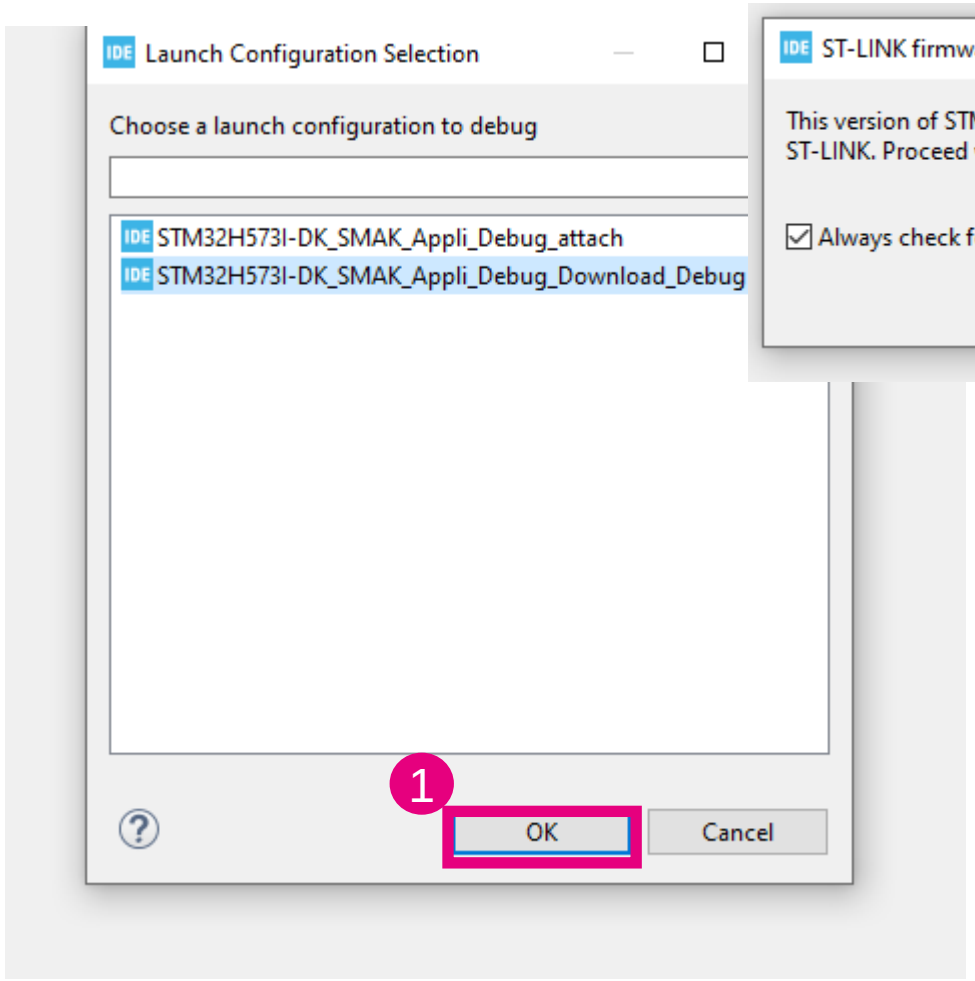
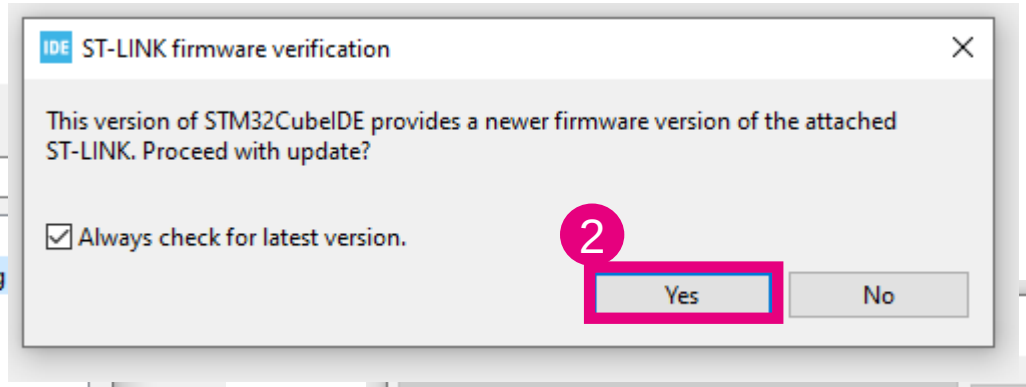
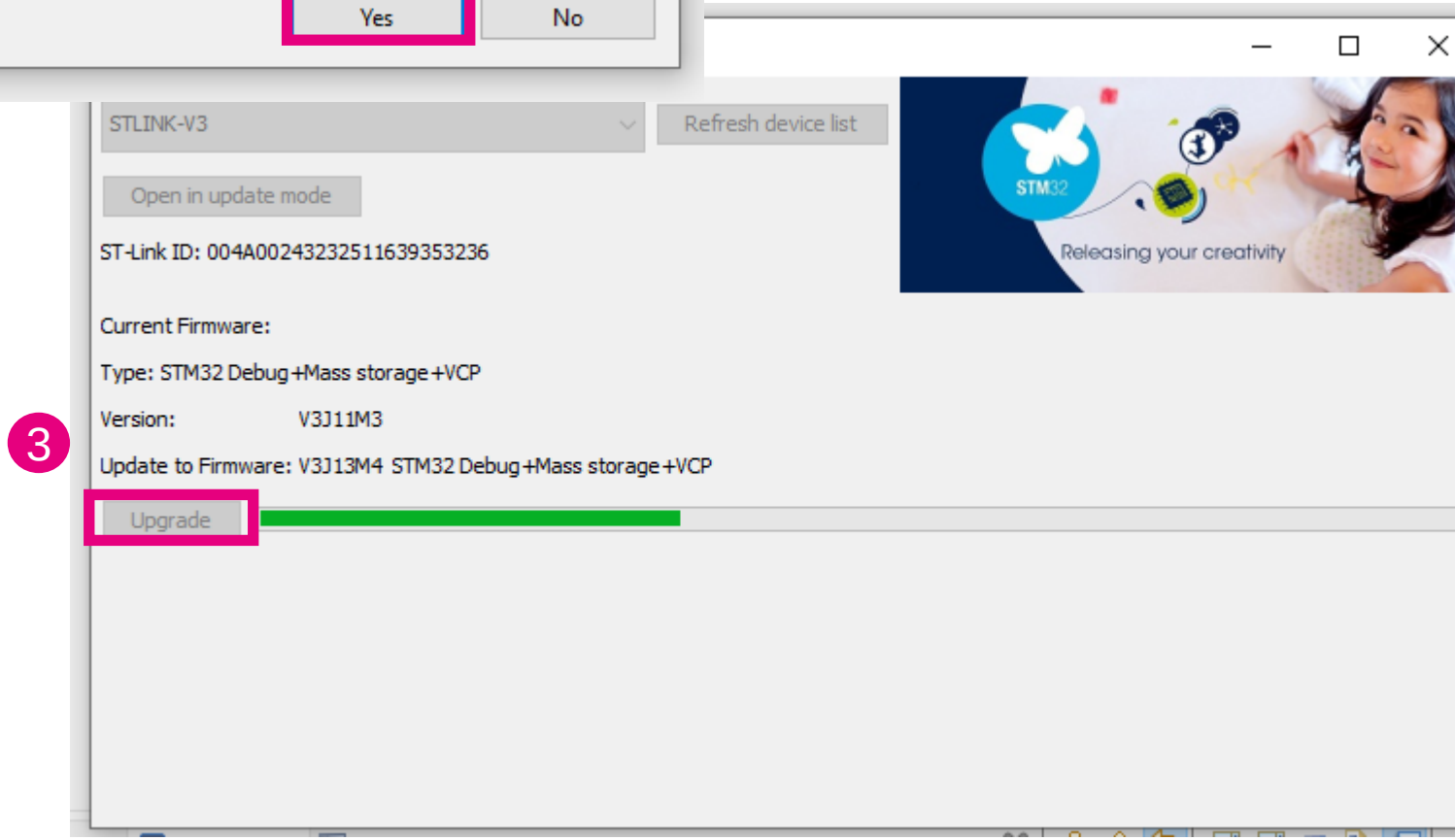
Load and debug the SAMK application



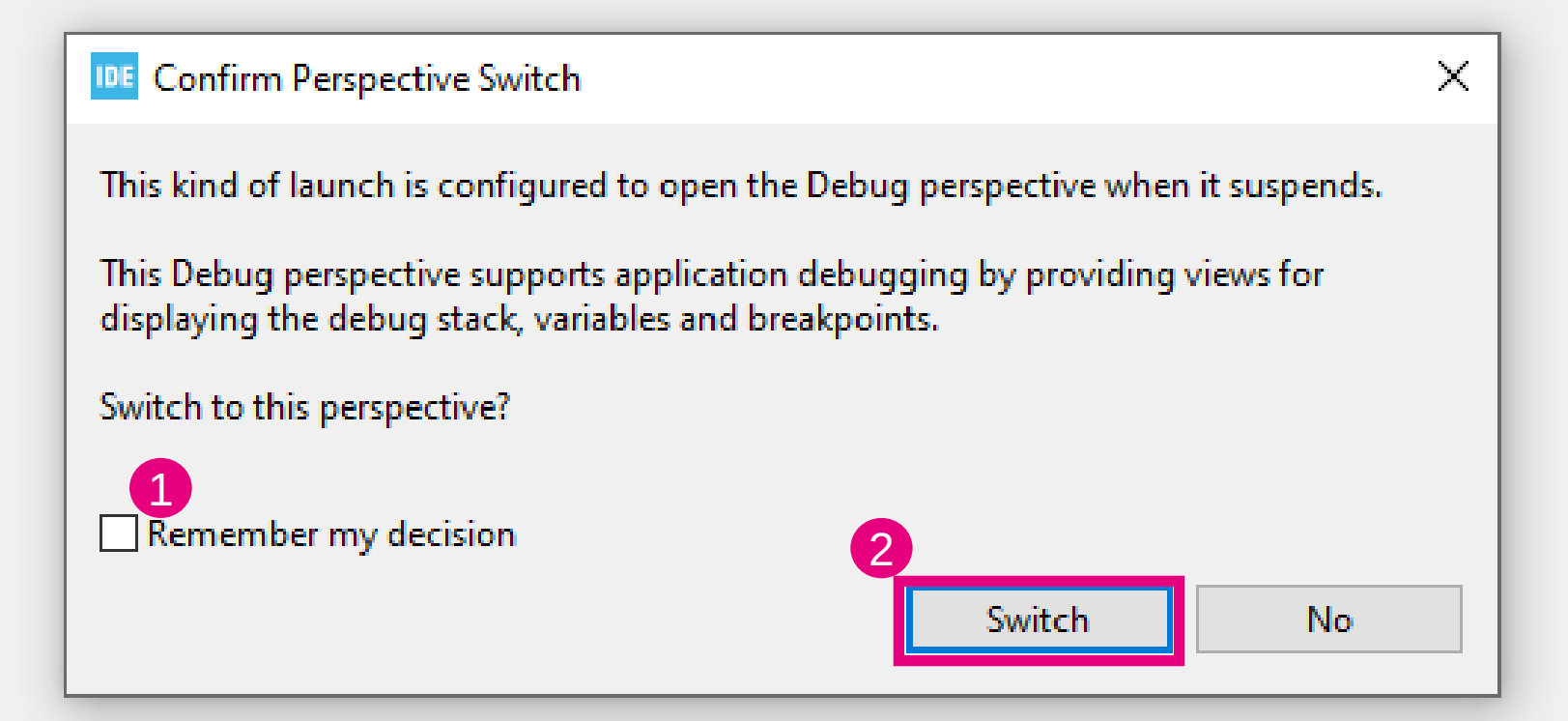
Update ST-LINK if asked







Activate Debug Perspective

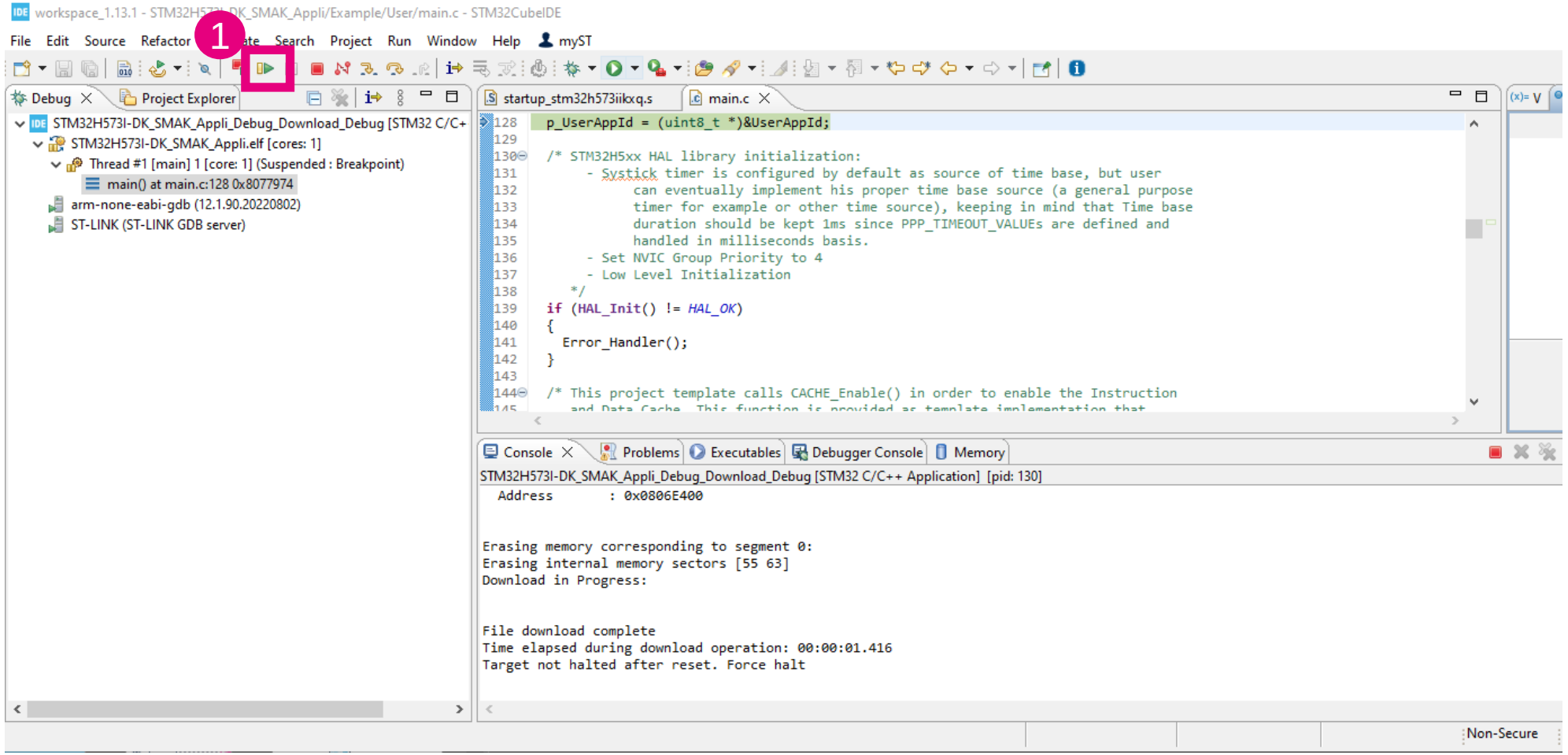


SMAK application debug

- Add breakpoint line 162 which is first printf line : double click on “162”
- Run/Resume of F8
- Then press F6 and see the lines printing in TeraTerm

- => You can download and debug the SMAK example application as if you were developing on a STM32 without TrustZone in open state

Launch the SMAK appli



Hands-on: NS Application and Secure Manager services

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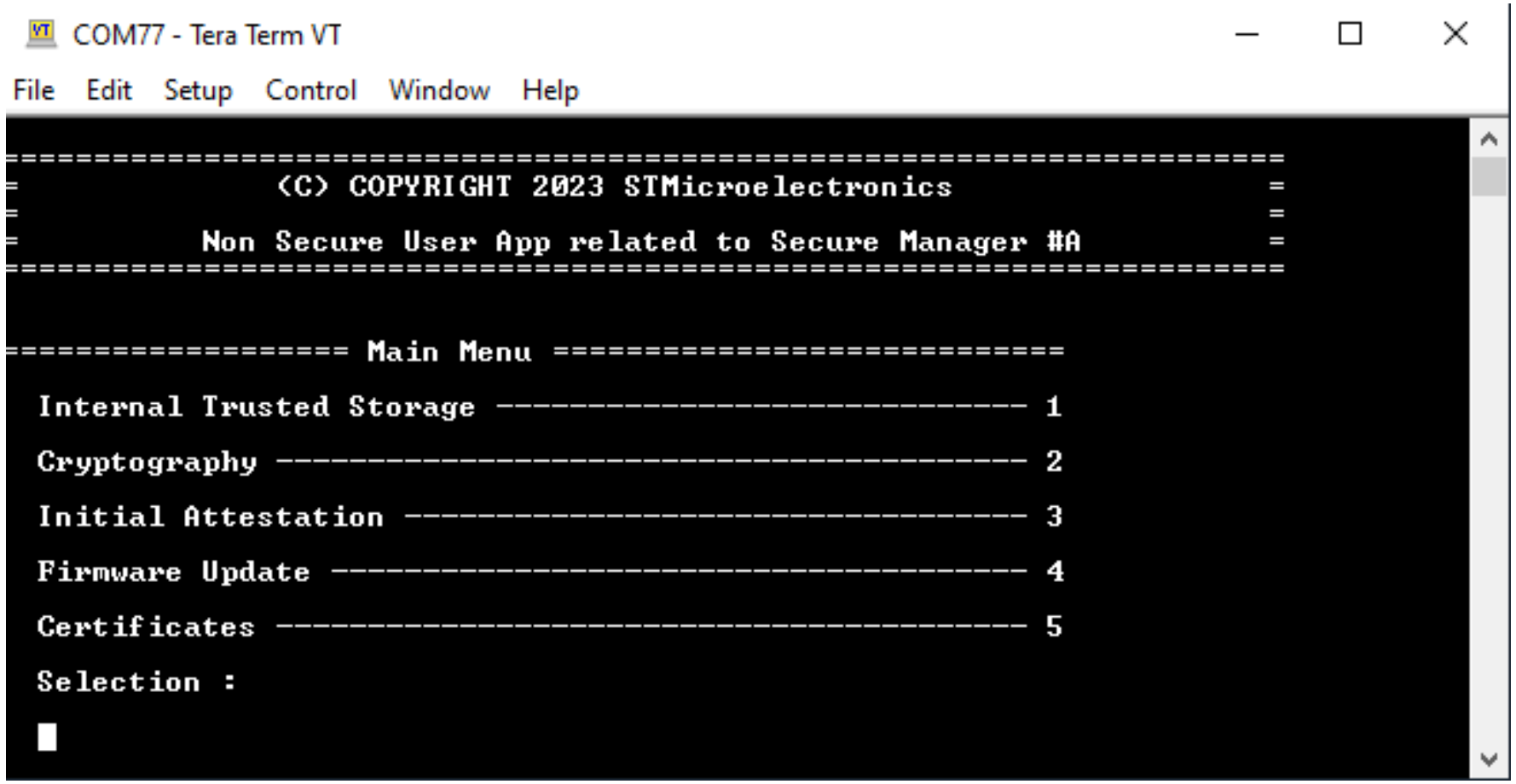
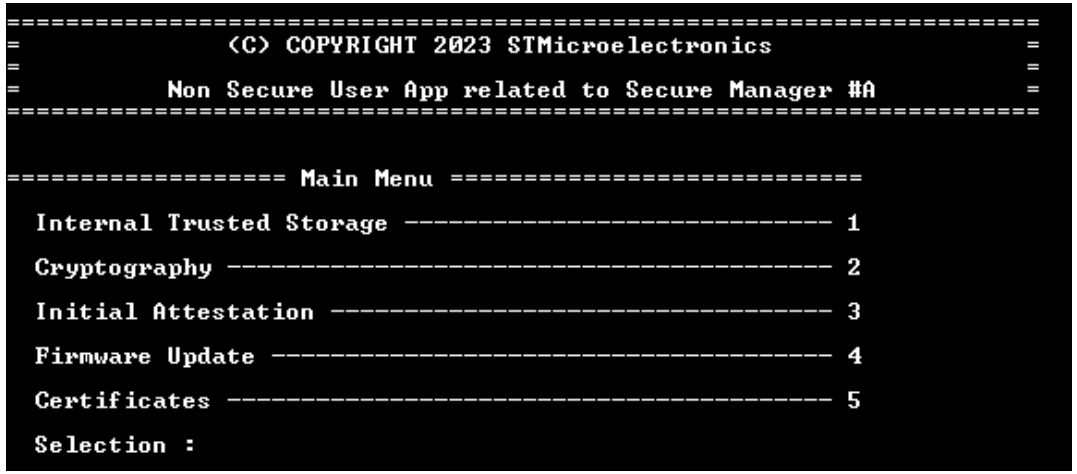
SMAK appli UI

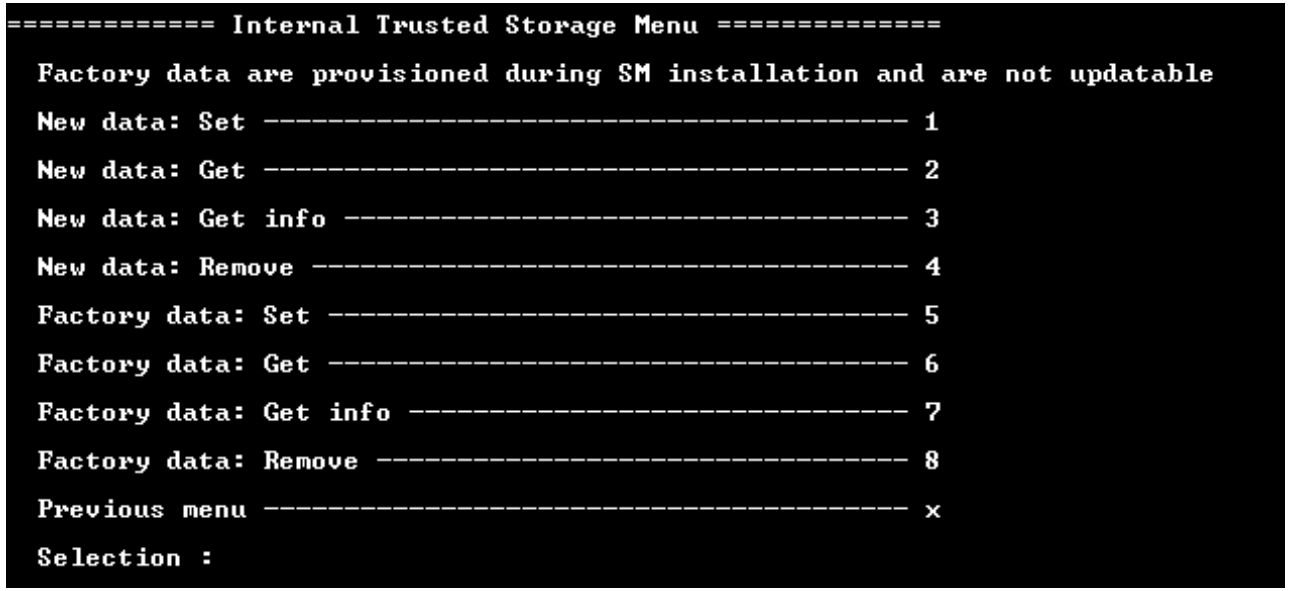


SMAK appli UI



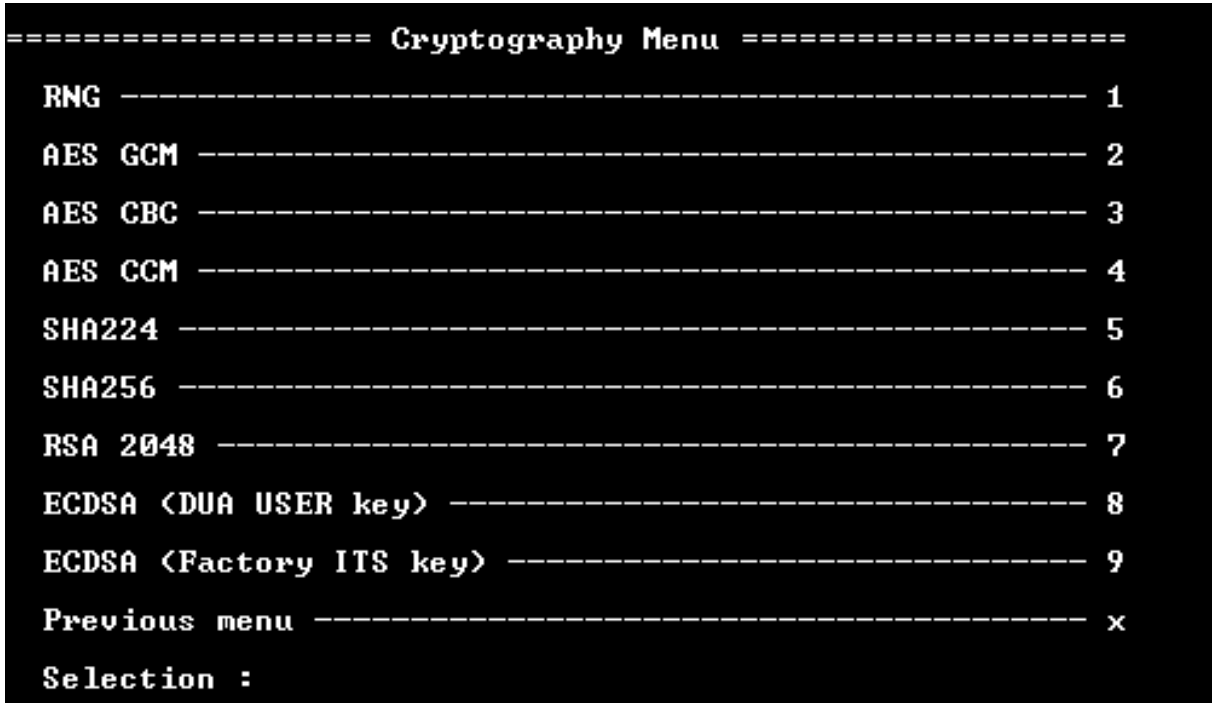
- SMAK example application provides implementation of PSA API for each service category (1 to 4)
- Item 5 does not use PSA API. Just displays the X509 certificates provided by the platform

Internal Trusted Storage



- Example of dynamic writing into secure store
- Example of accessing pre-provisioned data (Factory data)
- Secure manager provides the ability to pre-provision the Internal Trusted Storage using a simple tool (we will use it later)

Cryptography

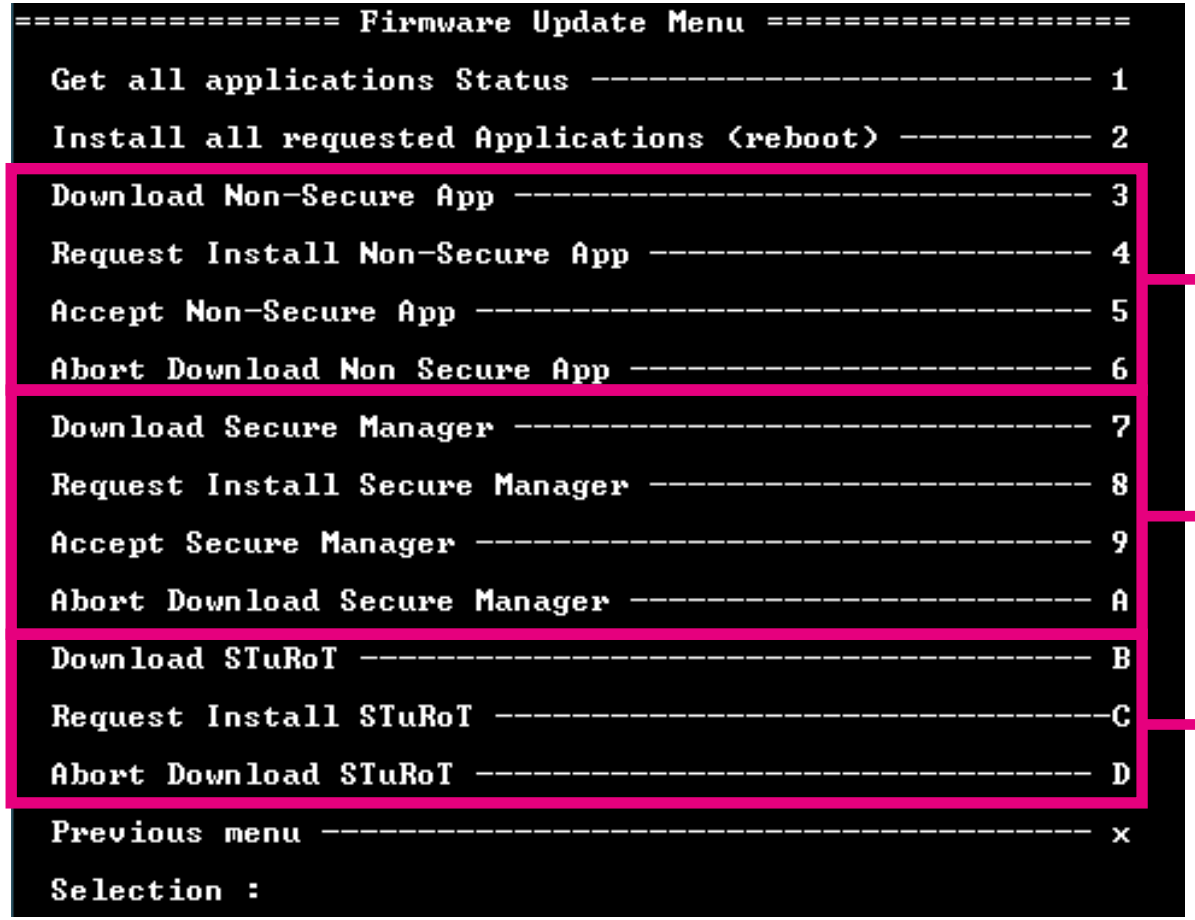


- Set of examples of PSA Crypto API usage

Initial Attestation

- Provides Initial Attestation token signed by Device Unique Authentication DUA1 key

Firmware Update



→ Secure User application update

→ Secure manager update

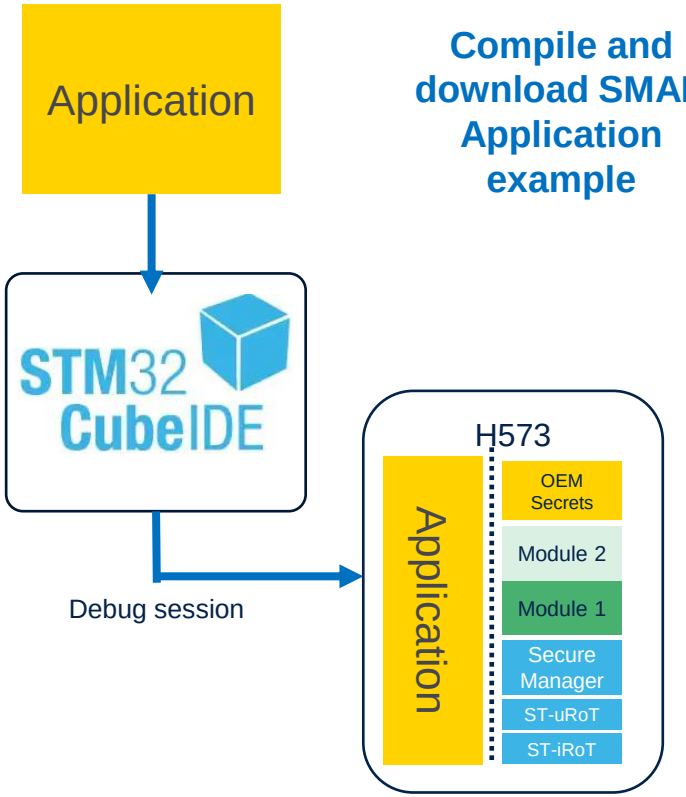
→ Secure ST-uROT (2nd stage bootloader) update

Certificate

- Display both certificate content in X509 pem format

SMAK Development Flow

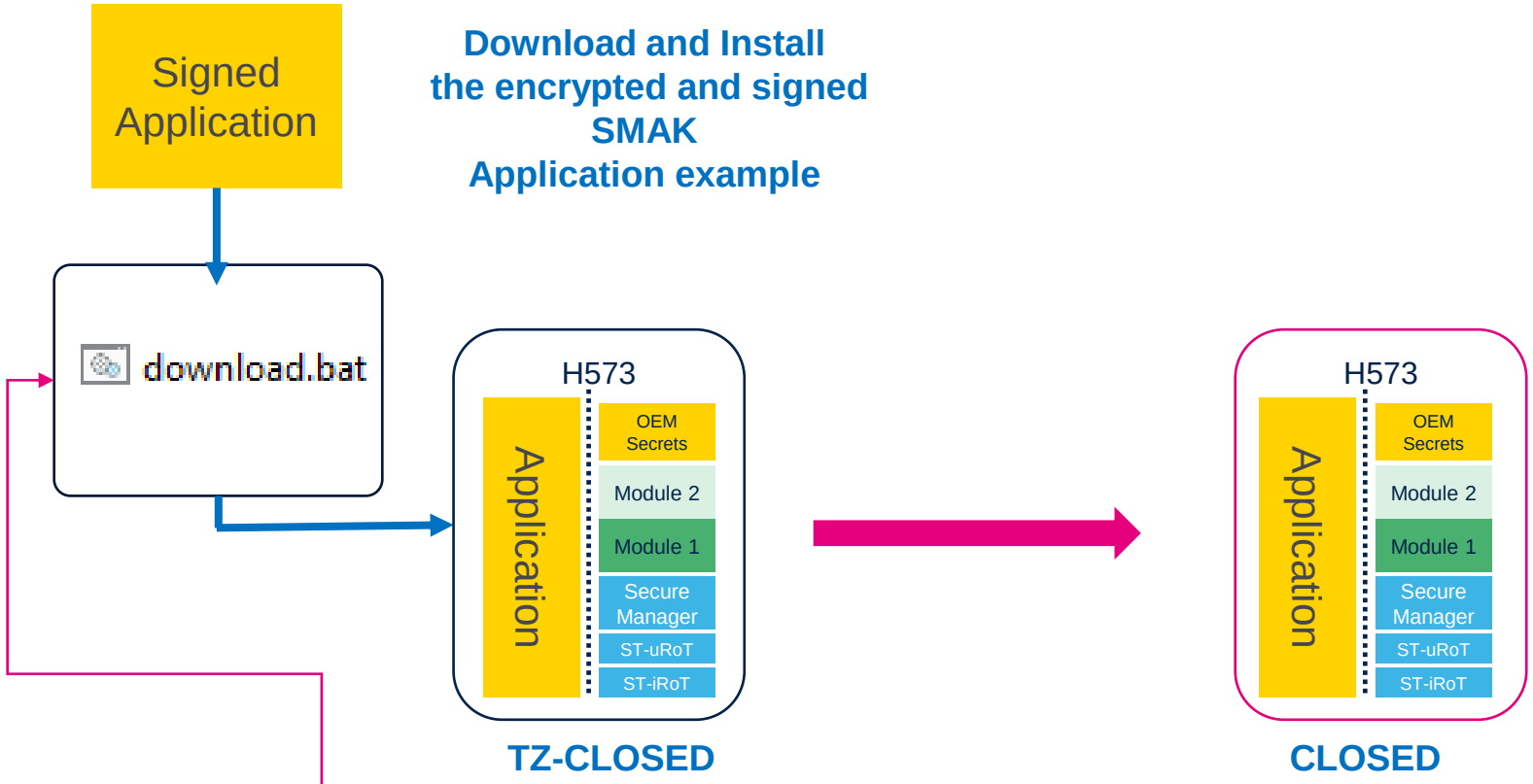
Application Development Flow



Development completed

SMAK Installation Flow

Application Installation Flow



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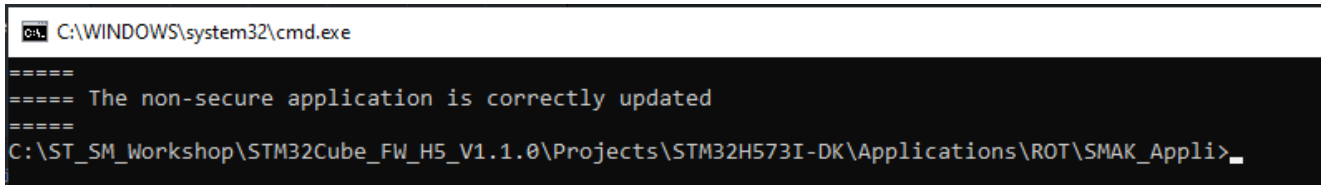

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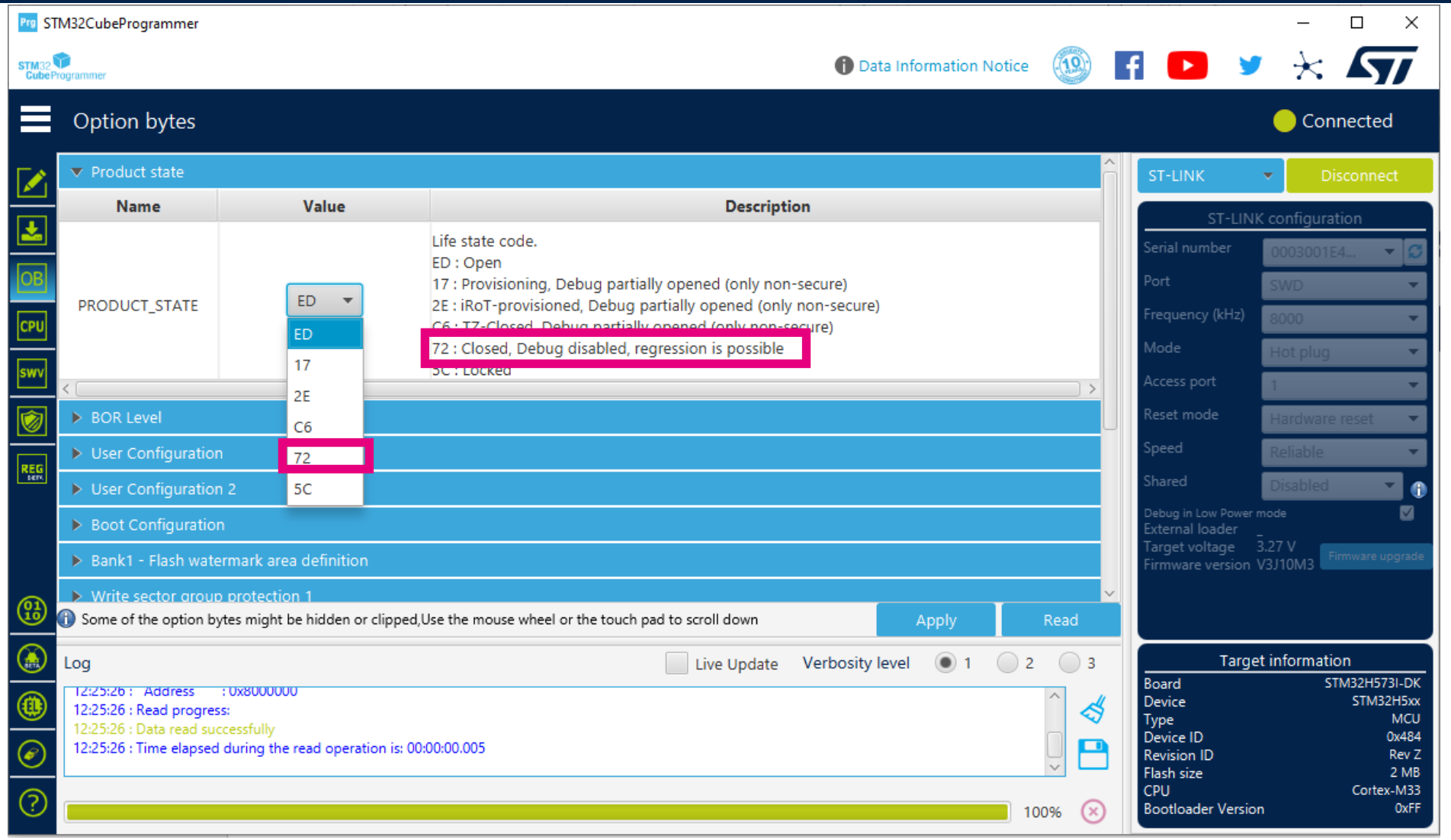
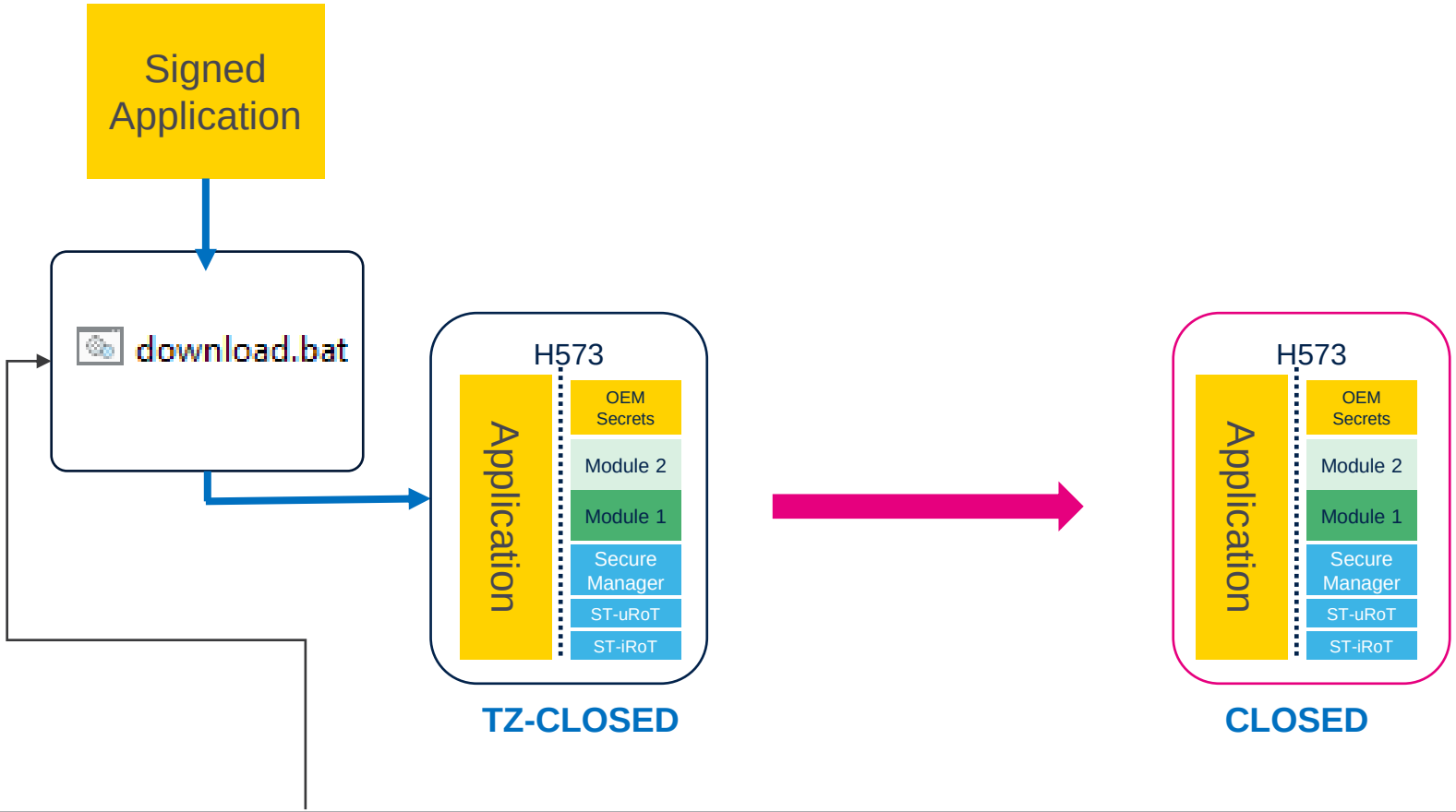
Secure Manager Ecosystem

Set device in CLOSED state



SMAK Installation Flow

Application Installation Flow



STM32Cube_FW_H5_V1.2.0\Projects\STM32H573I-DK\Applications\ROT\SMAK_Appli

Resources

Resources

Links

- STM32Trust: Web page
- Security with STM32H5: Wiki pages
- Getting Started with STM32H5 security: Wiki pages
- STM32 Embedded Security Learning Journey: Web page

Videos

- STM32H5 Training: Online Training
- STM32 Security MOOC: Online Course
- Secure Manager MOOC: Online Course

Docs

- AN5156 : Introduction to STM32 microcontrollers security
- AN6007 : Getting Started with STiRoT for STM32H5 MCUs
- AN6008 : Getting Started with Debug Authentication for STM32H5 MCUs
- UM3254 : Secure manager for STM32H573xx microcontrollers
- RM0481 : STM32H563/H573 Reference Manual

Agenda

1 Introduction

2 STM32H5 security features overview

3 Hands-On: Getting started with Secure Manager

4 Hands-On: SMAK Develop and Debug

5 Hands-On: Debug Authentication

6 Conclusion & Takeaways

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