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STM32H5 MCU series

Most powerful Arm[®]
Cortex[®]-M33 MCU yet





“

If only

an MCU could give me more design freedom and speed up my time to market.

This is where we come in



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“

If only

an MCU could offer certified & maintained security services.

This is where we come in



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STM32H5

Makes performance & security
more accessible



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Introducing the **STM32H5** MCU series for high performance designs



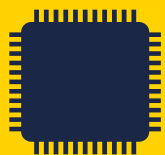
Most powerful Arm[®] Cortex[®]-M33 MCU

Industry-first 32-bit MCU with Arm[®] Cortex[®]-M33 core running as high as 250 MHz



Scalable security to address every need

From the most essential security building blocks to fully certified services maintained by ST



Optimized cost/performance trade-off

Based on ST's optimized 40 nm process technology
Large choice of memory, peripherals, and package options



STM32 MCU and MPU portfolio



MPU

STM32MP1
Up to 1 GHz Cortex-A7
209 MHz Cortex-M4

High Perf MCUs

STM32F7 1082 CoreMark 216 MHz Cortex-M7	STM32H7 Up to 3224 CoreMark Up to 550 MHz Cortex -M7 240 MHz Cortex -M4
STM32F2 Up to 398 CoreMark 120 MHz Cortex-M3	STM32F4 Up to 608 CoreMark 180 MHz Cortex-M4
STM32H5 Up to 1023 CoreMark 250 MHz Cortex-M33	

Mainstream MCUs

STM32F3 245 CoreMark 72 MHz Cortex-M4	STM32G4 569 CoreMark 170 MHz Cortex-M4	<i>Mixed-signal MCUs</i>	
STM32C0 114 CoreMark 48MHz Cortex M0+	STM32F0 106 CoreMark 48 MHz Cortex-M0	STM32G0 142 CoreMark 64 MHz Cortex-M0+	STM32F1 177 CoreMark 72 MHz Cortex-M3

Ultra-low Power MCUs

STM32L0 75 CoreMark 32 MHz Cortex-M0+	STM32L4 273 CoreMark 80 MHz Cortex-M4	STM32L4+ 409 CoreMark 120 MHz Cortex-M4	STM32L5 443 CoreMark 110 MHz Cortex-M33	STM32U5 651 CoreMark 160 MHz Cortex-M33
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Wireless MCUs

STM32WL 162 CoreMark 48 MHz Cortex-M4 48 MHz Cortex-M0+	STM32WB 216 CoreMark 64 MHz Cortex-M4 32 MHz Cortex-M0+	STM32WBA 407 CoreMark 100 MHz Cortex-M33
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Legend: Latest product generation ● Radio co-processor only



STM32H5 simplifies the design of secure industrial applications



Smart homes

Air conditioning systems
Fridges
Alarm systems

Factory automation

PLC
Motor control
Industrial pumps



Smart cities

Communication gateways
Light control
Energy conversion

Consumer

Keyboards, tracking devices
Medical accessories



Key features for factory automation

STM32H5

Design freedom in harsh environments

- High performance core at 250 MHz
- Large and robust embedded memory
- Extended temperature range up to 125°C

Ready for Industry 4.0

- PSA & SESIP Level 3 certification targets
- SIL-ready enabled by native hardware features
- Extended connectivity
(Ethernet MAC, FD-CAN, MIPI-I3C and USB)



Key features for IoT and connectivity systems

STM32H5

Performance in space-constrained devices

- High performance at 250 MHz
- Low power dissipation
 - 61 $\mu\text{A}/\text{MHz}$ at 250 MHz
 - 1.7 V power supply
- Small package sizes

Simplified connectivity solution

- Pre-provisioned security keys for registration to cloud & OEM servers
- Extended connectivity (MIPI- I3C, SDMMC, USB, UCPD)

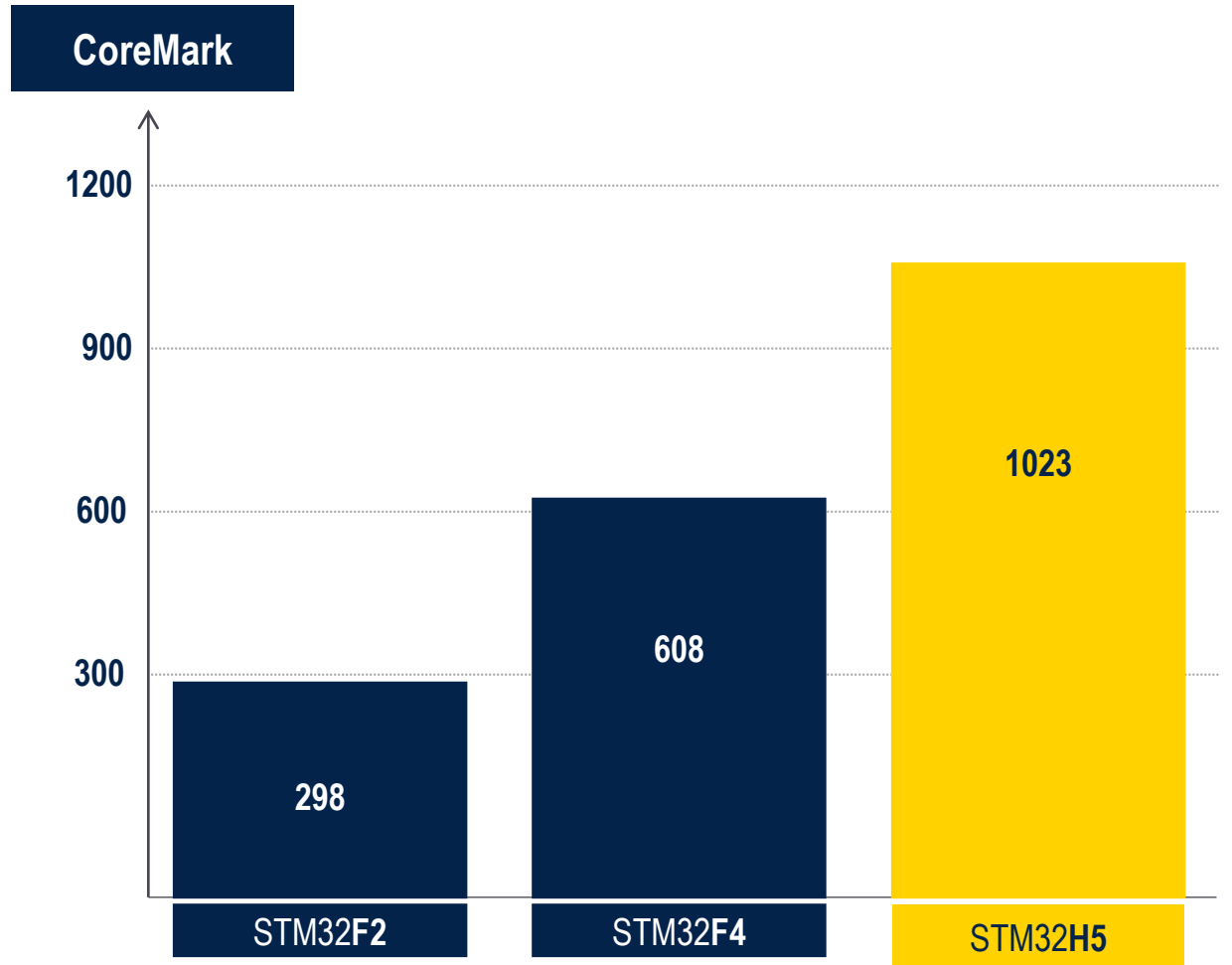




Boosting application performance

STM32H5

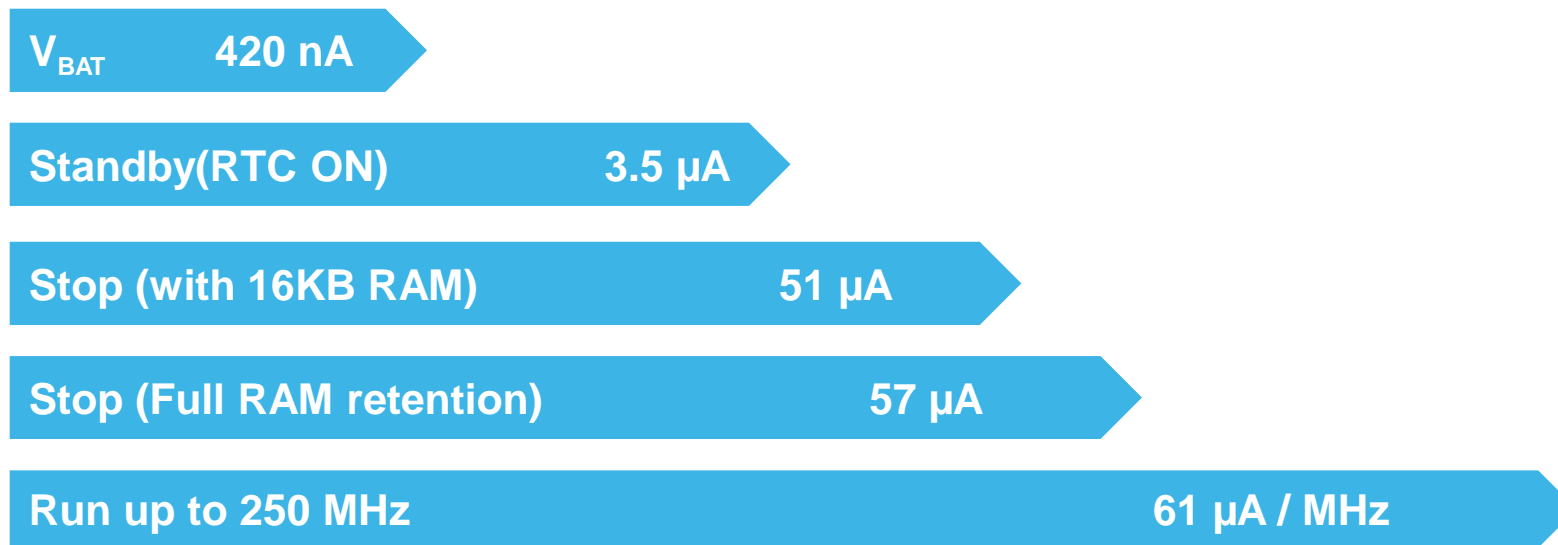
- Arm® Cortex®-M33 at **250 MHz**
375 DMIPS & 1023 CoreMark
- **Instruction and data cache** for internal and external memory (ART Accelerator™)
- Mathematics accelerators: **FMAC** and **Cordic**





Flexible power modes

Efficient power consumption thanks to the switched mode power supply option (SMPS)



Typical: 25°C, $V_{DD} = 3V$, SMPS mode

Scalable security to boost your time to market

How many security building blocks do you need to reach your security goals?



Choose between different security offers

From secure hardware to full solution owned & maintained by ST.



target certifications

Robust hardware features and turnkey SoC software implementations

<p>Memory protections against illegal access control</p>	<p>Cryptography for hardware robustness</p>	<p>Turnkey SOC security services</p>	
<p>OTP, HDP, WRP, MPU Ext. Flash Decryption OTFDec Secure Debug Active Tamper</p>	<p>Side channel AES, PKA Additional AES, PKA, SHA, TRNG, OTFDec, HUK NIST - CAVP certified CryptoLib</p>	<p>STM32Trust TEE Secure Manager</p>	
<p>Platform authentication during product lifecycle</p>	<p>Code isolation for runtime protection</p>	<p>Easy registration to clouds & servers</p>	
<p>2 boot stages Protection level states Debug authentication</p>	<p>7 isolation stages Arm® TrustZone® technology Dedicated keystores</p>	<p>Multi-tenant IP protection</p>	
		<p>Pre-integrated 3rd party PKI lifecycle</p>	
		<p>Immutable Root of Trust</p>	

State-of-the-art security assurance level



Secure Manager

A Trusted Execution Environment (TEE) integrating core security services

A simplified customer journey

Seamless cloud/server support

Supporting remote provisioning

Multi-tenant IP protection

The first MCU supplier to offer a certified and maintained TEE solution to customers

A simplified customer journey

- Turnkey SoC TEE security services
- Certified secure implementations
- TrustZone® complexity abstraction
- Designed for LTS – long term service
- PSA API compliant

Seamless cloud/server support

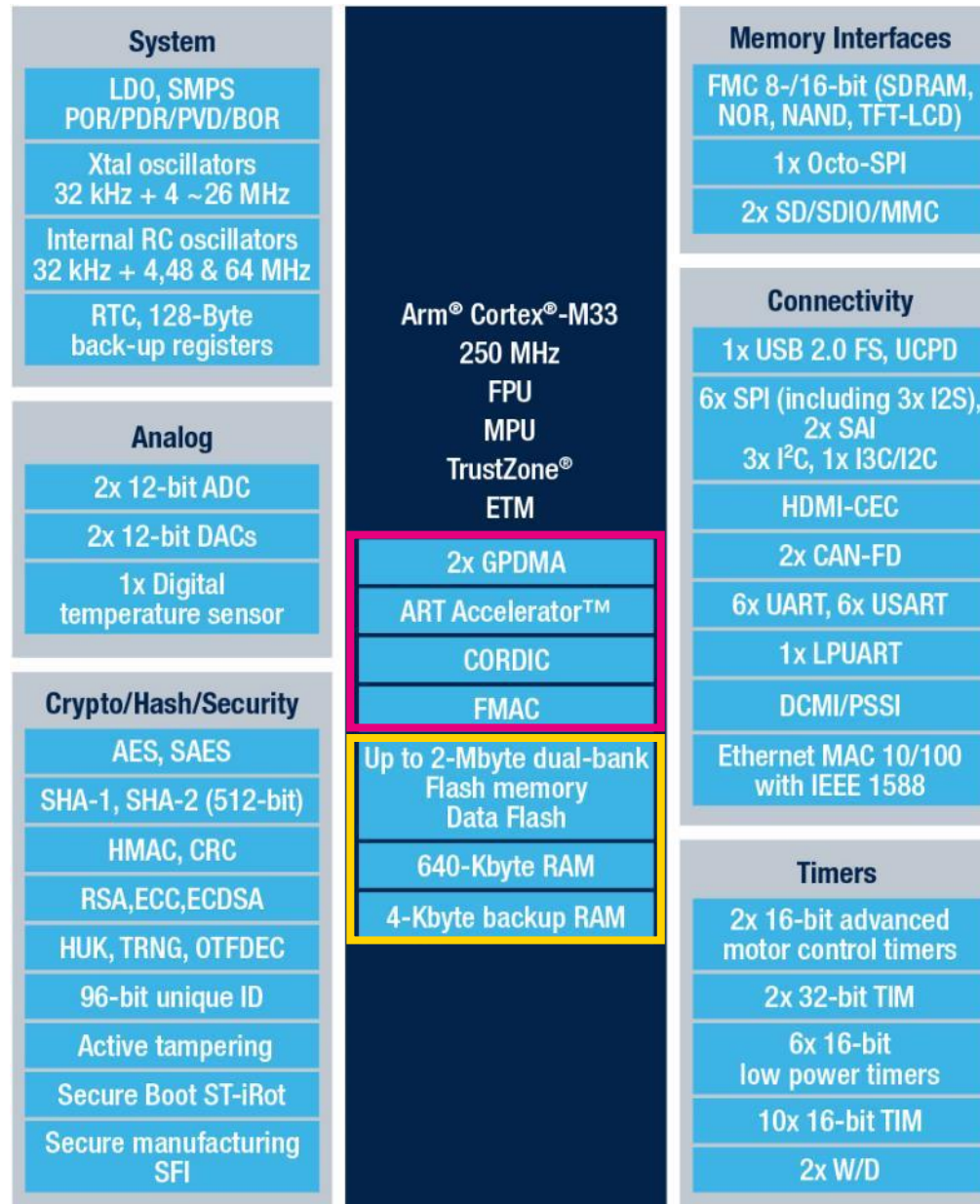
- Seamless cloud/server registration
- Pre-provisioned keys & certificate
- PSA compliant attestation

Fostering many business cases

- Multi-tenant IP protection
- Isolation for confidentiality at installation & runtime
- Protected development flow
- 3rd party PKI pre-integration
 - Remote & in-the-field credential administration
 - Ease registration & lifecycle for cloud partners



STM32H573 MCU block diagram



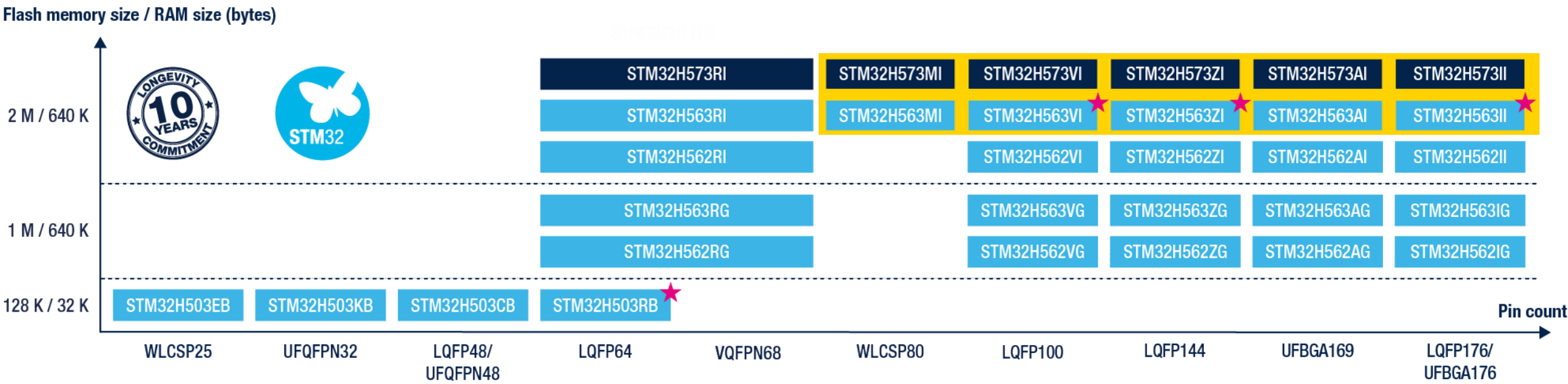
Numerous integrated peripherals

Advanced accelerators

Large embedded memory

STM32H5 portfolio

A large offer with multiple package choices



Legend: ■ Without HW crypto ■ With HW-Crypt & ST-iRoT Additional SMPS option ★ Available now, other RPNs will be available in Q2'2023.



Multiple package options to developer needs



32/48/68-pin QFN
25/80-pin WLCSP

48/64/100/144/176-pin LQFP
169/176-pin UFBGA



3 memory size options

2 Mbytes Flash / 640 Kbytes RAM
1 Mbytes Flash / 640 Kbytes RAM
128 Kbytes Flash / 32 Kbytes



Security options

With hardware crypto and ST-iRoT
Without hardware crypto and ST-iRoT

**More than
30 products**



Development tools for STM32H5 series

Jump-start your evaluation, prototyping, and design

* \$15

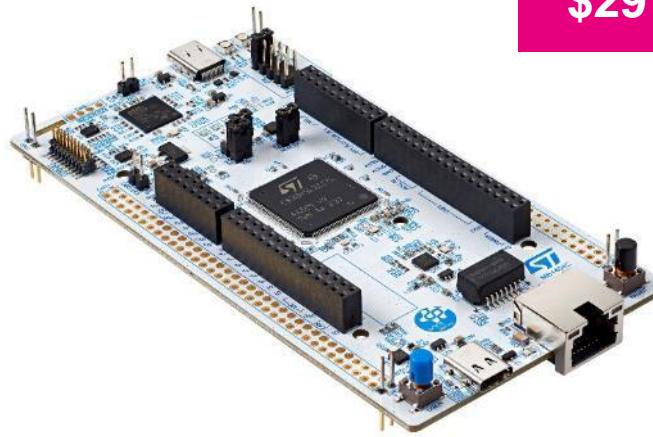


NUCLEO-H503RB

Affordable prototyping

USB, Arduino uno IF, 64-pin MCU

* \$29



NUCLEO-H563ZI

Affordable prototyping

USB, Ethernet, Arduino uno IF,
144-pin MCU

* \$99



Available in Q2'23

STM32H573I-DK

Multi-connectivity kit

USB, Ethernet, MicroSD, Display,
512-Mbit Octo-SPI flash, Audio,
Multi-extension IFs, 176-pin MCU

**Recommended Resale Price (RRP)*



STM32Cube framework

Helping developers release their creativity

Comprehensive offer helping you accelerate your development

Focus on quality, compatibility and stability

Documentations, trainings and worldwide support channels



Applicative reference implementations

Extension libraries and AI toolkit

Hardware

Embedded SDK

Development tool kit

Development resources





STM32Cube Framework

Tools and software supporting you during all your design steps

MCU, boards
and SW
selection

HW and SW
Configuration

Application Development and debug

Code and HW
options
programming

Run-time
application
monitoring



STM32
Finder



STM32
CubeMX



STM32
CubeMCU Packages



STM32
CubeExpansion



STM32
CubeIDE



STM32
CubeProgrammer



STM32
CubeMonitor

Verticals and
Partners solutions

IDEs from Partners

Programmers from Partners

Worldwide support channels



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STM32Cube expansions cloud reference integrations

Easily connect your devices to main cloud service providers

Security

- ✓ Secure boot
- ✓ Private key and secrets storage
- ✓ Seamless registration process
- ✓ X509 certificate

Ready-to-run project

- ✓ Quick Connect script
- ✓ Project example
- ✓ Secure and non secure project

STM32H5 connects smart things
to major cloud providers in a
secure way

STM32 
CubeExpansion



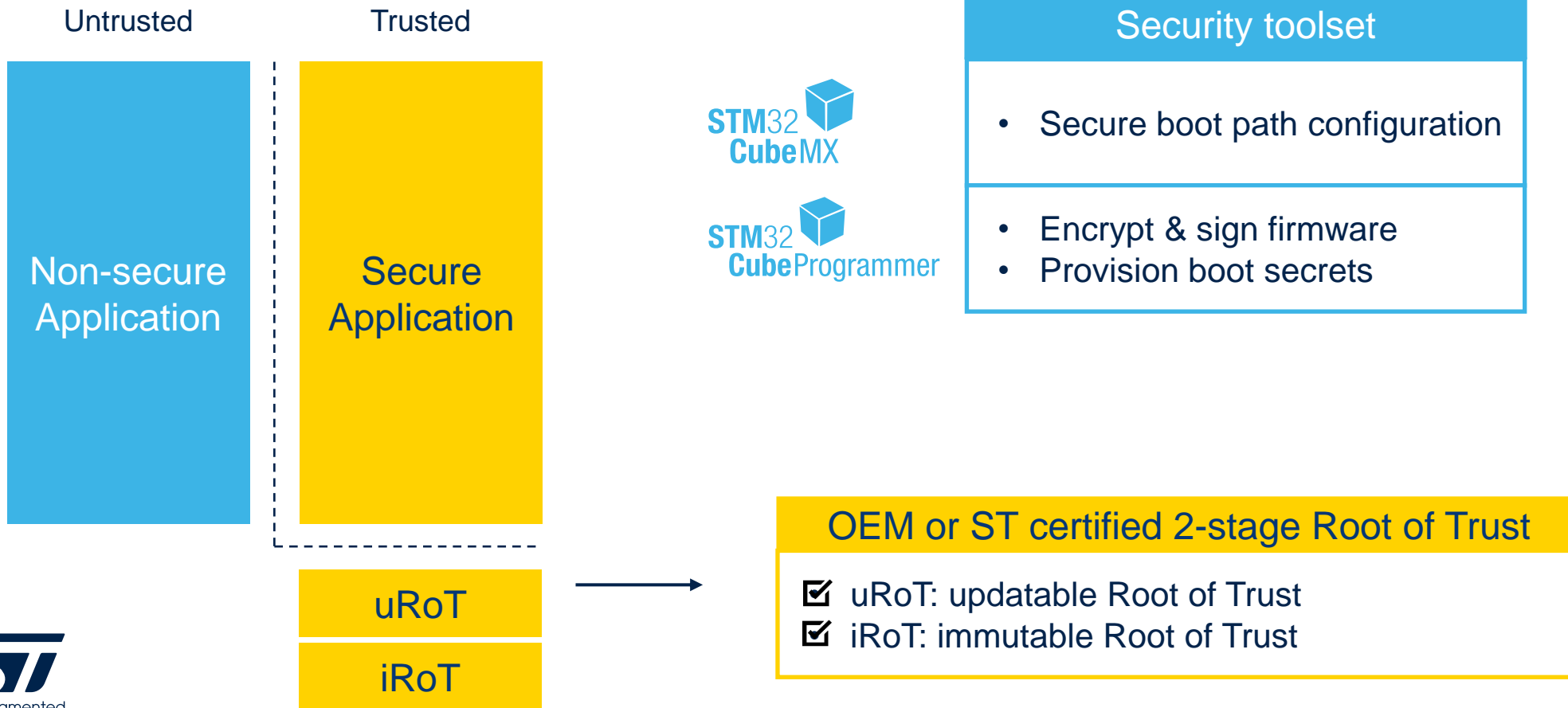
Connectivity

- ✓ Cellular
- ✓ Wi-Fi
- ✓ Ethernet

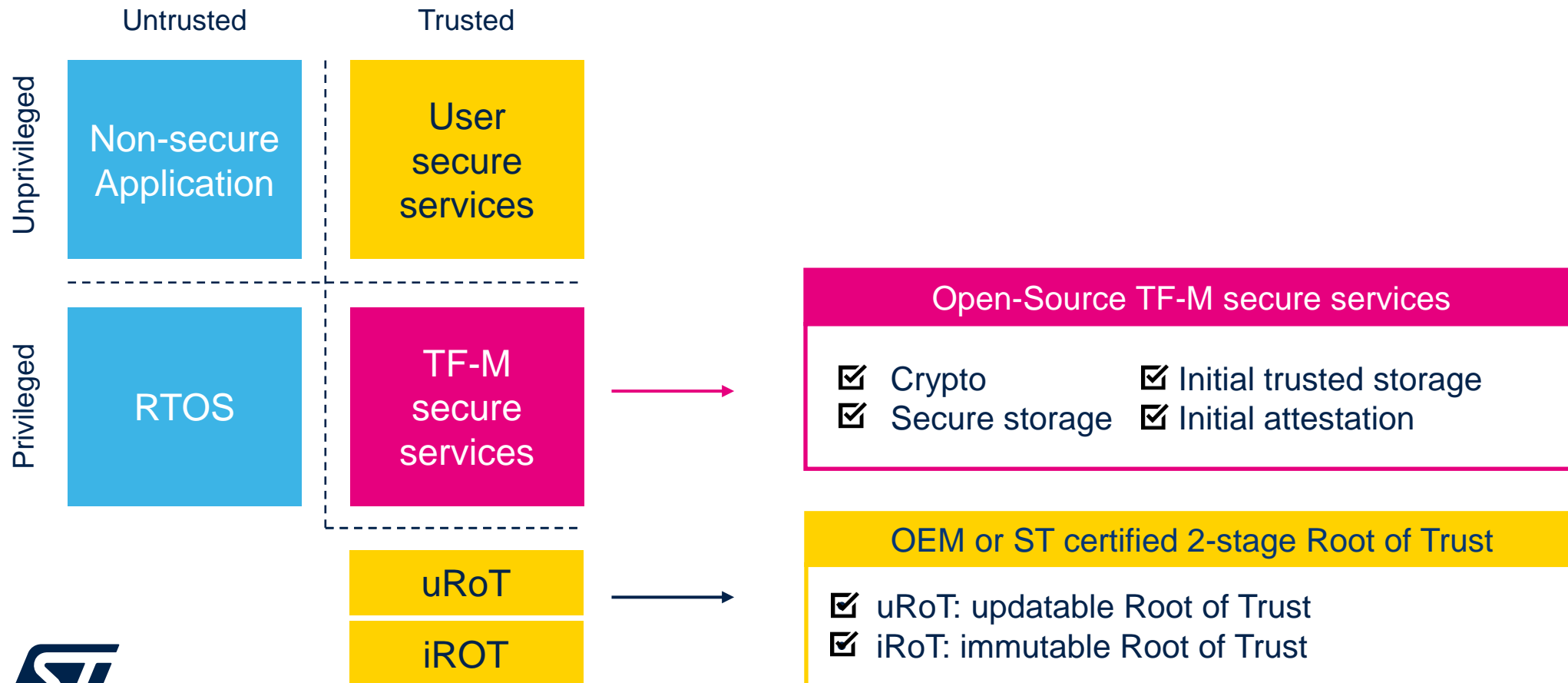
Cloud SDK

- ✓ Secure cloud connection
- ✓ MQTT based secure communication
- ✓ Secure Firmware update

Reference for PSA immutable Root of Trust



Scalable reference firmware leveraging STM32H5 security features



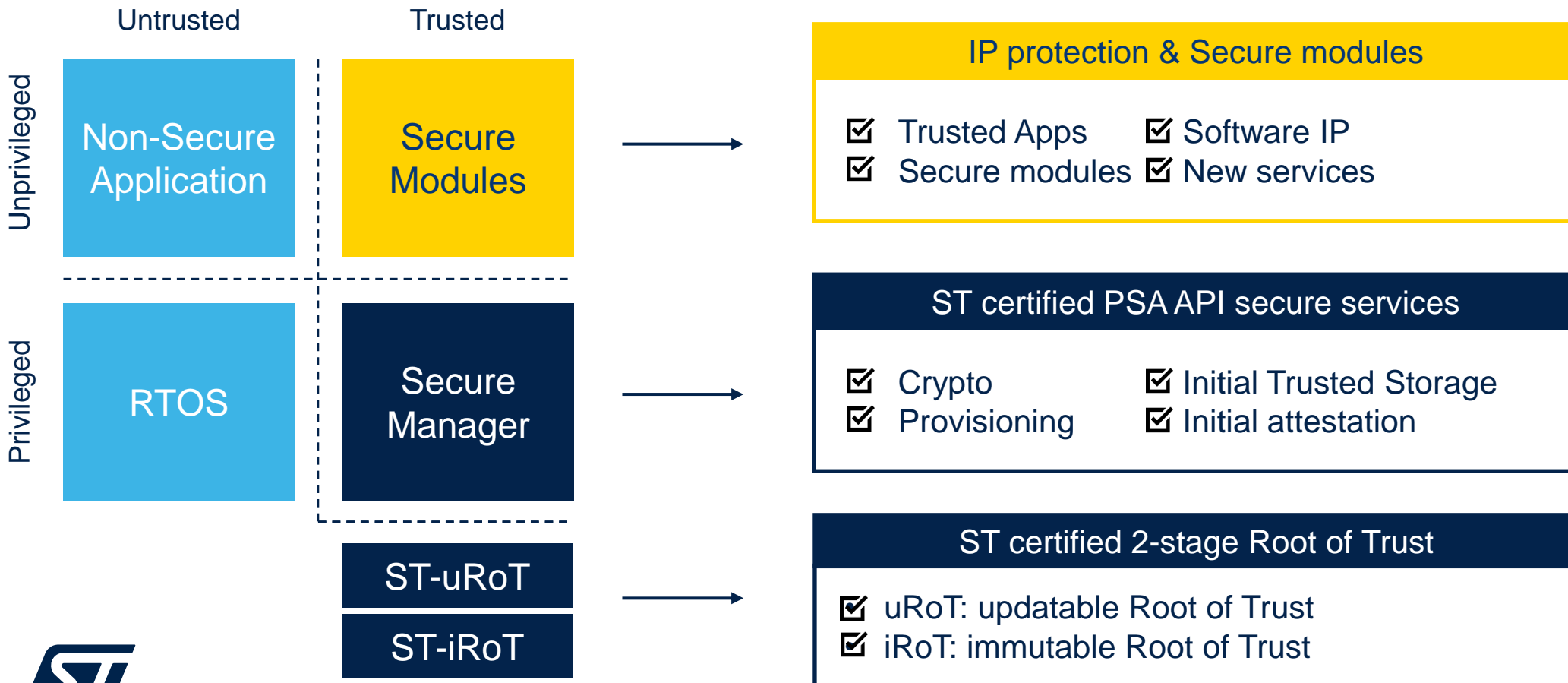
TrustedFirmware



psacertified™
level three

target certifications

A certified set of SoC security services to reduce design effort




TrustedFirmware



psacertified™
level three



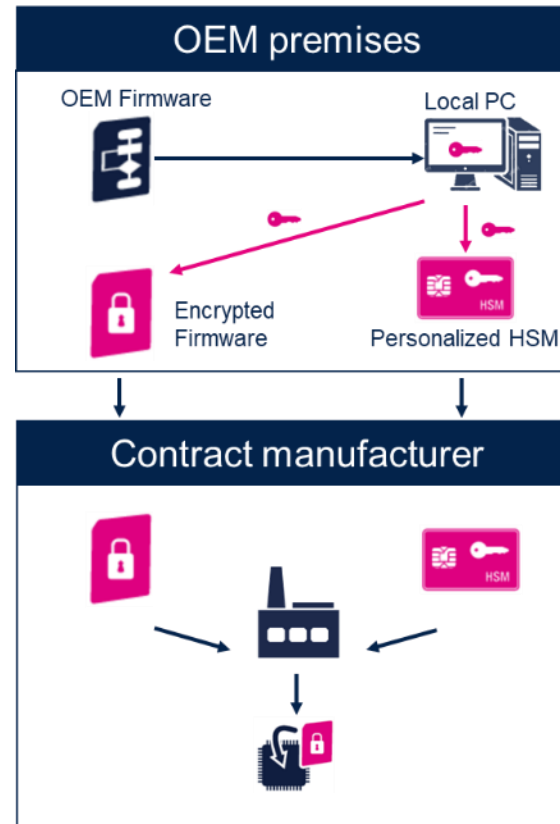
SESIP™3

target certifications

Secure your production flow

Secure Firmware Install (SFI)

Protect application firmware during the manufacturing stage



End-to-End security Programming

Complete toolset to encrypt OEM binaries with the [STM32 Trusted Package Creator](#) software

Securely flash the STM32 with licenses from a [STM32HSM](#) at the programming partner location

Control the [number of devices](#) programmed with the firmware



Start your project based on the STM32H5 now!

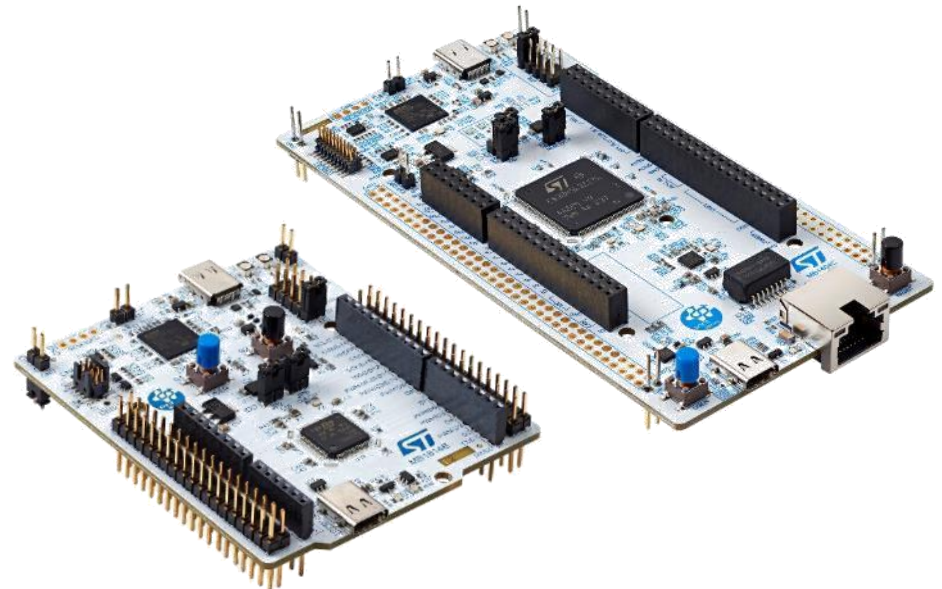
STM32H5

High performance

Scalable security

Optimized cost/performance

Available now!



Releasing your creativity



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[community.st.com](#)



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[github.com/stm32-hotspot](#)



[www.st.com/stm32-mcu-developer-zone](#)



Our technology starts with You

Find out more at www.st.com/STM32H5

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