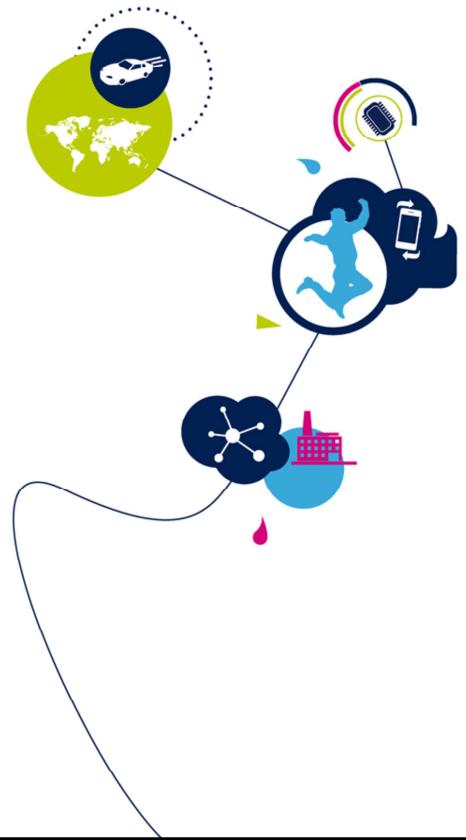


STM32L5 - Welcome

Welcome session

Revision 1.0



Hello, and welcome to this STM32L5 training session.

Training session organization

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- Introduction
- System
- Memory
- Security & Safety
- Analog
- Peripherals
- Watchdogs & Timers
- Ecosystem
- Next steps

This session is organized to provide you with the most important information to ensure that you can develop your application as easily as possible. You will find a technical description of all the STM32L5 modules including peripherals and development tools organized into specific sections: system, memory, security, analog, peripherals, watchdog and timers and ecosystem.

You can browse each section separately and learn about each module in the order of your choice and at your convenience.

This session also allows you to search directly for a keyword and you will have a direct access to the sections covering this information.

STM32L5 MCU series

Excellence in ultra-low-power with more security



Now, let's take a closer look at the STM32L5 new series of low-power microcontrollers.





First STM32 Based on Cortex-M33

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STM32L5 is the answer

- More security with TrustZone and ST security implementation
 - HW to resist to Logical and board level attack
- Lower Power consumption
 - STM32 ultra-low-power technology
- Integration, Size, performance
 - More performance, high memory size and wide portfolio



The STM32L5 microcontroller series provides a new optimal balance between performance, power and security.

It harnesses the security features of the Arm Cortex-M33 processor and its TrustZone for Armv8-M combined with ST security implementation.

The ST-proprietary ultra-low-power technology creates a class-leading MCU for energy-conscious applications running on Internet of things (IoT), medical, industrial and consumer devices.

Offering up to 512 Kbytes of flash (dual bank) memory and 256 Kbytes of SRAM, this STM32L5 series reaches an upgraded level of performance (442 CoreMark) thanks to this new core operating at a frequency of up to 110 MHz, and a new ST ART Accelerator™ (supporting now also external memory).

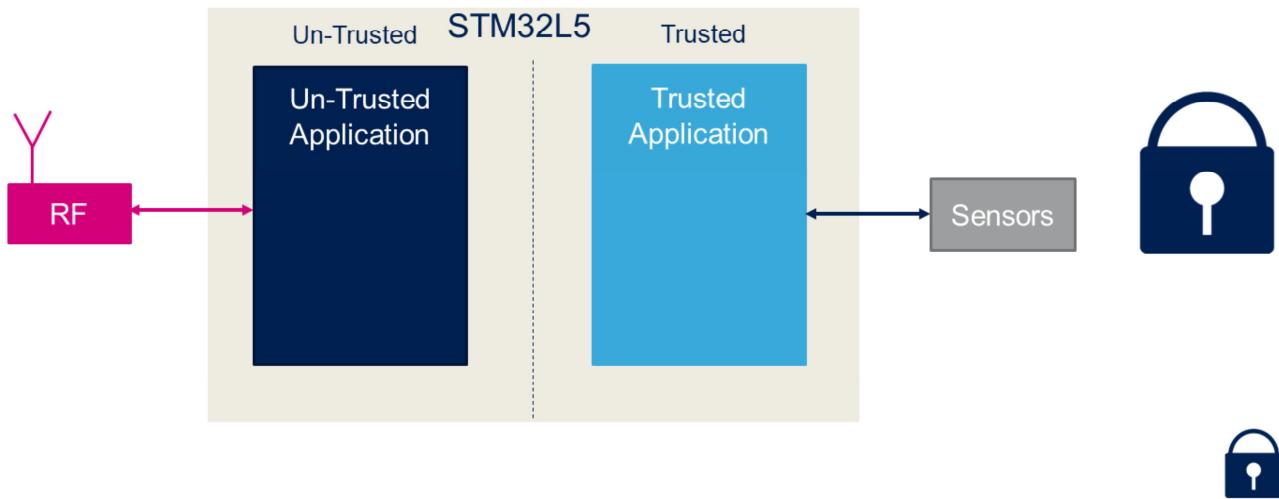


Security: TrustZone for Isolation

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TrustZone provides full isolation

Example of IoT application implementation

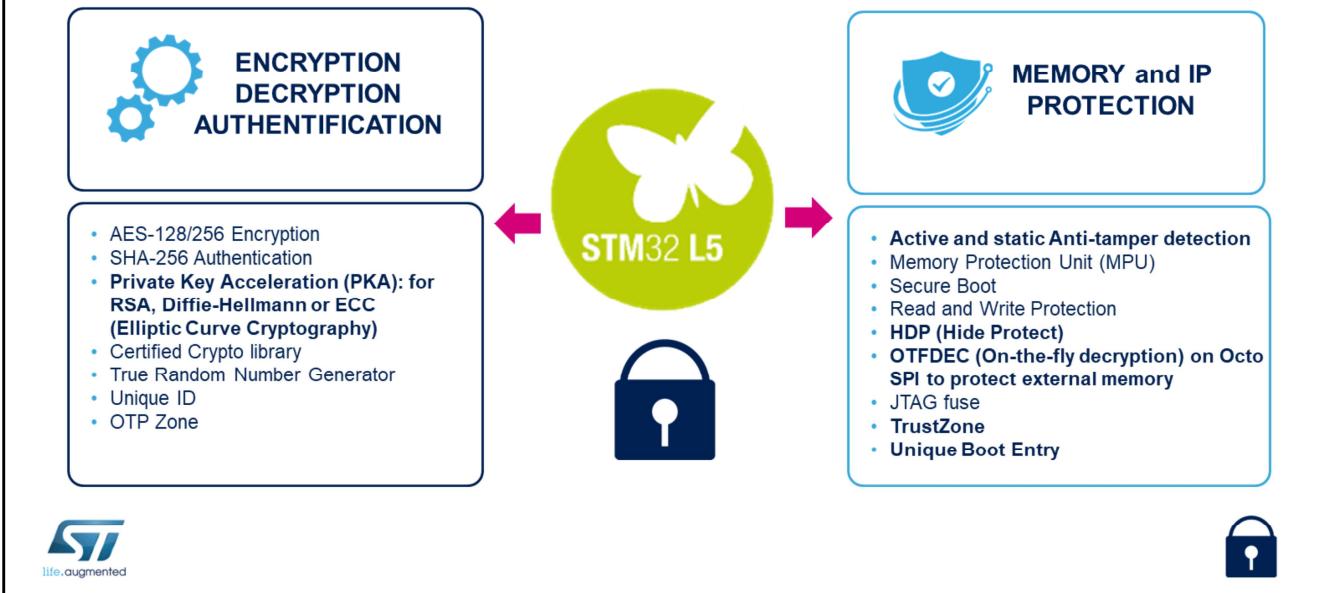


Security has emerged as one of the 3 key areas that developers of embedded and IoT applications are thriving to improve.

The STM32L5 Series devices offer security foundation compliant with the trusted based security architecture (TBSA) requirements from Arm. They embed the necessary security features to implement a secure boot, secure data storage, secure firmware installation and secure firmware upgrade. Flexible life cycle is managed thanks to multiple levels of readout protection. Firmware hardware isolation is supported thanks to securable peripherals, memories and I/Os, and also to the possibility to configure the peripherals and memories as “privilege”.

A Full Set of Security

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STM32L5 microprocessor offers a full set of security. It is based on a flexible hardware supporting software secure isolations with TrustZone.

It also provides enhanced security service such as:

- Dedicated secure user memory space for Secure Boot,
- Symmetric and asymmetric crypto accelerations, memory and IP protection,
- Independent Read out protection between secure / non secure domains,
- Active IO tamper detection,
- Certified cryptographic library,
- Embedded Secure Firmware Install loader and ecosystem.
- Dedicated peripherals reinforcing security like a HASH hardware accelerator and a true random number generator
- several protection mechanisms for embedded Flash memory and SRAM

The STM32L5 Series devices also offer active tamper detection and protection against transient and environmental perturbation attacks thanks to several internal monitoring which generate secret data erase in case of attack.



Extend the Battery Life Time

7

- STM32L5 reuses the STM32L4/L4+ technology achieving **best-in-class** power consumption
- STM32L5 integrates an optional **SMPs** (DC/DC buck voltage regulator) which can be enabled/disabled on the fly to optimize the energy.
- Proven by EEMBC test results:

ULPBENCH™ 370 ULPMark-CP
An EEMBC Benchmark



The STM32L5 series achieves the best power consumption with a proven EEMBC ULPBench® result of 370 ULPMarks with the core profile benchmark.

It integrates an optional SMPs step down converter which can be enabled/disabled on the fly to optimize the energy.

Its consumption numbers are:

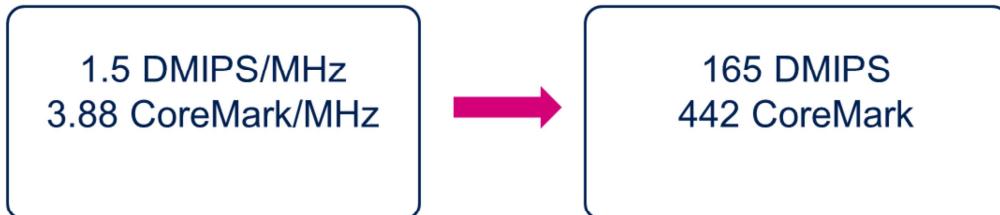
- 33 nA in shutdown mode
- 3.6 µA in stop mode with full SRAM and peripheral states retention with 5µs wake-up time
- Down to 60 µA/MHz in active mode

More Performance

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Better responsiveness of the application

- New Arm® Cortex®-M33 performance: +20% versus Cortex-M4



- New ST ART Accelerator™: working both on internal and external Flash
 - 8 Kbytes of instruction cache



The STM32L5 series is an ultra-low-power microcontrollers family based on the high-performance Arm® Cortex®-M33 32-bit RISC core running at up to 110 MHz and thus offering a performance increased by +20% versus the Cortex-M4 core, achieving 165 DMIPS and 442 CoreMark scores. Its new ST ART Accelerator enabling faster Flash accesses can work on both internal and external Flash memories. This 2 key IPs enable a better responsiveness of any applications running on STM32L5 devices.

Thank You

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Now let's get started with the training. Do not hesitate to follow the events and news about this product on our website at www.st.com/stm32l5.

Thank you!