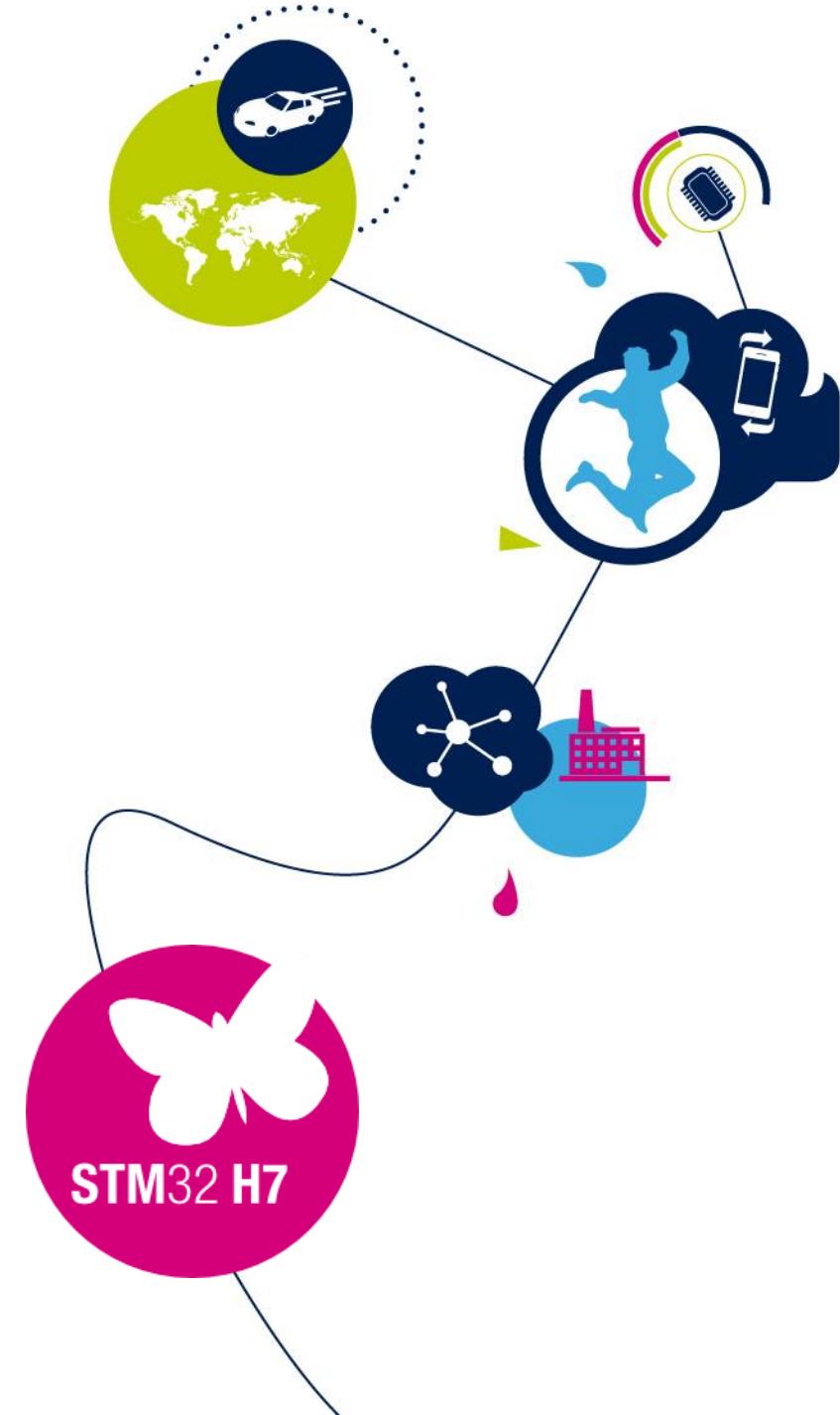


STM32H7

World Most Powerful MCU

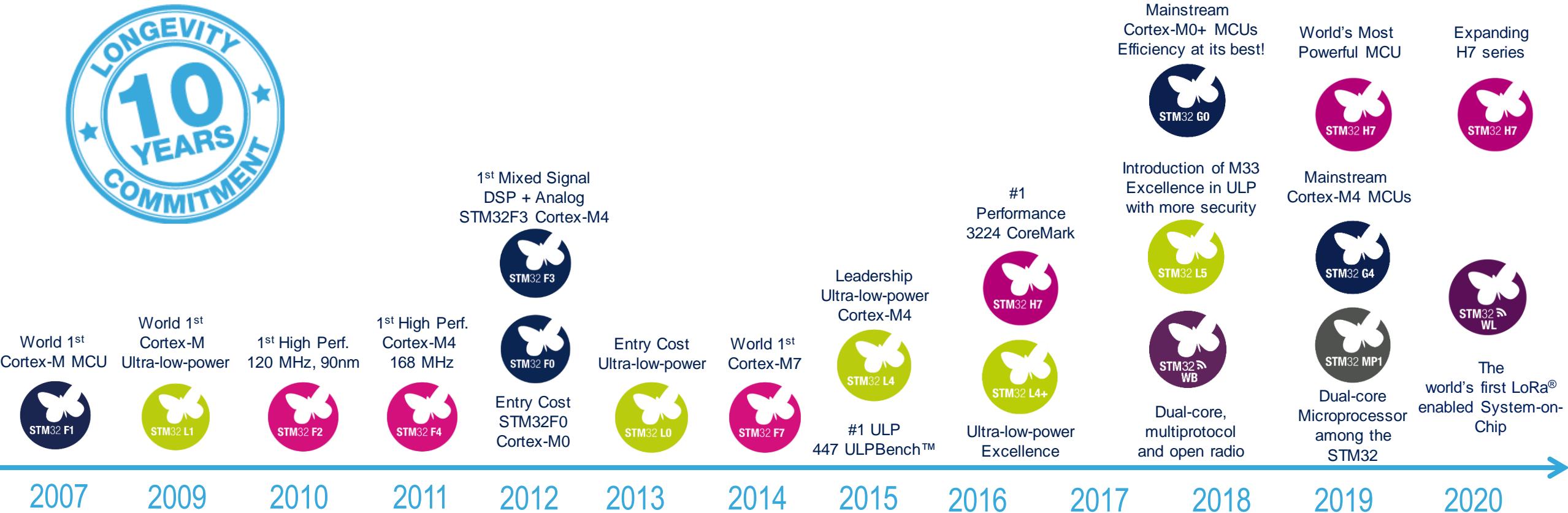
Marketing Presentation





Continuing the STM32 Success Story

Leader in Arm Cortex[®]-M 32-bit General Purpose MCU





New product lines expanding the STM32 portfolio



New Performance Record

2424 + 800 CoreMark (Cortex[©]-M7 @480 MHz + Cortex[©]-M4 @240 MHz)



Single and Dual-core flexible architecture for industrial, security or AI applications
Accelerated graphics, fast data transfer, advanced peripherals



Advanced security features

Crypto Hash, Cortex[©]-M7 STM32Trust security ecosystem



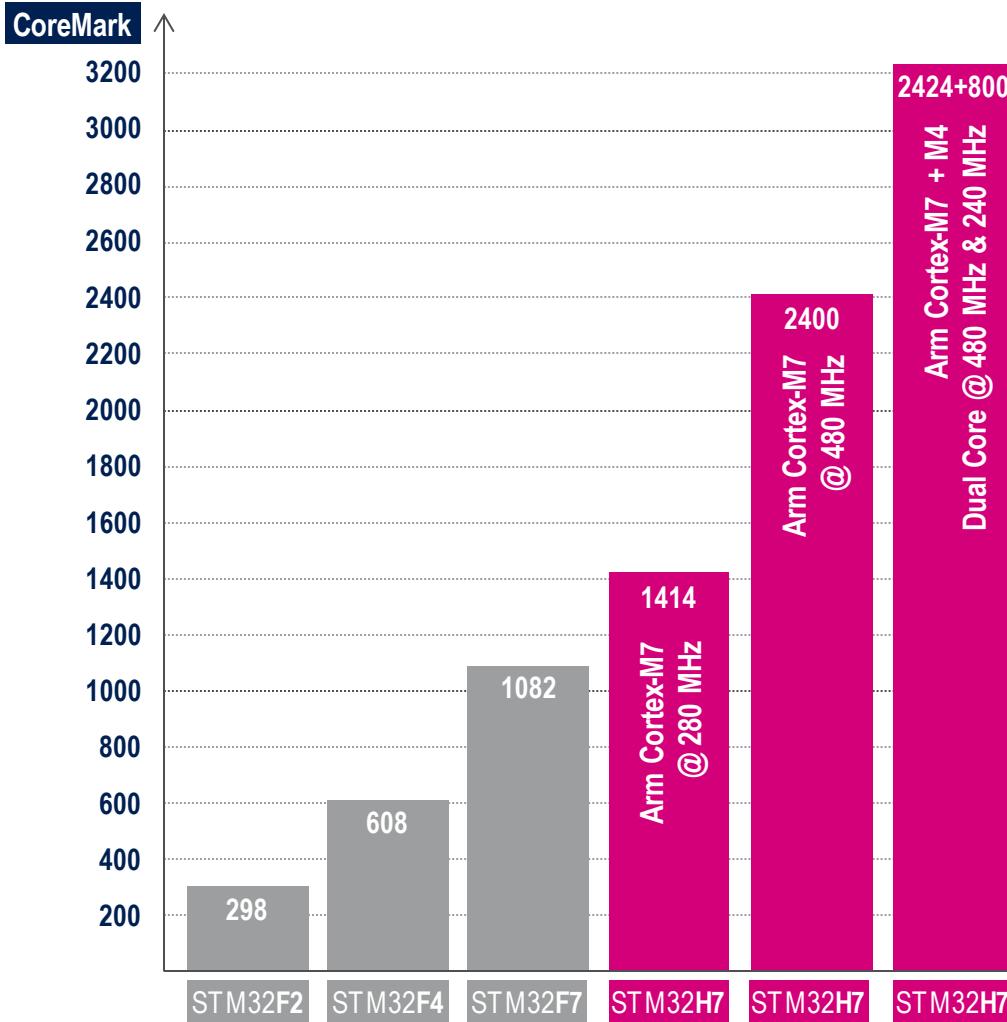
Rich eco-system to speed-up your design

SW tools, HW boards, community and partners



Performance Record

High-Performance Range



Arm® Cortex®-M7 @480MHz

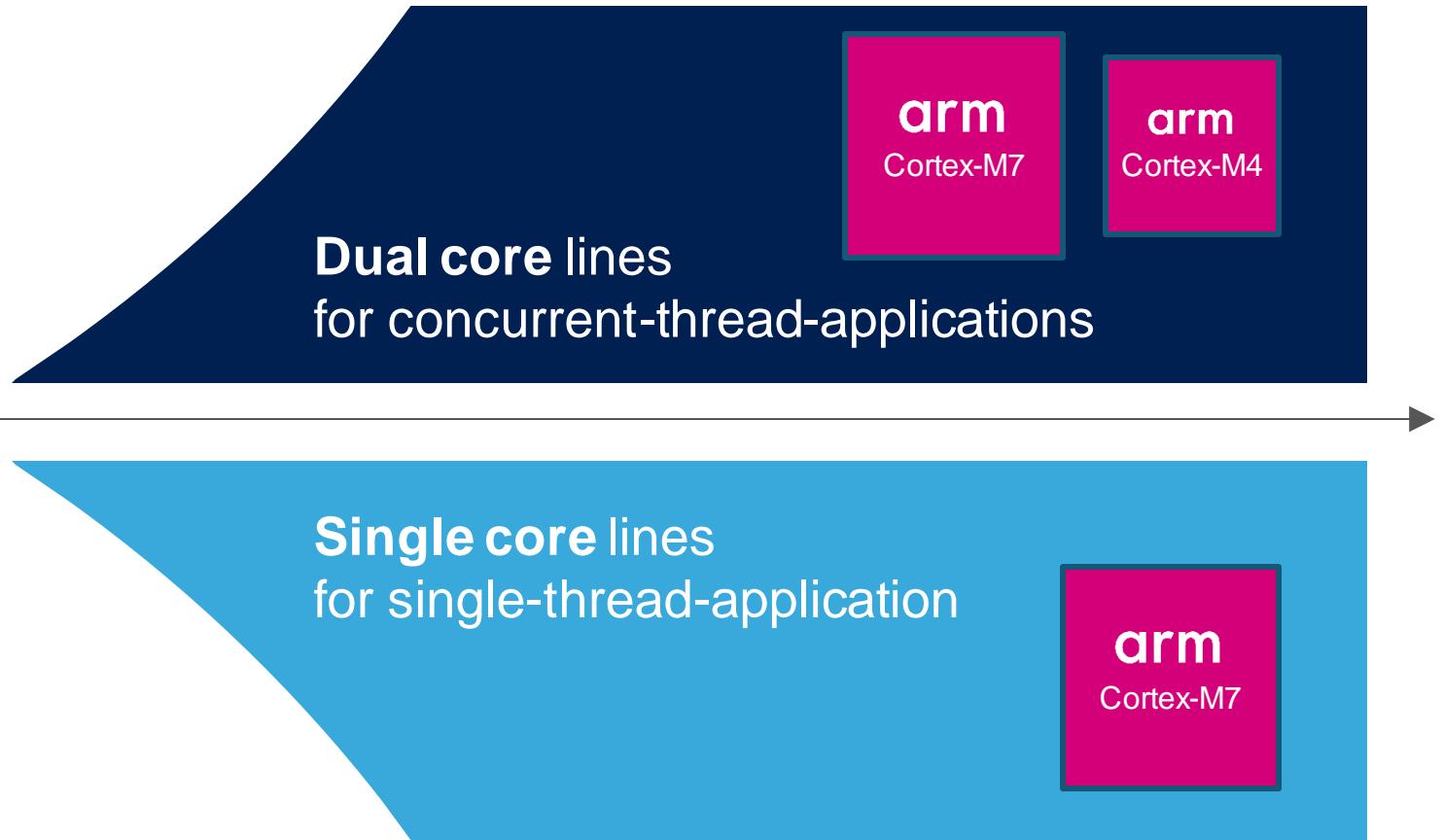
Most powerful Cortex core with double precision FPU, MPU, advanced DSP and L1 cache

Arm® Cortex®-M4 @240MHz

Best in class core for **real-time** with single precision FPU, DSP, MPU and ART Accelerator™

Extend the STM32H7 Experience

7





STM32H7 Portfolio

8

Now over 170 Part Numbers



Dual-core
Line



Single-core
Line



Value Line

NEW

STM32H7A3/B3
280 MHz
599 DMIPS
RAM 1.4 MB
Flash up to 2 MB

STM32H742
480 MHz
1027 DMIPS
RAM 692 KB
Flash up to 2 MB

STM32H743/753
480 MHz
1027 DMIPS
RAM 1 MB
Flash up to 2 MB

NEW

STM32H7B0
280 MHz
599 DMIPS
RAM 1.4 MB
Flash up to 128 KB

STM32H750
480 MHz
1027 DMIPS
RAM 1 MB
Flash up to 128 KB

STM32H745/755

480 + 240 MHz
1027 + 300 DMIPS
RAM 1 MB
Flash up to 2 MB

STM32H747/757

480 + 240 MHz
1027 + 300 DMIPS
RAM 1 MB
Flash up to 2 MB



Arm® Cortex® core

Cortex®-M7

Cortex®-M7 & -M4

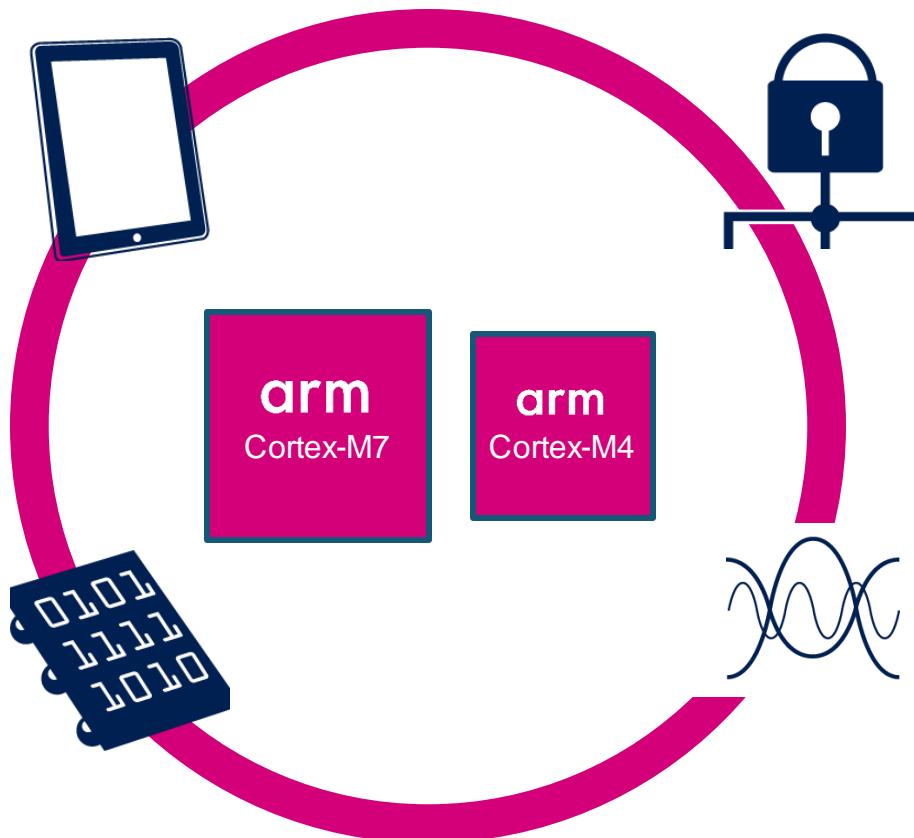
Powerful Cores Supported by a Powerful Architecture

Display nice graphic

The Chrom-ART Accelerator and MJPEG codec offload the CPU by more than 90%

Transfer data efficiently across peripherals

The Main DMA takes care of the most complex schemes between memories and peripherals with up to 16 channels to offload the CPU



Manage security

Use dedicated **cryptography** and **Hashing** HW acceleration to offload the CPU by more than 90%

Generate complex wave forms

High-Resolution timer (2.1ns) can generate complex wave forms synchronized on multiple events, with no CPU assist

Dual-core Architecture Approach

2 Simple Examples

10

Industrial tool machine



Cortex-M7 = HMI
Cortex-M4 = Com/Gateway + Motor Control + Sensor pre-processing (AI)

Home automation & security

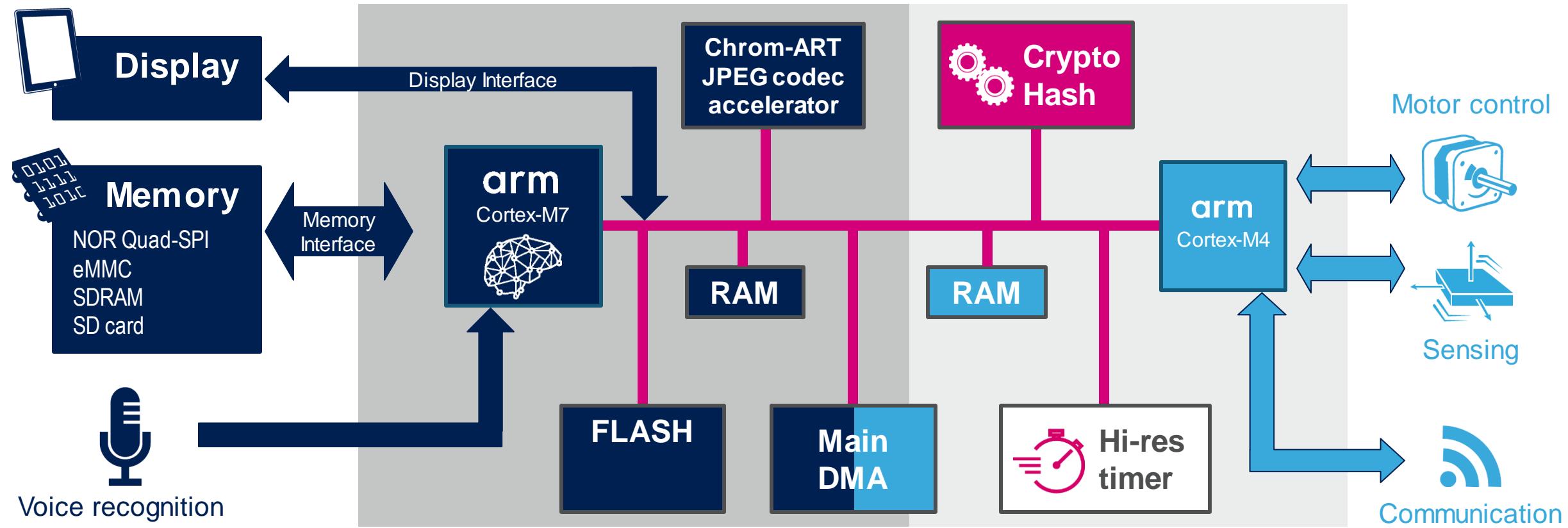


Cortex-M7 = AI NN (Pattern recognition, ASR)
Cortex-M4 = Com/Gateway + Real-time I/F

Build Complex Applications

Mixing AI and Real-time Control

Connected Kitchen Aid with advanced HMI (Large display and Voice recognition)



Benefits of Dual-core Architecture



Increase system performance

- 2x processing units working in parallel (2 applications or run time safety check by 1 core)
- Reduces computation time and average power consumption



Reduce development time

- Reduce development time
- Reduce dependencies between dev. Teams (one team per core)
 - Less components on the PCB to ease and shorten PCB design and validation



Increase system efficiency

- Workload balance between 3 power domains
- Cortex-M7 (more powerful): GUI, DSP, security
 - Cortex-M4 (real-time): Connectivity, RTOS, Motor control or process control task
 - Batch Acquisition Mode domain: sensors acquisition, GPIO and low power management



Reduce system cost

- Reduce BOM cost by transferring more tasks to STM32H7

- Remove external devices (by integrating secondary functions)
- 1 MCU instead of 2
- Extends connectivity
- Enhance user interfaces
- Integrated SMPS (few ext. components needed)

STM32Trust on STM32H7 Series

13



www.st.com/stm32trust

Global security
ecosystem and services

STM32 concept
Support customer's
Secure Boot / Root Of Trust

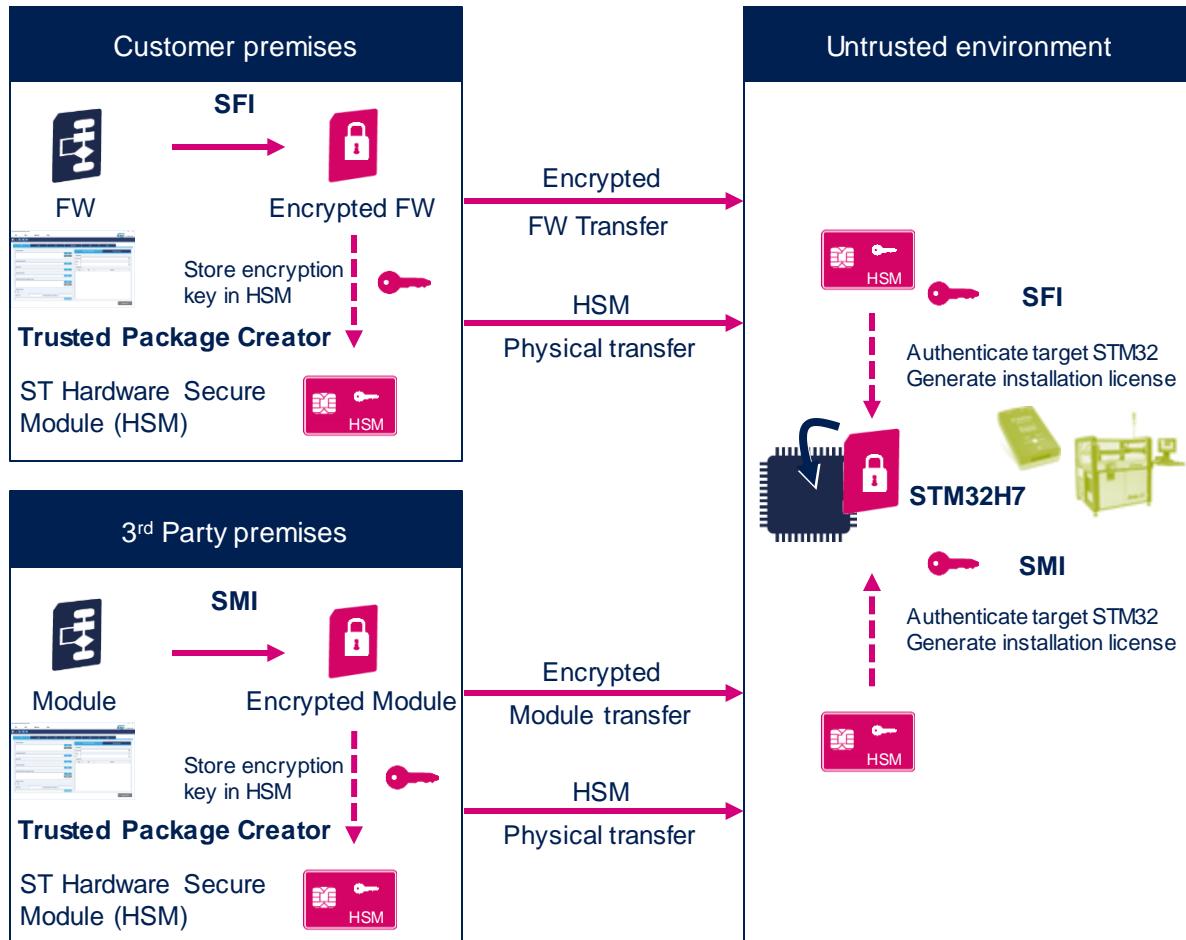
SFI
A Secure Installer of
Secure Boot / Root Of Trust

SBSFU
A reference SW package for **FW Update**
and **Secure Boot / Root Of Trust**

Embedded Secure Firmware Install - SFI

14

Manage STM32 authentication, firmware decryption and installation



Secure Loader
embedded services
provisioned by ST
→ Mass Market
approach

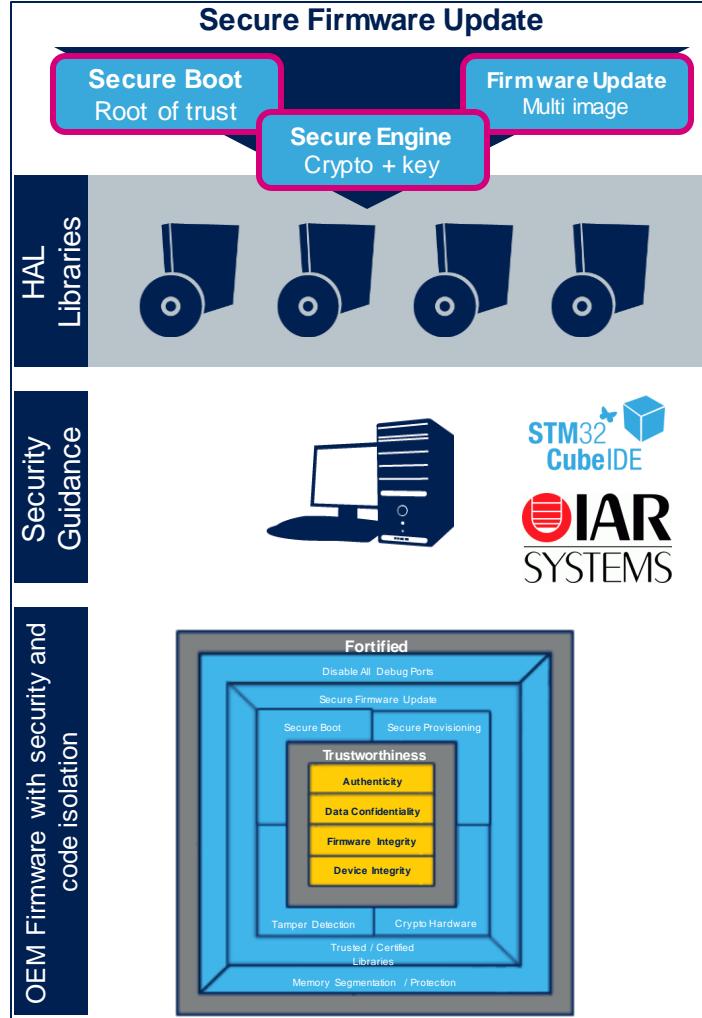
ST ecosystem
with
Encryption, HSM and
programming tools

Firmware cloning
protection on the first
installation
via
UART / SPI / USB

Protect 3rd party
Software IP
(SMI)

Secure Boot Secure FW Update - SBSFU

15



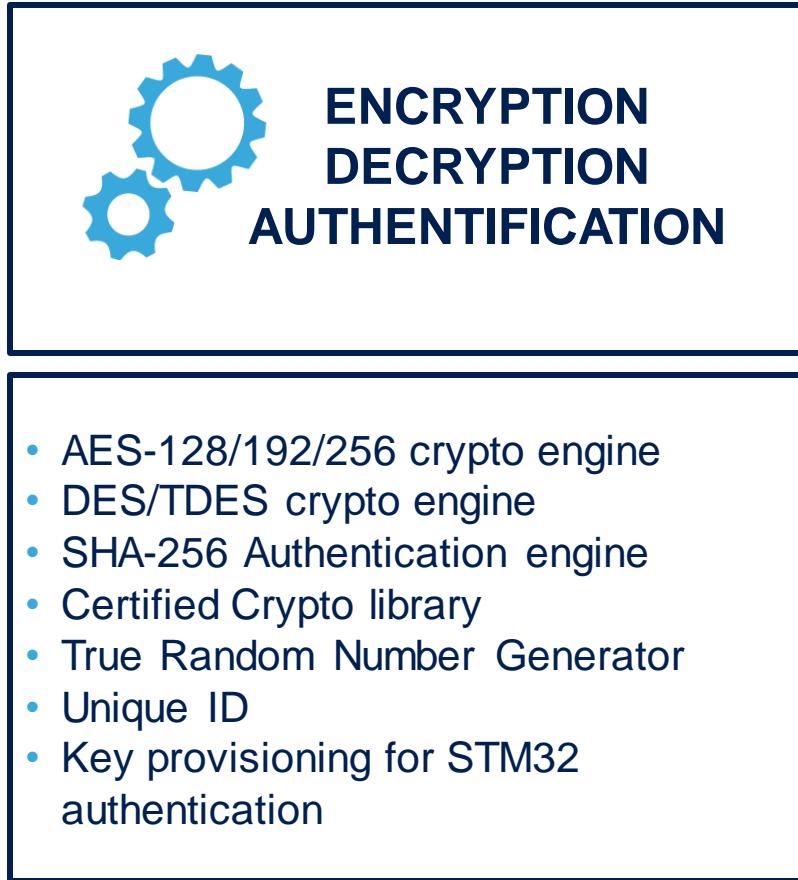
Reference library source code for IAP

- Demonstrate SW modules for:
- Secure Boot
 - Secure Engine for Crypto and key
 - Firmware Update image management

Ensure authentication and secure programming
of in the field products

Reference implementation of STM32H7
hardware memory protections

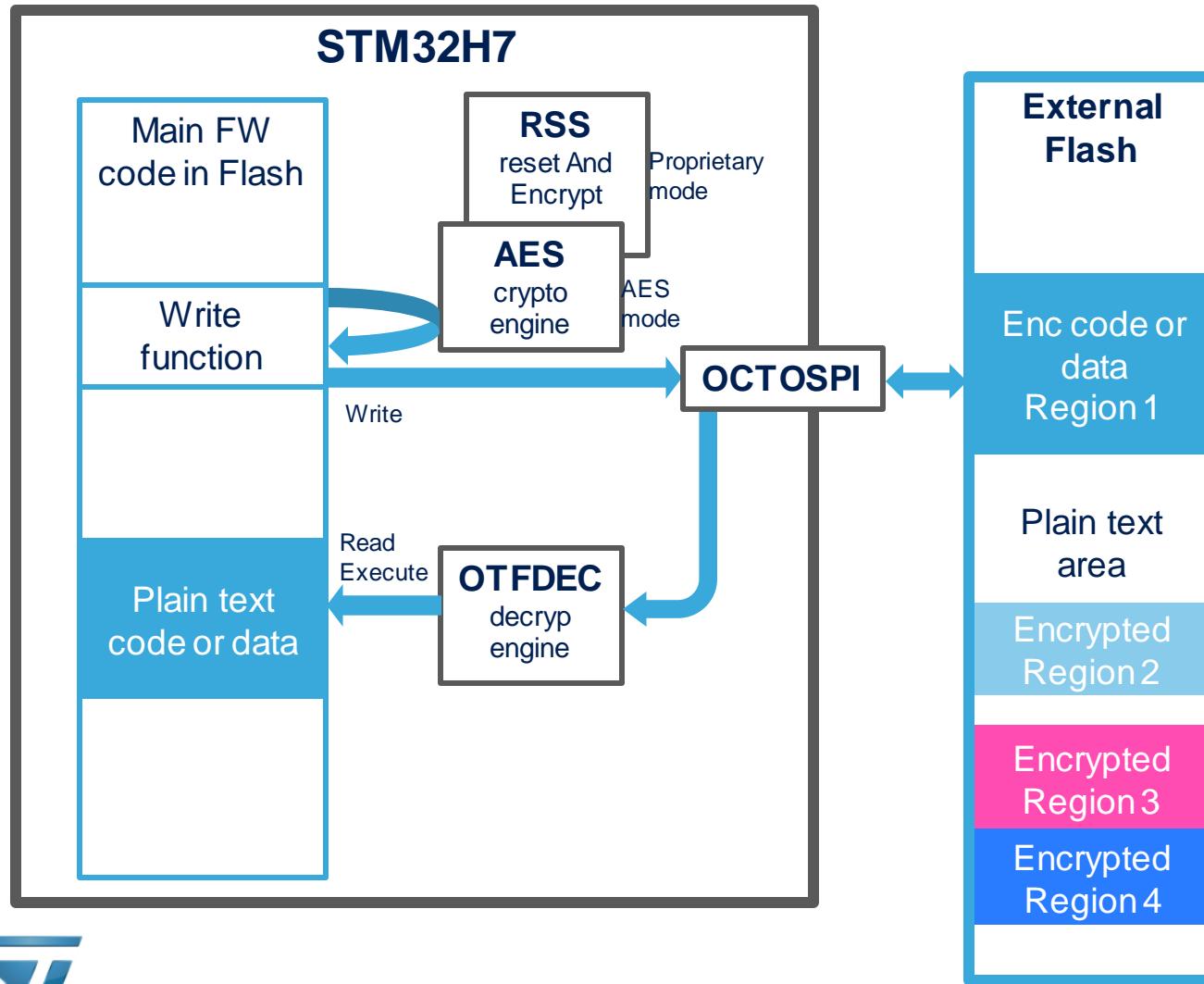
A Full Set of Security



Octo-SPI Encryption / Decryption

with on the Fly Decrypt Engine

17



Execute In Place (XIP)
encrypted code in external flash

Up to 140MHz bus speed

Define up to 4 regions encrypted
with dedicated keys

AES-CTR 128 mode for Code
and or Data management

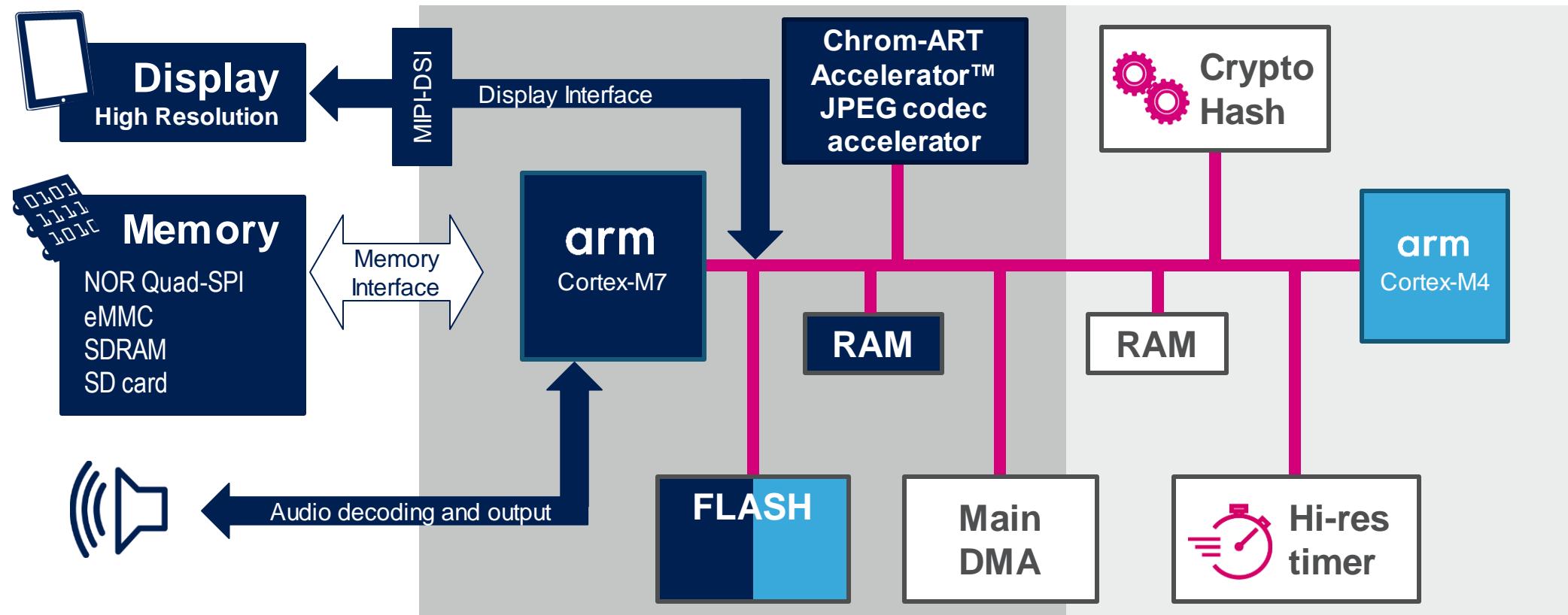
Proprietary mode for advanced
Code management



Detailed use-cases
Performance and smart architecture
are yours to innovate

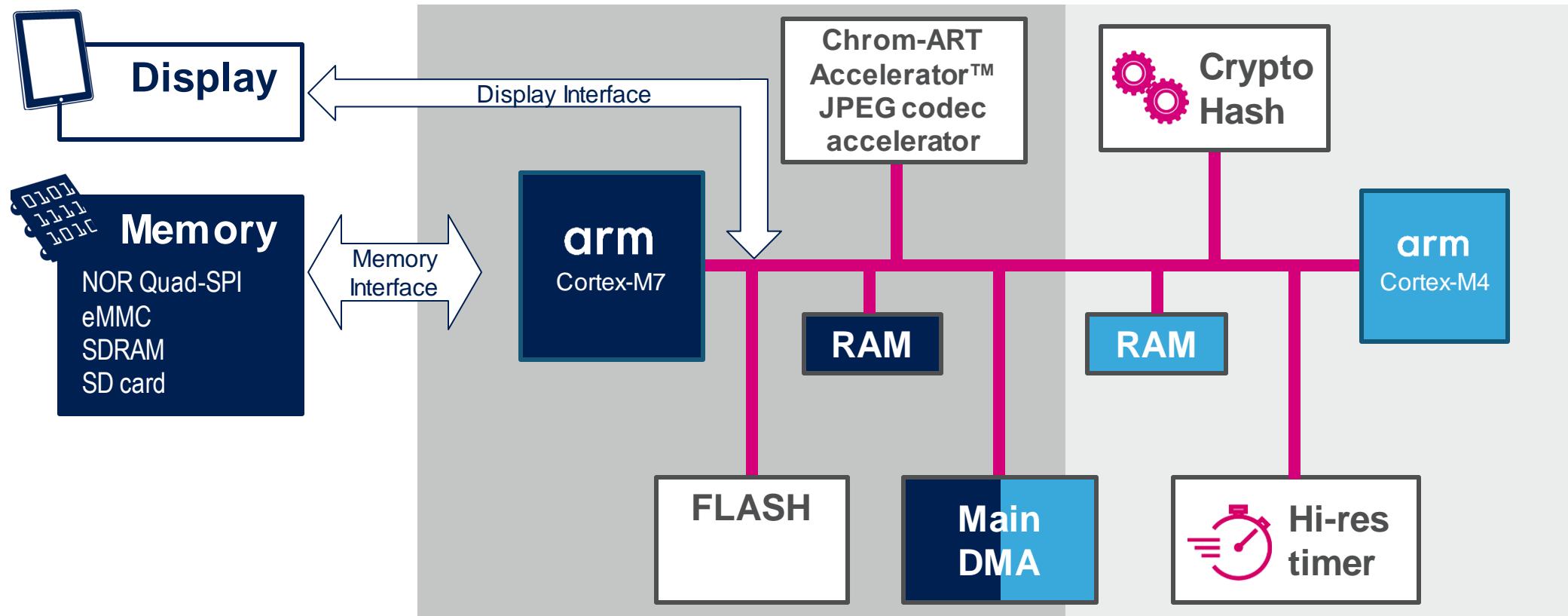
Create a Rich Human Machine Interface

Cortex-M7 - handling audio and rich HMI, Cortex-M4 running Real Time control tasks



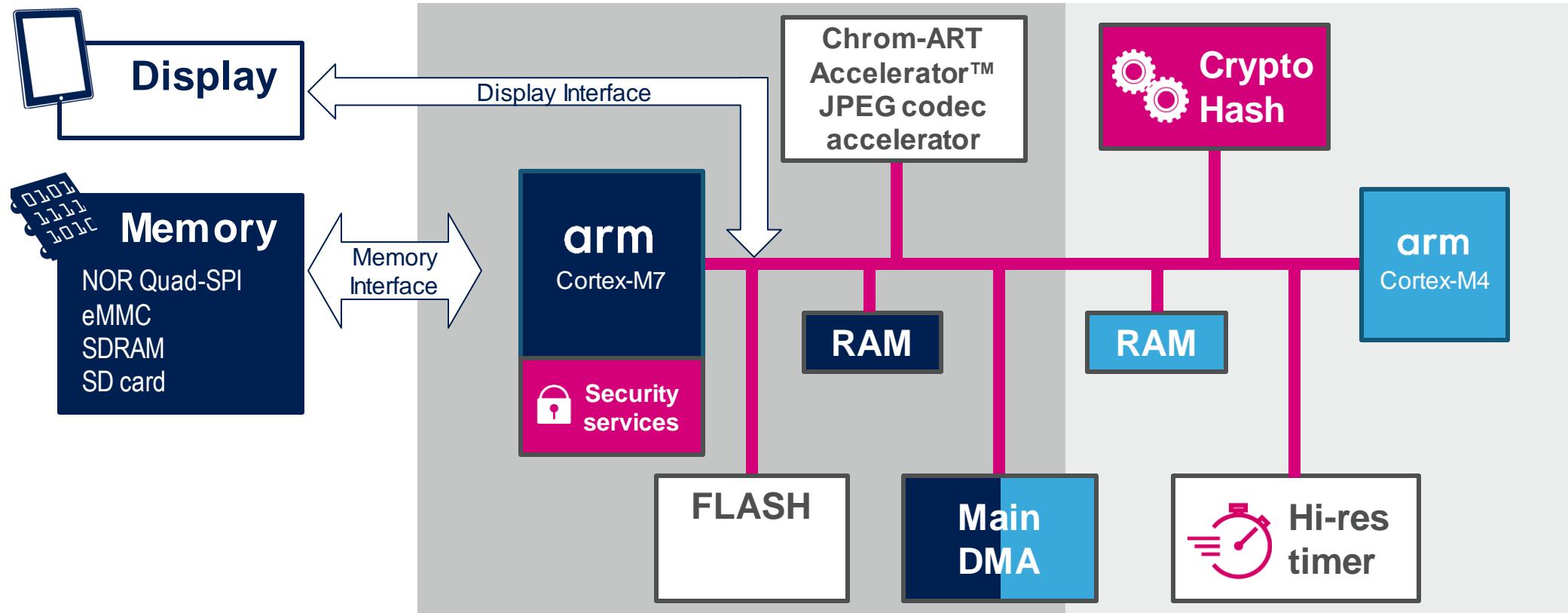
Seamlessly Move and Format Data

Main DMA - Flexible and high speed data transfers schemes without CPU load



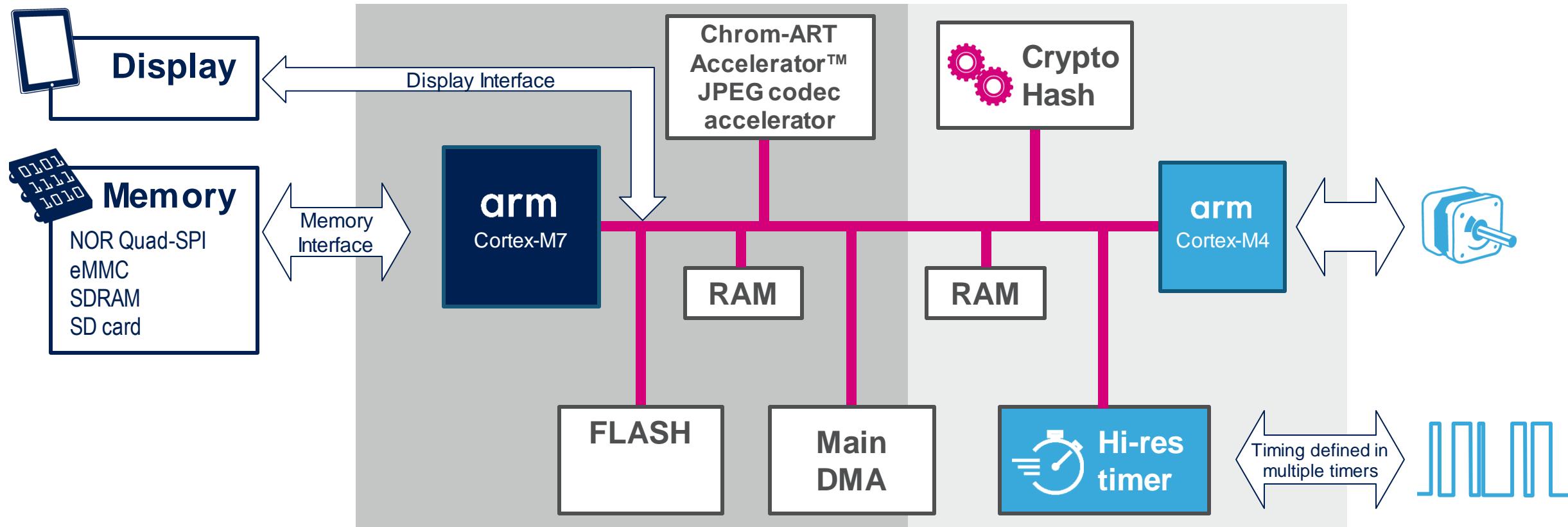
Reinforce the Security in your Solution

Cryptography and Hashing hardware assist
Authenticate your chip and securely install your code in memory



Control Real-time Applications

High resolution timer: advanced wave forms generation



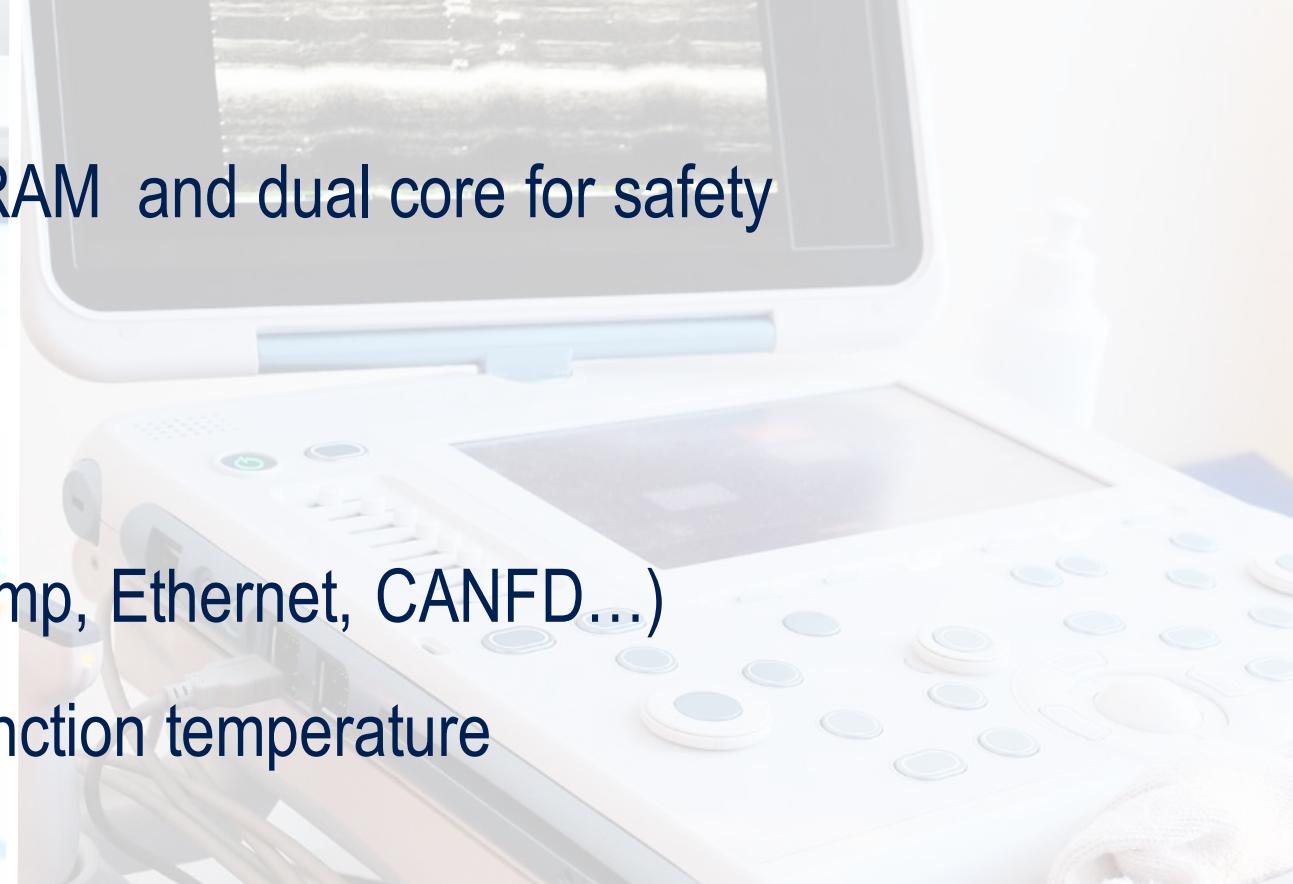
Industrial and Health & Wellness DNA

23

Industrial

- Error Code Correction on all Flash and RAM and dual core for safety
- Large choice of packages
- Advanced digital and analog
(High resolution timer, 16-bit ADC, Op-Amp, Ethernet, CANFD...)
- High temperature -40°C up to 140°C junction temperature

Health & Wellness



Industrial and Health & Wellness DNA

24

Industrial

- **Inverters**
Advanced timers and analog peripherals
- **Communication gateway**
Rich connectivity and optional dual core
- **Human Machine Interface**
Chrom-ART Accelerator™, Chrom-GRC™ and display interfaces for TFT and MIPI-DSI

Health & Wellness

- **Health and wellness**
Chrom-ART Accelerator™, Chrom-GRC™ and display interfaces for TFT and MIPI-DSI
- **Individual assistance** (hearing, respiratory)
Advanced timers and analog
- **Measurements and Data logger**
Advanced Analog

Consumer

- Small packages
 - Power efficiency and high performance
 - Advanced audio and graphic
 - High-speed peripherals
 - Large expandable memories to support ever increasing communication protocols
- 

Consumer

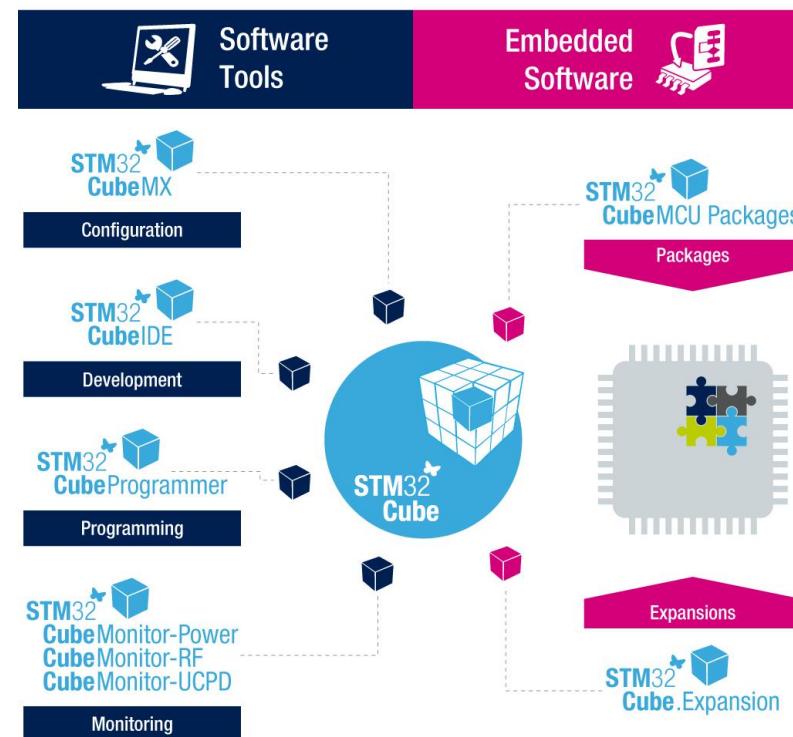
- **IoT gateway**
Large memory and rich communication peripherals
- **Access control**
Chrom-ART Accelerator™ , Chrom-GRC™ and display interfaces for TFT and MIPI-DSI
- **Drones**
High processing architecture with dual core option, advanced timers and analog peripherals, small packages



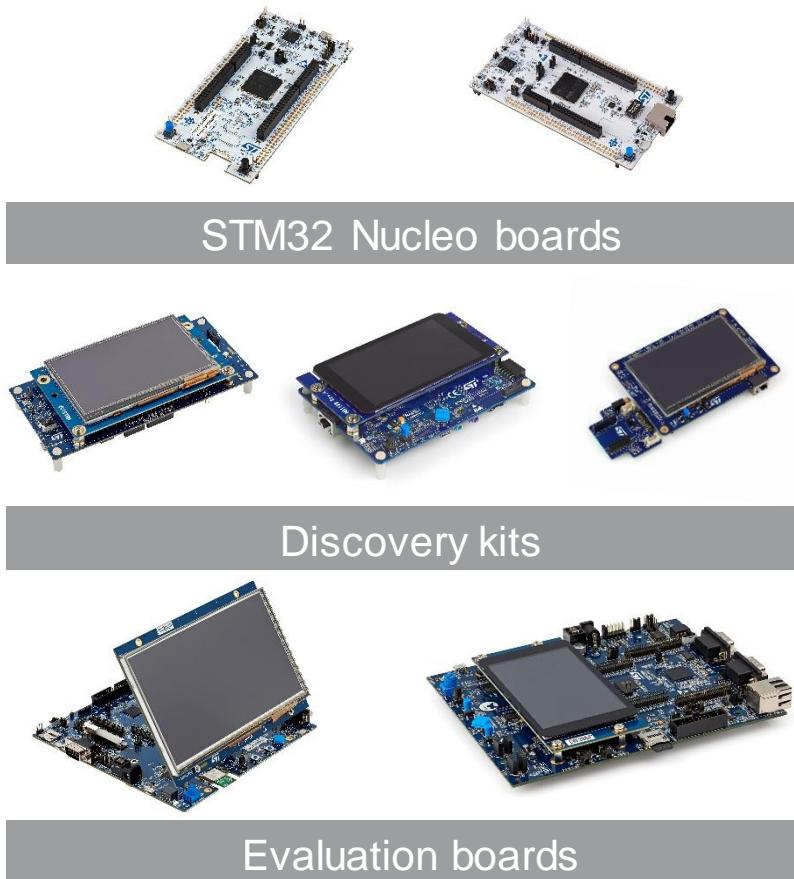
STM32H7 ready ecosystem

Supported by the STM32 Ecosystem

Software



Hardware



Customer support



FAE - Worldwide
Customer Support



community.st.com

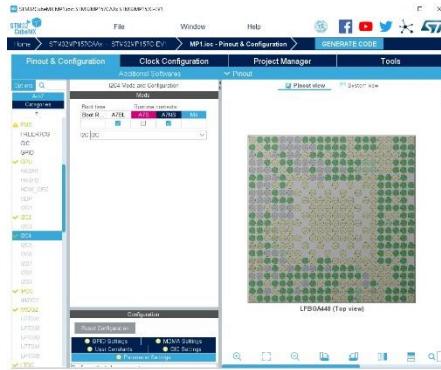
MOOC



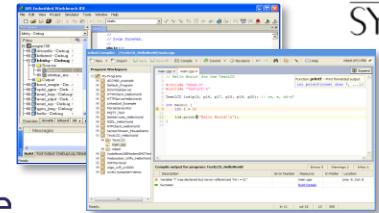
Software Tools for Dual-core Architecture

29

Complete support of Arm Dual Cortex-M architecture



arm KEIL



All-in-one STM32 programming tool
Multi-mode, user-friendly



STM32CubeMX

STM32CubeMX enhanced for Dual-core

- Configure and generate Code
- Multi-core resources allocation
- Peripherals configuration

IDEs Compile and Debug

Multi-Core Solutions

- Partners IDE
- Free IDE based on Eclipse
- **Multi-core** debugging

STM32 Programming Tool

STM32CubeProg

- Program the application into the chip
- Device information and readout
- Signing tool & license generation

STM32H7 Hardware Solutions

Speed-up evaluation, prototyping and design



Starting at
\$318



Starting at
\$97



Starting at
\$69



Starting at
\$87



Starting at
\$27



Evaluation Boards

Full feature STM32H7 evaluation

- STM32H743I-EVAL2
- STM32H753I-EVAL2
- STM32H747I-EVAL
- STM32H757I-EVAL
- STM32H7B3I-EVAL

Discovery Kits

Flexible prototyping & demo

- STM32H745I-DISCO
- STM32H747I-DISCO
- STM32H747I-DISC1
- STM32H750B-DK
- STM32H7B3I-DK

Nucleo-144 Boards

Affordable and quick prototyping

- NUCLEO-H743ZI2
- NUCLEO-H753ZI
- NUCLEO-H745ZI-Q / H755ZI-Q
- NUCLEO-H7A3ZI-Q

Software, Tools and Services

a Broad Ecosystem to Support Development



Large selection of partners
already engaged for:

- Embedded software
- Software tools
- Graphics UI
- Security
- Training and services





STM32H7 Line-up

Tailored for Your Needs

| | CORE, MEMORIES AND ACCELERATION | STM32 H7 Product line | f_{CPU} (MHz) | Dual-Bank Flash memory (bytes) | RAM (bytes) | OctoSPI & OT - FDEC | Camera I/F | Graphic | Power supply | Stop mode (typical) / RAM retention |
|--|---------------------------------|----------------------------|--------------------|---|---|------------------------|---------------|---|---|---|
| | | | | | | | | | | |
| Arm® Cortex®-M7 or Cortex®-M7 + Cortex®-M4 | CONNECTIVITY | STM32H747/757 ¹ | 480 + 240 | Up to 2 Mbytes | 1 Mbyte (incl.128 Kbytes DTCM + 64 Kbytes ITCM + 64 Kbytes backup1) + 4 Kbytes backup2 | | • | TFT-LCD JPEG codec MIPI-DSI | DCDC + LDO | 360 μ A / 1MB 250 μ A / 768KB |
| | | | | | | | | TFT-LCD JPEG codec | DCDC + LDO | 360 μ A / 1MB 250 μ A / 768KB |
| Single-core lines | | | | | | | | | | |
| AUDIO | GRAPHIC | STM32H7A3/7B3 ¹ | 280 | Up to 2 Mbytes | 1,4MB (incl.128K DTCM, 64K ITCM, 1184K+SRAM, 4K backup) | • | • | TFT-LCD JPEG codec Chrom- GRC | DCDC + LDO | 32 μ A / 1.4MB 28 μ A / 32KB |
| | | | | | | | | TFT-LCD JPEG codec | LDO | 1270 μ A / 1MB 910 μ A / 768KB |
| OTHER | | STM32H743/753 ¹ | 480 | Up to 2 Mbytes | 1 Mbyte (incl.128 Kbytes DTCM + 64 Kbytes ITCM + 64 Kbytes backup1) + 4 Kbytes backup2 | | • | LDO | 1270 μ A / 692KB 910 μ A / 704KB | |
| | | | | | | | | | | |
| Value line | | | | | | | | | | |
| GRAPHIC | | STM32H7B0 | 280 | 128 Kbytes | 1,4MB (incl.128K DTCM, 64K ITCM, 1184K+SRAM, 4K backup) | • | • | TFT-LCD JPEG codec Chrom- GRC | DCDC + LDO | 32 μ A / 1.4MB 28 μ A / 32KB |
| | | | | | | | | TFT-LCD JPEG codec | LDO | 1270 μ A / 1MB 910 μ A / 768KB |

Notes :

1. Optional - dedicated CPN, STM32H753, STM32H755, STM32H757 for the Crypto Variants

2. Maximum extended temperature range: 125 °C ambient / 140 °C junction. Dedicated part numbers on STM32H745/H755

- Single and Dual core versions
- High performance up to 480MHz
- 2MB Flash Dual Bank
- 1MB RAM
- More security features (Boot, Tamper ...) and security services (optional)
- 35 communication peripherals
- 16-bit ADC up to 3.6Msps, up to 5MSPS in 12-bit, Comparators, Op Amp
- TT-CAN and FD-CAN
- High-Resolution timer (2.1ns)
- Low-Power Timers
- LDO and SMPS option
- Up to 140C junction temperature

STM32H742

Single Core

| System | Chrom-ART Accelerator™ |
|--|------------------------|
| LDO, USB and backup regulators POR/PDR/PVD/BOR | |
| Multi-power domains | |
| Xtal oscillators 32 kHz + 4 ~48 MHz | |
| Internal RC oscillators 32 kHz + 4, 48 & 64 MHz | |
| 3x PLL | |
| Clock control | |
| RTC/AWU | |
| 1x SysTick timer | |
| 2x watchdogs (independent and window) | |
| 82/114/131/140/168 I/Os | |
| Cyclic redundancy check (CRC) | |
| Unique ID | |
| | |
| Control | |
| 2x 16-bit motor control PWM synchronized AC timer | |
| 10x 16-bit timers 2x 32-bit timers | |
| 5x Low-power timer | |
| 16-bit High res. timer | |
| | |
| Analog | |
| AXI and Multi-AHB bus matrix | |
| 4x DMA | |
| True random number generator (RNG) | |

| Cache I/D 16+16 Kbytes | 2-Mbyte dual-bank Flash memory |
|------------------------|--|
| | RAM 688KB incl. 64KB ITCM |
| | FMC/SRAM/NOR/NAND/SDRAM |
| | Dual Quad-SPI |
| | 1024-byte + 4-Kbyte backup SRAM |
| | |
| Connectivity | |
| | HDMI-CEC |
| | 6x SPI, 3x I ² S, 4x I ² C |
| | Camera interface |
| | Ethernet MAC 10/100 with IEEE 1588 |
| | MDIO slave |
| | 2x FDCAN (Flexible Data rate) |
| | 1x USB 2.0 OTG FS/HS |
| | 1x USB 2.0 OTG FS |
| | 2x SDMMC |
| | 4x USART + 4 UART, LIN, smartcard, IrDA, modem control |
| | 1x Low-power UART |
| | 4x SAI (Serial audio interface) |
| | SPDIF input x4 |
| | DFSDM (8 inputs/4 filters) |
| | SWP (Single Wire Protocol) |
| | |

Flash memory size / RAM size (bytes)



- An entry level version of the STM32H7 series
- Easy migration from the F7 and F4 series due to the pin for pin compatibility on common packages
- A wide choice of packages and form factors

STM32H753/H743

Single Core General Purpose

| | |
|--|---|
| System | |
| LDO, USB and backup regulators | Chrom-ART Accelerator™ |
| POR/PDR/PVD/BOR | JPEG Codec Acceleration |
| Multi-power domains | |
| Xtal oscillators | 2-Mbyte dual-bank Flash memory |
| 32 kHz + 4 ~48 MHz | RAM 1056KB incl. 64KB ITCM |
| Internal RC oscillators | FMC/SRAM/NOR/NAND/ SDRAM |
| 32 kHz + 4, 48 & 64 MHz | Dual Quad-SPI |
| 3x PLL | 1024-byte + 4-Kbyte backup SRAM |
| Clock control | |
| RTC/AWU | |
| 1x SysTick timer | |
| 2x watchdogs (independent and window) | Cache I/D 16+16 Kbytes |
| 82/114/131/140/168 I/Os | |
| Cyclic redundancy check (CRC) | |
| Unique ID | |
| Control | |
| 2x 16-bit motor control | |
| PWM synchronized AC timer | |
| 10x 16-bit timers | Arm® Cortex®-M7 480 MHz |
| 2x 32-bit timers | |
| 5x Low-power timer | |
| 16-bit High res. timer | |
| Crypto/Hash processor | |
| 3DES, AES 256, GCM, CCM | Floating point unit (DP-FPU) |
| SHA-1, SHA-256, MD5, HMAC | Nested vector interrupt controller (NVIC) |
| Security services SFI and SB-SFU | JTAG/SW debug/ETM |
| | Memory Protection Unit (MPU) |
| | ROP, PC-ROP anti-tamper |
| optional | |
| AXI and Multi-AHB bus matrix | |
| 4x DMA | |
| True random number generator (RNG) | |

Flash memory size / RAM size (bytes)



Legend:

- without HW crypto/hash
- with HW crypto/hash

- Easy migration from the F7 and F4 series due to the pin for pin compatibility on common packages
- A wide choice of packages and form factors
- Optional crypto variants offering the security services (SFI and SB-SFU) support



STM32H7A3/H7B3

Single Core General Purpose

| | | |
|--|---|---|
| System | Chrom-ART Accelerator™ Chrom-GRC™ JPEG Codec Acceleration | 2-Mbyte dual-bank Flash memory RAM 1376KB incl. 64KB ITCM FMC/SRAM/NOR/NAND/ SDRAM 2x OctoSPI 1024-byte + 4-Kbyte backup SRAM |
| Dual-power domains | | |
| Xtal oscillators 32 kHz + 4 ~48 MHz | | |
| Internal RC oscillators 32 kHz + 4, 48 & 64 MHz | | |
| 3x PLL | | |
| Clock control | | |
| RTC/AWU | | |
| 1x SysTick timer | | |
| 2x watchdogs (independent and window) | | |
| Up to 168 I/Os | | |
| Cyclic redundancy check (CRC) | | |
| Unique ID | | |
| | | |
| Control | Floating point unit (DP-FPU) Nested vector interrupt controller (NVIC) JTAG/SW debug/ETM Memory Protection Unit (MPU) ROP, PC-ROP active-tamper | 1x Low-power UART 2x SAI (Serial audio interface) SPDIF input x4 DFSDM (8 inputs/4 filters) |
| 2x 16-bit motor control PWM synchronized AC timer | | |
| 10x 16-bit timers 2x 32-bit timers | | |
| 2x Low-power timer | | |
| | | |
| Crypto/Hash processor | 3DES, AES 256, GCM, CCM SHA-1, SHA-256, MD5, HMAC, OTFDEC Security services SFI and SB-SFU | 3x 12-bit, 2-channel DACs 2 x 16-bit ADC (up to 3.6 Msps) 20 channels/up to 2 MSPS Temperature sensor 2x COMP 2x OpAmp |
| optional | | |

Flash memory size / RAM size (bytes)



- A STM32H7 single core with high memory integration
- LDO and SMPS for optimized power consumption
- A wide choice of packages and form factors
- Optional crypto variants offering the security services (SFI and SB-SFU) support

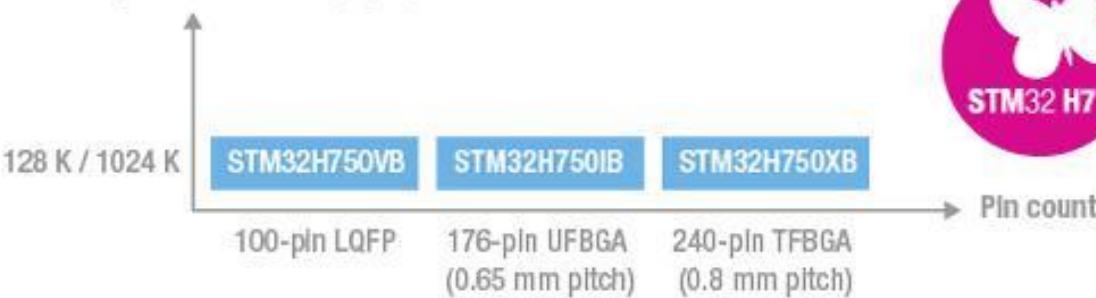


STM32H750

Value line

| | | |
|--|---|---|
| System | Chrom-ART Accelerator™ JPEG Codec Acceleration | 128-Kbyte Flash memory RAM 1056KB incl. 64KB ITCM |
| LDO, USB and backup regulators POR/PDR/PVD/BOR | | FMC/SRAM/NOR/NAND/ SDRAM |
| Multi-power domains | | Dual Quad-SPI |
| Xtal oscillators 32 kHz + 4 ~48 MHz | | 1024-byte + 4-Kbyte backup SRAM |
| Internal RC oscillators 32 kHz + 4, 48 & 64 MHz | Cache I/D 16+16 Kbytes | |
| 3x PLL | | |
| Clock control | | |
| RTC/AWU | | |
| 1x SysTick timer | Arm® Cortex®-M7 480 MHz | |
| 2x watchdogs (independent and window) | | |
| 82/140/168 I/Os | | |
| Cyclic redundancy check (CRC) | | |
| Unique ID | | |
| | | |
| Control | | |
| 2x 16-bit motor control | Floating point unit (DP-FPU) | 128 K / 1024 K |
| PWM synchronized AC timer | Nested vector interrupt controller (NVIC) | STM32H750VB |
| 10x 16-bit timers | JTAG/SW debug/ETM | STM32H750IB |
| 2x 32-bit timers | Memory Protection Unit (MPU) | STM32H750XB |
| 5x Low-power timer | ROP, PC-ROP anti-tamper | |
| 16-bit High res. timer | | |
| | | |
| Crypto/Hash processor | | |
| 3DES, AES 256, GCM, CCM | 2x 12-bit, 2-channel DACs | |
| SHA-1, SHA-256, MD5, HMAC | 3 x 16-bit ADC (up to 3.6 Msps) | |
| Security services SFI and SB-SFU | 20 channels/up to 2 MSPS | |
| | Temperature sensor | |
| | 4x DMA | |
| | True random number generator (RNG) | |
| | 2x COMP | |
| | 2x OpAmp | |

Flash memory size / RAM size (bytes)



- A STM32H7 running up to 480 MHz with Flash reduced to the essential to implement user bootloader and focus on external memories usage
- Come natively in Crypto variants only
- Add new package (LQFP144, LQFP176)

STM32H7B0

Value line

| | | |
|---|--|--|
| System | Chrom-ART Accelerator™ Chrom-GRC™ JPEG Codec Acceleration | 128-Kbyte Flash memory RAM 1376KB incl. 64KB ITCM FMC/SRAM/NOR/NAND/ SDRAM 2x OctoSPI 1024-byte + 4-Kbyte backup SRAM |
| Dual-power domains | | |
| Xtal oscillators 32 kHz + 4 ~48 MHz | | |
| Internal RC oscillators 32 kHz + 4, 48 & 64 MHz | | |
| 3x PLL | | |
| Clock control | | |
| RTC/AWU | | |
| 1x SysTick timer | | |
| 2x watchdogs (independent and window) | | |
| Up to 138 I/Os | | |
| Cyclic redundancy check (CRC) | | |
| Unique ID | | |
| | | |
| Control | Floating point unit (DP-FPU) Nested vector interrupt controller (NVIC) JTAG/SW debug/ETM Memory Protection Unit (MPU) ROP, PC-ROP active-tamper | 1x TFT LCD controller HDMI-CEC 6x SPI, 3x I ² S, 4x I ² C Camera interface MDIO slave 2x FDCAN (Flexible Data rate) 1x USB 2.0 OTG FS 2x SDMMC 5x USART + 5 UART LIN, smartcard, IrDA, modem control 1x Low-power UART 2x SAI (Serial audio interface) SPDIF input x4 DFSDM (8 inputs/4 filters) |
| 2x 16-bit motor control PWM synchronized AC timer | | |
| 10x 16-bit timers 2x 32-bit timers | | |
| 2x Low-power timer | | |
| | | |
| Crypto/Hash processor | 3DES, AES 256, GCM, CCM SHA-1, SHA-256, MD5, HMAC, OTFDEC Security services SFI and SB-SFU | 3x 12-bit, 2-channel DACs 2 x 16-bit ADC (up to 3.6 Msps) 20 channels/up to 2 MSPS Temperature sensor 2x COMP 2x OpAmp |

Flash memory size / RAM size (bytes)



Legend: ♦ LDO □ LDO + internal SMPS only ■ available in Q2-2020

- A STM32H7 running up to 280 MHz with Flash reduced to the essential to implement user bootloader and focus on external memories usage
- Come natively in Crypto variants only



Pin count

STM32H755/H745

Dual Core Industrial

| | | |
|---|---|--|
| System | Chrom-ART Accelerator™ JPEG Codec Acceleration | 2-Mbyte dual-bank Flash memory RAM 1056KB incl. 64KB ITCM FMC/SRAM/NOR/NAND/ SDRAM Dual Quad-SPI 1024-byte + 4-Kbyte backup SRAM |
| Multi-power domains | | |
| Xtal oscillators 32 kHz + 4 ~48 MHz | | |
| Internal RC oscillators 32 kHz + 4, 48 & 64 MHz 3x PLL | | |
| Clock control | | |
| RTC/AWU | | |
| 1x SysTick timer | | |
| 2x watchdogs (independent and window) | | |
| 82/114/140/168 I/Os | | |
| Cyclic redundancy check (CRC) | | |
| Unique ID | | |
| Control | | |
| 2x 16-bit motor control PWM synchronized AC timer | Floating point unit (DP-FPU) Nested vector interrupt controller (NVIC) | 2 M / 1 M |
| 10x 16-bit timers 2x 32-bit timers | JTAG/SW debug/ETM Memory Protection Unit (MPU) | STM32H755ZI STM32H755II STM32H755BI STM32H755XI |
| 5x Low-power timer 16-bit High res. timer Optional extended temperature range support (125°C) | ROP, PC-ROP anti-tamper | STM32H745ZI STM32H745II STM32H745BI STM32H745XI |
| Crypto/Hash processor | | 1 M / 1 M |
| 3DES, AES 256, GCM, CCM SHA-1, SHA-256, MD5, HMAC | AXI and Multi-AHB bus matrix 4x DMA | STM32H745ZG STM32H745IG STM32H745BG STM32H745XG |
| Security services SFI and SB-SFU | True random number generator (RNG) | 144-pin LQFP 176-pin LQFP UFBGA (0.65 mm pitch) 208-pin LQFP 240-pin TFBGA (0.8 mm pitch) |
| optional | | |

Flash memory size / RAM size (bytes)



Legend:

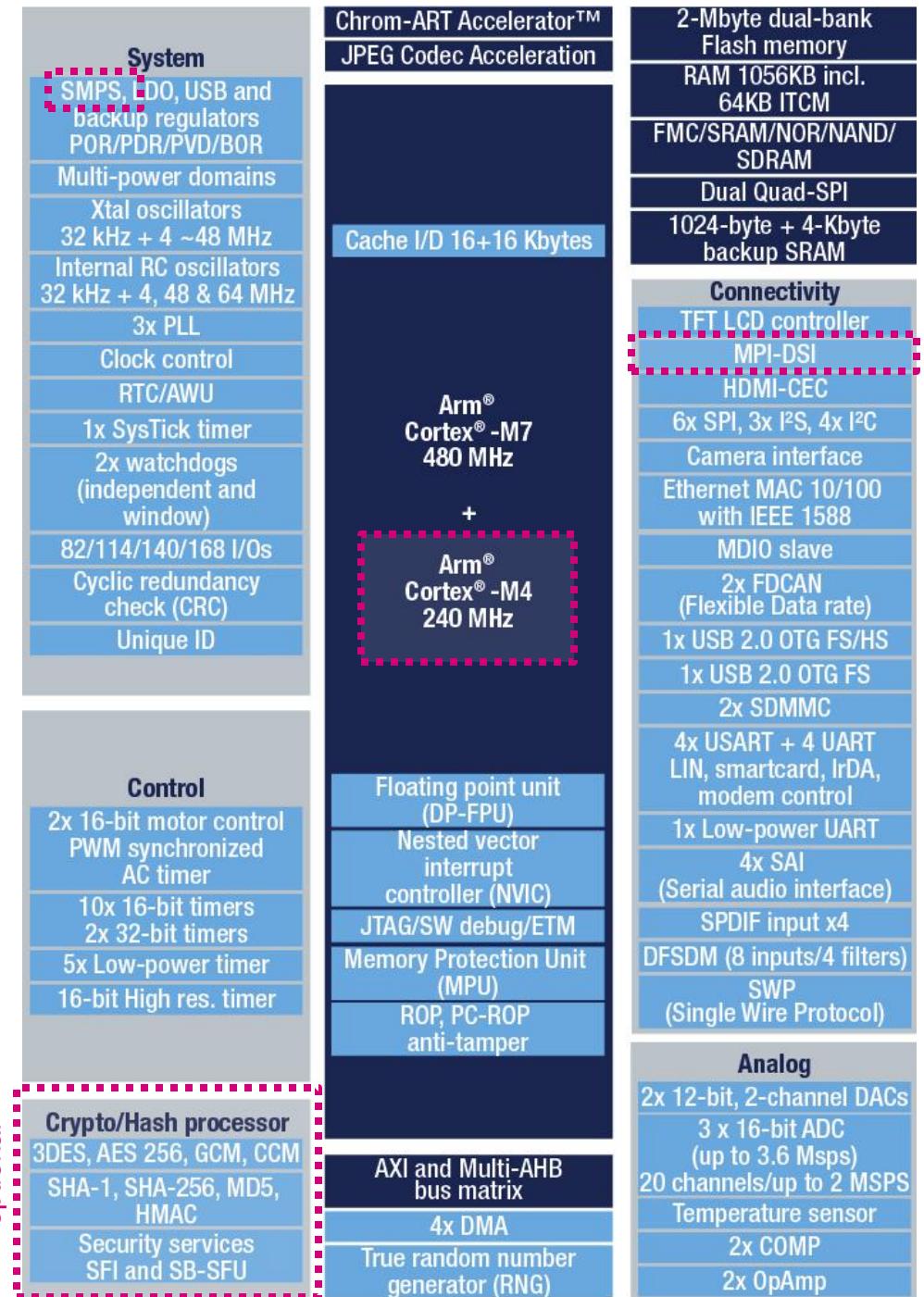
- without HW crypto/hash
- with HW crypto/hash

- A STM32H7 Dual core version
- LDO and SMPS for optimized current consumption
- A wide choice of packages and form factors suitable for industrial or appliance applications
- Optional crypto variants offering security services (SFI & SB-SFU) support
- Optional support of extended Temperature range on specific part numbers



STM32H757/H747

Dual Core Graphic



Flash memory size / RAM size (bytes)



Pin count

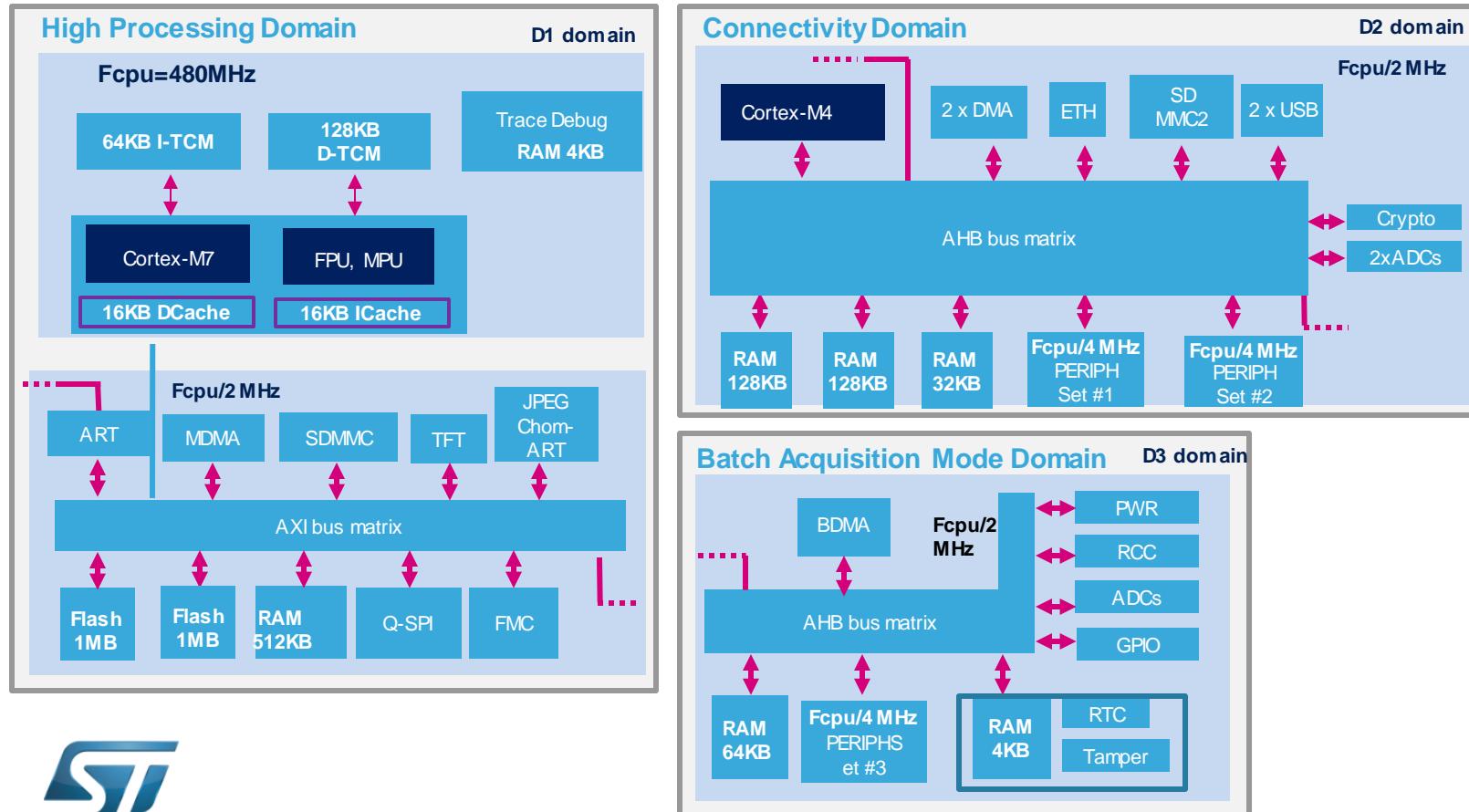
Legend:

- without HW crypto/hash
- with HW crypto/hash

- A STM32H7 Dual core version for advanced graphic thanks to the MIPI-DSI Phy allowing to connect high resolution displays
- LDO and SMPS for optimized current consumption
- A wide choice of packages and form factors suitable for highly integrated applications
- Optional crypto variants offering the security services (SFI and SB-SFU) support

Dual Core Block Diagram by Power Domain

Multi-power domain architecture for maximum flexibility and minimum power consumption



- Three power domains for maximum flexibility:** To allow the shutdown of unused domains and minimize current consumption
- Power efficiency in RUN mode**
Thanks to 40nm process, dynamic voltage scaling and SMPS
- Batch Acquisition Mode Domain**
For always ON tasks, Including Vbat subdomain with RTC and backup RAM

Flexible Architecture for Power Efficiency

Only 60% of the dynamic power of the STM32H7 Single core thanks to the SMPS

| | | |
|--------------|--|---------------------|
| Wake-up time | CM7/CM4 RUN (VOS1) at 400/200 MHz - PERIPH OFF 38 µs | 145 µA / MHz* |
| | CM7 RUN (VOS1) at 400 MHz - PERIPH OFF, CM4 idle 390 µs | 121µA / MHz* |
| | STOP Mode (D3 STOP, D1 and D2 STDBY) 390 µs | 60µA*** |
| | STANDBY + 4 KB RAM | 3.6 µA / 4.3 µA**** |
| | STANDBY | 2.1 µA / 2.8 µA**** |
| | V _{BAT} | 30 nA / 0.75 µA**** |

Typ @ V_{DD} = 3 V, @ 25 °C

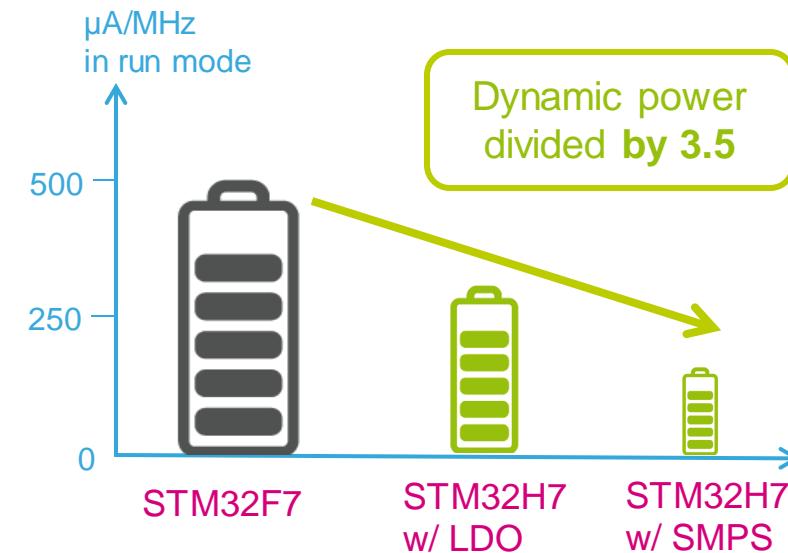
Notes:

* from Flash (Cache ON and Reg. ON)

*** VOS5; Flash OFF, no IWDG

**** with RTC, at 3V

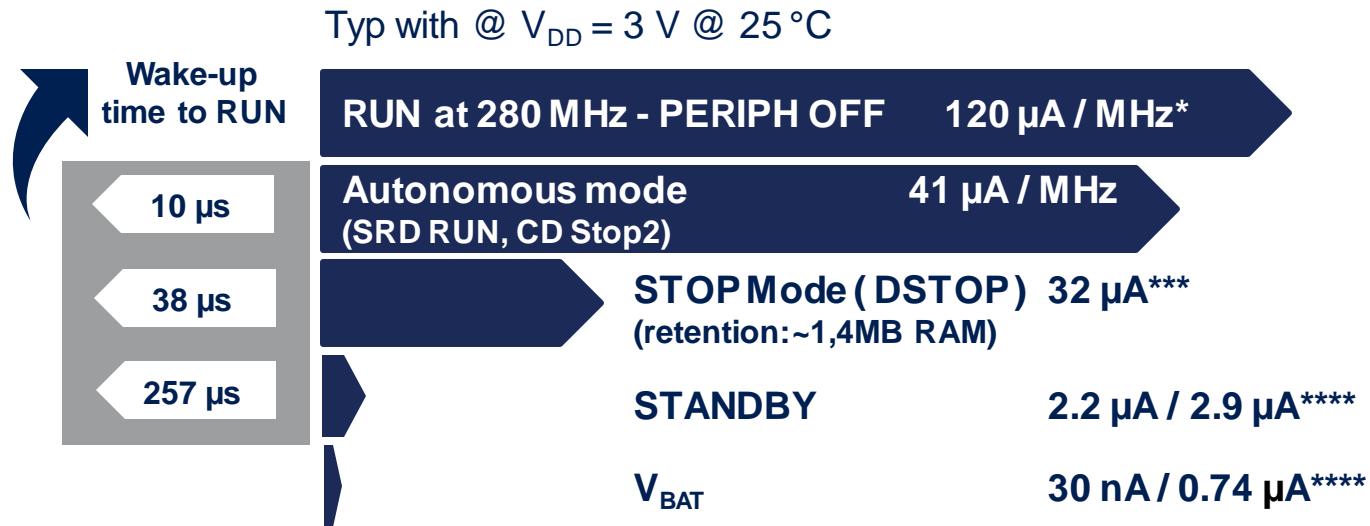
More details available in product Sheet available at www.st.com



Flexible Architecture for Power Efficiency

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60% of the dynamic power thanks to the SMPS vs LDO

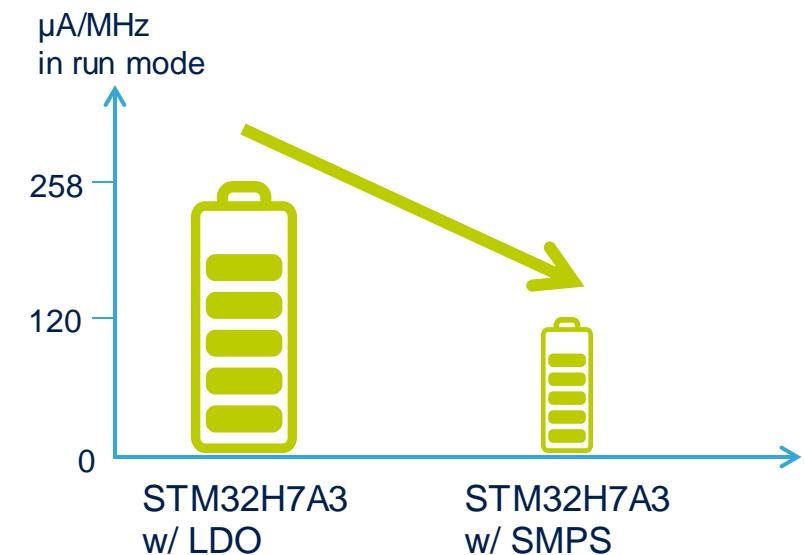


* from Flash (Cache ON and Peripheral OFF), SMPS ON

** BAM run at 64MHz, SPI clock 16 MHz,
data stored in Smart Run Domain RAM via BDMA

*** VOS5, Flash LP mode, no IWDG ,SMPS ON

**** with RTC





STM32H7 Dual core

STM32H7x5 & STM32H7x7

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STM32H7 Microcontrollers Combine
Dual-Core Performance with Rich Feature Integration



- System integration
- Advanced connectivity and control
- Security services

- ▶ STM32H7x5 [here](#)
- ▶ STM32H7x7 [here](#)
- ▶ ST blog article [here](#)



www.st.com/STM32H7



STM32H7 Single core

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STM32H7A3/H7B3 & STM32H7B0 Value line

New STM32H7 Microcontrollers for best combination of performance, integration and power saving inside an MCU ready for secure and SMART connected products



- ▶ STM32H7A3/H7B3 [here](#)
- ▶ STM32H7B0 Value line [here](#)



STM32H7 Series - Key Take Away

New product lines expanding the STM32 portfolio



New Performance Record

2424 + 800 CoreMark (Cortex[©]-M7 @480 MHz + Cortex[©]-M4 @240 MHz)



Single and Dual-core flexible architecture for industrial, security or AI applications
Accelerated graphics, fast data transfer, advanced peripherals



Advanced security features

Crypto Hash, Cortex[©]-M7 Security services



Rich eco-system to speed-up your design

SW tools, HW boards, community and partners

Releasing Your Creativity

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