RV College of Engineering®

ARM Processor Families

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ARM Cortex Processor Families

- ***A Profile*** **:** Application processors which are designed to handle complex applications such as high-end embedded operating systems (OSs)

  -These processors requiring the highest processing power, virtual memory system support with memory management units (MMUs).

  E.g: High-end mobile phones(Samsung S6: Samsung Eqynos).

- ***R Profile*****:** Real-time, high-performance processors targeted primarily at the higher end of the real-time market.

  -Those applications, such as high-end breaking systems and hard drive controllers, in which high processing power and high reliability are essential and for which low latency is important.

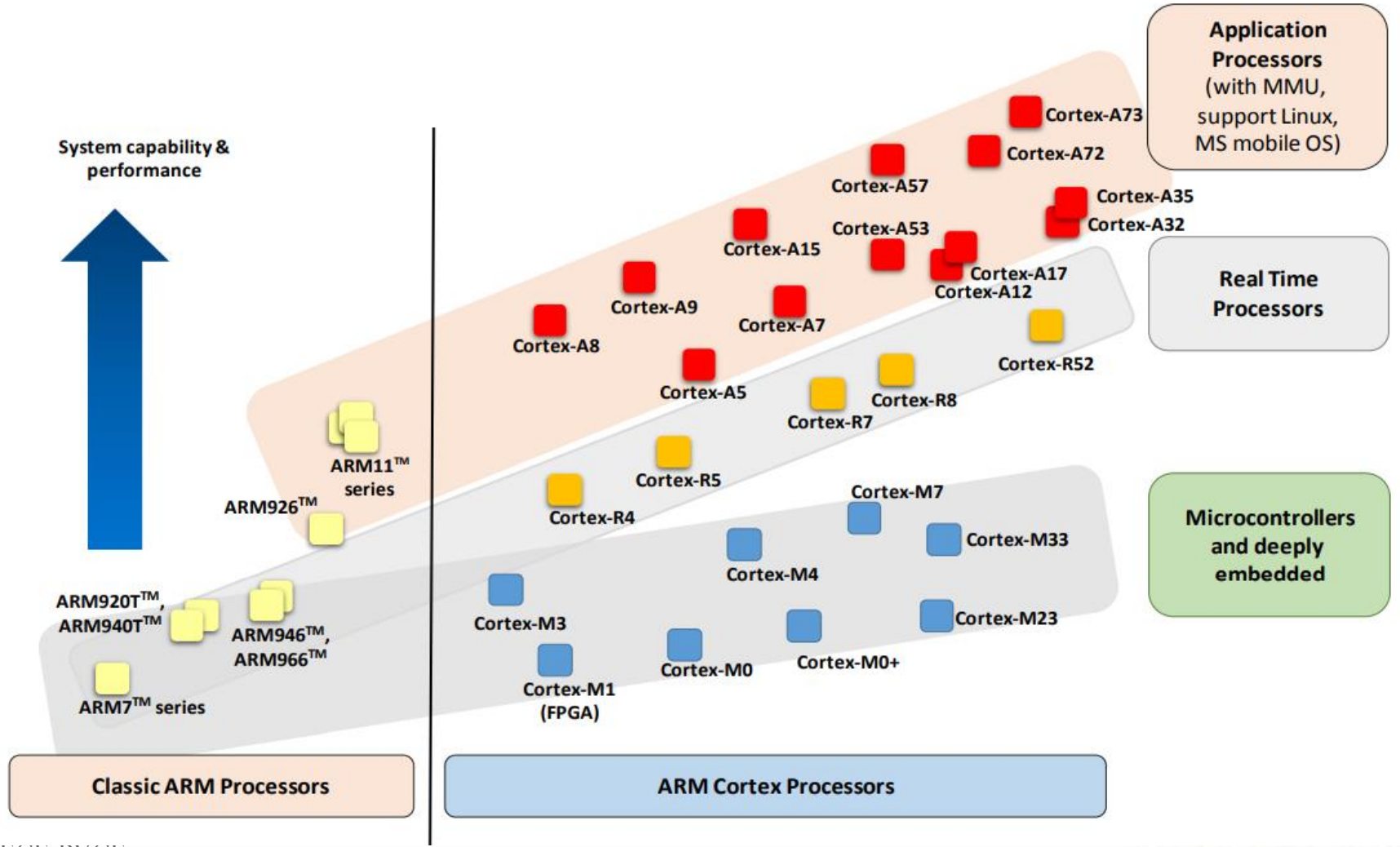
- ***M Profile*** : Processors targeting low-cost applications in which processing efficiency is important and cost, power consumption, low interrupt latency, and ease of use are critical.

ARM Processor Families contd..

- ***Neoverse N1:*** Delivering market-leading server performance at the half the power, the N1 CPU ushers in a revolutionary era of compute efficiency or performance/watt. Targeted for server work loads and data centres.
- ***Ethos :*** Highly scalable and efficient NPU, the Ethos enables new immersive applications with a 2.5x increase in single-core performance now scalable from 1 to 10 TOP/s and beyond through many-core technologies. It provides flexibility to optimize the ML capability and IoT applications.

Source: www.arm.com

ARM Processor Families



Typical Application Domains

Cortex - A

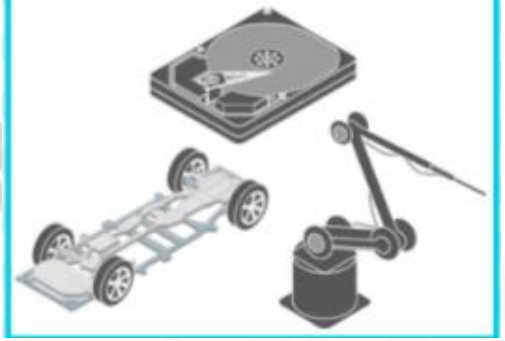
Highest performance

Optimised for
rich operating systems

Cortex - R

Fast response

Optimised for
high performance,
hard real-time applications



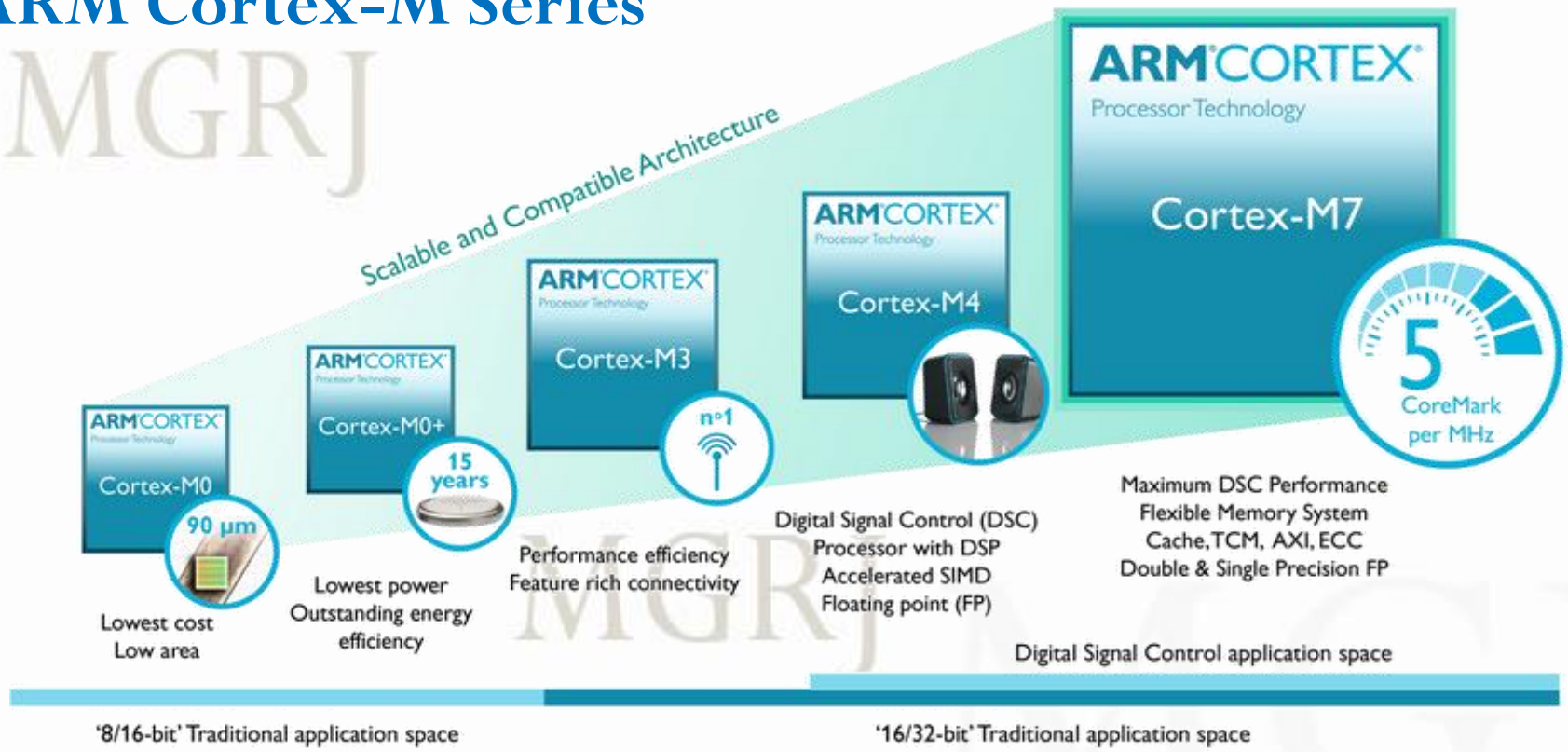
Cortex - M

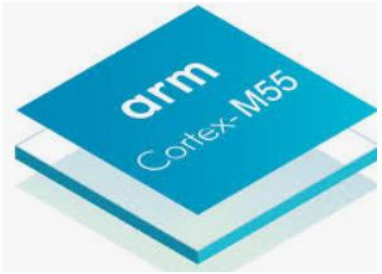
Smallest/lowest power

Optimised for
discrete processing and
microcontrollers

Source: google

ARM Cortex-M Series



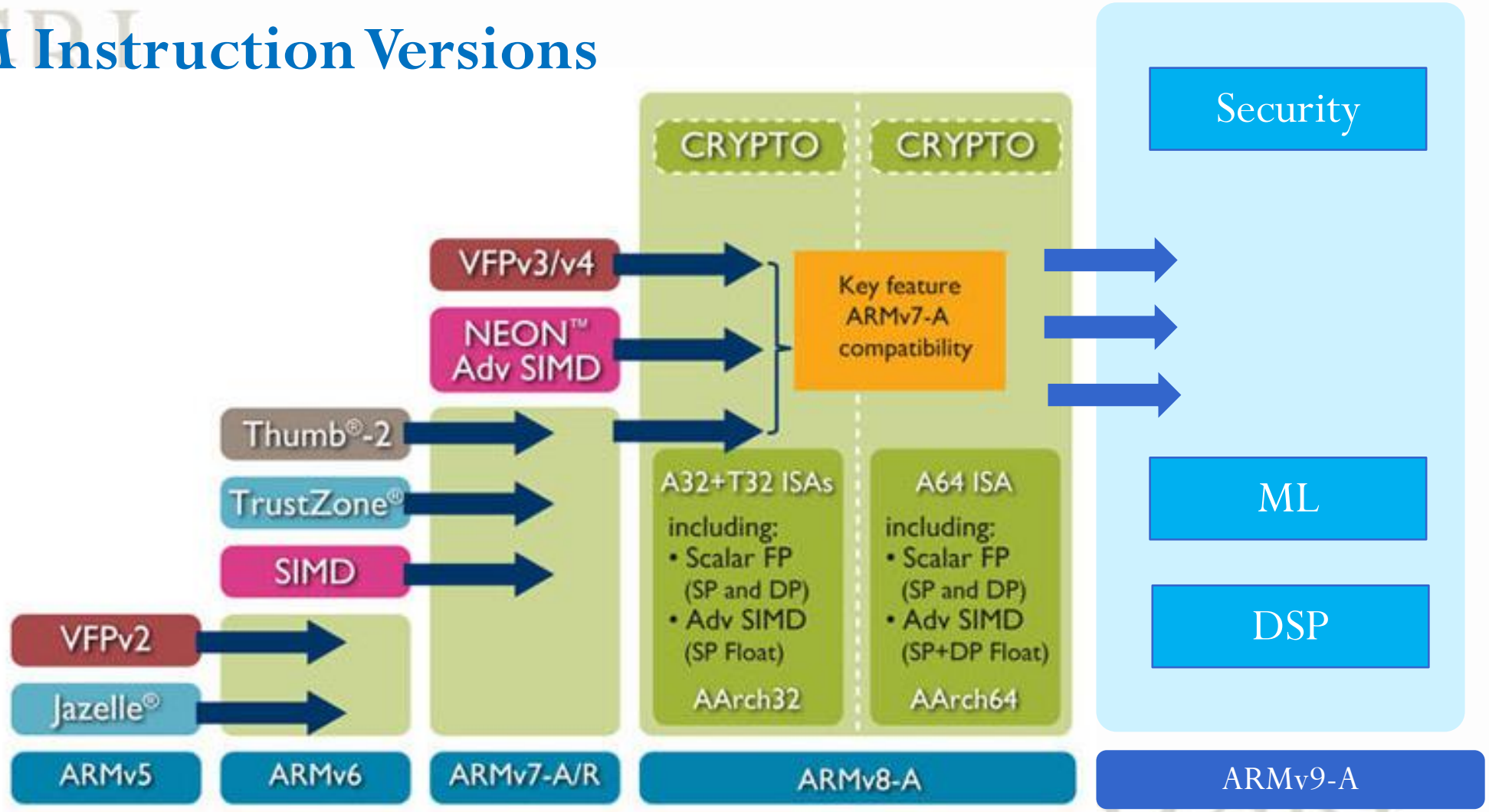


For more info on CoreMark: www.eembc.org

CoreMark

- CoreMark is small, portable, easy to understand, free, and displays a single number benchmark score to represent the speed of processors.
- A processor with higher CoreMark number is faster. This rating is given by CoreMark consortium.
- Earlier DMIPS(Dhrystone Million Instructions Per second) is the metrics used specify the speed of processors.
- To avoid the problems associated with the DMIPS(Dhrystone MIPS), CoreMark rating is introduced.
- More info on CoreMark: https://www.eembc.org/coremark/

ARM Instruction Versions



ARMv7-M ARMv8-R/M www.arm.com

STM32 CubeMX

- Embedded finder: MCUs/MPUs, boards, examples
- Pinout, Peripherals & Middleware configuration
- Clock configuration
- Project generation for Keil, IAR & STM32CubeIDE
- Power consumption estimation
- Software package manager
- Embedded tutorial videos and documentation