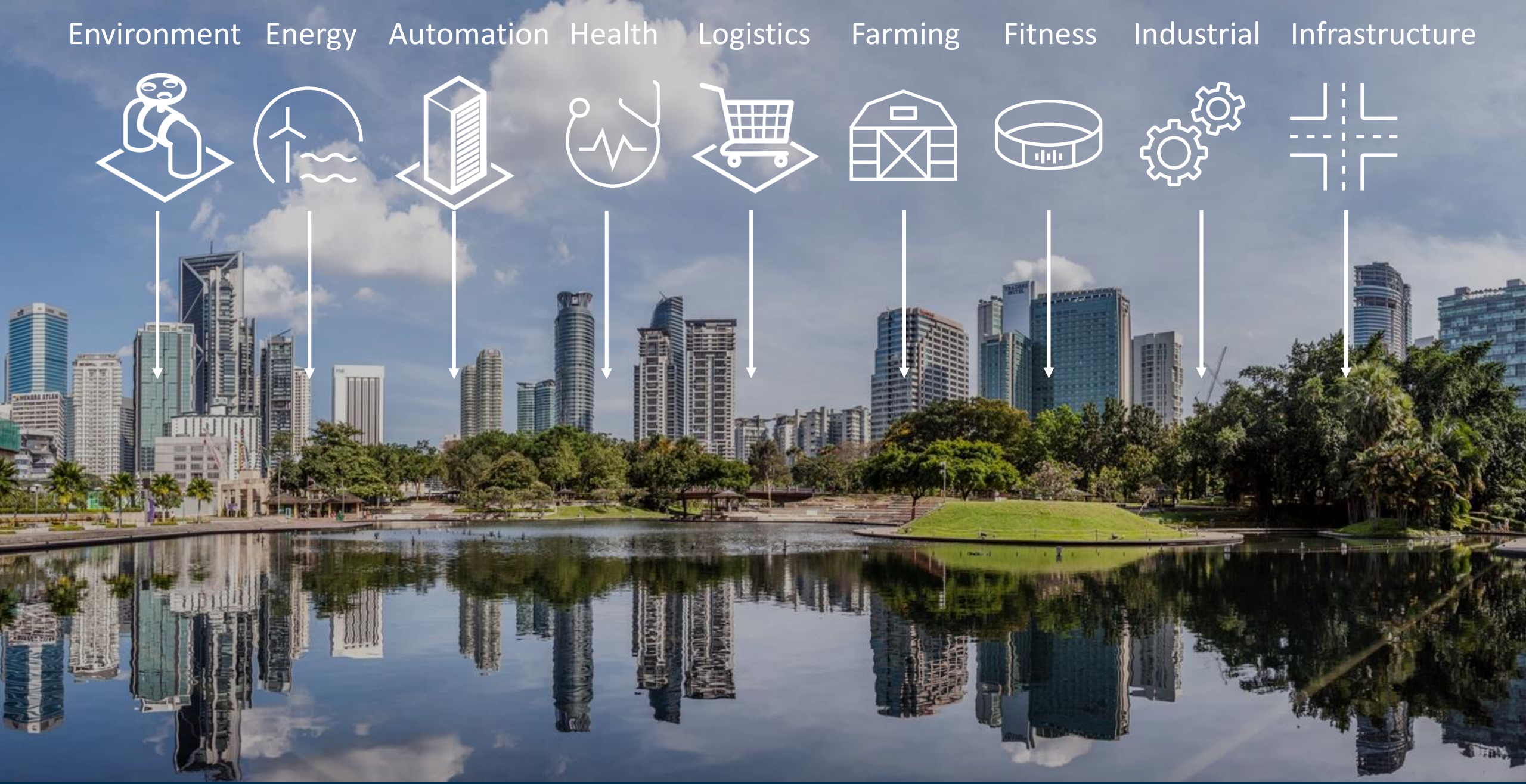
Arm生态系统赋能中国家电产业智能科技创新

Lifeng Geng

November, 2019



1000s of applications in Embedded and IoT

The next technology revolution will be remembered as the ‘AIoT’ era, where **1 Trillion devices** will be connected to the Internet over the coming years

This ‘hyper connected world’ will transform all aspects of business, industry and society, **creating transformational value opportunities** by **leveraging data** from devices to provide intelligence, insight, and impact

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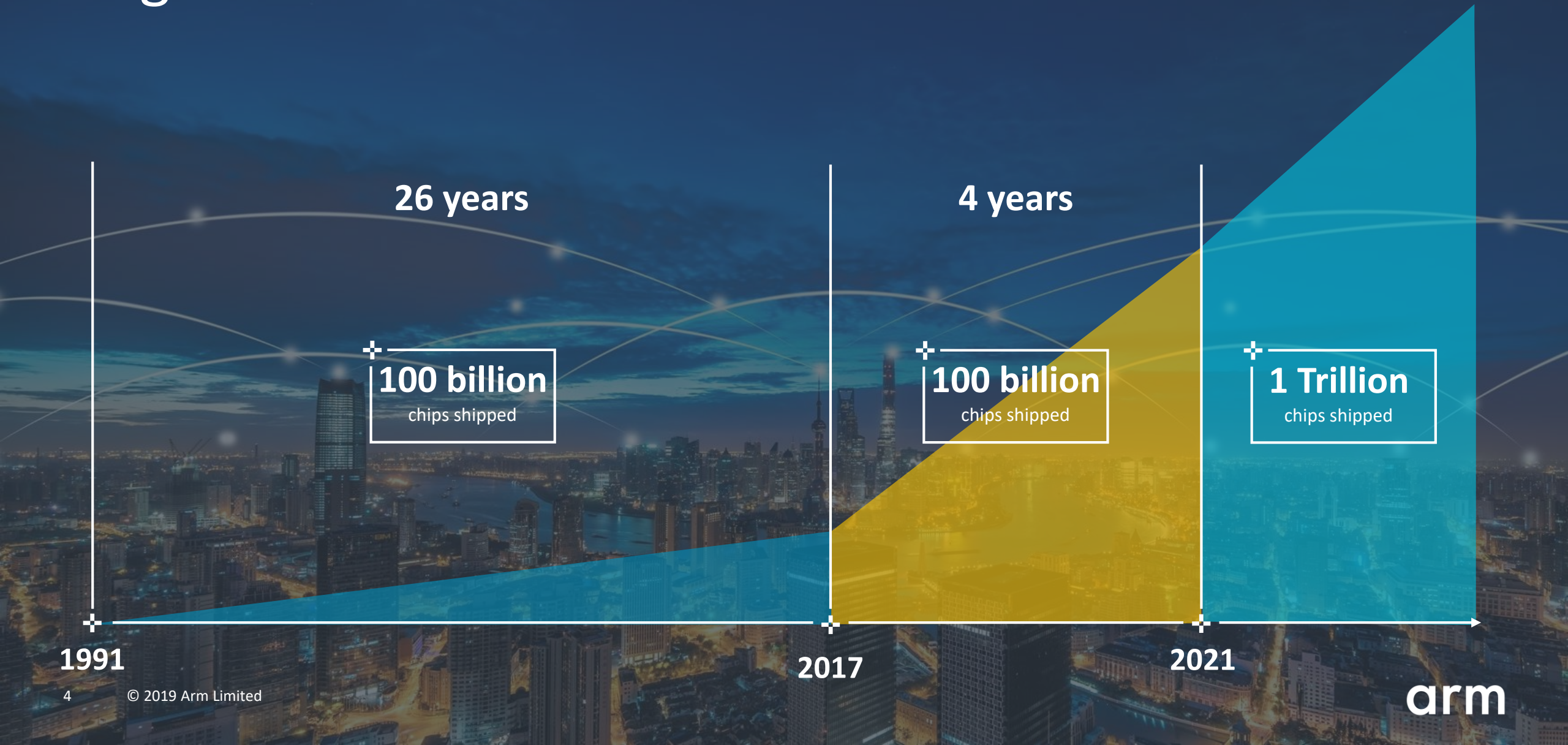
Dig. Transformation creates the value to drive IoT at scale



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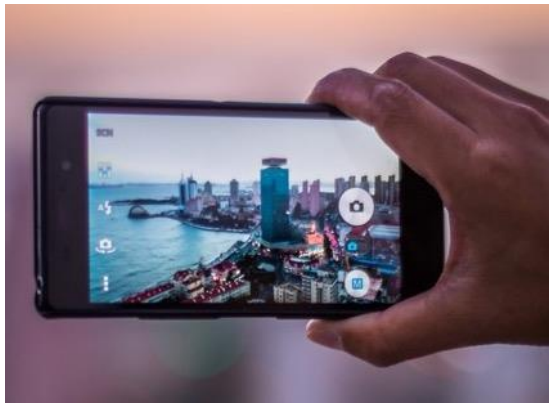
Diverse applications need diverse compute



Cortex-A

Highest performance

Designed for high-level operating systems

Cortex-R

Faster responsiveness

Designed for high performance, hard real-time applications

Cortex-M

Smallest/lowest power

Designed for discrete processing and microcontrollers

SecurCore

Tamper resistant

Designed for physical security

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Cortex-M processor value proposition

Lower energy cost	Energy efficient	Low power implementation Sleep mode support Wake-up Interrupt Controller Increased intelligence at node
Lower software cost	Ease of use	Broad tools and OS support Binary compatible roadmap CMSIS support Pure C target
Competitive products	High performance	32-bit RISC architecture High-efficiency processor cores Integrated Interrupt Controller (NVIC)
Lower silicon cost	Reduced system cost	Thumb-2 code density Area-optimized designs CoreSight debug support

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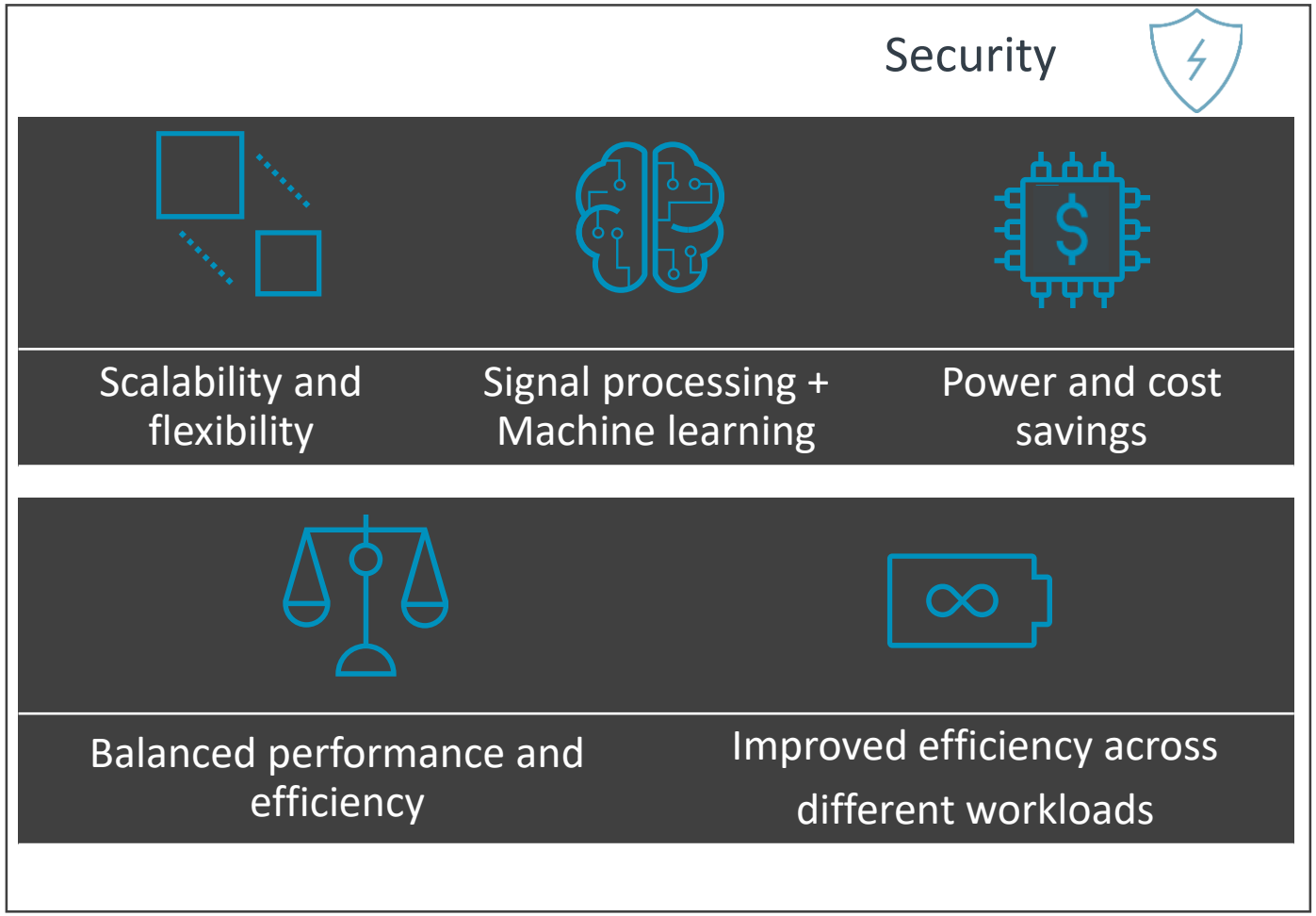
Increasing compute requirements offer growth opportunities

Expanding compute use cases, leading to higher processing complexity at the edge

No ‘one size fits all’ use cases; different blends of compute needed

Unified programmer’s view needed to seamlessly leverage the best-fitting hardware



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Market dynamics – smart user to real-world interaction

- Interaction with objects is moving away from buttons to voice and vision
- Objects and vehicles are increasingly aware of their environment and act on it
- Capabilities pioneered by smartphone are now extending into embedded and automotive
- User experience, high quality and immersive: headsets, AR-VR, soundbars, car-audio…
- Signal processing and machine learning (ML) are becoming pervasive in embedded applications

User aware

Context aware

Wire-free HQ experience

Vision / ML / AI

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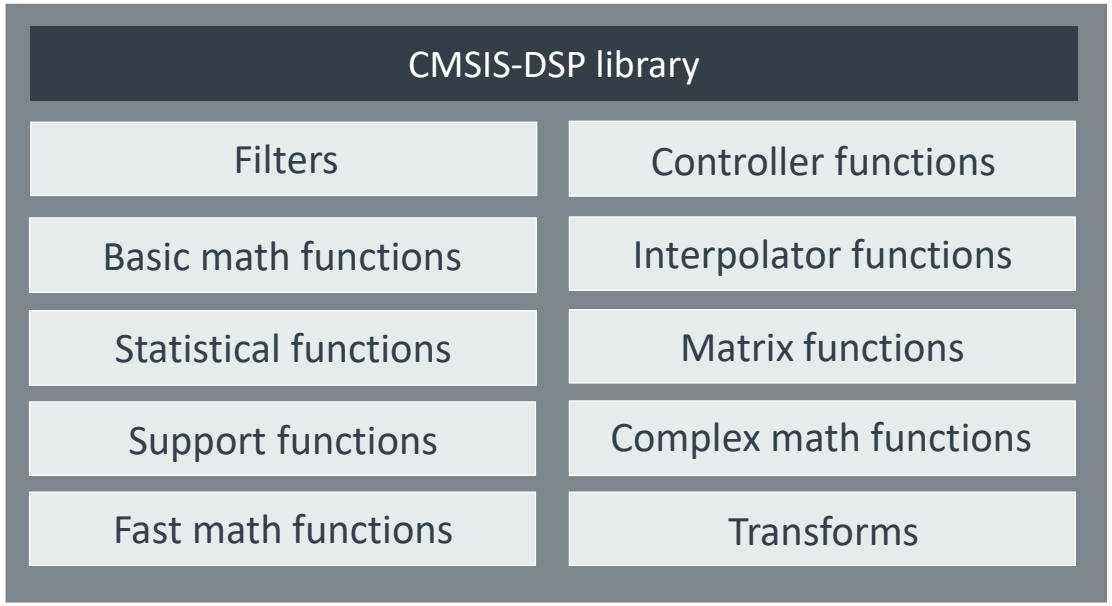
A versatile DSP ecosystem for Cortex-M

Fundamental DSP Functions on Cortex-M – available for free!



CMSIS COMPLIANT
ARM® Cortex® Microcontroller Software Interface Standard

Examples of ecosystem solutions and partners

- Audio codecs
- Voice codecs
- Image processing
- Keyword spotting
- Audio enhancement
- Sensor fusion
- Motor control
- Connectivity
- Simulation tools

MathWorks
forté media
hillcrestlabs
PICUSTECH SOFTWARE
WAVES
VOCAL TECHNOLOGIES, LTD.
ADAPTIVE DIGITAL
audio analytic
QUANTIMETRICA
DSP CONCEPTS
ALANGO Technologies and solutions

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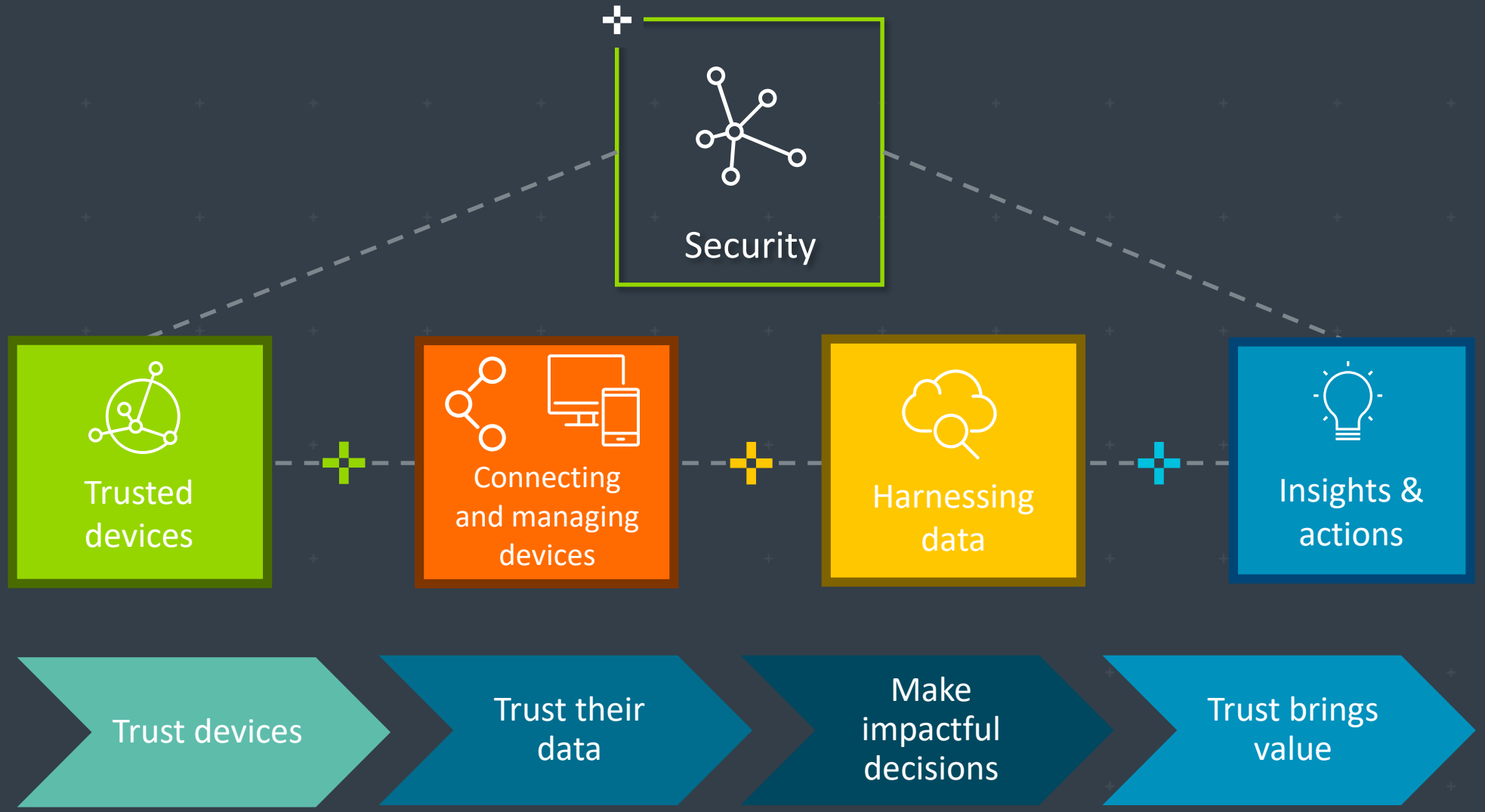
Trust is essential for digital transformation



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Key value for TrustZone: Efficient isolation

Comprehensive

- Secure, holistic protection across the entire processor and system

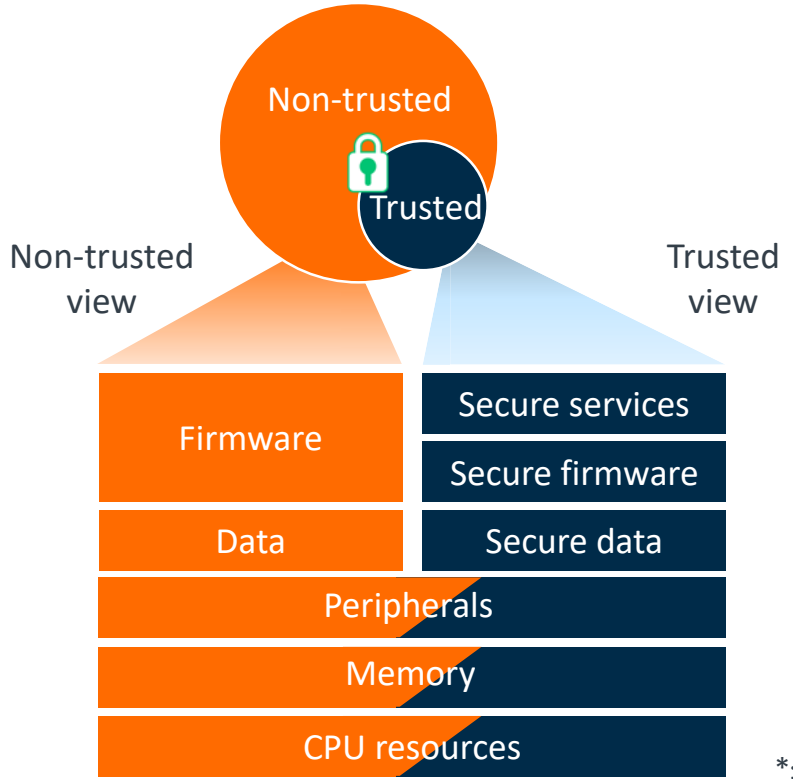
Simple to use

- Transparent to software developer
- Same programmer's model

Optimized for small embedded

- Hardware-enforced isolation
  - No hypervisor code or memory overhead
- Deterministic, low-latency interrupts

Two worlds - one CPU real-time transition*



*≤2 cycles

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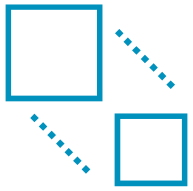
Security for even the most constrained devices

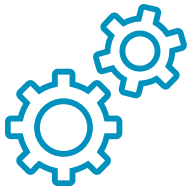
Cortex-M23	Cortex-M33
Foundation for securing IoT applications	
Protect and monetize valuable IP	
Build scalable, flexible and compatible solutions	
Security even for constrained devices	Create secure solutions for diverse markets

TrustZone
for Armv8-M

Power
efficiency



Solution
scalability



Ease of
development

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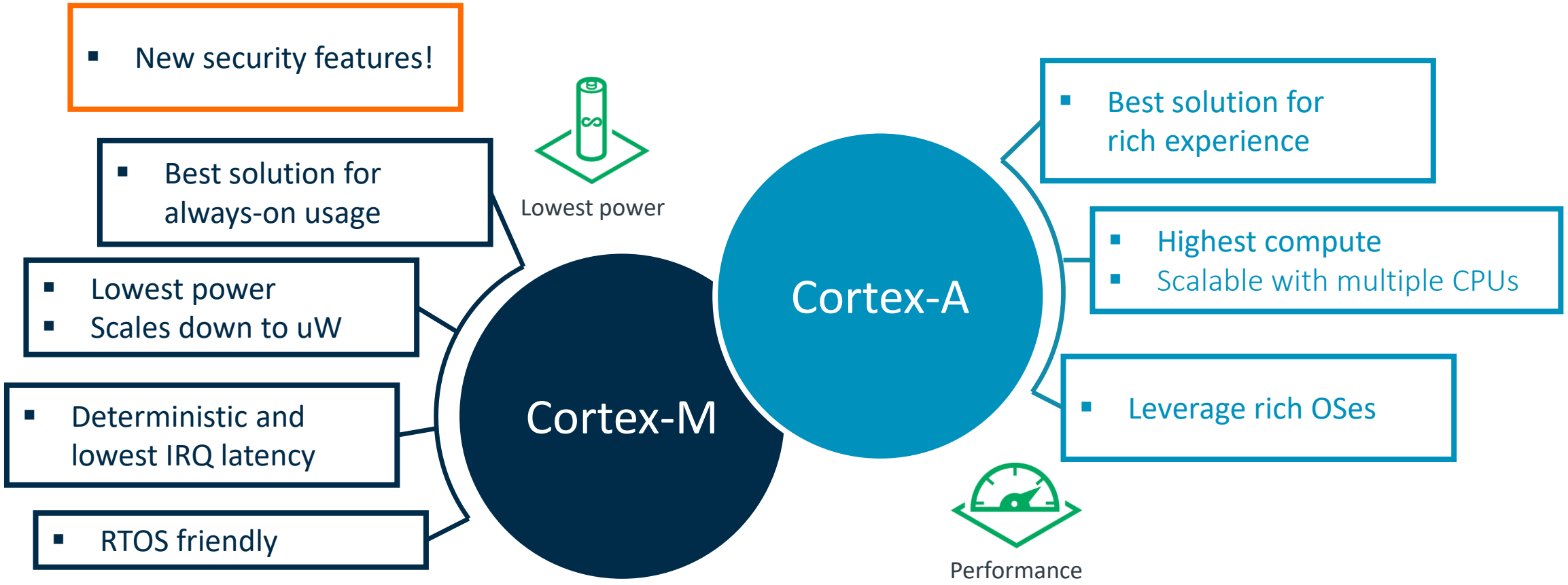
Combining the benefits of Cortex-A and Cortex-M



Common foundation: fabric and debug infrastructure, tools, ecosystem

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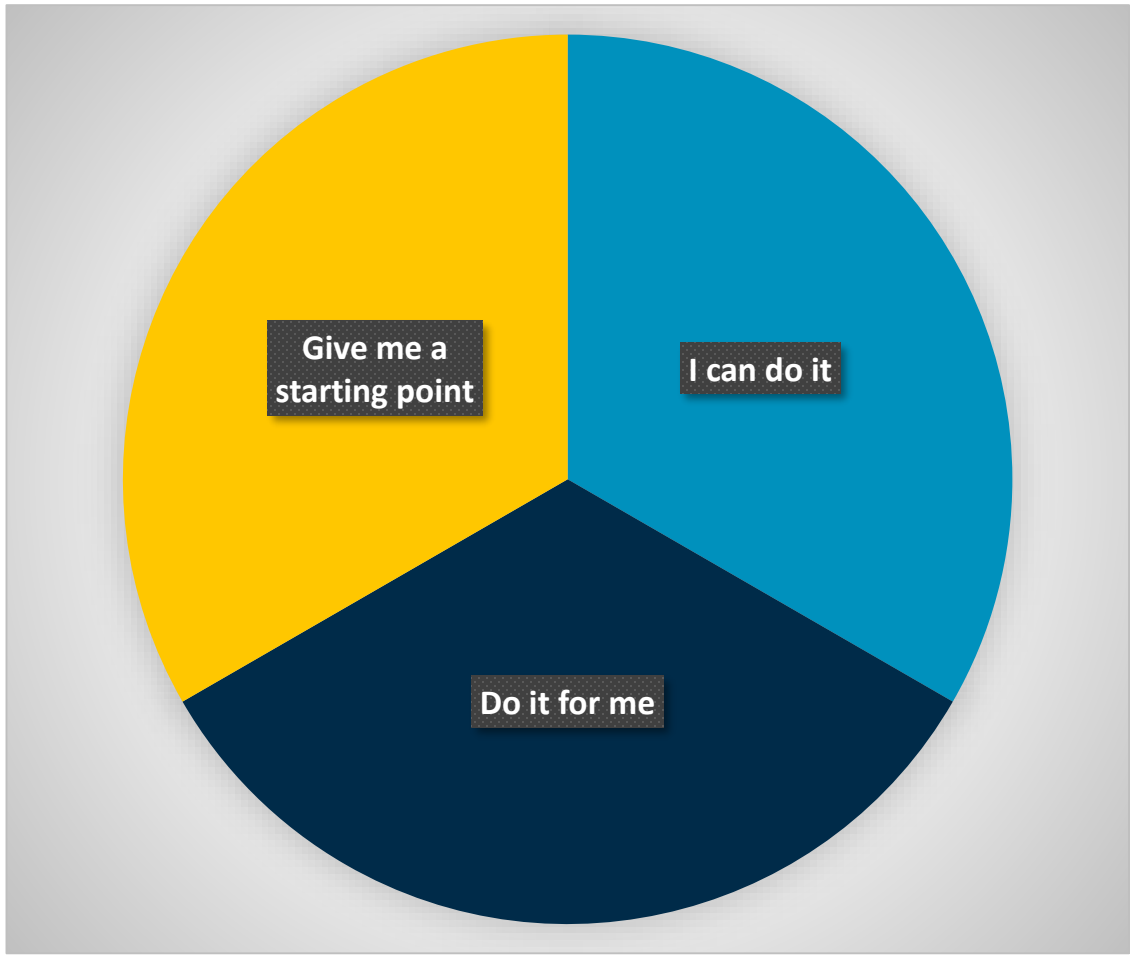
Secure SoC Design

Three types of partner with different capabilities and requirements



- I can do it
  - Know how to design an SoC and make it secure
  - Require just the IP blocks from Arm
- Do it for me
  - Perhaps less experienced, under resourced with tight time scales
  - Require as much help as possible to design, integrate and verify a secure SoC
- Give me a starting point
  - Need to develop a unique and secure solution
  - Require a starting point that can be modified to requirements without re-inventing the wheel

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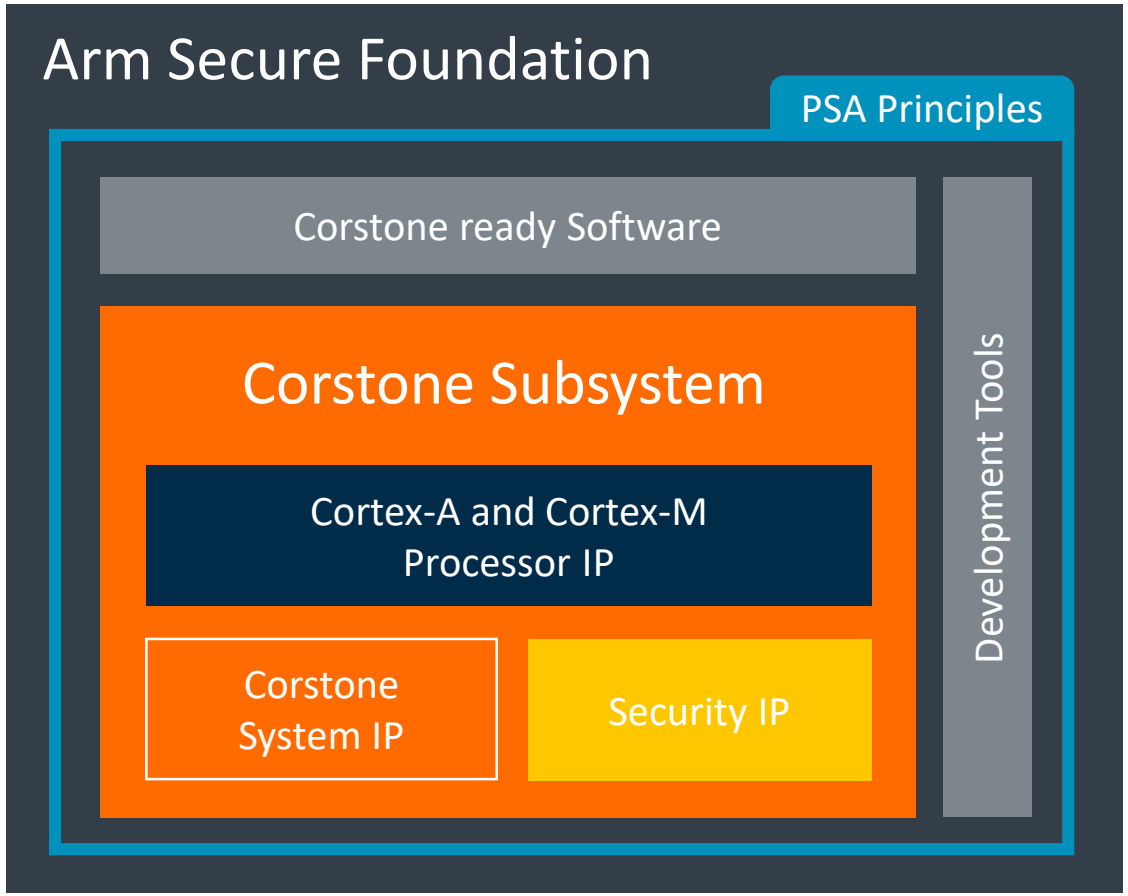
Arm Secure Foundation

Reference designs for the heart of your SoC



Processor License

Processor IP
- Cortex-A and/or Cortex-M / STAR

Corstone foundation IP License

Corstone Subsystem
- Tested system designs to build on or use as a reference

Corstone System IP
- Vast collection of System IP

Security IP License (optional)

Security IP
- Hardware security functions

Open Source Software

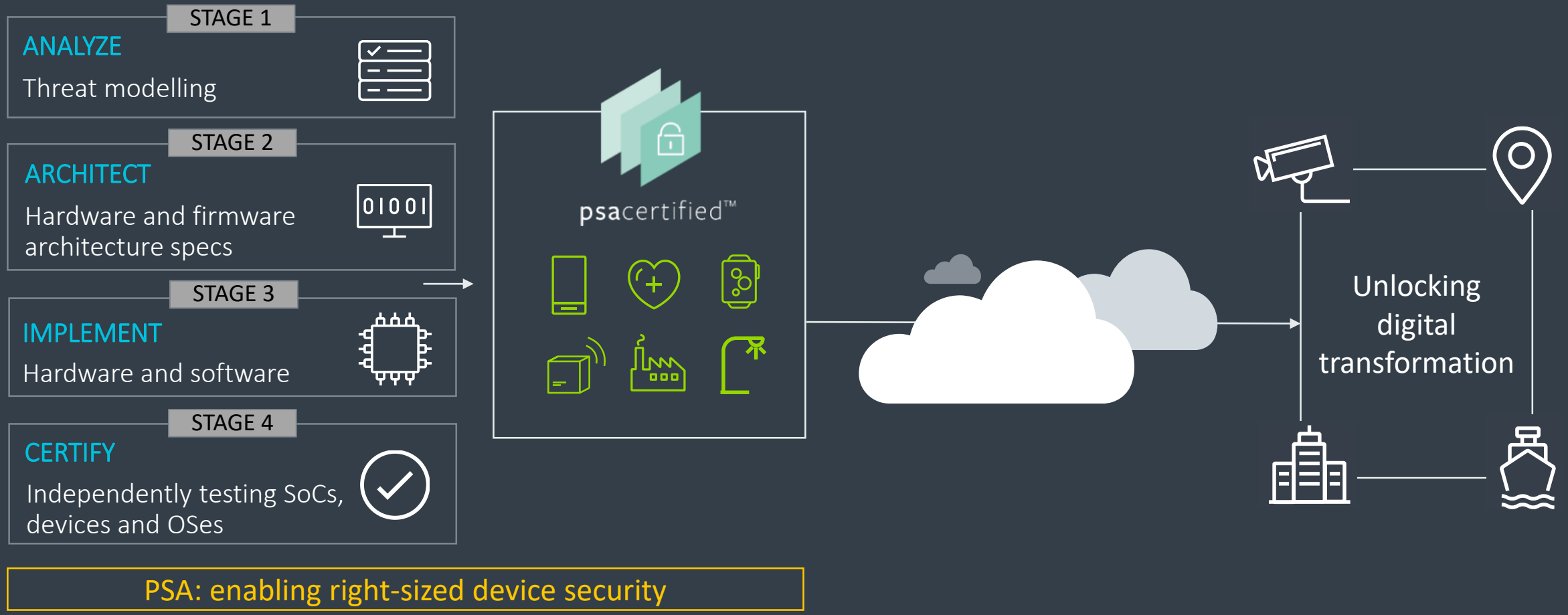
Corstone Ready Software
- TF-M and multiple RTOS support

PSA Principles

Designed with PSA Principles

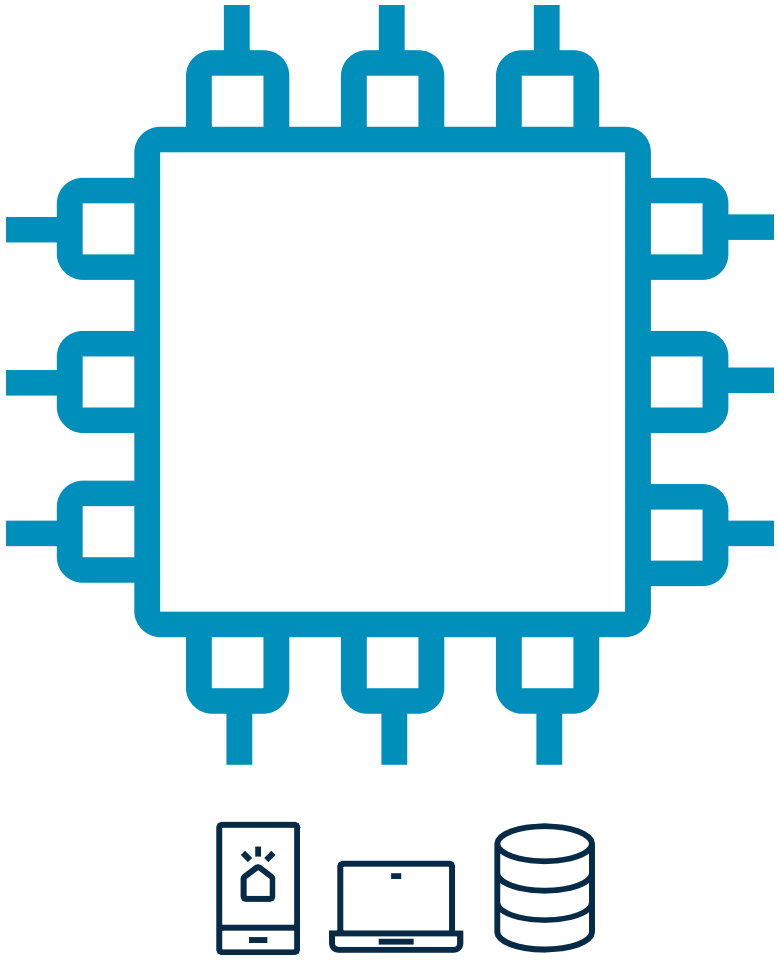
Platform Security Architecture (PSA)

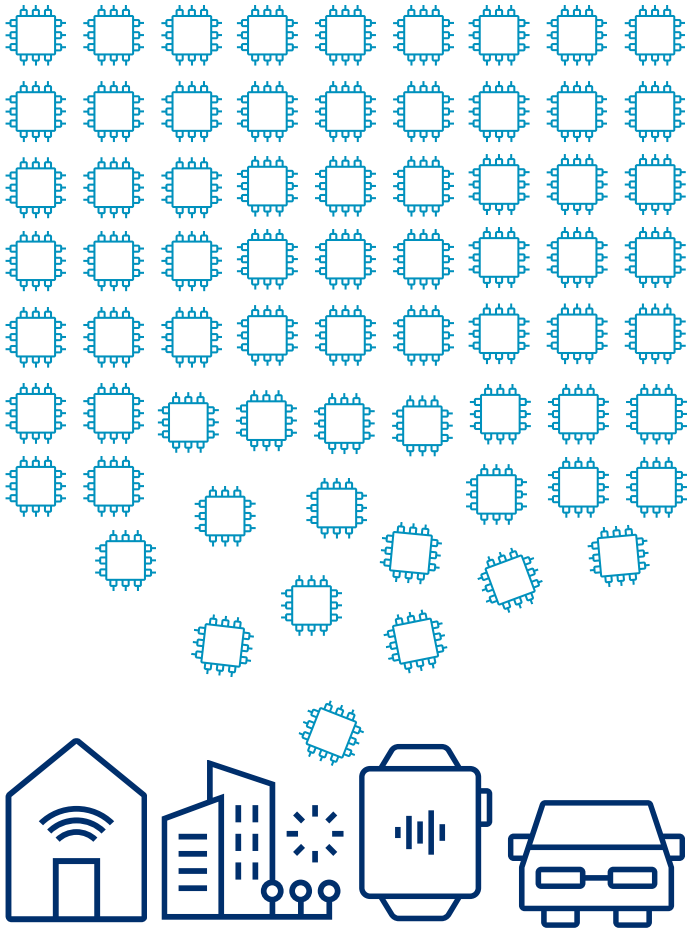
The open device security framework, with independent testing



PSA: enabling right-sized device security

Enabling Innovation: Finding the Balance





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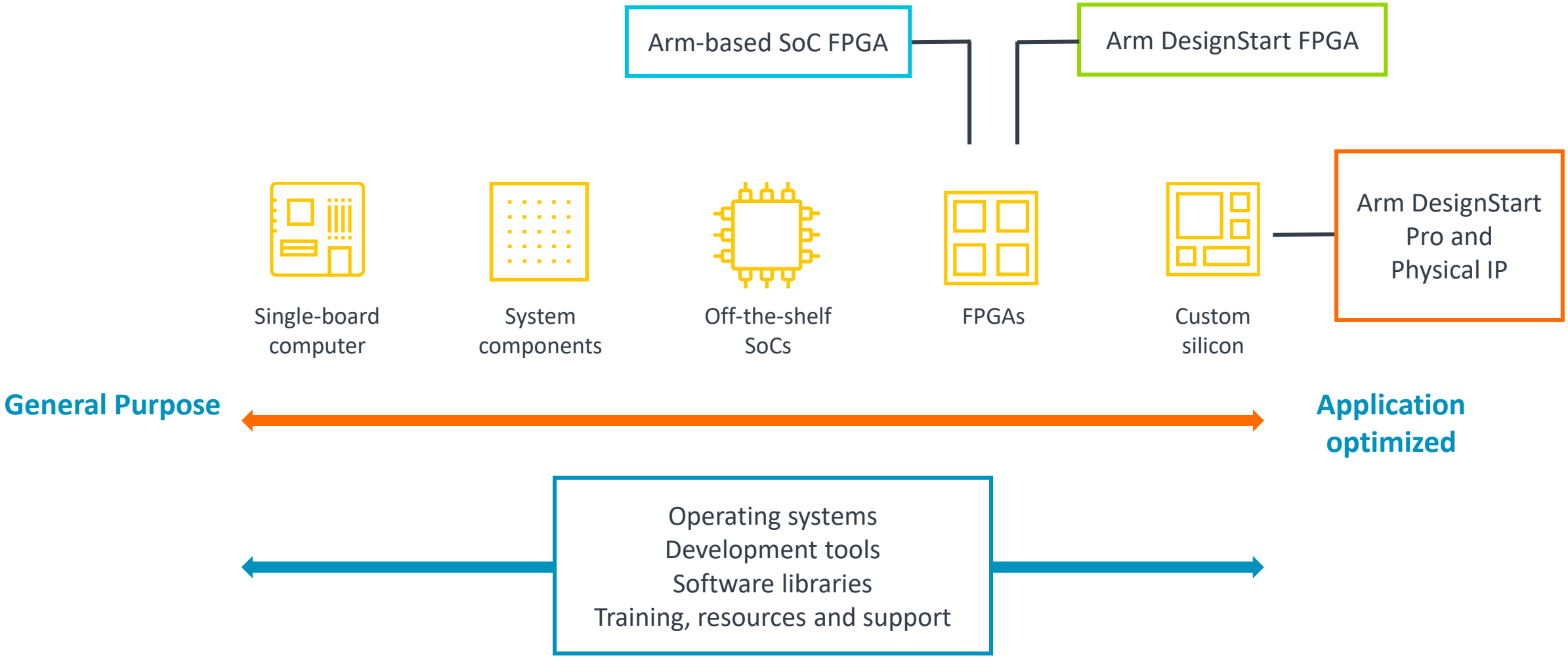
All benefiting from the same tools, software, and ecosystem



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Speed-up design with fast access to Arm IP and ecosystem

DesignStart for custom SoCs/ASICs

- ✓ Cortex-M0 and Cortex-M3 CPUs for no upfront fee
- ✓ Cortex-A5 CPU: lowest-cost route to Linux-capable design
- ✓ 1,000s of physical IP libraries

DesignStart FPGA

- ✓ Cortex-M1 and Cortex-M3 CPUs
- ✓ Soft IP integrated in FPGA partners' tool flow
- ✓ No license fee, no royalties

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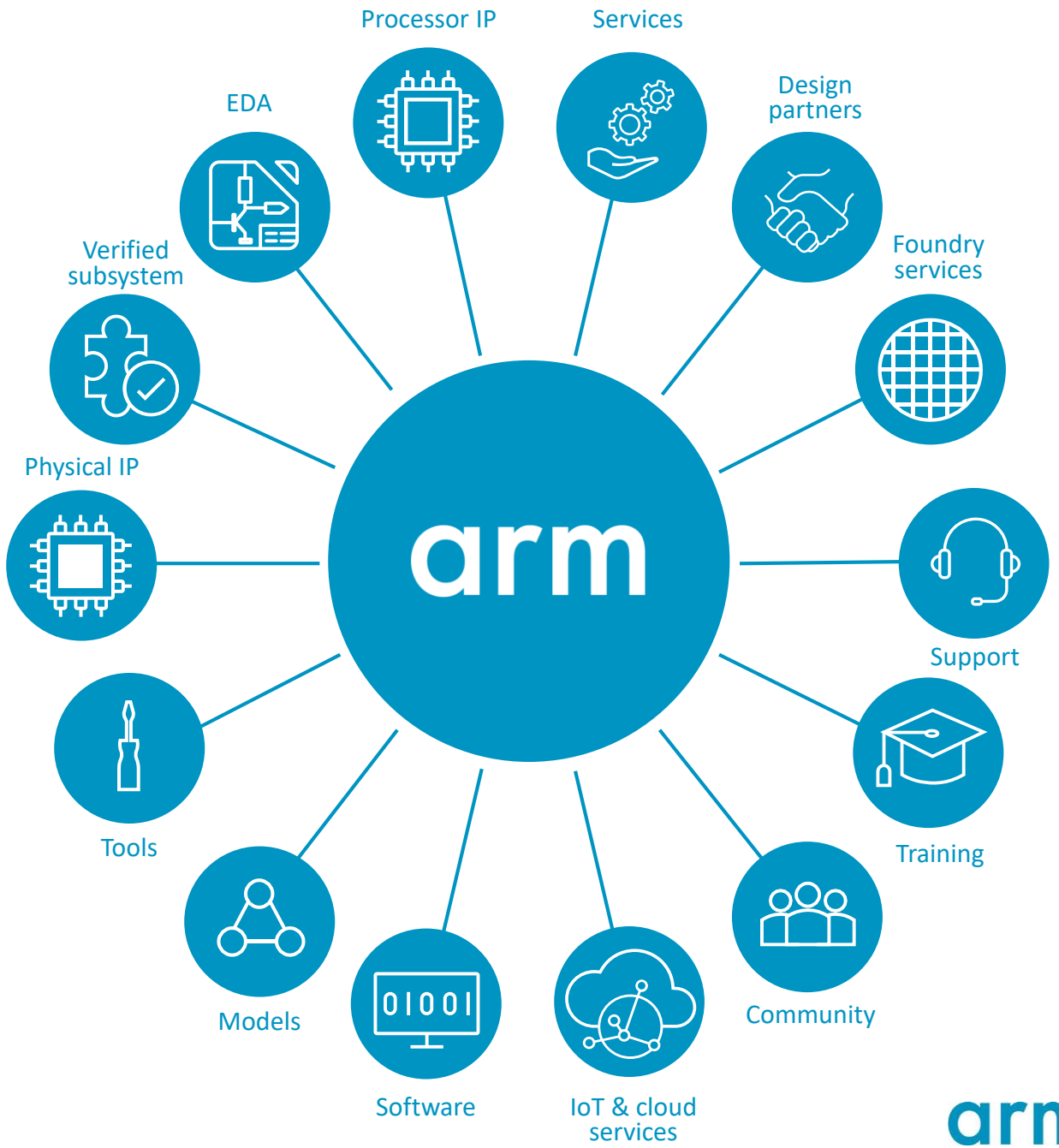
Much more than a CPU for silicon success

- Providing the lowest risk path to silicon
- Building on proven excellence in IP delivery
- Enabling innovation and reducing friction
- Evolving the business to enable the next wave of connected devices



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Summary: Arm is powering the IoT revolution

- 1000s of embedded and IoT applications will shape human life
- Arm IoT continuum – providing from off-the-shelf components to the possibility to create Custom SoCs solutions tailored to a specific application
- Build secure IoT applications with Platform Security Architecture – ground-up baked-in security

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Welcome to contact with us

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