Brought to you by Informa Tech

The intelligent wave:
How a growth in advanced and accelerated compute will drive adoption of RISC-V

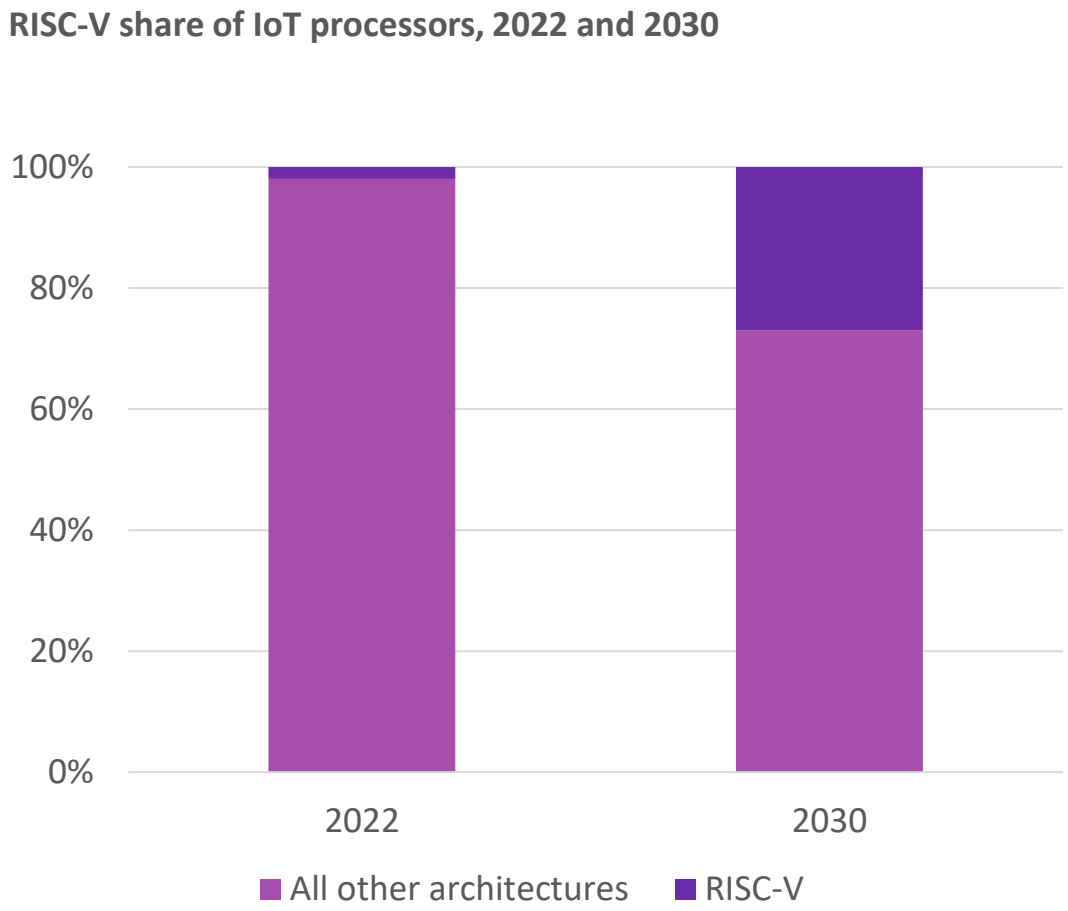
Edward Wilford
Senior Principal Analyst, IoT

RISC-V Summit EU
25|06|2024

OMDIA

What inevitability looks like

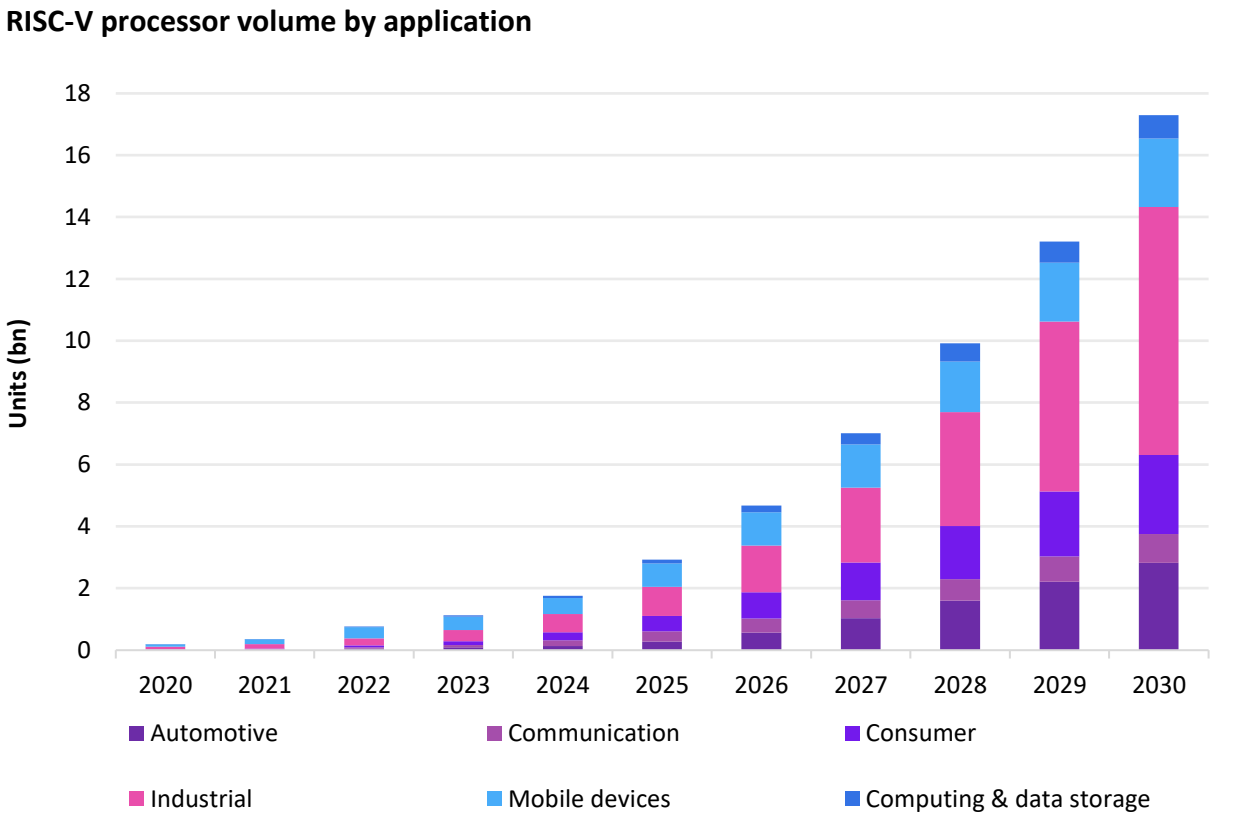
- Once largely thought of as a deeply embedded/basic microcontroller architecture (commercially)
- Omdia expects RISC-V to hold more than a quarter of IoT processors in 2030



Source: Omdia

Not just a novelty.

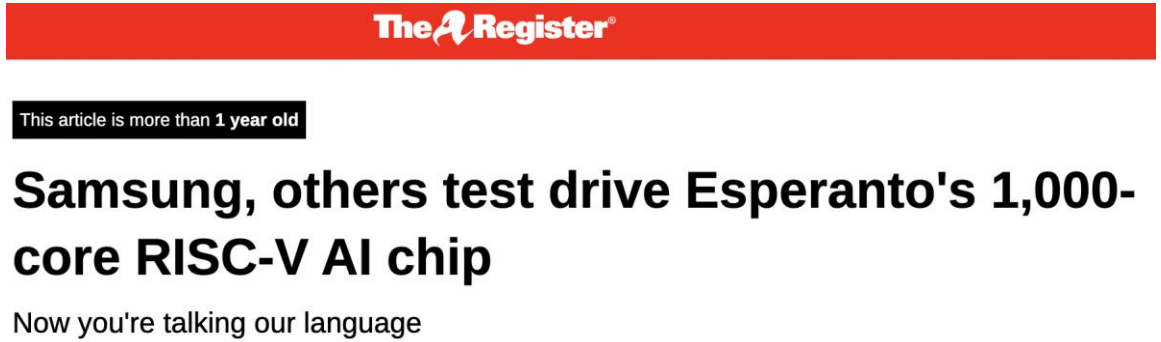
- 30% of RISC-V processors in 2024 are deployed in industrial devices
- 80% CAGR in IoT from 2020-2025



Source: Omdia

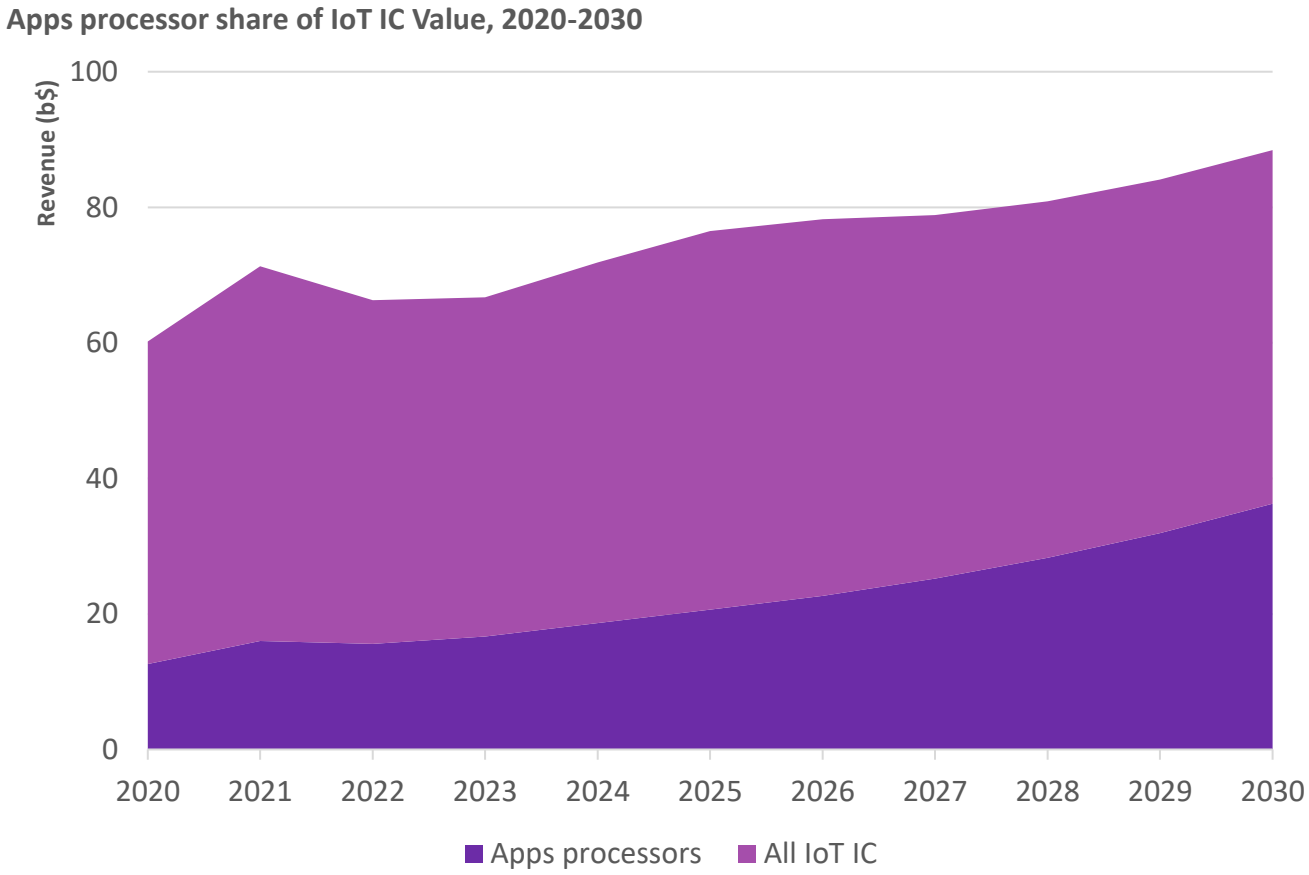
Note: why count processors?

- Difficulty in finding a useful metric
  - Can’t count main-core chips
  - Can’t count cores

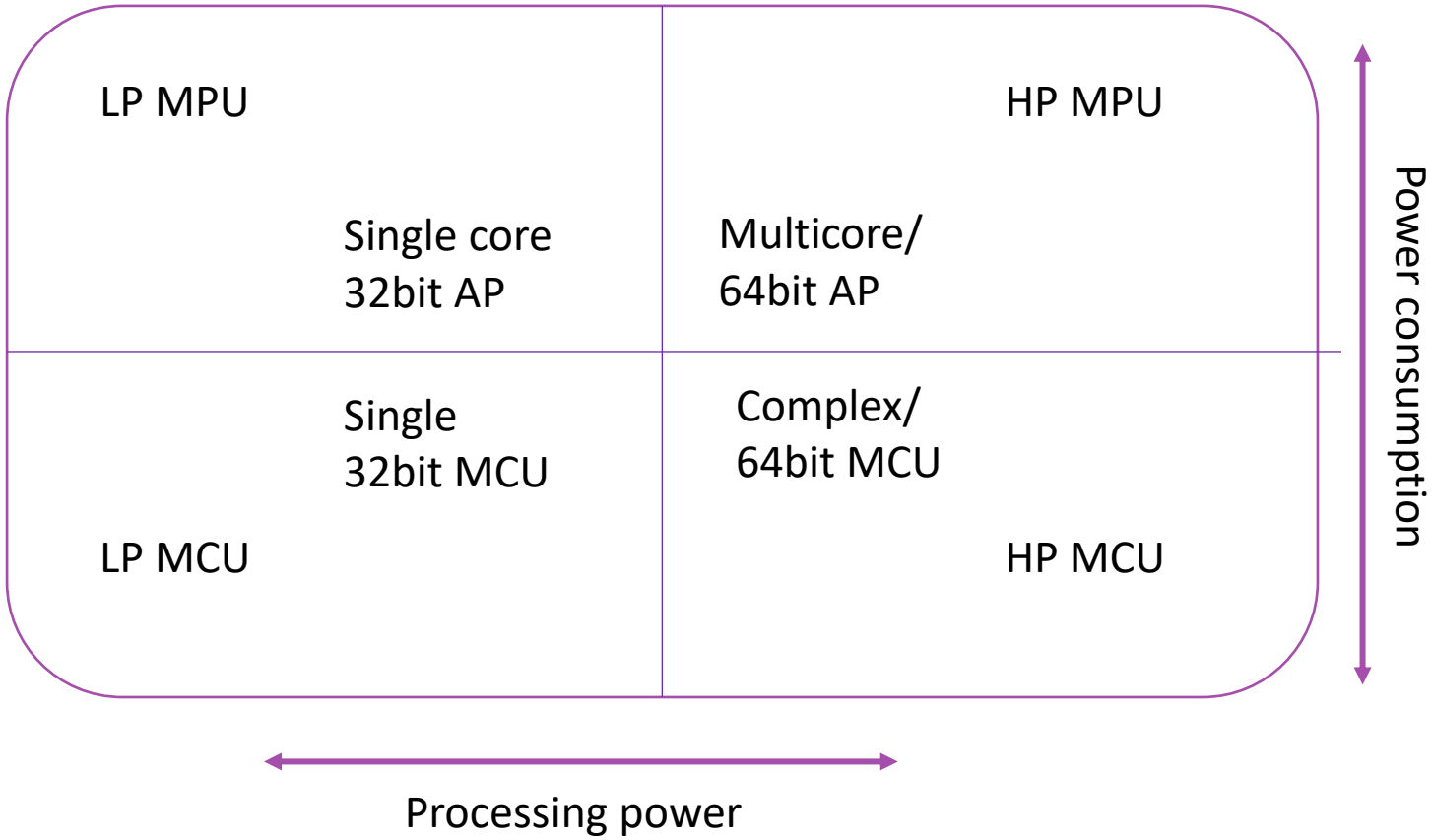


Applications processors are driving IoT value

- Apps processors made up:
- 21% of IoT IC value in 2020,
- 25% in 2023,
- …and are forecast to top 40% in 2030



Part of a general trend of increased capability



Single to quad core

Across the industry, processing power has shown remarkable increase and spread

Industrial gateway

- Uno-127 Advantech IIoT Gateway – Single-core Arm Cortex-A8 (2016)
- Uno-220 Advantech IIoT Gateway – Quad-core Arm Cortex-A72 (plus GPU) (2022)

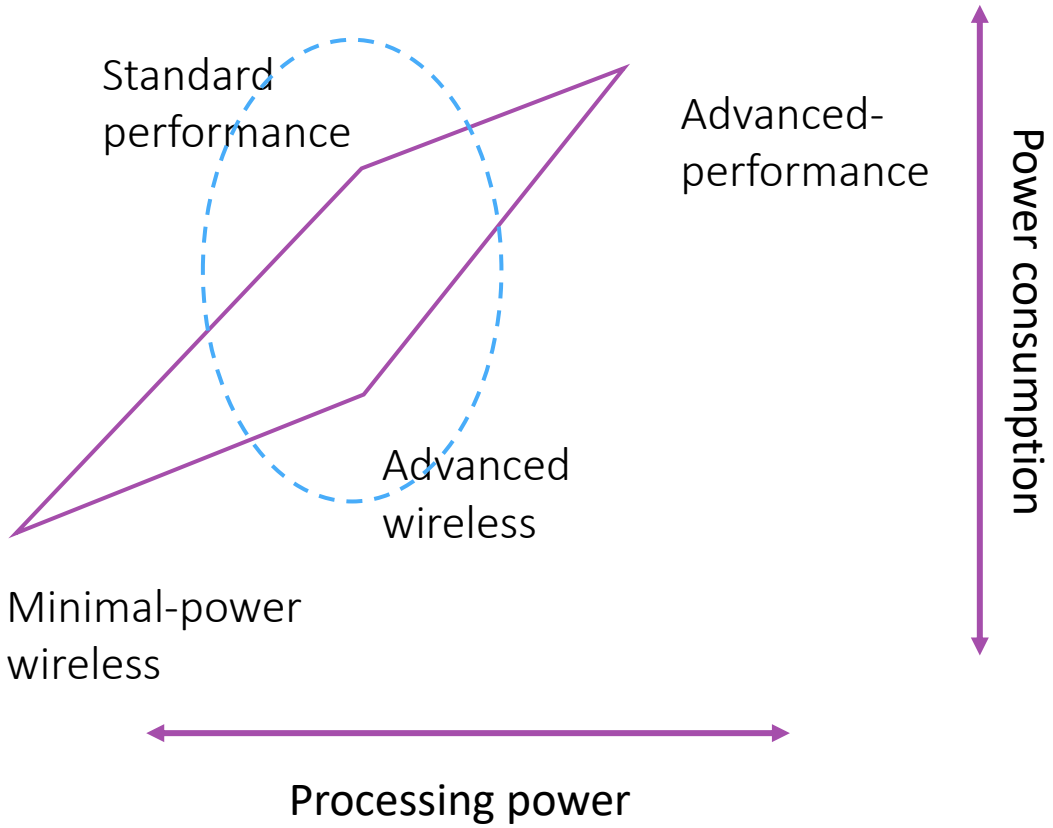
Amazon Echo

- TI Arm Cortex-A8 (2016)
- Mediatek Quad-Core Arm Cortex-A35 (plus GPU & NPU) (2022)

Google Chromecast

- Marvell Armada Arm Cortex-A9 (88DE3005) (2016)
- Amlogic S905D3G quad Arm Cortex-A55 (plus GPU) (2022)

A glimpse of the future



- Expect lower-end MPU and higher-end MCU to converge
- Differentiation based on level of compute
- What CPU do you use when the CPU isn't your top priority?

More GP = more entrenched

General Purpose MCU and MPU both are the hardest to displace

- MCU has a higher rate of GP
- MPU GP is more of a software proposition
- If a box runs a given set of software, the nature of the box is significantly less important
- ‘The box doesn’t care’

Advanced processors represent the biggest opportunity

No chip-for-chip replacement

- What RISC-V is not going to displace: STM32 MCUs, i.MX MPUs
- Where it will have a sizable impact: secondary cores, parallel processing, custom processors (Microcontroller and apps processor both)
- Novel applications will be the ladder, like AI
- AI is permeating the industry

When AI works, we call it software…

When it doesn't work, we say we need more AI

A story of amazingly good timing

The limits of gigantic AI

- Diminishing returns on throwing power and parameters on the pyre
- Omdia's Enterprise AI survey shows that half of large organizations have a dedicated GenAI budget for 2024…
- …but there is increasing worry about confabulation, limited improvements, and required supervision

A story of amazingly good timing

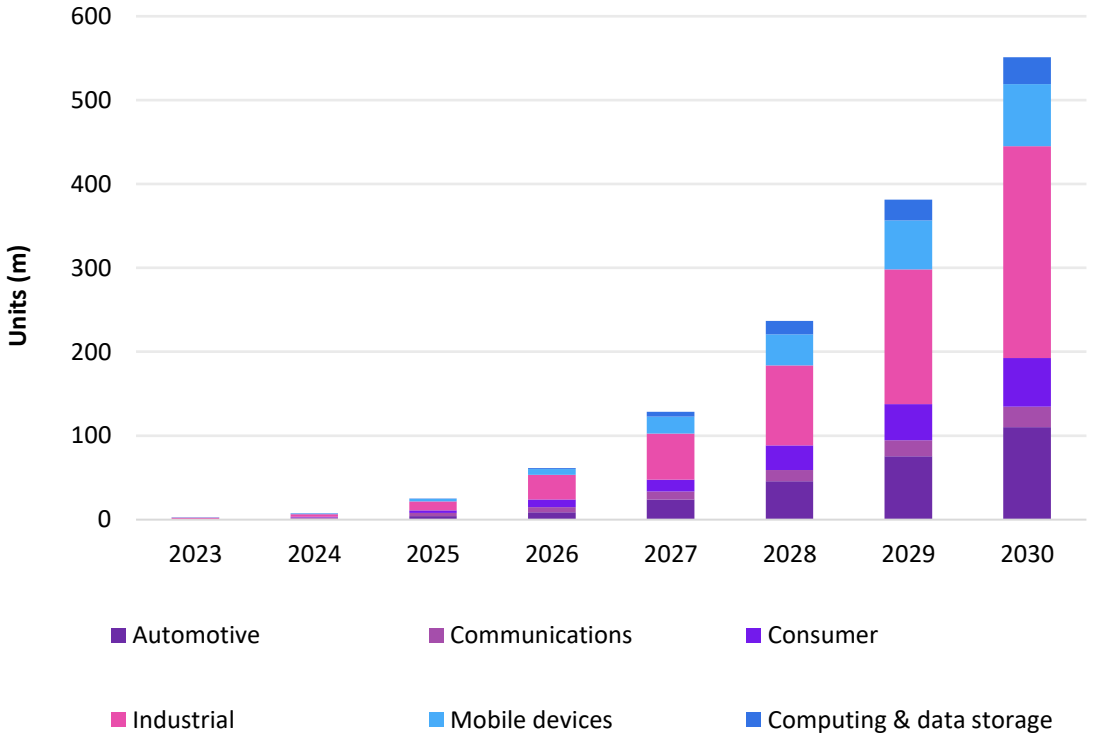
Embedded/Edge AI solves problems

- By contrast, there is opportunity in AI that solves specific problems
- AI without the ATP
- AI that happens closer to the data edge, and allows for closed models, comparatively clean data, and minimal transmission.

RISC-V and applied AI will lift each other

- Accelerate for a purpose
- Edge AI needs flexible, scalable processors
- Customisation cuts power needs—crucial for end users paying their own bills

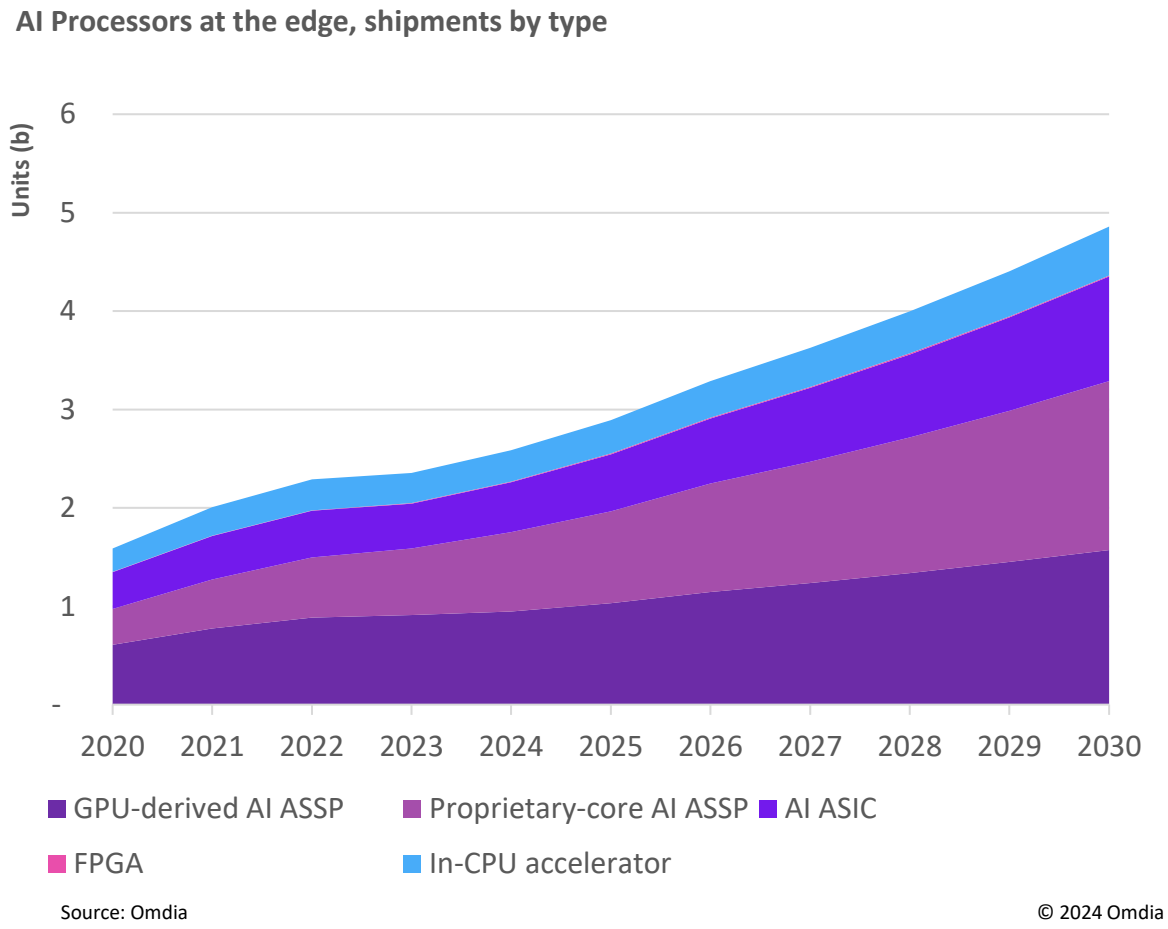
RISC-V processors in AI applications



Source: Omdia

This time for sure

- Overall trend towards AI ASICs and ASSPs, away from GPUs
- RISC-V processors are predicted to make up about 10% of these edge processors in 2030
- However, if you exclude GPUs, the total is closer to 15%
- **The tail behind these processors is also hugely significant**



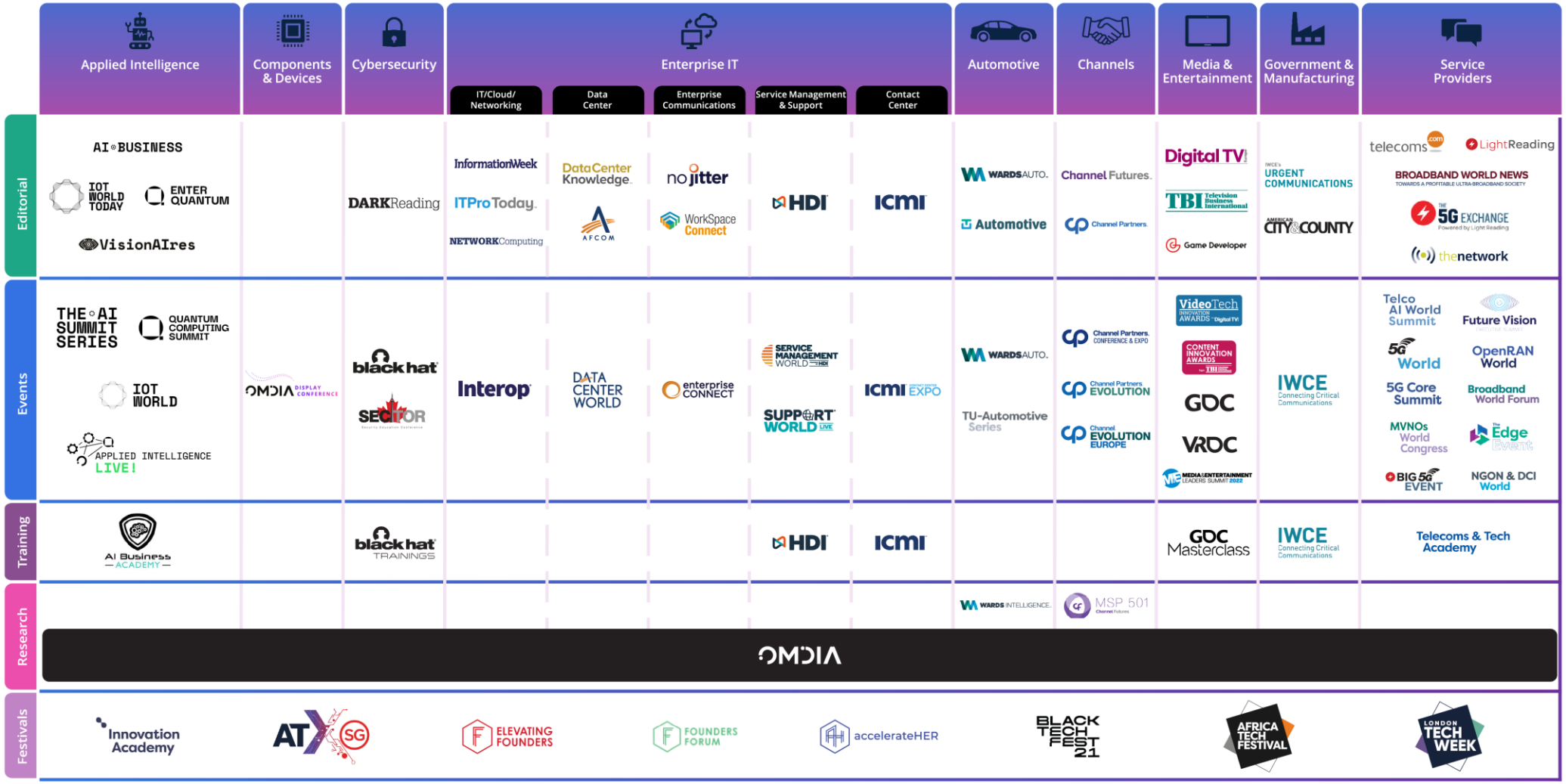
Source: Omdia

In conclusion

- RISC-V and advanced edge processing (both applications and acceleration) are growing together
- The more compute, the more supplemental IP.
- Each shift is an opportunity
- AI represents the largest and most influential shift in the embedded space
- AI that is going to *do* things (other than generate heat and headlines) is going to be Embedded AI

Source: Omdia

Informa Tech provides market-leading B2B intelligence, industry forums and marketing services to the technology community. Our goal is to inspire the leaders, the pioneers and the innovators to design, build and run a better digital world.



OMDIA

Thank You!

06/25/24

Edward.Wilford@informa.com

@edward-wilford-omdia

@OmdiaHQ