A Safe Software Convergence:

How Automotive and Industrial Designs are Eliminating Boundaries and Creating Opportunities

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Automotive as a sandbox

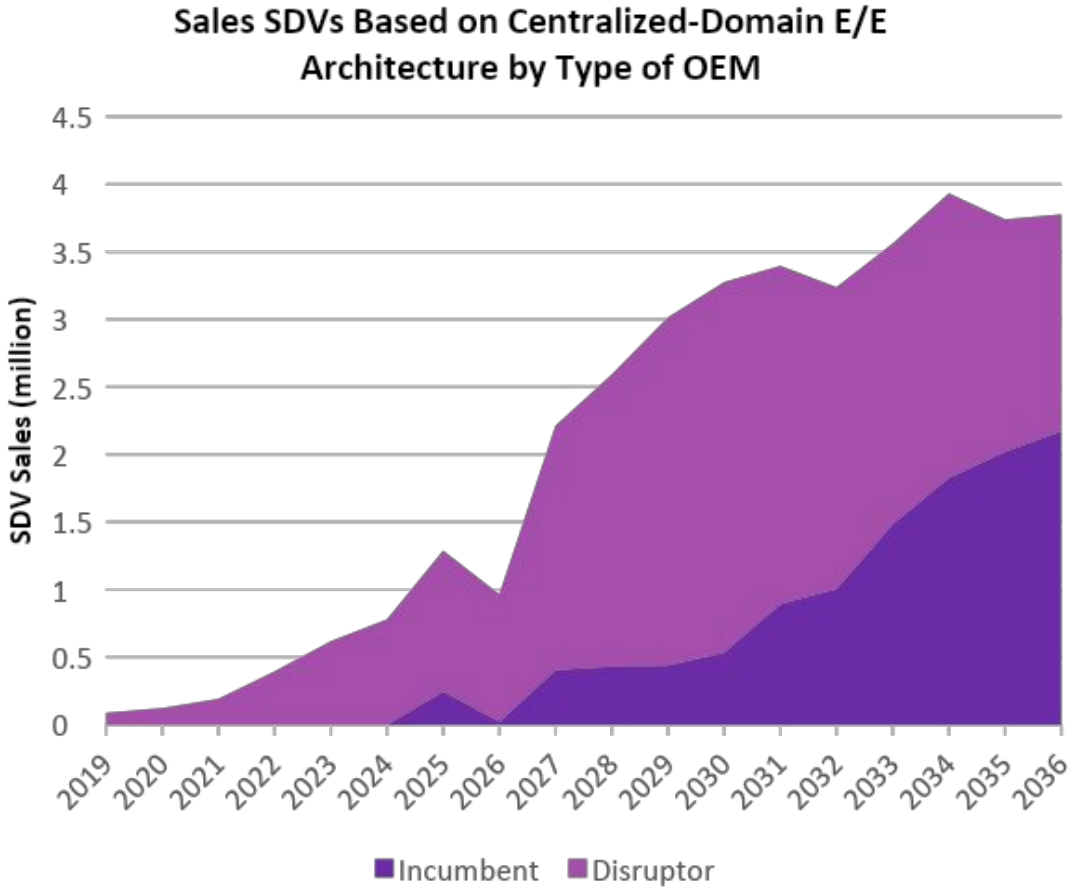
For decades, automotive has been seen as a separate ecosystem

- Long development cycles
- Unique requirements (including safety)
- Complex tier system
- Extremely resistant to change
- Closest analogue is industrial

- **Automotive Semiconductors**
  - ISO 26262 safety compliance
  - Temperature range: -40°C to 125°C
  - 10-15 year product lifecycles
- **Industrial Semiconductors**
  - Focus on rugged reliability
  - Diverse application support
  - Shorter development cycles

The SDV revolution

- **Explosive Market Growth**
  - Omdia expects OEM software and digital investments to triple by 2035
- **Industry Transformation**
  - 75% of industry leaders expect software-defined experiences to be core to automotive brand value by 2035
  - Shift from traditional hardware-dependent models to flexible software platforms
  - Growing emphasis on predictive maintenance and AI-powered diagnostics



The SDV revolution, in practical terms

Between 30-150 ECUs in distributed architecture

Modern consolidated E/E architectures, such as centralized domain and zonal architectures, offer several key benefits:						
Integration of high-performance computing within consolidated ECUs.	Decoupling of hardware and software for greater flexibility and scalability.	Use of advanced technologies, such as Ethernet, for fast communication between ECUs and vehicle sensors.	Seamless connection of vehicle systems and sensors to the cloud, enabling frequent and reliable over-the-air (OTA) updates.	Sophisticated, interconnected vehicle features that use cross-domain and cloud data.	Reduction in the number of physical components, such as cable harnesses, which decreases vehicle weight—a critical factor for improving the range of electric vehicles.	Simplification of physical architecture results in easier manufacturing processes, enhanced update capabilities, and potentially lower overall costs.

Architectures in common

The spread of software-defined architectures

- **Traditional Approach**
  - Fixed function hardware, Limited updates, Separate development
- **Modern Architecture**
  - Programmable SoCs, Containerized apps, Unified frameworks
- **Real-time Processing**
  - Sub-ms response times, Deterministic behavior
- **Safety Standards**
  - ISO 26262 (Automotive)
  - IEC 61508 (Industrial)

Shared drivers, shared solutions

- Separate design cycles no longer make sense.
  - If it’s fast, safe, and secure enough for automotive…
  - Lower barriers to entry for automotive, more resemblance to ‘traditional’ compute
    - *Tangent—is compute of all types converging?*
  - Solves (some) supply chain issues, volume issues, potentially opens up software ecosystem
  - Adds flexibility to industrial automation

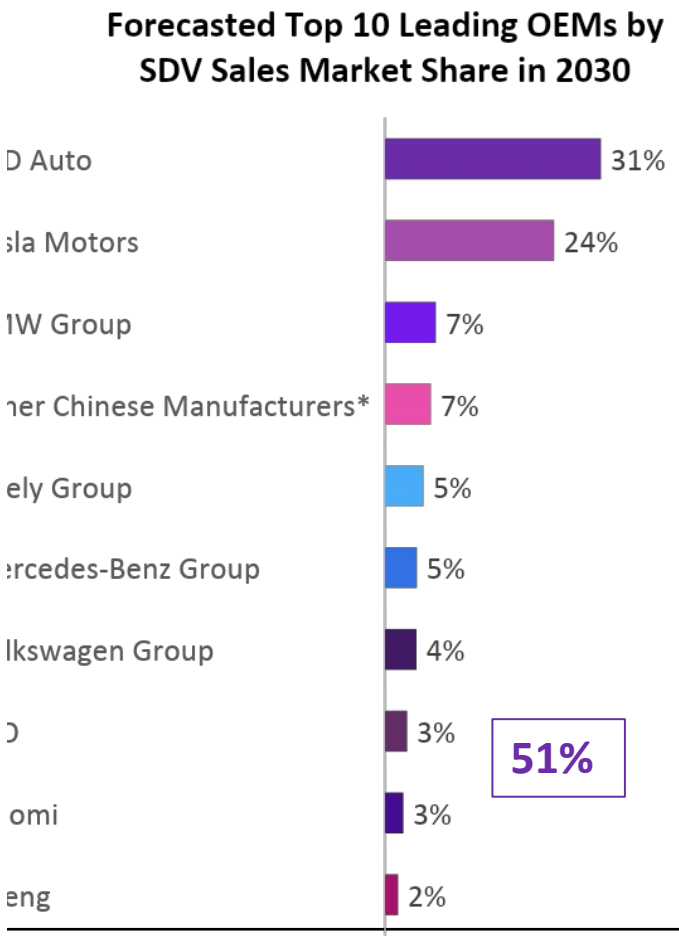
RISC-V will be found where there is agile compute

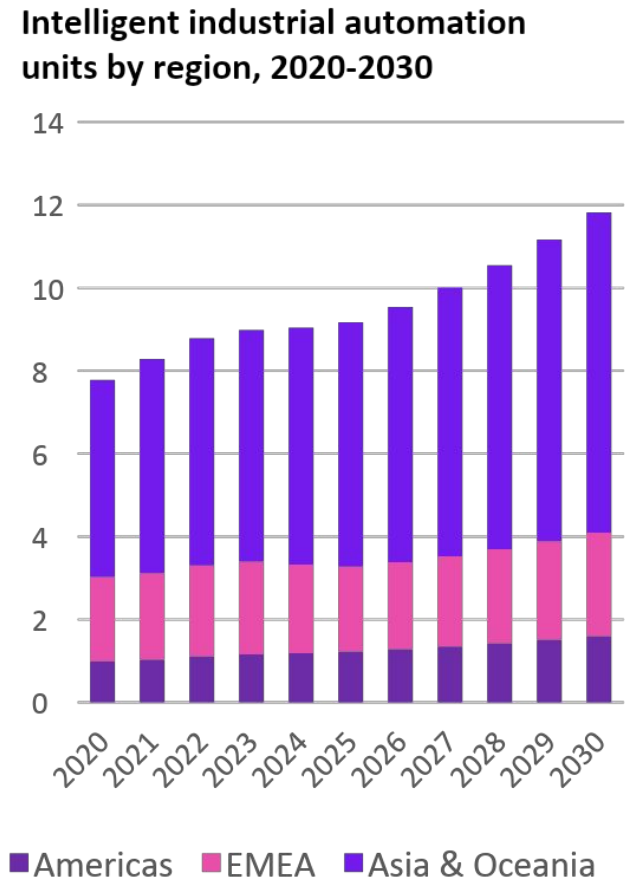
RISC-V is strongest in the most significant areas of both intelligent automotive and industrial

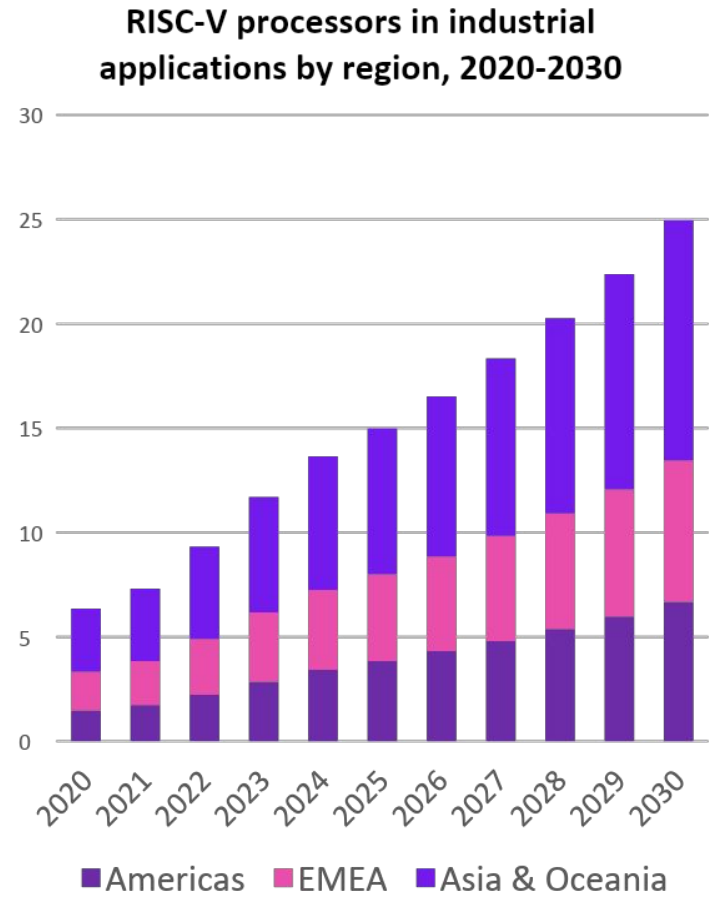
- Safe, secure, scalable
- Development time
- Independence
- Right-sizing intelligence

Opportunities in regional development cycles

China predicted to be the locus of SDV, RISC-V, industrial automation…

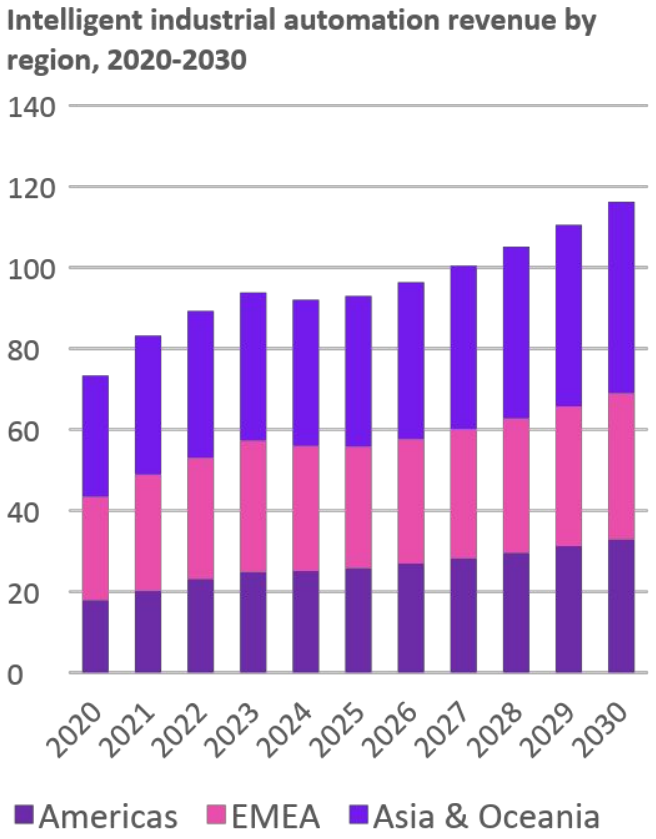


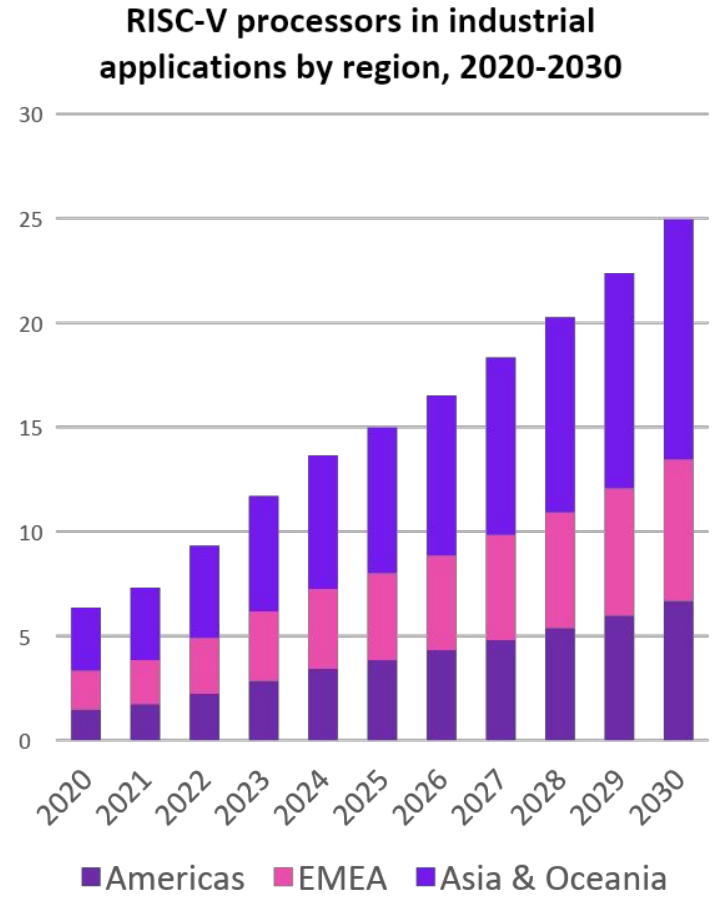




Opportunities in regional development cycles (a second look)

…but the biggest opportunity may be in Europe





Thank You!

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