Andes Technology Corp. Investor Conference Report

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Spokesperson

Mar. 04, 2024

Safe Harbor Notice

Except for the historical information contained herein, the matters addressed in this presentation are forward-looking statements that involve certain risks and uncertainties that could cause actual results to differ materially, including but not limited to weather, impact of competitive products and pricing, industry-wide shifts in the supply and demand for semiconductor products, rapid technology change, semiconductor industry cycle, and general economic conditions.

Except as required by law, Andes undertake no obligation to update any forward-looking statement, whether as a result of new information, future events or otherwise.

Report Topics

- Andes Company Introduction
- The Financial & Operation Status
- The Key Applications & The Trend
- The R&D Power for The Future

Andes Company Introduction

Andes Highlights

- Founded in March 2005 in Hsinchu Science Park, Taiwan, ROC.
- Well-established high technology IPO company
- Over 500 people; 80% are engineers.
- TSMC OIP Award "Partner of the Year" for New IP (2015)
- Founding Premier membership in the RISC-V International Association (RISC-V Foundation) (2020)
- AI Global Media Award "Most Outstanding Embedded Processor IP Supplier" (2020)
- EE Awards - "Taiwan-Product Award" & "Asia-Company Award" (2021)
- Top 500 High-Growth Companies Asia-Pacific (2023)

Andes Mission

- Innovate performance-efficient processor solution for low-power SoC

Emerging Opportunities

- Smart and Green electronic devices
- Cloud Computing and Internet of Things and Machine Learning

Andes Technology Corporation

Quick Facts on Andes

19 Years
Pureplay CPU vendor

500+
Employee , > 80% R&D

400+ Customers
Licensing AndesCore™

14Bn+ SoC
Total Customer Shipment

2023 Operation Result

Revenue $ Growth
1.04 Bn, NT$
13.5% YoY

License $ Growth
18.3% YoY

Royalty $ Growth
-1.2% YoY

SoC Shipping Q'ty
2.1Bn

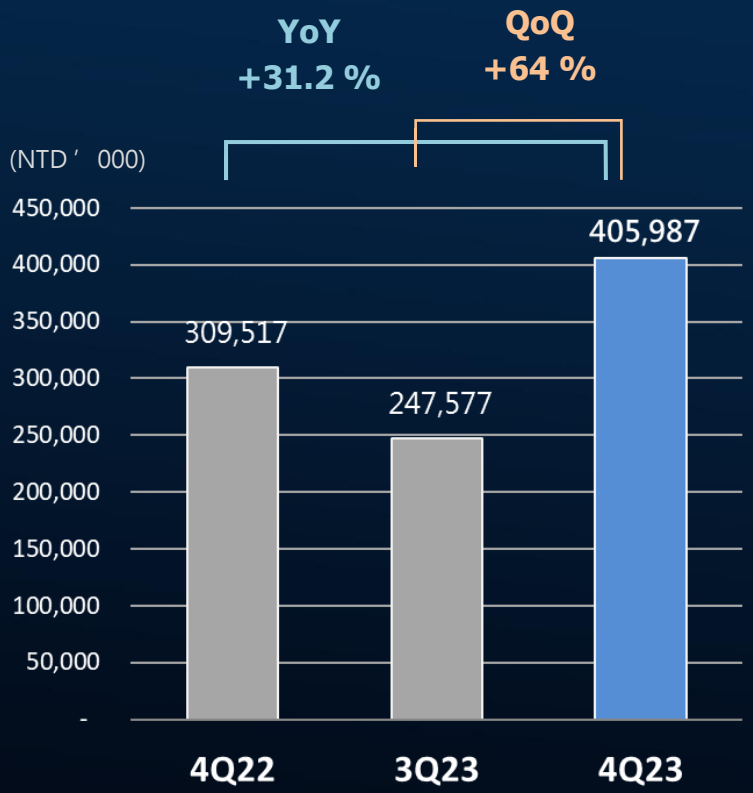
Andes and RISC-V International (RVI)

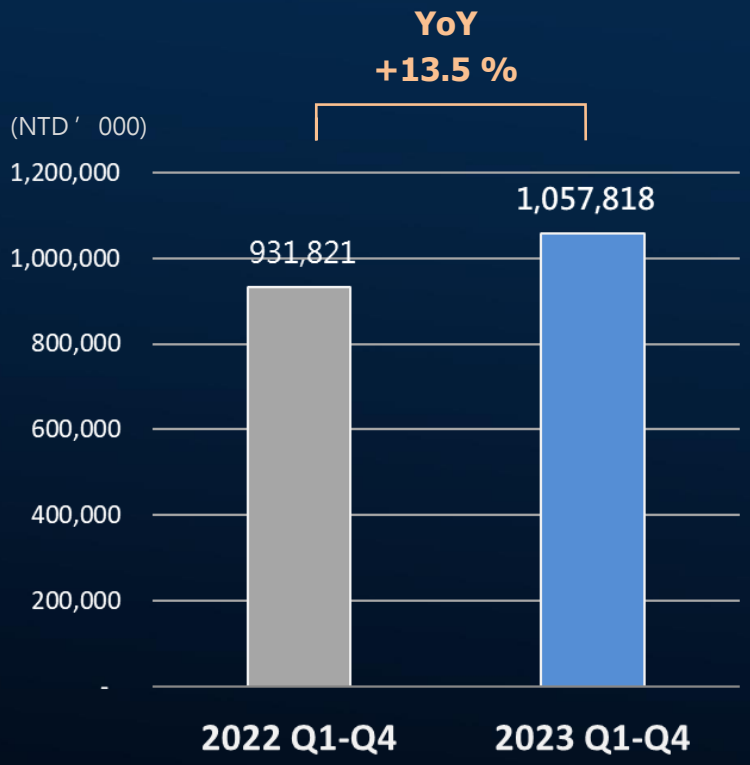
Founding & Premier Member from 2016

- Board of Directors
- Technical Steering Committee
- Chairs/Co-Chairs of Task Groups
- Ambassador

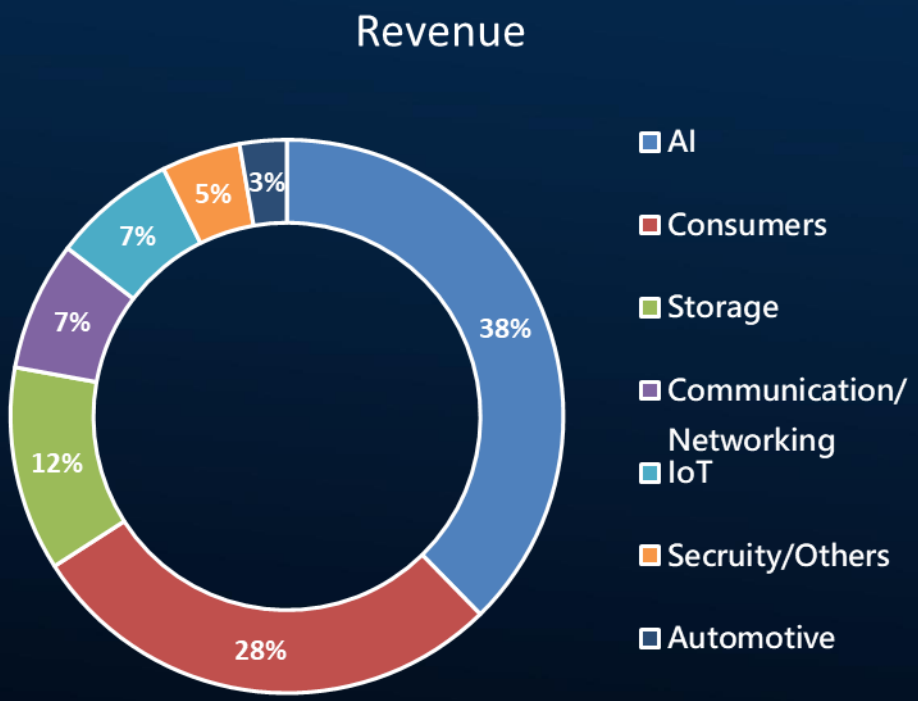
The Financial & Operation Status

4Q23 Revenue Analysis

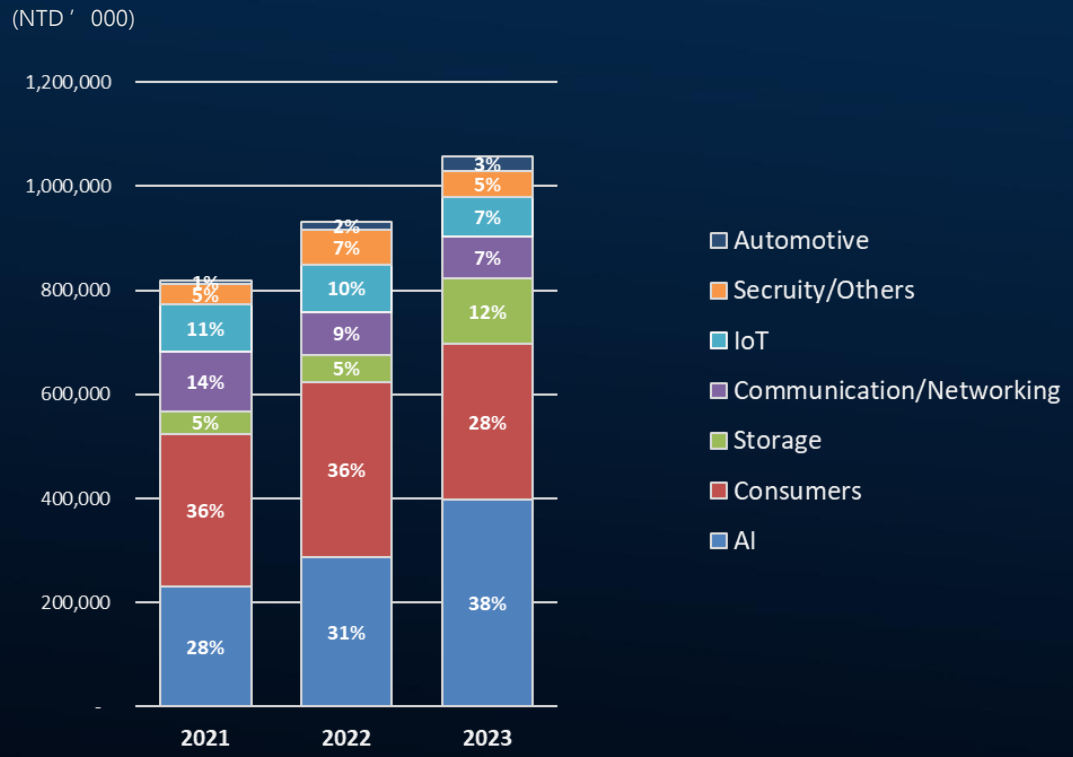




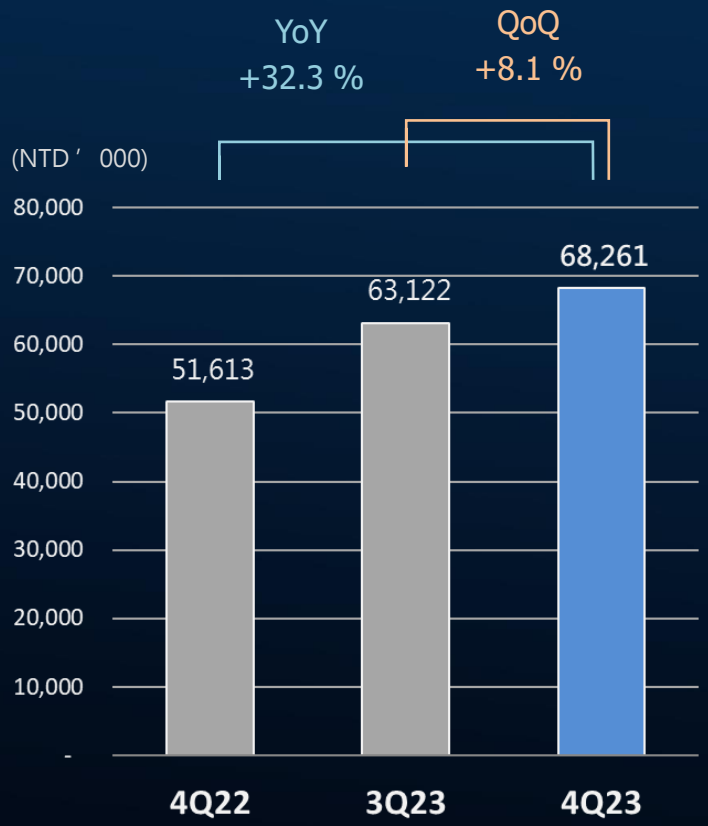
2023 Q1-Q4 Revenue Analysis by Application

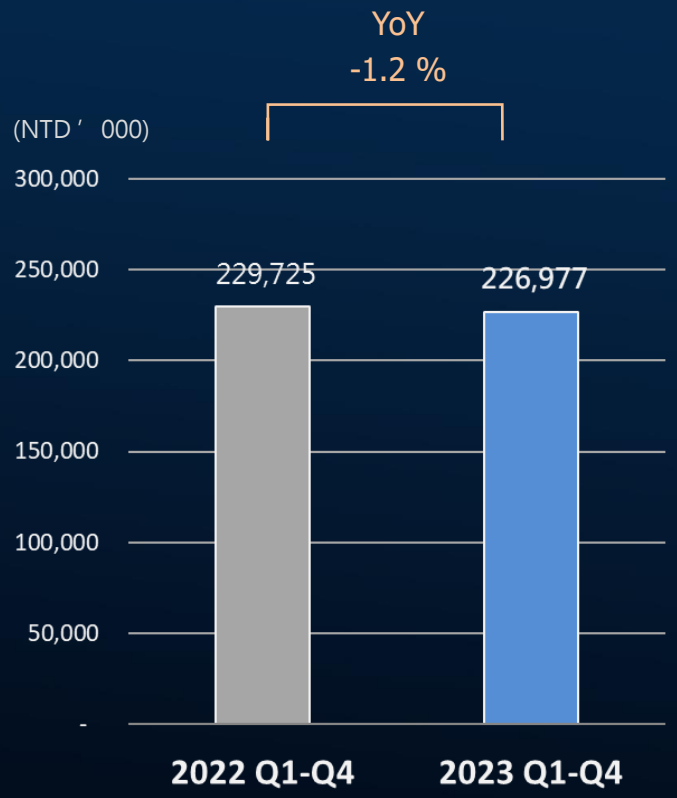


2021 to 2023 Revenue Analysis by Application

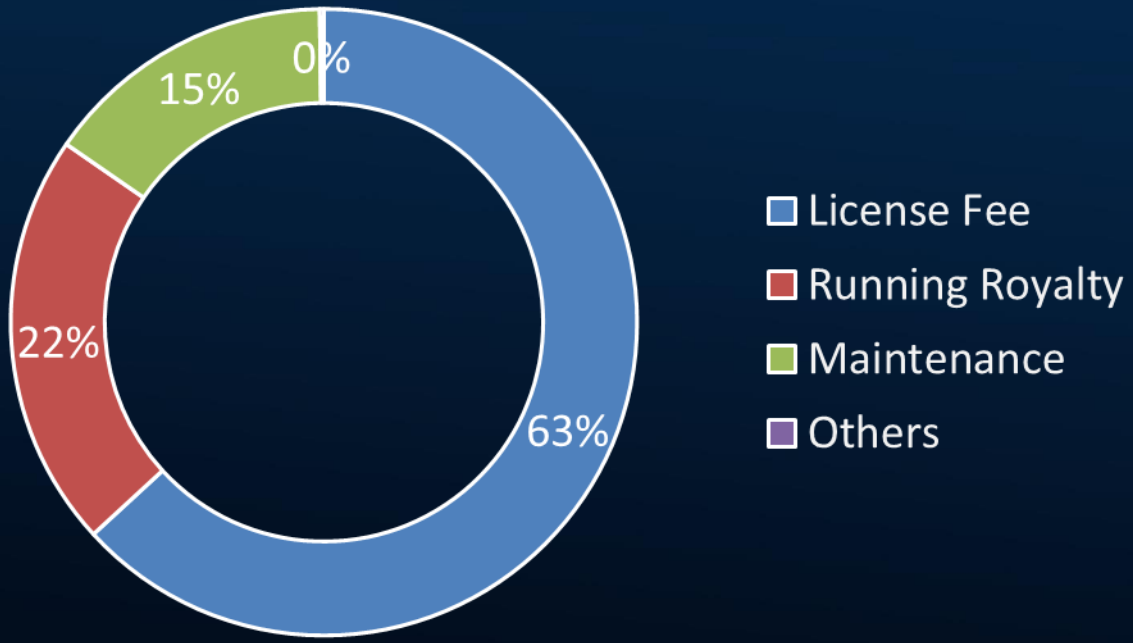


4Q23 Royalty Analysis

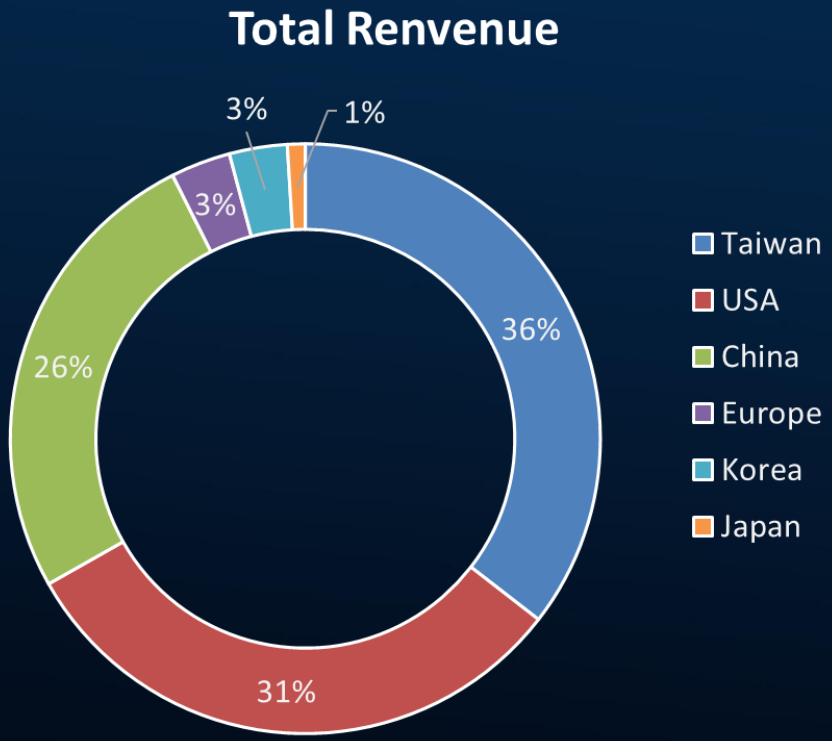




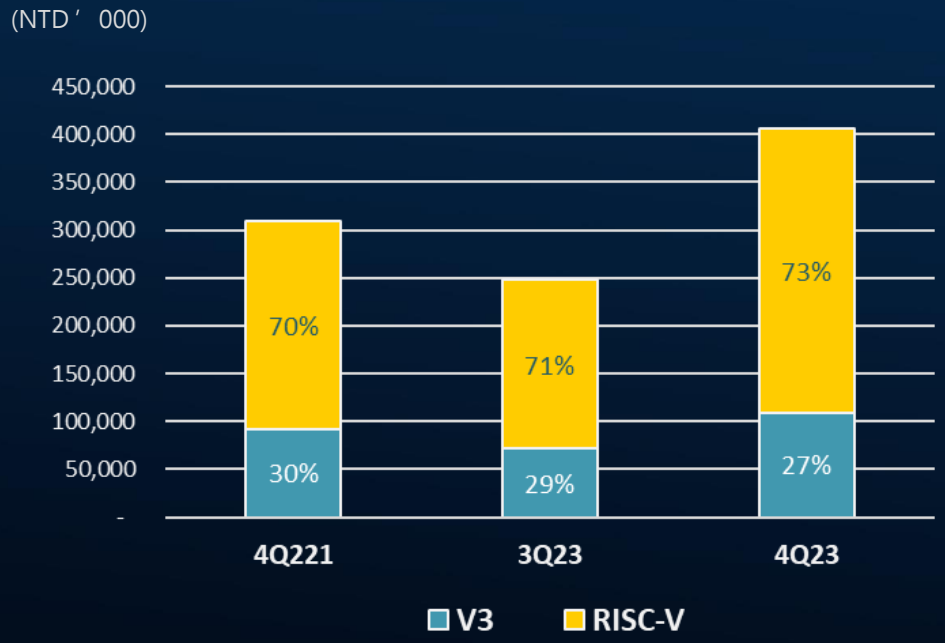
2023 Q1-Q4 Revenue Analysis by Business Model



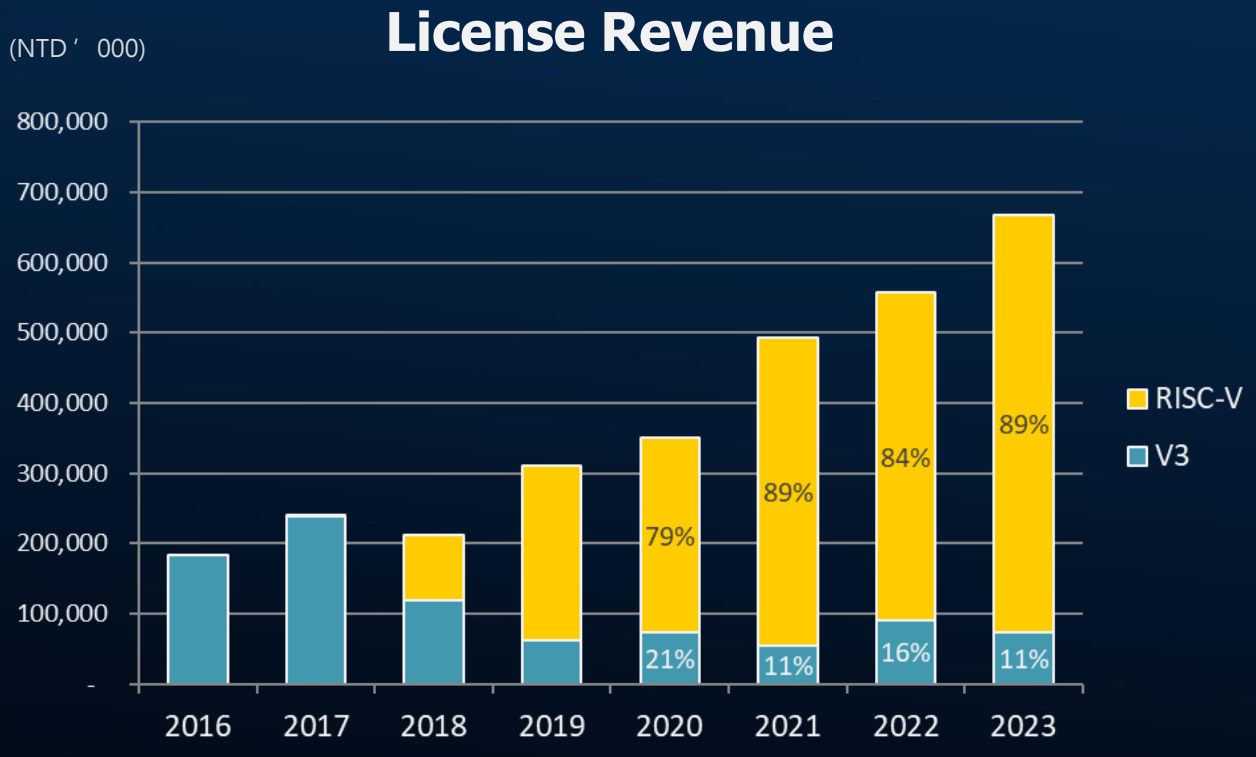
2023 Q1-Q4 Revenue Analysis by Region



4Q23 Revenue Analysis - RISC-V

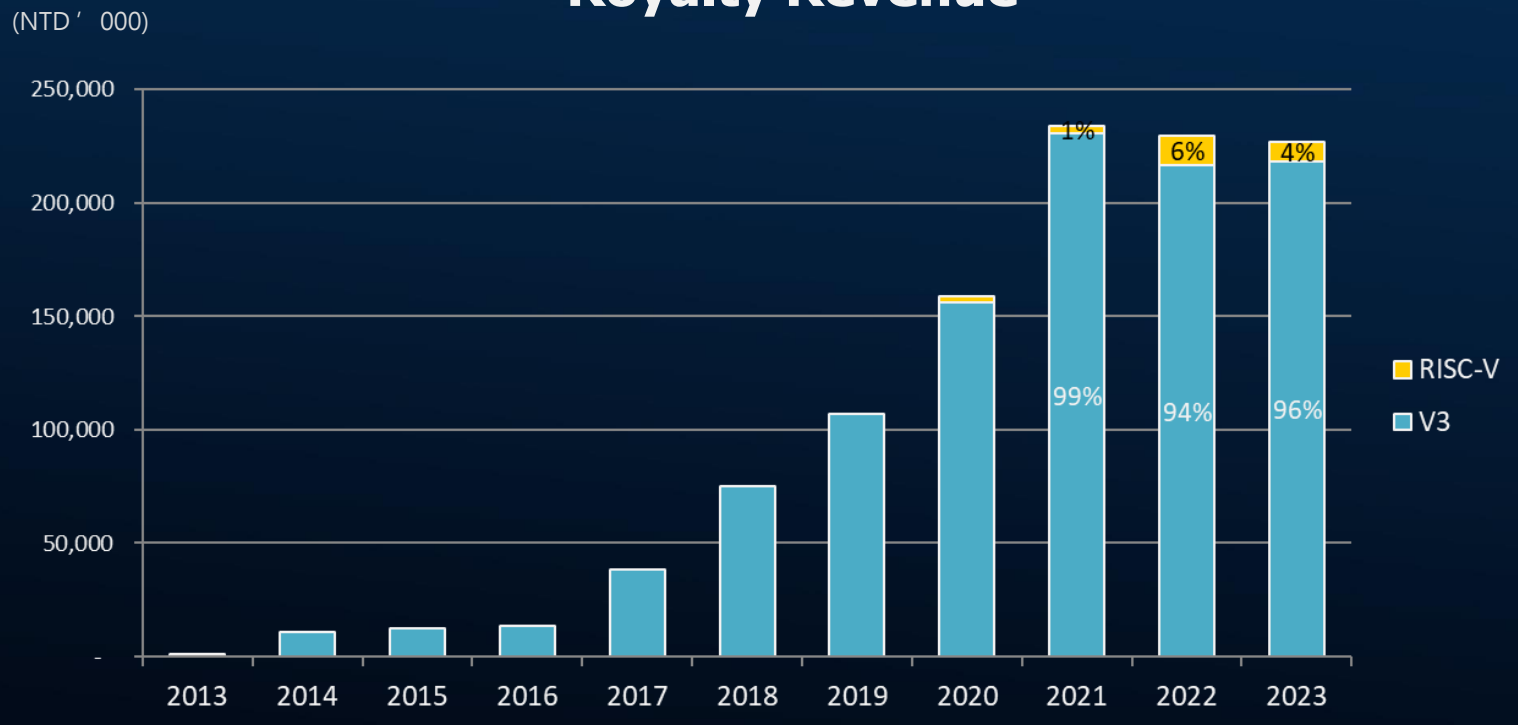


Historical License Revenue Analysis



Historical Royalty Revenue Analysis

Royalty Revenue



The Key Applications & The Trend

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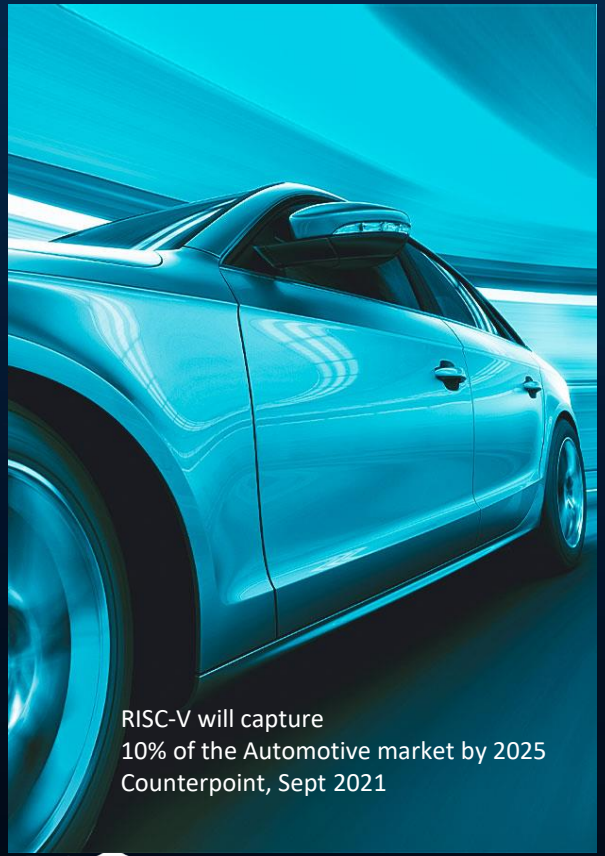
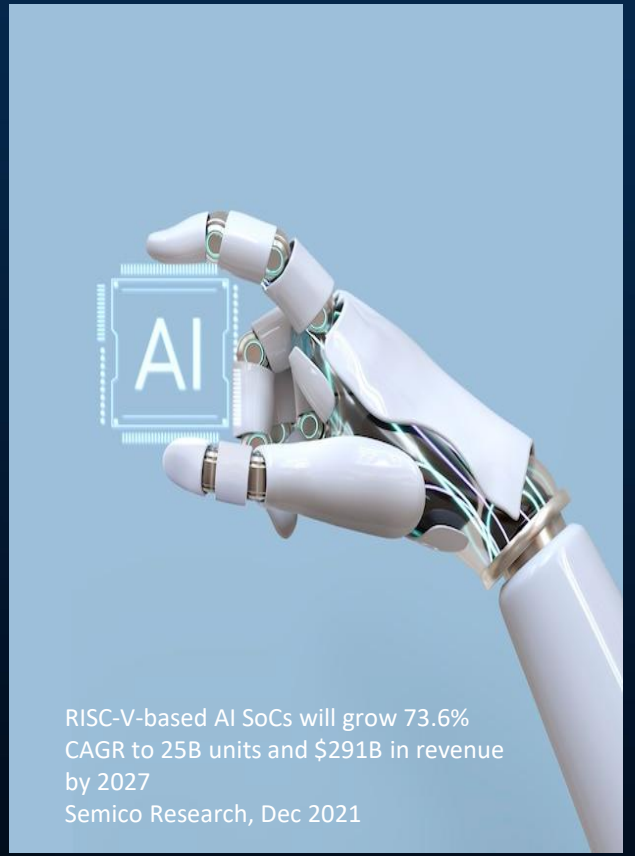


RISC-V will capture
10% of the Automotive market by 2025
Counterpoint, Sept 2021

RISC-V will command 28% of the
IoT market by 2025
Counterpoint, Sept 2021



RISC-V-based AI SoCs will grow 73.6%
CAGR to 25B units and $291B in revenue
by 2027
Semico Research, Dec 2021

RISC-V growth momentum Led by Industrial Leader

BOSCH Infineon NXP NORDIC SEMICONDUCTOR
Leading Semiconductor Industry Players Join Forces to Accelerate RISC-V
Aug. 2023

RENESAS
Renesas Extends Leading RISC-V Embedded Processing Portfolio with New Motor Control ASSP Solution
Sep. 2022

mobileye An Intel Company
Intel Mobileye EyeQ Ultra RISC-V processor targets Level 4 autonomous driving
Jan. 2022

epi European Processor Initiative
European processor project shows shift to RISC-V
Dec. 2021

NSI-TEXE
NSITEXE achieves world's first RISC-V processor with vector extension certified for ISO 26262 ASIL D ready product
Aug. 2021

Rambus
RISC-V crypto core is qualified to ASIL-D for automotive designs
Jan. 2020

Kneron
Kneron Unveils Its First RISC-V SoC Built for Autonomous, Assisted Driving
Nov. 2021

ILITEK
I Love Innovation
Andes and IAR Together Enable Leading Vendor ILITEK to Accelerate the Development of its ISO 26262 Ready TDDI SoC ILI6600A
Feb. 2023

iar
Andes and IAR Systems enable leading automotive-focused IC design companies to accelerate time to market
Mar. 2022

Green Hills SOFTWARE
Andes Technology and Green Hills Software Team Up to Deliver Advanced Automotive Safety Platform for RISC-V
Aug. 2022

imperas
NSITEXE Selects ImperasDV for Automotive Quality RISC-V Processor Functional Design Verification
May 2022

Virtual Open Systems
VOSySmonitoRV, a Secure Monitor Layer for RISC-V Architecture Mixed-Critical Systems

PARASOFT
Andes Technology and Parasoft Collaborate to Provide Seamless Software Testing Tools for Automotive Functional Safety Applications
Dec. 2022

LDRA
Andes Technology Collaborates with LDRA to Deliver Integrated Tool Suite for Safety-Critical Software on Andes RISC-V CPU Solutions
Jan. 2023

Solid Sands
Upgrade to Solid Sands' latest SuperTest version supports Andes to its ambitions for further growth in the automotive sector
May 2023

Andes is Supporting RISC-V for Automobiles

Since founded in March 2005,
Andes Technology is working step-by-step on
RISC-V for ISO 26262 Functional Safety

2016

Andes Joined RISC-V Foundation as one of the Founding Members

- Promoted as Founding Premier Member of RISC-V International in **2019**

2017

The First RISC-V Architecture AndesCore™ NX25 and N25 Released

- 25-Series became one of world's most licensed RISC-V CPUs

2020

Andes Development Process Certified for ISO 26262

- Andes became the first ISO 26262 certified RISC-V CPU IP supplier in the world

2022

AndesCore™ N25F-SE Certified for ISO 26262

- N25F-SE became the first full compliant ISO 26262 certified RISC-V CPU in the world

2024

AndesCore™ D25F-SE to be Released

- A series of Andes Functional Safety CPU cores will soon follow

AndesCore™ for Automotive Electronics

- **Supporting a Wide Variety of Functional Safety Applications:**
  - Dashboard display, in-car monitoring, keyless entry, lighting control, tire pressure monitoring, vision ADAS, microcontroller and many more
- **Developers using AndesCore™ Functional Safety Processors to:**
  - Introduce new electronic systems on automobiles
  - Upgrade existing systems that needs to be ISO 26262 compliant

In-car Monitoring

Head Lights

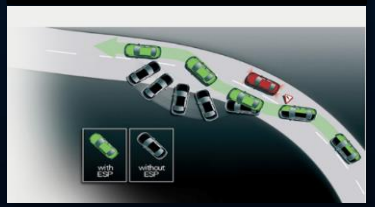
Keyless Control

Blind Spot Monitor

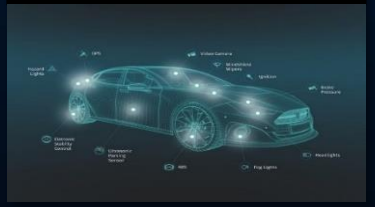
Touch & Display

EPS

ESC



Sensors & Actuators

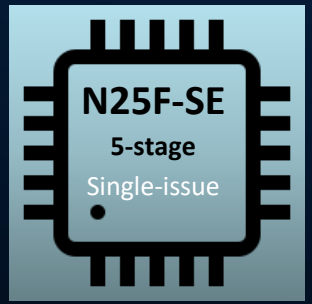


BMS

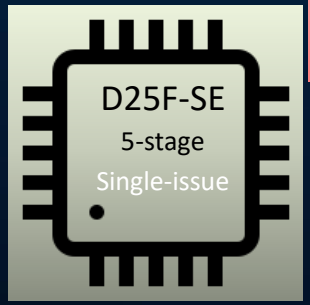
Andes FUSA Roadmap

Computing Power

Mainstream Processing

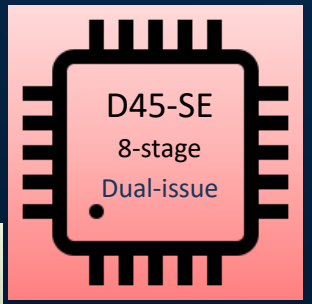


ASIL-B Compliant
IP: Available now
Already Certified



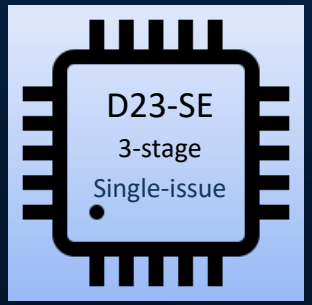
ASIL-B Compliant
IP: Available now
Certified: Q1, 2024

Mission Critical



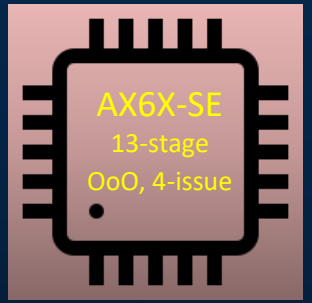
ASIL-D Compliant
ASIL-B Supported
IP: Available now
Certified: Q3, 2024

Low Power & Security



ASIL-D Compliant
ASIL-B Supported
IP: Q2, 2024
Certified: Q4, 2024

High Performance



ASIL-D Compliant

2023 2024 2025 2026

Note: roadmap subject to change without notice

Andes Automotive Ecosystem

- Co-working with global leading suppliers in the automotive industry
- Andes and ecosystem partners jointly deliver the trusted RISC-V automotive solutions to designers complying with the standard of functional safety ISO 26262
- Partner Ecosystem Catalogs

Security

- Rambus — HSM / RoT
- SECURE-IC — Securyzr™ SE
- Virtual Open Systems — VOSySmonitoRV
- Beanpod / TrustKernel — TEE

Safety RTOS

- WITTENSTEIN — SAFERTOS
- Microsoft — Microsoft Azure RTOS
- WNDRVR — VxWorks

AUTOSAR

- VECTOR — AUTOSAR
- SIEMENS — Capital VSTAR, Nucleus SafetyCert
- FPT Software — MaaZ AUTOSAR

Compiler / Debugger

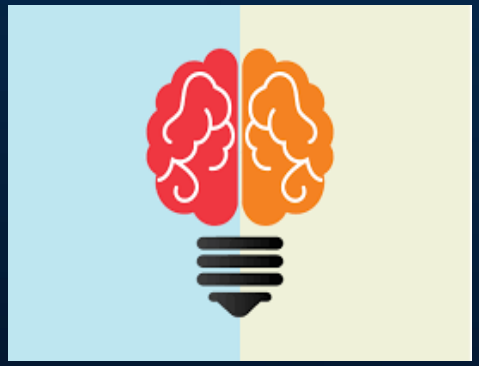
- iar — EWRISCV
- Green Hills Software — MULTI IDE / Compiler RTOS
- TASKING — RiscFree IDE/Compiler
- ASHLING — Compiler
- LAUTERBACH Development Tools — TRACE32 Debugger

Tool

- LDRA Assured — LDRA Tool Suite
- PARASOFT — Parasoft C/C++ Test

RISC-V for Datacenter & Cloud

RISC-V offers unique Opportunity for accelerators

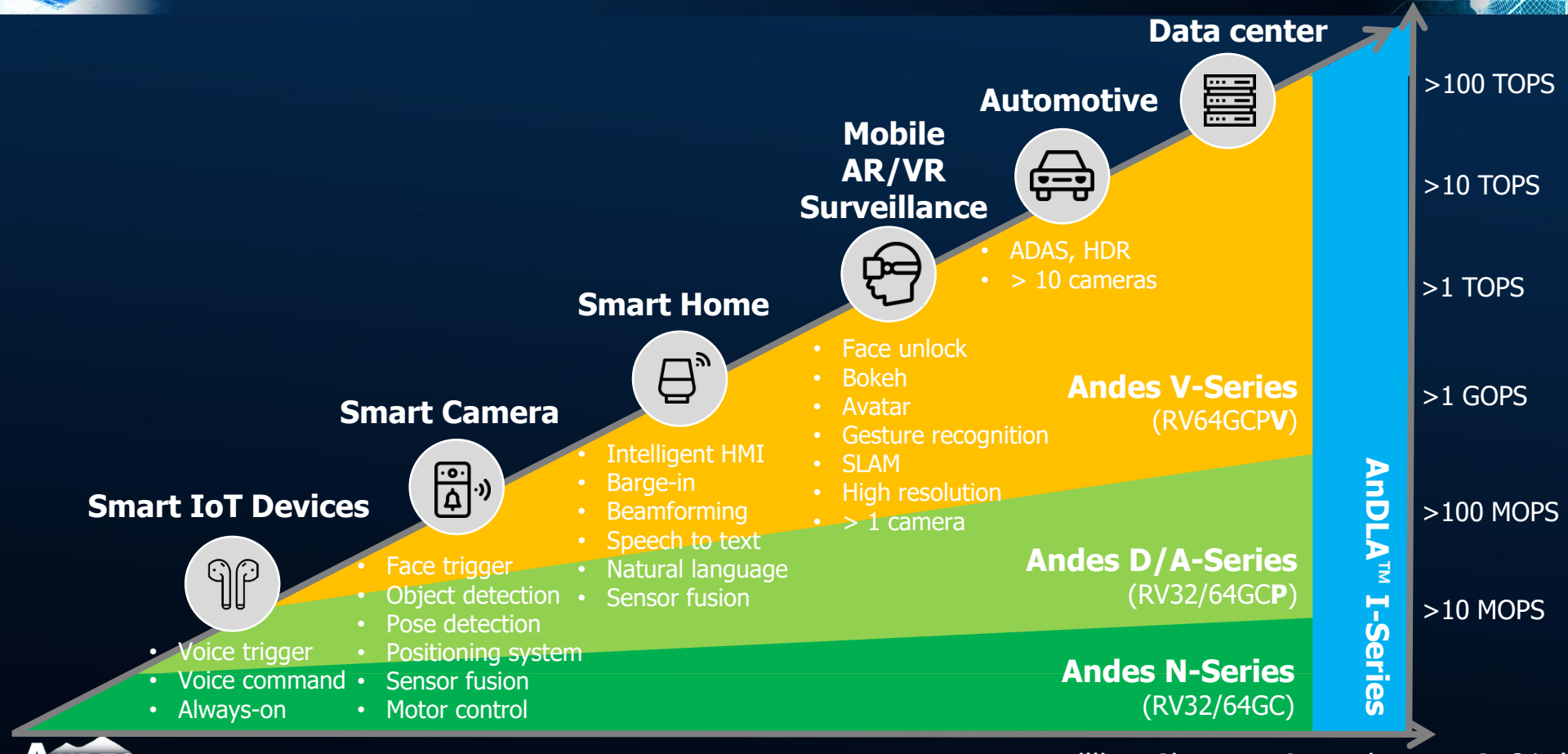


Custom computing for AI and other emerging workloads

Achieve your performance and power targets

RISC-V CPU core market will grow 115% CAGR, capturing > 14% of all CPU cores by 2025

Andes RISC-V Processors to Fit Your AI



MTIA: Meta Training/Inference Accelerator

- ISCA 2023 paper, "MTIA: First Generation Silicon Targeting Meta's Recommendation Systems"
- Proc-A/B: AX25-V100, an early version of the popular NX27V
- Custom extensions: for new interfaces, instructions and registers
- Performs quite well on low and medium complexity models

Figure 3: High-level architecture of the accelerator

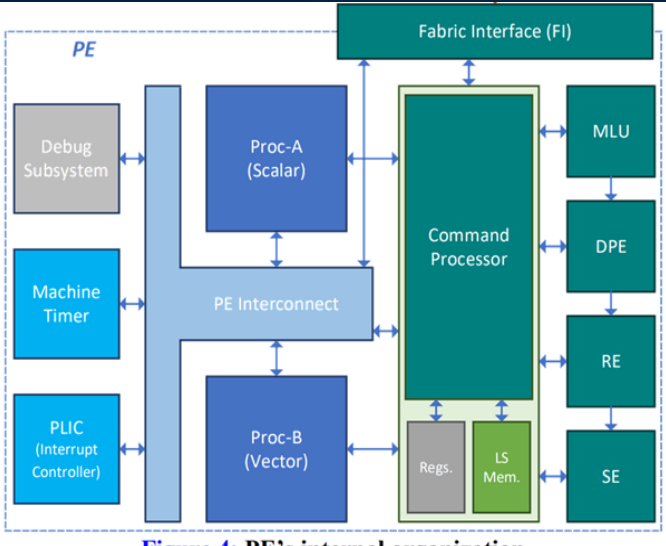
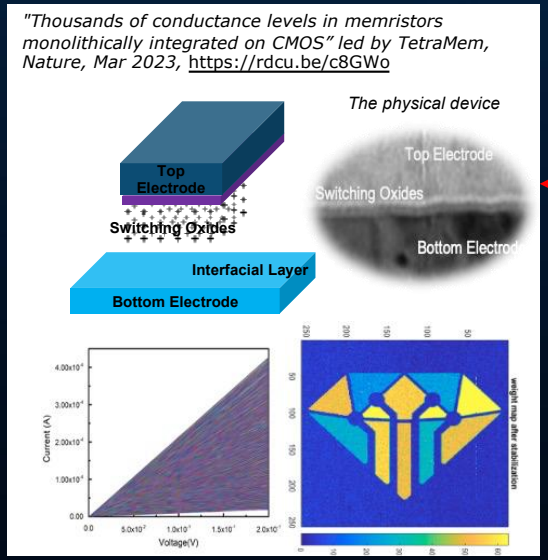


Figure 4: PE's internal organization

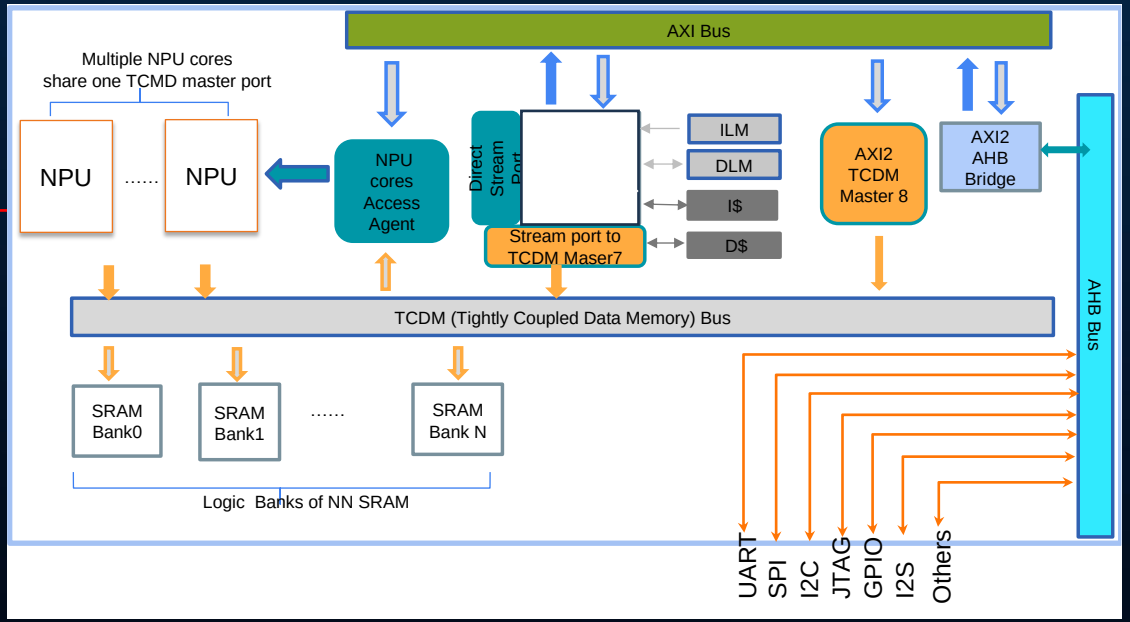
All photos: courtesy of ACM

Edge AI With Analog In-Memory Computing

- TetraMem Analog In-Memory-Computing MX200 (RRAM-based)
- 8-bit 256x256 (64K) MAC Engines, >30 TOPS/W performance
- ML core operators (conv, gemm) processed in NPU
- Remaining operations processed in RISC-V Vector processors and control CPU

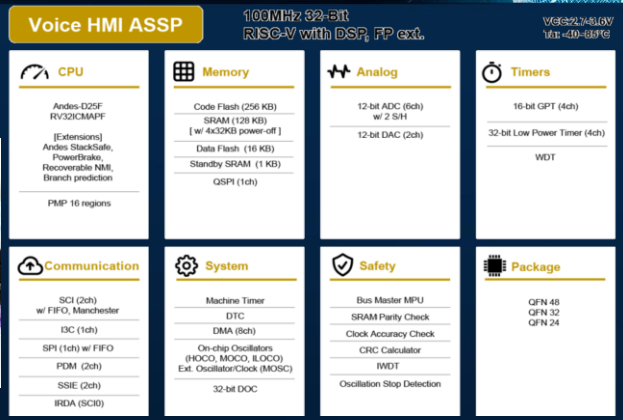


Powered by 8 bits multi-level RRAM device



Endpoint AI

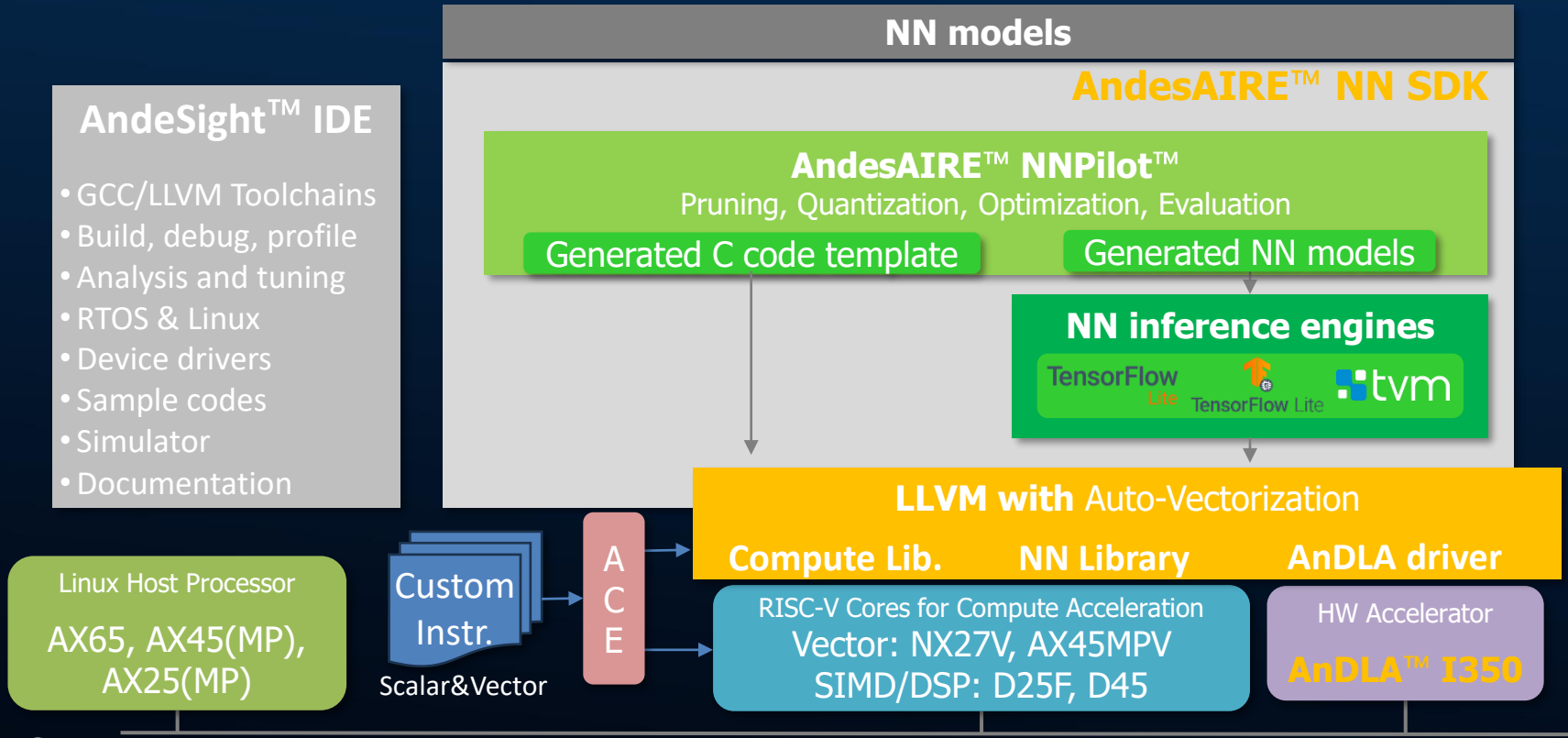
- Renesas R9A06G150 Voice-Control ASSP
  - With 100MHz DSP-capable D25F processor
  - ML-based voice recognition gets >50% speedup by using P-extension



- Spacetouch SPV60 Intelligent audio processor
  - High performance for customer development
    - 100 GOPS NPU for noise reduction, echo cancellation, howling suppression
    - uDSP for FFT/IFFT, atan, log, etc.
    - 400MHz D25F with ID caches/Local Memory
  - Rich audio interfaces and other peripherals
  - Applications:
    - Intelligent voice, smart earphone, professional audio

AndesAIRE™: Andes AI Runs Everywhere

HW/SW Solutions for AI from the Edge to the Cloud



AndesAIRE™ - Andes AI Runs Everywhere

Smart Camera

Smart Sensor

Smart Home Appliance

AIoT / tinyML

Robotics

Wearable

The R&D Power for The Future

Andes RISC-V CPU Cores

AX60 Series 13-stage OOO Linux MP		AX65	AX66	AX6X-SE	A72~A78; N1/V1/X1
Categories	*Power-efficient*	*Mid-range*	*Extended*	*FUSA*	
45 Series 8-stage Superscalar	N45, NX45	D45	AX45MPV A45(MP), AX45(MP)	D45-SE	A53/55, R52/ R82, M7
27 Series 5-stage MemBoost		NX27V	A27(L2), AX27(L2)		A5/7/35
25 Series 5-stage Fast&Compact	N25F, NX25F	D25F	A25(MP), AX25(MP)	D25F-SE N25F-SE	A5/7/35, R4/5, M4/33
Compact Series	N22, N225	D23		D23-SE	M0/0+/3/33/4
Categories	*Embedded Control*	*Compute Acc.*	*Linux AP*	*FUSA*	*References*

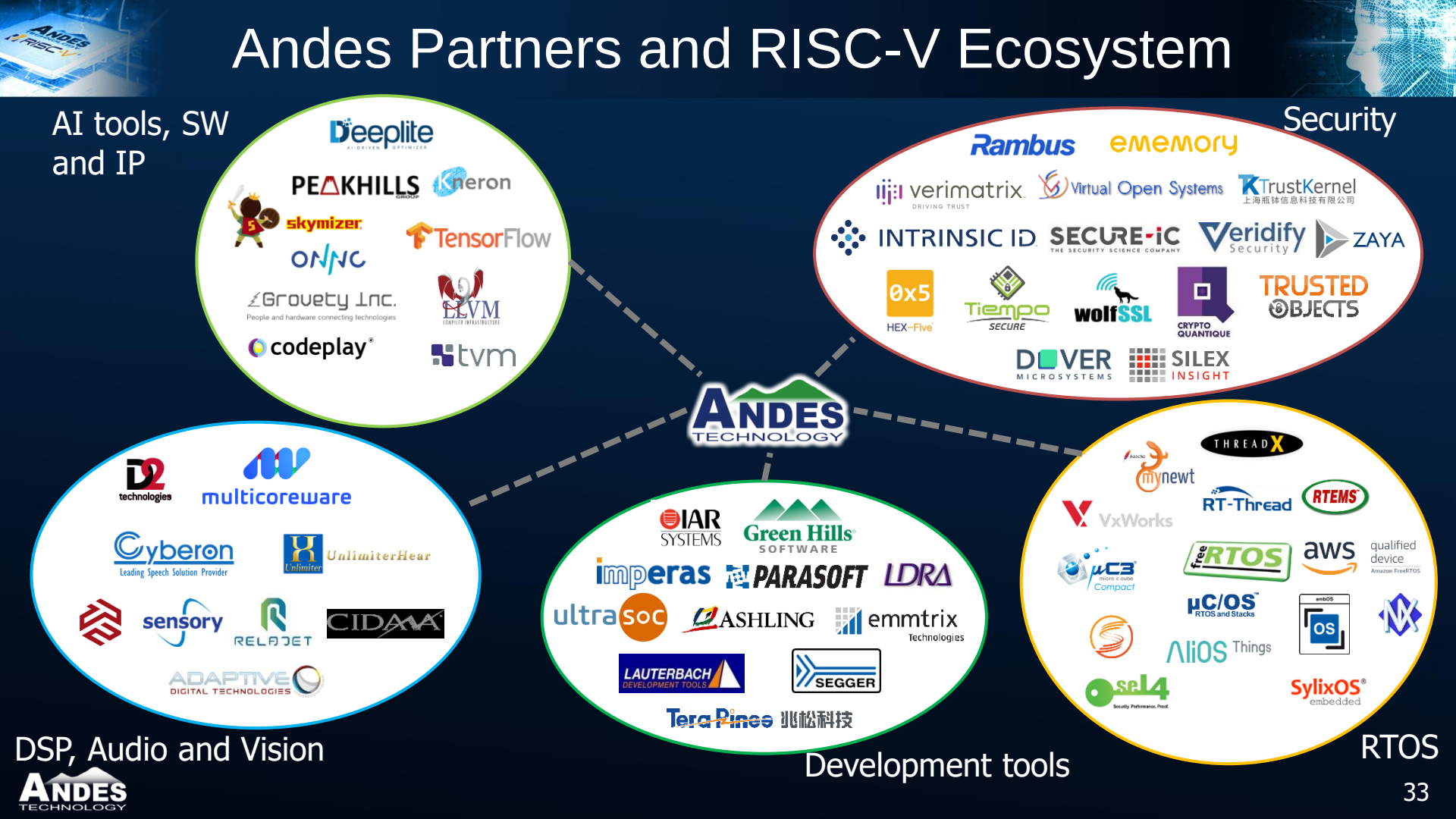
- **To be released in 2024:** D25F-SE, D45-SE, AX66
- **Under Planning :** D23-SE, AX6X-SE

Note: roadmap subject to change without notice

RISC-V Continues to RISE Rapidly

- **RISE: RISC-V Software Ecosystem, a project under LF Europe**
- **To accelerate the development of RISC-V open source SW**
- **Led by industry leaders**
- **Areas to focus over time:**
  - Compilers & Toolchains
  - Language Runtimes
  - System Libraries
  - Debug & Profiling Tools
  - Simulator/Emulators
  - Kernel and Virtualization
  - Linus Distro Integration
  - System Firmware
- **More at** *https://riseproject.dev*

Andes Partners and RISC-V Ecosystem



Thank you