NextSoC and MAIFE co-innovation projects

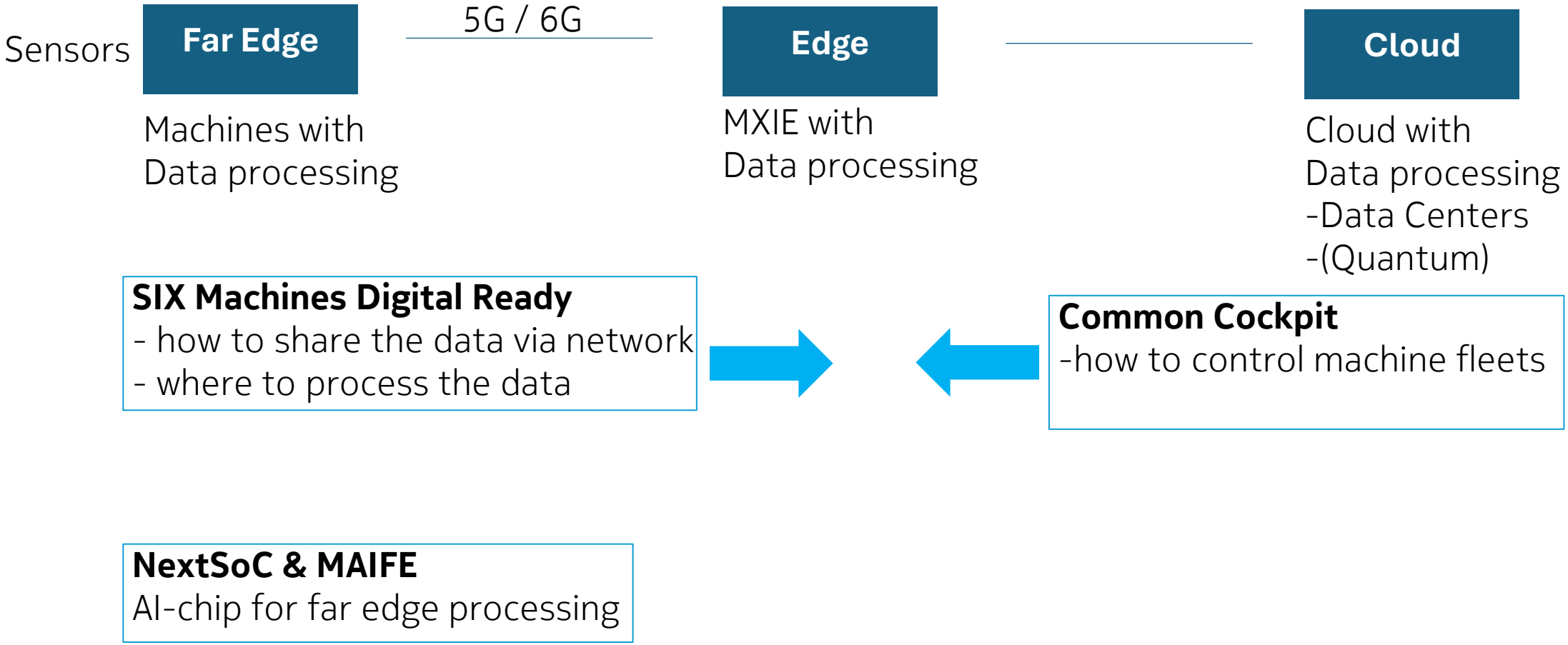
Veturi Lead Networking event 30.10.2025

Juha Salmelin

New optimized Industry and dual-use networks

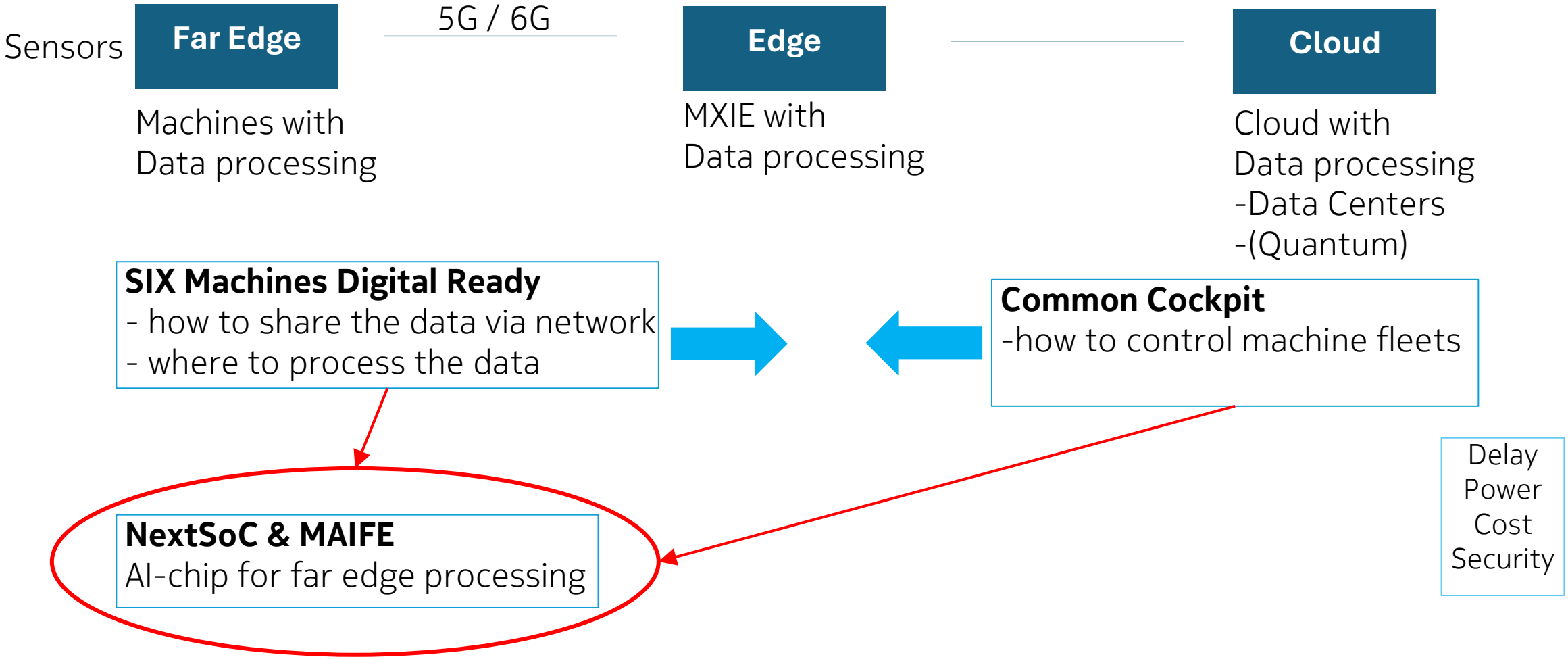
Delay
Power
Cost
Security

Related Projects in LEAD-Veturi



New optimized Industry and dual-use networks

Related Projects in LEAD-Veturi



NextSoC and MAIFE co-innovation projects

LEAD co-innovation projects with MEF (Microelectronics Finland) and companies

NextSoC
- Derivate from Tampere SoCHUB
- SoC arch and Security functions
-TaU + industry partners

PM Prof. Timo Hämäläinen TaU

MAIFE
- Special IoT interfaces and processing
- Risk-V processor environment A-Core
- Aalto, OU and TaU + industry partners

PM Prof. Marko Kosunen Aalto

Component repository with FiCCC
- EU compatible IP-block repository
- Finland special IP-blocks for industry and dual-use

Finland Chip Competence Center
FiCCC Dir. Pasi Pylväs

Tampereen yliopisto
Tampere University

SoC Hub Chips Impact

NextSoC

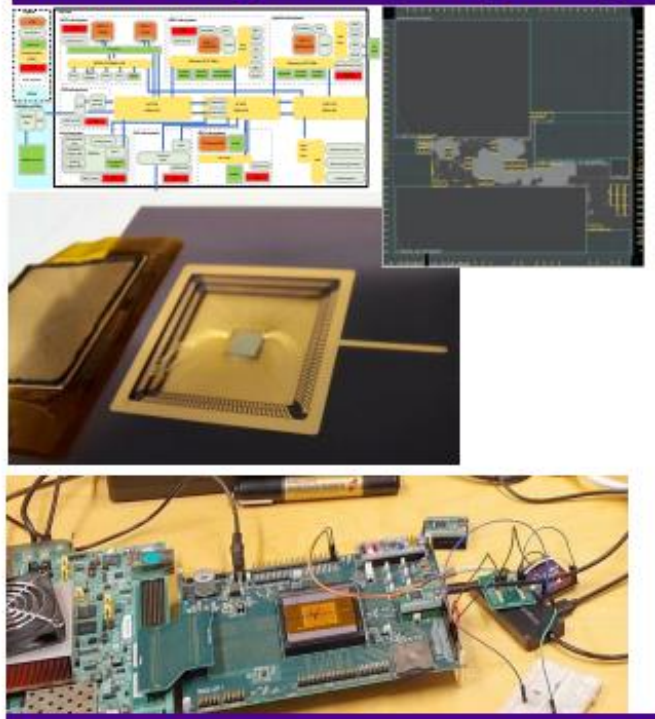
Record breaking time in complex SoC creation

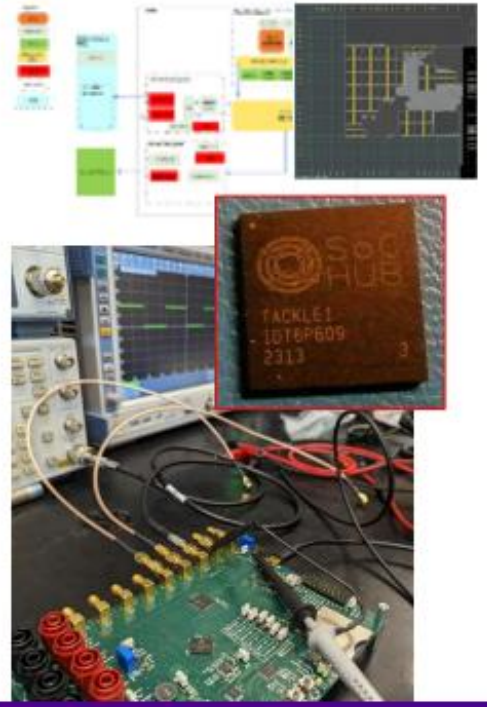
High-speed connectivity for chiplet readiness

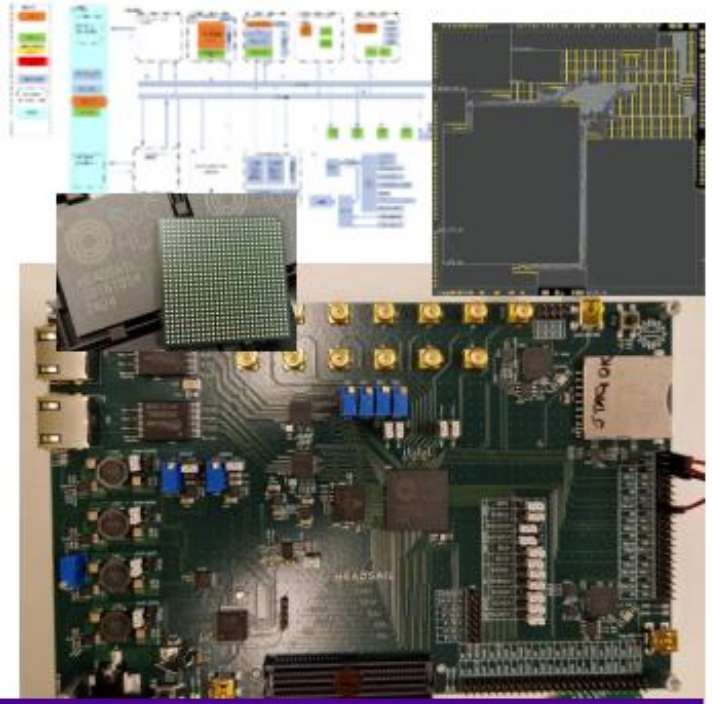
World Top 3 SoC with Linux, AI

- Edge, robotics
- Full template for future chips

Industrial grade quality, very high Technology Readiness Level







All in: Chip, PCB, Firmware, all design steps to GDSII and product validation

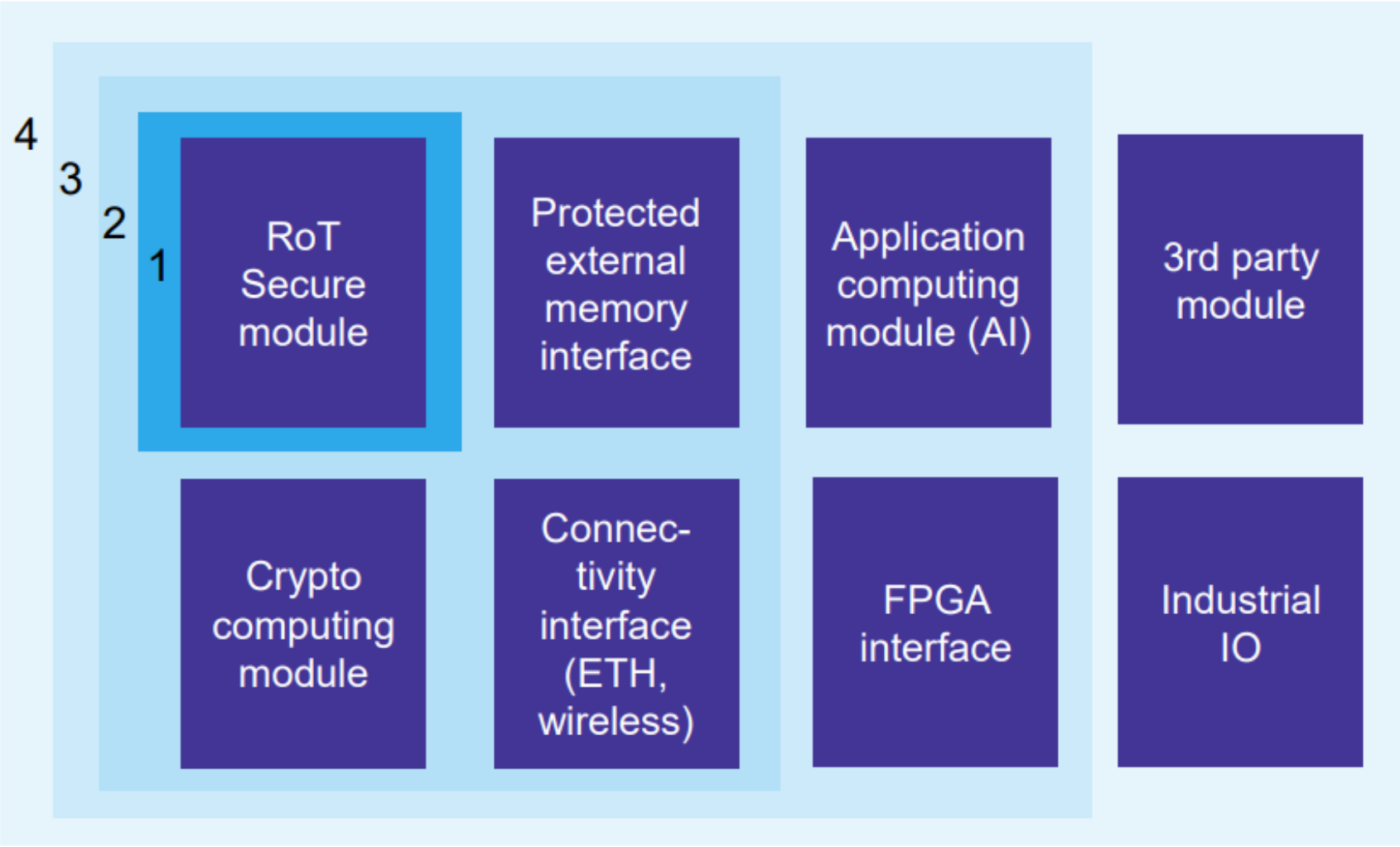
Ballast
15mm2 TSMC 22nm, 256PGA, 130M transistors

Tackle
2x 4mm2 TSMC 22nm, 88QFP, 12M transistors

Headsail
25mm2 TSMC 22nm, 624 BGA, 340M transistors

Tampereen yliopisto
Tampere University

NextSoC: Modular secure chips

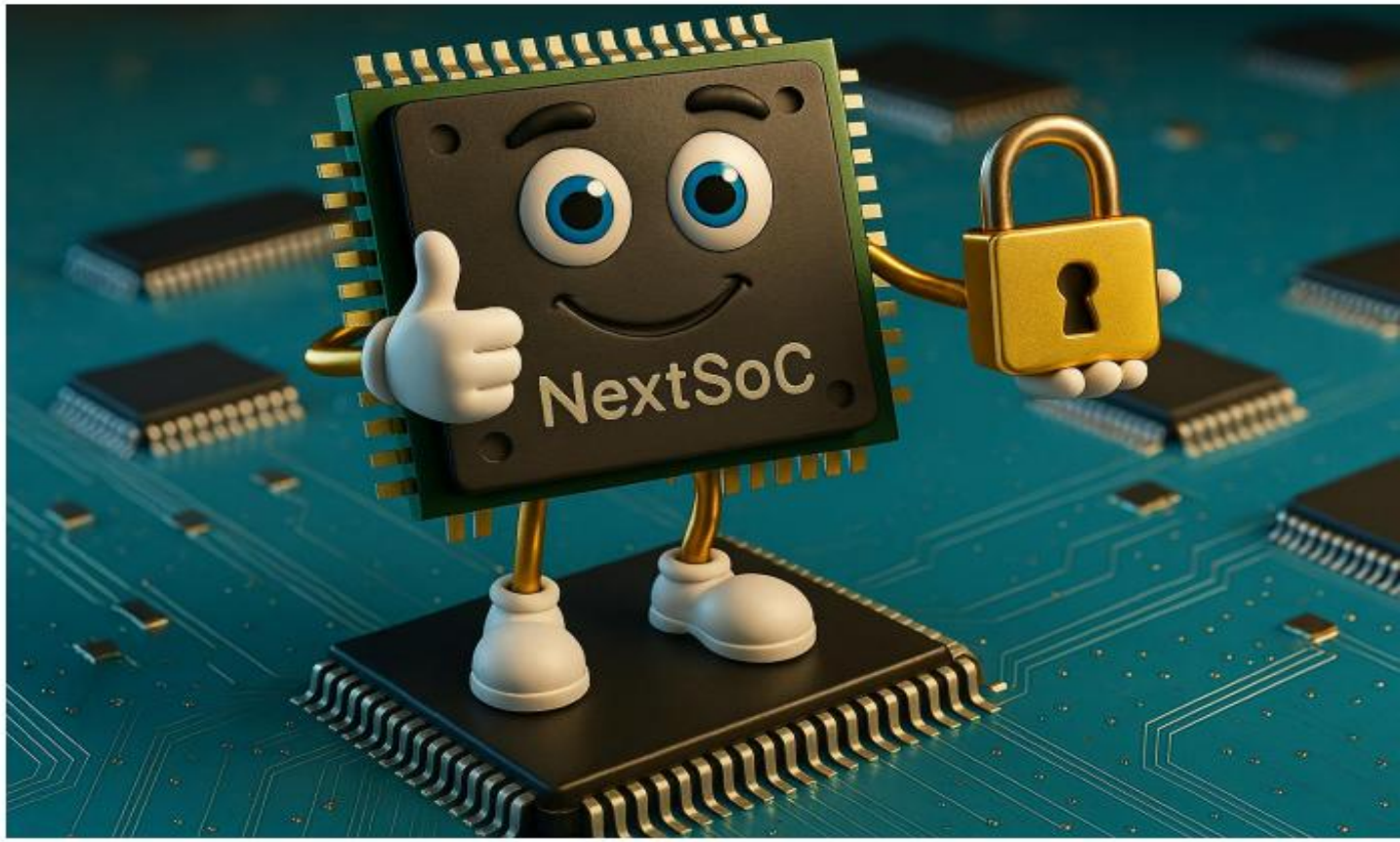


- Modules that can be implemented as
  - Stand-alone chips for PCB integration
  - Chiplets for System-in-Package
  - Subsystems on System-on-Chip
- Scalable by required functionality of the end product
  - Minimum is Root of Trust
  - Maximum is secure high-performance networked computing platform for embedded systems

Tampereen yliopisto
Tampere University

NextSoC objectives

1. **Secure**
   - The new norm for any embedded/ industrial product
   - Execution of crypto algorithms/applications
   - Hardening of the HW, SW, physical and integration
2. **Industrial**
   - Same template but customizable chips for most embedded/heavy machine companies in Finland
3. **Integrated**
   - System-in-Package - the first user of the EU pilot line SiPFAB
   - Chiplets for varying life-cycle products



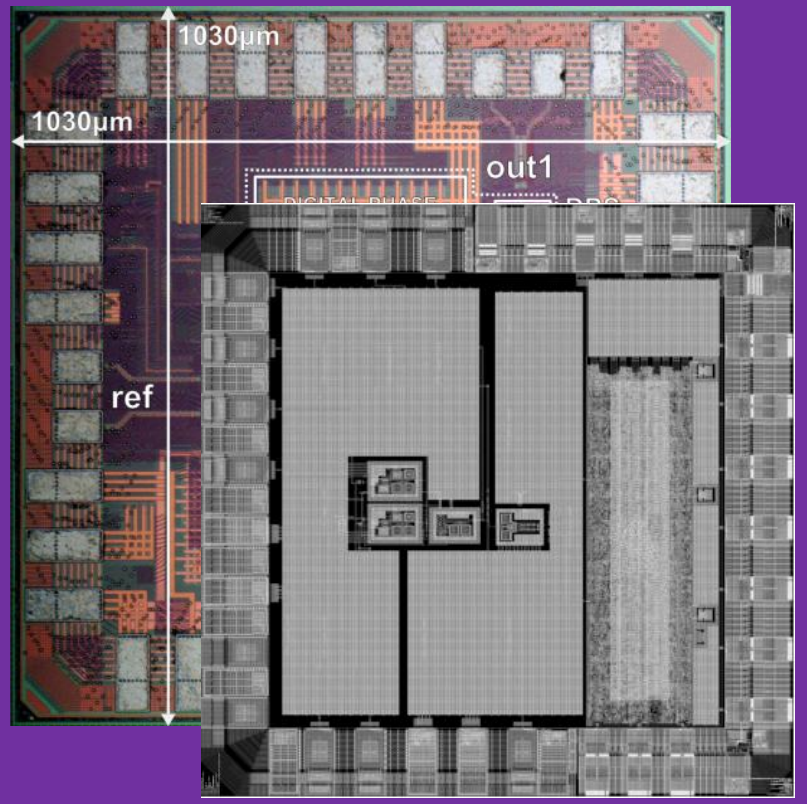
3 years project starting early 2026, continues SoCHUB activities (next silicon already planned)
Project budget 10Me, PM Professor Timo Hämäläinen TaU
Partners: 7 industry company

MAIFE

Modular AI-Enhanced Communications and Sensing at Far Edge

Marko Kosunen

24.9.2025



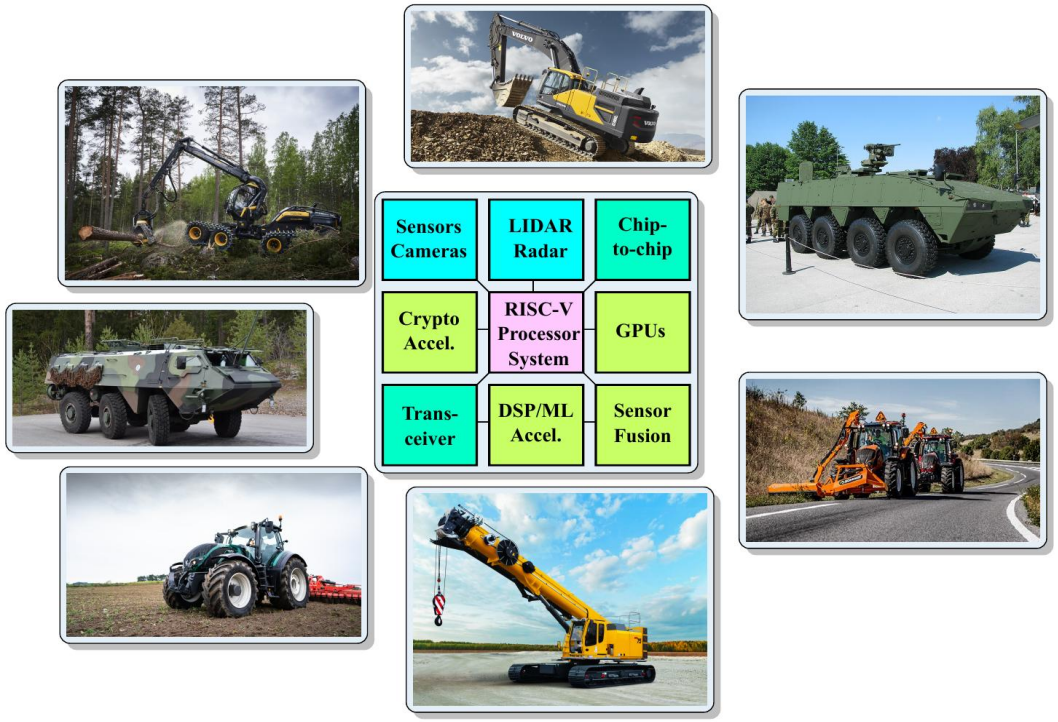
Aalto-yliopisto
Aalto-universitetet
Aalto University

Tampere University
Tampere University of Applied Sciences

UNIVERSITY OF OULU

MAIFE in a nutshell

- Processing platform for 'large machines'
- Use cases: Industry, heavy machinery with connection defense applications.
- Multi-core mixed-mode processing system.
- Communications (chip-to-chip, wireless)
- Sensor interfaces (camera, LIDAR, RADAR, IMU...). Content tailored according to preferences of the partners.
- Accelerators for DSP and sensor fusion, enhanced with AI and ML. Content tailored according to preferences of the partners.



•Project type and Partners

MAIFE

- Business Finland Co-innovation consortium, Nokia Veturi Lead
- 3 years project starting 2026
- Volume target: 20M€ , Industry 50% , Academia 50%
- Partner companies (not binding):
  - Not to be disclosed in this phase, totally 8 companies
- Research organizations
  - Aalto University (Marko Kosunen, …)
  - Tampere University (Timo Hämäläinen,…)
  - University of Oulu (Lauri Koskinen,…)
- Coordinator: Aalto University

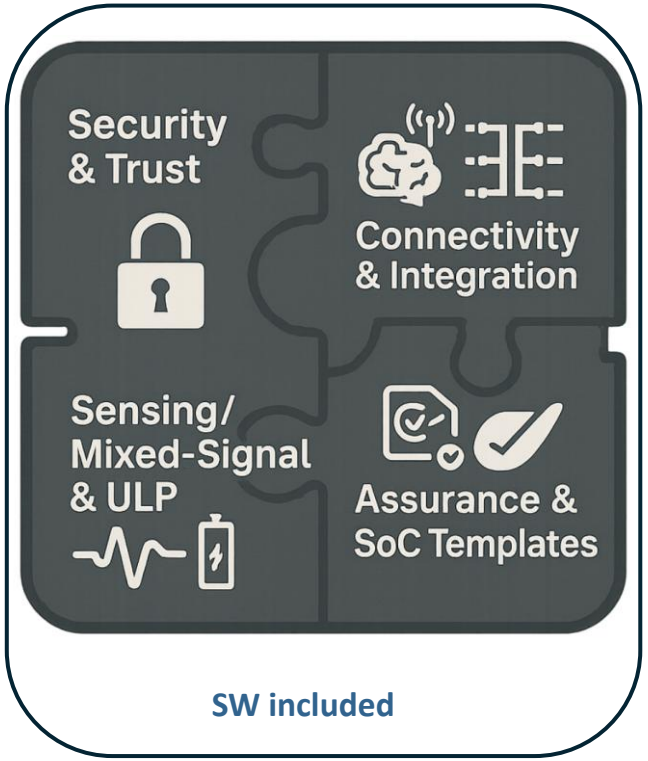
Building a National Critical IP Asset with Managed Marketplace

- Drivers for national critical IP asset
- Starting point for the IP asset
  - Combine NextSoC and MAIFE activities for maximized re-use
  - Build initial IP asset on university IPs, NextSoC and MAIFE IPs
- From university IPs to premium quality IP marketplace by FiCCC

From Security to Critical IP = foundations we must master

FiCCC Repository

Critical IP, a national vision



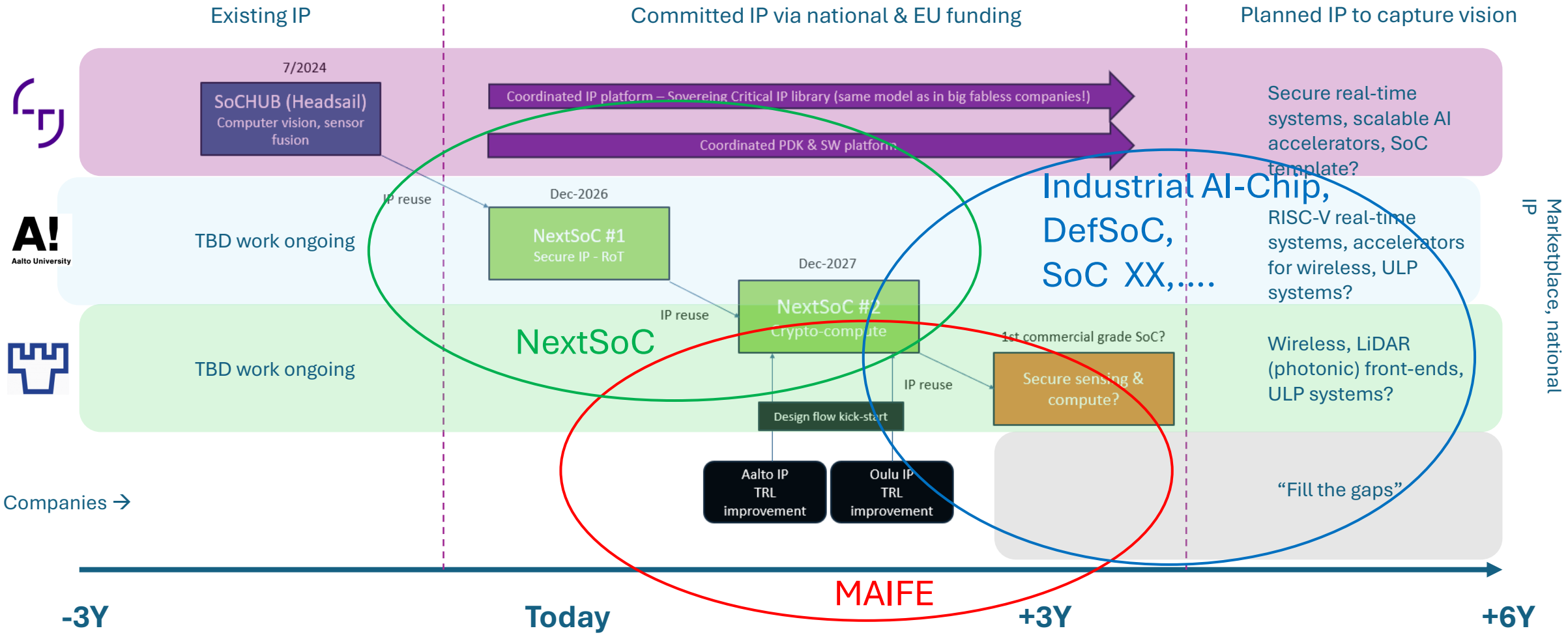
- Finnish universities already produce silicon-proven IP
- FiCCC makes it reusable, traceable, and market-grade through a simple process:
  1. University → provides silicon-proven IP
  2. FiCCC → packages, verifies & publishes
  3. Industry → validates & reuses

CHIP HAPPENS FiCCC

Universities will help business better than even

FiCCC

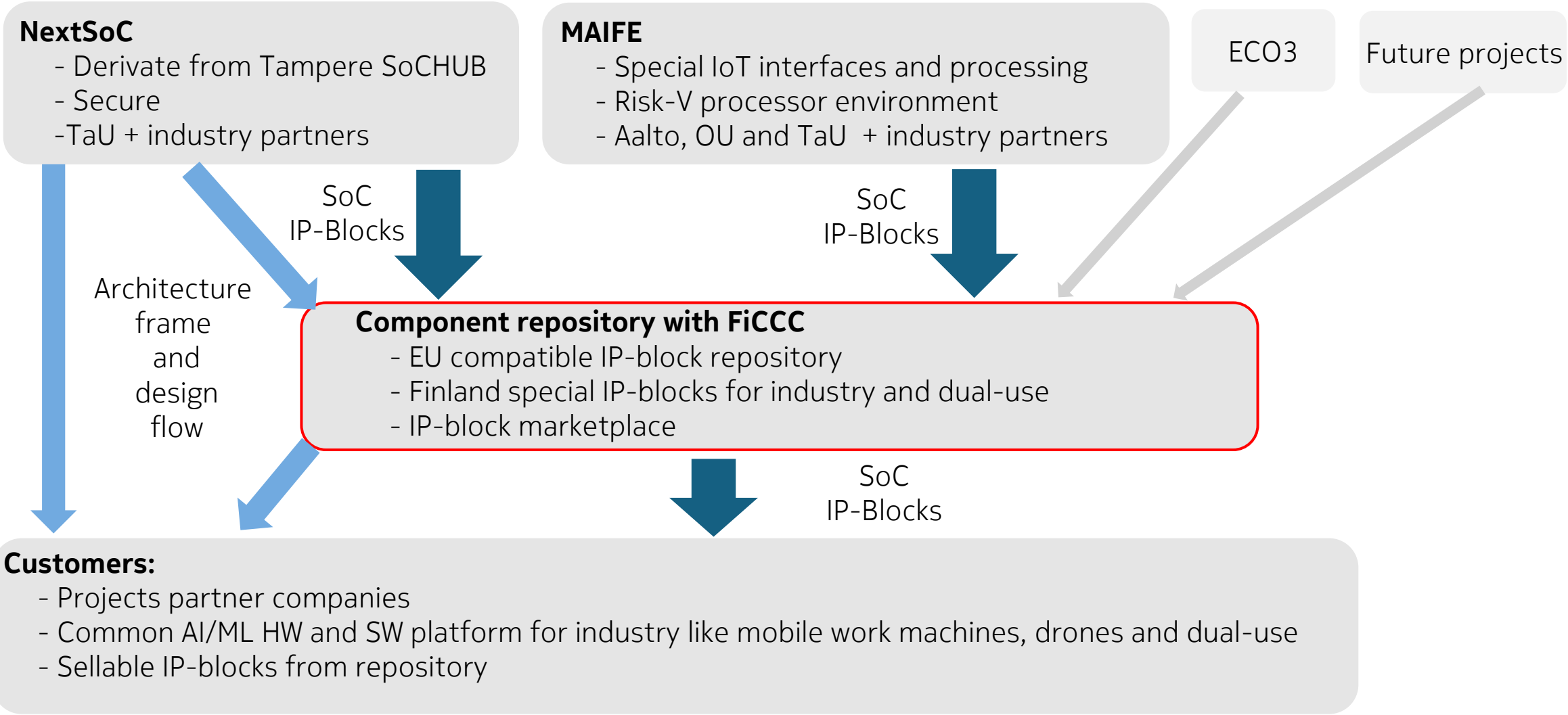
Finland's Critical Chip IP Roadmap – **The starting point**



www.ficcc.eu

NextSoC and MAIFE co-innovation projects

MEF (Microelectronics Finland) and companies



Delivering collaborative advantage

We are bringing together universities, partners and customers to create the digital services and applications of the future.