CrossControl EU Project Idea

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SOME PAST CO-CREATION PROJECTS

CRAFTERS

CRAFTERS - ConstRaint and Application driven Framework for Tailoring Embedded Real-time Systems
2012-2015

Embedded **many-core systems**: marketable lead applications driving ecosystem development and benchmarking on the fields of **industrial applications**, intelligent transport systems, video and image processing, and wireless communications. Key challenges include guaranteeing secure, safe, reliable, and timely operation, back-annotation based forward system governance, tool-tool, **tool-middleware, and middleware-hardware exchange interfaces**, and energy management with minimal run-time overhead.

- 26 partners, coordinator Technoconsult ApS, Denmark
- main partners Infineon Technologies AG, Tampere University, Thales Italy
- Finnish consortium: Tampere University, Mobisoft, CrossControl

+ wide research-focused content
+ safety + realtime + many-core
+ safety & non-safety co-existence

PRODUCTIVE4.0

Productive4.0 - Electronics and ICT as enabler for digital industry and optimized supply chain management covering the entire product lifecycle
2017-2020

https://productive40.eu

Digitalization (Industry 4.0), distributed systems, industrial use cases on IoT, Arrowhead framework

- 109 partners, 19 countries, 65% from industry
- Coordinator: Infineon Technologies AG
- Finnish consortium: VTT, Tampere University, Konecranes, Metso Outotec, Wapice, CrossControl

+ industry-focused use cases
+ relevant IoT-platform and application development

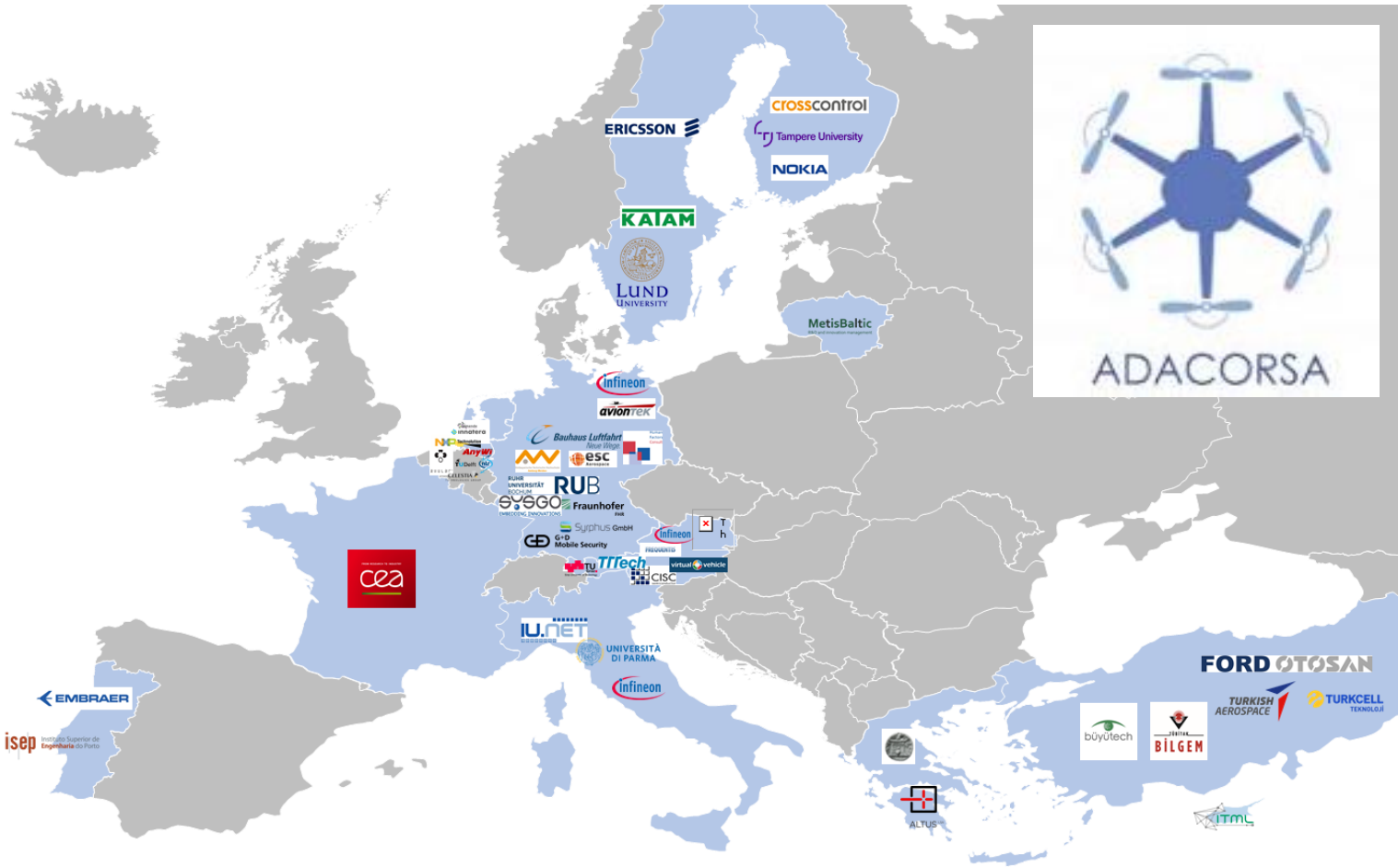
CrossControl Oy, EU-projects

ADACORSA

ADACORSA - Airborne data collection on resilient system architectures
2020-2023
Vision: Provide European technology to render **drones** as a safe and efficient component of the mobility mix, with differentiated, safe and reliable capabilities in extended **beyond visual line of sight** (BVLOS) operations.

https://adacorsa.eu/

- 50 partners
- Coordinator: Infineon Technologies AG
- Finnish consortium: Tampere University, Nokia, CrossControl



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ADACORSA, SMART FORESTRY USE CASE

- Data feed (camera, LiDAR, other sensors) collected by the drone
  - Over the canopy: tree heights, locations
  - Terrestrial flight below the canopy: log width, species
- Drone and onboard computing by Avular (NLD)
- Algorithms by Katam (SWE) and University of Lund (SWE)
- Post-flight analysis at the edge computing platform by CrossControl
- Moving the analysis from cloud to the AI-powered edge at the field

+ AI-platform and tool chain evolution
+ successful smart forestry pilot, workflow involving several actors

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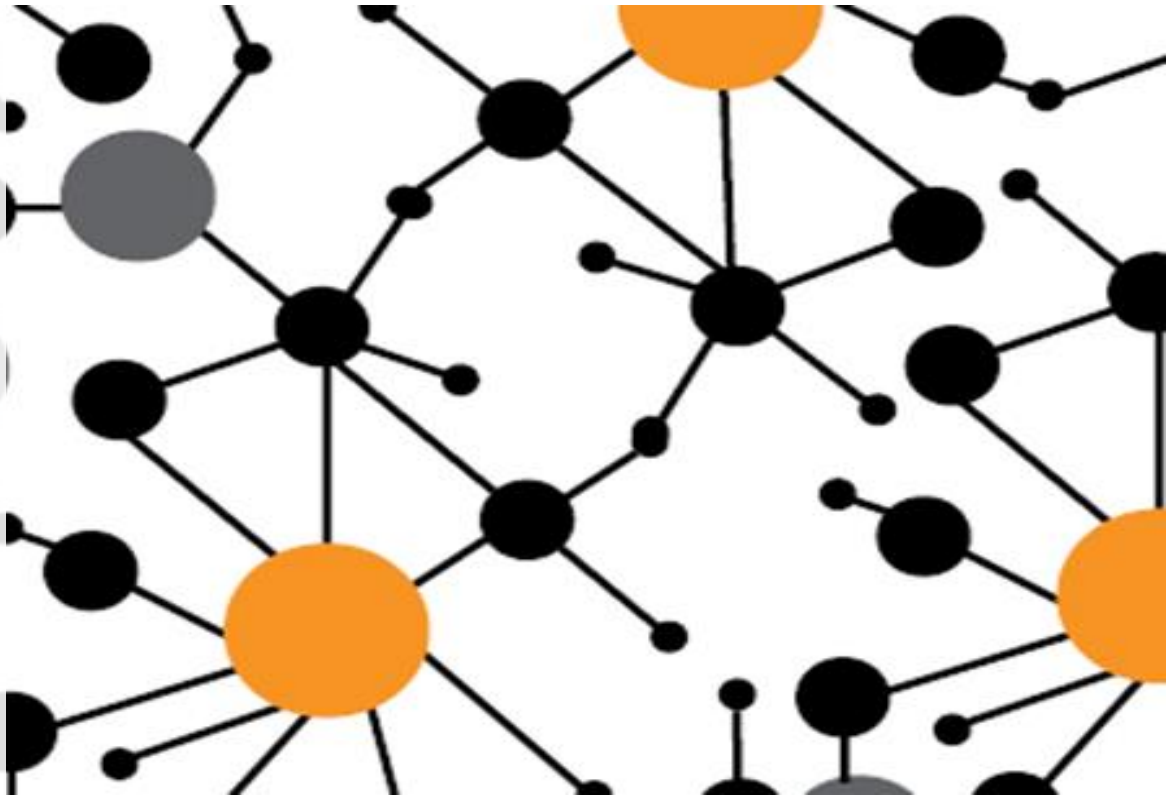
WHAT NEXT?



SOFTWARE DEFINED MACHINE

- Going from "Machine was at its best when it rolled out from production line" to "best in its current version and will be even better in future"
- For machine owner: Promise that his effiency/productivity/safety/comfort will improve during the lifetime of the machine – new buying criteria
- For OEM: New ways to differentiate from competitors, reshaping the machine to a revenue platform
- Boost sustainability

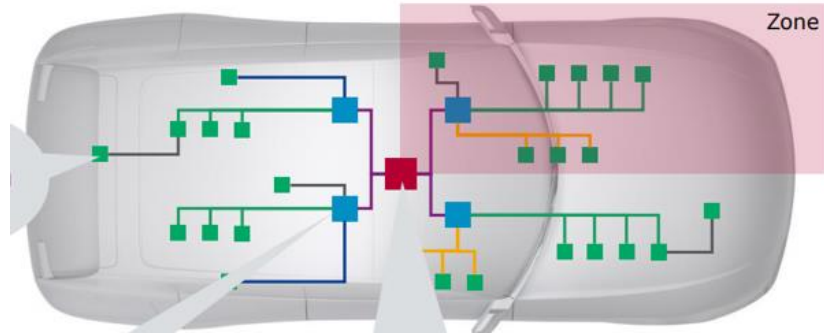
New approach for Software

New approach for System architecture

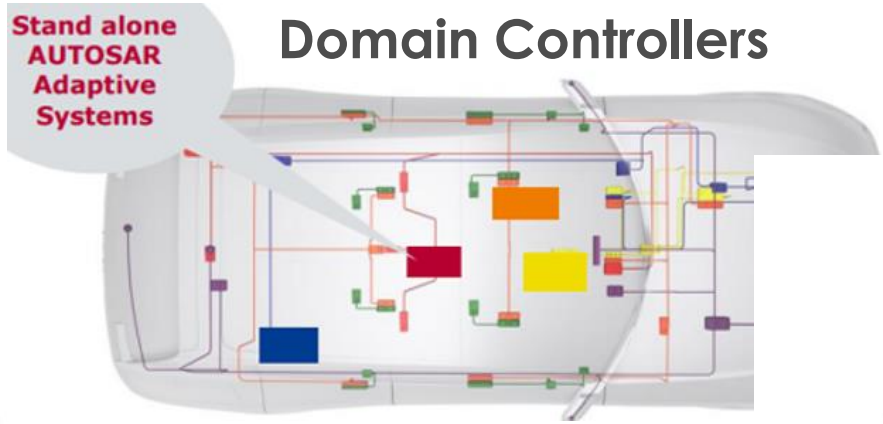
REVOLUTION IN SYSTEM ARCHITECTURE

- What is the next thing coming from automotive to mobile machines?

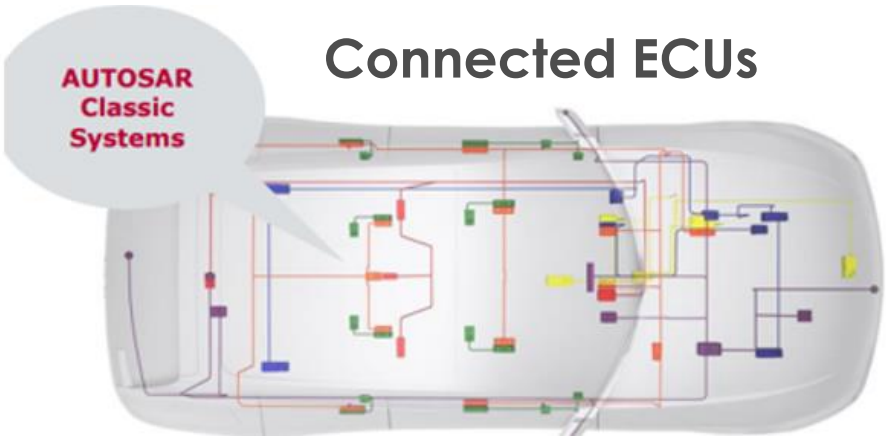
Zonal or Central Computing

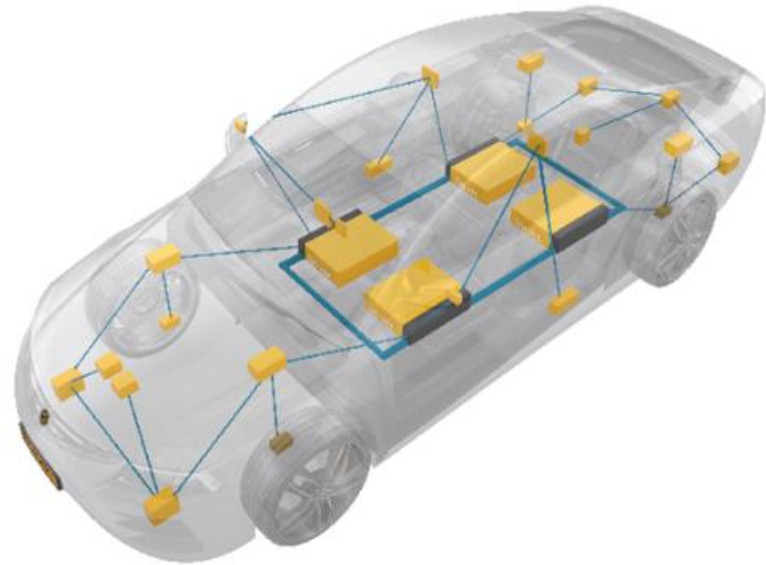


Domain Controllers



Connected ECUs





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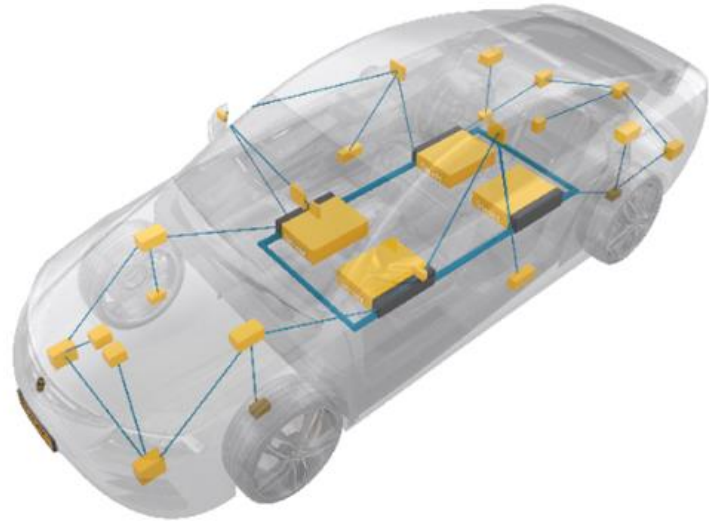
VEHICLE SERVER

- Key piece to enable transition to Software Defined Machine (SDM), central point of innovation



- Scalable performance, updatable capabilities
- Capable to control multiple displays
  - MIPI PHY-A and MASS (daisy chainable, 15m, safety end to end)
- Separates the lifecycles of displays and computing

- Supports running multiple OS simultaneously (3rd party, cyber security, realtime, safety…)
- Mixed criticality
- Scalable AI capabilities
- Automotive TSN ethernet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