T R A N S A C T

Towards safe and secure distributed cyber-physical systems

The overarching goal of the TRANSACT project is to develop a universal, distributed solution architecture for the transformation of safety-critical cyber-physical systems, from localised standalone systems into safe and secure distributed solutions leveraging edge and cloud computing.

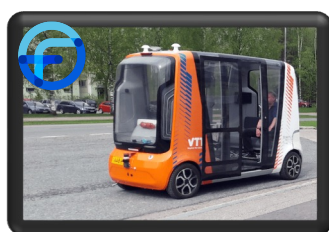1 Transforming CPS' architecture from monoliths to distributed solutions

2 Ensuring CPS' performance in the device-edge-cloud continuum

3 Ensuring CPS' security and privacy in the device-edge-cloud continuum

4 Devising business models for CPS deployed in the device-edge-cloud continuum

Coordinator: PHILIPS MEDICAL SYSTEMS

Industrial use cases

UC1: Remote operation of autonomous vehicles for the navigation in urban environments

UC2: Critical maritime decision support enhanced by distributed, AI enhanced edge and cloud solutions

UC3: Cloud-featured battery management systems

UC4: Edge-cloud-based clinical applications platform for Image Guided Therapy and diagnostic imaging systems
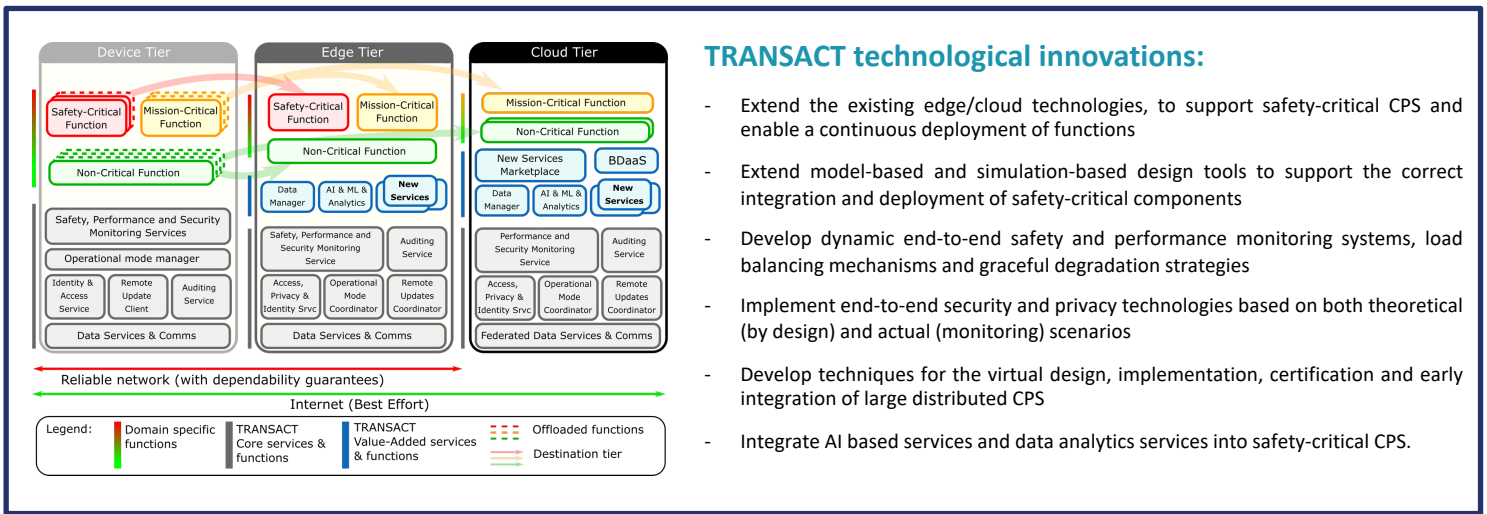

UC5: Critical wastewater treatment decision support enhanced by distributed, AI enhanced edge and cloud solutions

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TRANSACT technological innovations:

- Extend the existing edge/cloud technologies, to support safety-critical CPS and enable a continuous deployment of functions

- Extend model-based and simulation-based design tools to support the correct integration and deployment of safety-critical components

- Develop dynamic end-to-end safety and performance monitoring systems, load balancing mechanisms and graceful degradation strategies

- Implement end-to-end security and privacy technologies based on both theoretical (by design) and actual (monitoring) scenarios

- Develop techniques for the virtual design, implementation, certification and early integration of large distributed CPS

- Integrate AI based services and data analytics services into safety-critical CPS.

Eclipse POOSL for early system validation

Parallel Object-Oriented Specification Language (POOSL)

- Light-weight modeling and simulation for early system validation

- Successful applications in high-tech companies

Eclipse Open-Source Project

- Eclipse Modeling Project for model-based development technologies

- Research result from TU/e and ESI, industrialised by Obeo

- POOSL website: https://poosl.org
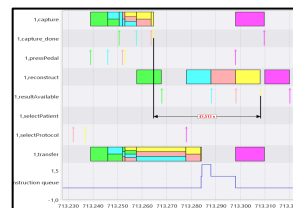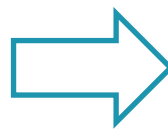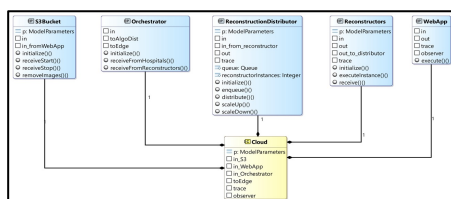
Modeling & simulation by POOSL

Visualization by TRACE

+ Native integration with POOSL
+ Eclipse Incubator project
+ https://www.eclipse.org/trace4cps

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