

Key Innovation

One of the main problems the CPS designers face is *“the lack of simulation tools and models for system design and analysis”*. COSSIM plans to offer an integrated simulation framework that covers all aspects of a CPS (**processing nodes, network, energy/power estimation and security**).

Technical approach

A Novel CPS tool-chain

COSSIM develops a novel simulator framework that integrates modified/extended versions of existing simulators for the different CPS sub-systems:

GEM5 (for the digital components of the processing nodes of a CPS)

OMNET++ (for the network infrastructure of a CPS)

McPAT (energy and power consumption estimations of processing nodes) and **MiXIM** (energy consumption of the network)

Most innovative characteristics of the COSSIM framework:

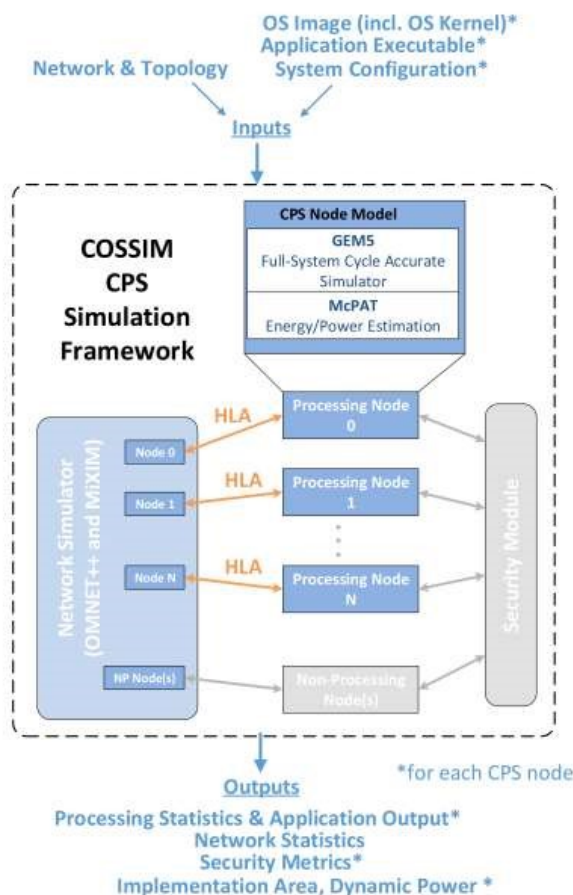
Integration and future expansion: COSSIM employs the *HLA architecture* for integration of different components and for future expandability with other established CPS frameworks (e.g. Ptolemy)

Performance: COSSIM will be *fully parallel* taking advantage of multiple cores/processors/distributed systems while *also employing FPGAs* for further acceleration and more accurate results

Security: COSSIM integrates *for the first time security measurement models* and methodologies

Demonstration and use

Effectiveness of the COSSIM simulation framework will be demonstrated on two complex applications: a Building Management System (Tecnalia) and a Mobile Visual Search application (STMicroelectronics)



Expected Results

- Simulate at a **cycle accurate level** the executable(s) in the processing nodes of a CPS and the **actual network** interconnecting them
- Provide **significantly more accurate power/energy estimations** than existing systems
- Support and simulate certain **security features** of the overall CPS
- **Significantly higher performance** than existing CPS simulation systems

Project Details

Contract number
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Community contribution
2,9 M€

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36 months

Project Partners