Formal Methods for Testing Networks of Controllers

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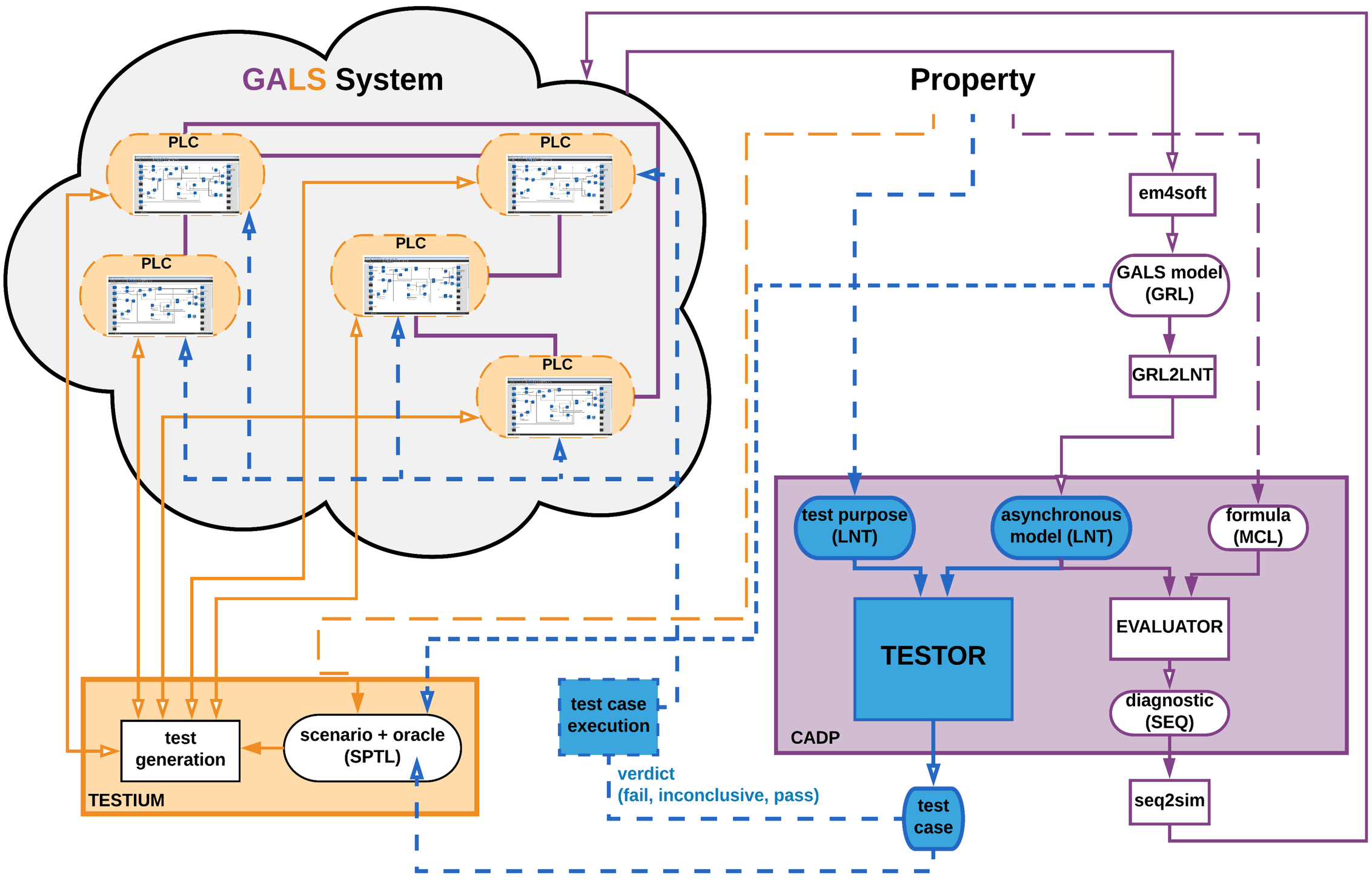
CONVECS - Méthodes Formelles, Modèles et Langages

Context

Validation of critical Globally Asynchronous Locally Synchronous (GALS) systems, e.g., a network of Programmable Logic Controllers (PLCs)



Objectives

- Automatic generation of a test suite covering a GALS model
- Test case execution a network of PLCs

Solution

- TESTOR [1]: On-the-fly conformance test case generation from a GALS model described in GRL [2], and a test purpose described in LNT [3]
- Validate the approach by connecting generated test cases to PLCs
- Use generated test cases to improve synchronous testing in GALS

References

[1] **TESTOR: A Modular Tool for On-the-Fly Conformance Test Case Generation**
L. Marsso, R. Mateescu, W. Serwe, TACAS 2018

[2] **Formal Modelling and Verification of GALS Systems Using GRL and CADP**
F. Jebali, F. Lang, R. Mateescu, Formal Aspects of Computing vol (28):767-804, 2016

[3] **From LOTOS to LNT**
H. Garavel, F. Lang, W. Serwe, ModelEd, TestEd , TrustEd. LNCS 10500, 2017