Testing is a very important matter in the life-cycle of software. It represents a validation technique to increase the level of confidence in the software. Several standards related to testing have been proposed for the protocols and industrial systems. We distinguish different types of tests: conformity, interoperability, robustness, performance, non-regression. In a number of cases, the time devoted to testing may be greater than 50% of the life cycle. It is therefore necessary to develop methods and tools to reduce this time. The use of a formal specification is very effective and interesting. It allows for several types of validation tools to be used: formal verification, simulation, proof and often the automatic generation of executable code and the automatic generation of test sequences. In the talk, we will focus on the case of communication protocols and reactive embedded systems using, as formal models, transition systems and their extensions (with variables, predicates, clocks, time...). Furthermore, testing architectures are required in order to ensure a degree of controllability and observability.

The problems of the testing and the generation of test sequences are related to the test coverage, reducing the number of tests (and therefore the time spent on testing), reducing the size of tests and architectures.

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