# PRAGMADEV TESTER

## Testing the specification
## as well as the implementation

☆ = ★

### co-simulation

| Model (Specification) | ⟷ | Test suite (Validation) |

### co-generation

| Generated code (Design) | ⟷ | Generated code (Unit & Integration) |
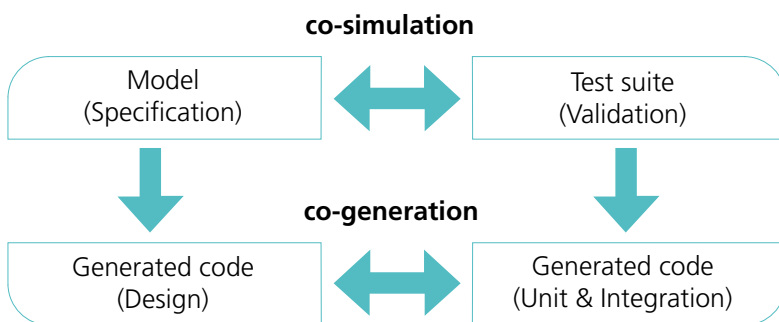
- **MODEL DRIVEN TESTING**
- **CONTINUOUS INTEGRATION**
- **IMPLEMENTATION INDEPENDENT TEST SUITES**
- **LEGIBLE TEST CASES**
- **GRAPHICAL EXECUTION TRACES**

## ■ STANDARD

**PragmaDev Tester implements ITU-T standard testing language TTCN-3** (Testing and Test Control Notation). TTCN-3 has been designed to test all types of systems whether they are event based (asynchronous) or function based (synchronous). **It has been successfully used the last 15 years** in the industry for testing and certification in various domains such as Telecommunication, Automotive, Railway, and Finance.

## ■ DEDICATED

**TTCN-3 is basically a programming language with dedicated test features**:

- It has its own data types or it can use external data types defined in ASN.1.
- It embeds a number of basic services such as timers, messages, parallel testing.
- The concept of templates allows to match very complex information in a single line.
- It embeds the concept of verdict and defines rules to aggregate verdicts coming from different test cases.

Some test equipments support TTCN-3 natively including a TTCN-3 compiler and the adapters to the testing equipment interfaces.

# TTCN-3



*A simple test case*

## ABSTRACT

TTCN-3 is a high level testing language that can be **used to test a high level model of your system**. As PragmaDev Studio supports different modeling technologies such as UML, SDL-RT, and SDL, **the implementation of TTCN-3 in our tool allows to test the model very early in the development process**. In that case the tool will generate the interface between the System Under Test and the Test Suites.

TTCN-3 is also a **very detailed testing language** that can test a software or even a hardware implementation of a system. TTCN-3 defines the concept of Test System Interface in order to adapt the test suite to any kind of system.

*TTCN-3 testing architecture: the control part launches the Master Test Component that starts Parallel Test Components. The interface with the System Under Test is done through ports.*

## INTEGRATED

PragmaDev Tester is part of PragmaDev Studio which offers **three levels of modeling** from informal, semi-formal, to formal. Formal modeling allows to verify the dynamic behavior of the model with the built-in simulator without generating any code. On the test side, the same simulation feature is available so that the simulated model can be tested against a simulated test suite.

Once a high level model is verified, code can be generated for implementation on a real target. Once again, it is possible to generated code out of the test suite to be executed on a real tester and test the implementation of the system. PragmaDev code generator provides integration for the **most popular real time operating systems** and the model debugger has interface with several debuggers and cross-debuggers in order to graphically debug in the model. Integration features and debugger interfaces are available for both the code generated out of the model as well as from the test suite. Last but not least test execution can be **graphically traced with PragmaDev Tracer**.
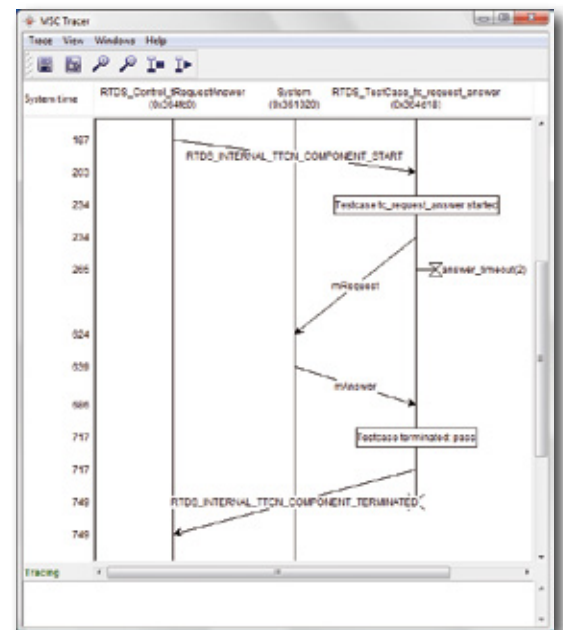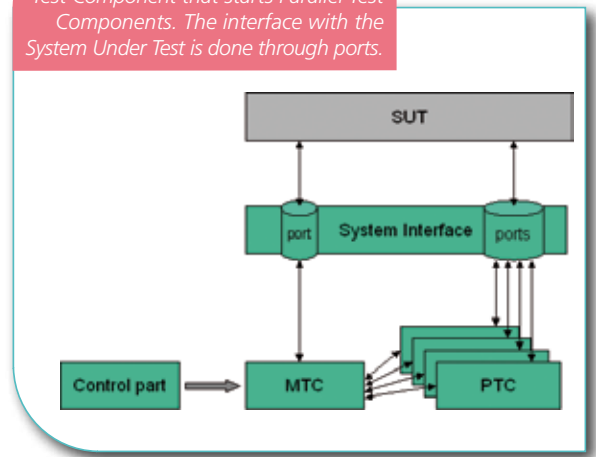


*Execution trace of a test case*
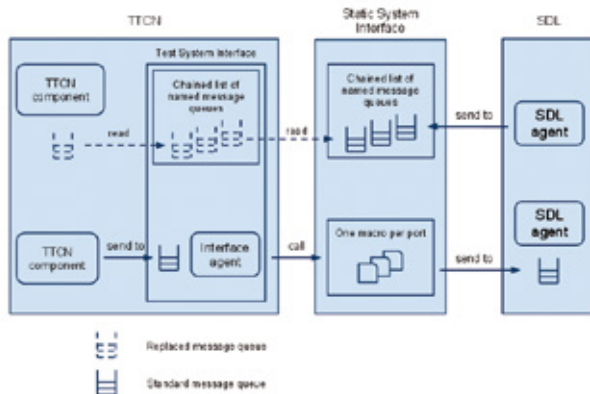


*Easy integration of the generated code with the System Under Test*

## MODEL BASED TESTING

PragmaDev has setup a technical partnership with **Verimag** laboratory in Grenoble and has created a common lab with **CEA List** in Paris. Both labs have a well recognized expertise in model checking. Integration of these technologies allows to automatically generate a set of test cases based on properties, or on coverage of one or several transitions in the reference model.



Reference Model

**generates**

Conformance Test