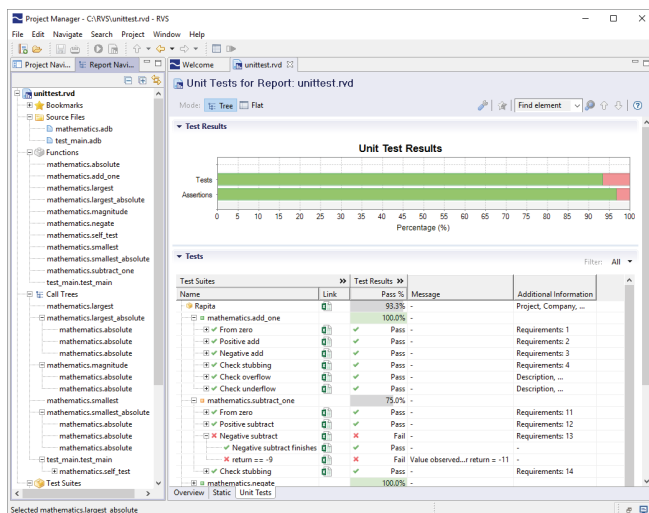# Functional testing for critical software with RapiTest

RapiTest

How can RapiTest help you?

RapiTest drives the inefficiencies out of functional testing in critical software verification projects. By automating the creation and execution of unit, integration and system tests from input tests written in easy to use test formats, it reduces the cost of critical software verification.

RapiTest's test formats make it easy to write tests at any level (unit, integration, system) and define all types of stub behavior used in the industry.

Benefits of using RapiTest

- Automated platform for unit and system testing both **on-target** and **on-host**. Integrate testing into your existing build process to improve the efficiency of your testing.

- **Efficient test generation**. Minimize build cycles and test rig utilization by running multiple tests per build.

- **Fast incremental builds**. RapiTest builds only critical files when your code base changes, even in systems with very large code bases.

- **Manage project artifacts**. import requirements from various formats, link tests to requirements, view test results against requirements and export traceability results.

- **Minimize "usercode"** by writing tests in the powerful spreadsheet and script formats of RapiTest. These let you write test cases for generics or multi-dimensional tables without "usercode".

- **Portable test environments**. Share test environments between multiple testers, even where source code is unavailable to them.

- **Advanced support for Ada**. RapiTest handles even the most complex Ada code constructs such as generics, nested functions and private types.

- **Flexible stubbing options**. Write both simple and complex behavior for stubbed functions easily. RapiTest supports all types of stubbing behavior, including stubs, fakes, mocks, spies and dummies.

- **Interface with other RVS plug-ins**. Integrate coverage, timing and scheduling analysis into your testing process.

How does RapiTest work?

RapiTest uses input test suites to automate functional testing by building a test harness, executing tests, collecting data and generating reports.

It accepts a variety of test input formats supplied through a simple user interface. By integrating with your existing development environment, RapiTest reduces the overheads needed to test your code.

RapiTest supports large testing projects by offering a portable test environment and retaining references to code and revision numbers in test reports.

Key features

Functional testing

- Generate and run functional tests at any level (system, integration, unit)

- Generate test templates quickly

- Automatically generate test vectors to check boundary values for C and C++ functions

- View status of tests for each requirement

- View requirements coverage in UI and continuous integration server

- Merge reports from different test runs and builds

- Analyze source code only once per project to reduce unnecessary overheads

- Easily manage test runs, quick filter and select tests with specific status (new, modified, failed), save and load test selections

- Portable test environments let you use a single project file throughout a team

- Results filtering and search options to highlight project progress over time

- Requirements traceability

    - Import requirements from various formats

    - Link tests to requirements

    - View status of tests for each requirements

    - Export traceability results

- White box testing

- Black box testing

Test authoring

- Minimize usercode by defining even complex tests easily using spreadsheet or script formats

- Automatically reformat spreadsheet tests to ensure readability and easy review

- Write a variety of stub behaviors without usercode

- Tutorials, documentation and training to get started easily

Language support

- Ada 83-2012, support for GNAT Pro™ and Green Hills™ compilers among others

    - Handles even the most complex code constructs such as generics, nested functions and private types

- Support for C and agreed C++ language features

Integration with build system

- Multiple strategies available:

    - Compiler wrappers

    - Clone integration

    - Scripting into build system directly

- Support for very large code bases

- Shared integration with other R**VS** tools

Target integration

- Support for data collection using CAN, Serial, Ethernet, debuggers and our own **RTB**x data logger

- Extremely low overhead map data collection can be configured with a single assembly instruction

- No library/run-time dependencies or dynamic memory requirements

Tool qualification

- Qualification kit and service to support DO-178B/C and ISO 26262 tool qualification

Third party integration

- Tools such as Mx-Suite™, MATLAB® Simulink®, ANSYS® SCADE® Test™ and GNAT GPS

- Continuous build servers

    - Custom plugins for Jenkins and Bamboo

    - Integration with other CI systems such as Microsoft TFS and GitLab supported by JUnit export format

- Support migrating tests from other tools e.g. VectorCAST and AdaTest

- Common requirements management tools through Requirements Interchange Format (ReqIF)

- Debuggers *e.g.* Lauterbach, iSYSTEM

- SCM systems such as Apache® Subversion®

Integrated testing environment

- Summary and detailed results views

- Treemaps to view test results of your system at a glance

- Reduce retesting effort by automatically calculating the most efficient set of tests to run to achieve previous coverage when code changes

- Code viewer:

    - View source code alongside pre-processed and instrumented code

    - Color-coded by whether tests passed or failed

- Compare reports

- Database-like search function

Compatibility

- Runs on host operating systems

    - Windows 7+ and Windows Server 2008 R2+

    - Linux distributions including Ubuntu and Red Hat

- Results can be collected from systems without supported operating systems and transferred to a supported system for analysis

Licensing

- Enterprise license gives you access to new versions, support and maintenance

- One-year support and maintenance included in purchase price

- Single price for all features

- Licenses transferrable across projects