![Rapita Systems - A Danlaw Company - Safety through quality]

PRODUCT BRIEF

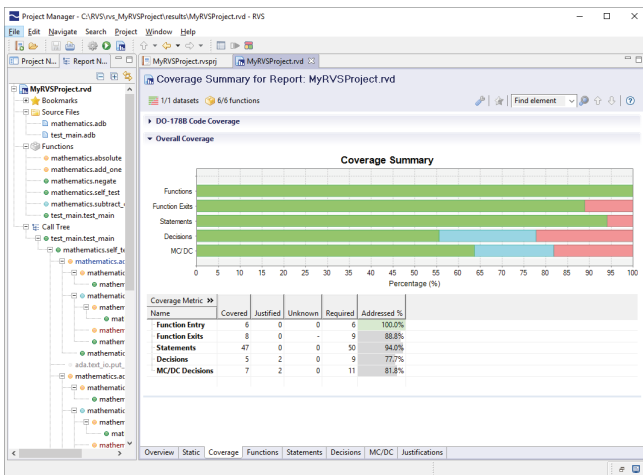# On-target structural code coverage analysis with RapiCover

Product brief: Rapi**Cover**

⊑ Rapi**Cover**

How can Rapi**Cover** help you?

Rapi**Cover** is the leading tool for performing structural code coverage analysis. Designed specifically to work with embedded targets and satisfy certification requirements, Rapi**Cover** supports all coverage metrics required by DO-178B/C and ISO 26262:

- Function coverage
- Statement coverage
- Decision/branch coverage
- MC/DC (modified condition/decision coverage)

*Coverage results collected by Rapi**Cover***

Benefits of using Rapi**Cover**

Rapi**Cover,** the most advanced structural code coverage analysis tool on the market, reduces the time and effort needed to perform structural code coverage analysis in even the most complex critical software projects. By using Rapi**Cover**, you can:

- Complete coverage analysis in fewer test cycles.
- Reduce instrumentation overheads by up to 90% compared to other coverage analysis tools.
- Seamlessly integrate code coverage analysis into your existing development environment.
- Reduce your reporting effort by being able to:
  - Combine multiple reports.
  - Merge coverage from different runs and builds, even when they have different instrumentation.
  - Merge coverage from unit and system level tests.

- "Justify" untested code (coverage holes) and migrate justifications across builds.
- View the progress of your testing over time through continuous build servers such as Jenkins.
- Reduce your certification effort by taking advantage of Rapi**Cover**'s tool qualification support.

Rapi**Cover** use cases

- Identify code uncovered by test requirements.
- Identify test requirements missing for full coverage of your code base.
- Structural code coverage analysis to meet DO-178B/C objectives.
- Structural code coverage analysis to meet ISO 26262 requirements.

How does Rapi**Cover** work?

Rapi**Cover** analyzes your source code to determine the optimal positions to apply instrumentation for coverage analysis. Integration with Rapi**Cover** includes a strategy for efficient collection of map data during your build process. Rapi**Cover** uses the map data obtained when you run your code, either on-host or on-target, to generate a coverage report you can view to see the coverage you obtained.

Rapi**Cover**'s instrumentation process can be customized to suit your coverage analysis needs. Whether you need to perform incremental coverage, instrument "literal" or "traditional" MC/DC decisions or analyze coverage on multi-core architectures, Rapi**Cover** has everything you need.
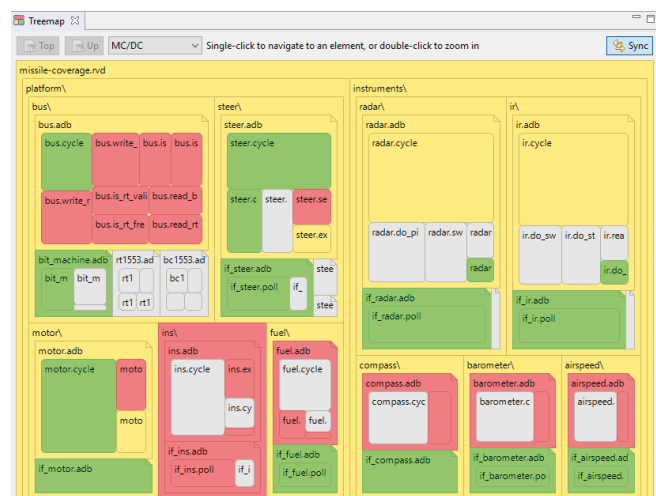
Treemaps view makes it easy to understand your coverage at a glance

Key features

Code coverage analysis

- On-host and on-target structural code coverage analysis
- Statement, function, decision/branch and MC/DC coverage
- Coverage of complex code structures, including:
    - Ada elaboration code and case statements
    - C bitwise operators and assignment operators
    - Non-returning calls
- Fully configurable analysis:
    - Include or exclude specified modules/functions/directories from analysis
    - Apply different coverage instrumentation levels for each folder/file/function
    - CAST-10 "literal" or "traditional" decisions
    - Masking or unique case MC/DC
- Supports up to 1000 conditions per decision
- Merge coverage from different test runs, builds and strategies
- Combine coverage from source code and object code (with Rapi**Cover**^{Zero})

Language support

- Ada 83, 95, 2005 and 2012, compilers including GNAT Pro™ and Green Hills®
- C and C++, compilers including Visual Studio®, GCC™, Diab® and TASKING®
- Assembly code insertions
- Mixed language source code

Build integration

- Multiple strategies available:
    - Compiler wrappers
    - Clone integration
    - Scripting into build system directly
- Support for very large code bases
- Split instrumentation between builds
- Shared integration with other R**VS** tools

Target integration

- Support for data collection using CAN, Serial, Ethernet, debuggers and our **RTB**x data logger
- Extremely low overhead coverage data collection
- No library/run-time dependencies or dynamic memory requirements
- Extremely efficient MC/DC target library
- Collect and report coverage on a per-test basis
- Coverage analysis across power cycles (subject to hardware requirements)

- Freeze and reset coverage collection to eliminate accidental coverage

Justifications

- Assign justifications to manually mark code as covered by analysis
- Apply custom fields and templates to justifications
- Apply justifications to multiple locations
- Migrate justifications when code changes
    - Smart technology identifies new locations for justifications for review
- Multi-user editing support

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® and GNAT GPS™
- Continuous build servers e.g. Jenkins®, Atlassian Bamboo®
- Debuggers e.g. Lauterbach™, i-SYSTEM®

Integrated testing environment

- Summary and detailed results views
- Treemap view for coverage overview and navigation
- Code viewer:
    - View source code alongside pre-processed and instrumented code
    - Color-coded by analysis type and whether code is covered, uncovered or justified
    - View missing coverage up to the condition level
- Suggest missing test vectors for MC/DC coverage
- Compare reports
- Database-like search function
- Configurable export formats
- Multi-user testing environment

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

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About Rapita

Rapita Systems provides on-target software verification tools and services globally to the embedded aerospace and automotive electronics industries.

Our solutions help to increase software quality, deliver evidence to meet safety and certification objectives and reduce costs.

Find out more

A range of free high-quality materials are available at:
rapitasystems.com/downloads

SUPPORTING CUSTOMERS WITH:

| Tools	Services	Multicore verification
Rapita **Verification Suite**:	V&V Services	CAST-32A Compliance
Rapi**Test**	Integration Services	Multicore Timing Solution
Rapi**Cover**	Qualification	
Rapi**Time**	SW/HW Engineering	
Rapi**Task**	Compiler Verification	

Contact

Rapita Systems Ltd.
Atlas House
York, UK
YO10 3JB

+44 (0)1904 413945

Rapita Systems, Inc.
41131 Vincenti Ct.
Novi, Mi, 48375
USA

+1 248-957-9801
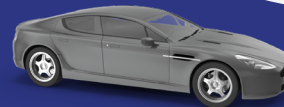
rapitasystems.com

linkedin.com/company/rapita-systems

info@rapitasystems.com