

On-target structural code coverage analysis with RapiCover

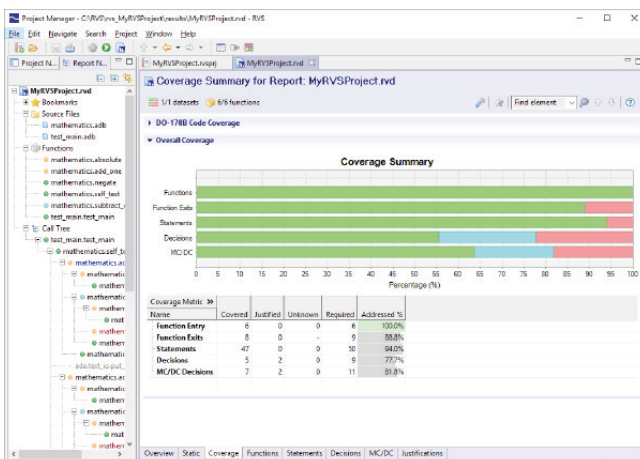
RapiCover

How can RapiCover help you?

RapiCover is the leading tool for performing structural code coverage analysis. Designed specifically to work with embedded targets and satisfy certification requirements, RapiCover 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)

- 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 RapiCover’s tool qualification support.



RapiCover 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.

Benefits of using RapiCover

RapiCover, 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 RapiCover, 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.

How does RapiCover work?

RapiCover analyzes your source code to determine the optimal positions to apply instrumentation for coverage analysis. Integration with RapiCover includes a strategy for efficient collection of map data during your build process. RapiCover 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.

RapiCover’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, RapiCover has everything you need.

Key features of RapiCover

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 RapiCover^{Zero})

Language support

- Ada 83, 95, 2005 and 2012, support for compilers including GNAT Pro and Green Hills
- C and C++, support for compilers including VisualStudio, 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 RVS tools

Target integration

- Support for data collection using CAN, Serial, Ethernet, debuggers and our RTBx 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
 - Custom plugins for Jenkins and Bamboo
 - Integration with other CI systems such as Microsoft TFS and GitLab supported by Cobertura export format
- Debuggers e.g. Lauterbach, iSYSTEM

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
- Mask source code to support verification of confidential code with third-party organizations

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



Rapita Systems Inc.
41131 Vincenti Ct.
Novi, MI 48375

Tel (USA):
+1 248-957-9801

Rapita Systems Ltd.
Atlas House, Osbaldwick Link Road
York, YO10 3JB
Registered in England & Wales: 5011090

Tel (UK/International):
+44 (0)1904 413945