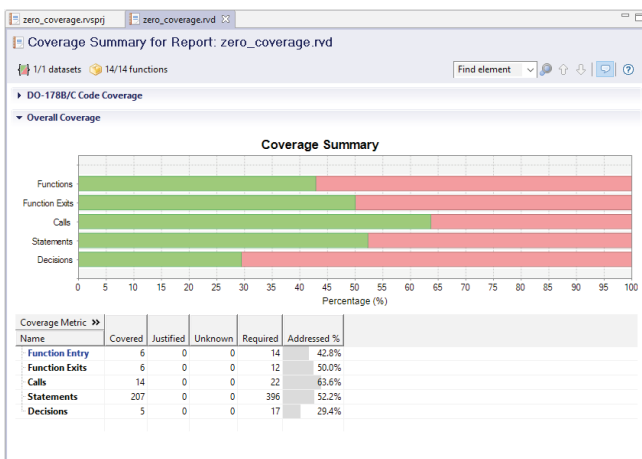


Zero-footprint coverage analysis with RapiCover^{Zero}

RapiCover^{Zero}

How can RapiCover^{Zero} help you?

RapiCover^{Zero} lets you observe the structural coverage achieved during the execution of object code from critical software without needing to make any modifications to, or even have access to, your project's source code.



Benefits

Verify the structural coverage achieved from tests of critical software without needing:

- Any instrumentation.
- Project source code.
- Any modification to your development environment.

RapiCover^{Zero} use cases

- Structural coverage analysis for third-party libraries.
- Structural coverage analysis with no impact on the code base or development environment.
- Structural coverage analysis to meet DO-178B/C objectives.
- Structural coverage analysis to meet ISO 26262 requirements.

How does RapiCover^{Zero} work?

RapiCover^{Zero} reconstructs information on software execution behavior by matching branch trace information collected from the hardware (which must support this) with a control flow graph produced from a disassembly of the software binary.

Having matched this data, a reconstructed branch trace is created, which can be used to analyze the coverage of the executable code that was achieved while it ran.

The branch trace is a crucial component of the analysis process and this must be available in the existing development environment through the CPU and/or external hardware being used.

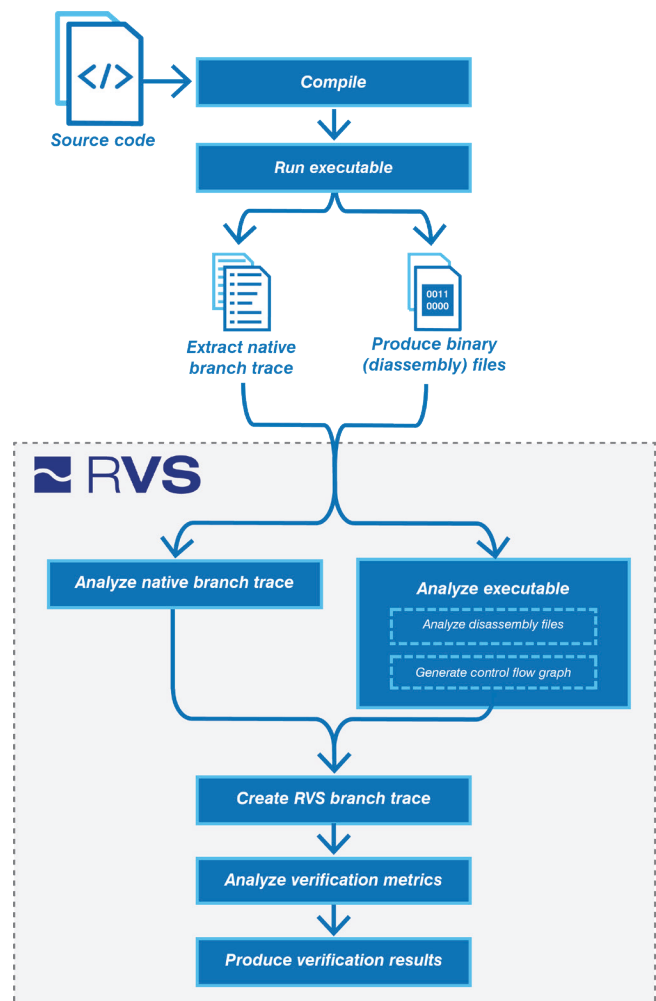


Figure 1. RapiCover^{Zero} verification process

Key features

Structural coverage analysis

- Statement, function, decision and branch coverage directly from object code
- Merge coverage from different test runs, builds and strategies
- Combine coverage from object code and source code analysis (with RapiCover)

Language support

- Any language that targets machine code
- Mixed source languages

Supported development environments

- Development environment must produce and collect branch trace information during program execution
- Platform Support Package required to interface between RapiTaskZero and development environment
- For more information, see the Zero-footprint hardware support page on our website
- We develop additional Platform Support Packages for compatible environments

Integration support

- Automatable testing environment
- Support for very large code bases
- No library/run-time dependencies or dynamic memory requirements
- Coverage analysis across power cycles (subject to hardware requirements)
- Shared integration with other zero footprint RVS tools
- Continuous build servers e.g. Jenkins, Bamboo
- Multicore support (depending on hardware support)

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
- Import justifications from and export to third-party tools
- Multi-user editing support

Integrated testing environment

- Summary and detailed results views
- Treemap view for coverage overview and navigation
- Filter results by subprogram

- Code viewer:
 - View object code alongside source code, where available
 - Color-coded by analysis type and whether code is covered, uncovered or justified
 - View missing coverage
- Compare reports
- Database-like search function
- Multiple export formats e.g. text, XML, CSV, HTML
- 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

Should I use RapiCover or RapiCoverZero?

RapiCoverZero offers many benefits, but in some cases RapiCover may be more appropriate for you. Consult Table 1 below to decide if RapiCoverZero or RapiCover is best for you. For more information, contact us at info@rapitasystems.com.

Table 1. Comparison of key RapiCover and RapiCoverZero features

Feature	RapiCover	RapiCoverZero
Works without source code	No	Yes
Works without Instrumentation	No	Yes
Integration with development environment	Integration needed	No integration needed
MC/DC analysis	Yes	No
Tool qualification support	Yes	Not yet available
Trace size and data processing time	Depends on applied instrumentation	Typically larger trace and longer data processing times
Supported development environments (target, data collection mechanism)	Flexible, almost any environment supported	Specific environment and PSP needed



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