RAPITA Systems
A BAE Systems Company

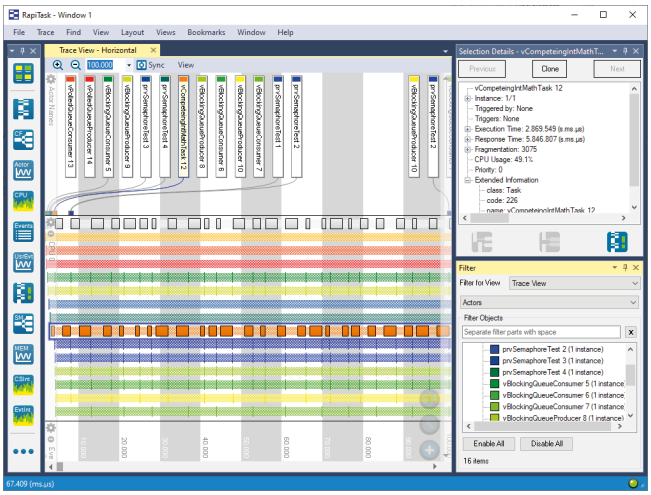
Product brief

Zero-footprint RTOS event tracing with RapiTask*Zero*

RapiTask Zero

How can RapiTask*Zero* help you?

RapiTask*Zero* lets you observe the execution time behavior 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 execution time behavior from tests of critical software without needing:

- Any instrumentation.
- Project source code.
- Any modification to your build system.

RapiTask*Zero* use cases

- Understand system scheduling behavior.
- Locate rare timing events.
- Understand system capacity issues.

How does RapiTask*Zero* work?

RapiTask*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 scheduling behavior of the executable code 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.

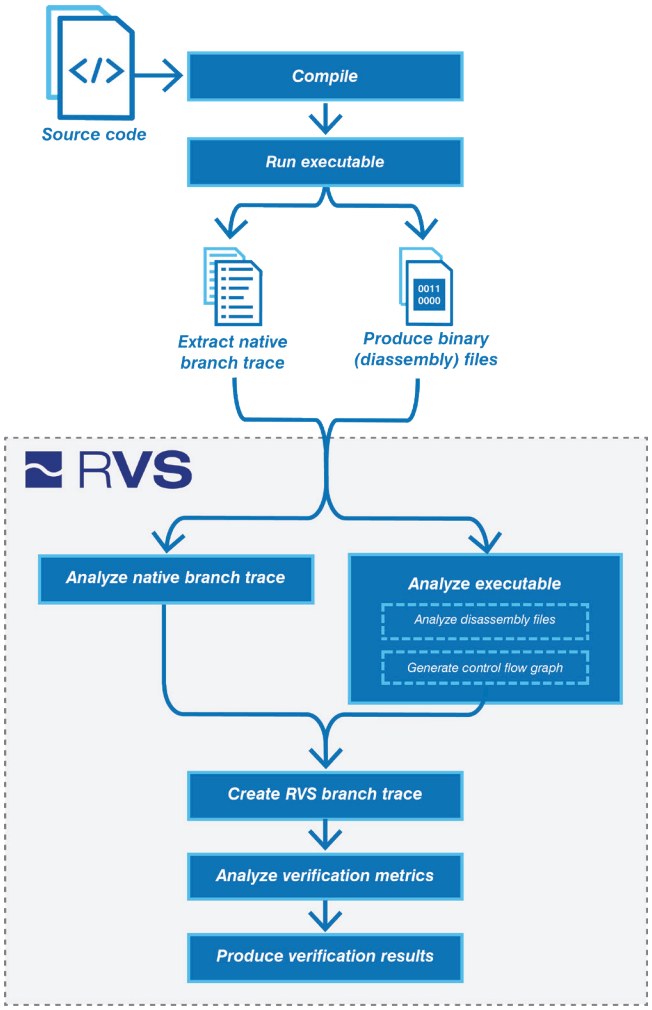


*Figure 1. RapiTask*Zero* verification process*

Key features

Task-level timing analysis

- Analyze task-level timing metrics directly from object code
- Calculation of system-level scheduling metrics and related data:
  - Response time
  - Periodicity
  - Jitter
  - CPU utilization
  - Fragmentation
- RTOS-independent scheduling visulization

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 Rapi**Task**^{Zero} 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
- Shared integration with other zero footprint R**VS** tools
- Multicore support (depending on hardware support)

Integrated testing environment

- Invocation timeline charts to help understand timing behavior at a glance
- Custom task coloring
- Hide tasks
- Jump to trace location
- Trace rewind feature to debug timing behavior
- Filter results by subprogram
- Code viewer:
  - View object code alongside source code, where available
- Database-like search function
- Multi-user testing environment

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 RapiTask or RapiTask^{Zero}?

Rapi**Task**^{Zero} offers many benefits, but in some cases Rapi**Task** may be more appropriate for you. Consult Table 1 below to decide if Rapi**Task**^{Zero} or Rapi**Task** is best for you. For more information, contact us at enquiries@rapitasystems.com.

*Table 1. Comparison of key Rapi**Task** and Rapi**Task**^{Zero} features*

Feature	RapiTask	RapiTask^{Zero}
Works without source code	No	Yes
Works without instrumentation	No	Yes
Integration with development environment	Integration needed	No integration needed
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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