



## Rapita Verification Suite v3.4



On-target software verification solutions



# Rapita Verification Suite

RVS significantly reduces the cost and effort of understanding, measuring, verifying and optimizing embedded, real-time software for high-integrity applications

**RVS provides a framework for on-target verification for embedded, real-time software (Figure 1). This relies on observing the software running on its actual target hardware.**

RVS helps you to verify:

- Software timing performance (Rapi**Time**)
- Structural code coverage (Rapi**Cover**)
- Scheduling behavior (Rapi**Task**)
- Other properties (See “Early Access Program”, overleaf)

**RVS is available in two variants:**

**RVS Aero** supports the verification of high integrity, safety-critical avionics projects written in Ada or C. It can support legacy architectures and development tools found in lengthy projects. RVS Aero ultimately helps engineers to satisfy DO-178B/C or equivalent military standards.

**RVS Auto** addresses the specific needs of the automotive market. It supports engineers working with micro-controllers of all sizes, whether using real-time operating systems (including AUTOSAR OS compliant) or not, and helps meet the increasingly frequent requirement for ISO 26262.

*“The more challenging the development and test environment, the less likely it is to benefit from pure “off the shelf” solutions. Our engineers work with you to understand the issues you face, helping you to devise a customized solution for your target environment.”*

[www.rapitasystems.com](http://www.rapitasystems.com)

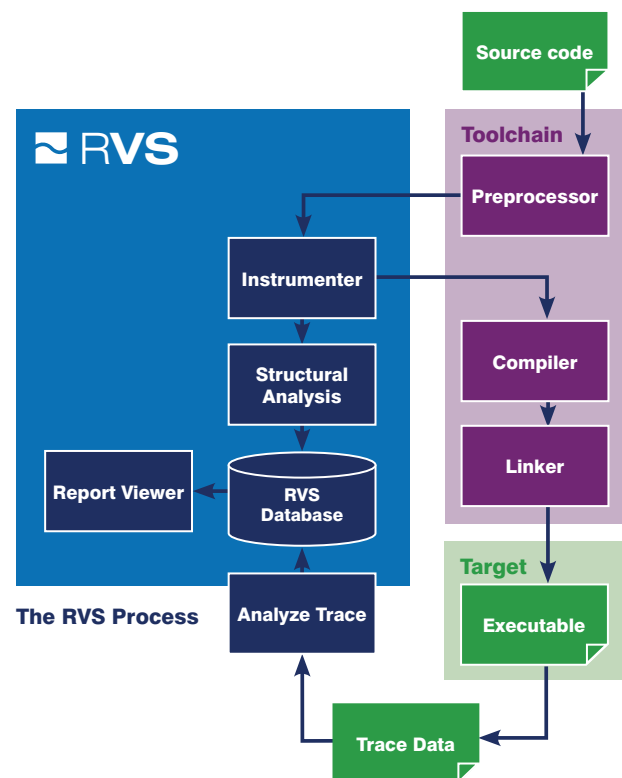


Figure 1: On-target verification with RVS

## RVS: A “Tailored COTS” solution

Using commercial-off-the-shelf (COTS) verification tools for embedded systems presents a problem: the variety of parts (compilers, processors, RTOS) means a typical COTS “one-size-fits-all” verification tool is a poor fit.

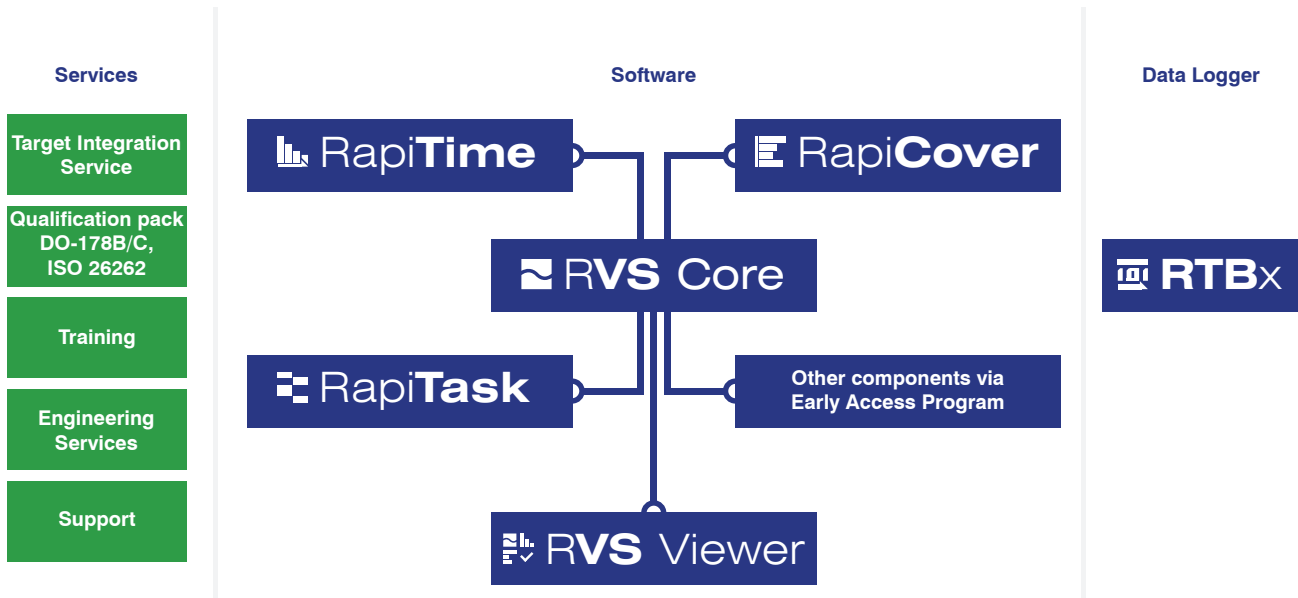
To provide the best possible verification solution for your embedded environment, each RVS deployment uses a customized integration. This integration can be developed by you, following our guidance; or we can

provide our Target Integration Service (see overleaf), which achieves a high-quality integration in minimal time.

Compared to standard COTS, this “Tailored COTS” solution results in:

- Fewer tests required to collect results
- Reduced effort and costs
- Verification data optimized to meet your project’s needs

# Verification solutions for engineers working on critical real-time embedded systems



## RapiTime

RapiTime is a performance measurement and timing analysis tool.

Working on your target system, RapiTime measures performance, determines worst-case execution times (WCET), and guides your optimization efforts.

The benefits provided by RapiTime include:

- Reducing costs of measuring execution time for your application with automated instrumentation, measurement and analysis.
- Providing usable WCET values derived from actual system measurements.
- De-risking optimization activities by rapidly identifying the best opportunities to increase performance.



## RapiCover

RapiCover is a structural coverage analysis tool designed specifically to work with embedded targets. RapiCover supports analysis up to and including MC/DC.

The benefits RapiCover provides include:

- Completing coverage testing in fewer test cycles due to a minimal memory footprint/performance impact, which comes from RapiCover's lightweight, configurable instrumentation.
- Reducing reporting effort. RapiCover reports support combining multiple coverage reports and justifying untested code.
- Reducing certification risk. RapiCover handles many complex coding structures not supported by other code coverage tools.



## RapiTask

RapiTask provides visualization of RTOS scheduling and event tracing for complex embedded systems. RapiTask supports detailed investigation of timing issues via an interface to RapiTime.

Benefits that RapiTask delivers include:

- Reducing debugging time by helping to locate rare timing events, such as race conditions.
- De-risking system integration activities by understanding system capacity and load issues on multitasking and multicore systems.
- Protecting your investment: RapiTask is portable between many target systems – not tied to a specific RTOS.



## Rapita Systems Ltd

We specialize in providing customized on-target verification solutions for large critical real-time embedded software systems in the avionics and automotive electronics markets.

Founded in 2004 to bring real-time verification products to market, Rapita Systems now has clients and distributors around the world.

### RVS tools support

**Languages:** C, C++ and Ada (RVS Aero); C and C++ (RVS Auto).

RVS has been used with a wide variety of compilers, processors, real-time operating systems and data logging solutions including:

**Processors:** PowerPC; Intel x86; ARM; Infineon Tricore, C166 (and derivatives); Freescale HC12/HCS12/HCS12X, 68k, P4080; NEC V850; MIPS; TI TMS320; LEON and others.

**C, C++ Compilers:** ANSI C, Wind River, GCC, Tasking, Cosmic, Green Hills, IAR, Keil, MSVC, Borland and others.

**Ada Compilers:** AdaCore, GNAT, Green Hills, XD Ada

**Host Operating Systems:** Windows 2000, XP, Vista, 7 and 8, Linux

**Real-Time Operating Systems:** VxWorks, Integrity, AUTOSAR, PikeOS, DEOS and others

**Data logging methods:** Rapita's RTBx, Lauterbach, iSystems, in-memory, Nexus, ARM ETM, Tektronix Logic Analyzers.

The RVS tool architecture allows you to integrate with new targets, compilers, real-time operating systems and data logging solutions. We can also do this for you: see Target Integration Service (below).

### Target Integration Service

To achieve the best results from RVS, we recommend the Target Integration Service. This package results in a high-quality integration, allowing you to get the best possible verification results in the most convenient way.

## Support

Rapita's policy is to always provide you with the best level of support we can realistically achieve. This includes fast turnaround of any issues you may have and the flexibility to provide interim releases quickly. We have a strong history of excellent support and regard this aspect as an essential part of providing a quality product

### Qualification Kits

To facilitate your use of RVS tools as verification tools within a project requiring DO-178B/C or ISO26262 certification, we provide several options:

- Qualification Data
- Qualification Kit
- Qualification Service

### Early Access Program

We participate in many collaborative research programs, with a large variety of organizations. This results in our development of a wide range of advanced technologies in various pre-production stages.

Rapita's customers have greatly benefitted from having access to this technology.

Working with us in our Early Access Program gives you the ability to use our pre-production technology for your specific needs. Access to this technology is normally provided through defined engineering services and gives you the opportunity to influence the development of the technology into a product.

### For more information on RVS:

- Visit [www.rapitasystems.com](http://www.rapitasystems.com)
- Download white papers at:  
[www.rapitasystems.com/downloads](http://www.rapitasystems.com/downloads)
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