RAPITA SYSTEMS
A DANLAW COMPANY

Safety through quality

BROCHURE

Software verification services for aerospace

Document ID: MC-BR-005 Aerospace Software V&V v13 INDT-v10

Proven testing solutions for critical software

We provide expert **software verification services** to the aerospace industry, increasing software quality, delivering evidence to meet safety and certification objectives and reducing project costs.

Verification and validation activities

- Unit and integration testing
- System and acceptance testing
- DO-178C process definition and optimization
- Test automation
- Timing analysis and optimization
- On-target problem solving
- Third-party software verification
- Assurance services

> *We approached Rapita looking for a complete end-to-end solution for software verification. Rapita delivered this and has also performed a range of system-level activities.*
>
> *We've appreciated their responsiveness from the get-go and the obvious synergies from having testers and tool provider under one roof.*
>
> *Jim Pettinger, Director of Electronic Systems at Triumph Integrated Systems*

Reduce testing effort

Our fusion of expertise, smart processes and industry-leading tools reduces the effort needed to test critical software:

Engineering expertise

Our dedicated and experienced engineering teams are ready to apply themselves to test projects worldwide, working either on-site or at our offices in the UK and US.

Smart processes

Our proven V&V processes work alongside your quality management system, allowing us to provide high-quality solutions on-time, on-budget, every time.

Rapita tools

Our industry-leading software verification toolset, R**VS**, underpins our V&V services, helping our engineers to efficiently produce verification evidence for your project.

Working with us

- We recognize that each test project is different, and work with you to meet your needs.
- We run testing activities both on-site and at our UK and US offices, and can support **UK / US EYES ONLY** projects.
- We can host test equipment at our offices to facilitate system and acceptance test activities.

Meeting verification objectives

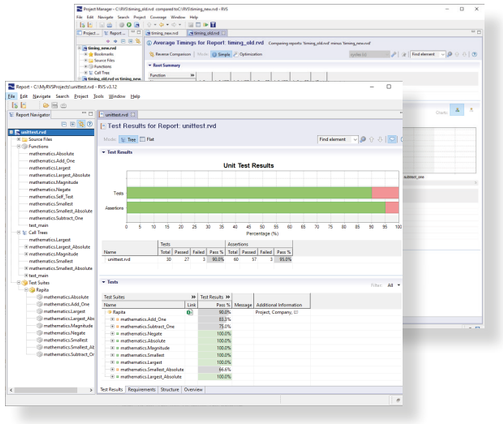
Unit and integration testing

Unit and integration testing

Unit and integration-level testing of critical software demonstrates that the software complies with its low-level requirements and is robust.

We provide unit and integration-testing services including the following:

- Reviewing low-level requirements
- Writing and running requirements-based test cases and procedures
- Performing requirements-based and structural coverage analysis (including MC/DC)
- Producing verification evidence for DO-178C or other guidelines/standards
- Raising problem reports



Our engineers perform unit and integration testing activities efficiently. They are experts at using Rapi**Test**, which reduces the time needed to write and run tests, and analyze results, improving project efficiency. We support testing activities for DO-178C projects up to and including Design Assurance Level A.

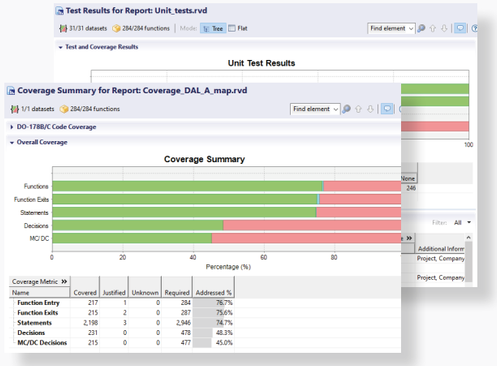
System and acceptance testing

System and acceptance testing

Testing systems end-to-end is crucial in ensuring that the whole system works correctly when components are combined. During testing, the software components in the system should be shown to interact correctly with each other and satisfy requirements.

We provide system-level testing services including the following:

- Testing high-level requirements
- Setting up simulations of a system's direct environment at physical interface level
- Developing system-level tests to demonstrate functional and performance requirements
- Identifying and highlighting faults during tests



We reduce the effort needed to perform system and acceptance testing by integrating seamlessly into your existing team and getting up to speed quickly on your test rig. If needed, we can host and operate test equipment at our offices in the UK and US.

Process improvement & automation

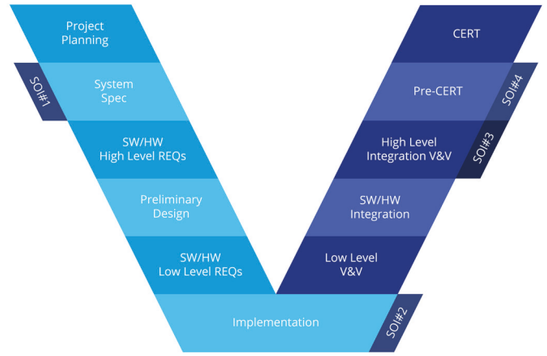
DO-178C process definition and optimization

DO-178C process definition and optimization

DO-178C guidelines define objectives for the software life cycle process and the evidence that must be supplied to indicate that these objectives have been met. To ensure compliance, it is crucial to understand DO-178C objectives and follow efficient processes.

We offer services including the following to help define and optimize DO-178 processes:

- Defining efficient compliance processes
- Performing gap analysis to highlight process changes needed for compliance
- Reviewing test plans to improve process efficiency
- Training on DO-178C processes, potential pitfalls and migrating from DO-178B to C
- Certification and DER services, compliance finding and SOI audits



We offer these services together with our partner ConsuNova, a global leader in consultancy services that ensure compliance and an efficient project testing life cycle. ConsuNova's staff are compliance experts with significant experience in the industry, many of whom are active DERs.

Test automation

Test automation

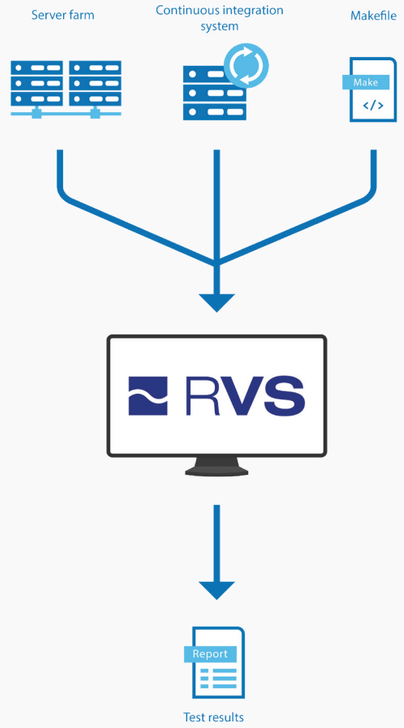
Automated testing is crucial to the efficiency of critical V&V projects. This helps to ensure that a project is completed on-time and on-budget, and gives confidence that results are accurate and repeatable.

We provide test automation solutions including the following:

Defining efficient compliance processes

- Developing custom test systems to automate acceptance test procedures
- Integrating R**VS** tools with specific development environments and target hardware
- Configuring systems to run tests automatically in continuous build environments
- Reducing unit test generation effort through automatic template generation

With access to powerful tools such as R**VS** and Mx-Suite™, our engineers can increase the level of test automation in your project.

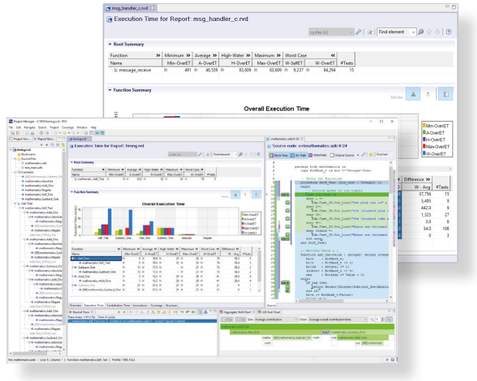


Expert support when you need it

Timing analysis and optimization

Timing analysis and optimization

Critical software must often meet stringent execution time requirements, requiring analysis of the software's timing behavior. This analysis is also needed when upgrading legacy systems with new functionality, or to extract maximum performance from the hardware platform being used. Further, evidence from timing analysis is needed to certify software for critical applications.



We support your needs for timing analysis through activities including:

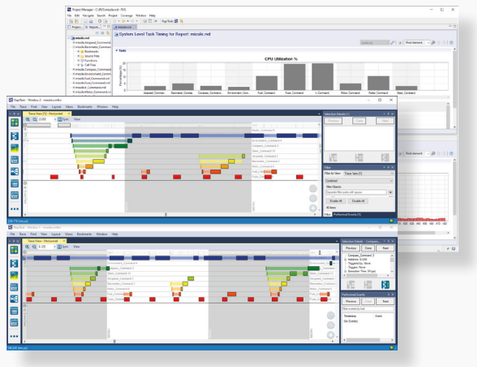
- Measuring and analyzing execution time behavior
- Producing worst-case execution time evidence for certification
- Identifying candidates for timing optimization and optimizing systems
- Providing expert support when evaluating and working with multicore processors

Rapita was founded on the development of innovative timing analysis technology, and we've remained at the forefront ever since. We have continued our world-leading research into novel techniques including multicore timing analysis, and development of the best timing analysis tool on the market, Rapi**Time**.

On-target problem solving

On-target problem solving

We offer expert help to diagnose and resolve unexpected problems that may occur during your project life cycle. By identifying and resolving these quickly, we help you keep your project on-time and on-budget.



We can help you solve a range of on-target problems including:

- Resolving differences in system behavior between host and target implementations
- Investigating issues related to third-party RTOS and BSP components
- Freeing up target resources to host additional functionality while maintaining performance
- Ensuring seamless migration of software from a legacy platform to a new target

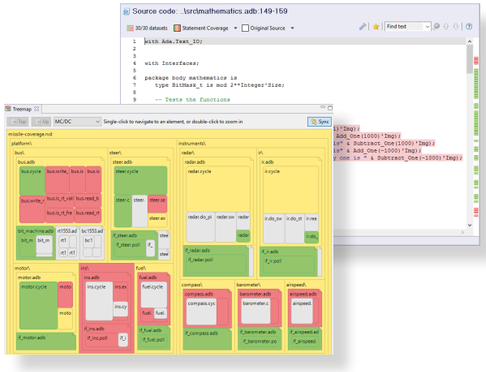
Our expert engineers are able to quickly understand your code base, domain and target environment, diagnose problems (using R**VS** tools where appropriate) and recommend clear paths to resolution. We are responsive and work closely with you to resolve difficult problems in an efficient and timely manner.

Associated services

Third-party software verification

Third-party software verification

Third-party, off-the-shelf software is often utilized in critical software projects. When it is, it must be shown to behave as expected and not introduce risks or errors, particularly in high-criticality contexts such as DO-178B/C.



We offer services including the following to support your use of third-party software:

- RTOS verification
- Compiler verification and validation
- Project-specific tool qualification and testing

Our expert engineers can apply their experience to verify third-party software used in your project. By providing an independent solution that you can trust, we remove the burden of verification from you, so you can focus your effort on project-specific implementations.

Assurance services

Assurance services

Safety analysis is crucial in assuring the integrity of software systems. By addressing safety throughout the development life cycle, issues can be identified and resolved earlier, when they are much more cost-effective to resolve.

Likelihood	Severity: Negligible (1)	Minor (2)	Moderate (3)	Major (4)	Fatal (5)
Rare (1)	1	2	3	4	5
Unlikekly (2)	2	4	6	8	10
Possible (3)	3	6	9	12	15
Likekly (4)	4	8	12	16	20
Certain (5)	5	10	15	20	25

We offer independent software assurance services for critical and high-integrity software including:

- Software assessment, including HAZOP, SHARD, STAMP and FPTC
- Software assurance case generation, including safety arguments, GSN and CAE
- Software life cycle environment analysis including tool criteria evaluation, tool defect assessment and tool qualification
- Software vulnerability analysis – coding standards and programming language semantics
- Software process assessment – configuration control, quality assurance, traceability and review records

Third-party software verification

Assurance services

RAPITA Systems
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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	Engineering Services	Multicore verification
Rapita **Verification Suite**:	V&V Services	**MACH**[178]
Rapi**Test**	Integration Services	Multicore Timing Solution
Rapi**Cover**	Qualification	
Rapi**Time**	SW/HW Engineering	
Rapi**Task**	Compiler Verification	

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