RAPITA SYSTEMS
A DANLAW COMPANY

Safety through quality

CASE STUDY

RapiCover

GMV verify ISO26262 automotive software with RVS

Case study: RapiCover

"RapiCover has been a critical element to achieve the project objectives: its integration and reporting capabilities has given us data we can trust on the progress of the verification activities and the quality of our software"

GMV is a leader in the automotive sector with more than 20 years of experience.

Its solutions include cutting-edge technologies in autonomous driving, such us GNSS-based positioning & ADAS (computer vision, navigation, motion planning), SDV solutions (cloud-native & embedded-native architectures, microservices), safety-critical systems (up to ASIL-D, ISO 26262, ISO 21448), AI (Data processing, Decision-making, Situational Awareness, ML), cybersecurity (services, ISO 21434, PSOC & VSOC), connected vehicle solutions (safety & security, mobility, telematics) and C-ITS services (V2X).

GMV head office in Madrid, Tres Cantos

It offers customized developments for different platforms (in-vehicle, mobile, infrastructure, cloud) and flexible collaboration with OEMs, Tier-1s, infrastructure, mobility service providers.

Summary

The challenge

- Code coverage analysis for safety-critical automotive software for a large European OEM
- The project was a large C++ project using modern language features and a sophisticated build system
- Qualification support needed for ISO 26262 certification

The solution

- Rapita supported GMV engineers to implement a Rapi**Cover** integration to collect coverage results during testing
- Two reporting configurations implemented to support customer workflow
- Qualification kit provided for project

The benefits

- Flexible integration supported analysis of modern C++ code on build system
- Support enabled GMV engineers to implement the integration
- Flexible licensing supported qualification across GMV business units

The challenge

GMV were looking for a solution for code coverage analysis for their safety-critical automotive software, which they were developing for a large European OEM.

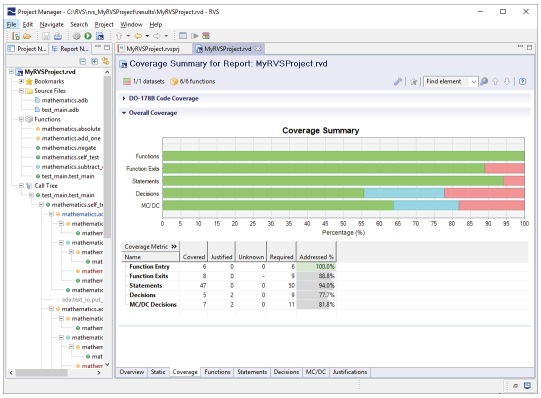
The software was written in C++, and the project was very large, and built using a sophisticated build system.

As the end software required ISO 26262 certification, the solution would need to be qualified.

GMV selected Rapita Systems and its R**VS** software to help implement a robust verification workflow for the project.

The solution

Rapita worked with GMV engineers to integrate Rapi**Cover**, Rapita's code coverage analysis solution, into the project environment.



*Coverage Summary Report in Rapi**Cover***

The solution could produce coverage results for function call, statement, and branch coverage, as well as Modified Condition/Decision Coverage (MC/DC). While the project didn't require coverage analysis at the MC/DC level, this was available in the integration, which was helpful for futureproofing GMV's project and verification processes.

To support analysis of the modern C++ language features used in GMV's code, specific compiler extensions were added to the project to ensure that Rapi**Cover** could analyze the full code base.

The GMV and Rapita team set up two configurations for reporting of coverage results, including reporting using GMV's continuous integration system.

To meet ISO 26262 requirements, GMV needed Rapi**Cover** to be qualified for use on the project. This was achieved by the combination of an off-the-shelf qualification kit for Rapi**Cover**, together with a qualified integration service to ensure that the use of Rapi**Cover** on GMV's specific environment was robust.

The benefits

Rapi**Cover**'s flexible integration strategies ensured that coverage results could be collected efficiently even on GMV's project environment, which was complex. Rapi**Cover** handled coverage reporting for the full project, which was very large, and compiler extensions ensured support for all of GMV's C++ code. This also supported reporting using GMV's preferred process, which was to have two reporting mechanisms, including reporting through their continuous integration system.

As Rapi**Cover** supports the automation of coverage analysis and reporting up to MC/DC, the use of Rapi**Cover** on the project has provided confidence that Rapi**Cover** can meet GMV's verification needs if they later require it for other projects.

Rapita's flexible licensing supported qualification for the project. The qualification kits deployed for this project were pre-purchased by GMV's central procurement department, and can be used for ISO 26262 and DO178C (aerospace) projects with no restrictions.

> "Rapi**Cover** is a flexible tool that has increased the efficiency of our engineering team. Rapi**Cover** has been a critical element to achieve the project objectives: its integration and reporting capabilities has given us data we can trust on the progress of the verification activities and the quality of our software. Rapita support has exceeded our expectations."
>
> **Ricardo Eito Brun**
>
> Quality Assurance Manager
> **GMV**

Next steps

To learn how Rapi**Cover** can help reduce the cost and effort of code coverage analysis, see our product page.

To enquire about how Rapita can help, visit our contact page.

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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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