RTI Safety-Critical Architecture Assessment

HIGHLIGHTS

The RTI/Verocel Safety-Critical Architecture Assessment reduces your risk by providing comprehensive safety-critical and system-certifiability design analysis.

SAFETY-CRITICAL ARCHITECTURE ASSESSMENT

RTI and Verocel offer a joint Safety-Critical Architecture Assessment, ensuring that certification rigor is architected into your distributed real-time system from the start.

The Safety-Critical Architecture Assessment extends the RTI Architecture Study by adding in-depth safety-critical and systemcertifiability design analysis. The assessment includes analysis of system data distribution, integration, platform architecture and certification requirements. This includes mapping safety-critical data distribution technology to system functional requirements and partitioning frameworks, as well as determining traceability and artifact evidence materials required for satisfying certification criteria such as DO-178B/ED-12B Level A.

COMBINING RTI AND VEROCEL EXPERTISE

Leveraging middleware, platform, and safety-critical certification expertise at the start of your project reduces risk and ensures an optimal architectural design that is certifiable. RTI and Verocel have combined their expertise to address the difficult task of designing systems such that the system software can satisfy the safety certification criteria — and be affordable — particularly when having to absorb enhancements. In addition, the Safety-Critical Architecture Assessment will cover:

- Integrated Modular Avionics (IMA) certification of distributed system

- Certifying new and legacy modules

- Addressing the effort necessary in raising software levels (e.g., from DO-178B Level C to A)

Our RTI Professional Services team is made up of the best and the brightest in the area of critical systems development. RTI will train your team, match your system requirements to a data distribution design, and provide project development support in order to mitigate your project risk, increase productivity and ensure quality in your final deliverable — often on a shortened schedule.

The assessment also addresses the certification of new technologies, such as XML-based configuration and object-oriented paradigms.

RTI and Verocel perform the study by spending several days onsite with your system designers at the beginning of an engagement. We then consult with the designers as needed over a 3–5 week period. At the end of the engagement, RTI and Verocel engineers jointly deliver a written report and present the conclusions and recommendations.

SAFETY-CRITICAL ARCHITECTURE ASSESSMENT

Designing safety-critical systems is increasingly challenging as software complexity escalates and business demands push systems into riskier and more diverse uses. While the guidance on airborne software certification is mature, issues are still evolving with respect to software re-use, military avionics certification, ground-based software and other technologies such as object-oriented and modelbased designs.

The Safety-Critical Architecture Assessment supplements RTI's distributed systems expertise with strategic guidance

to aid solution developers and integrators in architecting systems with safety certification in mind. The goal of the assessment is to provide guidance necessary to map a path to affordable system certification. This includes assessing available middleware technologies, performing functional gap analysis and mapping required middleware and application module functionality to appropriate partitioning platforms.

The assessment also addresses the formidable task of coordinating and delivering traceability and artifact evidence materials for certification criteria. The RTCA/DO-178B (EUROCAE/ED-12B) guidance document describes objectives that must be satisfied, but does not prescribe how to achieve these objectives. This Safety-Critical Architecture Assessment addresses what is necessary to design a certifiable system and create the certification materials that will be acceptable during all of the audits leading to the final audit before approval.

THE ASSESSMENT COVERS:

- Analyze Connext Safety Critical API, discovery and QoS policies with respect to system platform and functional requirements— yielding gap analysis

- Analyze the software aspects of certification including the applicability of current guidance documents (DO-178B/ED-12B, DO-248B, and DO-297)

- Review any existing company specific plans, standards, and currently available artifact evidence with the goal of providing guidance so your project can achieve compliance with the selected/recommended standard.

- Assess the effort necessary to develop all verification materials— analysis and reviews of design, code, and tests necessary to certify your system

- Assess the effort to review, analyze, and test your software and its related components with the independence required by regulators

- Report on how to deploy open architecture and data-centric systems while satisfying safety-critical objectives

- Report on how to manage the lifecycle of certifiable systems and perform incremental certification when enhancements are required

- Assess performance trade-offs with safety certifiability: design and technology recommendations for high-performance distributed systems

- Architectural guidance and safety-critical technology recommendations to best meet regulators' requirements while balancing development time and cost (e.g., use of robustly partitioned systems and object-oriented practices)

- Assess effort of raising existing software to a higher assurance level (e.g. DO-178B Level C to A)

- Report on how to design and manage certifiable and reusable software modules and their lifecycle data

- Report on how to address the certification of existing software modules and COTS products.

- Address the qualification of tools to be used

- Address supporting incremental, composable systems from a certifiability perspective

- Help assess system requirements in light of the SC-205 committee's proposed software assurance document (Communications, Navigation and Surveillance/Air Traffic Management Systems (CNS/ATM)) intended for ground based and space-borne systems

ABOUT VEROCEL

Verocel provides expertise and services for Software Verification in the safety critical software industry. The Verocel staff has extensive experience providing safety critical software services in the avionics, nuclear and railway industries. Our services include the development and review of software plans and standards, software requirement and test development, software structural coverage analyses, life cycle data traceability, and outsource support. Founded in 1999, Verocel is privately held and headquartered in Westford, Massachusetts.

ABOUT RTI

Real-Time Innovations (RTI) is the largest software framework provider for smart machines and real-world systems. The company's RTI Connext® product enables intelligent architecture by sharing information in real time, making large applications work together as one.

With over 1,500 deployments, RTI software runs the largest power plants in North America, connects perception to control in vehicles, coordinates combat management on US Navy ships, drives a new generation of medical robotics, controls hyperloop and flying cars, and provides 24/7 medical intelligence for hospital patients and emergency victims.

RTI is the best in the world at connecting intelligent, distributed systems. These systems improve medical care, make our roads safer, improve energy use, and protect our freedom.

RTI is the leading vendor of products compliant with the Object Management Group® (OMG) Data Distribution Service™ (DDS) standard. RTI is privately held and headquartered in Sunnyvale, California with regional headquarters in Spain and Singapore.

Download a free 30-day trial of the latest, fully-functional Connext DDS software today: https://www.rti.com/downloads.

Your systems.
Working as one.

CORPORATE HEADQUARTERS

232 E. Java Drive, Sunnyvale, CA 94089
Telephone: +1 (408) 990-7400
Fax: +1 (408) 990-7402
info@rti.com

rti.com

rti_software

rtisoftware

company/rti

connextpodcast

rti_software