Topic: N092-121

Real-Time Innovations

Minimally Intrusive Real-time Software Instrumentation Technologies
RTI System Designer, a computer software development tool, provides software engineers capability to graphically construct Data Distribution Service (DDS) based computer networks. DDS is used extensively throughout the Department of Defense (DoD) in general, and the Surface Navy in particular. RTI, a 20-year old 150-employee Silicon Valley company and the world's largest embedded middleware provider, was named "The Most Influential Industrial Internet of Things (IIoT) Company." RTI successfully delivered multiple prototype versions of RTI System Designer to the US Navy AN/SPY-6 Air and Missile Defense (AMDR) Prime Contractor. This tool helps RTI maintain its industry-leading DDS market position by providing great value to existing RTI Connext DDS customers. RTI is seeking other DDS users to evaluate and provide feedback on the RTI System Designer tool.

Technology Category Alignment:
Air Platforms
Autonomy
Command, Control, Communications, Computers, & Intelligence (C4I)
Cyber
Ground and Sea Platforms

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SYSCOM: NAVSEA
Contract: N00024-11-C-4132

Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=N00024-11-C-4132

Department of the Navy SBIR/STTR Transition Program
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NAVSEA #17-520

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WHO

SYSCOM: NAVSEA

Sponsoring Program: Program Executive Office Integrated Warfare Systems Combat Systems

Transition Target: AN/SPY-6 Air and Missile Defense Radar (AMDR)

TPOC:
(540)653-1512

Other transition opportunities: All current RTI Connext Data Distribution Service (DDS) users, including hundreds of Department of Defense (DoD) customers, are potential users. There are over 1000 projects using RTI Connext DDS worldwide.

Notes: RTI System Designer Product Screenshot
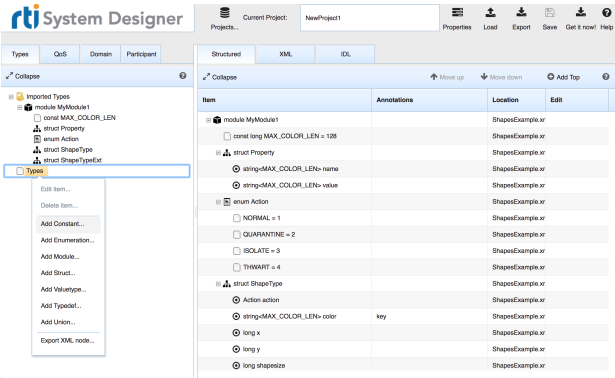
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WHAT

Operational Need and Improvement: Navy distributed software systems are often loosely coupled. Different components are developed at different times and by different teams. Emulated components are necessary to test interfaces not yet available in final implementation. The US Navy needs the ability to rapidly create realistic scenarios in DDS-based command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) and combat management systems to simulate and test functionality. This is currently a manual process. RTI System Designer automates this process.

Specifications Required: The Navy requires an expedient and generic approach to emulating software system components on the Data Distribution Service (DDS) communications bus for AN/SPY-6 AMDR. Efficient, flexible, and test-driven message traffic emulation allows for early integration of multiple software components, thus ensuring interoperability and performance while reducing AMDR program cost and risk. The Navy requires integration and test of multiple and interrelated software components, each with varying development timelines, maturity and availability. RTI System Designer and RTI Scenario Editor provides this message traffic emulation in-place of the missing software components.

Technology Developed: The RTI System Designer software product was partially developed through this SBIR. RTI System Designer is currently an advanced prototype.

Warfighter Value: The AN/SPY-6 AMDR Prime Contractor asserts a potential for $9 million in non-recurring engineering (NRE) cost avoidance because of this technology and its companion product, the RTI Scenario Editor. Another non-Navy Department of Defense (DoD) user asserts that the two products would save man-months of development, integration and test time.

Full system testing will be possible by executing emulated scenarios for components under development automation and regression tests to ensure the correctness of the system under development, and to support rapid development and faster final integration of system components.

WHEN

Contract Number: N00024-11-C-4132 **Ending on:** June 8, 2017

Milestone	Risk Level	Measure of Success	Ending TRL	Date
RTI Prototyper - predecessor technology to RTI System Designer	N/A	Product Released	7	December 2015
Scheduler to execute scenarios with 10 ms accuracy.	N/A	Demonstrated	7	July 2016
Dynamic scripting language (Lua) to support the data types defined in Object Management Group(OMG) DDS XTypes specification.	N/A	Demonstrated	7	December 2016
Configuration Editor GUI tool to define and edit the system information model.	N/A	Demonstrated	7	April 2017
RTI System Designer fully supported as standard product.	Low	Product Released	6	June 2018

HOW

Projected Business Model: RTI will fold the results of this SBIR effort into its standard RTI Connext DDS product offering. RTI has successfully used this business model several times in the past to transition SBIR developed technology. As a result, RTI has an industry leading 100% percentile DoD Commercialization Achievement Index (CAI).

Company Objectives: RTI seeks additional organizations to evaluate RTI System Designer and provide feedback.

Potential Commercial Applications: Nearly all RTI Connext DDS commercial customers can benefit from RTI System Designer. RTI customers span diverse Internet of Things (IoT) markets, including healthcare and medical devices, energy, mining, air traffic control, trading, automotive, unmanned systems, supervisory control and data acquisition (SCADA), ground stations, and big data science.

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