



CAPABILITY BRIEF

# Multi-Domain Operations (MDO)

USING A PROVEN MODULAR OPEN SYSTEMS APPROACH TO ACCELERATE MDO C2 SUPPORT

## HIGHLIGHTS

Robust TRL 9 safety, security, interoperability and network resilience solution

Rapid technology insertion, maintainability and extensibility capabilities

Standards-based, layered security that is easy to deploy for real-time data-in-motion

Ability to leverage both legacy and new network infrastructure

COTS RTCA DO-178C and EUROCAE ED-12C DAL A certification evidence

Facilitates Modular Open Systems Approach (MOSA) standards adoption

Today's military networked platforms are growing exponentially in capability and utilization, while taking on the additional burden of supporting multiple services, agencies and mission partners. These networked platforms are challenged by the requirement to insert new 'plug and fight' capabilities rapidly and reliably into deployed systems to support joint and multi-domain operations (MDO), many of which are limited by constrained bandwidth, lossy communications and contested operational environments.

Meeting these operational demands requires three core competencies:

1. The ability to develop and acquire open and *scalable network connectivity capabilities* that support unyielding network bandwidth and security demands
2. The ability to *rapidly integrate* diverse military network assets for U.S. Armed Services, agencies and coalition partners, including both legacy and innovative, state-of-the-art technologies
3. The ability to ensure that all data transmissions between connected warfighters and their unmanned and machine-to-machine (M2M) robotic support systems are *secure at all times*

RTI Connex DDS improves both performance and system affordability by providing rapid interoperability with other sea, land, air, space and cyberspace multi-domain, multi-service systems, based on our rich, real-time Quality of Service (QoS) capabilities and loosely coupled architecture. RTI works with the world's leading military network systems to provide the highest levels of safety, security and reliability for mission-critical command and control within DDS-based open architecture systems.

RTI Connex<sup>®</sup> DDS provides an open architecture connectivity framework that is fast, scalable, reliable and secure, both within the network and between sea, land, air, space and cyberspace systems. Based on the Object Management Group<sup>®</sup> (OMG) Data Distribution Service<sup>™</sup> (DDS) standard, RTI Connex DDS enables the rapid integration of both new and legacy communication assets and can form the connectivity framework for multiple proprietary networks with minimum investment and rework.

Connex DDS prioritizes interoperability as an imperative for U.S. Military MDO and Joint All Domain Operations (JADO), as well as enabling coalition partners to participate and deliver combat-multiplying capabilities within the MDO environment.

This interoperability is the foundation of deployable Joint All-Domain Command and Control (JADC2) operations. Both MDO and JADC2 systems must integrate sensor and radar data to drive efficient command and control of soldiers, sensors, adaptive squad architectures, unmanned systems, helicopters, jets, ships and command and control vehicles/nodes. These systems must also control weapon systems including cruise and ballistic missiles, to accurately deliver target, weapon and location information to both autonomous and human operators.

The data-centric architecture of DDS naturally enables the efficient delivery or separation of secure information from multiple sources. This multi-supplier and multi-domain interoperability increases cross-service and coalition collaboration efforts, while reducing the total lifecycle costs and total cost of operations (TCO) of networked platforms.

### STANDARDS-BASED SECURITY FOR DATA-IN-MOTION

Connex DDS Secure is the first commercial solution to comply with the open OMG DDS standard security specification. Connex DDS Secure's security plugins provide participant authentication, access control per topic of data, encryption, data tagging and event logging, all without modifying the existing DDS network infrastructure. Connex DDS Secure ensures data confidentiality and integrity, while protecting data-in-motion information across multiple security domains from unauthorized access and tampering. Connex DDS Secure enables systems integrators to design MDO components that facilitate security, without compromising the ability of various people and systems to collaborate. This is accomplished by creating data-centric "Zero-Trust" security networks.

### COTS RTCA DO-178C AND EUROCAE ED-12C DAL A CERTIFICATION EVIDENCE

Connex DDS offers commercial-off-the-shelf (COTS) RTCA DO-178C and EUROCAE ED-12C DAL A certification evidence containing over 5,000 hyperlinked files audited by a third party for rapid and reliable review by airworthiness authorities and other safety certification professionals. This evidence contains all documentation required for achieving airworthiness and safety certification by aviation certification authorities, including certification plans; test and verification plans and results; design documents; tests and test results; and the software accomplishment summary. The availability of this evidence as a COTS product vastly reduces military program safety certification costs and risk.

### POWERFUL PARTNER ECOSYSTEM ENABLES RAPID SYSTEMS DEPLOYMENT

RTI's avionics partner ecosystem consists of microprocessor manufacturers, COTS board vendors, real-time operating system (RTOS) suppliers, graphics driver providers, control design tools vendors and HMI graphic design tool suppliers that couple COTS certification evidence with their products. Complete standards-based solution stacks with certification evidence can be quickly assembled with confidence to unleash MDO and JADC2 application software teams to deliver competitive advantages over all adversaries. These solution stacks enable a range of MDO deployments, including strategic systems like AEGIS and IBCS, and tactical systems where DDS transports and manages information from multiple sensors into a Battalion Tactical Operations Center.

### PROVEN TECHNOLOGY WITH RAPID INSERTION AND MDO MAINTENANCE CAPABILITIES

Connex DDS is built upon a loosely coupled architecture, enabling robust application domain partitioning and accelerated update of critical technologies with minimal system impact and re-test. Connex DDS is a peer-to-peer data connectivity framework designed as a safety-critical, cyber-physical network architecture. Connex DDS also includes a rich set of tools that accelerates module and system-level development, debugging, testing, integration and optimization. RTI has over 1,500 design wins. Currently, RTI network solutions are used in over 1,000 defense systems, including the following U.S. Department of Defense (DoD) programs:

- Aegis
- Aurora ALIAS
- AWACS
- CMS RIP/RIF
- DVE-M
- GBSAA
- Global Hawk
- JBC-P
- Predator/Reaper
- SPY Radar
- SSDS
- SUMIT
- SWAN
- UGCS

#### COMPLIANCE

DUNS: 797735883  
CAGE: 03FH8

#### NAICS Codes:

- 511210 Software Publishers
- 541511 Custom Computer Programming Services
- 541512 Computer Systems Design Services

## ABOUT RTI

Real-Time Innovations (RTI) is the largest software framework company for autonomous systems. RTI Connex® is the world's leading architecture for developing intelligent distributed systems. Uniquely, Connex shares data directly, connecting AI algorithms to real-time networks of devices to build autonomous systems.

RTI is the best in the world at ensuring our customers' success in deploying production systems. With over 1,500 designs, RTI software runs over 250 autonomous vehicle programs, controls the largest power plants in North America, coordinates combat management on U.S. Navy ships, drives a new generation of medical robotics, enables flying cars, and provides 24/7 intelligence for hospital and emergency medicine. RTI runs a smarter world.

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 offices in Colorado, Spain and Singapore.

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

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