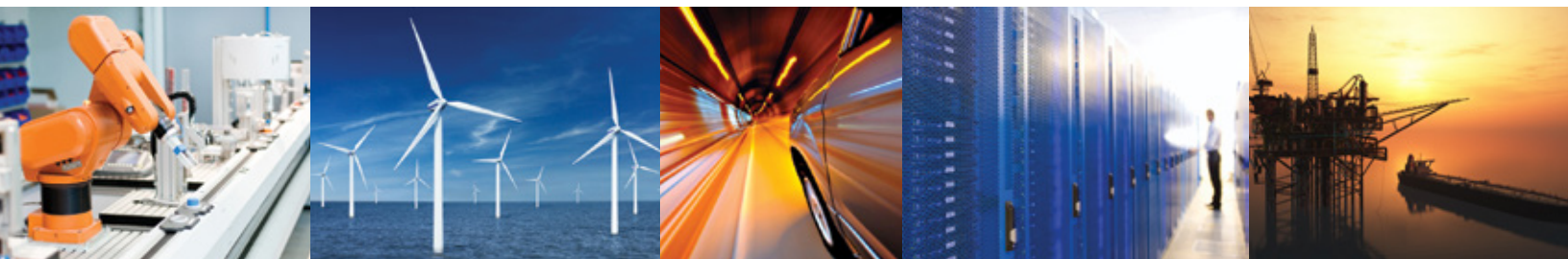


# RTI Connex<sup>®</sup> DDS Cert



Safety-Certifiable Connectivity Platform



Connex<sup>®</sup> DDS Cert is a safety-certifiable communications infrastructure with an available DO-178C Level A Certification Package. Based on the DDS standard, it provides developers with high-level publish/subscribe communication APIs that simplify application logic while eliminating the need for custom networking code. This can save tens of thousands of lines of application software and the need to develop its accompanying certification artifacts.

## Highlights:

Meets stringent safety certification standards

Reusable certification evidence available for DO-178C Level A

Implements DDS API and network protocol

Eliminates custom communication and networking code

High-level publish/subscribe APIs simplify application logic

Small memory footprint

Bundled source code

Highly portable across operating systems and CPUs

Completely decentralized architecture with no message brokers

UDP multicast for efficient broad data distribution

Pluggable transport interface for other connection types

Because of their demanding requirements, safety-critical systems have traditionally used custom software to communicate between different subsystems, applications and modules. Developing this software and any necessary certification evidence is time-consuming and expensive. Just producing certification artifacts can take months to years of effort.

Connex DDS Cert provides an off-the-shelf alternative. It is available with a complete Certification Package for the flight-critical avionics standard DO-178C Design Assurance Level A (DAL A), one of the most stringent safety standards. This package also provides the basis for certification to other standards including IEC 61508 for industrial systems, IEC 60601 for medical devices and ISO 26262 for automotive systems.

Connex DDS Cert replaces traditional low-level networking code with high-level publish/subscribe APIs based on the Object Management Group (OMG) Data Distribution Service (DDS). Modules communicate by simply publishing the data and commands they produce and subscribing to the data they need. Connex DDS Cert handles all of the communication details, including discovery, messaging, routing, redundancy, serialization, and state synchronization for late joiners.

Support for well-defined and interoperable interfaces make Connex DDS Cert an ideal foundation for an open architecture--reducing ongoing integration, maintenance and upgrade costs. Its DDS support aligns with many Open Architecture initiatives, including the Future Airborne Capability Environment (FACE), UAS Control Segment (UCS) Architecture, and Open Mission Systems (OMS).

## Standards Compliance

### Data Distribution Service (DDS)

The Connex DDS Cert API and network protocol support the DDS standard. Application code is portable across Connex DDS Cert and other DDS implementations. Connex DDS Cert also interoperates peer-to-peer with Connex DDS Professional and Connex DDS Micro, and with other DDS solutions using RTI Routing Service as a bridge.

### Future Airborne Capability Environment (FACE)

Connex DDS Cert supports all of the FACE Operating Systems Segment (OSS) profiles: Security, Safety Base, Safety Extended and General Purpose. It is also compatible with RTI's Transports Services Segment (TSS) Reference Implementation, providing the foundation for a DO-178C certifiable TSS.

## Comprehensive Connectivity Solution

### Peer-to-peer communication

Connex DDS Cert is completely decentralized for low-latency, high throughput and high scalability. Applications directly exchange data in a true peer-to-peer manner – no servers, message brokers or daemon processes act as bottlenecks or single points of failure.

### Real-time Quality of Service (QoS)

Applications have comprehensive control over and visibility into real-time behavior, including timing, deadlines, resource utilization and system state. QoS can be specified per-topic and per-subscriber.

### Optimized publish/subscribe

Data can be reliably multicast to multiple applications and devices for extremely efficient streaming data distribution. With multicast, messages can be routed and filtered by the network switch instead of by the middleware or application software.

### Wire efficiency

The DDS Real-Time Publish-Subscribe (DDS-RTPS) protocol is extremely wire efficient. Data is sent in a compact binary representation.

## Optimized for Small-Footprint Applications

### Low memory requirement

The Connex DDS Cert library links with your application. The library size is optimized for small footprint applications and memory allocation is kept to a minimum.

### Highly portable

Bundled source code enables developers to port Connex DDS Cert to new operating systems, compilers or processor architectures. RTI Connex DDS Cert has no built-in dependency on operating system services. Applications can be implemented on platforms with minimal operating system capabilities or no operating system at all. Processor support ranges from 16-bit microcontrollers with 32-bit integer support to multicore Intel and PowerPC CPUs. Leading enterprise operating systems, including Linux and Windows, are supported as well to ease application development and testing.

## Designed for Safety-Critical Applications

### Certification Package

Connex DDS Cert is designed to be certifiable as a component of a complete system undergoing certification to RTCA DO-178C (EUROCAE ED-12C). The optional DO-178C Level A Certification Package is produced in partnership with Verocel, a leader in mission-critical software verification with a proven track record of dozens of DO-178 certifications. All of the certification evidence is contained in a DVD or ISO image with hyperlinks to facilitate navigation.

### Small code size

With minimized lines of source code, Connex DDS Cert provides a cost-effective foundation for rigorous certifications.

### Deterministic behavior

The code is developed using process guidelines that ensure deterministic behavior. All memory allocation is done at startup and no memory is freed at run-time.

## About RTI

RTI provides the connectivity platform for the Industrial Internet of Things.

Our RTI Connex® messaging software forms the core nervous system for smart, distributed applications. RTI Connex allows devices to intelligently share information and work together as one integrated system. RTI was named "The Most Influential Industrial Internet of Things Company" in 2014 by Appinions and published in Forbes.

Our customers span the breadth of the Internet of Things, including medical, energy, mining, air traffic control, trading, automotive, unmanned systems, industrial SCADA, naval systems, air and missile defense, ground stations, and science. The total value of system designs that trust RTI for their fundamental architecture exceeds \$1 trillion.

RTI is committed to open standards, open community source and open architecture. RTI provides the leading implementation of the Object Management Group (OMG) Data Distribution Service (DDS) standard.

RTI is the world's largest embedded middleware provider, privately held and headquartered in Sunnyvale, California.



Your systems. Working as one.

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