

RTI Connex DDS Secure



First Connectivity Software Designed for Architecting and Securing IIoT Systems of Systems



RTI Connex[®] DDS Secure is a connectivity framework that enables Industrial Internet of Things (IIoT) system architects to build secure and scalable systems of systems. Built on the Connex Databus, Connex DDS Secure supports fine-grained security, providing the flexibility to implement capabilities required by their systems, such as authentication, encryption and access control without compromising performance.

Highlights:

Fine-grain security offers flexibility of protecting different parts of the RTPS message

Provides authentication, authorization, confidentiality and integrity

Protects discovery information, metadata and data

Defends against unauthorized access, tampering and replay

Operates without centralized servers for high performance, scalability and availability

Runs over any transport including TCP, UDP, multicast and shared memory

Integrates with existing security infrastructures and hardware acceleration

Secures unmodified existing DDS applications

Standards-based to ensure forward interoperability as IIoT systems evolve

Securing IIoT systems – such as those in autonomous vehicles, medical, energy, transportation and defense industries – requires careful architecting of the entire IIoT system from edge-to-cloud. This includes considerations for integrating diverse technology components from different project teams or third-party suppliers. However, now a connectivity framework that promotes interoperability between devices is available. One option is for OEMs to write and maintain the integration code to connect these complex devices.

Security must also be balanced with performance. Intelligent systems must perform reliably with the added processing requirements for security functions such as encrypting and signing data.

The Connex Databus is a data-centric framework for distributing and managing real-time data in the Industrial IoT. It allows applications and devices to work together as one, integrated system. As a software databus with a security framework, Connex DDS Secure takes a data-centric approach to securing data including:

- Interoperability between DDS Security applications based on the system's data model.
- Optimized security and performance by authenticating and encrypting only sensitive data.
- Automatic discovery of each participant for peer-to-peer communications.

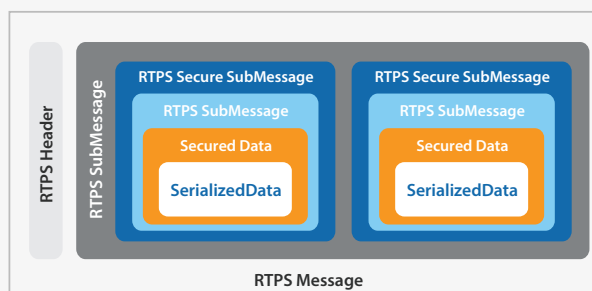
Capabilities Delivered with Built-in Security Plugins

Authentication	<ul style="list-style-type: none"> • X.509 Public Key Infrastructure (PKI) with a pre-configured shared Certificate Authority (CA) • RSA or Elliptic Curve DSA (ECDSA) for authentication • Diffie Hellman (DH) or ECDH for shared secret
Access Control	<ul style="list-style-type: none"> • Configured by domain using a shared Governance file signed by shared CA • Control over ability to join DDS Domains and Partitions and reading or writing topics • Control on individual objects and Quality of Service (QoS) via plugins
Cryptography	<ul style="list-style-type: none"> • AES128-GCM and AES256-GCM for encryption • AES128-GMAC and AES256-GMAC for authentication and integrity • Protected Key Distribution
Logging	<ul style="list-style-type: none"> • Log security events to a file or distribute securely over DDS

Fine-grained security

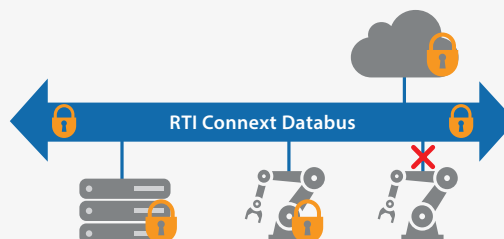
Choose between non-secured, signed and encrypted topics to meet your performance needs. Not only can select topics be protected, but they can be protected at varying levels of granularity to provide further optimization. Fine-grained security allows architects to:

- Sign the entire RTPS message
- Sign/encrypt select RTPS sub messages
- Sign/encrypt the serialized user data



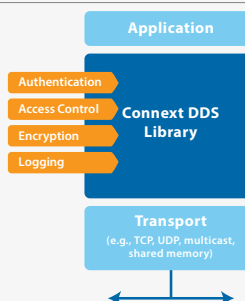
Security over multicast

Security is implemented above the transport layer. Therefore, any Connex DDS transport can be used securely, including UDP, TCP and shared memory. Support for UDP multicast (both reliable and best effort) enables efficient data distribution to multiple authenticated subscribers to the same data.



Pluggable and customizable

Minimal-to-no changes are required for existing DDS applications when using built-in plugins. The plugins only need to be configured via XML to enable security. An optional SDK is available for custom plugins, crypto modules or support for custom hardware like crypto accelerators or TPMs.



About RTI

Real-Time Innovations (RTI) is the Industrial Internet of Things (IIoT) connectivity company. The RTI Connex[®] databus is a software framework that shares information in real time, making applications work together as one, integrated system. It connects across field, fog and cloud. Its reliability, security, performance and scalability are proven in the most demanding industrial systems. Deployed systems include medical devices and imaging; wind, hydro and solar power; autonomous planes, trains and cars; traffic control; Oil and Gas; robotics, ships and defense.

RTI lives at the intersection of functional artificial intelligence and pervasive networkingSM.

RTI is the largest vendor of products based on the Object Management Group (OMG) Data Distribution Service[™] (DDS) standard. RTI is privately held and headquartered in Sunnyvale, Calif.



Your systems. Working as one.

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