RTI DDS Toolkit for LabVIEW
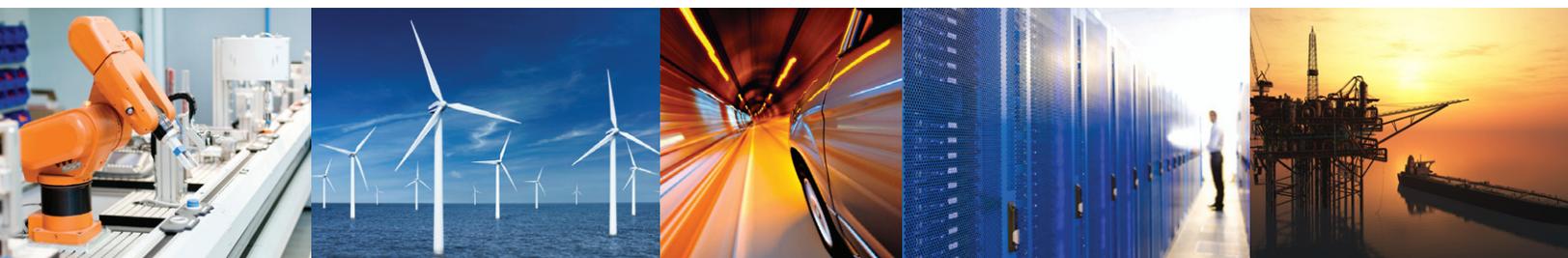
Fast, secure and interoperable publish/subscribe data communications

The RTI® DDS Toolkit for LabVIEW allows you to reliably and securely exchange data across highly distributed and heterogeneous systems. Built on RTI Connext DDS, the market-leading implementation of the open standard Data Distribution Service (DDS) for Real-Time Systems, the RTI DDS Toolkit seamlessly exchanges data between LabVIEW VIs and other DDS compliant applications. By providing a high performance, secure and interoperable alternative to custom communication solutions, the RTI DDS Toolkit significantly reduces your development, integration and maintenance costs.

Standard Features:

Toolkit Features Included with LabVIEW:

Extremely low latency and high throughput

Secure authentication, encryption and access control

Highly resilient with no single point of failure

Scales to thousands of nodes and millions of data points

Reliable multicast for efficient data distribution

Decentralized architecture with no services or brokers required

Seamless communication over shared memory, LAN, WAN and internet

Core technology proven by 1000+ customers

Supports LabVIEW Real-Time targets running NI Linux

Optional Features:

SDKs for C, C++, C#/.NET, Java, JavaScript, Python, Lua and Ada

Adapters for integrating existing apps

Tools for distributed system debugging and monitoring

Real-time data recording and replay

Integration with RDBMS and Microsoft Excel

The RTI DDS Toolkit helps you overcome several distributed system challenges:

- Deliver low latency and high throughput while scaling to large systems
- Provide data privacy, integrity and access control
- Reliably publish data to many subscribers, including streaming data
- Easily integrate LabVIEW with other applications

The RTI DDS Toolkit provides a set of subVIs for publishing and subscribing to data. They allow you to easily exchange data between LabVIEW VIs and other applications that use DDS.
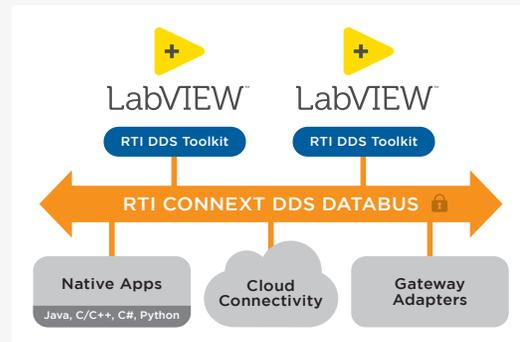
The RTI DDS Toolkit, including support for LabVIEW Real-Time on NI Linux, is integrated in LabVIEW 2017 and higher in the Block Diagram / Data Communication Palette. You can install it by clicking on the 'Install' shortcut, or directly from the VI Package Manager.

POWERED BY

LabVIEW™

Rich Ecosystem

The RTI DDS Toolkit works seamlessly with the RTI Connext product line. Capabilities include:

- Connext DDS libraries and SDK for all major programming languages, operating systems and CPU families, including CompactRIO
- Routing between networks and security domains
- Tools for integrating, debugging and monitoring distributed systems
- Real-time data recording for post-mortem analysis and debugging
- Replay of recorded data for testing and simulation
- Adapters and adapter SDK for easy integration with other protocols and unmodified existing applications
- Transports for low-bandwidth networks such as satellite and radio
- Bi-directional database integration for data sharing between SQL and DDS applications
- Bi-directional Microsoft Excel integration
- REST/HTTP interface for web applications and scripting

Optimized for Mission-Critical Real-Time Systems

The RTI DDS Toolkit employs a completely decentralized communications architecture. It does not require any servers, services or message brokers. The messaging infrastructure is completely embedded in the RTI subVIs, which communicate peer-to-peer. This delivers:

- Minimum latency because there is no intermediate software or gratuitous network hops
- Maximum throughput and scalability because there is no service acting as a bottleneck or choke point
- Non-stop availability because there is no single point of failure
- Easy embedding because there are no services that must be started and administered

Automatic discovery eliminates the need for deployment-time configuration. Applications are plug-and-play, facilitating use in dynamic networks. The DDS middleware automatically discovers and routes data between matching publishers and subscribers at runtime; systems are self-forming and self-healing.

Multicast support provides highly scalable one-to-many and many-to-many data distribution. Messages only have to be sent over the network once, regardless of the number of subscribers. The network switch automatically routes data to all subscribing nodes. This maintains low latency even for very broad data distribution. Since network-level multicast is unreliable, Connext DDS includes an optional reliability protocol optimized for real-time behavior.

Fine-grained control over messaging Quality of Service (QoS) and security allows you to optimize tradeoffs between latency, throughput, CPU overhead and network overhead. The security, timeliness and reliability of data delivery are configurable per-stream and per-application. This eases integration of applications with disparate performance needs such as real-time and IT applications.

About RTI

Real-Time Innovations (RTI) is the Industrial Internet of Things (IIoT) connectivity company. The RTI Connext® 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 networking[SM].

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.

rti

Your systems. Working as one.

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