

# RTI Training

## BENEFITS

- Bring your team up to speed quickly with hands-on training
- Tailor your training to your budget, timing and project requirements
- Understand middleware capabilities and how to apply them to your project
- Learn best practices in the architecture of your distributed real-time system
- Design your application for optimal efficiency from the start

Jumpstart your team's productivity and accelerate your project via RTI Training. RTI's expert consulting team offers training options to take your team from project inception through deployment.

Training opportunities range from initial "Quick Start" training on middleware to modularized advanced topics such as troubleshooting distributed applications and taking advantage of Quality of Service tuning. Additionally, we offer custom one-day or more in-depth analyses of your architecture, design, integration needs and application deployment.

### World-Class Training Team

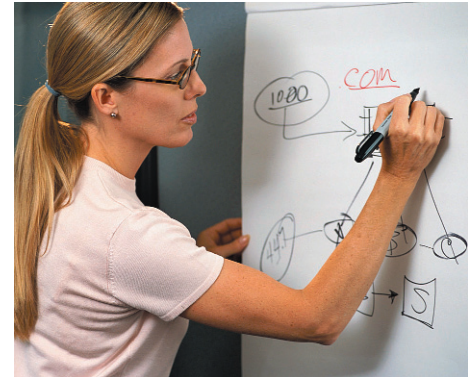
RTI training is led by members of RTI's consulting services group, a team with decades of experience in the design and implementation of distributed real-time applications. Areas of expertise range from military and aerospace to transportation, communications and industrial automation.

RTI, the industry leader in real-time messaging middleware, is uniquely experienced in the optimization and tuning of large scale, high-performance distributed systems. In addition to our middleware expertise, amassed pioneering the OMG Data Distribution Service standard, our expertise includes extensive knowledge of networking hardware, operating systems and protocol stacks—as well as their interactions. RTI also pioneered an off-the-shelf, real-time distributed data management solution based on standard SQL and DDS interfaces. We have decades of experience with fully-deployed large-scale applications.

### Tiered Training — Scales to Your Needs

RTI Training scales to meet your team's needs.

- **Quick Start:** Most new projects with RTI start with a two-day Quick Start onsite training, which provides initial hands-on training on RTI products. These Quick Start sessions are tailored to the needs of



your team and project and offer plenty of opportunity to interact with the instructor on your application's requirements.

- **DDS Workshops:** Similar to the Quick Start training sessions, we offer two-day Data Distribution Service workshops in various locales. The workshops are not customized but provide much of the same training materials as are provided in a Quick Start. The workshops provide an affordable and convenient way to learn about the DDS standard or to bring additional team members up to speed as they join a project.
- **Advanced Course Modules:** Supplement your training with advanced training on special topics, such as Quality of Service tuning, debugging and development tools, and data-centric design. Mix and match training modules according to the particular requirements of your application and team.
- **Customized Training & Short-Term Consulting:** If you don't see a training module that fits your needs, RTI experts can tailor a training session for you. In addition, we offer short-term, targeted consulting options such as an architecture study, design review, and integration review that can assist your team through a particular phase of the project, maximizing efficiency at minimum cost.



## RTI Quick Start Training

As the name “Quick Start” implies, this two-day onsite training course is designed to get your team up and running with RTI middleware as fast as possible. The Quick Start is a hands-on course that is taught by knowledgeable instructors with extensive experience building large-scale deployed middleware applications. Because of their real-world experience building applications,

they are able to tailor the material to your particular requirements and are available to answer application-specific questions.

## RTI Data Distribution Service Workshops

RTI Data Distribution Service workshops are offered in a variety of locations world-wide. The two-day workshops cover all of the key aspects of the OMG Data Distribution Service standard as well as the

extensions of the RTI Data Distribution Service implementation and RTI Developer Platform toolset. The workshops provide an alternative to customized Quick Start training, particularly as new team members are brought on. The workshops also provide a great way to become familiar with Data Distribution Service middleware standard and to evaluate the appropriateness of DDS in your future application.

## Quick Start and Workshop Course Outline

### General Introduction

**Objective:** Understand RTI products and services, brief company history and schedule.

- Agenda review
- Examples of customer applications
- RTI products and services

### DDS Introduction

*(for DDS compliant products)*

**Objective:** Understand the problem that DDS solves; describe general concepts and terminologies in DDS.

- What is DDS?
- Evolution of the DDS communication model
- Entities in the DDS infrastructure
- Quality of Service parameters that govern those entities
- Demo of DDS at work

### Quality of Service(QoS) Tuning

**Objective:** Gain detailed understanding of QoS parameters and what they can do.

- Data volatility and delivery
- Presentation options
- Redundancy measures
- User data delivery

### Basic Hands-on Exercises

**Objective:** Use RTI tools to generate code and an application; modify QoS parameters to alter behavior.

- RTI tools
- “Hello World” publisher and subscriber
- RTI manual, API documentation
- Modifying default QoS

### Dynamic Discovery

**Objective:** Understand the dynamic discovery process to be able to tune and configure according to your own requirements.

- Participant discovery phase
- Endpoint discovery phase
- Configuration parameters
- Tuning parameters

### Keys and Instances

**Objective:** Understand the difference between topics, instances and keys; discuss use cases of these.

- Advantage of using keys
- Common use cases
- Relevant API calls and QoS parameters

### Reliable Communication

**Objective:** Illustrate the send and receive queue management, timeout constraints and important events.

- Reliability mechanisms
- Reliability objects
- QoS parameters and default behavior
- Design challenge

### Threading Model

**Objective:** Understand the underlying threads in RTI's implementation

- Database thread
- Event thread
- Receive thread
- Callbacks and settings for each thread

### Listener Callbacks

**Objective:** Understand the different types of events and their corresponding listener callbacks

- Listener hierarchy
- Callback ordering
- Status and event definitions

### Multicast Communication

**Objective:** Understand how to use multicast to send/receive data

- Receiver settings

### Troubleshooting

**Objective:** Illustrate the various methods and tools used to trouble-shoot.

- Common design errors
- Common implementation errors
- Debugging tools and methods

### Course Requirements

- Reasonable programming experience in C, C++ or Java on a major platform such as Windows, Linux or Solaris
- Laptop with either Windows XP or Linux 2.4 or 2.6.
- For Windows XP users: Visual Studio 2003 or Visual Compiler 6.0
- For Linux users: GCC 3.2.2 compiler

## Advanced Modules — Mix & Match to Meet Your Project Needs

RTI offers advanced courses to supplement the Quick Start training, providing additional training as your team gains more familiarity with RTI middleware, and supplying explicit, detailed training on key concepts. The advanced courses are taught by RTI real-time networking experts with real world experience in designing and debugging distributed systems.

The advanced training courses are one day each, designed to be combined to create a two-day onsite training session. Sample training modules include:

### How to Debug and Optimize Distributed Applications

Learn the secrets of debugging a complex distributed application in this intensive one day course. This course will present techniques and patterns for troubleshooting discovery, performance, and lost data problems when implementing systems using RTI middleware. Drawing on real-world examples, the course will demonstrate how to solve tricky networking problems. Topics include creating and interpreting logs; network monitoring and troubleshooting; using network tools such as rttidsping,

rttidsping, and RTI Protocol Analyzer, and using RTI Analyzer to find programming errors that slow or block communication. This class is intended for existing customers who have a basic knowledge of RTI middleware and some application development experience.

### Data-Centric Design

Take your networked applications to the next level through a data-centric design approach using RTI Data Distribution Service. Data-centric design is the latest methodology for creating robust distributed systems by focusing on the data model. This one day course teaches the data-centric design approach and how to develop a data-centric distributed system. During the course you will learn how to create a data model, manage the data distribution, and build your system architecture around the data needs. Next the course will apply the data-centric concepts to RTI Data Distribution Service: using IDL for the data model, setting QoS for data distribution, and using RTI Real-Time Connect to integrate real-time data distribution with a database or other enterprise application. This class is intended for those that have completed an RTI Data Distribution Service Quick Start training or Workshop.

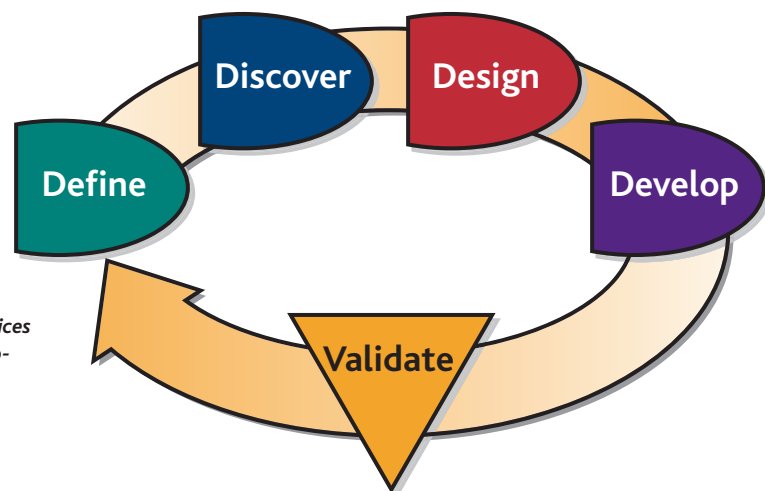
### Using Quality of Service Settings

Discover how to harness the power of RTI's rich set of Quality of Service (QoS) to maximize the reliability and performance of your application. This course starts with the fundamentals of QoS policies and how different QoS policy groups are related to RTI subsystems, entities, and to each other. It then uses real life examples to show how to set QoS policies to control a wide range of middleware behaviors such as reliability, persistence, failure detection, traffic shaping, transport configuration, and more. Finally, the course discusses the causes of QoS incompatibilities and how to correct them. This class is intended for existing customers who have a basic knowledge of RTI products and some application development experience.

### Course Details

For a more complete course description or to suggest additional training modules you would like to see, please contact us:

[workshops@rti.com](mailto:workshops@rti.com)  
or call us at +1-408-990-7400.



*Our field-proven approach to projects and services is reflected in our flexible training program, supporting you through all phases of application design, development and deployment.*

### Customized Training & Short-Term Consulting

RTI offers a number of customized training and consulting options, from one-day consultations to full-scale design, development and integration consulting.

For additional training, if you have a particular training requirement, please let us know and we can develop a course module to meet your needs.

In addition to training, we offer short-term consulting packages designed to improve your project architecture and design, maximize your use of RTI's rich feature set, and accelerate your middleware development and integration. These short-term consulting packages provide an affordable way to reap the benefits of RTI's expertise.

### Architecture Study

An example of RTI's short-term consulting packages is the RTI Architecture Study. With the Architecture Study, an RTI Services Consultant evaluates your application architecture to ensure it takes maximum advantage of RTI's feature set and performance potential.

Each RTI Architecture Study document is tailored for the particular needs of the customer. Example contents of an Architecture Study include:

- Requirements, System Overview, Core Concept Review
- Design Patterns
- Discovery and Tuning (domain binding, topology, discovery, threading, identification)
- Reliable Data Model
- Topic Design
- Communication Design Patterns (e.g. heartbeating, checkpointing)
- Operating System Tuning for Optimal Performance
- System Optimization, Framework Selection (operating system, network hardware, middleware configuration)
- Prototype Open Architecture Implementation
- Gap Analysis, proposed solutions for unmet requirements

### Design Reviews

RTI experts can assess your middleware design, providing you with an efficient and effective way to ensure optimal application design early in your project.

Additionally, we offer a more complete four-week on-site Design Support Package which provides expert installation, design, and system support.

### Contact Us

To find out more, please email [workshops@rti.com](mailto:workshops@rti.com) or call us at +1-408-990-7400.

### About RTI

Real-Time Innovations (RTI) provides high-performance infrastructure solutions for distributed real-time applications. RTI middleware delivers dramatic improvements in latency, throughput and scalability while slashing cost of ownership. A broad range of industries leverage RTI's software and design expertise, including defense, intelligence, simulation, industrial control, power generation, transportation, finance, medical and communications. Founded in 1991, RTI is privately held and headquartered in Sunnyvale, California. For more information, please visit [www.rti.com](http://www.rti.com).