

# RTI Architecture Study

## Meet Your Distributed Application's Design Objectives

### BENEFITS

- Meet performance and scalability requirements
- Reduce project risk
- Ensure total system integration
- Fully utilize DDS capabilities
- Save costly rework at the end of the development cycle

Mitigate project risk by optimizing your distributed system design to meet your performance and scalability goals.

With an RTI Architecture Study, RTI's expert consulting team evaluates your requirements and networking infrastructure. RTI then provides you with a written report summarizing design options, recommending implementation strategies, identifying risk areas and proposing mitigation options.

### Mitigating Risks

When designing real-time distributed systems, many requirements must be taken into account. These include:

- Throughput and latency
- Discovery performance
- Scalability — number of nodes and communicating applications
- Fault tolerance
- Connectivity options

These requirements must be considered in the selection of middleware as well as in a system's overall architecture. If the middleware and architecture fail to deliver the required performance and scalability, the result could be catastrophic in terms of delivery time and re-engineering cost. Unfortunately, the risk is particularly acute because performance and scalability problems are usually not detected until near the end of the development cycle, after system integration.

The RTI Architecture Study mitigates your project risk by helping you make the right middleware and design decisions up front. Additionally, the study provides valuable analysis to help you optimize and tune your application.

### RTI's Expertise in Distributed Systems

RTI is the industry leader in real-time communications middleware. RTI was a principal driver of the Object Management Group (OMG) Data Distribution Service for Real-Time Systems standard (DDS).



RTI also pioneered an off-the-shelf, real-time distributed data management solution based on standard SQL and DDS interfaces. Architecture studies are led by members of RTI's consulting services group, a team that has been involved with the DDS standard since its inception. The team has 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 is uniquely experienced in the optimization and tuning of large scale, high-performance distributed real-time systems. This includes extensive knowledge of networking hardware, operating systems, protocol stacks and middleware—as well as their interactions. This enables RTI to understand the ramifications of architectural decisions, configuration options and Quality of Service (QoS) parameters on latency, throughput and scalability.



## How It Works

A typical architecture study starts at your work site, with an RTI expert working with you and your team to identify your application's requirements and use cases. The RTI expert then works with you to design an appropriate architecture to best meet the objectives and requirements of your distributed application. Typically, this initial review also includes an in-depth discussion about DDS application design, system optimization, performance tuning, scalability, and training on various DDS properties and core design tenets. The initial review is followed up with a comprehensive report of the topics covered and specific recommendations.

## Example Topics

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 — applicable DDS design patterns
- Domain 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 (e.g. LynxOS, VxWorks, Integrity)
- System Optimization, Framework Selection (operating system, network hardware, middleware configuration)
- Prototype Open Architecture Implementation
- Gap Analysis, proposed solutions for unmet requirements

## Contact Us

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

## HIGHLIGHTS

### An RTI consultant will:

- Assess your application's requirements, design and architecture
- Advise on tuning your DDS application for performance and scalability
- Review DDS properties and core design tenets
- Create application architecture prototype (if necessary)
- Advise on system integration, optimization and tuning — OS, network and middleware
- Identify risk areas and design options
- Provide design and code examples

## About RTI

RTI supplies middleware and distributed data management solutions for real-time systems. With innovative technology and deep expertise in distributed applications, RTI provides an unequalled competitive advantage to customers developing systems that benefit from high-performance access to time-critical data. RTI solutions have been deployed in a broad range of applications including command and control, intelligence, surveillance, data fusion, simulation, industrial control, air traffic control, railway management, roadway traffic monitoring and multimedia communications. Founded in 1991, RTI is privately held and headquartered in Sunnyvale, California.