

# RTI in Energy

Empowering Distributed Energy Solutions of Tomorrow



The power and utility sector is witnessing significant disruption and changes in policy, technology, and customer requirements. The Industrial Internet of Things offers the energy industry an opportunity to deliver on the promise of smart energy. Industrial-strength data sharing can improve power generation and distribution and enable the efficient use of renewable energy resources at large scale. RTI Connex<sup>®</sup> DDS leads the way.

## Proven Readiness for Critical Infrastructure

Integration with DNP3, IEC 61850, and SCADA communications

Standards-based interoperability with Industrial IoT applications outside the power industry

Real-time performance for intelligent control at the edge of the grid

Extremely scalable: suitable for increasingly large-scale and complex systems

Low latency with real-time Quality of Service (QoS)

Highly resilient: systems are self-forming and self-healing with no single point of failure

Secure with full support for confidentiality, integrity, and access control

Able to seamlessly connect local and wide area networks, allowing integration of resources across a broad region

Proven integration of a fast local control loop with secure connectivity over long distances and with cloud infrastructure

All energy systems share requirements for high reliability, performance, security and scale across the critical infrastructure. RTI Connex<sup>®</sup> DDS – supported by RTI's experience in critical infrastructure designs – provides a solid foundation for the most advanced energy systems of tomorrow.

Based on the widely adopted Data Distribution Service (DDS) Industrial IoT standard, Connex DDS delivers "big iron" reliability and performance to the world's most demanding power applications, from huge hydropower dams to microgrid distribution systems. It is an equally effective connectivity solution for systems ranging in size from the largest power plant in North America (transmitting 300,000 data values across 40,000 points) to the new microgrid architectures with their mix of local generation and dynamic loading.

Connex DDS is an effective and well-proven method of integrating resources across local and wide area networks. RTI's unique databus technology can integrate a fast local control loop, connect it securely over long distances, and deliver the data to a cloud infrastructure.

RTI drives the industry's most advanced distributed security architecture, backed by our real-world experience and continuous investments into security research in the areas of protection, detection, SCADA design and distributed trust.

*"We chose RTI and their Connex DDS platform because it has been proven on large, distributed systems. RTI also provided extensive training, development, and debugging expertise in our labs, which helped us immeasurably."*

**James Ethridge, Principal Software Engineer, Alencon**

## Developing New Smart Grid Architecture



Traditional central-station power grids operate on 15-minute output update cycles that result in operators over-generating power to compensate for variation in power generation or demand. To efficiently integrate distributed energy resources, the grid needs fast-reacting intelligence at the edge.

RTI is collaborating with other members of the Industrial Internet Consortium (IIC) to introduce the flexibility of real-time analytics and control into power grids and ensure that power is generated more accurately and reliably to match demand. IIC's Communication and Control Testbed for Microgrid Applications will re-architect the power grid system into a series of distributed microgrids that control smaller areas and support load, generation, and storage. These microgrids will enable efficient integration of solar and wind into the grid, creating a dynamic, open marketplace for smart grid vendors. RTI is proud to lead this effort to create power grid of the future.

## Accelerate Grid Modernization



RTI is also a member of the Smart Grid Interoperability Panel (SGIP), whose OpenFMB™ (Open Field Message Bus™) Priority Action Plan applies Industrial Internet technologies and techniques to enable the Smart Grid. The Priority Action Plan will develop a smart-grid framework to enable combining solar, wind, and storage into an efficient, secure, flexible architecture for Distributed Energy Resources (DERs). DDS powers the current OpenFMB information-sharing implementation.

## Ensure Critical Infrastructure Availability



The largest power plant in North America has replaced its SCADA control system with RTI Connex DDS. The aging, monolithic SCADA system was no longer effective at meeting today's important requirements – extreme availability, fault tolerance, performance, security, and ability to implement wide-area communications.

The new, DDS-based control system is modern, distributed, secure, and very reliable. Compared to the old SCADA system, it's smarter, more efficient, and easier to evolve. Also, because it's based on modern networking protocols, the new DDS design can leverage new technology as it becomes available, such as cloud computing, connectivity, and security.

## Find and Delivering the Right Data



Siemens Wind Power, one of the world's largest wind turbine manufacturers, uses RTI Connex DDS to integrate its entire farm. Wind turbine farms can include as many as 500 turbines with 100-meter blades. Turbine control requires fast local loops and maintenance data collection. Gust control across the array necessitates fast communications with dynamic, selective filtering.

RTI Connex DDS provides fast, reliable connectivity across Siemens' many turbines. With Connex DDS, a Siemens Wind Power farm optimizes power, monitors its own health, and reacts to its environment by capitalizing on the power of the Industrial IoT.

### 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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