RTI Connext® DDS enables the data-driven medical systems of modern healthcare. It provides the medical-grade connectivity framework that seamlessly and securely exchanges real-time data between healthcare devices, applications and systems. Built on the robust OMG® DDS standard, Connext DDS manages data complexity with ease and provides a foundation for AI and CDS applications for improved efficiency, fewer medical errors and improved patient outcomes.

THE MEDICAL-GRADE CONNECTIVITY FRAMEWORK

Connext DDS delivers a proven framework to address the wide range of demanding data connectivity requirements in healthcare (Table 1). For development teams designing complex systems, Connext DDS provides:

- Innovative data-centric connectivity that delivers full visibility into data in motion
- A single solution to address the wide range of demanding data connectivity requirements
- Plug-and-play interoperability between systems and system components
- Scalability for increasingly large and complex systems
- Self-forming and self-healing resilient systems with no single point of failure
- Proven integration of a fast local control loop with secure connectivity over long distances and with cloud infrastructure
• Low latency with real-time Quality of Service (QoS)
• Reliable systems operation over low-bandwidth communication links with long transmission delays
• Fully interoperable DDS Security support for confidentiality, integrity and access control

Medical Robotics
Medical robotics – a technology once thought of as science fiction – is now a reality. Medical professionals use robots for everything from surgery and rehabilitation to non-invasive general hospital and pharmacy applications. Connext DDS is the connectivity framework for interconnected human-controlled, collaborative and fully-autonomous robotic medical systems. It provides real-time information exchange between complex system components and high-precision robotics, while meeting stringent patient privacy, safety certification and security requirements.

Connext DDS provides the framework to process, analyze and act on high-volume, real-time data with low latency in a redundant, fault-tolerant architecture (Figure 1). Robotic and haptic systems built on Connext DDS are resilient, self-forming and self-healing with no single point of failure. Built-in security based on the proven DDS Security standard provides for confidentiality, authentication, nonrepudiation and access control, keeping robots safe from security breaches.

Medical Imaging
Medical imaging plays a vital role within the healthcare system and has been at the forefront of technology adoption. It can improve patient outcomes through faster disease detection and more accurate diagnosis. Recent advances in medical imaging have allowed doctors to observe events at the molecular level, examine specific characteristics of a heartbeat and study individual processes within the brain. Connext DDS provides the critical infrastructure to allow these advancements to continue. Connext DDS is the connectivity framework for the development of next-generation medical imaging systems, allowing all of the sub-systems in a complete medical imaging platform to work as a single, integrated solution. It transmits large amounts of data between systems reliably, securely and in real time (<ms and deterministic).

Healthcare IIoT
Hospitals today employ thousands of intelligent machines to improve patient care. The latest equipment has sensors, software, pervasive networking and mobile components – yet often can’t exchange data with the machine on the other side of the bed. This can lead to administrative and patient care inefficiencies, cost overruns, medical errors, longer recovery times and even death.

Connext DDS was designed specifically for the complexity of distributed IIoT environments. Its central databus architecture connects publish-subscribe data from proprietary machines, software and mobile devices, enabling real-time information flow throughout the healthcare enterprise and providing a foundation for AI and Clinical Decision Support (CDS). It exchanges data reliably and securely, while operating within strict regulatory compliance.
Connext DDS transmits the correct patient data, where it’s needed, when it’s needed, every time, leading to lower operating costs and improved patient outcomes (Figure 2).

CONNEXT DDS IN ACTION

RTI has deep experience in supporting distributed systems within highly-regulated markets. Connext DDS users rely on RTI software to manage the connectivity aspect of their systems (Figure 3), decreasing time to market and lowering costs. Here are some of their stories.

Enabling faster emergency response to save lives
When a critical health event occurs, faster response times lead to better outcomes. The Physio-Control System of Care helps to improve survival for STEMI patients by linking field and hospital care teams to speed the care cycle. Stroke patients and many others also benefit from the comprehensive information delivery the system provides. Hospitals know exactly what to expect before patients reach their doors, which means care teams can be assembled and briefed in advance. This gives hospitals the opportunity to prepare for the patient’s arrival, which can potentially shorten time to definitive therapy.

Lowering the cost of care through interoperability
DocBox is developing an innovative clinical process management solution for hospitals that promises to help clinicians eliminate medical mistakes, improve clinical workflow and processes, and free up much of the time spent on administrative duties so that they, and particularly nurses, can focus on providing care. RTI’s Connext DDS is used to provide
secure, interoperable device connectivity allowing proof of concept consolidation of device alarms, health, and status. Additionally, it allows decision support to utilize data from a variety of medical devices.

“GE Healthcare is leveraging the RTI Connext DDS-based architecture to connect medical devices, cloud-based analytics, and mobile and wearable instruments.”

Matt Grubis, Chief Engineer for Mobile Digital Health Solutions, GE Healthcare

RTI CONNEXT DDS IS USED BY LEADING HEALTHCARE COMPANIES INCLUDING:

GE Healthcare

bK ultrasound

MD PnP

stryker

MEVION

DOCBOX

ABOUT RTI

Real-Time Innovations (RTI) is the largest software framework provider for smart machines and real-world systems. The company’s RTI Connext® product enables intelligent architecture by sharing information in real time, making large applications work together as one.

With over 1,500 deployments, RTI software runs the largest power plants in North America, connects perception to control in vehicles, coordinates combat management on US Navy ships, drives a new generation of medical robotics, controls hyperloop and flying cars, and provides 24/7 medical intelligence for hospital patients and emergency victims.

RTI is the best in the world at connecting intelligent, distributed systems. These systems improve medical care, make our roads safer, improve energy use, and protect our freedom.

RTI is the leading vendor of products compliant with the Object Management Group® (OMG) Data Distribution Service™ (DDS) standard. RTI is privately held and headquartered in Sunnyvale, California with regional headquarters in Spain and Singapore.