

DATASHEET

# RTI in Healthcare

ENABLING THE FUTURE FOR CONNECTED HEALTHCARE

## HIGHLIGHTS

A proven, secure, high-performance connectivity framework for reliable, interoperable data exchange among complex devices and/or large-scale systems of systems

Built-in DDS security that aligns with FDA cybersecurity guidance to protect data and patient privacy requirements

Data-centric connectivity for full visibility into data in motion and data at rest throughout the healthcare system

Plug-and-play interoperability that works seamlessly and securely between systems and medical devices

Scalability to millions of nodes for large, complex systems

Standards-compliant technology that reduces risk

### SECURELY CONNECTING THE MEDICAL TECHNOLOGY OF TOMORROW

Today's healthcare systems run on real-time data. Smart systems that utilize interconnected data - from devices to imaging, from bedside to telehealth - can improve patient outcomes, reduce medical errors and lower healthcare system costs. This seamless communication requires a highly-reliable connectivity framework to transport data, regardless of source, in real time. RTI enables the development of data-aware medical technology of tomorrow with Connext DDS, the connectivity framework built for the Industrial Internet of Things (IIoT).

RTI Connext DDS streamlines connectivity within complex devices and across healthcare systems, from edge to cloud. Developers can build and link healthcare applications, regardless of architecture or operating system. Its central databus seamlessly distributes data in motion, allowing medical devices and their components regardless of manufacturer - to work as a single integrated solution - reliably, securely and in real time. The distributed nature of the architecture ensures continuous uptime with no single point of failure.

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

DATA ITEM	AUTHENTICATION	ACCESS CONTROL	INTEGRITY	NON-REPUDIATION	CONFIDENTIALITY
Device diagnostic data	✓		✓		
Remote commands	✓	✓	✓	✓	
Patient data	✓	✓	✓		✓

Table 1: Example of DDS Security Scheme by Data Type

- 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. Connex 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.

Connex 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 Connex 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. Connex DDS provides the critical infrastructure to allow these advancements to continue. Connex 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.

Connex 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.

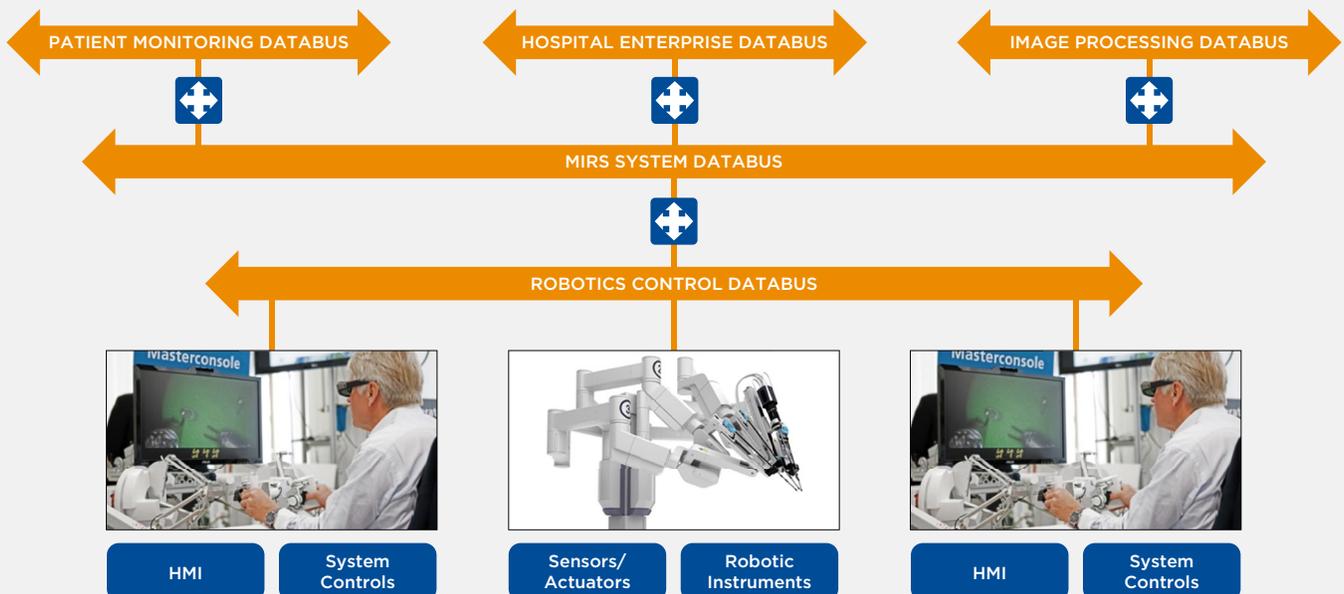


Figure 1: Medical Robotic Architecture

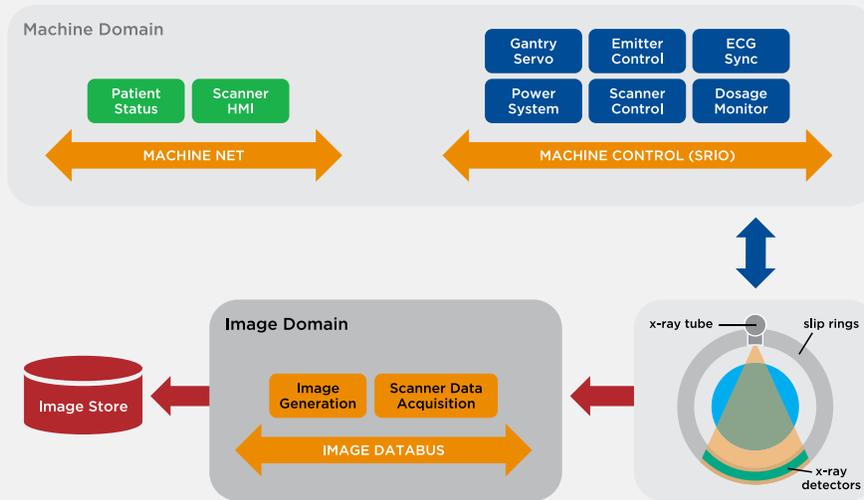


Figure 2: Example of Medical Imaging Architecture

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

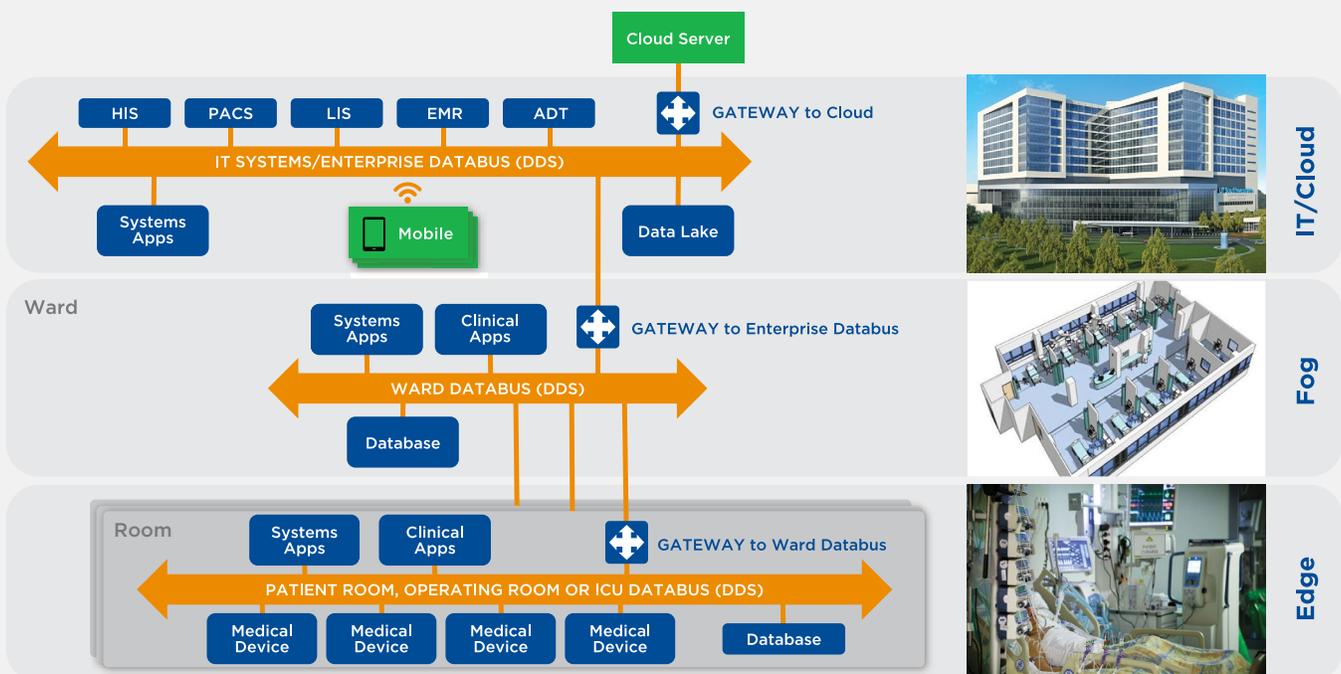


Figure 3: Example of Healthcare IIoT Architecture

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 Connex 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:**



## ABOUT RTI

Real-Time Innovations (RTI) is the Industrial Internet of Things (IIoT) connectivity company. The RTI Connex<sup>®</sup> 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<sup>SM</sup>.

RTI is the largest vendor of products based on the Object Management Group (OMG) Data Distribution Service<sup>™</sup> (DDS) standard. RTI is privately held and headquartered in Sunnyvale, Calif.

Download a free 30-day trial of the latest, fully-functional Connex DDS software today: <https://www.rti.com/downloads>.

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