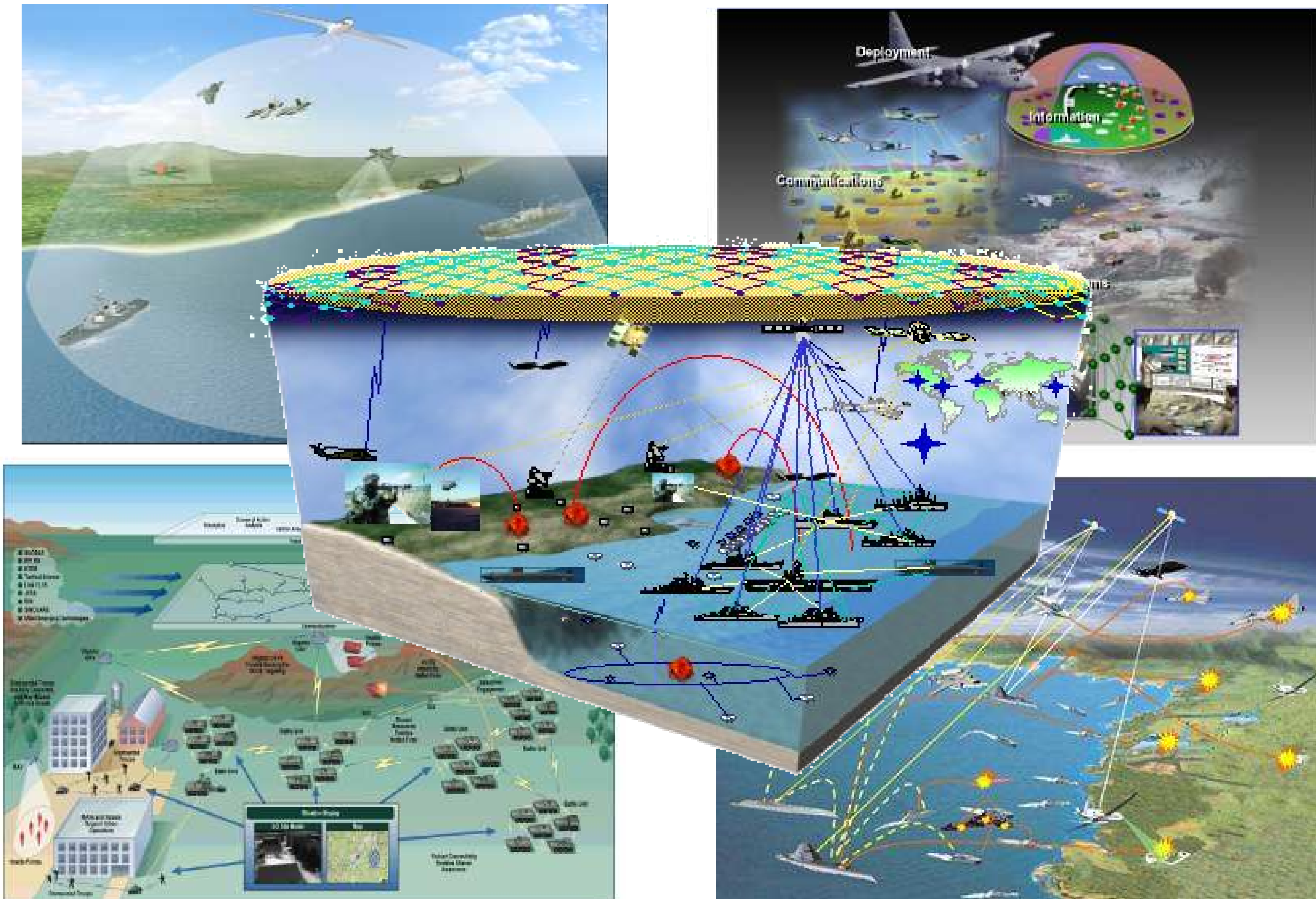
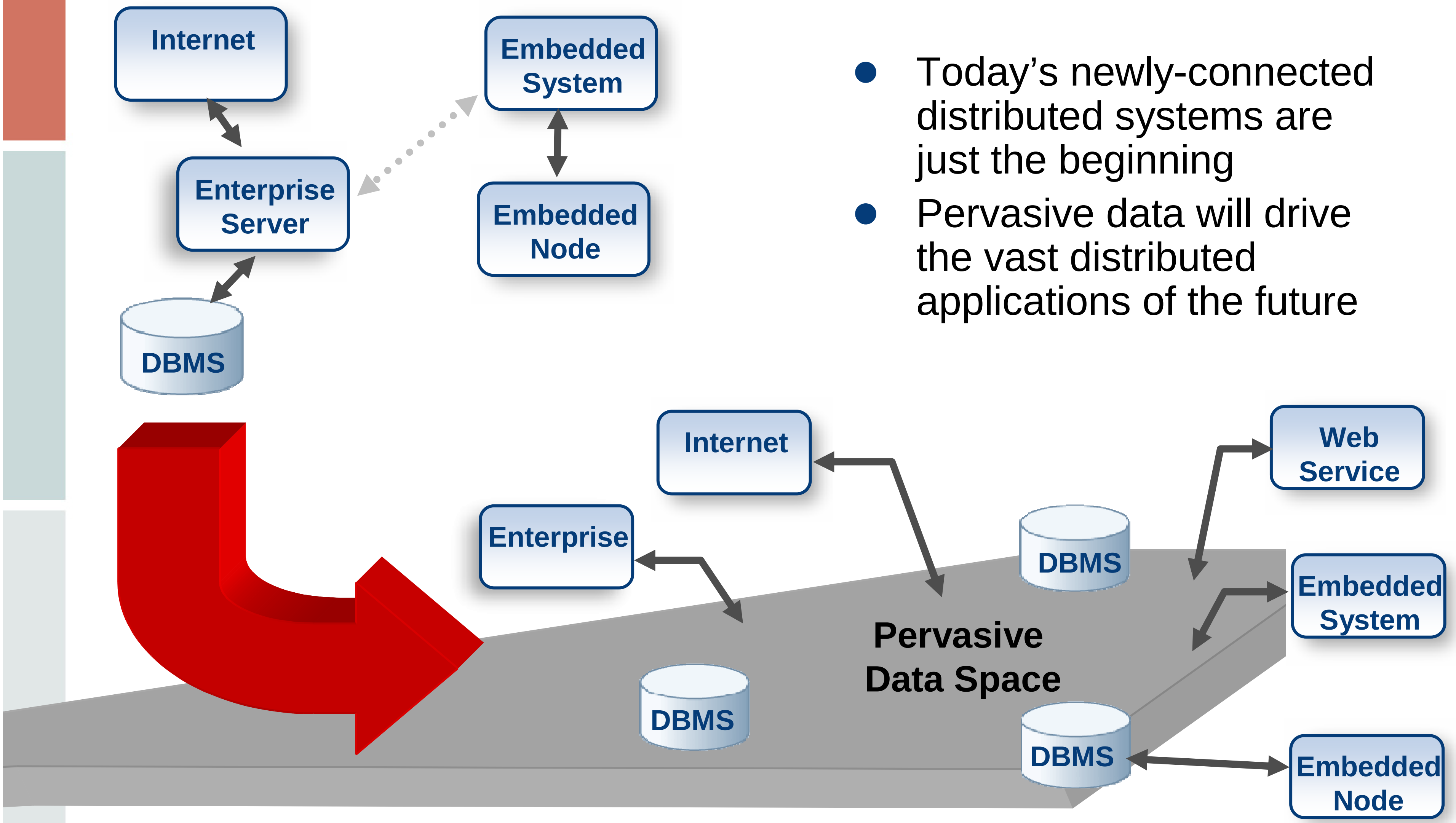
The Real-Time Middleware Experts™

The Data-Centric Future



Pervasive Data



- Today's newly-connected distributed systems are just the beginning
- Pervasive data will drive the vast distributed applications of the future

RTI Market Leadership

- ~400 different publish-subscribe applications
  - 75 DDS API applications
    - 20+ major Navy programs
    - All major US primes
  - Thousands of deployments

LOCKHEED MARTIN

NORTHROP GRUMMAN

BOEING

Raytheon

GENERAL DYNAMICS
Strength On Your Side

RTI

US Navy LPD-17 Ship-Wide Area Network

- The US Navy's LPD-17's sophisticated Ship-Wide Area Network (SWAN) includes:
  - shipboard, machinery, damage and steering controls
  - Mission control, navigation and communication systems
  - Many other components
- The challenge is the complexity of coordinating such a large number of disparate systems
- RTI forms the backbone for the entire SWAN to synchronize & manage this wide-ranging set of control systems

Military

Lockheed Martin US Navy Aegis Open Architecture Weapon System

- Next-generation of the U.S. Navy Aegis Weapon System
- Challenge to share time-critical data across highly distributed system including radar, weapons, displays and controls
- Need to maximize future scalability and flexibility
- RTI provides real-time communication infrastructure. Standards-based & extensible for future system enhancements

Military

Navy Open Architecture
Ship Self Defense System (SSDS)

- Project to employ standards throughout ship systems (frameworks, OS, etc.)
- Goal: Reduce total cost of ownership, ease system upgrades, reduce interoperability issues
- RTI selected as middleware: its extensibility enables an open architecture throughout Navy!
- RTI provided advanced integration, support & consulting

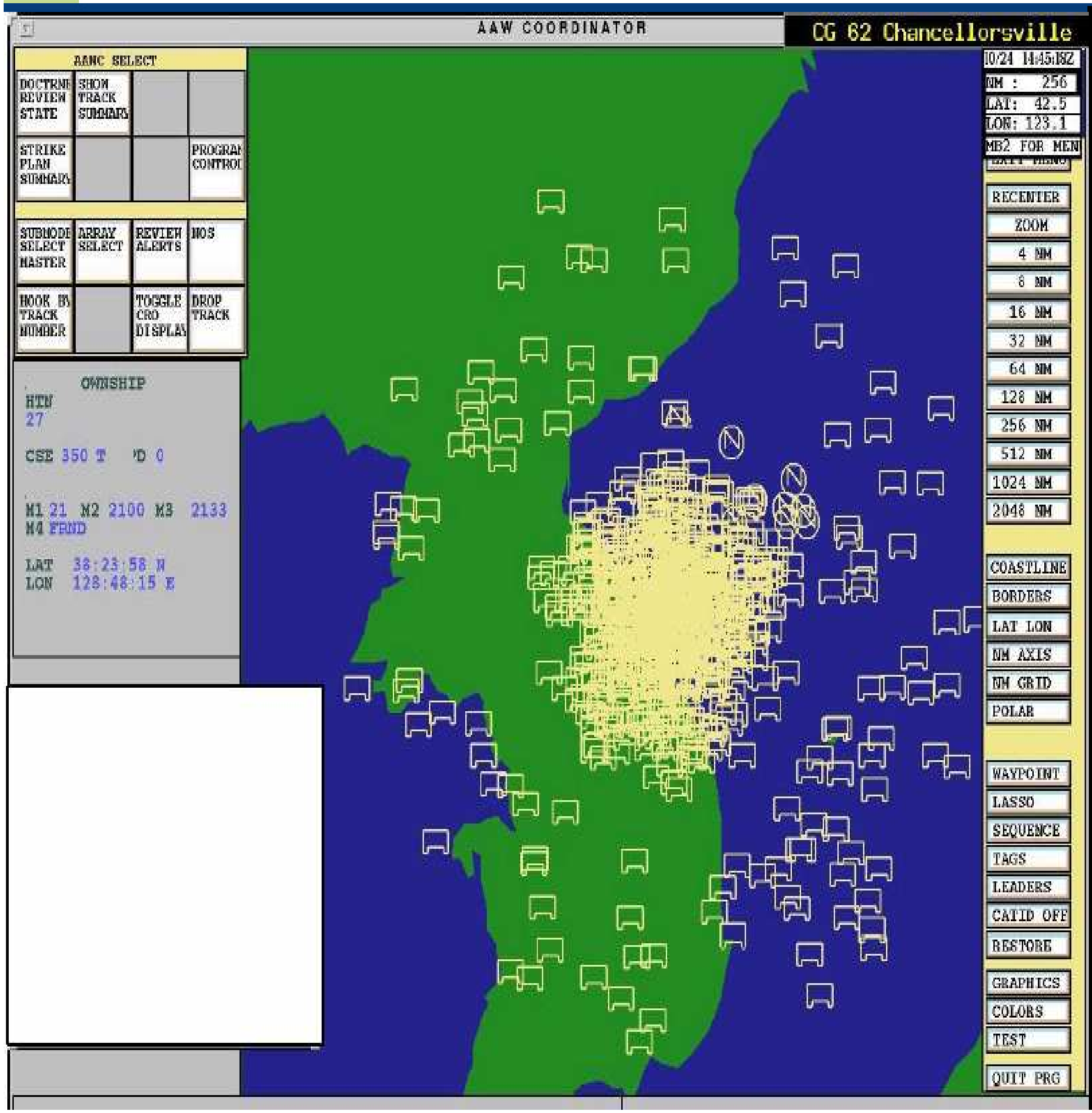
Military

Littoral Combat System (LCS)

- Distributed combat and control system for U.S. Navy ship
- Concerned with extensibility of system, compatibility between vendors, easy upgrades
- OMG DDS is the specified standards-based middleware in US Navy Open Architecture
- RTI selected on performance, extensions and advanced services

Military

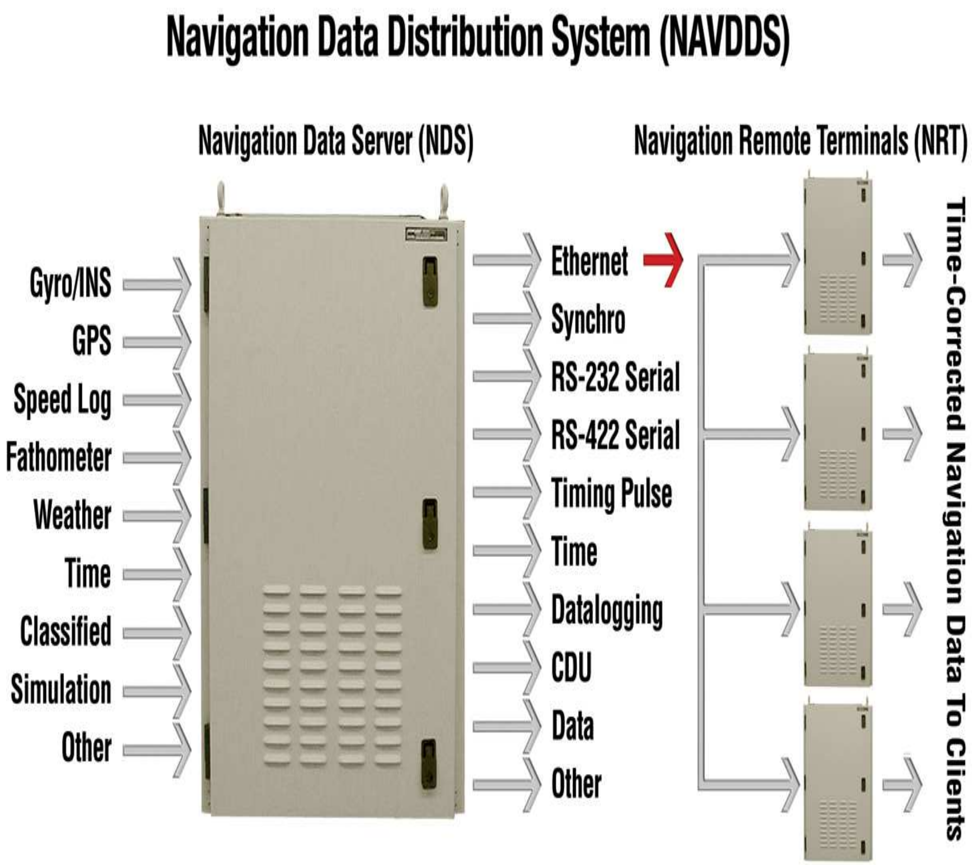
NSWC Dahlgren HiPer-D Test Bed



- High-Performance Distributed Computing (HiPer-D) program tracks thousands of targets, coordinates hundreds of computers on multiple ships
- System requirement to be real-time (microseconds) and deterministic (100% of the time)
- RTI provided COTS technology that met HiPer-D's stringent requirements for real-time & deterministic response in a distributed computing environment

Military

NavDDS Shipboard Navigation System



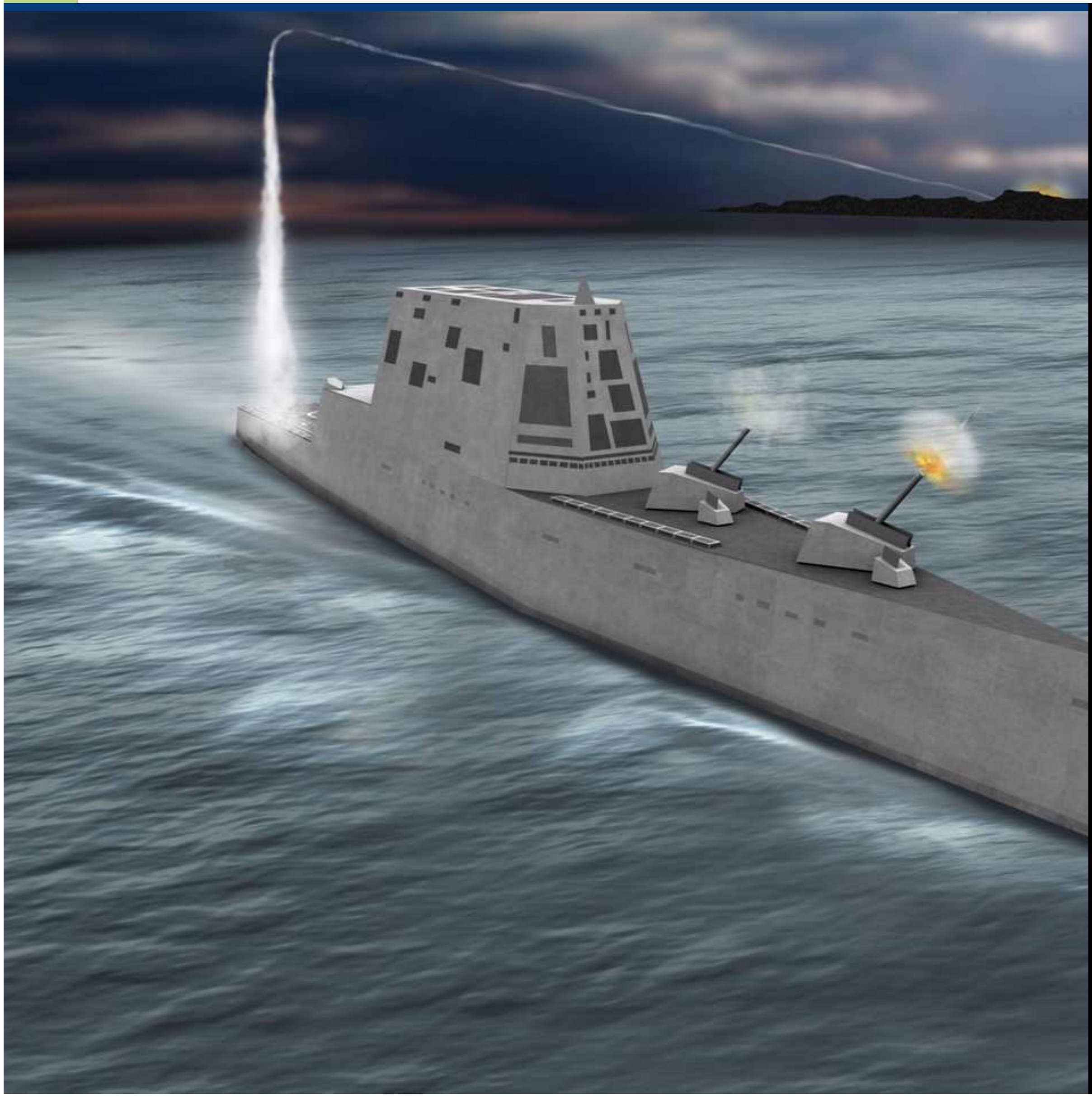
- Sperry Marine NavDDS seamlessly interfaces electronic navigation sensors with shipboard systems
- Challenge to scale from single sensors to large-scale, multiple-sensor system distributing time-critical data
- DDS does not require specific design knowledge of remote devices, enabling easy integration of new data sources
- DDS auto-discovery means can add new systems to architecture without reconfiguring existing subsystems

Transportation

Navy Open Architecture
Ship Self Defense System (SSDS)

- Project to employ standards throughout ship systems (frameworks, OS, etc.)
- Goal: Reduce total cost of ownership, ease system upgrades, reduce interoperability issues
- RTI Services provided advanced integration, support & consulting
- First deployment at sea now

DD(X) U.S. Navy Destroyer Program



- Developed under the DD(X) destroyer program, DDG 1000 Zumwalt is the lead ship in a class of next-generation, multimission surface combatants
- RTI powers the Total Ship Computing Environment Infrastructure (TSCEI), the backbone of the network computing system and basis for all DDG 1000 application software programs
- *"The selection of RTI came through a process which uses formal evaluation criteria and a source selection board to ensure that the Navy gets the best value. This is an emerging product market and it was determined that the offering from RTI, a small privately held company, provides the best value to the Navy."*

-- Raytheon DDG 1000 System Software Development Director Bob Martin

U.S. Army and University of Iowa Driving Simulator

- The National Advanced Driving Simulator provides state-of-the-art real-time driving simulation
- High number of systems – visual, motion, controls, etc. - exchanging and processing data in real-time
- Real-time performance was critical: other middleware such as CORBA and DCOM were simply not fast enough

CAE SimXXI Flight Simulation

- State-of-the-art full-flight simulator from CAE
- Challenge is communication between subsystems (over IEEE 1394) with low-latency data transfer
- RTI chosen because it excels in real-time performance and is simple to use and integrate

Simulation

Force Technologies Ship Simulations

- FORCE trains ship captains by using accurate simulations of actual locales worldwide
- Performance - many components need to come together and share data in real-time
- Scalability - Want to integrate systems more rapidly
- RTI delivered on the performance and scalability requirements. RTI also helped design the application

Simulation

High-Value Mobile Asset Tracking

- System used to wirelessly monitor high-value mobile assets such as locomotives, industrial equipment and marine vessels
- Biggest challenge was wireless bandwidth issues
- RTI addressed critical issues such as tuneability and discovery process over wireless network
- Company brought DDS knowledge from General Motors, chose Pub-Sub model, then chose RTI as vendor

Highway Traffic Monitoring in Tokyo

- The City of Tokyo provides real-time information to commuters and officials about traffic problems
- Hundreds of traffic monitors and information kiosks along the highway
- Challenge to deliver information to variety of server & client platforms, via links varying in bandwidth & location
- RTI enables reliable delivery of information over heterogeneous systems and with minimal bandwidth

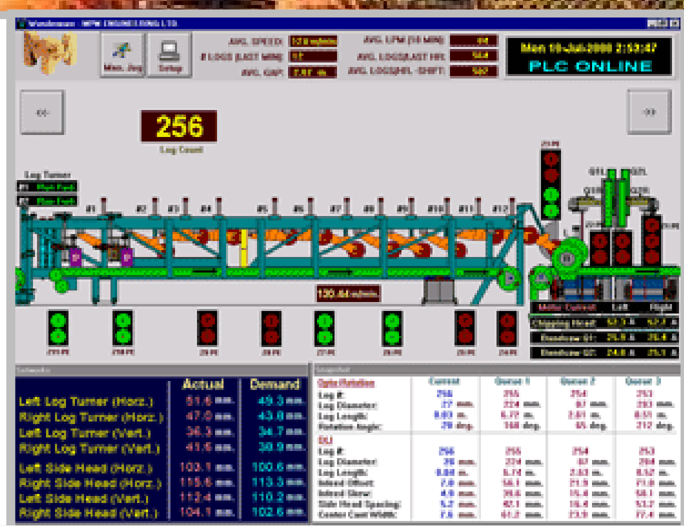
Transportation

U.S. Army Munitions Transfers

- The US Army built a “smart” robotic crane to automate manpower-intensive munitions transfer process
- Challenge to coordinate multifaceted system requiring high level of precision
- RTI offered the performance and reliability required for complex system
- RTI integrated hardware and software systems from many vendors

Industrial Automation

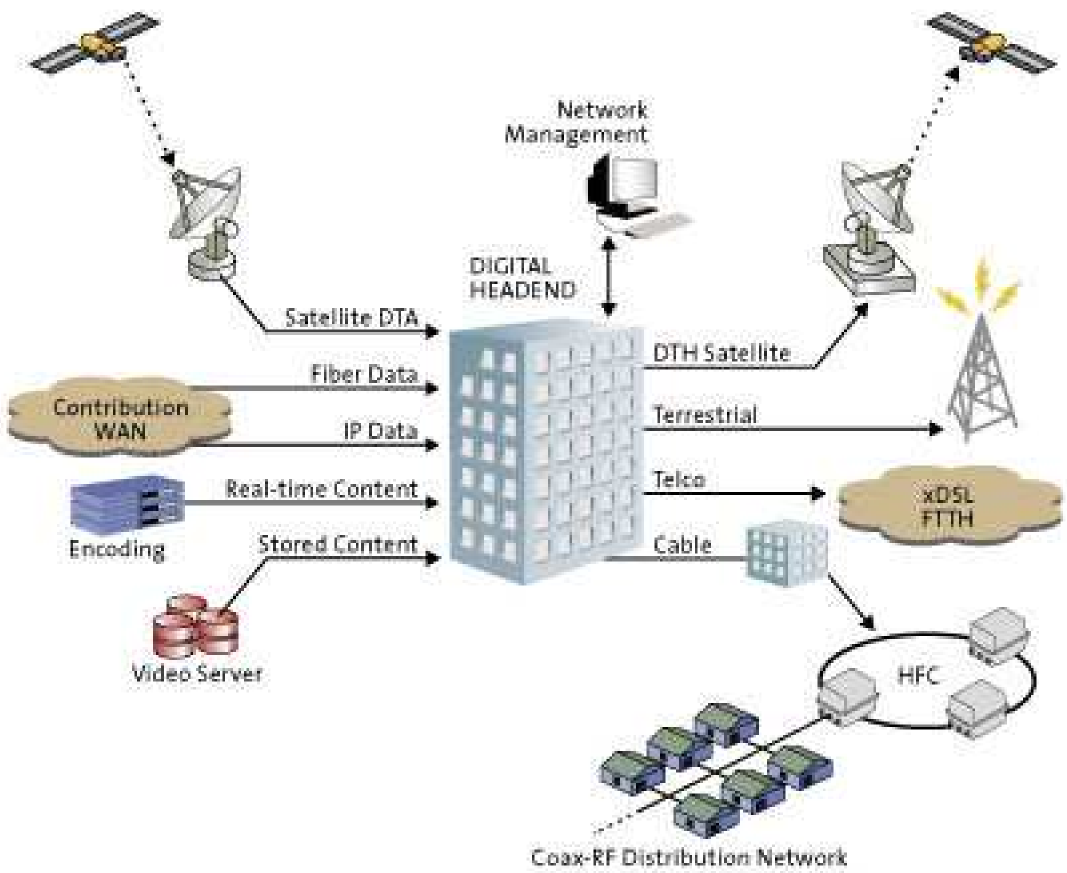
Schneider Programmable Logic Controllers



- Modern factories require the exchange of up-to-the-minute data on manufacturing processes, even with resource-constrained devices
- Challenge to incorporate devices with limited memory or processing power
- RTI with Schneider created a compact real-time publish-subscribe service – resides & executes in under 100 kb!

Industrial Automation

Harmonic Digital TV Video-on-Demand



- Harmonic builds transmission equipment to enable video-on-demand worldwide
- Challenge delivering data over WAN to and from disparate hardware
- RTI offers richer feature set than other solutions. Also enables scalability and future extensibility of the system
- Standard commercial off-the-shelf solution key to meeting tight schedule, lowering costs

Communications

Varian MRI and NMR Products

"RTI delivered great functionality at a low cost. Using RTI middleware saved us a lot of money, time, and effort compared to our previous in-house developed solution."

- Varian provides leading edge tools and solutions for diverse, high growth applications in the life science industry
- Varian needed a new software architecture to seamlessly handle its expanding product line of magnetic instruments
- RTI provided the flexible and powerful QoS needed. Using RTI has greatly simplified system integration and connection
- Varian is today shipping RTI middleware in their entire NMR instruments product line.

Medical

DARPA Flying Fox Autonomous Vehicle Systems

- Autonomous vehicle in the 2005 DARPA Grand Challenge race
- Unique characteristic of FireFox: adaptive vision system – vehicle "learns" through example
- Complex network of control and vision systems, sensors, processors, operating systems
- RTI integrates all kinds of data sources, shares data with minimal latency

Unmanned Vehicles

AWACS Radar System Upgrade

- Airborne control system for surveillance, command & control and battle management
- Upgrading system to be open, supportable, less expensive to maintain and extend
- RTI is standards-based, open and extensible, reducing integration risk
- RTI is a proven COTS solution, reducing total cost of ownership over in-house development

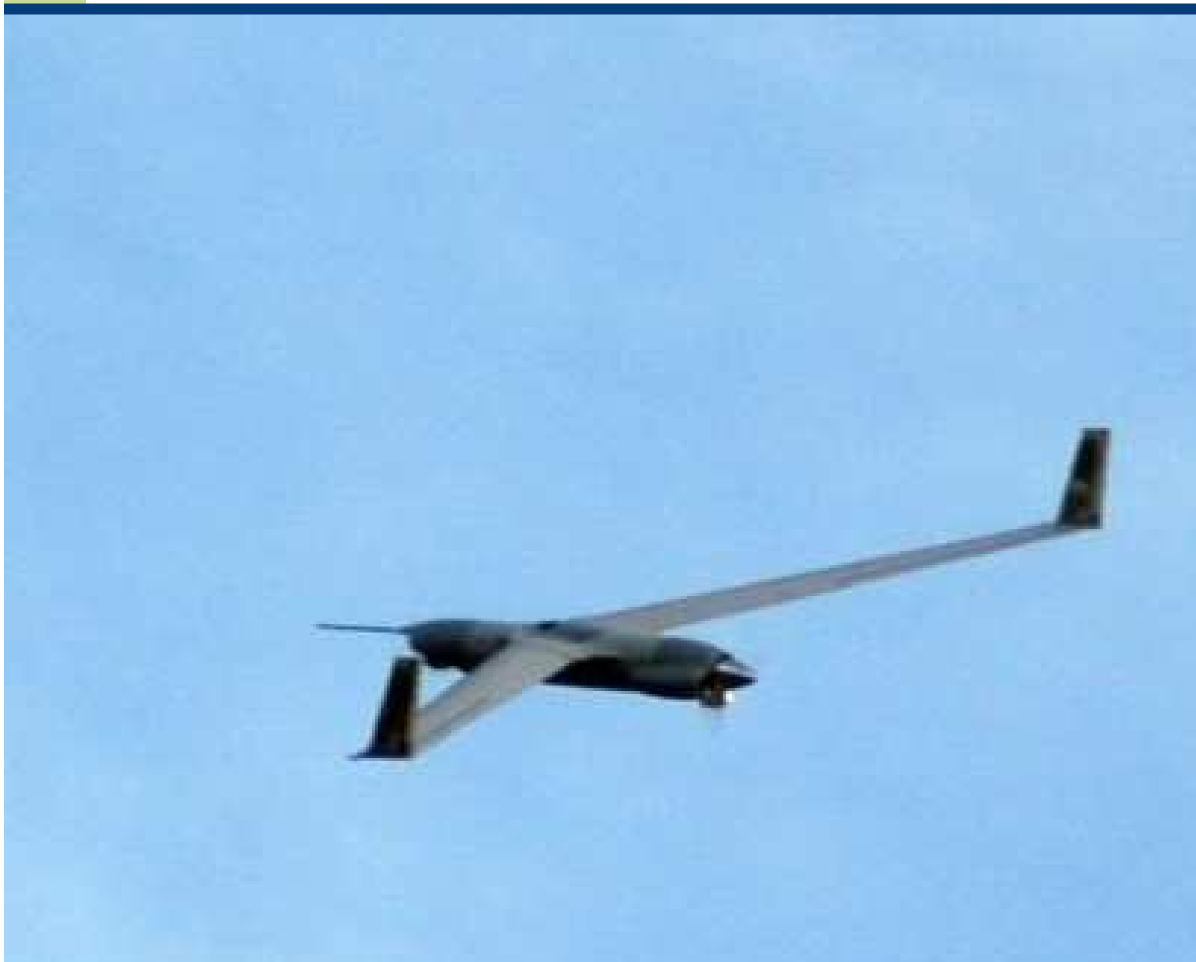
Military

DDS B-1B Tactical Systems Upgrade

- Adding new command & control and communications capabilities that need to work with legacy control system
- Need architecture that is open & modular for future extensions and upgrades
- RTI is open and scalable, reducing integration risk, standards-based ensuring supportability

Military

Insitu Unmanned Air Vehicle



"…we have seen a 30% increase in productivity based on not having to handle data communication issues." Gary Viviani, VP of Engineering

- Insitu is a recognized leader in the exploding UAV space
- The next generation of UAV's including the Scan Eagle and newer platforms
- Challenge is to have a successful UAV mission which requires impressive autonomy and reliable ground control
- RTI enables an information flow that is much more orchestrated and flexible allowing seamless switch control between multiple ground stations while connecting reliably over unreliable links

Military

RTI Leadership

- Market leader
  - #1 in embedded middleware market share* (encompassing *all* middleware types)
  - >70% worldwide share of DDS market**
- Experience leader
  - Fourth-generation maturity
    - Based on experience with ~400 different designs since 1996
    - Proven in real-world, mission- and life-critical applications
  - Wide and deep platform support (over 65 platforms)
- Technology leader
  - Consistently highest performance
  - Standards compliant, both API and wire spec
  - Flexibility: Modular, pluggable architecture
  - Zero-configuration deployment
  - Advanced protocol: Strict reliability, large-data-type support
  - Services leader
- Thought leader
  - Led standardization at OMG
  - Contributed interoperability protocol RTPS
  - Led SIG, DDS portal, DDS info days

*Embedded Market Forecasters, June 2006; **VDC Analyst Report, Nov 2006

Skip

What’s New at RTI?

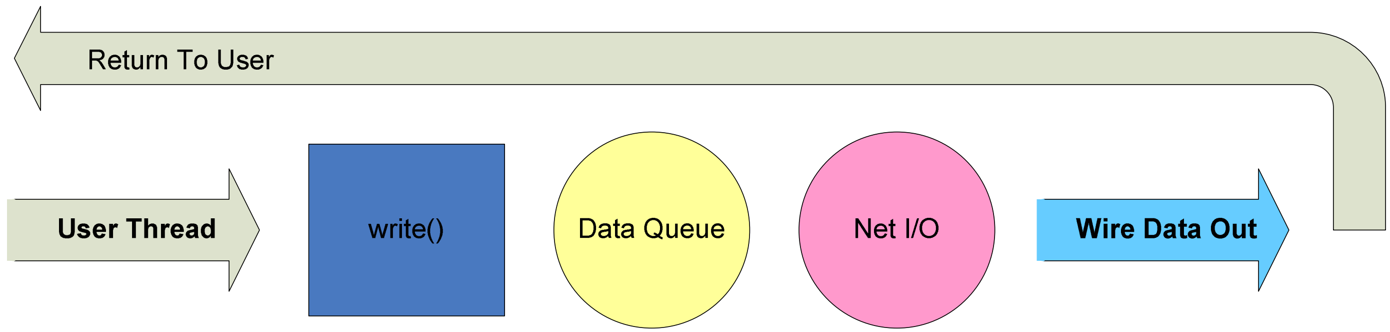
- RTI Data Distribution Service 4.1 released
- RTI Real Time Connect to Oracle introduced
- RTI Developer tool suite released
- RTI Architecture Study service offered
- RTI CORBA solution announced
- RTI Event Processing launched
- RTI Ecosystem growing

New in…
RTI Data Distribution Service 4.1d

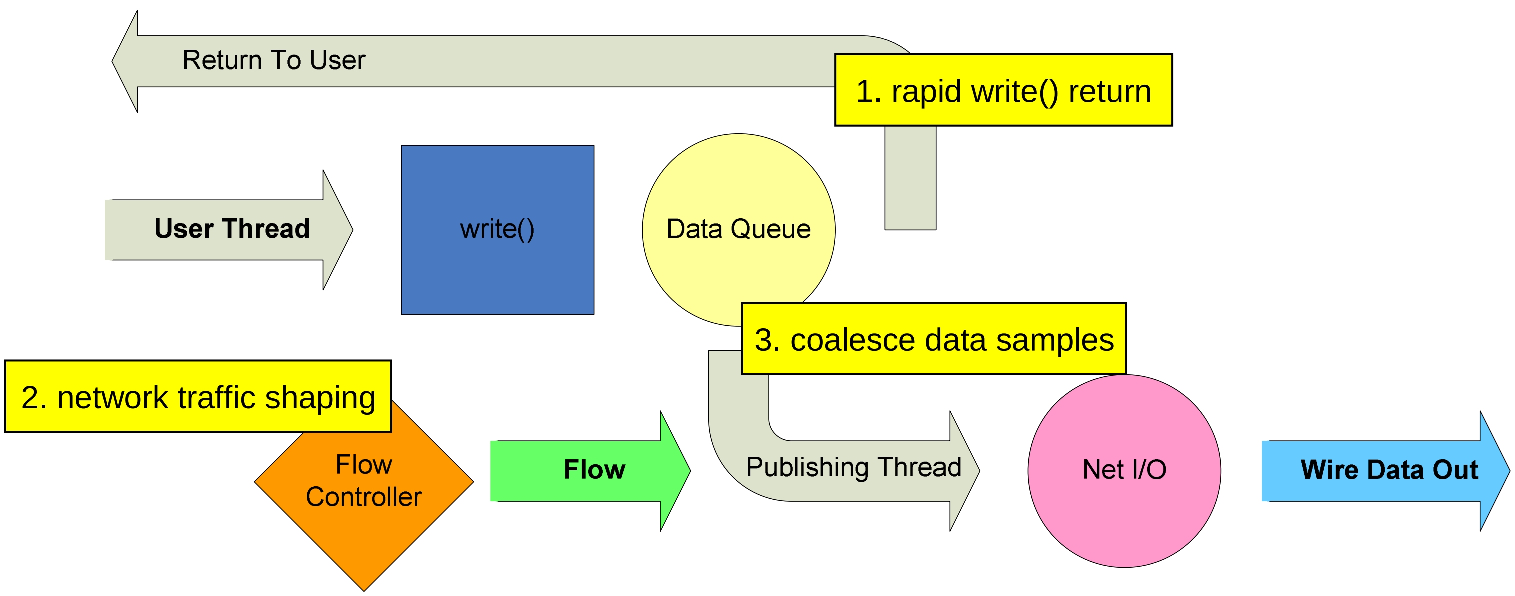
- Large data-type support
  - Even send video!
- Asynchronous data publishing
  - More efficient throughput
- IPv6 built-in transport
  - Including transport priority mapping
- Native support for 64-bit Linux, Solaris, Windows
  - Work with large data stores
- Multi-language support for Content Filtered Topics
- Port mapping
- C++ support for DDS Namespace
- Improved performance

Asynchronous Publishing

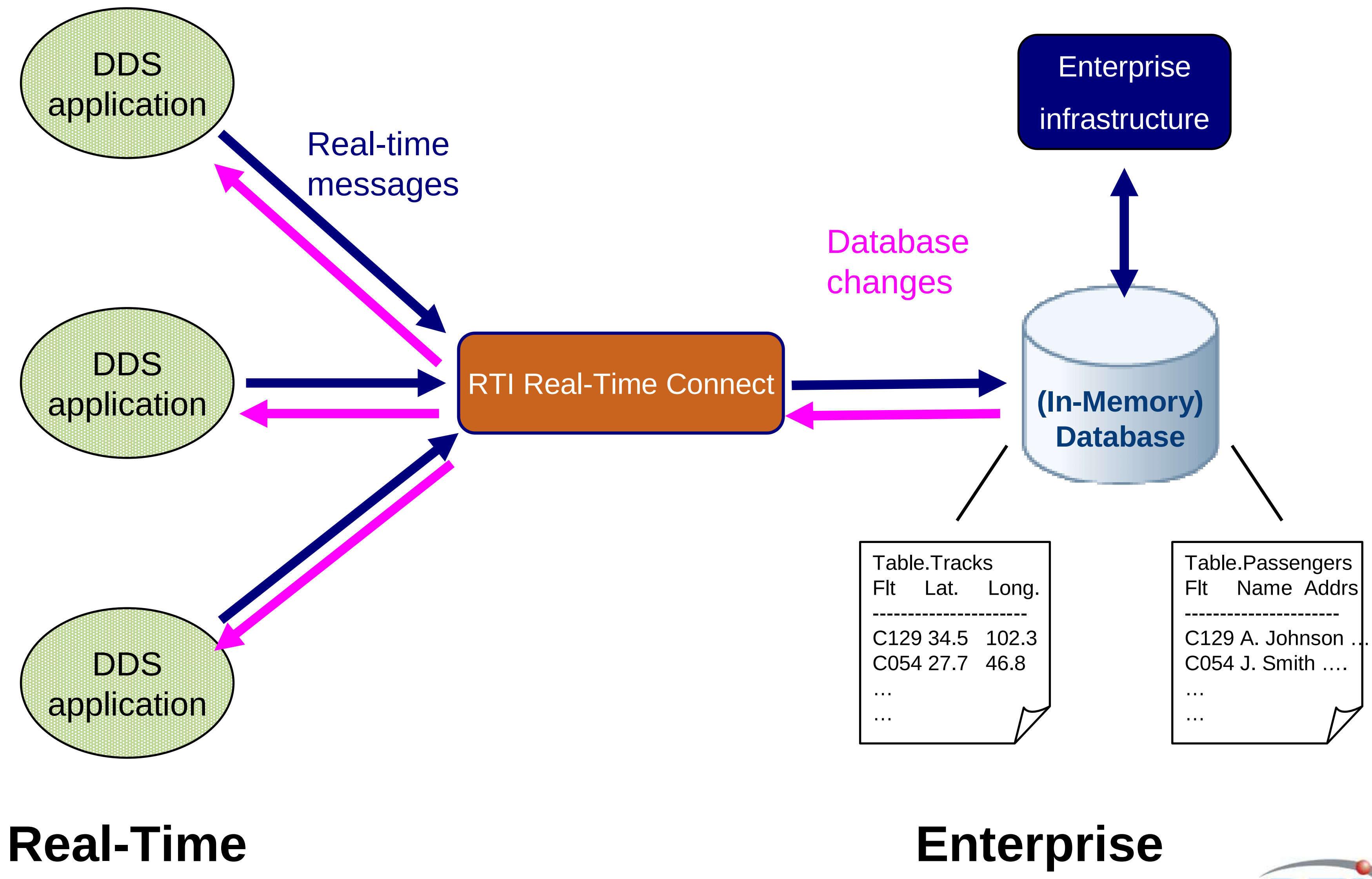
- synchronous send path:



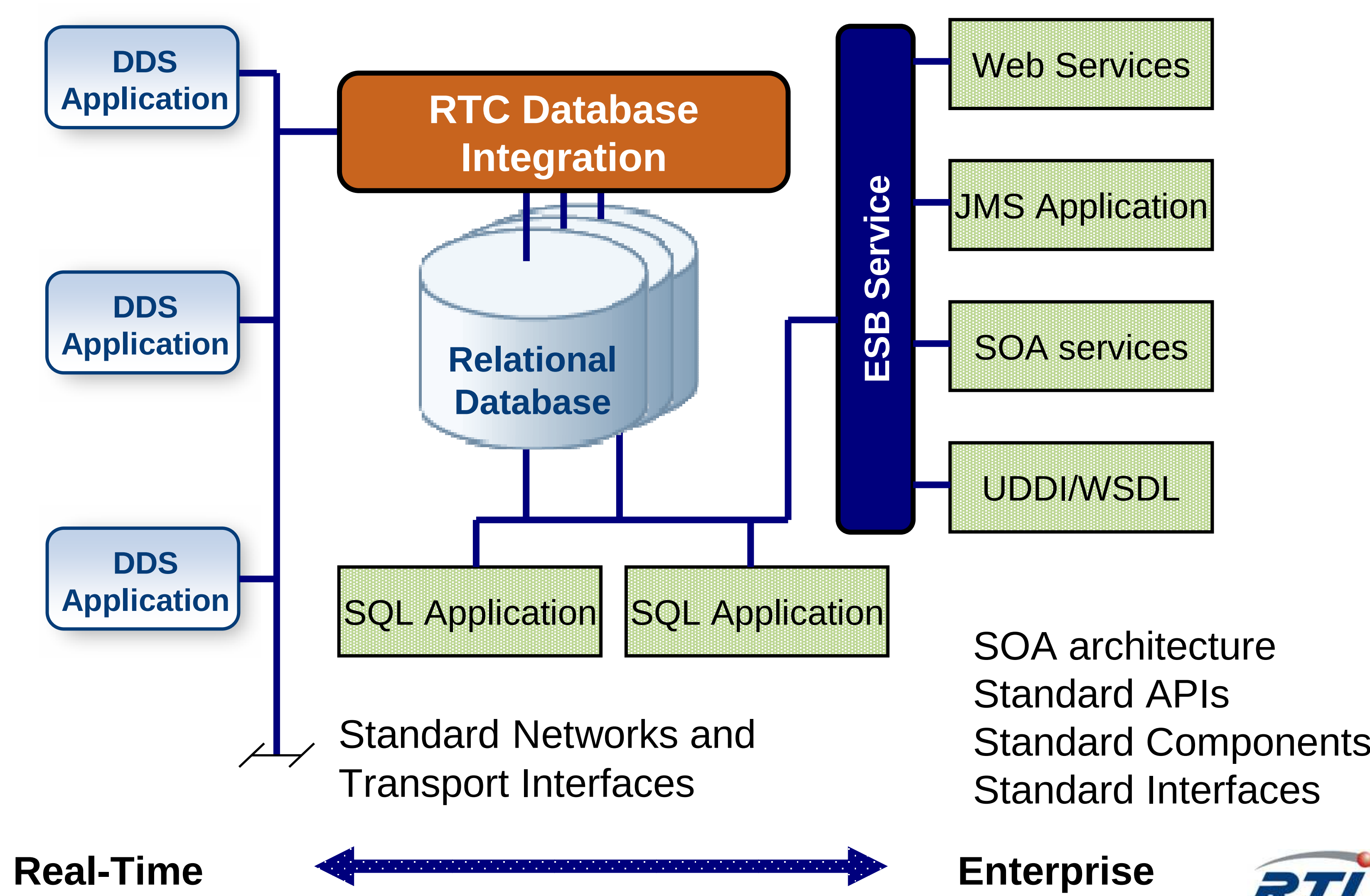
- asynchronous send path:



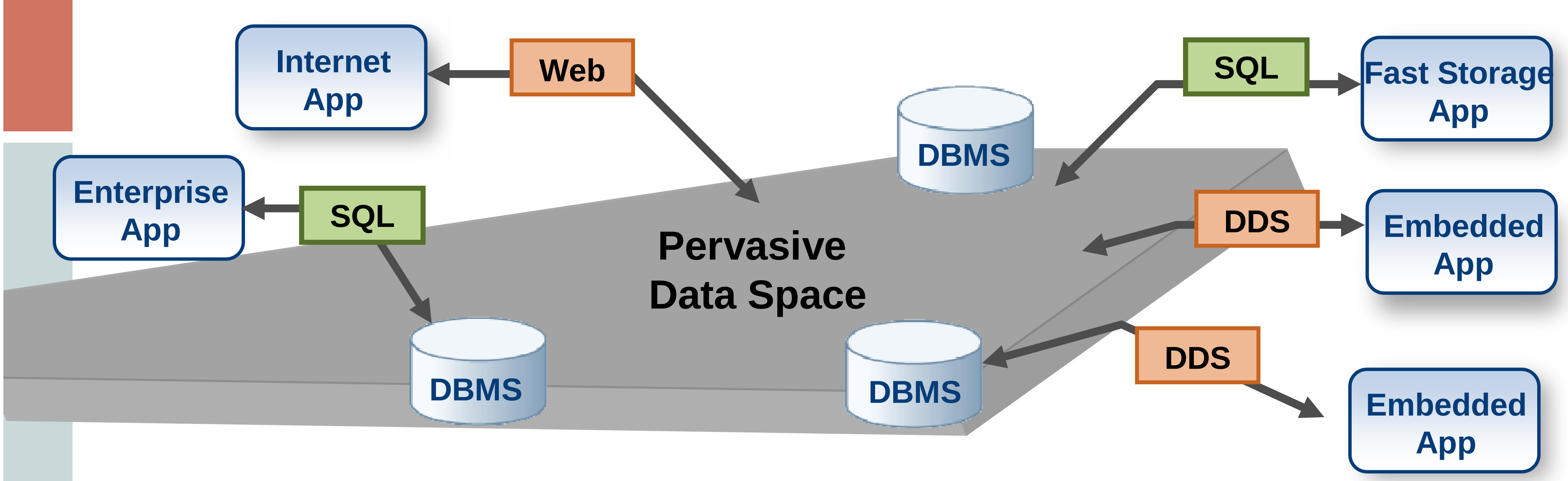
Introducing…
RTI Real-Time Connect to Oracle



Enterprise Integration



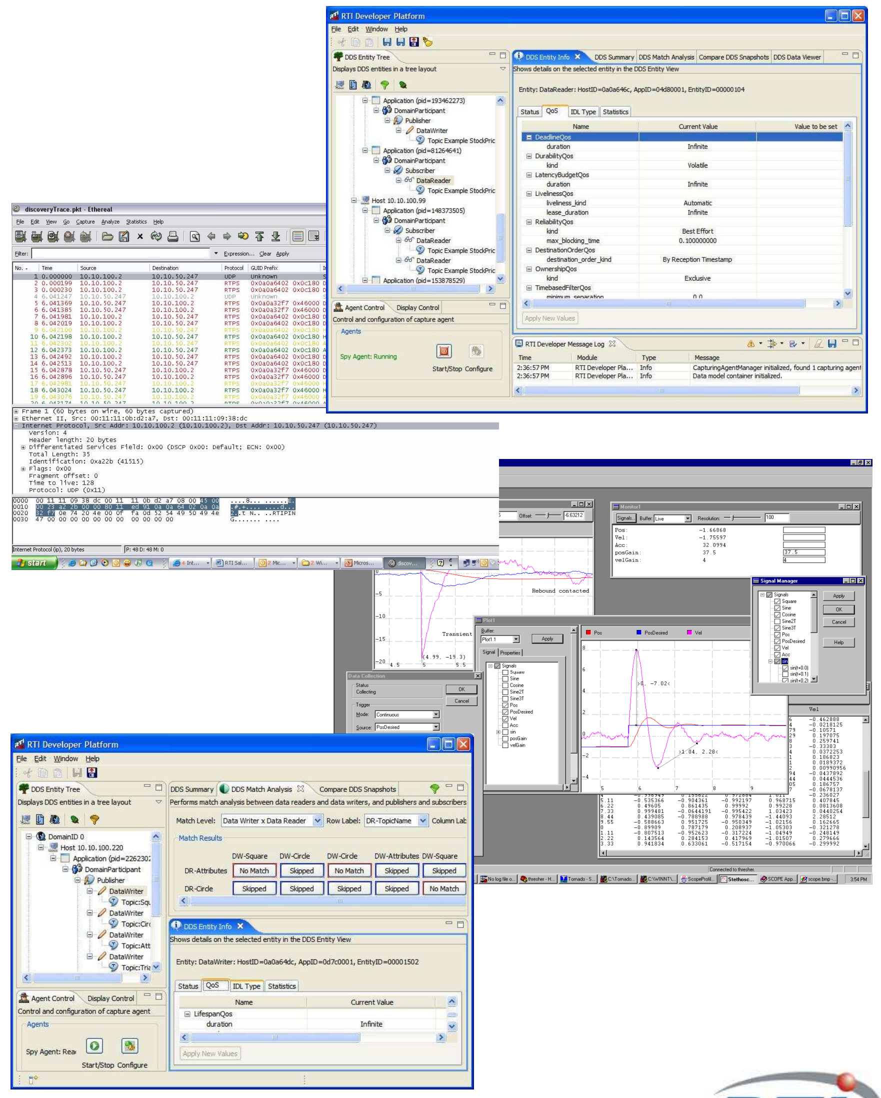
Standards-Based Pervasive-Data Space



- Delivers the first step towards the pervasive-data “e2E” vision
  - All data is accessible to all applications with standard APIs
  - The system can provide any information, past or present, to any location at any time.
  - Data models map transparently
  - No need for application-level bridging

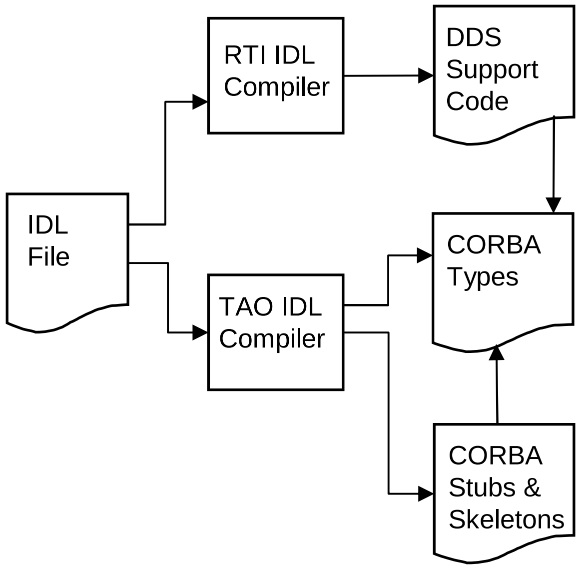
Introducing…
RTI Developer Platform

- RTI Analyzer
  - Understand connections and data flow
  - Tune QoS properties without changing code
- RTI Scope
  - Capture and monitor packet payloads
  - Collect time histories of Topic values
- RTI Protocol Analyzer
  - Sniff the wire and analyze traffic



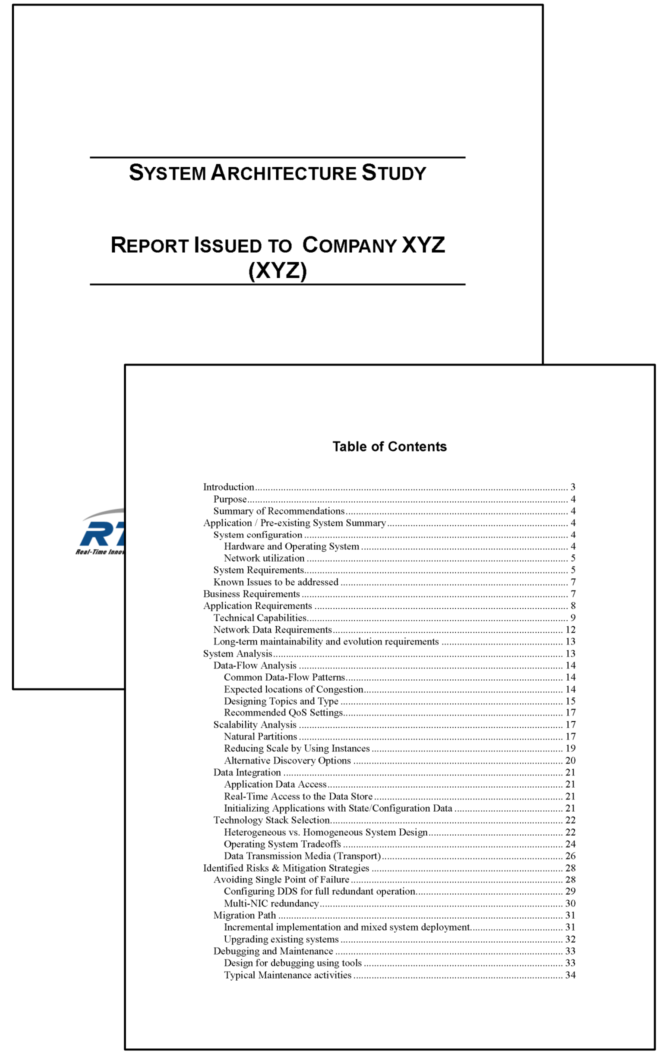
Introducing…
CORBA Integration and Support

- RTI now distributing and supporting CORBA
  - Partnership with OCI
  - OCI ACE TAO 1.4a source-code
    - RHEL 4.0 (32-bit & 64-bit)
    - Solaris 2.10 & Solaris 2.9
    - Windows
- Support CORBA and DDS applications with a common IDL file and language mapping
  - Generation of type-specific code that is compatible with OMG CORBA IDL mappings
  - Suport for Java CORBA types



Introducing… Architecture Studies

- Leverage RTI's deep experience
  - Reduce risk
  - Make the right decisions upfront
- Meet requirements:
  - Performance
  - Scalability
  - Availability
  - Integration
  - Selection and configuration of hardware and network
- Avoid costly rework late in development cycle
- Maximally leverage RTI products
- Identify risk areas and mitigation strategies



SYSTEM ARCHITECTURE STUDY

REPORT ISSUED TO COMPANY XYZ (XYZ)

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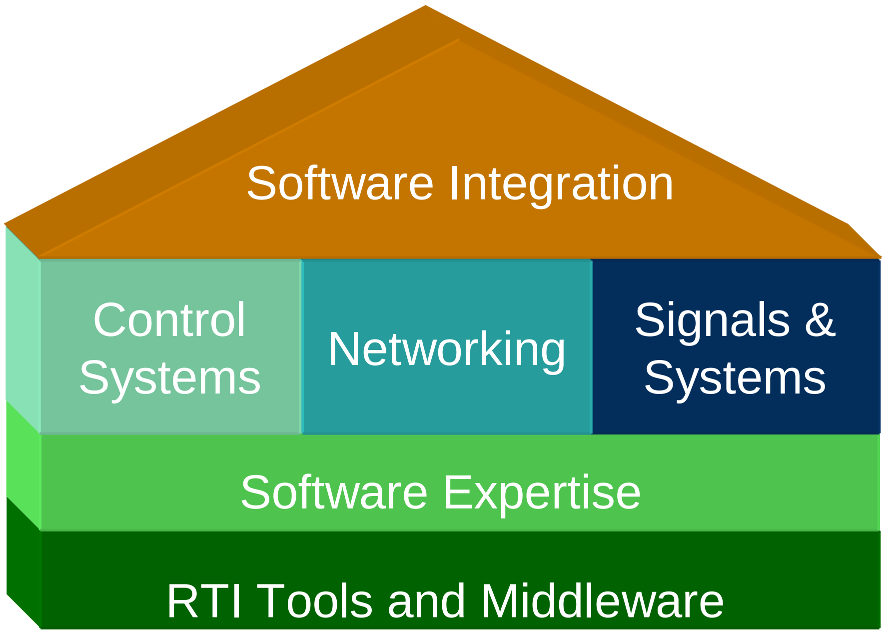
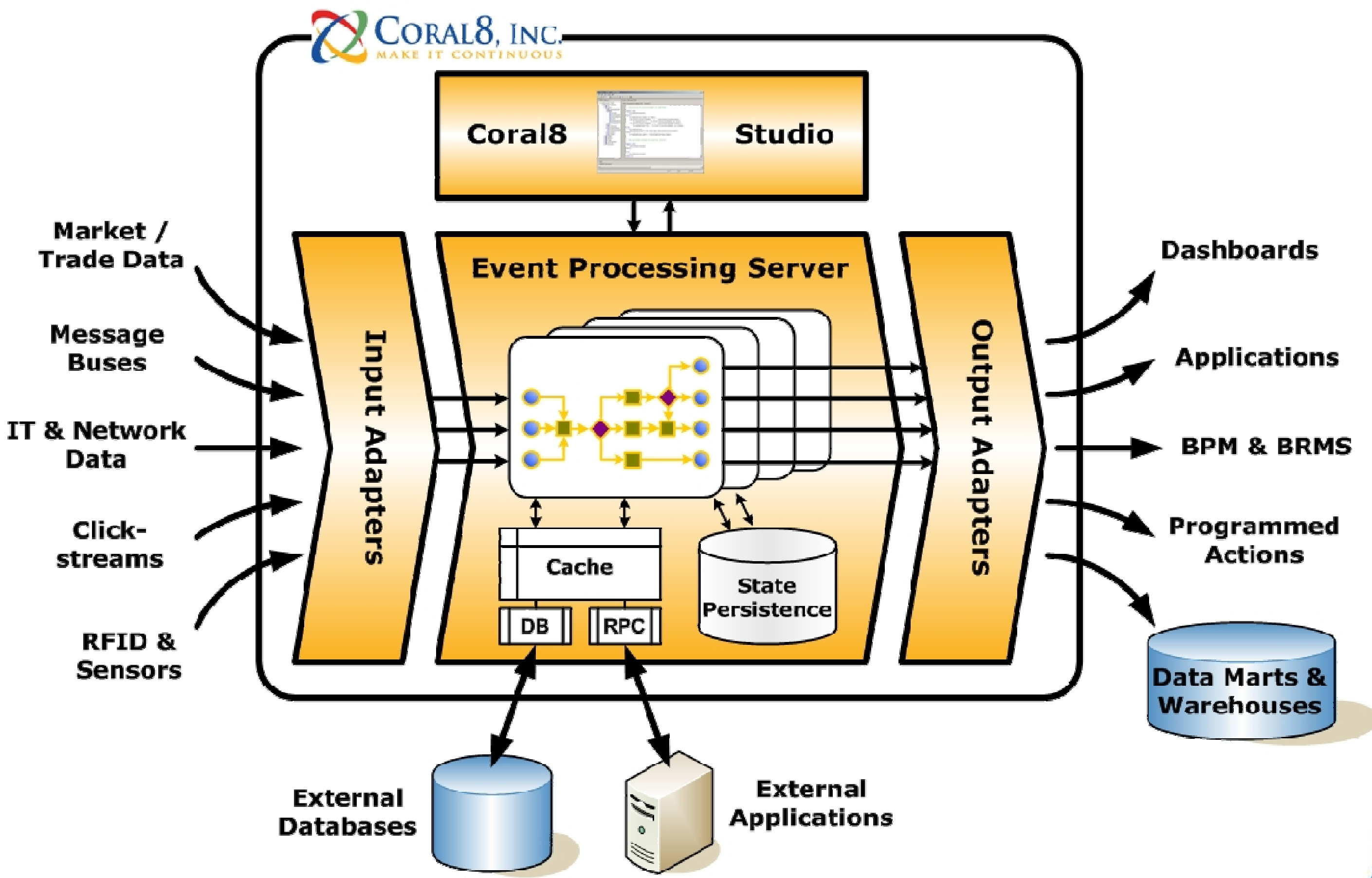
RTI's Expert Consulting



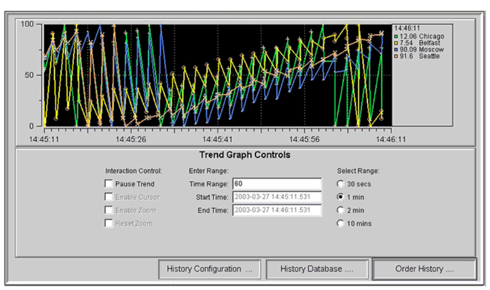
- Integration services
  - Custom drivers
  - Legacy hardware support
  - Hardware/software interface
  - Integrating multiple teams or vendors
- Networking solutions
  - Evolving **requirements** → **implementation** → **support**
  - Custom DDS middleware
- Architecture studies
  - Design assistance, audits, reviews
- Critical on-site testing and debugging support

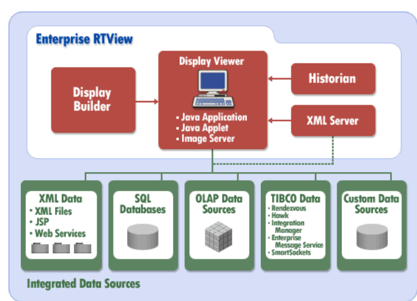
Introducing…
RTI Event Processing

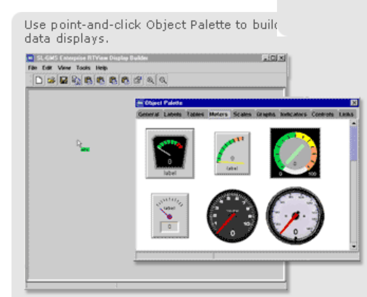
- CEP == an “inverse database”
- High-performance, intuitive decision processing
- Natural integration with DDS data model



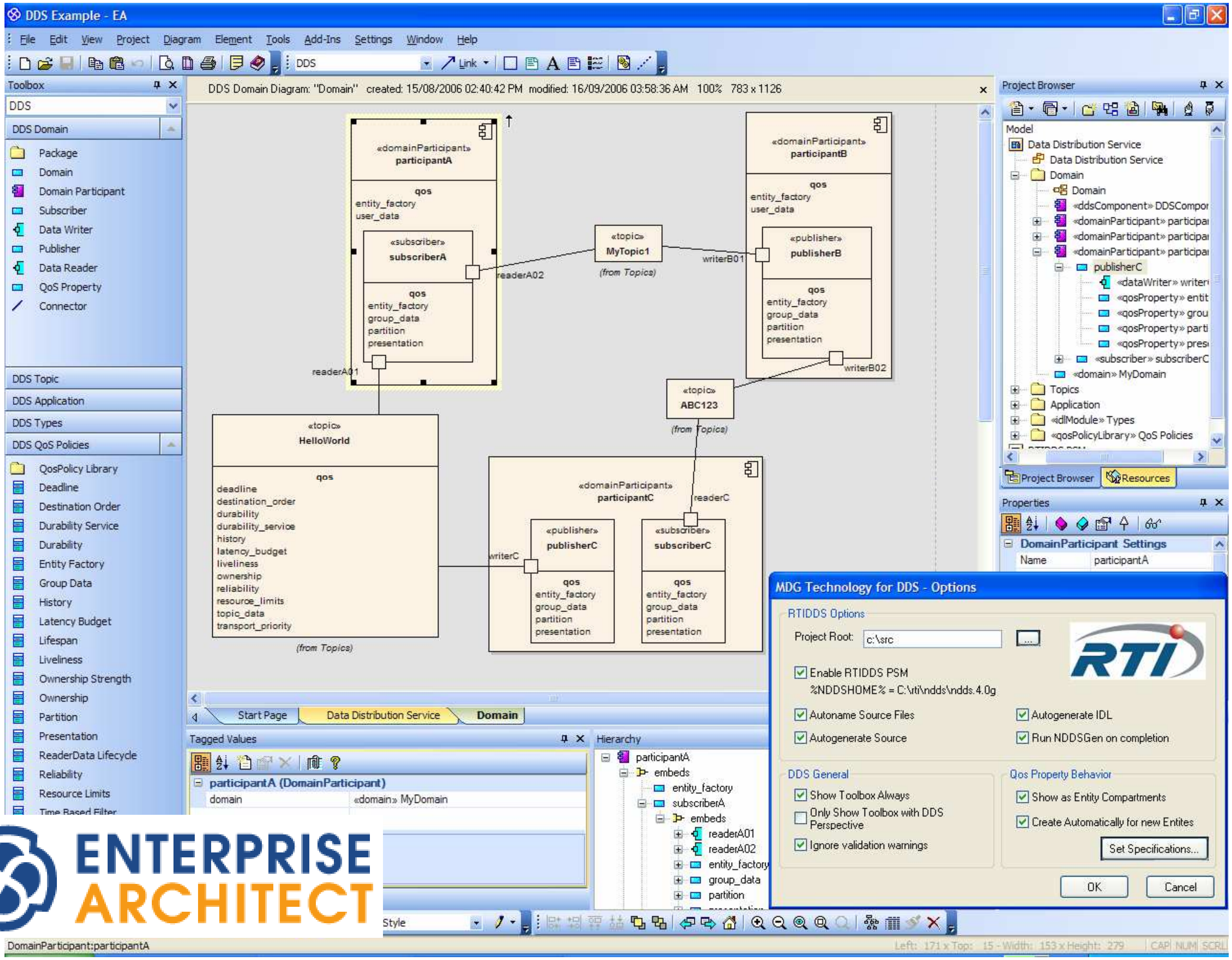
Introducing…
SL Enterprise RTView







Sparx Enterprise Architect and RTI Data Distribution Service Integration



RTI's Thriving Ecosystem

- Third parties go with the market leader
- Best-of-class technologies
  - *Coral8: Complex Event Processing
  - *Object Computing Inc. (OCI): ACE-TAO CORBA
  - *Oracle: In memory and enterprise databases
  - *Sherrill Lubinski (SL): Dashboard and GUI building
  - SparxSystems: UML and MDA tools
  - Themis: Application Management Tools
  - Dot21: Track Analysis and Visualization Tools
  - Motorola: Hardware integration
  - Arrow: Enclosures, packaged product
  - Wind River, LynuxWorks, Green Hills: RTOS
- The ecosystem can deliver whatever you may need

*RTI resells these technologies

RTI's Commitment to Customer Success

- Effective testing process
  - Extensive unit, feature, performance, stress tests
  - Fully-automated *nightly* build & test
  - Complete distributed lab facility
    - 100s of CPUs, many architectures, operating systems
- Formal development and support processes
  - Formal design requirements and tracability
  - Formal version control and release management
  - Formal issue tracking and prioritization
  - Formal release process and criteria
    - 65 OS+CPU+Compiler combinations supported as standard product (!)
  - Formal patch and hot-fix process
- Results (300+ users surveyed):
  - Would you recommend RTI products to others?

98% of respondents said yes

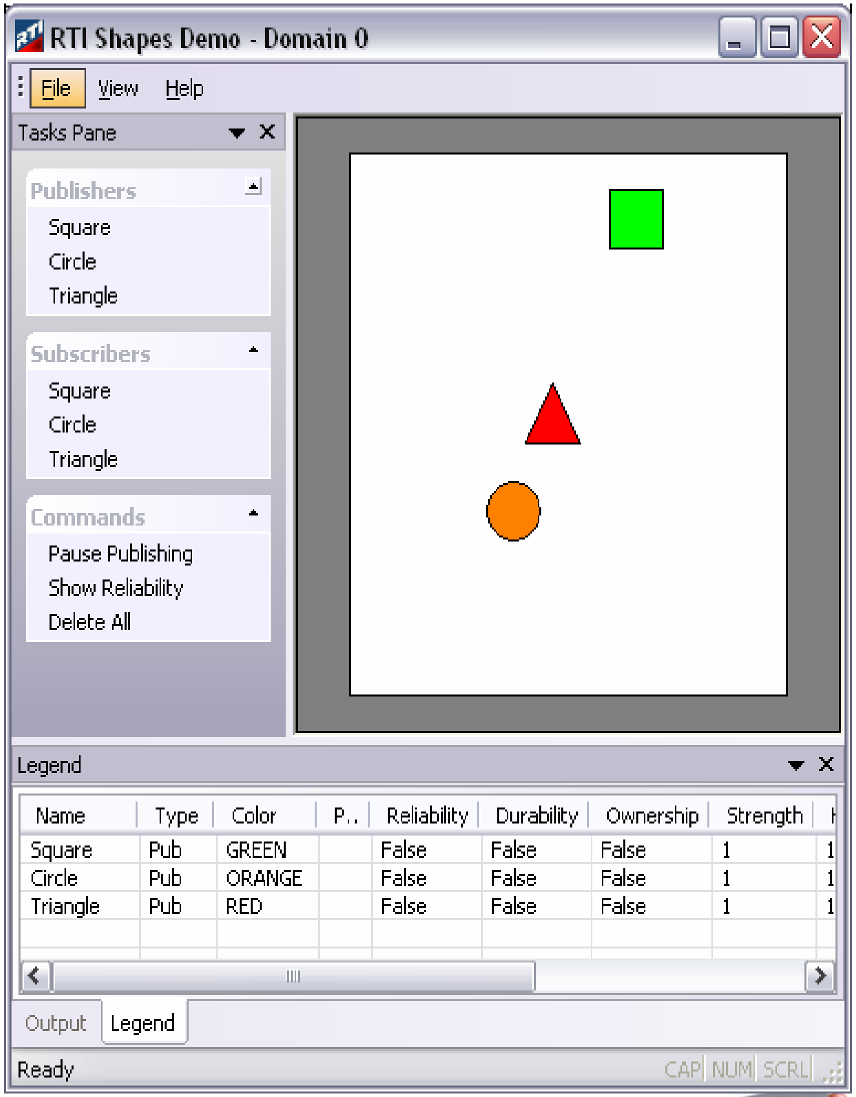
How Can You Learn More?

- Webinar overviews
  - DDS Introduction
  - Data-centric design
  - Enterprise integration
- QuickStart training
  - DDS basics
  - Hands-on RTI product training
  - Tools use
  - Over 350 graduates!
- Advanced training
  - Tuning
  - Design
  - Testing
  - On-site tailored programs

RTI

RTI Shapes Demo

- Download includes
  - Demo application
  - Guide with background material and illustrative examples
- Goals
  - Teach DDS concepts in a “fun” way
  - Explain PS concepts, QoS, multiple connections, ease of configuration
- Where
  - www.rti.com
  - Live now!



The Data-Centric Future

- Pervasive data will change the future
- DDS is key to this data-centric future
  - High performance
  - Fine delivery control
  - Enterprise integration
- The real change is a profound thought shift:

Code/architecture-centric		Data-centric
• Where are clients & servers?	→	• What information?
• What objects & methods?		• How fast/reliable/flexible?
• How do I access info?		• When is it available?
• How synchronized?		• How is it stored?

- We've only just begun
  - Huge problems remain: integrating many technologies, scalability, impedance matching, technology adoption

RTI

The RTI Difference

- Lowest risk
  - Market and thought leadership
  - Field-proven, mature technology
  - Broad and deep expertise
  - Standards compliance (DDS, SQL and others)
  - Corporate reliability and stability
  - 98% customer satisfaction
- Superior technology
  - Pervasive-data vision
  - Industry-leading performance
  - Rich capabilities and Quality of Service control
  - Advanced tools and ecosystem
  - Mature, proven process

OBJECT MANAGEMENT GROUP

RTI