

RTI Connex Conference 2017

rti

Industrial IoT Connex Conference

- Autonomous Vehicles
- Flying Cars
- Connected Hospitals

OCTOBER 18 - 19, 2017

HILTON SANTA CLARA

| REGISTER NOW

rti



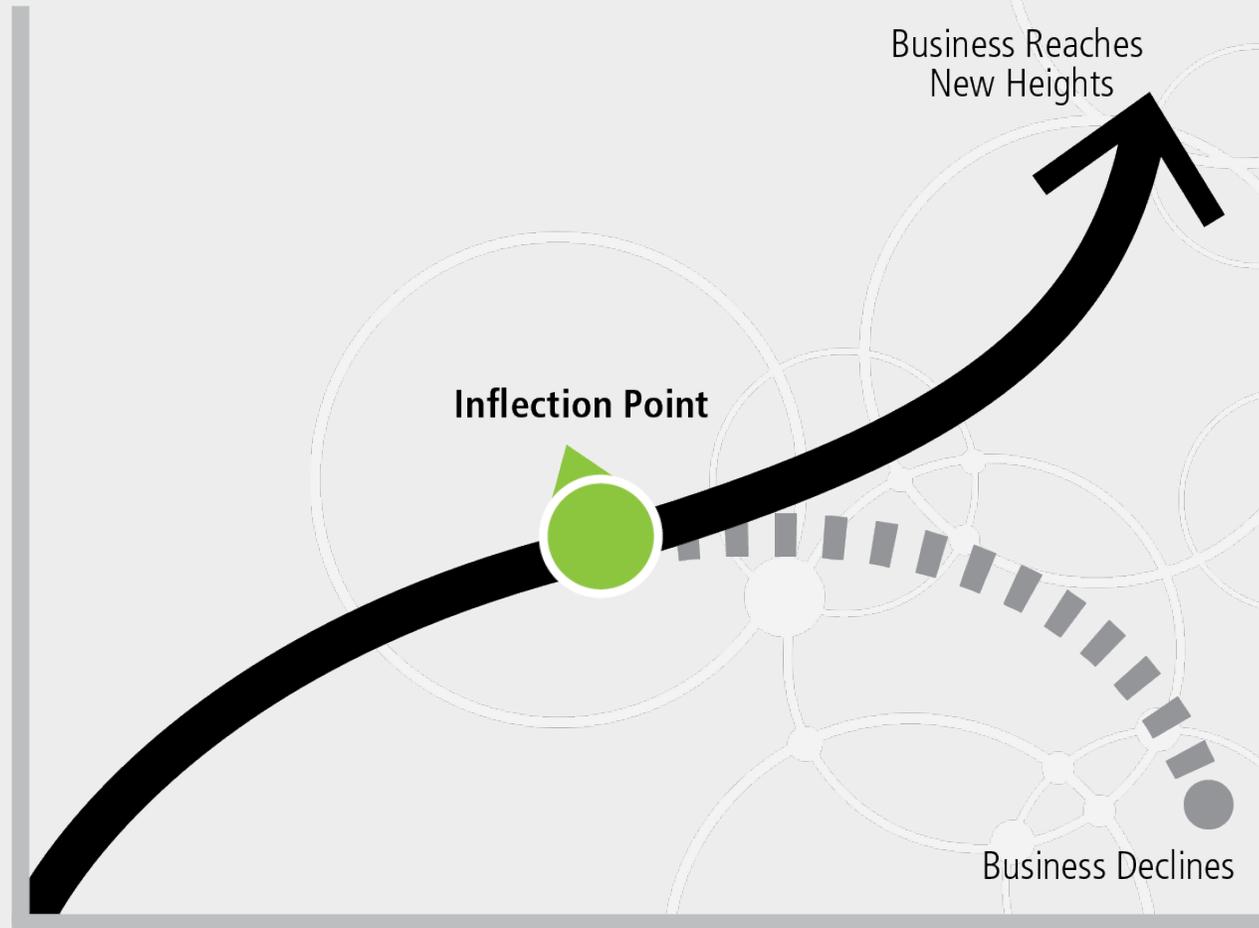
A Guide to the Industrial IoT & RTI's Role

Stan Schneider, PhD. RTI CEO

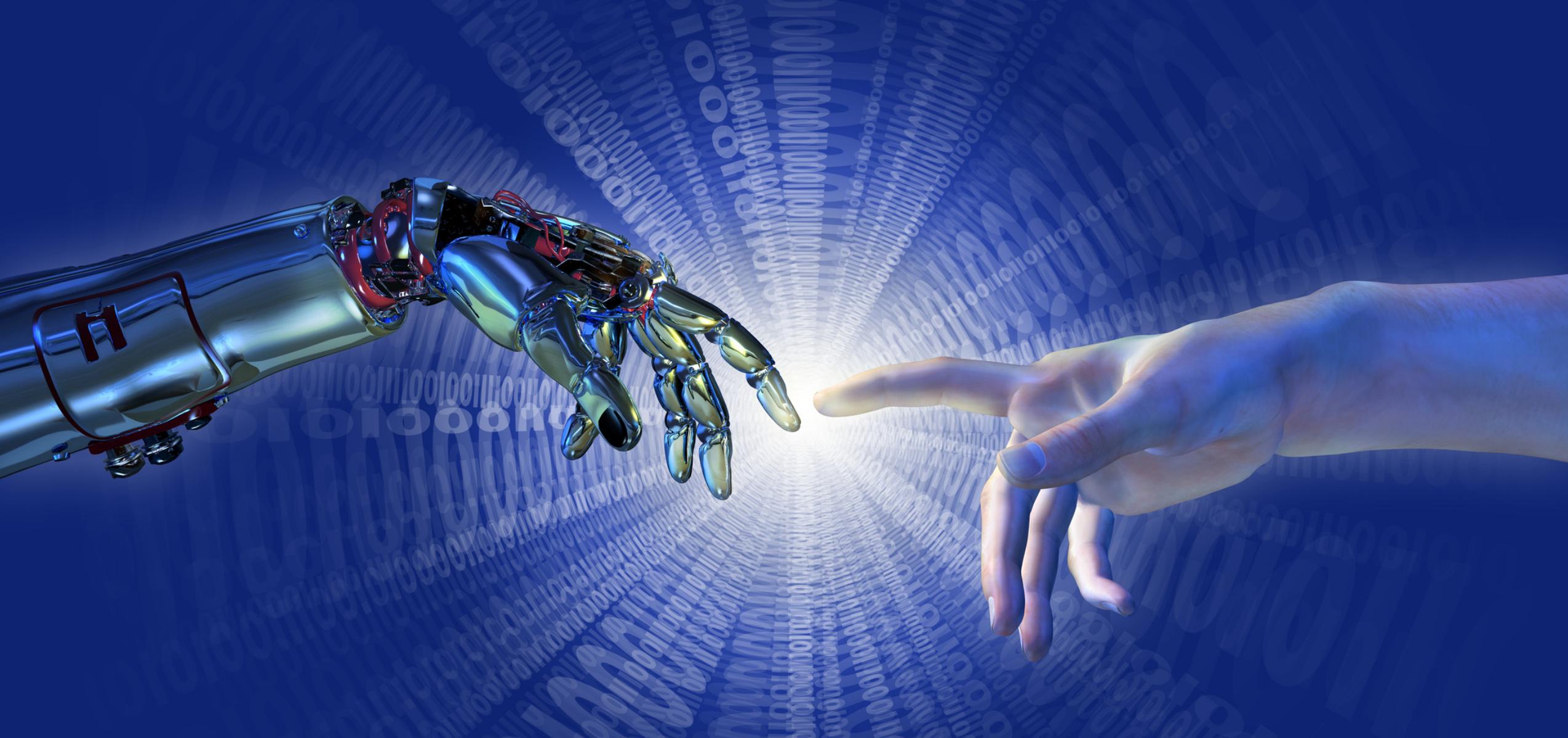
Momentum



Inflection



– *Only the Paranoid Survive* by Andrew Grove



The smart machine era will be the most disruptive in the history of IT
-- Gartner

The *Industrial* IoT Disruption

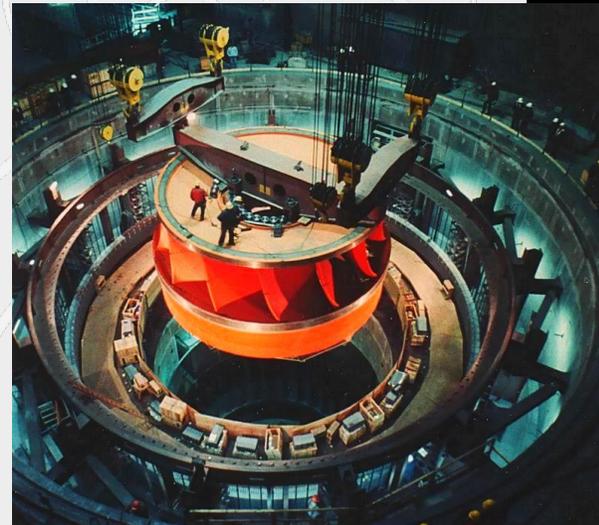


The real value is a **common** architecture that connects sensor to cloud, interoperates between vendors, and spans industries



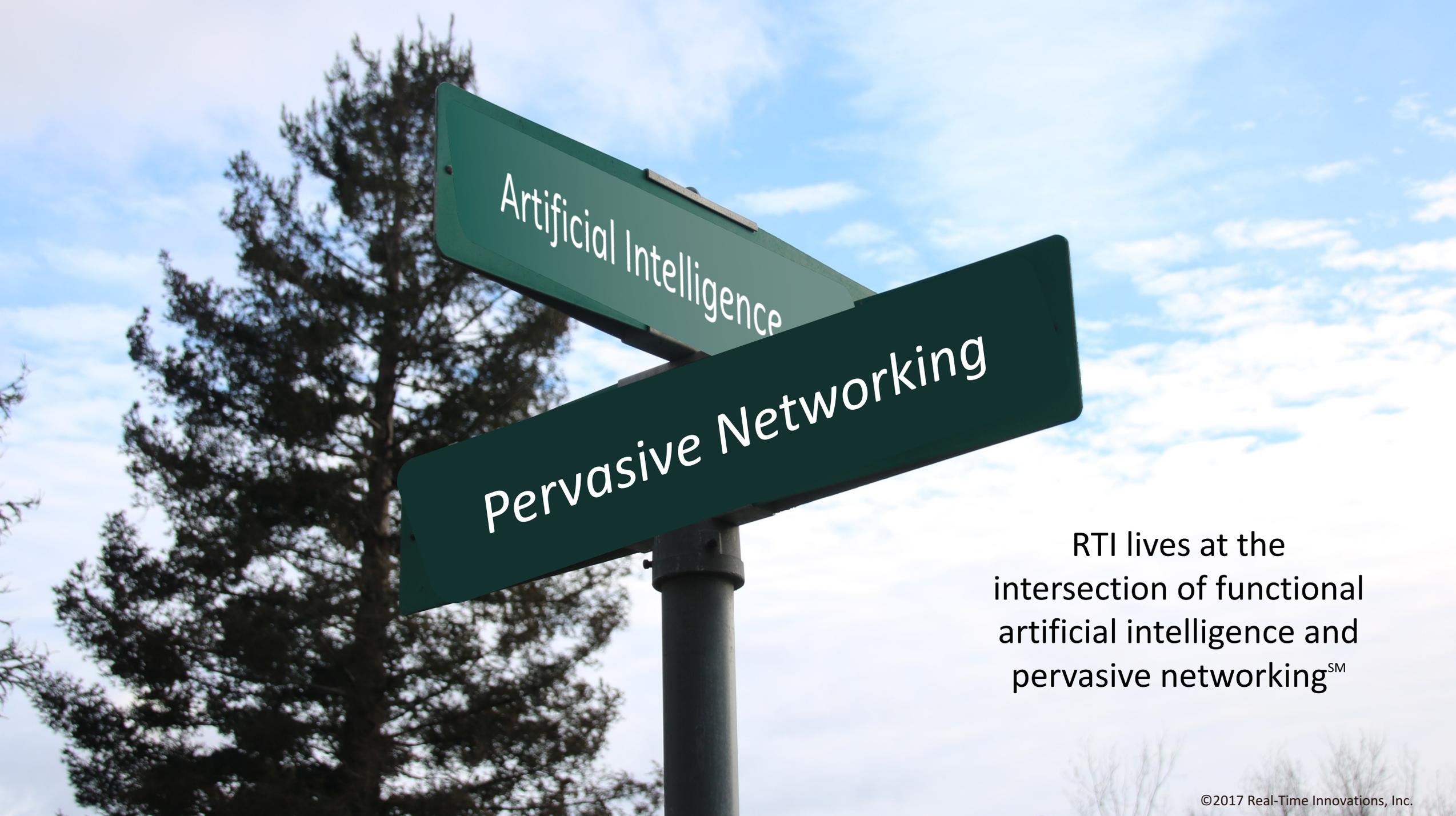
Why Is RTI?

To enable and realize the potential of smart machines to serve mankind



And It Will Change Everything



A street signpost with two signs. The top sign is light green and says 'Artificial Intelligence'. The bottom sign is dark green and says 'Pervasive Networking'. The signpost is set against a background of a blue sky with light clouds and a tall evergreen tree.

Artificial Intelligence

Pervasive Networking

RTI lives at the intersection of functional artificial intelligence and pervasive networkingSM

The Industrial IoT

- 1000+ design wins
- Many multi-\$b programs
- Full DDS, tools, services, support, secure & certified versions
- 150+ ppl, 40% growth 2016



What's the Disruption?

Change Drivers Across Industries

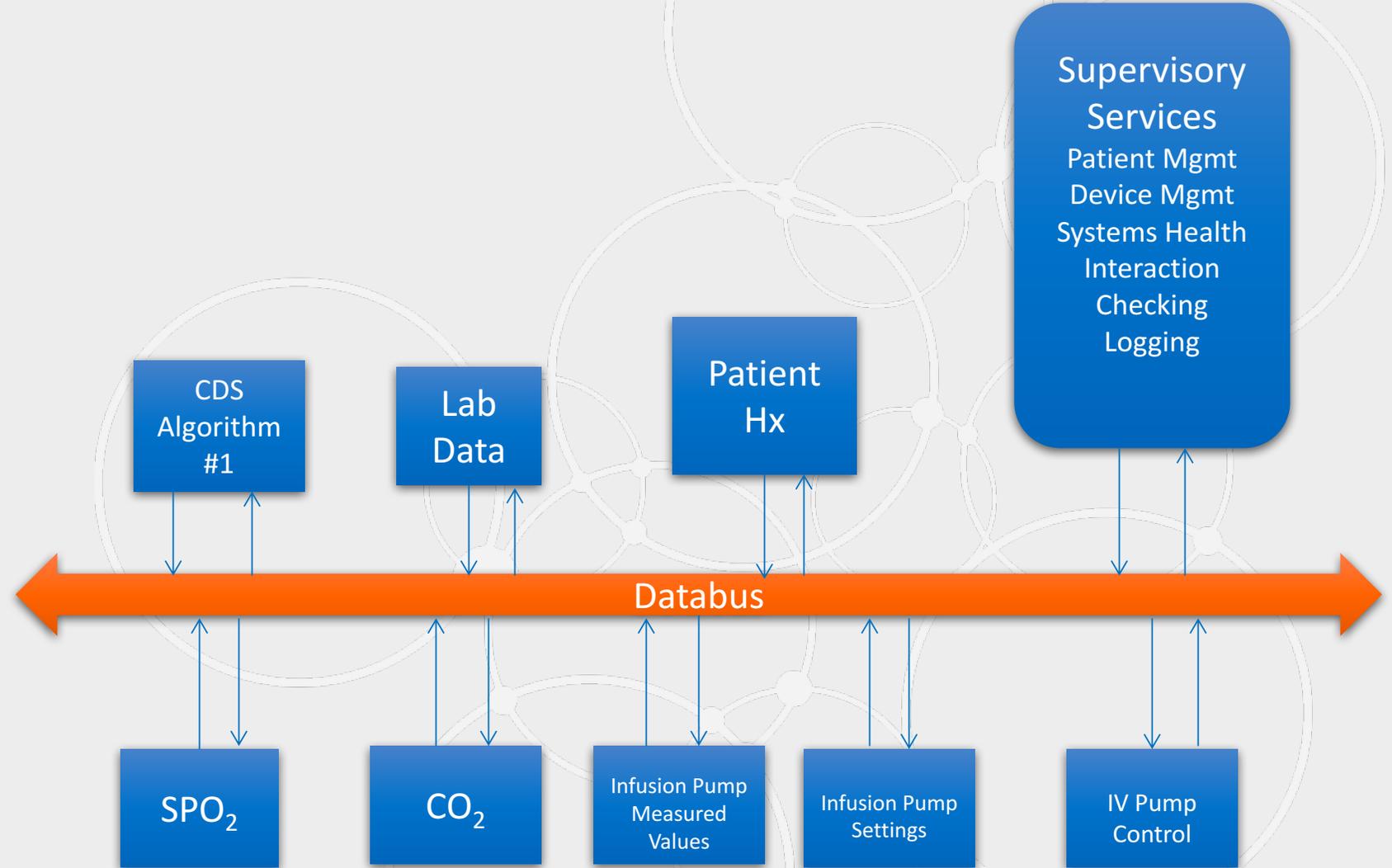
Problem: Mistakes Kill

“... the anesthesiologist forgot to resume ventilation after separation from cardiopulmonary bypass...”

Every surgical team surveyed has experienced this error!

Hospital error is the 3rd leading cause of death in the US

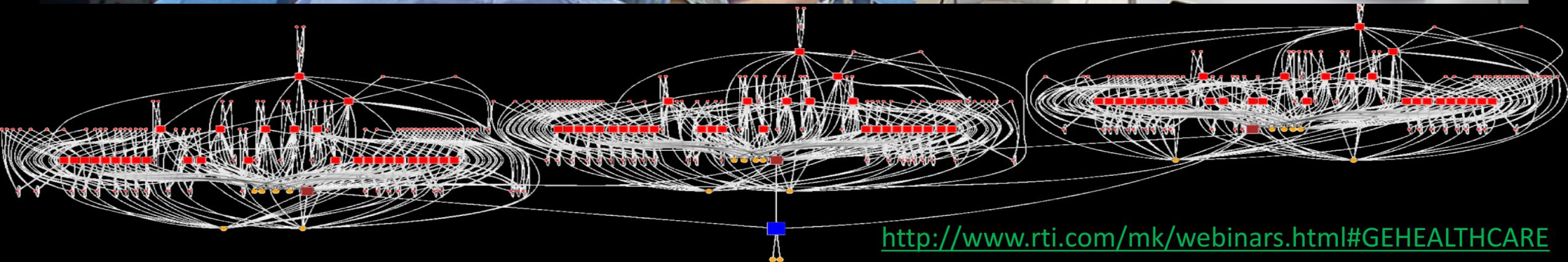
Solution: Smart Connected Patient Care



Smart Machines Join the Care Team

The Medical Industry Now Competes on Networking

GE Healthcare's smart distributed architecture will connect 300 types of devices with RTI software.



<http://www.rti.com/mk/webinars.html#GEHEALTHCARE>

Problem: Central Generation



Solution: Make Renewables Reliable



RTI runs the largest hydropower plants in North America, soon expanding to 75 dams.

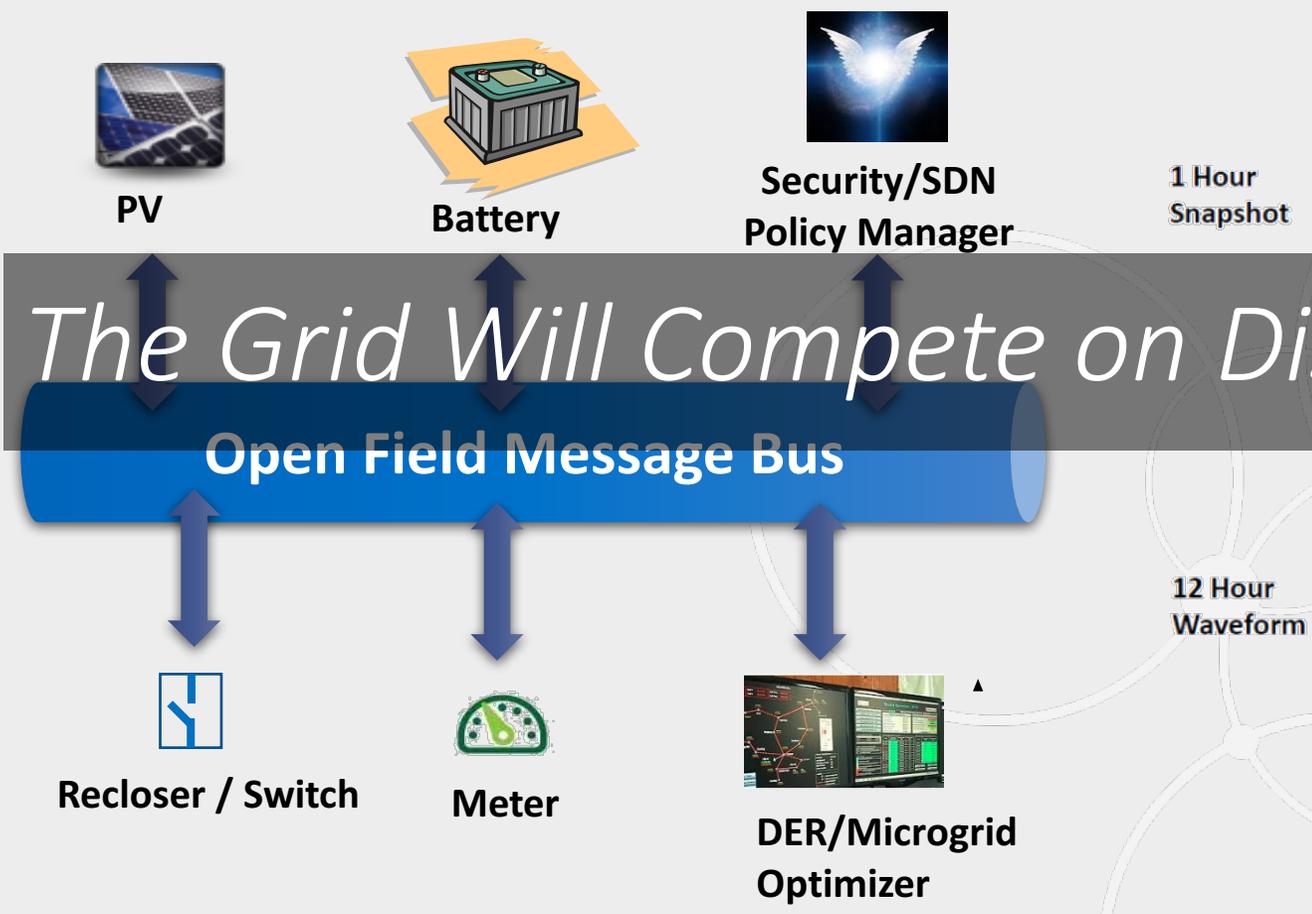


RTI is a principal in the leading new grid standard for solar and battery integration.

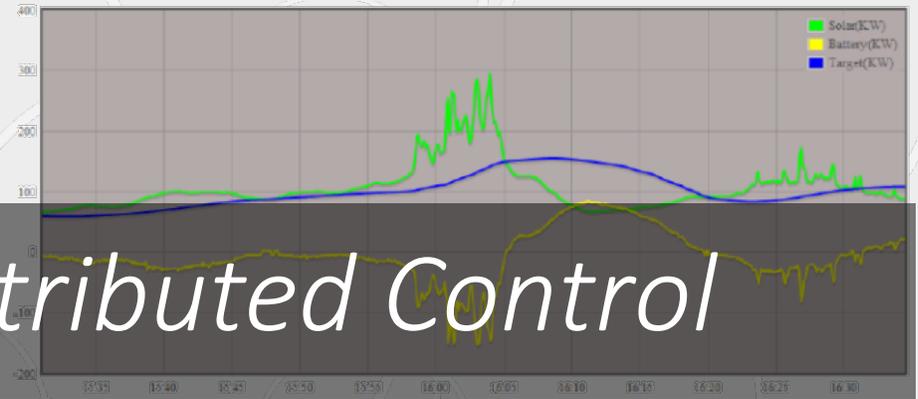


RTI controls Siemens Wind Power's most advanced wind turbines, thousands deployed worldwide.

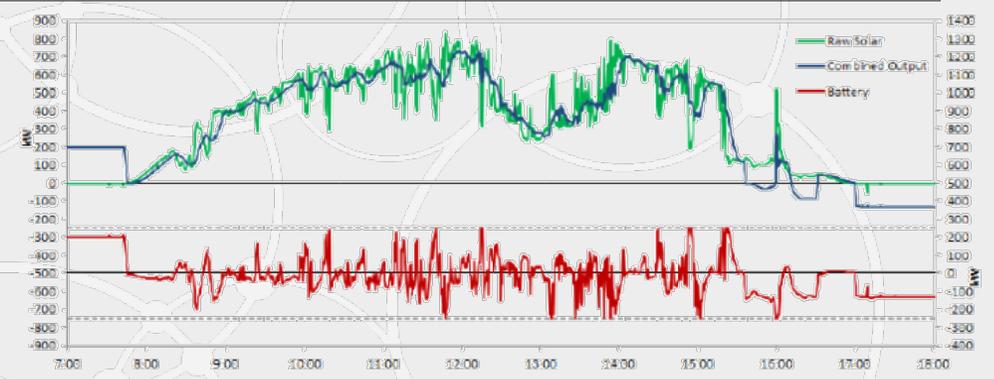
OpenFMB™: Enable Efficient DER



1 Hour Snapshot



12 Hour Waveform



Problem: Getting There is Dangerous and Slow



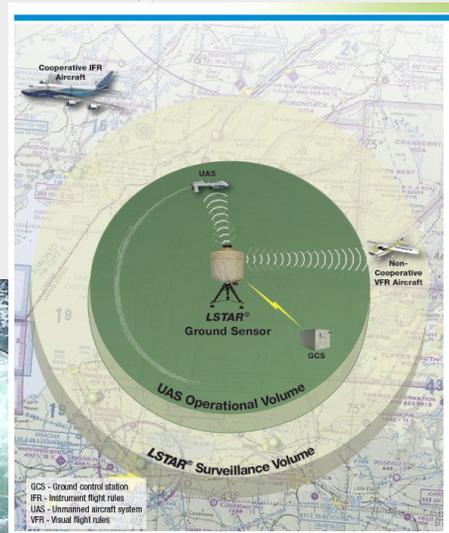
Solution: Why Drive?

- Smart transit infrastructure
 - Safer, faster, easier
- Autonomous cars (“carbotts”)
 - Change everything
- Fast, autonomous mass transit
- Autonomous flight



RTI's Deep Expertise in Autonomy

Founded from
Stanford Aerospace
Robotics Lab



- Connex DDS enables autonomy
 - Ensure reliable data availability
 - Guarantee real-time response
 - Manage complex data flow and state
 - Ease system integration
 - Allow any network
 - Build in security from the start
 - Make deployment flexible
 - Ease safety certification
 - Adapt Intelligence
 - Connect Vehicle/Cloud Systems

Autonomous Systems Dataflow Challenge

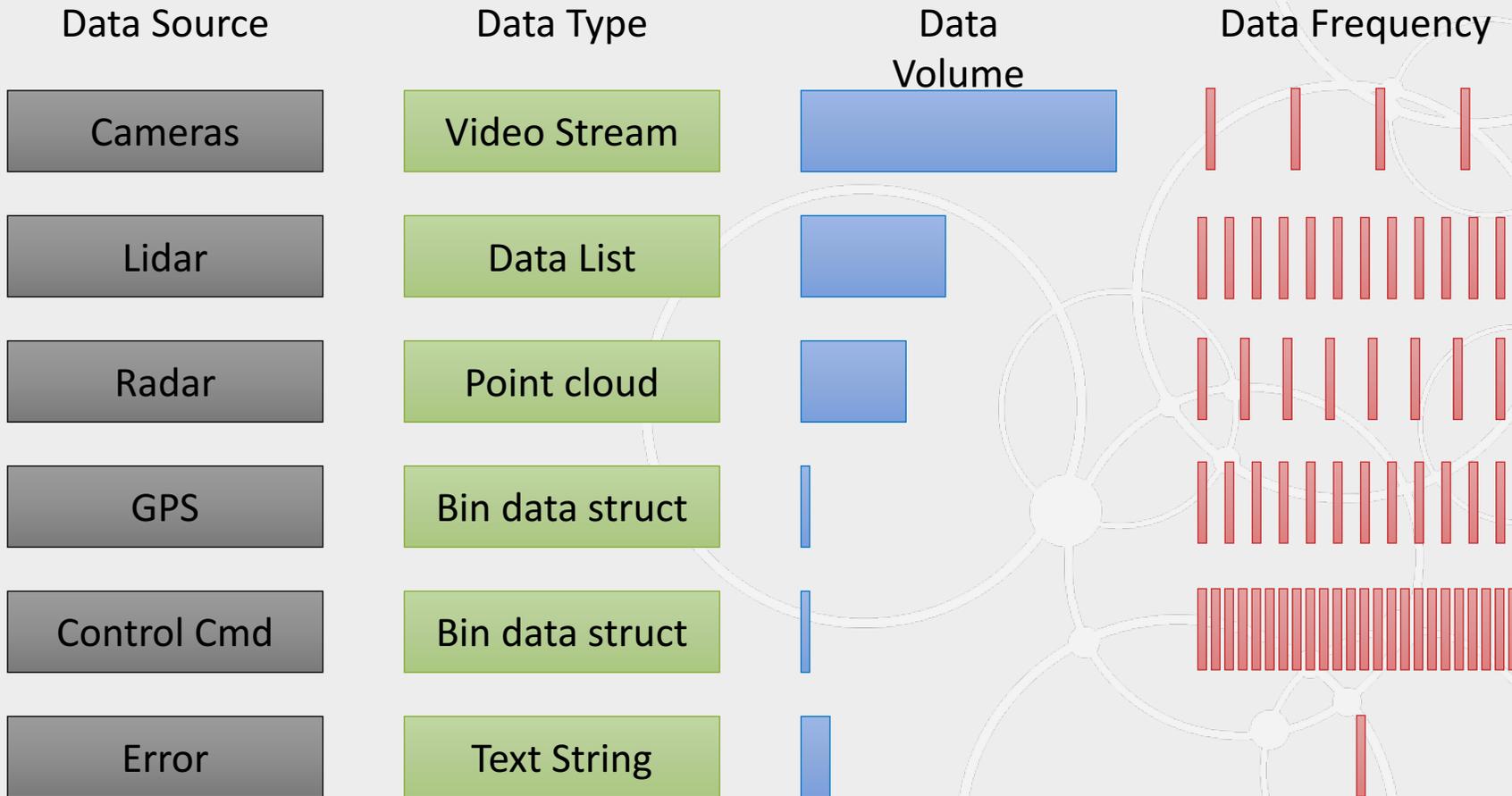


Data source	Data type	Data Volume	Data Frequency
Cameras	video stream	[Long bar]	[4 vertical bars]
Lidar	data list	[Medium bar]	[16 vertical bars]
Radar	point clouds matrix	[Short bar]	[8 vertical bars]
GPS	data message	[Thin bar]	[16 vertical bars]
Control Cmd	data message	[Thin bar]	[16 vertical bars]
Error Context	text strings	[Thin bar]	[1 vertical bar]

More than 14 *production-track* carbot designs use the RTI databus.

Heterogeneous data source
with various volume and frequency

Carbot Dataflow Challenge



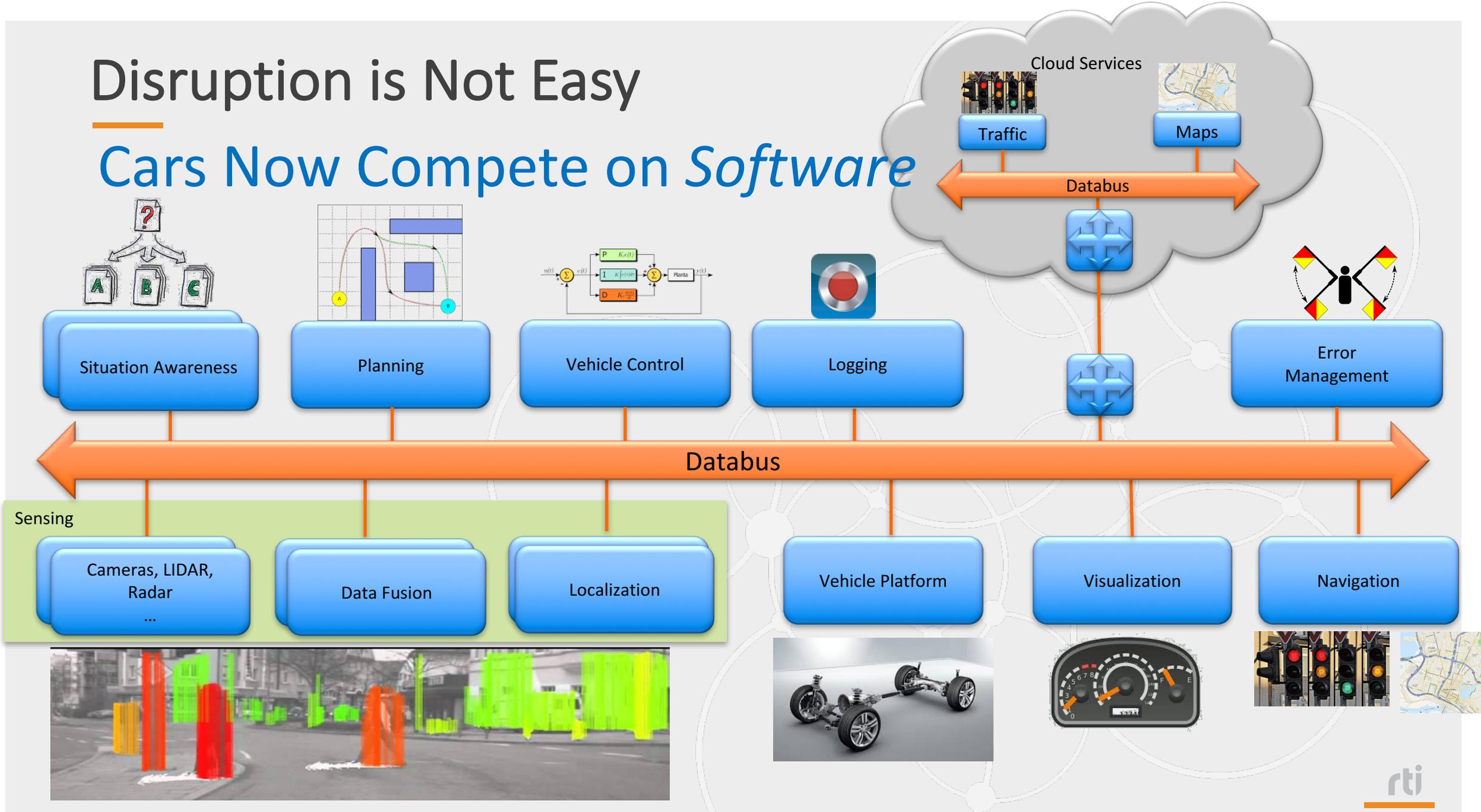
- Carbots need many different dataflows

- Volume
- Frequency
- Latency
- Reliability
- Destination

- A single databus that can handle all greatly simplifies the system

Disruption is Not Easy

Cars Now Compete on *Software*



What's the Disruption?



Software is eating the world
-- Andreessen Horowitz
Silicon Valley VC

The Real Disruption: Culture

“If you went to bed last night as an industrial company, you’re going to wake up this morning as a software and analytics company”

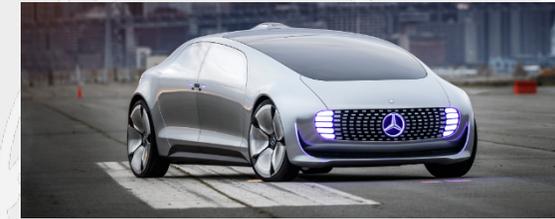
-- Jeff Immelt
GE CEO



The Industrial IoT

“If you went to bed last night as a *software and analytics* company, you’re going to wake up this morning as a *networking and security* company”

-- Stan Schneider

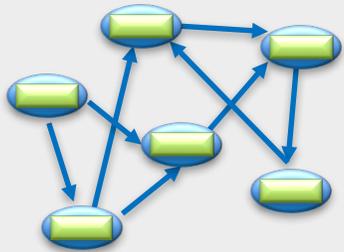


Why DDS?



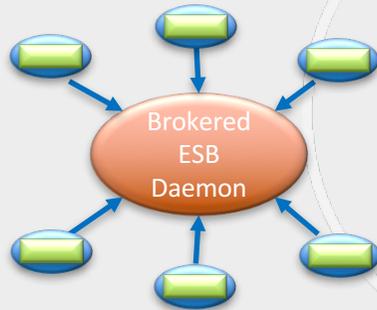
The Databus is Different!

Point-to-Point



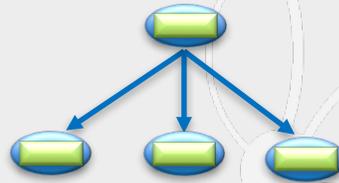
TCP
Sockets

Client/Server



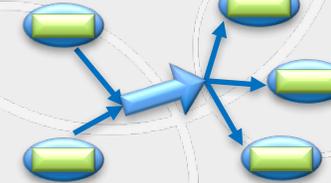
MQTT
XMPP
OPC
CORBA

Publish/Subscribe



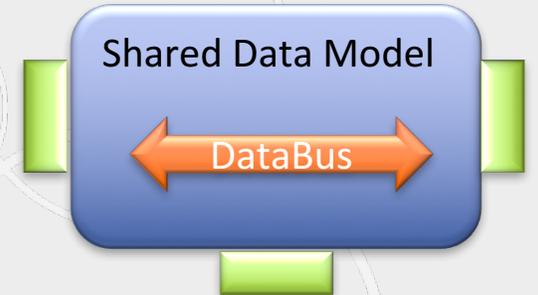
Fieldbus
CANbus
ZeroMQ
JMS

Queuing



AMQP
Active MQ

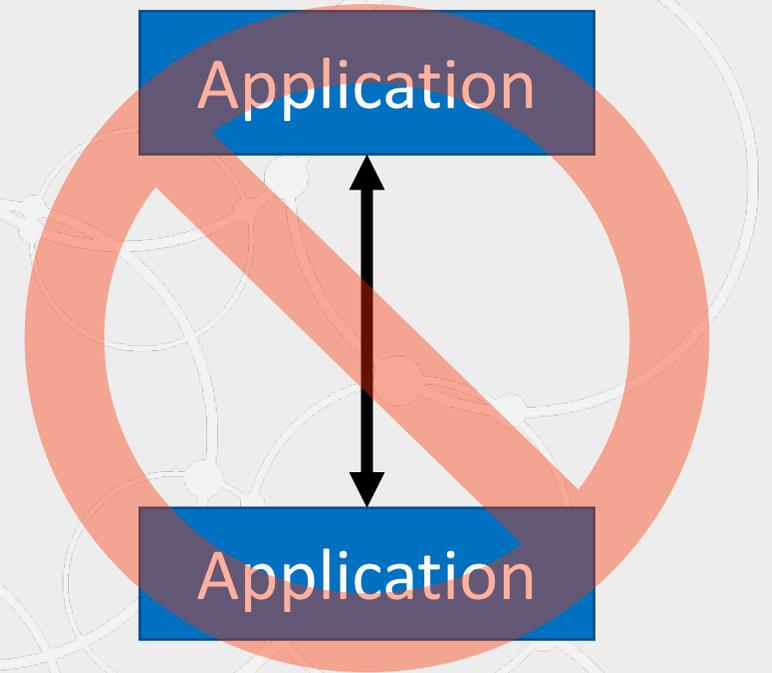
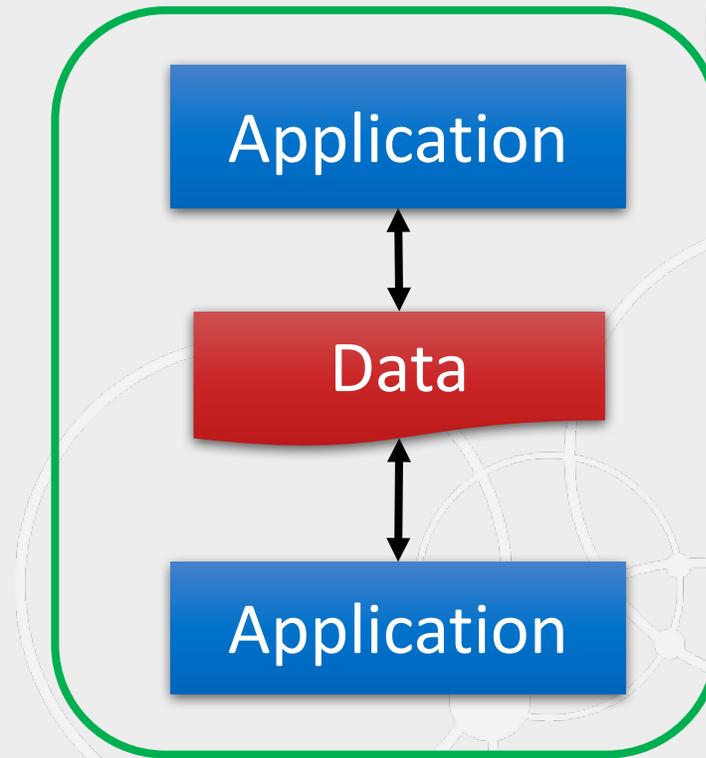
Data-Centric



DDS

The Databus

Data Centric
technology
connects
applications to
the data, not to
each other

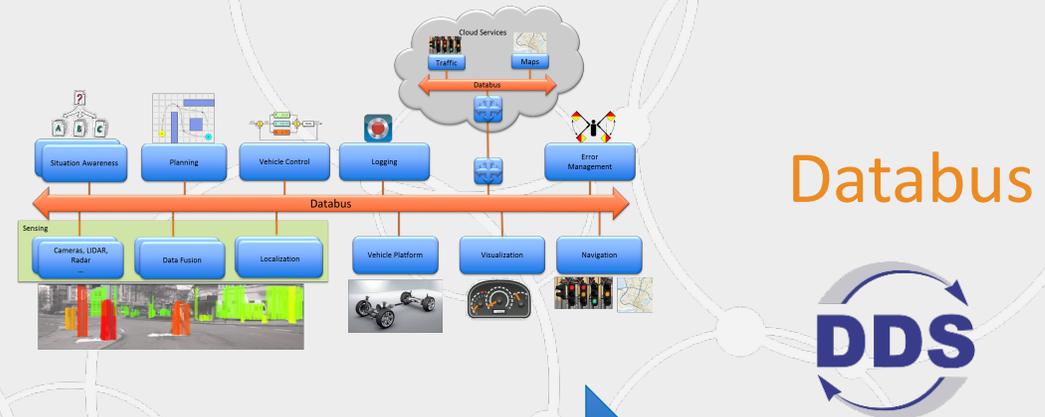
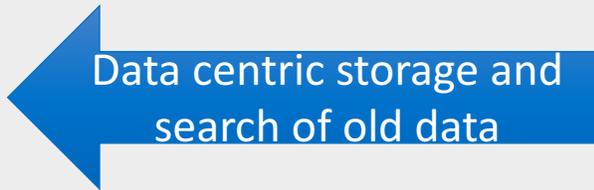


Message centric
Client/Server
Remote Objects
SOA

Database and Databus: *Data Science* Approaches



Database



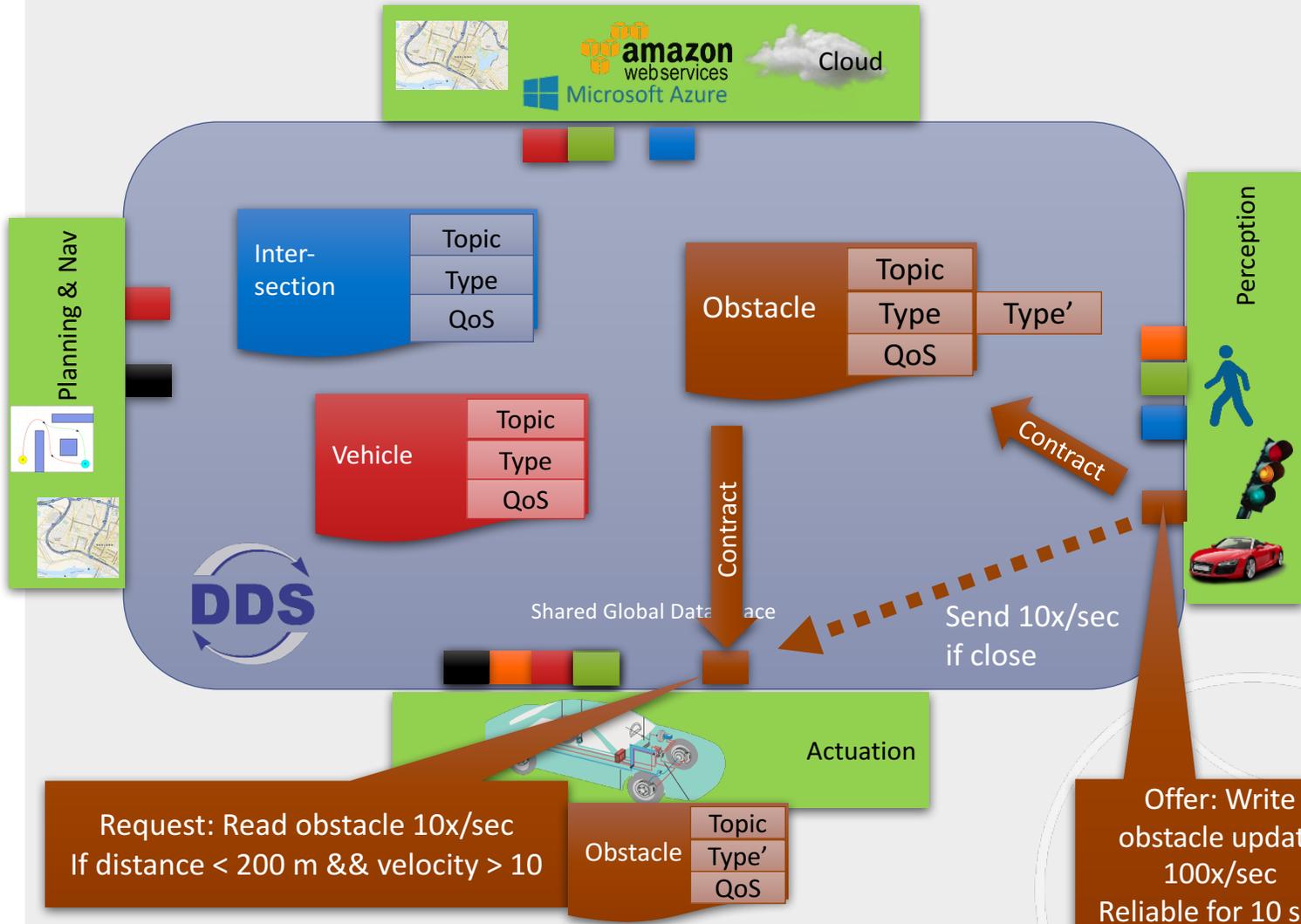
Databus



Why Data Centricity?

- Common “truth” for integration
- Extreme reliability & scalability
- Right data, right time, right place
- Complexity in infrastructure, not code
- No startup dependencies
- Generic tools and analyzers

Data Centric Software Integration



- Global Data Space
 - Automatic discovery
 - Read & write data in any OS, language, transport
 - Type-aware matching
 - Direct peer-to-peer comms
 - Redundant sources/sinks/nets
- No Servers!
- QoS control
 - Timing, Reliability, Liveliness, Redundancy, Ordering, Filtering, **Security**

Take it to Massive Scale

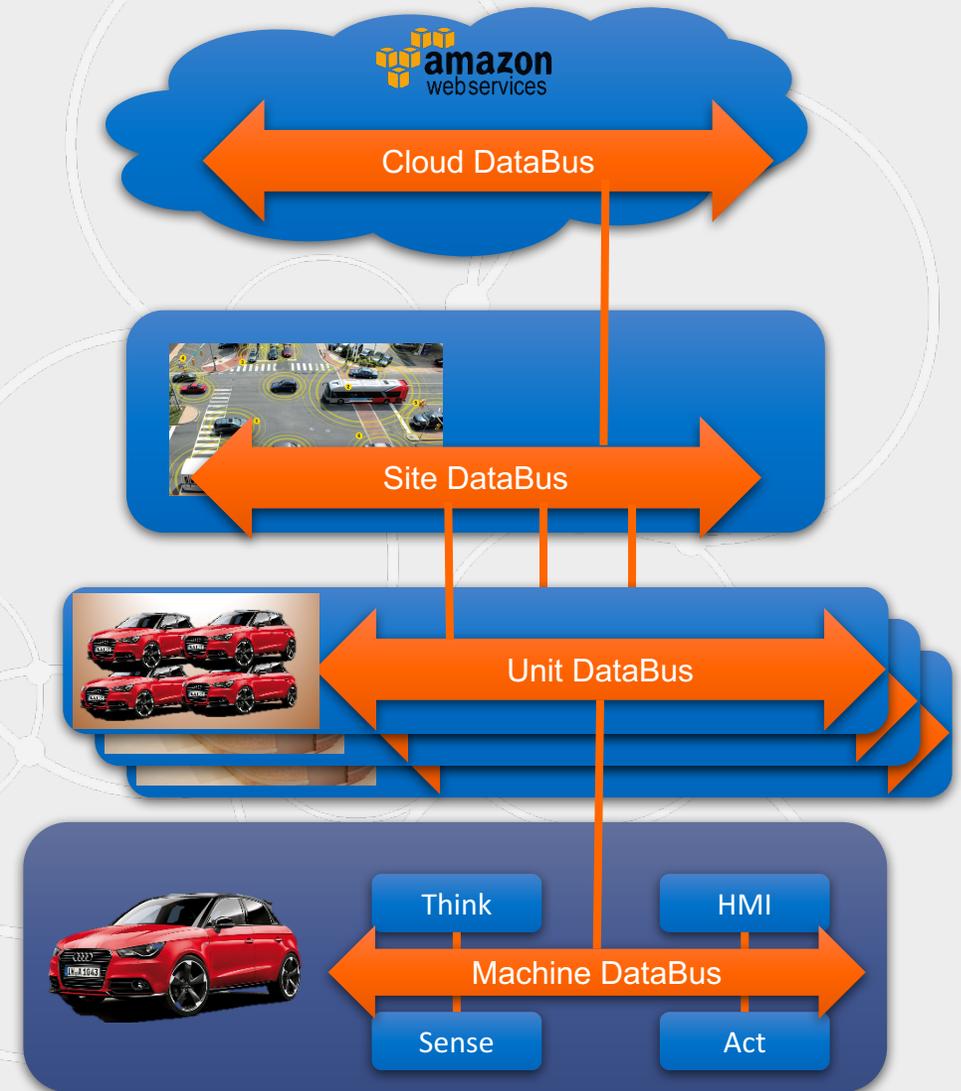
- Each level of the hierarchy has
 - Data model
 - Discovery
 - Security domain
- System-of-systems require
 - Subsystem export control
 - Data model translation
 - Discovery control

Intelligent
Industrial
Internet

Intelligent
System of
Systems

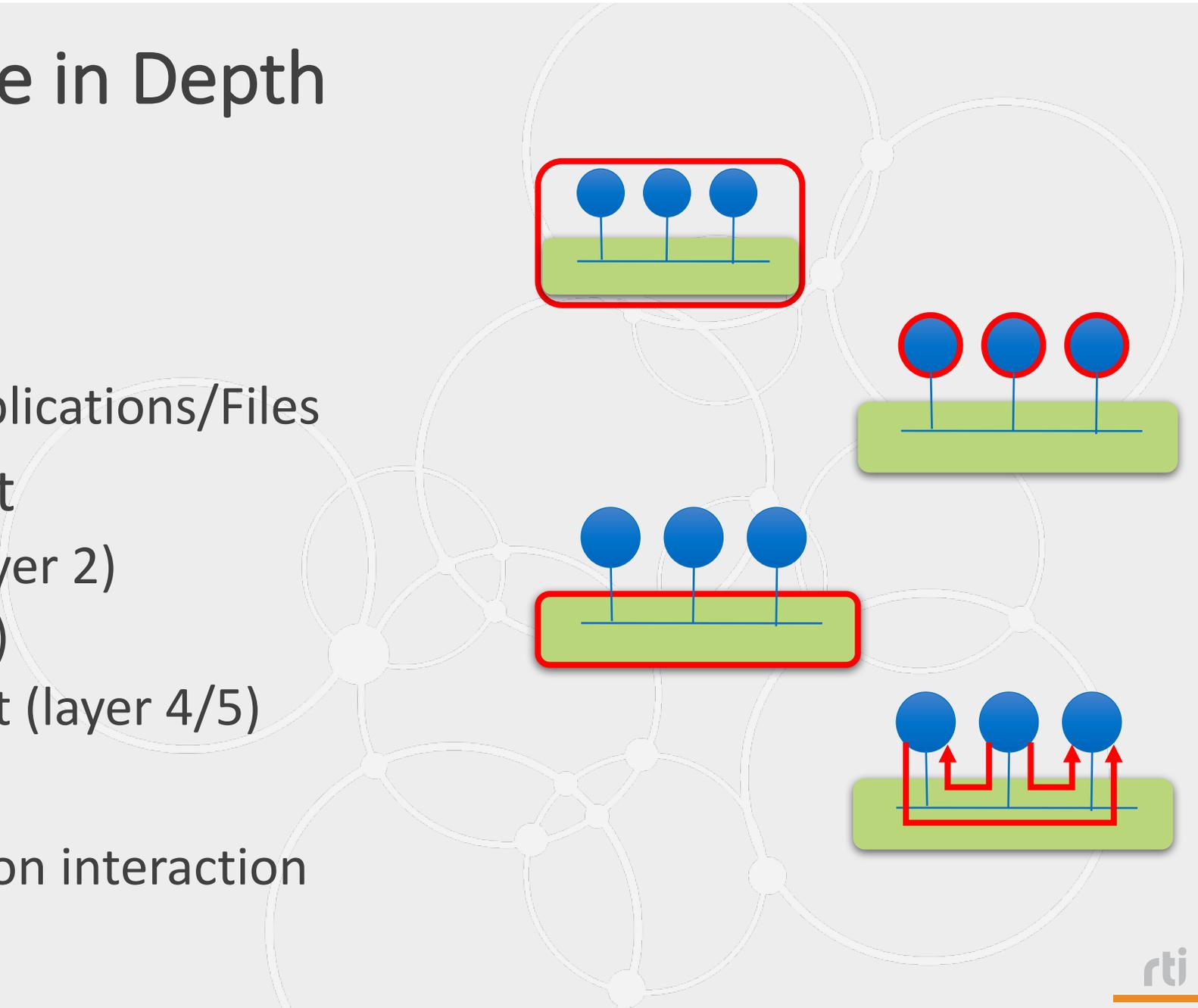
Intelligent
Systems

Intelligent
Machines



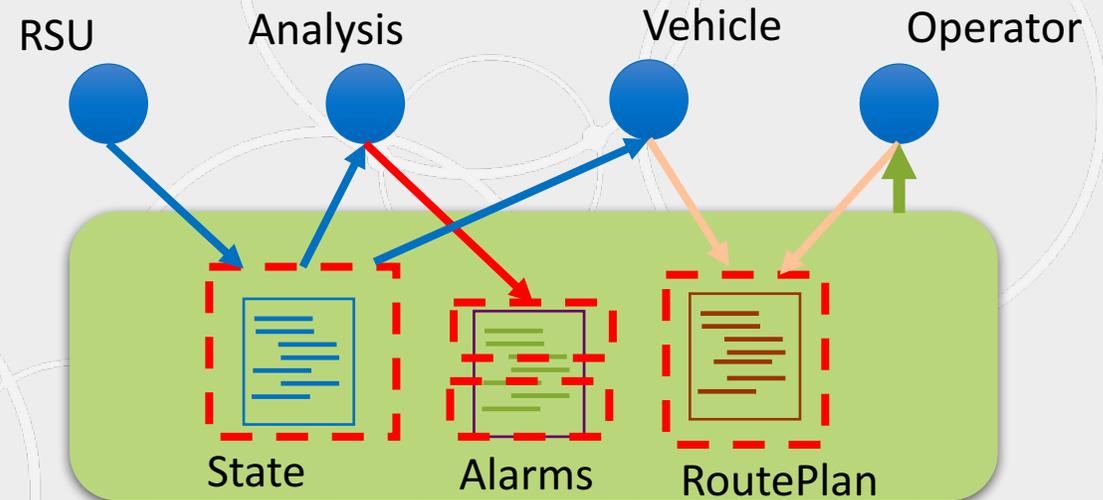
Security Defense in Depth

- System edge
- Host
 - Machine/OS/Applications/Files
- Network transport
 - Media access (layer 2)
 - Network (layer 3)
 - Session/Endpoint (layer 4/5)
- Dataflow
 - Control application interaction



Integrated *Dataflow* Security

- Dataflow-Level Security
 - Control r,w access to each data item for each function
- Complete Protection
 - Discovery authentication
 - Data-centric access control
 - Cryptography
 - Tagging & logging
 - Non-repudiation
 - Secure multicast
- **No code changes!**
- Plugin architecture for advanced users



Topic Security model:

- RSU: State(w)
- Analysis: State(r); Alarms(w)
- Vehicle: State(r), RoutePlan(w)
- Operator: *(r), RoutePlan(w)

Safety-Critical Components

- Connext DDS Micro Cert
 - Stringent SWaP requirements
 - Complete certification evidence
 - Full interoperability with DDS product line

Available

DO-178C Level A

- Flight management systems

Soon

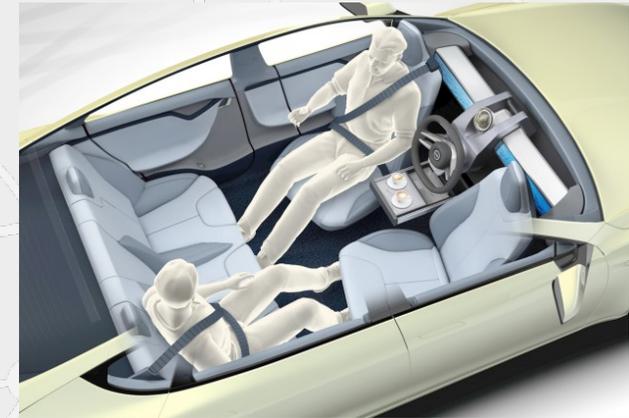
ISO 26262

- Road vehicle functional safety

Soon

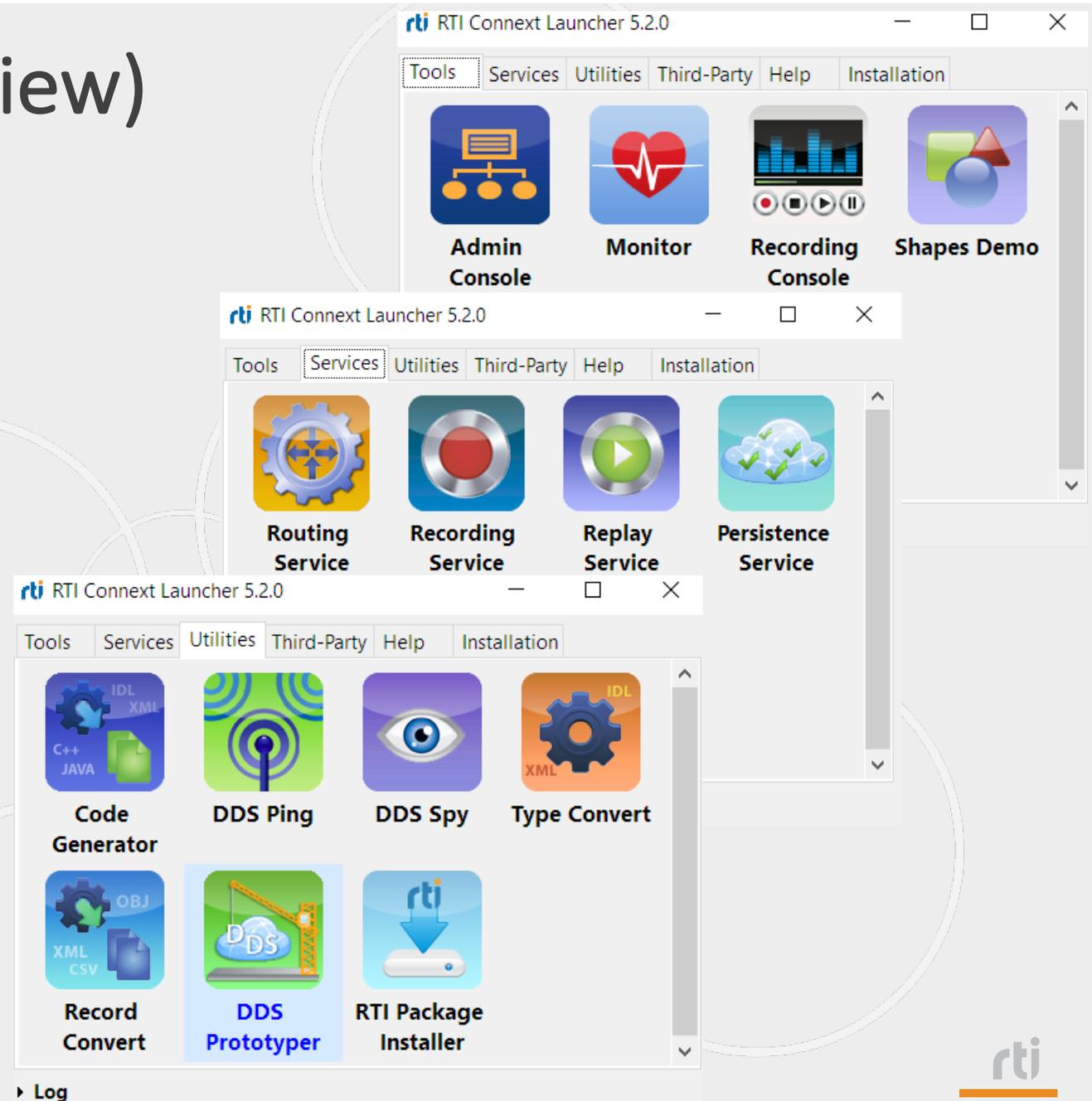
IEC 60601 class 3

- Medical devices



Tools & Services (overview)

- Data persistency
 - Persistence Service
 - Recorder
 - Database Integration Service
- Monitoring/Debugging
 - Replay
 - Monitor
 - Distributed Logger
 - Admin Console
 - Spreadsheet Add-in
 - Wireshark
- Integration
 - Routing Service
 - Queuing Service



Tools & Services - Overview

- Data Persistence
 - Persistence Service
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Tools



Admin Console



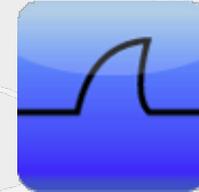
Monitor



Recording Console



Shapes Demo



Wireshark



Excel Add-in

Services



Routing Service



Recording Service



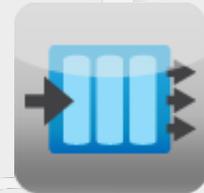
Replay Service



Persistence Service



Database Integration



Queuing Service



Web Integration Service

Utilities



Code Generator



DDS Ping



DDS Spy



Type Convert



Record Convert



RTI Package Installer

Why a Databus?

- No Servers
 - Easy redundancy, reliable availability, scale
- Reliable secure multicast
 - Fast ms or μ s response even under load to many applications
- Source selectivity
 - Finds and delivers exactly the right data to right place at the right time
- Explicit interface management
 - Combine many software modules and coordinate teams
 - Match versions
- Dataflow QoS
 - Adapt to any network & data demands



Positioning

DDS in the IIoT Space



The Big Picture



NGC3370

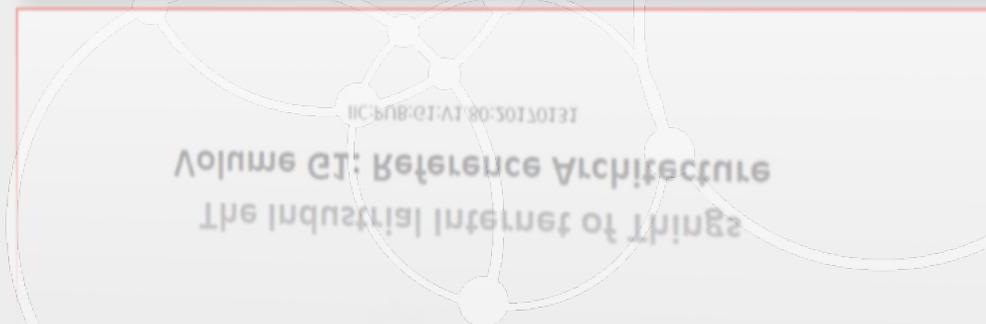
Industrial Internet Consortium: 270+ Companies, 30+ Countries

IIC Founding and Contributing Members

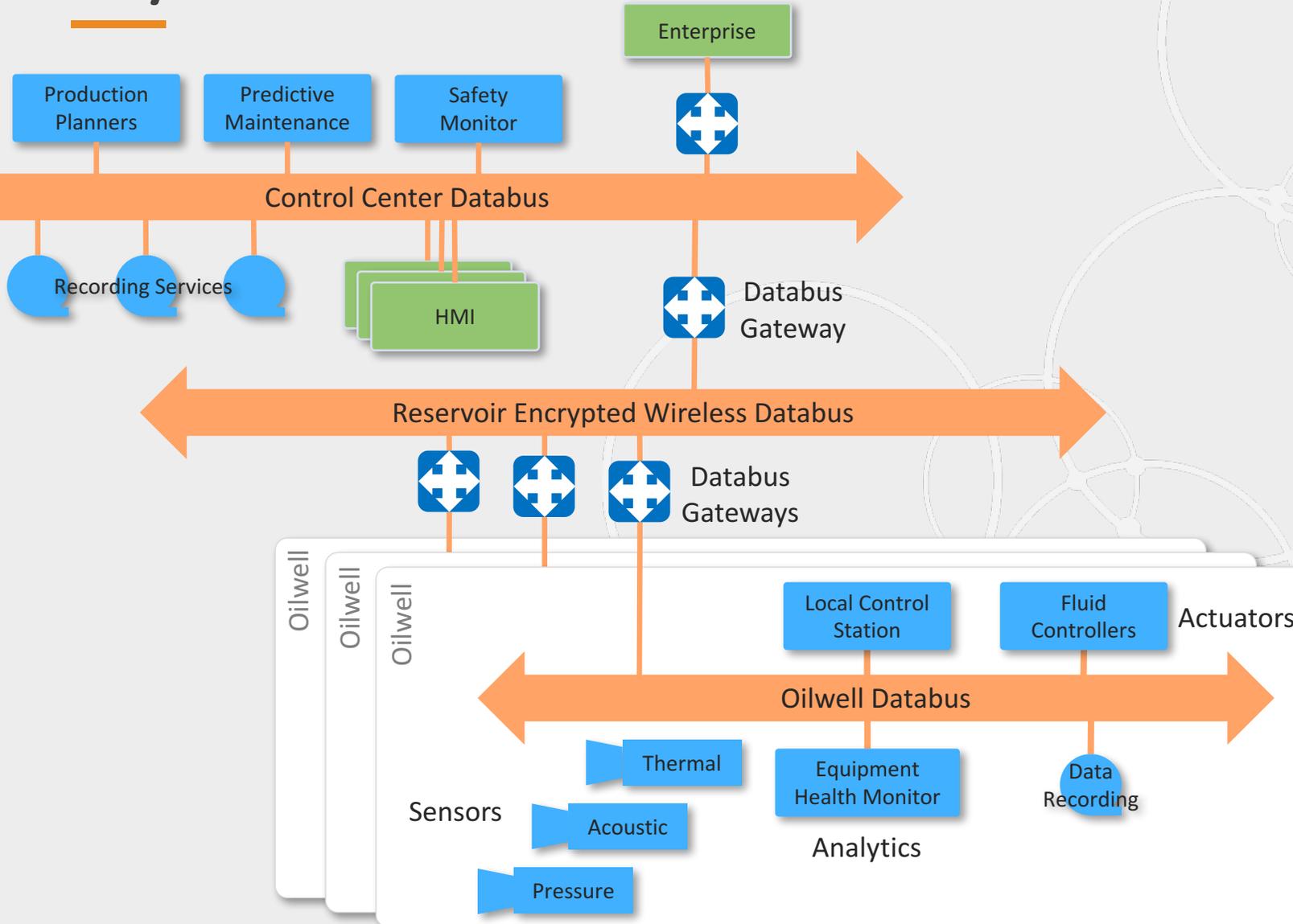


Reference Architecture

- Major new release of Industrial Internet Reference Architecture (IIRA)
- Key new content: The Layered Databus Architectural Pattern
- Lead author: RTI's Rajive Joshi



Layered Databus Architectural Pattern



- Common to all above examples
- Fits most industrial control applications
- Fast, reliable, scalable
- From IIC Industrial Internet Reference Architecture (IIRA) v1.8



Security Framework

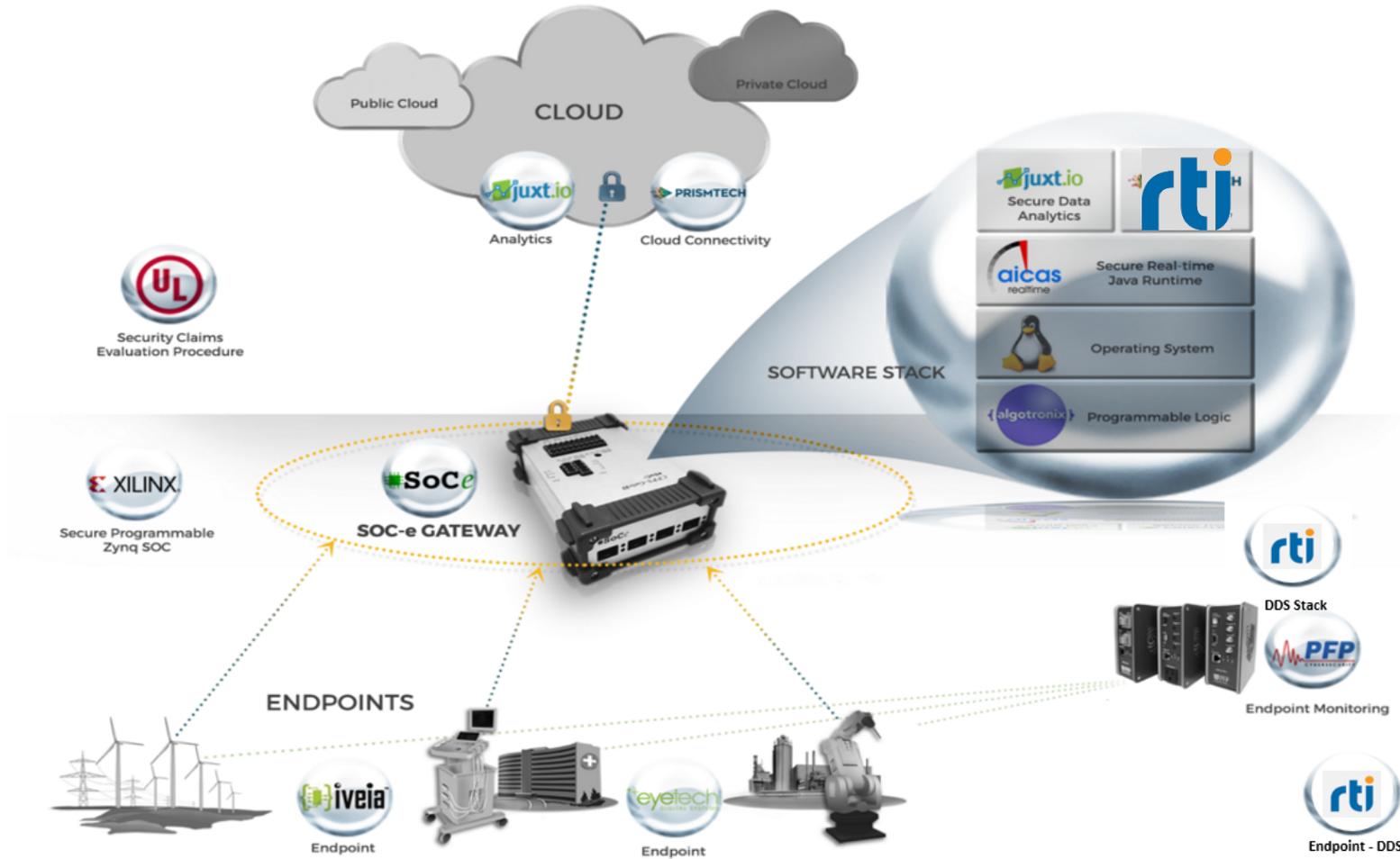
- The new Industrial Internet Security Framework (IISF)
- Only wide voice on security for IIoT
- Co-lead and primary author: RTI's Hamed Soroush





Security Claims Evaluation Testbed

SECURITY CLAIMS EVALUATION TESTBED



- IIC Sponsor Companies

- Xilinx
- Underwriters Laboratories (UL)
- Aicas

- Collaborating Companies

- Algotronix, EYETech, iVeia, JUXT, PFP Cybersecurity, RTI, SOC-e



IIC Testbeds!



Asset Efficiency Testbed



Condition Monitoring Testbed



Connected Care Testbed



Edge Intelligence Testbed



FA PaaS Testbed



FOVI Testbed



High-Speed Network Testbed



Industrial Digital Thread Testbed



INFINITE Testbed



Intelligent Urban Water Supply



Microgrid Testbed



Precision Crop Management Testbed



Security Claims Evaluation Testbed



Smart Airline Baggage Management



Smart Energy Management Testbed



Time-Sensitive Networks Testbed



Track and Trace Testbed



Smart Water Management Testbed

- IIC has by far the industry's most comprehensive testbed program
- Key goals
 - Ensure practical guidance
 - Make impact
 - Span the industry

The IIC Industrial Internet Connectivity Framework

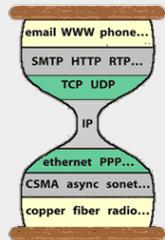
- The industry's only detailed analysis of IIoT Connectivity Technologies
- Architecture
- Assessment
- Standards
 - DDS
 - OPC UA
 - OneM2M
 - HTTP
 - MQTT
 - CoAP
- Examples & selection guidance
- Years of work by many architects across industries, standards, & technologies



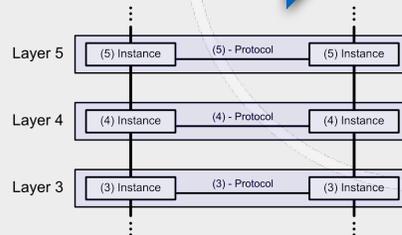
Released Feb 28, 2017

Evolution of the IIoT Connectivity Stack

4-Layer Internet Stack Model
(1970s)



7-Layer OSI Stack Model
(1984)



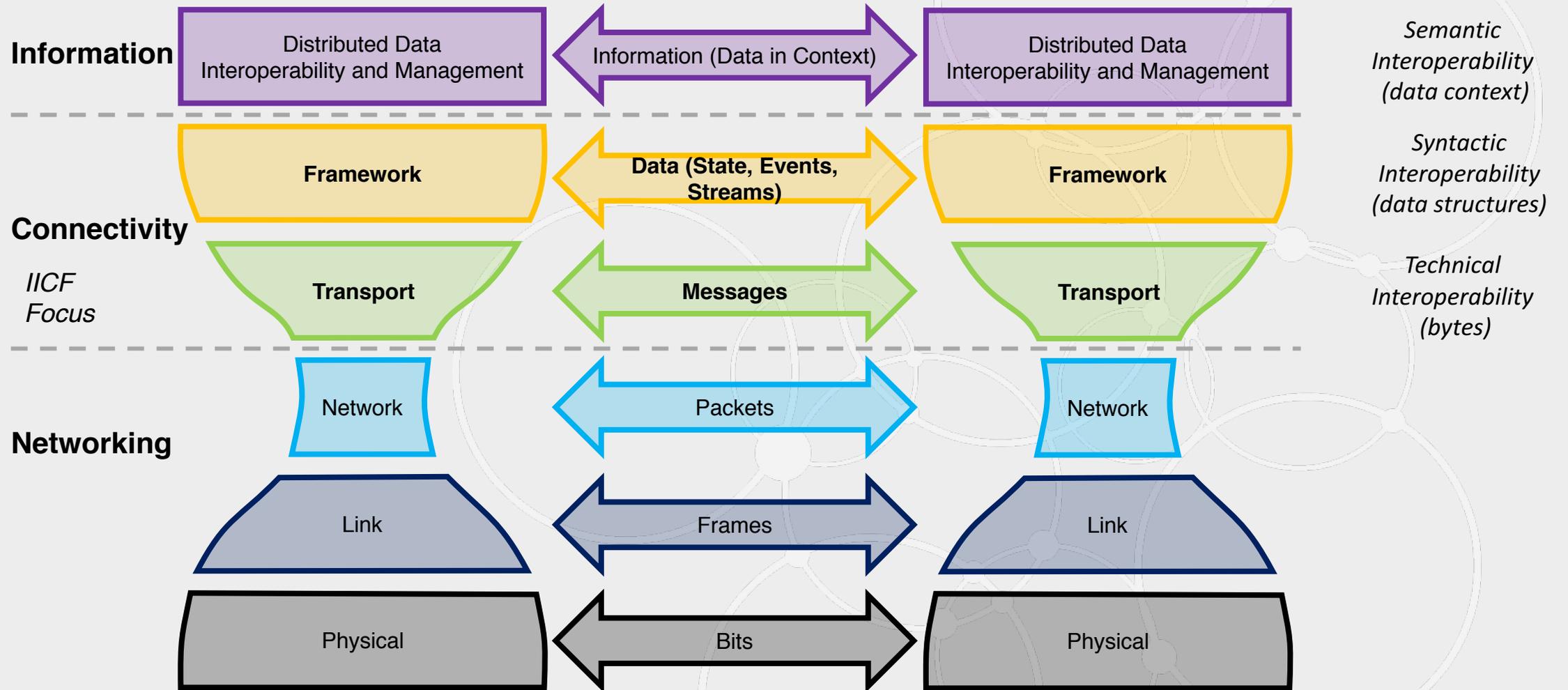
Industrial IoT
(2014)



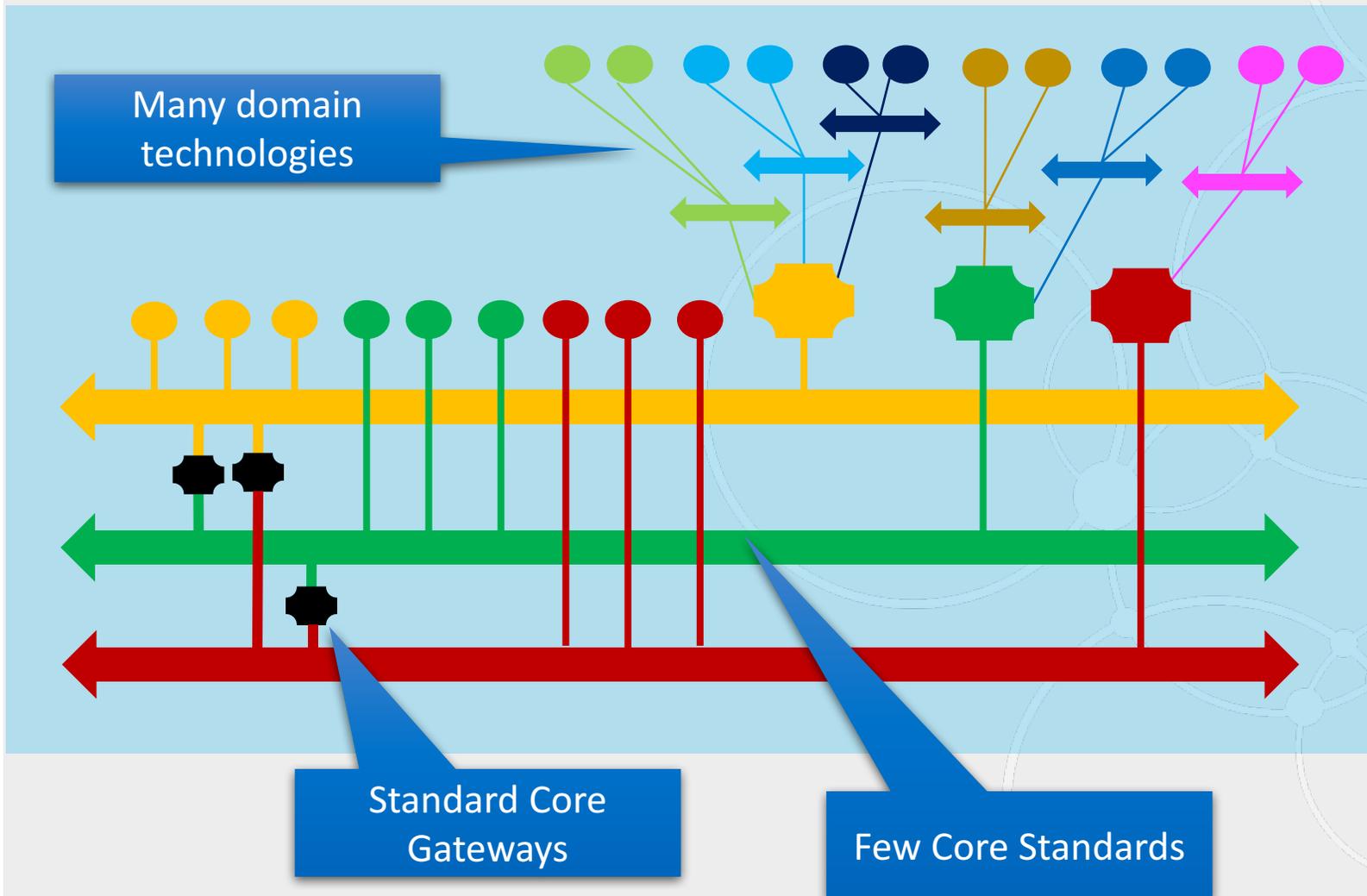
IIoT Connectivity Stack Model
(2017)



IloT Connectivity Stack Model

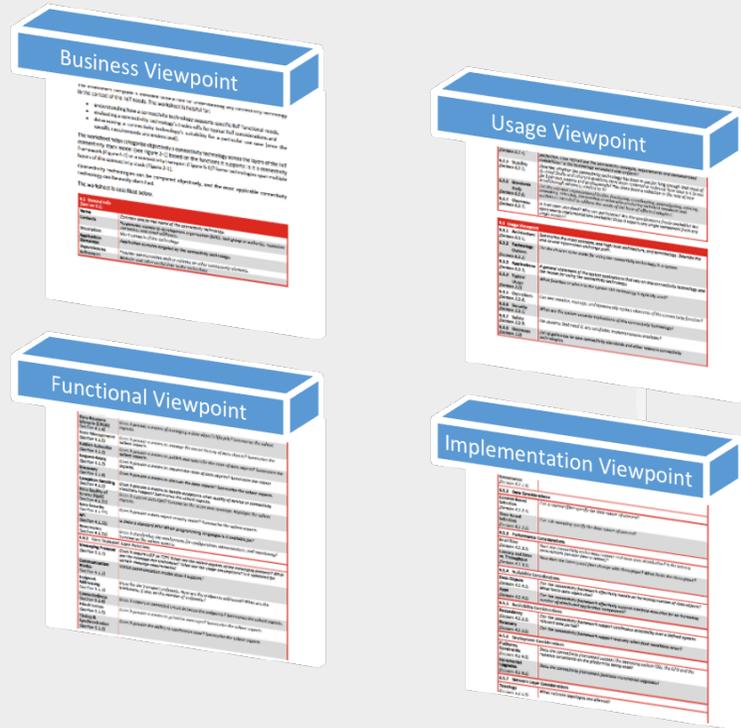


Connectivity Core Standards Architecture



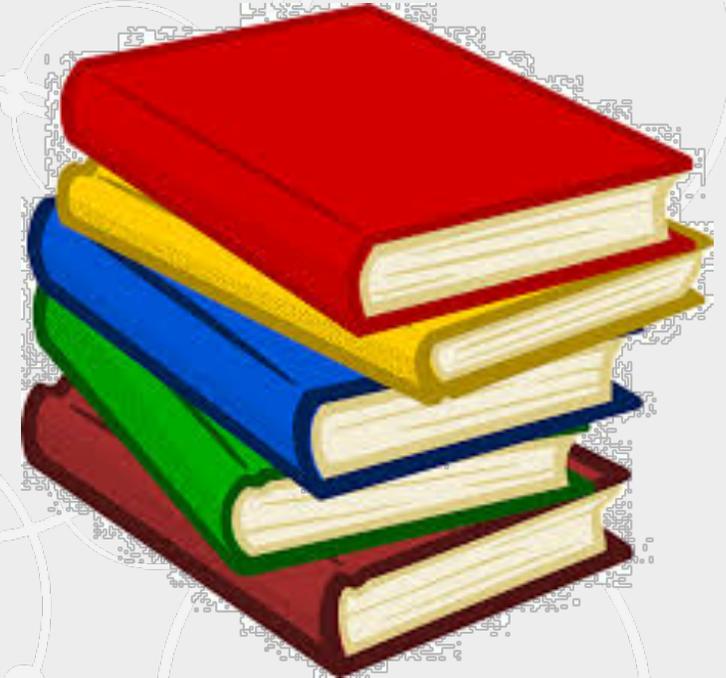
- The future will combine functions and standards
- Connectivity Core Standards
 - Span the space
 - Connect through Standard Core Gateways
 - Enable capable networks

IICF Catalog of Connectivity Standards!

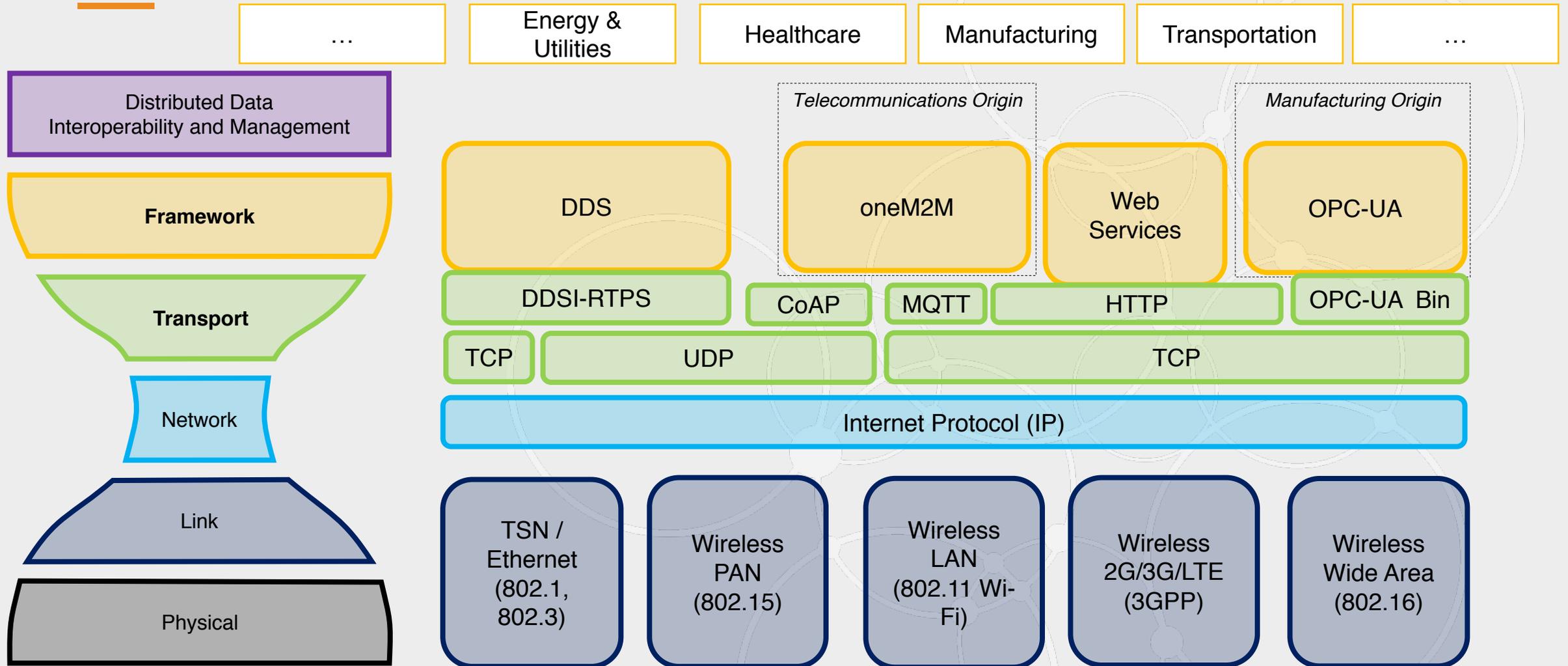


Assessment Template Worksheets

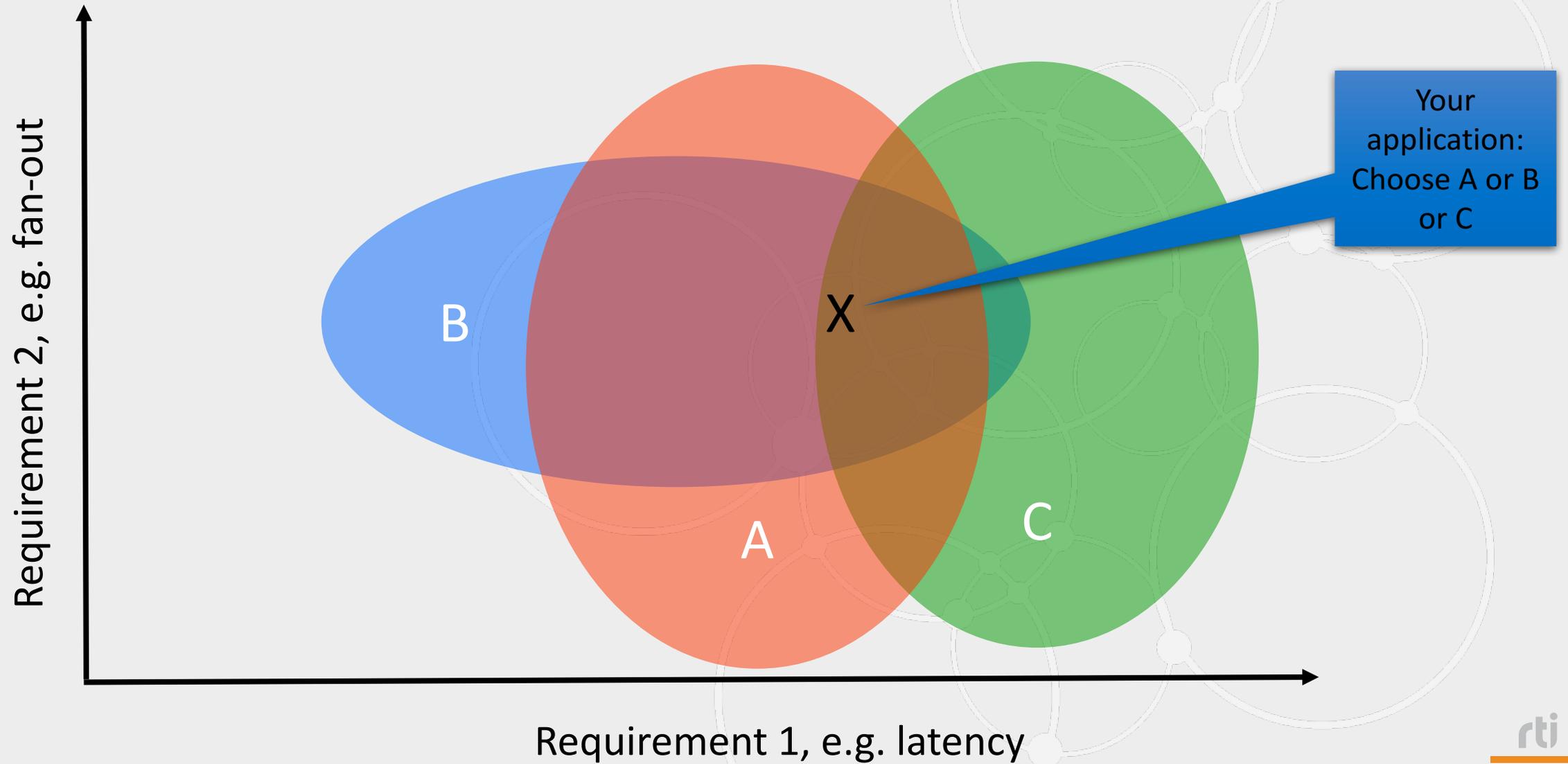
- Frameworks
 - DDS
 - OPC-UA
 - oneM2M
- Transports
 - HTTP
 - MQTT
 - CoAP



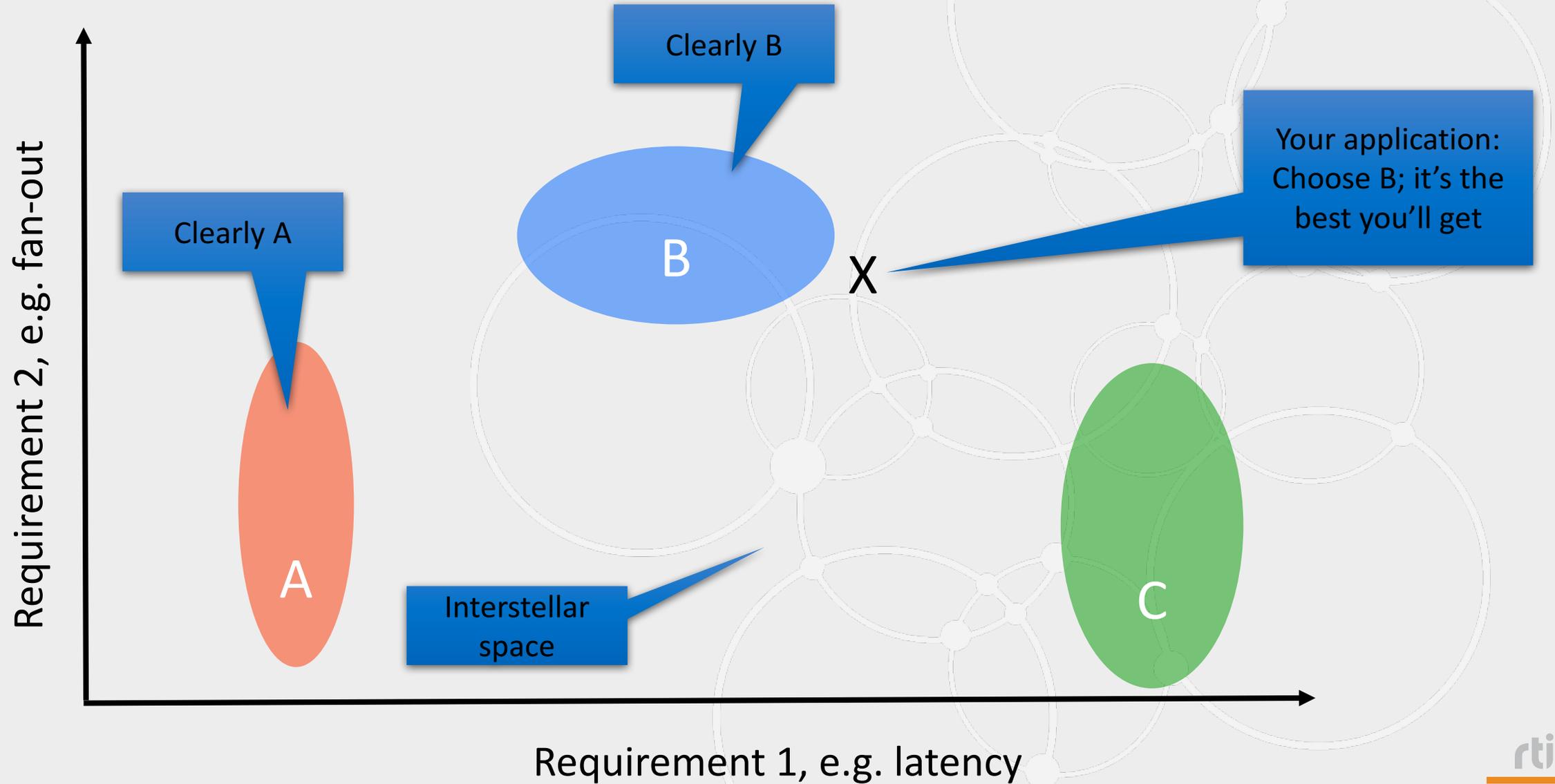
Connectivity Standards



IIoT Connectivity Perception



IloT Connectivity Reality



How to Choose?

System Aspect	Example User	Approach	Standard
Software Integration & Autonomy	Software Architect integrating components	Data-centric	DDS
Device interchangeability	Device manufacturer selling devices to technicians	Device-centric	OPC-UA
Web & Mobile User I/F	App builder supporting back-end services	RESTful	Web services/HTTP
ICT integration	Wide-area wireless telecom integrator	Common services layer	oneM2M

Choose DDS?

- Are there severe consequences of failure for a short time?
- Have you said “millisecond” in the last 2 weeks?
- Do you have more than 10 software engineers?
- Does your data have many destinations?
- Are you implementing a new IIoT architecture?

3+ Yes?

DDS

Choose OPC UA?

- Are you in discrete manufacturing?
- Are you associated with the German Plattform Industrie 4.0?
- Are you building a device that will be integrated by industrial or control engineers and technicians, rather than software engineers?
- Will your product be used in different applications in different systems, as opposed to a single (type of) system where you control the architecture?
- Have you said the word “workcell” in the last two weeks?

3+ Yes?



Choose OneM2M?

- Do you know what “ICT” stands for, and is that you?
- Is the cellular network your primary connection technology?
- Are your target applications largely composed of moving parts?
- Can the components of your system tolerate intermittent connections and loosely-controlled latencies?
- Will your system leverage services provided by a communications provider such as a telco?

3+ Yes?

one
M2M

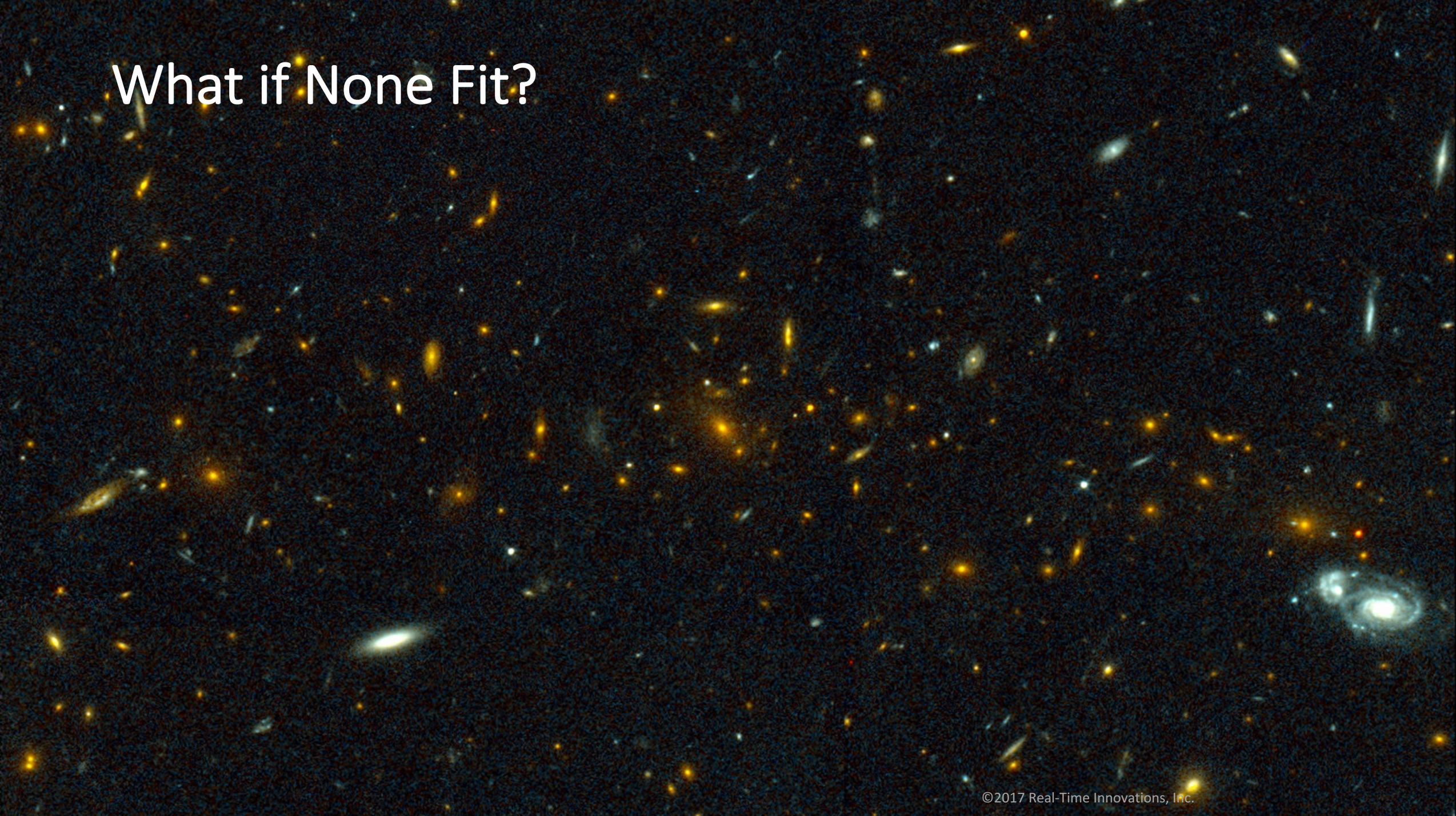
Choose MQTT?

- Do you think of your application as data collection?
- Is there little device-device communications?
- Is interoperability not a consideration?
- Do you have many small devices?
- Is software a minor challenge?

3+ Yes?

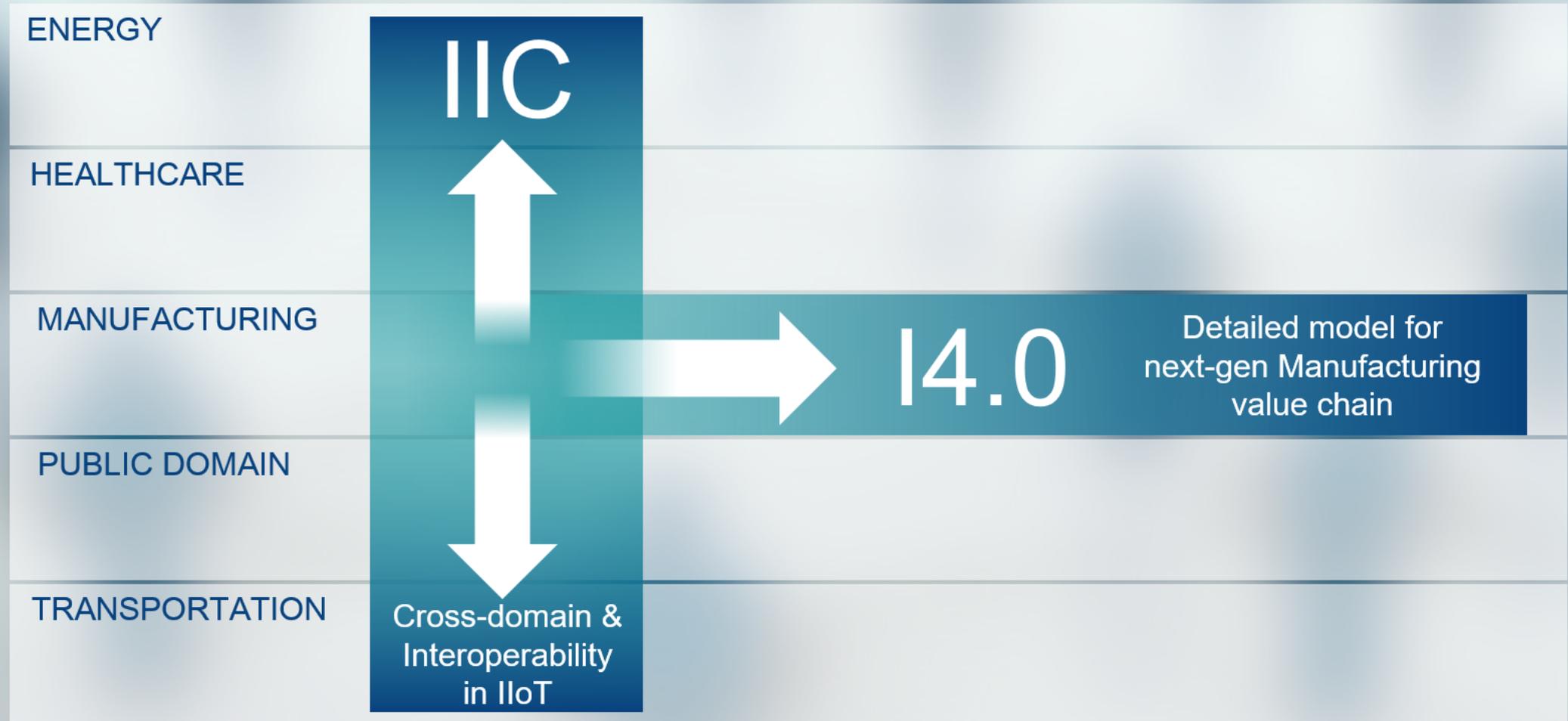


What if None Fit?



1

DOMAIN FOCUS AREAS ARE COMPLEMENTARY



The Applications & Users are Very Different

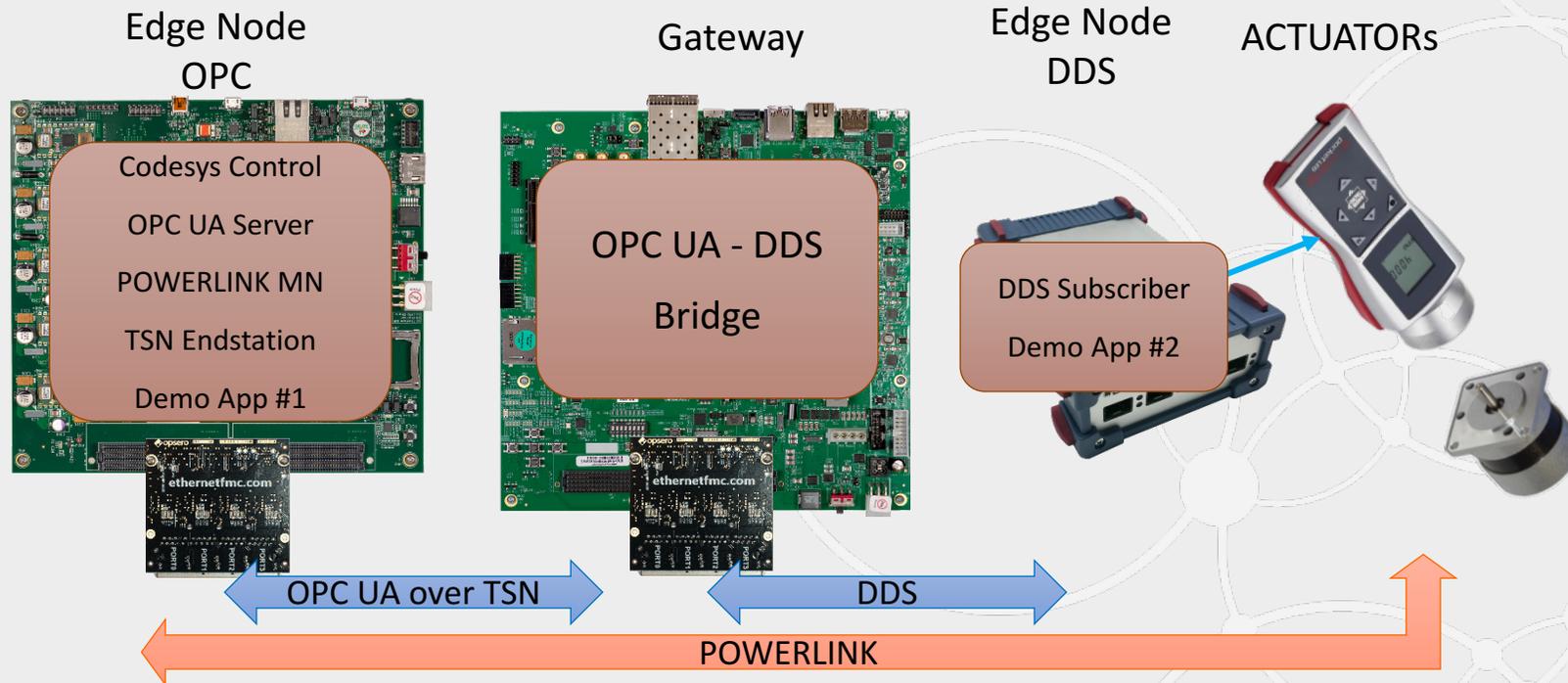


- You are a software architect. You:
- Manage & integrate software development teams
- Design & control architecture & data model
- Face challenges in defining software module interfaces, implementing redundancy, complex data flow

- You are a device manufacturer. You:
- Build a device for many applications
- Do not control the installation data architecture
- Face challenges of device vendor interoperability, users who are not software experts



OPC UA & DDS Integration Testbed



IIC's Highest Honor





IIC's Highest Honor...Rajive!

Progress

How are RTI & DDS doing?



Audi – Functional Engineering Platform (FEP-SDK)

HiL Simulation for development and test across the Volkswagen Group



Audi



Operational Traffic Control



DDS is in operation at Shanghai PVG ground control since 2015
Currently ground control for entire South East China region
Expanding to air operations.

GE Transportation

"By replacing our previous messaging software with RTI Connex DDS, we were able to increase efficiency by 30% while providing a secure, open architecture that will make it easy for us to monitor the system remotely into the future. Together with RTI we are building locomotives that leverage the full power of the Industrial Internet."

—Tab Mong, System Architect at GE
Transportation



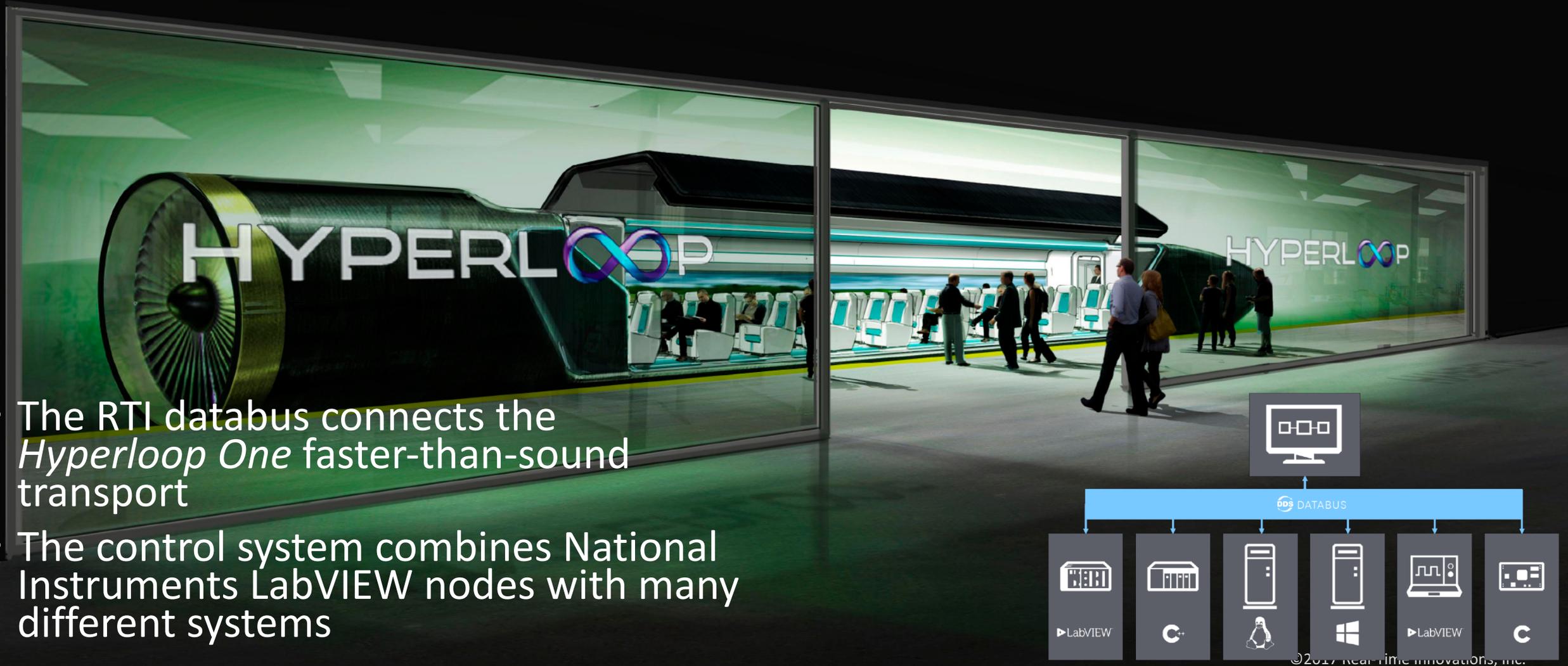
DDS On Board

A close-up, low-angle shot of a red car's side mirror and body panel. The car is moving forward on a road, with a blurred background suggesting motion. The side mirror is prominent, reflecting the sky and the road behind. The overall scene is bright and clear, with a focus on the car's design and movement.

- Many OEMs, Tier-1s, & tool vendors support DDS
- RTI carbot designs include major-brand passenger cars, trucks, mining vehicles, EV startups, campus shuttles, hyperloop and flying cars
- >14 of these production track

Control Future Transport

- The RTI databus connects the *Hyperloop One* faster-than-sound transport
- The control system combines National Instruments LabVIEW nodes with many different systems



Scale Intelligent Transportation



- Cubic's NextCity™ vision integrates city management, integrated traveler payment, and system information
- Modernizing traffic control and mass transit helps travelers find the smartest way to travel and easiest way to pay
- Helps transportation authorities manage demand across the entire transportation network in real-time



CUBIC™
Intelligent travel made real™

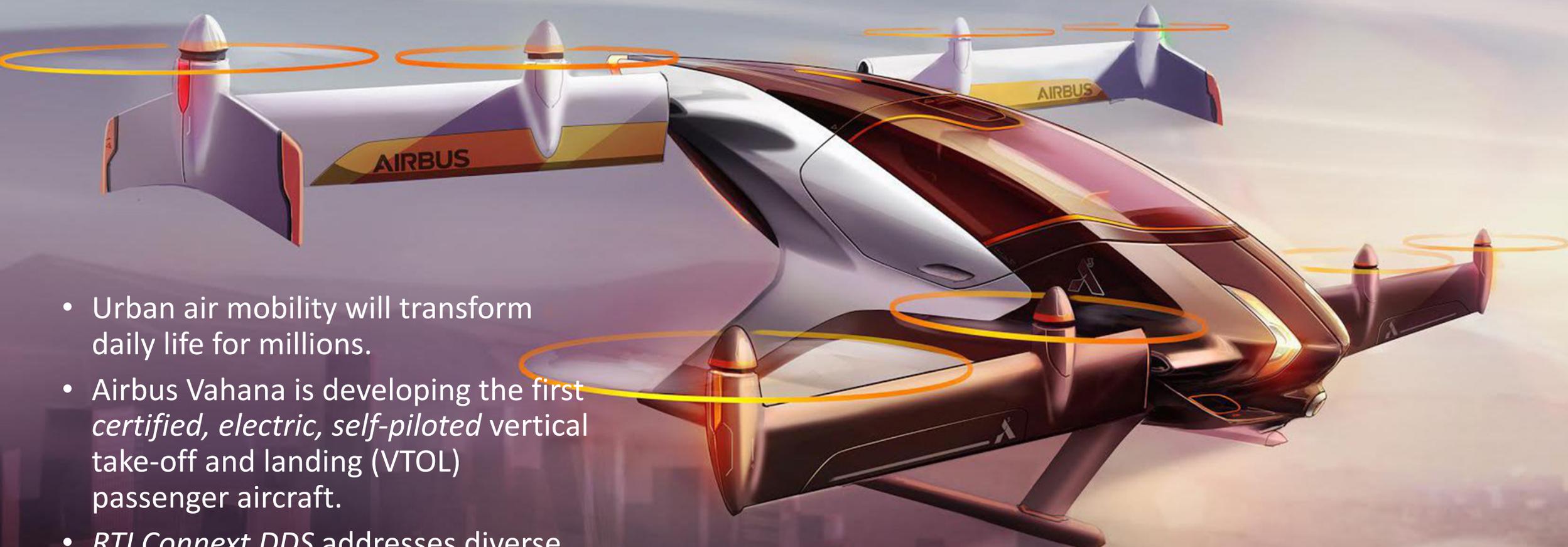


Large-Scale SCADA

- The NASA KSC launch control is the world's largest single-system SCADA
- It combines 300k points, at 400k msgs/sec
- RTI Connext DDS powers launch control, in-flight monitoring, UAV reentry-tracking ground station, and the recovery ship



Control a Safe Flying Car

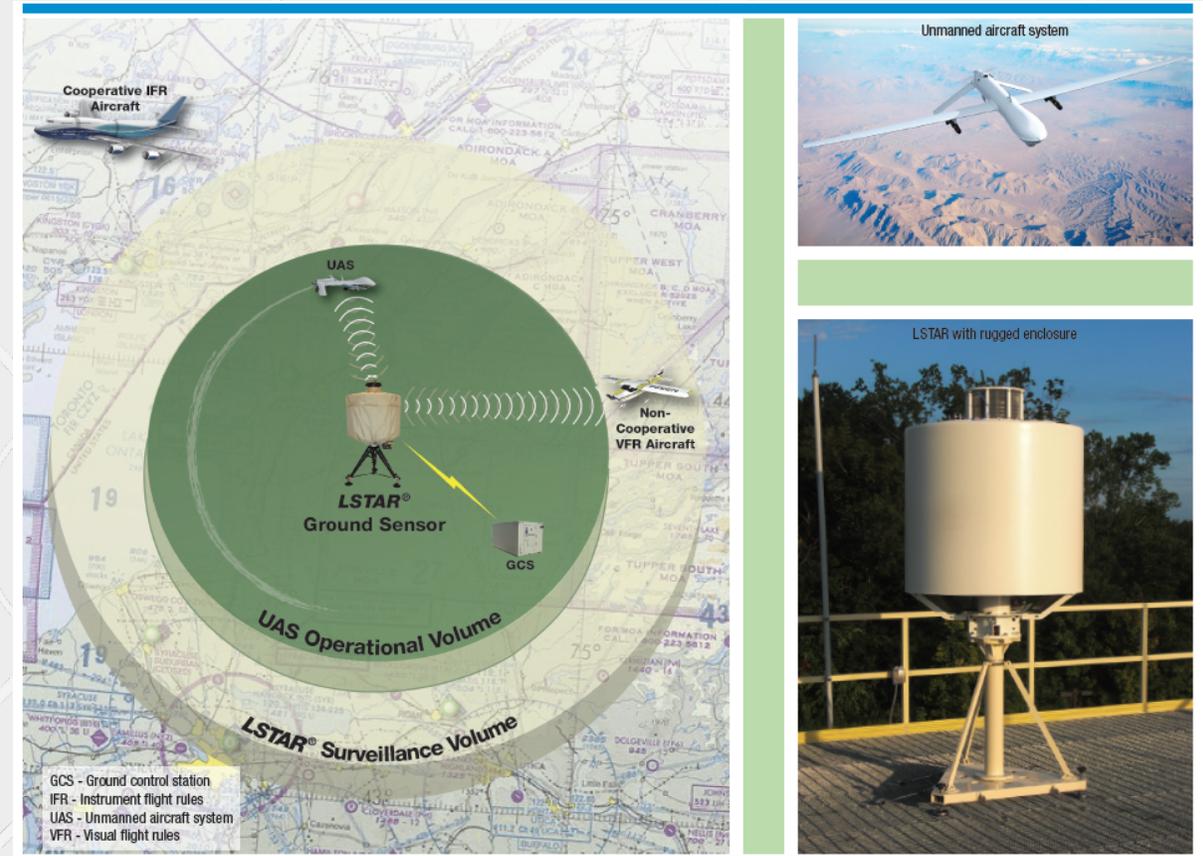


- Urban air mobility will transform daily life for millions.
- Airbus Vahana is developing the first *certified, electric, self-piloted* vertical take-off and landing (VTOL) passenger aircraft.
- *RTI Connex DDS* addresses diverse systems with the same technology, greatly simplifying design integration and modularity.



Enable UAS Flight in National Air Space

- The Ground Based Sense and Avoid system allows autonomous planes in US National Air Space
 - Repositioning
 - Training & testing
 - Disaster relief
 - Forest monitoring and fire suppression
- DO178C safety certified
- Operational with RTI Connex DDS in 2016



Management: US Army UAS Project Office
System integrator: SRC, Inc.

Hundreds of A&D Programs



Ulstein



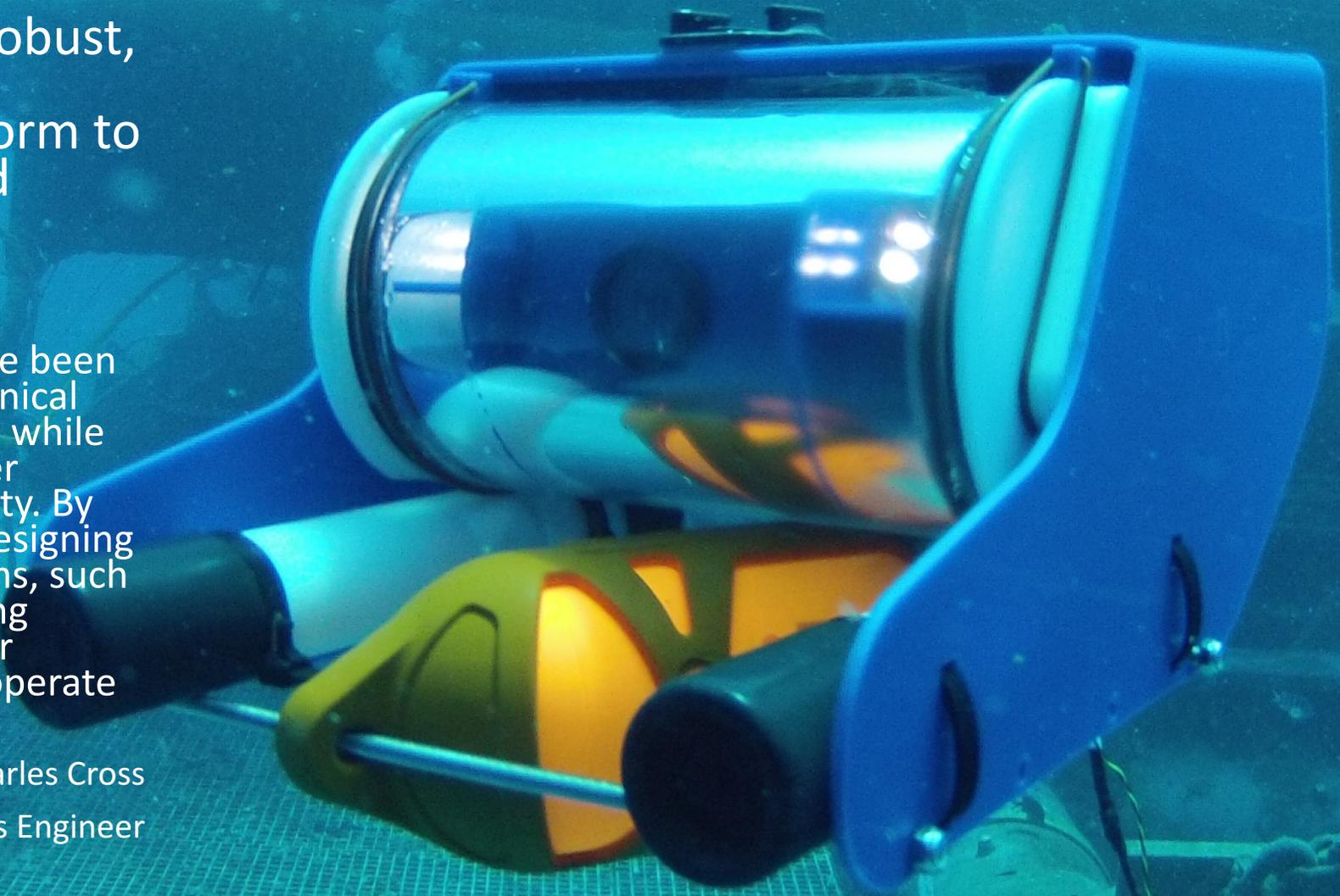
<https://www.youtube.com/watch?v=7A1zgxTIsck&index=2&list=PL8Cump0ma-y0InIteACs2nuBalikbLX-U>

Enable Undersea Exploration

OpenROV is bringing a robust, reliable and capable underwater drone platform to consumer, research, and industrial markets

“With RTI Connex DDS, we have been able to rapidly achieve our technical goals across multiple platforms, while satisfying the common customer requirement of product reliability. By leveraging emerging tools for designing and interfacing with DDS systems, such as OSRF's ROS2 (Robot Operating System), we made it possible for customers to expand and interoperate with our system.”

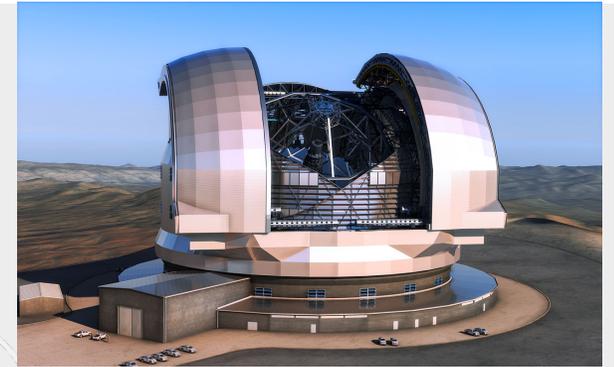
— Charles Cross
Embedded Systems Engineer



Advance Precision Science



Thor's Helmet Nebula
Credit: ESO/B. Bailleul



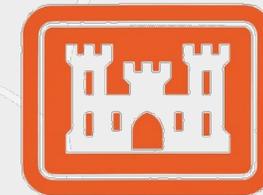
- European Southern Observatory's 8.2m Very Large Telescope can see objects four billion times fainter than the eye
- The new 39-meter Extremely Large Telescope, under construction, will be the world's largest optical telescope
- The telescopes precisely synchronize hundreds of servo mirrors and scientific instruments
- RTI middleware coordinates precise control and measurement



Critical Power Management



- DDS controls the 6.8 GW Grand Coulee Dam
 - Largest power plant in North America
 - Fastest-responding major power source on the Western Grid
- RTI system live since Jan 2014



**U.S. Army Corps
of Engineers®**



Hydropower Nationwide



- USACE's 75 dams generate 20.5 GW, or 100 billion kilowatt-hours a year
- 20 more dams installing in 2017
 - Chief Joseph, #2 in NA
 - The entire Willamette basin, OR
 - Savannah River, GA



Control Renewable Energy

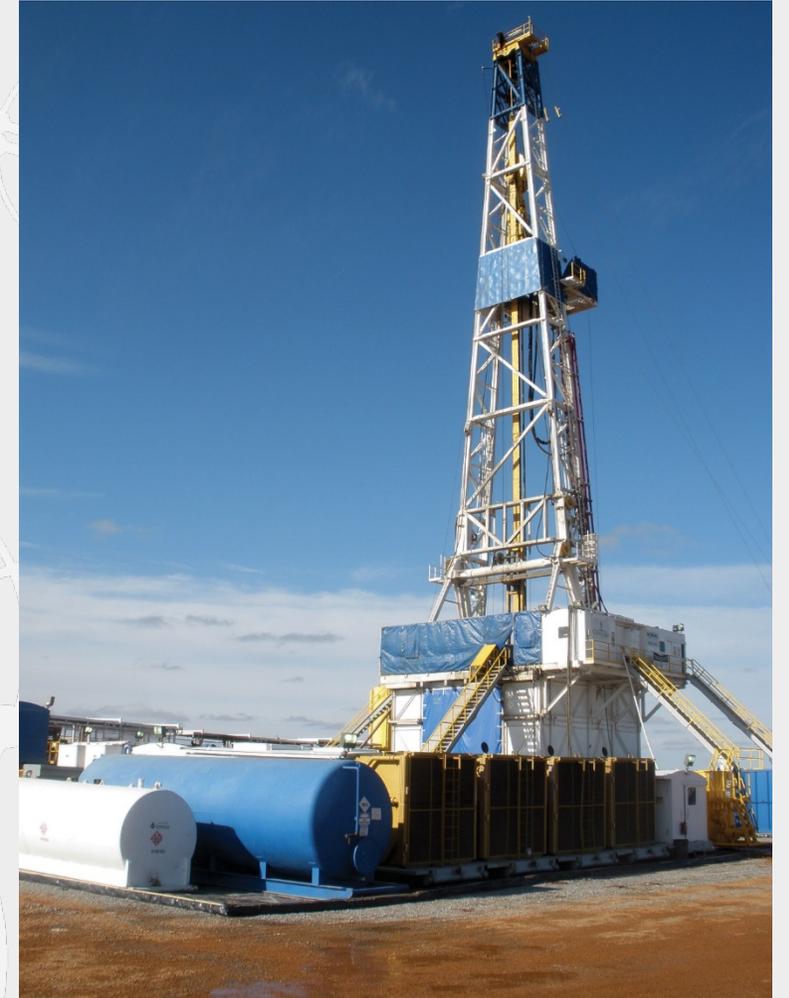


- The Spirae Wave Microgrid Solution reliably integrates Distributed Energy Resources (DER) such as solar, wind, and battery storage. It supports islanding, resynchronization, import/export, and spinning reserves management.
- Modern connectivity also supports new business models such as arbitrage, fuel offset, and virtual power plants.
- RTI Connex DDS enables its flexible, scalable, adaptable software architecture.

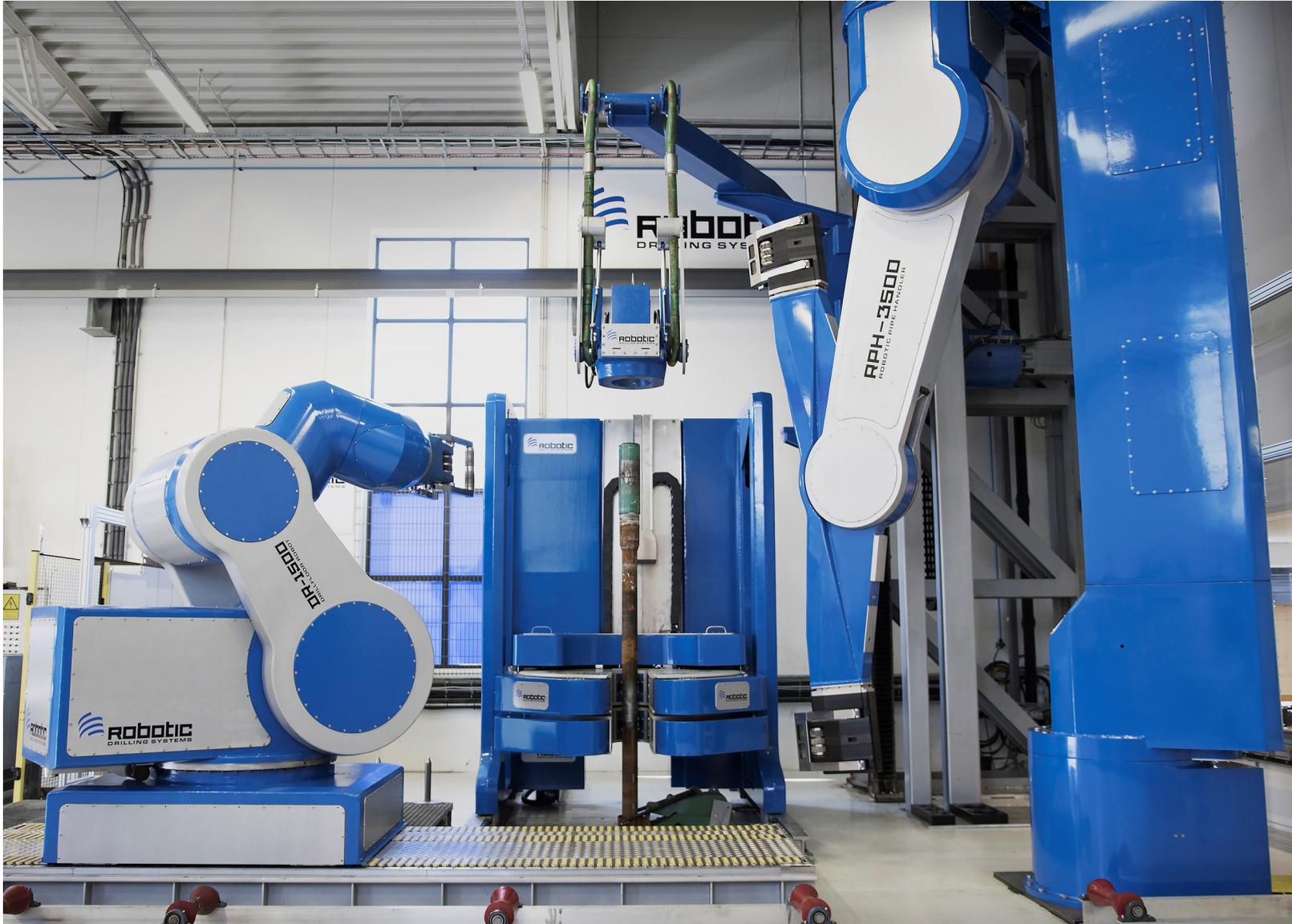


Drilling Automation

- Improves well quality and production
- Captures domain knowledge from the 60% of field experts retiring over next 6 years
- Increases safety
- Protects the environment
- Decreases drilling time and costs
- Decreases downtime and equipment failure



Efficient, Safe Automation



- Robotic Drilling Systems AS uses RTI Connext DDS to reduce manual operations for flexible drilling
- The RDS robotics system automates all operations on the drill floor, replacing slow, dangerous operations with **fast and safe** handling



ROBOTIC
DRILLING SYSTEMS

©2017 Real-Time Innovations, Inc.

Work in Harsh Environments

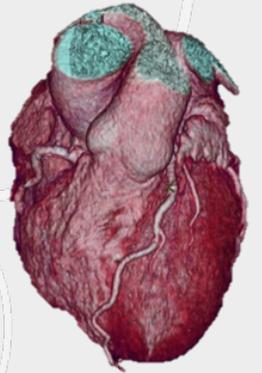


- Joy Mining is the world's largest mining equipment manufacturer
- RTI Connex DDS connects the controller, operator GUI, and historian
- Reliable, fast connectivity enables control, debugging, and system health monitoring for continuous mining

Common Platforms

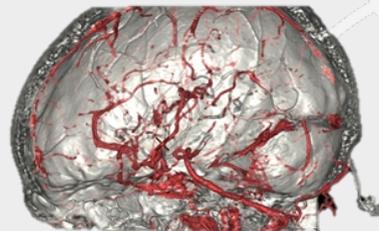


"GE Healthcare chose the DDS standard because it can handle many classes of intelligent machines. DDS satisfies the demanding requirements of our devices and supports **standardization on a single communications platform across product lines.**"



Revolution[®]

-- J Gustavo Perez, General Manager for
MI&CT Engineering



GE Healthcare Clinical Care Systems

- RTI's largest single project
- Will bring smart systems technology to hospitals worldwide



Vehicle/Cloud/Infrastructure Systems

**PHYSIO
CONTROL**



Physio-Control supplies emergency response medical equipment to 60% of the world's emergency vehicles

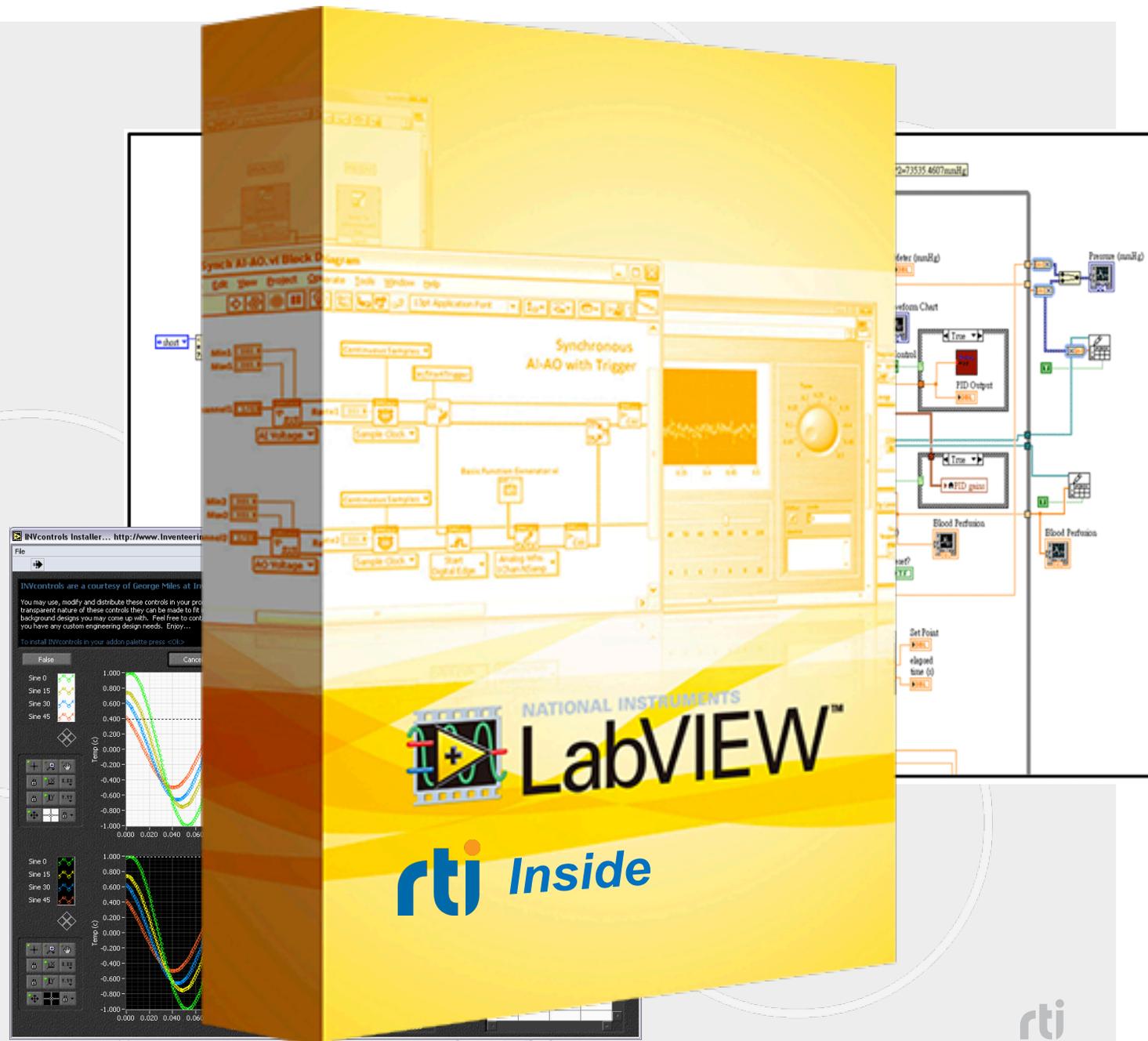
"Physio-Control is utilizing RTI Connex DDS to exchange critical patient care information throughout the system of care."

-- Dale Pearson, VP Data

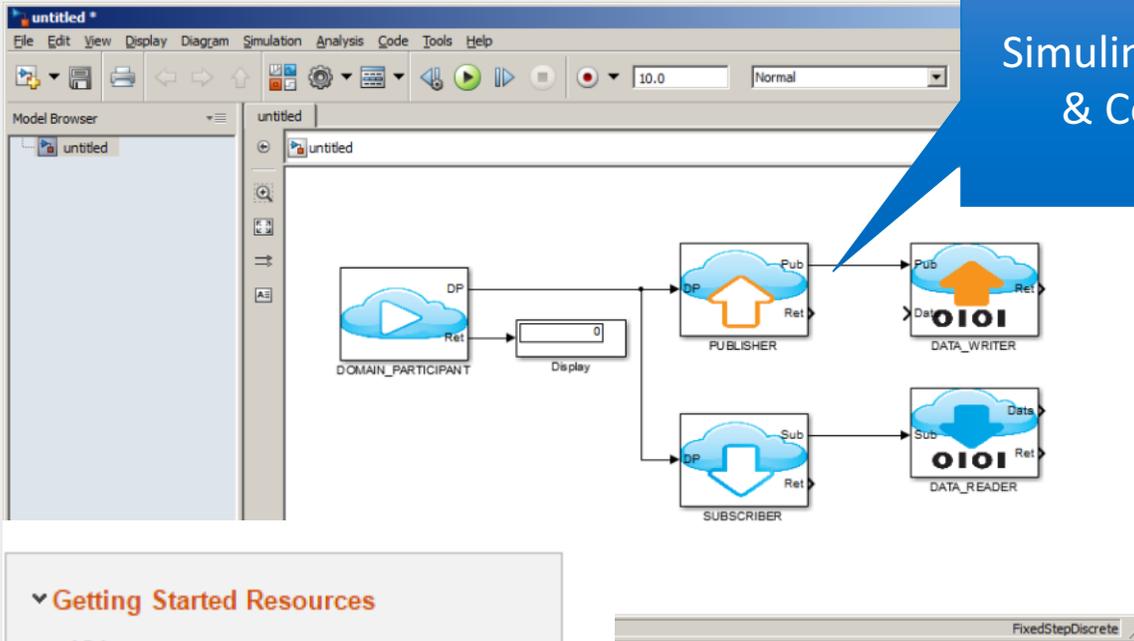
We envision a society in which no person dies from acute, treatable medical events



- DDS toolkit for LabVIEW integration inside LV Suite
- Joint sales & marketing efforts

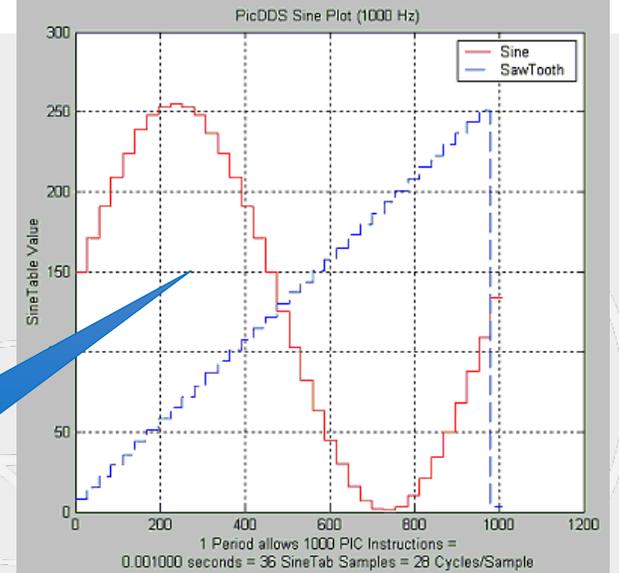


The Mathworks



Simulink Block Set
& Code Gen

Direct Matlab
Ingest, real-time
plotting and data
acquisition



Getting Started Resources

Videos

- [Installing the DDS Support Package](#) 9:00
- [MATLAB and the DDS Support Package](#) 13:08
- [Simulink and the DDS Support Package](#) 10:19
- [Getting Started with MATLAB](#) 7:00
- [Programming and Developing Algorithms with MATLAB](#) 4:32

Documentation

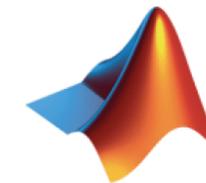
Detailed Video
Tutorials

70-Page User Guide
Including
Code gen, running
on Raspberry Pi

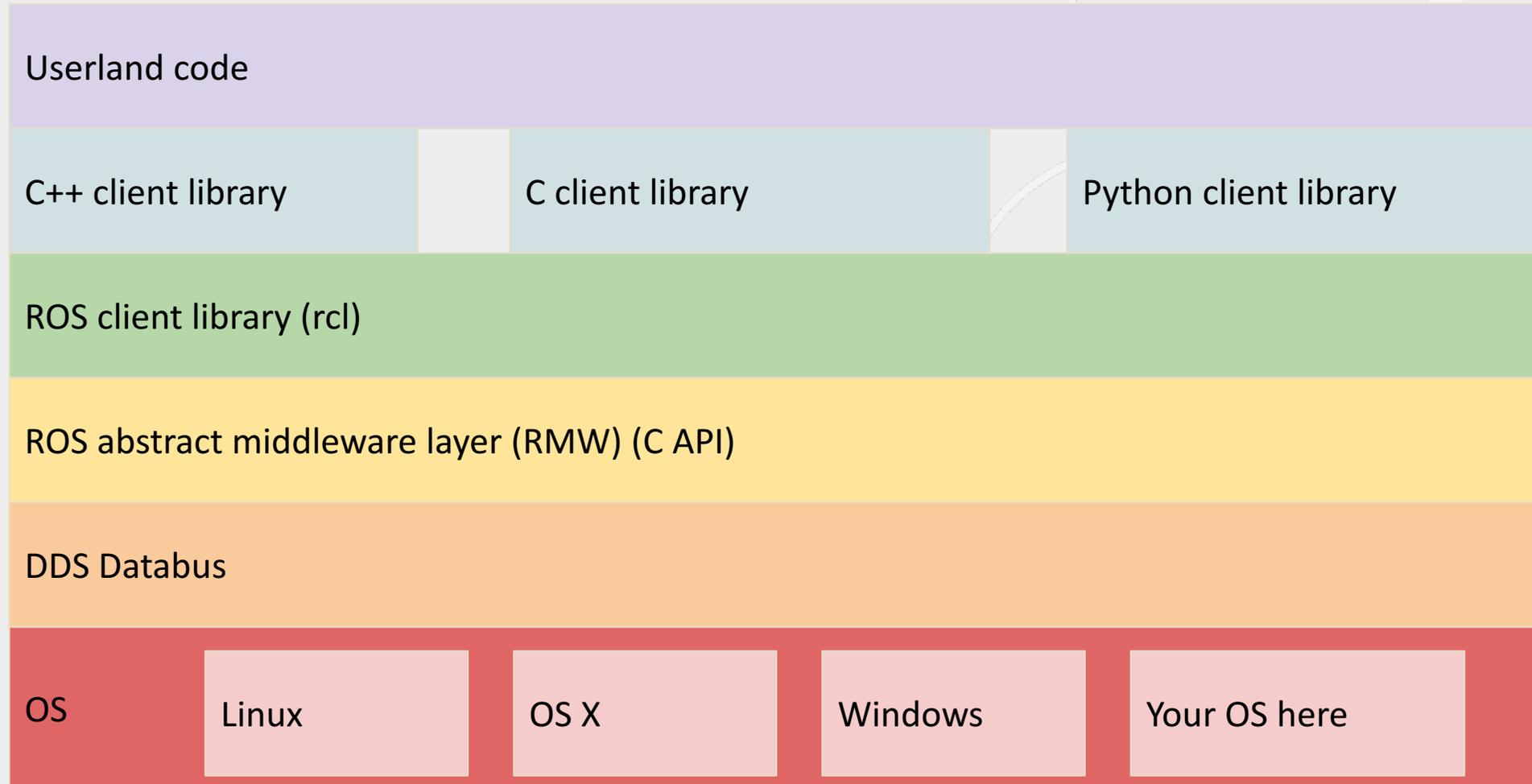
DDS Blockset Pilot Support Package (PSP) User Guide

Version 2.9.0

ISSUE DATE: 16 August 2016

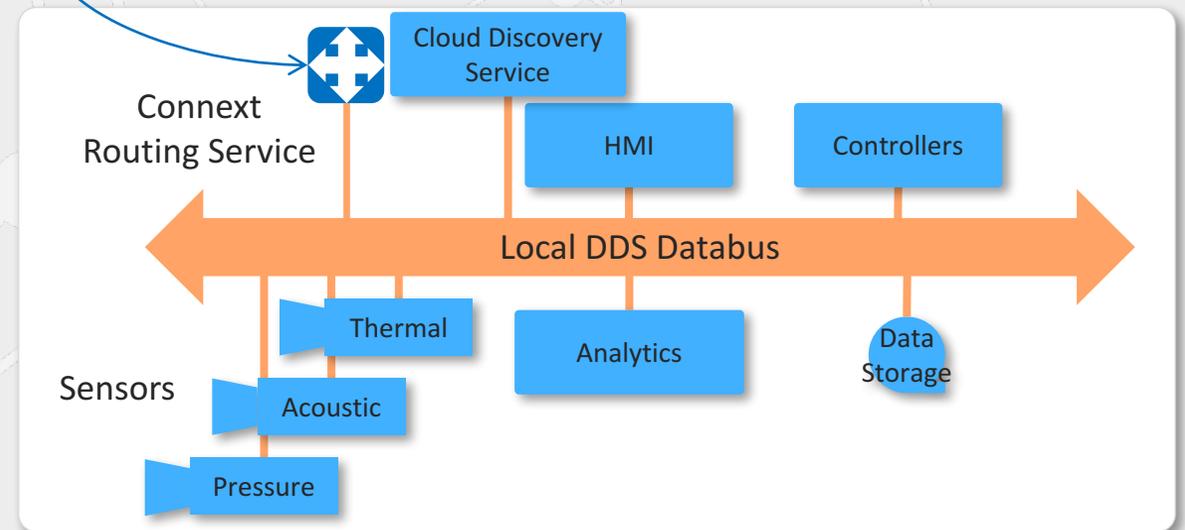
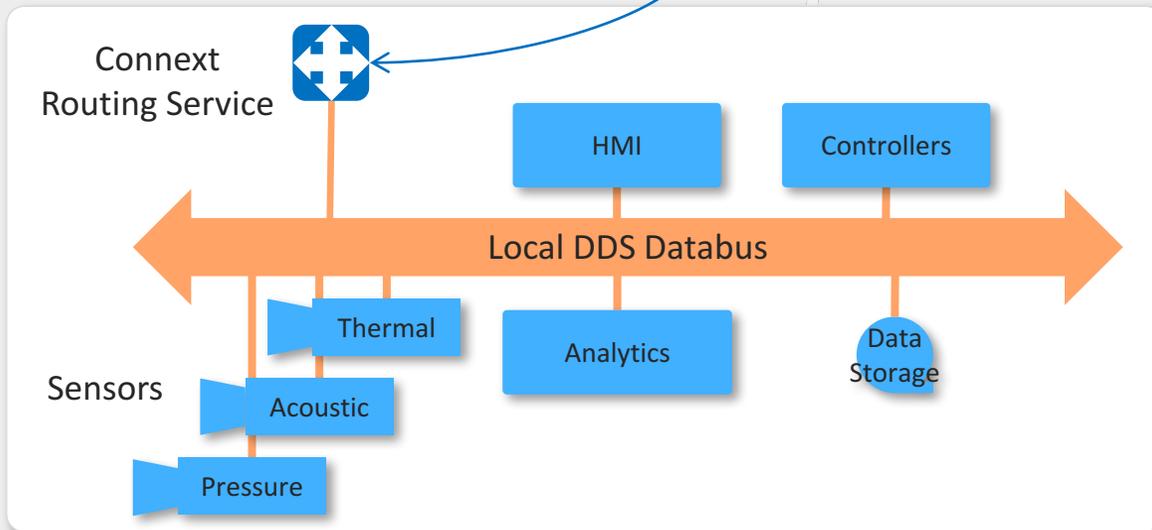
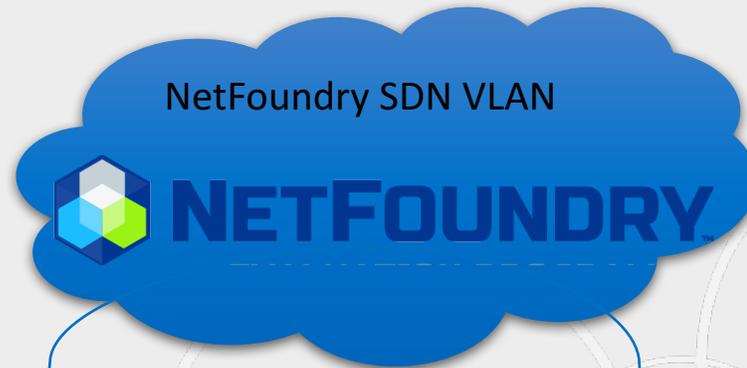


ROS2 Software Stack



NetFoundry Simplifies DDS over the WAN

- NetFoundry SDN solution for WAN
- Routing Service connection simplified with VLAN and Cloud Discovery Service
- Network security is simpler
- Increased performance over the WAN



2017 Plan



2017 Goals

Lead

- Build & solidify leadership position in IIoT

Grow

- Sustain 35+% sales and cash flow growth

Deliver

- Build execution ability to match market demand



Traction Across the IIoT

- Transportation

- Carbots
- Rail & mass transit
- Traffic control (ground & air)
- Drones and personal aviation



- Energy

- Renewable generation (hydro, wind, solar)
- Renewable integration (Substation automation, DER pilots, microgrids)
- Automated drilling & production



- Medical

- Intelligent connected medical devices
- Surgical robotics
- Imaging & treatment systems



- Defense

- Avionics & UAS
- Naval systems
- Radar/antimissile/air defense
- Ground vehicles
- Asset tracking/C2



DEVELOPER RESOURCES

GETTING STARTED WITH CONNEXT DDS

From download to hello world, we've got you covered. Find all of the tutorials, documentation, inspiration, and other materials you need to get started using Connex DDS today.



VIDEO TUTORIAL

Learn DDS Basics without Coding

Play with Shapes, the game-like application that teaches you fundamentals of DDS by demonstrating its capabilities without the need for coding.



VIDEO TUTORIAL

Connex DDS Installation (Linux)

Follow the simple steps in this video tutorial to install Connex DDS on Linux.



VIDEO TUTORIAL

Connex DDS Installation (Windows)

Follow the simple steps in this video tutorial to install Connex DDS on Windows.

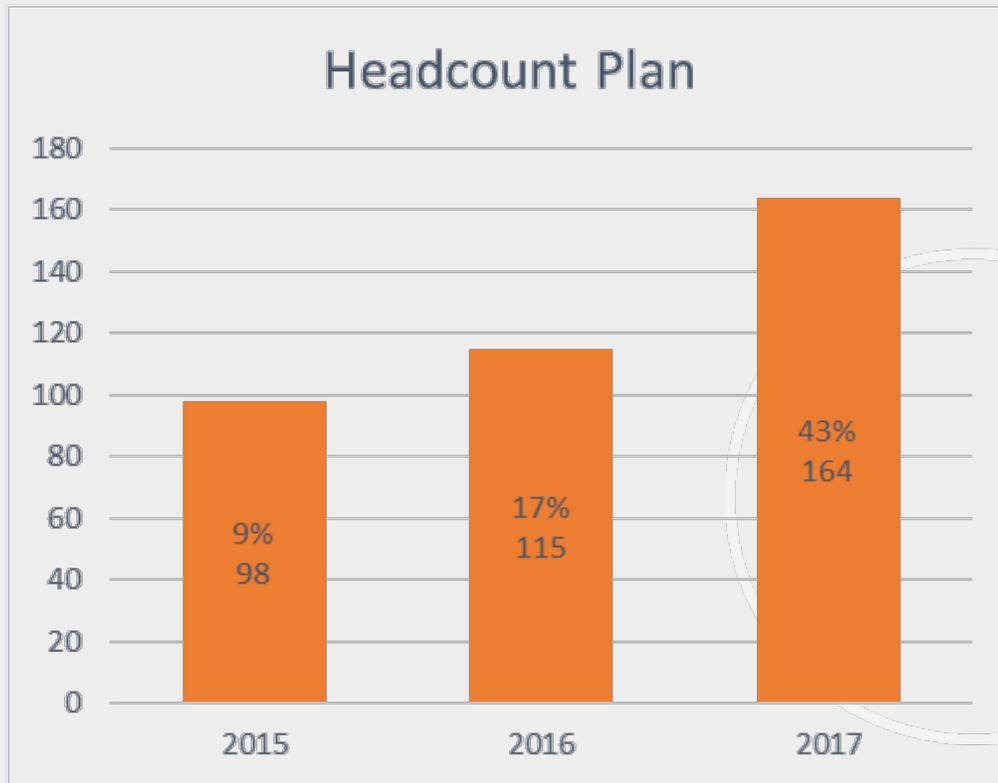


Some Numbers...

- ~2x revenue in 2 years
 - 2015 31% + 2016 42%
- ~130% cash retention (!)
- 140 new projects in 2016
- 1000+ design wins

“RTI has seen unprecedented growth in projects, customers and revenues. Even more exciting, the market is still young with only a few IIoT projects in production today. As more deploy, the market will expand tremendously. We live on the brink of an innovative new world of intelligent, connected systems.”

2017 Headcount Plan



43%

Expanding in Europe...



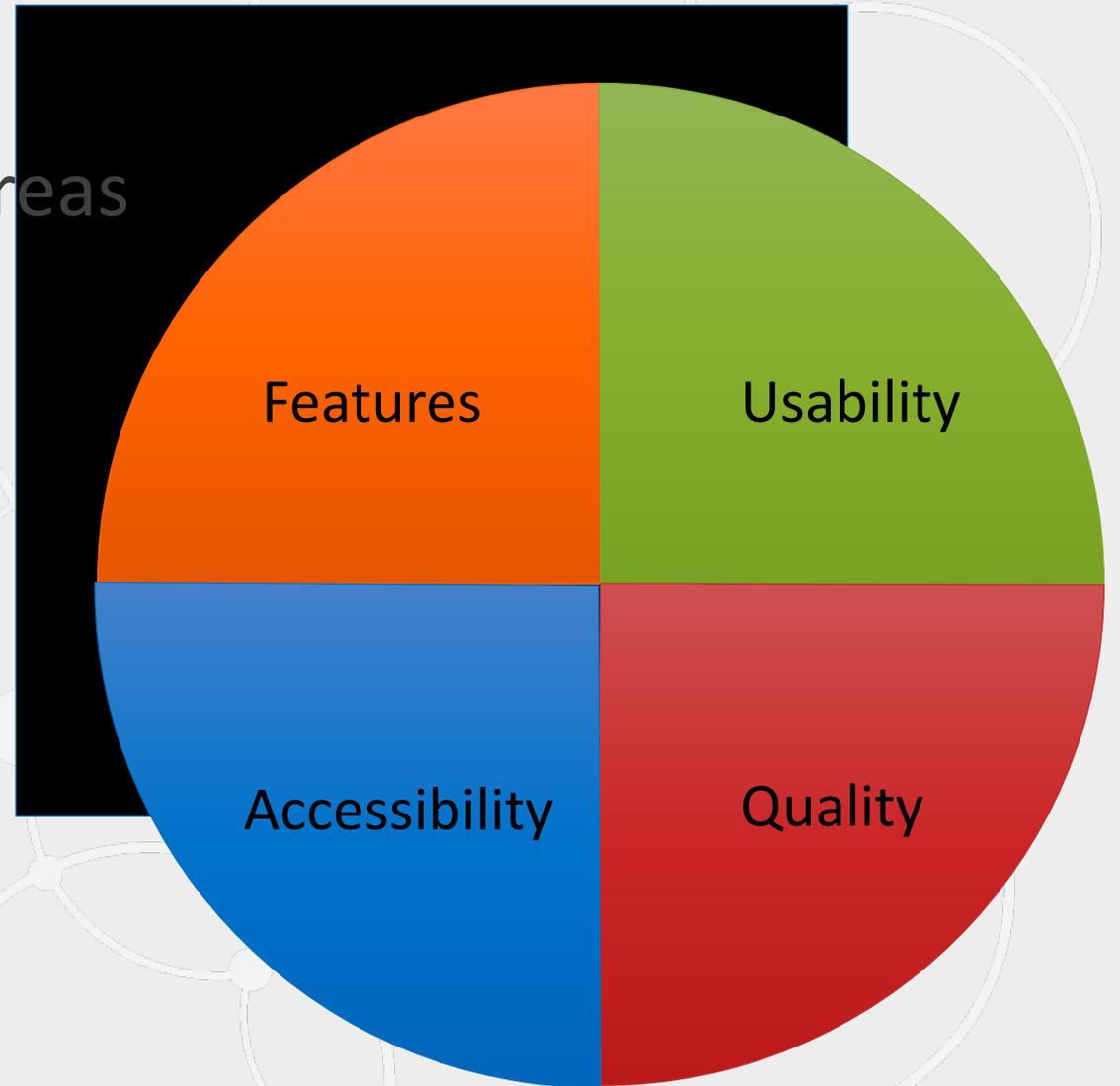
Scott McNealy



Welcome to RTI's Advisory Board!

Balanced Delivery

- Consistent progress in all key areas
- User input welcome!

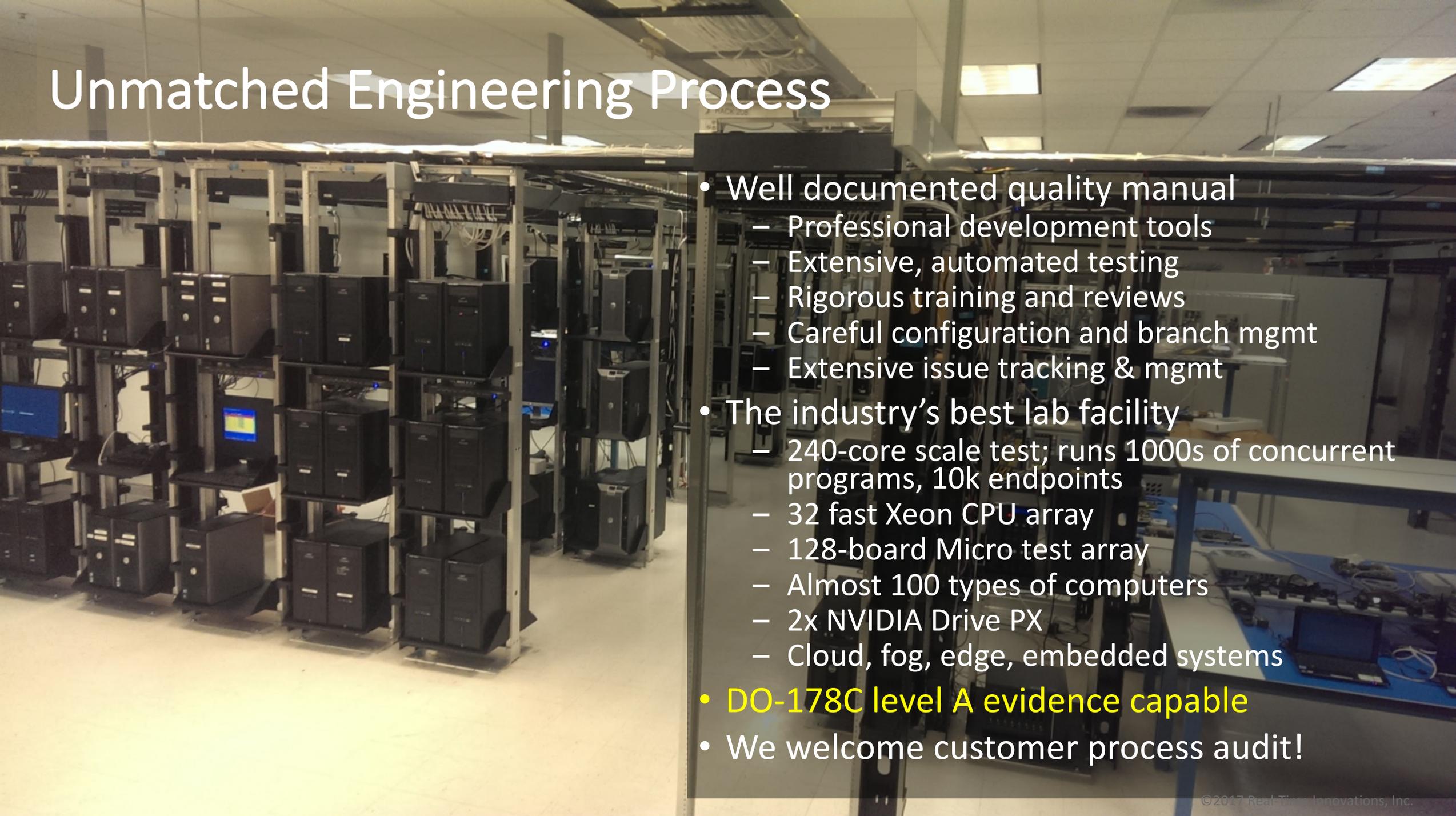


RTI Connex 5.3 “Faro”

A lighthouse on a cliff at sunset, with a beam of light shining across the sky. The lighthouse is white with a black top section and a red light. The sky is a mix of orange, yellow, and purple. The ocean is visible in the background.

- Major new release
- Top new functionality
 - Go anywhere
 - Ask for data anywhere
 - Keep data secure
 - Much more

Unmatched Engineering Process

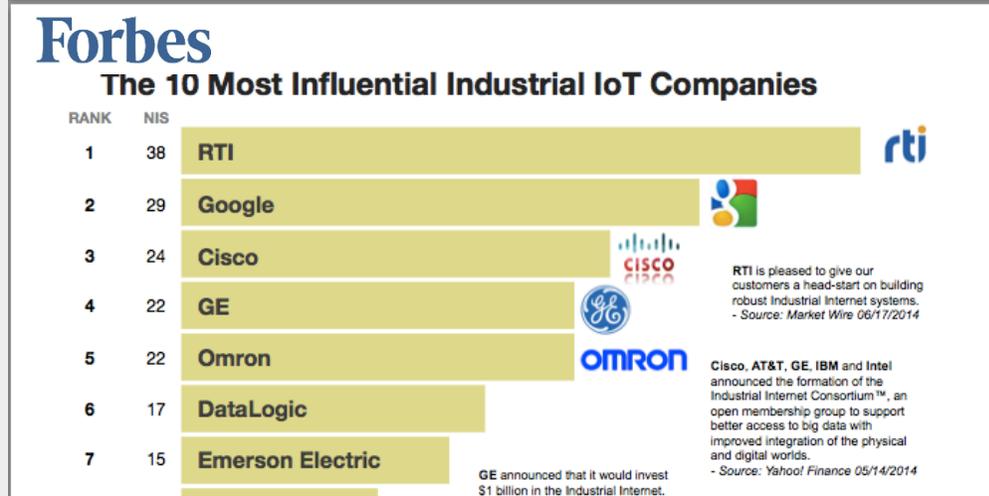
A photograph of a server room with multiple racks of server hardware. The racks are filled with various components, including monitors, keyboards, and server units. The room is well-lit with overhead fluorescent lights.

- Well documented quality manual
 - Professional development tools
 - Extensive, automated testing
 - Rigorous training and reviews
 - Careful configuration and branch mgmt
 - Extensive issue tracking & mgmt
- The industry's best lab facility
 - 240-core scale test; runs 1000s of concurrent programs, 10k endpoints
 - 32 fast Xeon CPU array
 - 128-board Micro test array
 - Almost 100 types of computers
 - 2x NVIDIA Drive PX
 - Cloud, fog, edge, embedded systems
- **DO-178C level A evidence capable**
- We welcome customer process audit!

Building Momentum



RTI Market Awareness



RTI: 2016 IoT Emerging Company of the Year for the Enterprise Market
Compass Intelligence



Top 25 IoT Companies 2017
CEO Top 10 Influencer 2017

Must Follow Company

All Nominees

Slock.it
EDITORS CHOICE WINNER

Slock.it brings the benefits of the Blockchain - transparency, security and auditability - to real-world objects.

Arkessa
PEOPLE'S CHOICE WINNER

Arkessa's goal is to future-proof customers' connections to the Internet of Things. To achieve this Arkessa has pioneered the

RTI
Your systems. Working as one.
PEOPLE'S CHOICE SILVER
Real Time Innovations

RTI is the world's largest embedded middleware provider, privately held in Sunnyvale, California, and provides the connectivity platform

udes
in platform
ships,
onsortium.
114

40
\$

TOP WORK PLACES 2017

Silicon Valley Top 10

RCR Wireless News
INTELLIGENCE ON ALL THINGS WIRELESS

HOME | INTERNATIONAL | POLICY | ANALYST ANGLE | OPINION | DEVICES | BIG DATA ANALYTICS | INTERNET OF THINGS | TEST EQUIPMENT | CARRIERS | MOBILE SIGNAL MAP | NFV | 5G | DAS | SDN | CLOUD COMPUTING | SMALL CELLS | EN

YOU ARE AT: Home » Business » In-depth: Top 10 Internet of Things companies to watch

INTERNET OF THINGS

In-depth: Top 10 Internet of Things companies to watch

Top 10 Companies Industrial IoT

- IBM
- AT&T
- Cisco
- GE
- RTI
- Consumer IoT
- Amazon
- Google
- Samsung
- Apple
- Microsoft



Top Industry Influence



CEO top 10 IIoT influencer

Top 100 IIoT Influencers

2nd Quarter of 2017

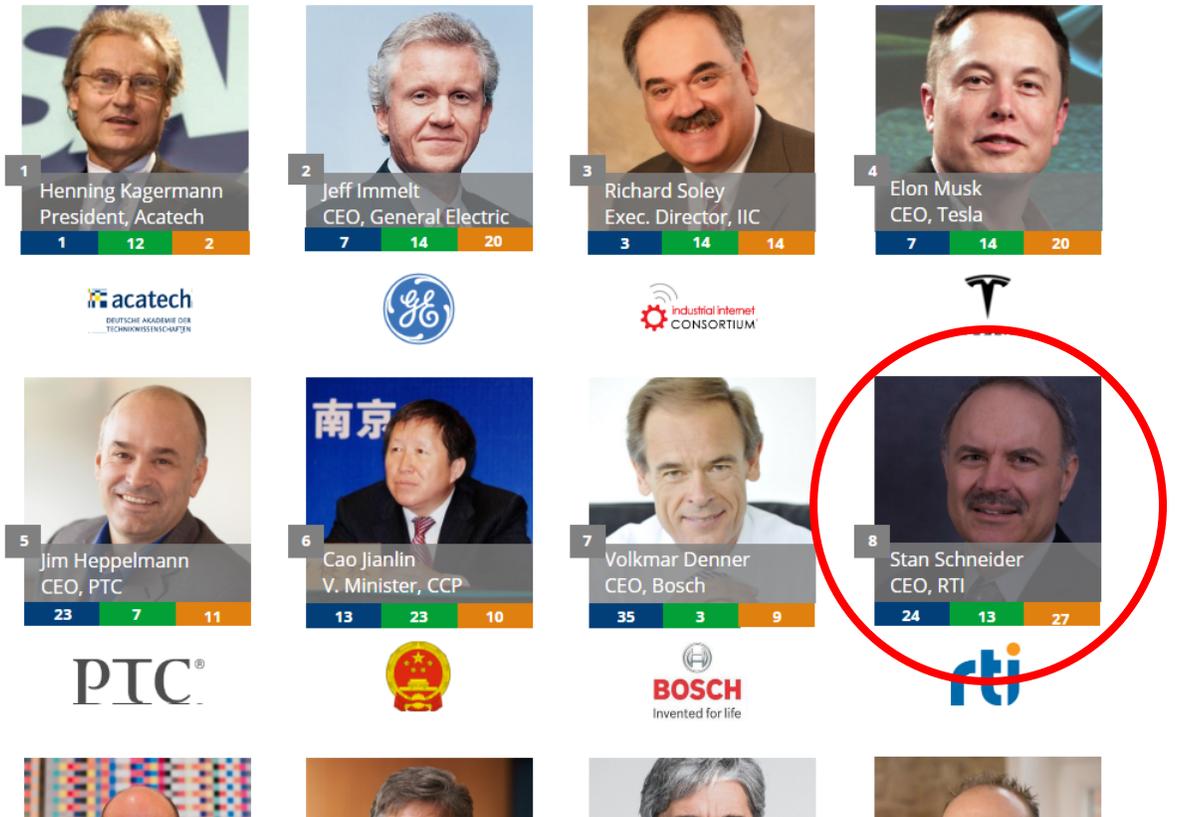
This quarter, we assessed IoT ONE's pool of influencers and identify the 100 individuals with the most influence in IIoT.

We welcome you to advise future rankings. Share who you believe are the most influential IIoT individuals [here](#).

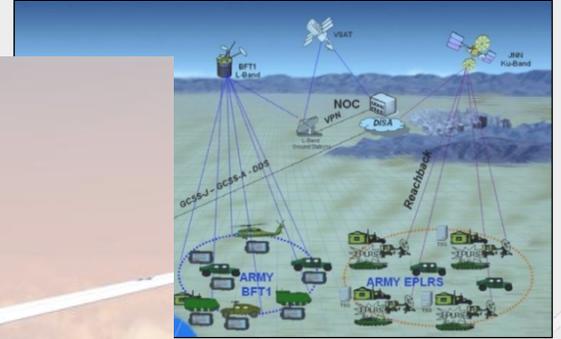
Ecosystem

Business

Technological



Some \$B Bets on RTI



We earn trust



The Industrial IoT Disruption



RTI lives at the intersection of functional artificial intelligence and pervasive networking



This is Profound!!



The real value is a **common** architecture that connects sensor to cloud, interoperates between vendors, and spans industries

Why RTI? Why Do We Have Momentum?

Truly profound technologies become part of everyday life. Motors, plastics, computers, and now networking have made this transition in the last 100 years.

Another step is emerging in this progression: pervasive, real-time data. This differs from the Internet in that this pervasive information infrastructure will connect devices, not people.

2006

This is Why We Have Momentum

- Vision
- Product
- People
- Influence



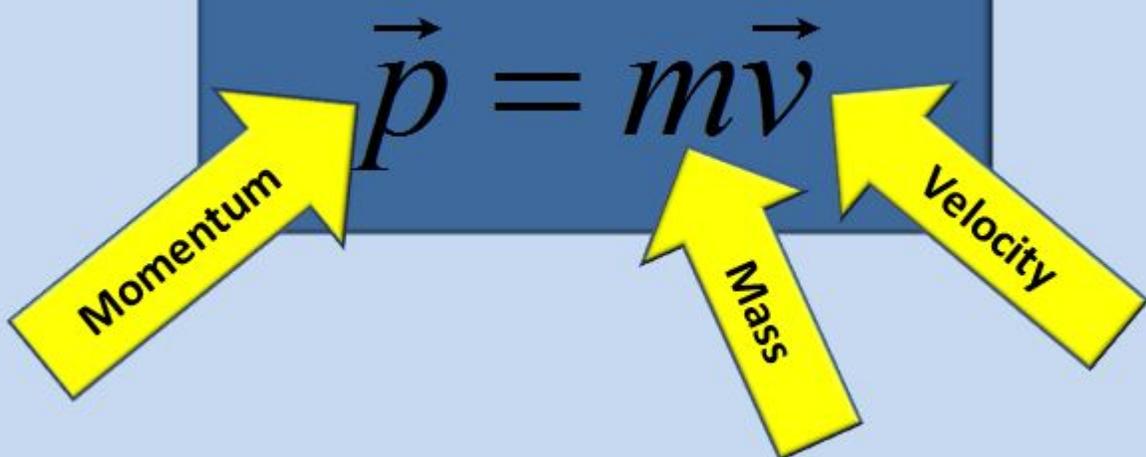
We Are Building The Future with You



Momentum Physics

- Increase it?
 - More of us
 - Moving faster together

Momentum = (mass) x (velocity)

$$\vec{p} = m\vec{v}$$


The diagram shows the equation $\vec{p} = m\vec{v}$ with three yellow arrows pointing to the terms: 'Momentum' points to \vec{p} , 'Mass' points to m , and 'Velocity' points to \vec{v} . The entire diagram is set against a light blue background with a dark blue box at the top containing the text 'Momentum = (mass) x (velocity)'.

What Do These Promise?

Artificial Intelligence

Pervasive Networking

Prom·ise

'präməs (Proper noun)

RTI's primary competitive advantage

“If your career, fortune, or life is on the line, rely on RTI's Promise”

RTI's Promise

- We realize potential
- We provide extraordinary value
- We believe in absolute honesty
- We work as a team
- We actively pursue excellence
- We make the world better

DWYSYWD. It really is that simple.



