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# Capture the Prize



Stan Schneider, PhD

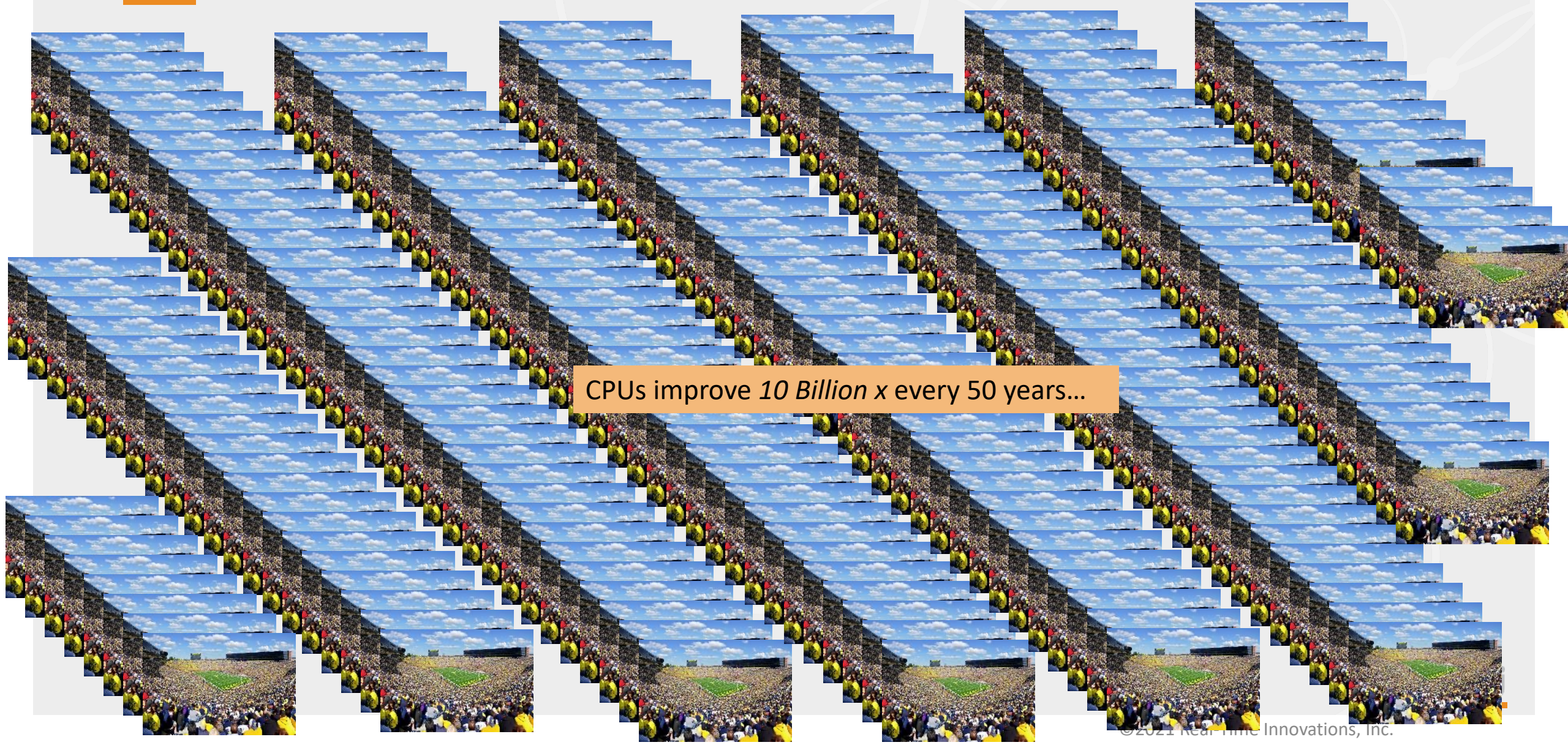
RTI CEO

A wide-angle, high-angle shot of a packed football stadium. The stands are filled with a dense crowd of spectators, many wearing blue and yellow clothing. In the center, a green football field is visible with white yard lines and the word "MICHIGAN" written in large yellow letters at the end zone. An American flag flies on a tall pole to the right of the field. In the background, a large scoreboard and stadium buildings are visible under a clear blue sky with some clouds.

In the last 25 Years...

CPUs improved *100,000x*  
Ohio State got more annoying

In 25 more years...CPUs will be another *100,000x*  
better



CPUs improve *10 Billion x* every 50 years...

A landscape photograph at sunset. The sky is a mix of blue and orange, with scattered clouds. Sunbeams radiate from behind a large cloud on the left. On the right, a large, dark silhouette of a tree stands prominently. The foreground is a dark, flat expanse, possibly a field or plain, with a line of smaller trees in the distance.

AI  
Today...

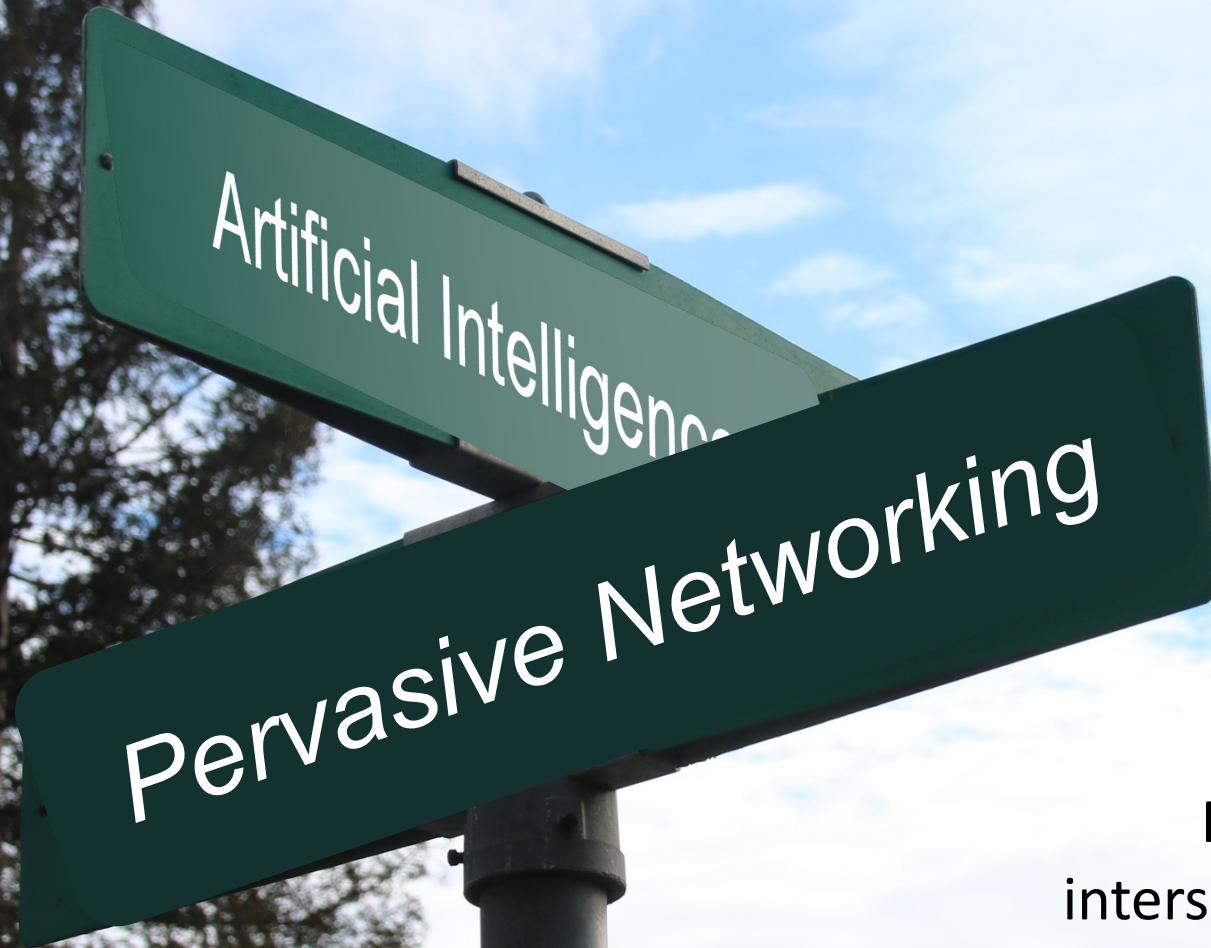
# AI Tomorrow

- Everything will be smart
- Everything will be connected
- *Everything will need software architecture*



The background features a light gray gradient with a pattern of overlapping white circles and nodes, resembling a network or molecular structure. The nodes are small white circles at the intersections of the larger circles.

*One software architecture will lead the change  
to intelligent distributed infrastructure*



RTI lives at the intersection of functional artificial intelligence and pervasive networking<sup>SM</sup>



# You Need RTI if You Face These Problems

- ✓ • Are there severe consequences of failure for one minute?
- ✓ • 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 building a smart real-world system?

3+ Yes?



# Can RTI Lead this Transition?

#1 in autonomy

Real-Time Innovations (RTI) is the **largest software framework company for autonomous systems**. RTI Connex is the **world's leading architecture for developing intelligent distributed systems**. Uniquely, Connex shares data directly, **connecting AI algorithms to real-time networks of devices to build autonomous systems**.

Unique value proposition for autonomy

RTI is the best in the world at ensuring our customers' success in deploying **production systems**. With over 1,500 designs, RTI software runs over 250 autonomous vehicle programs, controls the largest power plants in North America, coordinates combat management on U.S. Navy ships, drives a new generation of medical robotics, enables flying cars, and provides 24/7 intelligence for hospital and emergency medicine. **RTI runs a smarter world.**

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 offices in Colorado, Spain, and Singapore.

#1 in intelligent distributed systems

#1 in deployment

Contribution to a better world



# RTI's Why: To Enable Smart Machines

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By enabling a new generation of intelligent distributed systems, RTI boldly seeks to transform entire industries.

We particularly seek applications that promote a sustainable, safe, green, and healthy planet.

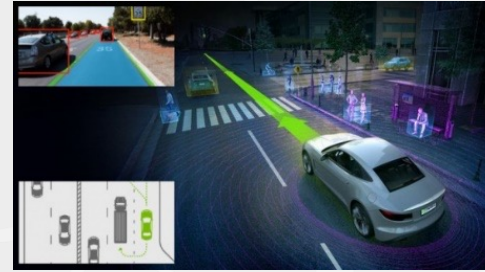
# Capture *The Prize*

RTI will dominate the architecture software for intelligent distributed machines across verticals

**RTI Runs a Smarter World**

# Autonomy Changes *Everything*

- Transportation
  - Autonomous vehicles
  - Rail & mass transit
  - Traffic control (ground & air)
  - Urban Air Mobility
- Energy
  - Renewable generation (hydro, wind, solar)
  - DER integration (future grid)
  - Automated drilling & production
- Medical
  - Intelligent connected medical devices
  - Imaging & treatment systems
  - Surgical and diagnostic robotics
- Defense
  - Naval systems
  - Open architecture integration
  - Radar/antimissile/air defense
  - Avionics & UAS
  - Ground vehicles
- Simulation and training



World



- Our customers have 3 things in common:
  - They are doing something new
  - They are doing something hard
  - They are *scared*

- Real-world autonomy is *hard*
  - Systems are *big and complex*
  - Must be *fast & reliable*, even if net is not
  - Things *change*
  - *Insight* is critical
  - Autonomous systems *need* remote help
- Connections *must* work
  - Secure
  - Real-time
  - Reliable (when needed)

Autonomy is too hard.  
How can we make it work?



The Real Problem? *Corner Cases*

You can't build a culture in pieces, any more than you can water a parking lot and call it a rainforest. Like our slogan, it has to *Work as One*.



***RTI Sells Trust***



# RTI's Pandemic

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RTI excels at distributed software. And distributed teams...



Change is the essential process of all existence  
— Spock, stardate 5730.2



# Realize What Drives Success

It's not finance, not strategy, not technology. Teamwork remains the ultimate competitive advantage, both because it is so powerful and so rare.

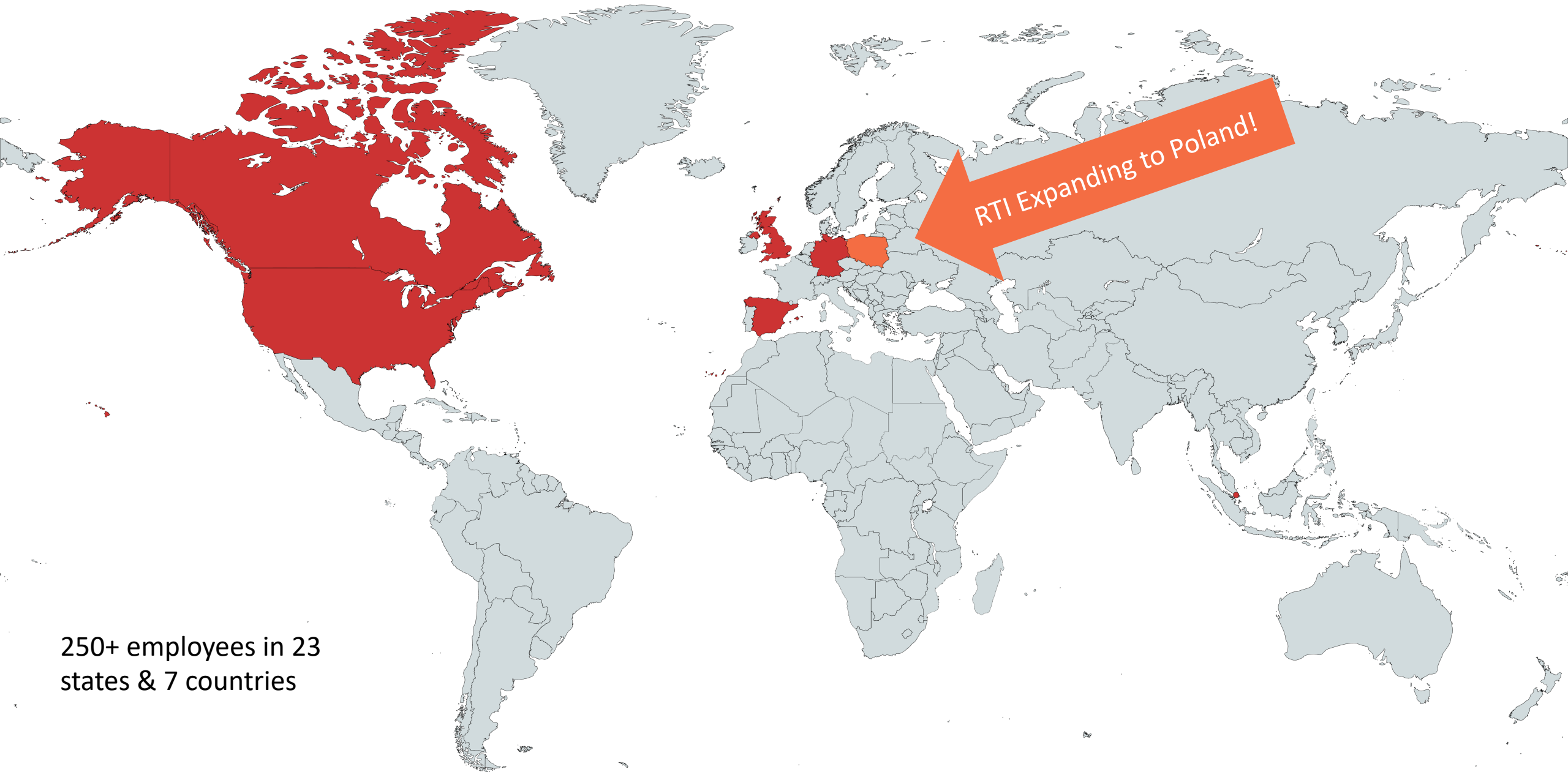
If you could get all the people in an organization rowing in the same direction, you could dominate any industry, in any market, against any competition, at any time.

Patrick Lencioni

(tl;dr: Teamwork)

# We Did Well Distributed..





250+ employees in 23 states & 7 countries

# RTI HQ, Sunnyvale, CA



- Heart of Silicon Valley
- 35k square feet
- Conference facility for 250+





Plenty of Room for Fun!





# World's Largest IIoT Test Lab

- 51 equipment racks + 6 tables
  - 1200+ enterprise-class cores; many embedded cores
  - 1.25 PetaBytes of storage
  - 200+ embedded boards
  - Runs 1000s of VMs
  - 25+ operating systems
  - 12 network types
  - Satellite lab in Spain
- Full remote operation
- Deep software stacks
  - Docker, Kubernetes, Linux, MySQL, Postgres, MariaDB, SFS, NTP, TripleO, OpenStack, Nova, Zabbix, Rundeck, Ansible, phpIPAM, ArchDB, Snipe-IT, Bamboo, OpenLava, Booked, GlusterFS, Ceph, Jenkins, Bitbucket, Artifactory



# RTI's Extensive Testing



- Configuration management, third-part sw mgt, and pull requests (Bitbucket, Artifactory)
- Dynamic analysis (Valgrind, with/without buffer pools)
- Static analysis (cppcheck, Coverity)
- Compiler warning detection (MSVC, clang, gcc)
- API Unit testing (RTI)
- Distributed Feature testing (bespoke feature tests, customer use cases and Qos configs)
- Interoperability testing (feature, product, vendor, language)
- Install testing (OOB experience, examples, documentation, minimal functionality)
- Performance testing (custom, Perftest), Memory Profiling (Memtest)
- Endurance testing (RTI)
- Fuzz testing (AFL, RTI)
- Continuous Integration (Bamboo, Jenkins) with Fast Build, Nightly, and Weekly build and tests on the full set of supported platforms (PAM).

# Denver Office

- 3900 E Mexico Avenue
  - 4<sup>th</sup> Floor
  - 9,667 SF
  - 56 Workstations
  - 12 Conference Rooms
  - 4 Phone Booths
  - Large Kitchen
- Just opened...already >20 people





Spain Office Open!



ESCUELA  
DE DANZA  
URBANA  
**BASMOVE**

Viva España!



# RTI Singapore

- APAC Headquarters
- Launch point for APAC expansion
- Sales, Services

# RTI Poland: Certification Expertise





# What's Next?

## *RTI will Lead the Future of Work*



The Office as  
A Place to Work  
with  
Incidental Interaction



The Office as  
A Place to *Interact*  
with  
Incidental Work



# RTI's Work Future

---

- Live where you like; work when and where you like
- Team Weeks: Rather than “days/week” for only locals...“weeks/year” for all
- Exciting and lively interaction at attractive destinations!



Ex  
—

**Great  
Place  
To  
Work<sup>®</sup>**

**Certified**

**MAR 2021-MAR 2022**

**USA**

**TM**

Tea

**Great  
Place  
To  
Work<sup>®</sup>**

**Certified**

**MAR 2021-MAR 2022**

**ESP**





# RTI's Pandemic: Pivot as a Strategy (PaaS)

1rnti

Here to Serve You

# What is RTI's Product?

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A plane *has* engines

An elephant *has* a trunk

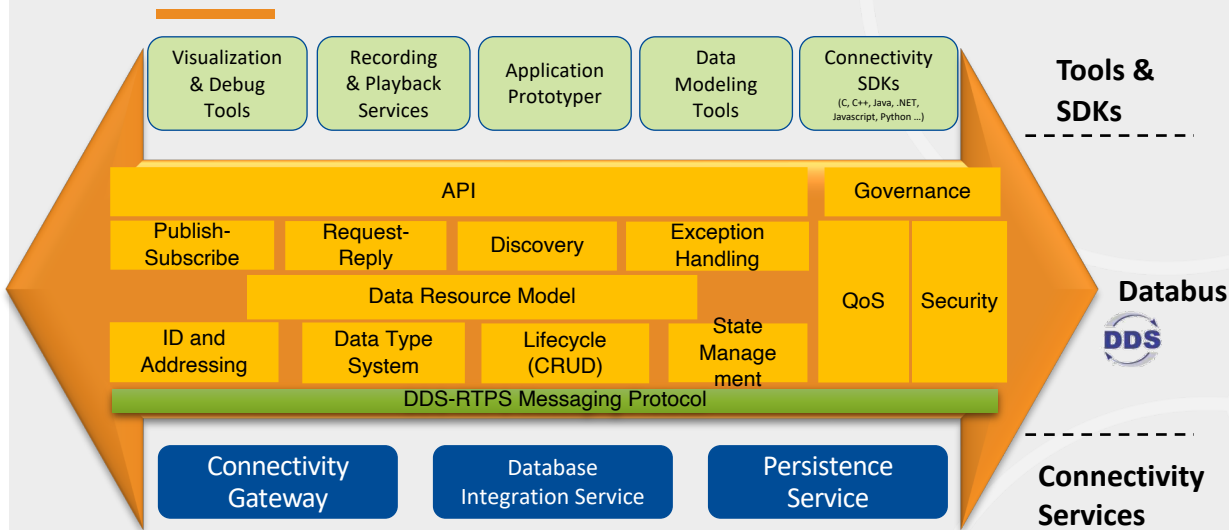




A runner *has* legs



# RTI Connex *has* a DDS

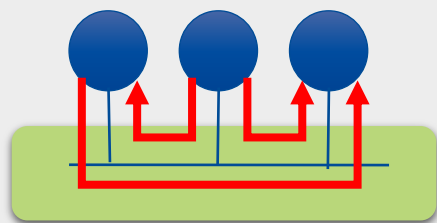


**Tools & SDKs**

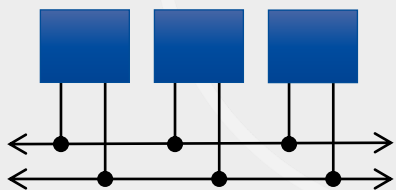
**Databus**  
DDS

**Connectivity Services**

**Databus**



**Security**



**Safety Cert**

## Tools

Admin Console    Monitor    Code Generator    System Designer    Shapes Demo    Wireshark

Micro App Generator    DDS Spy    Heap Analyzer    Launcher    LabVIEW Toolkit

## Services

Routing Service    Recording Service    Persistence Service    Queuing Service    Web Integration Service



# RTI is Far More than DDS

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- RTI Connex *has a* DDS. It is not *a* DDS.
  - We don't really compete with FastDDS, Cyclone, OpenDDS
- DDS is *only 10%* of what we do
  - Tech: tools, IS, platforms, cert
  - Quality: testing, lab, performance
  - Local: support, services, sales
  - Culture: trustworthy, responsive, excellent



RTI Connex

# Introducing



The First Software Framework for Widely Distributed Autonomous Systems



Bigger

## Connect Widely Distributed Systems

Real-Time WAN | Discovery | Data Compression

Broader

## Unite More Applications

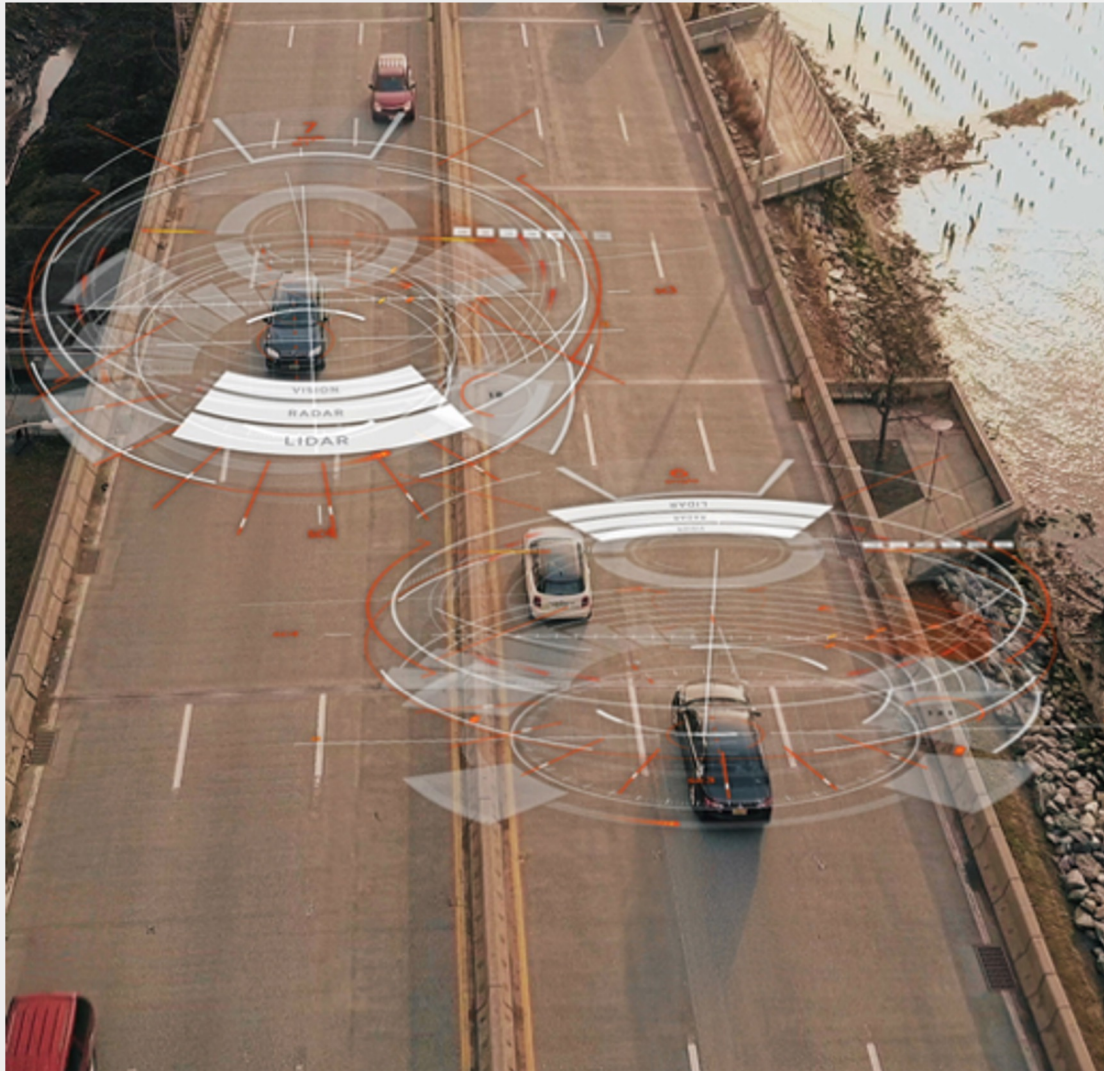
Platforms | Languages

Better

## Increase Developer Productivity

Observability | Enhanced Documentation | Configuration

# Introducing *Connex* Anywhere



**WAN Connectivity**

to **remote endpoints**

that is **seamless**

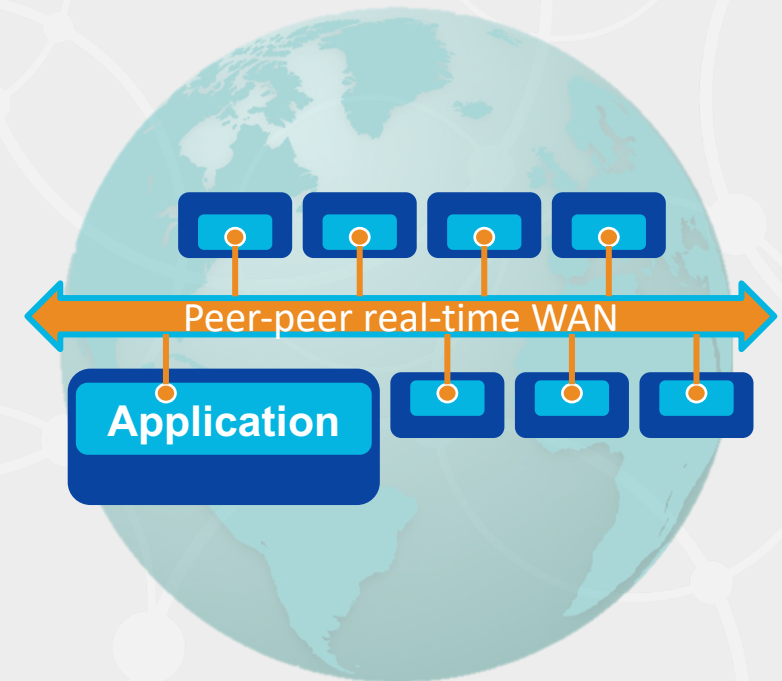
**scalable** and

**secure**

# Connnext Anywhere

- First software framework to support real-time communication over wide area, mobile and public networks
- Enables remote operation of autonomous systems

Connnext Secure  
+ Real-Time WAN Transport  
+ Cloud Discovery Service  
**Connnext Anywhere**



# Connexx Anywhere Lets RTI Take On Bigger Things

- Operators farther from the loop
- Analytics & decision support
- Everything as a Service (XaaS)





# More language options to choose from



New experimental Python API



New modernized multi-platform .NET API



C++11 improvements



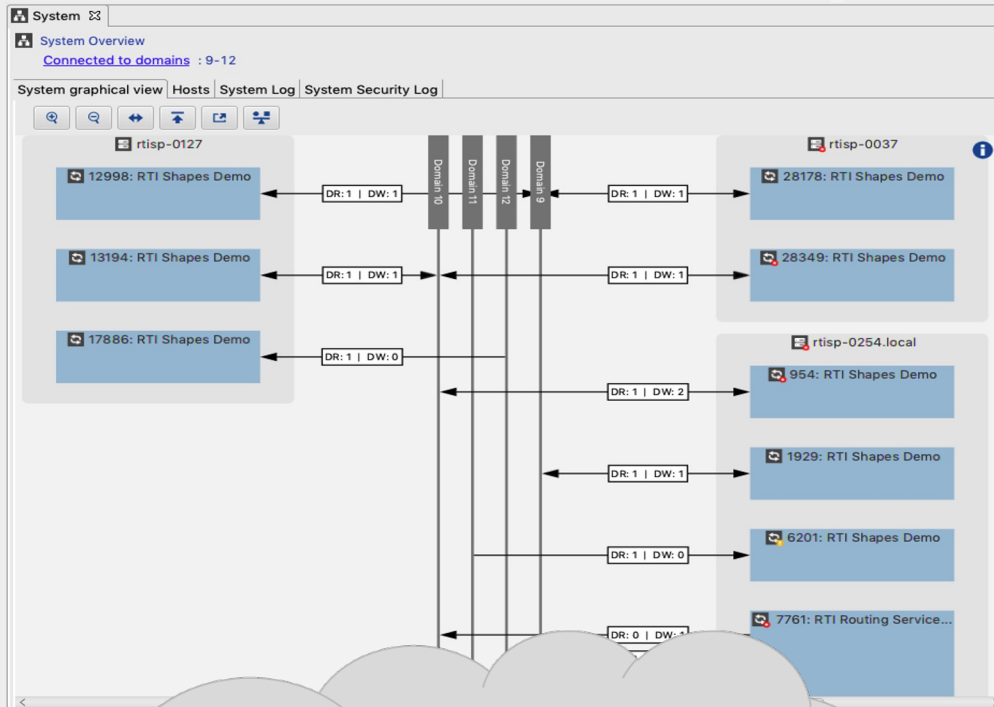
Java™



Ada



# With Broader Use and Better Understanding



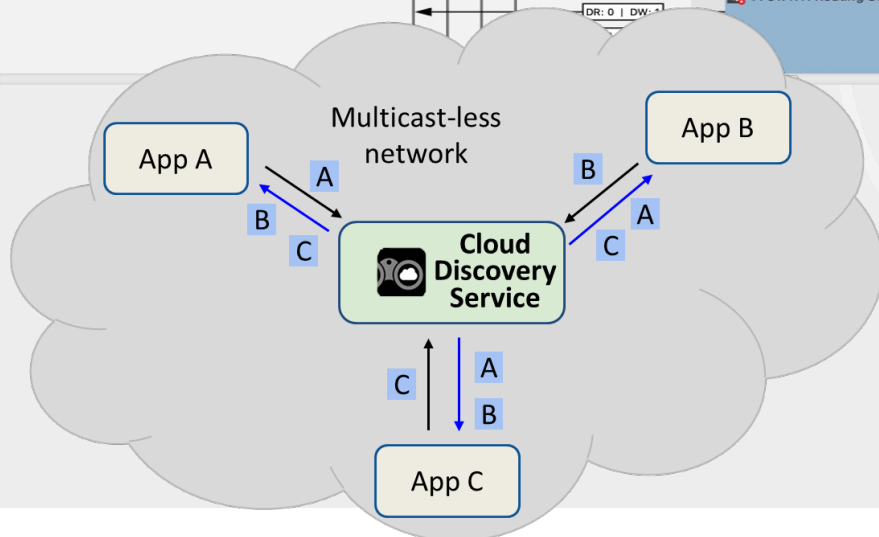
The screenshot shows the Visual Studio Code interface with an XML file open. The XML code is as follows:

```
1 <domain_participant_library name="NewDomainParticipantL
2 <domain_participant name="NewDomainParticipant1" doma
3 <publisher name="NewPublisher1">
4 <data_writer name="NewTopic1Writer" topic_ref="Ne
5 </publisher>
6 <subscriber name="NewSubscriber1">
7 <data_reader name="NewTopic1Reader" topic_ref="Ne
8 </subscriber>
9 </domain_participant>
10 </domain_participant_library>
11
```

The interface also shows a 'Participant Libraries' tree view with the following structure:

- NewDomainParticipantLibrary1
  - NewDomainParticipant1
    - NewPublisher1
      - NewTopic1Writer
    - NewSubscriber1
      - NewTopic1Reader

Visual Studio  
Visual Studio for Mac  
Visual Studio Code  
COMMAND LINE INTERFACE



# 4 NEW RTI Labs!



# LABS

## New Labs Products:

OPC UA Gateway



Connex Gateway



Connex Nano



OpenSSL CNG Engine



## Graduated Labs Products:

System Designer



Cloud Discovery Service



# RTI Connex Drive

# Connext Drive



CartoonStock.com

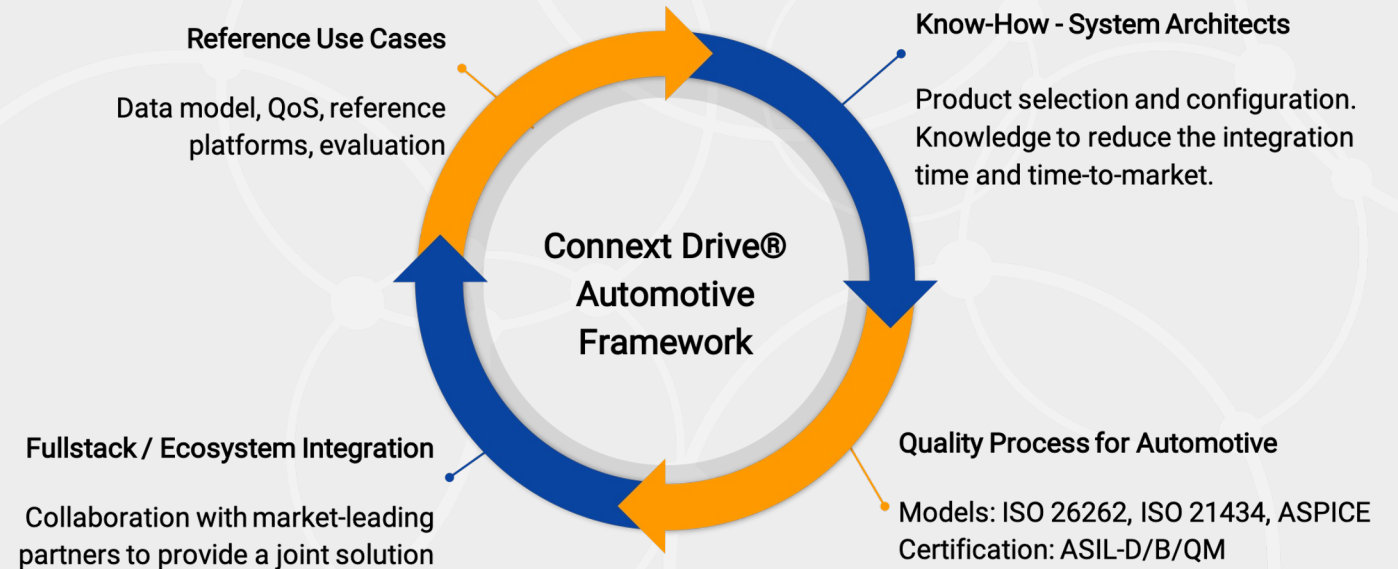


# Connnext Drive is a *Solution*

## The First Complete Automotive-Grade Connectivity Solution for Autonomous Vehicle Development

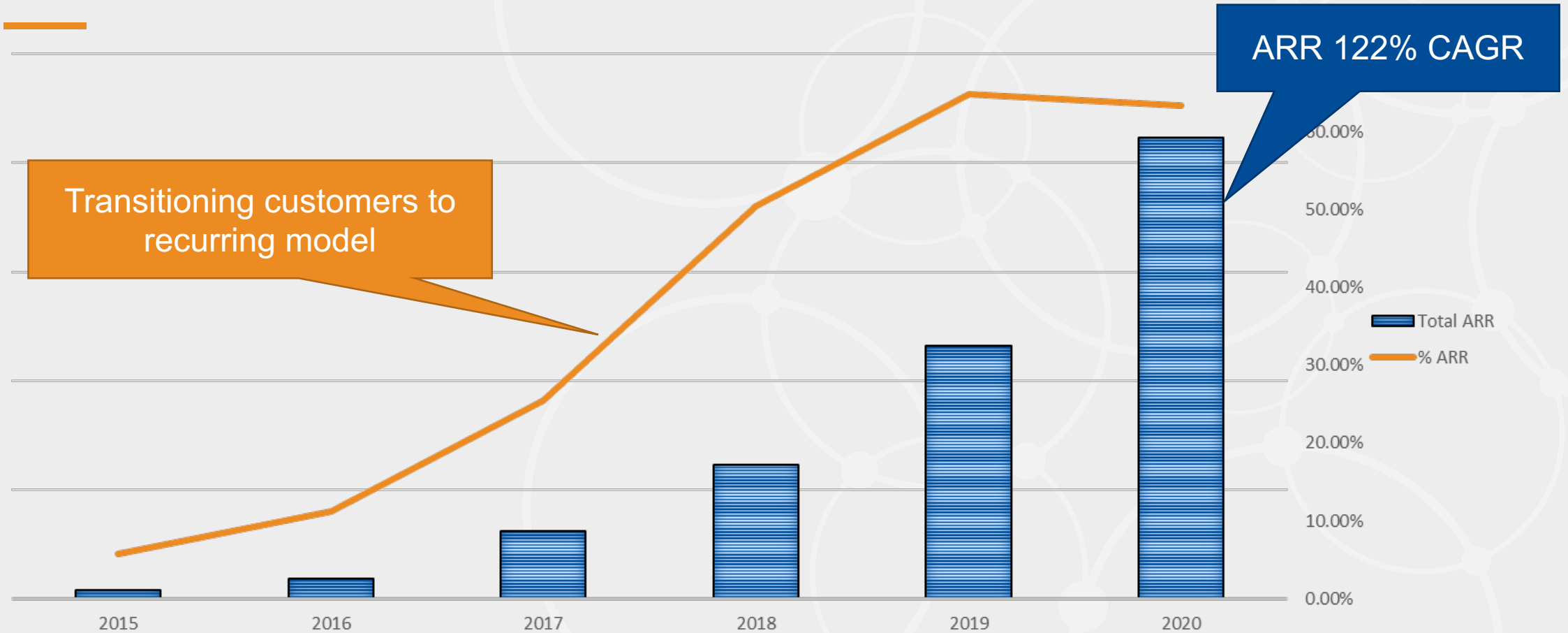
### Connnext Drive *is*:

- Product
- Services
- A Pricing Model
- Industry Use Cases
- A Process to Engage Customers
- An automotive-specific license



Connnext Drive is a targeted business model for automotive customers

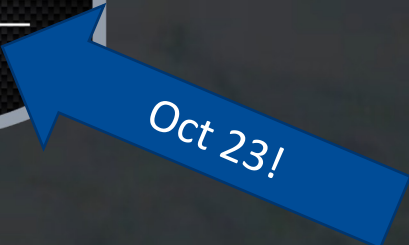
# RTI's Automotive Growth!



Growing very quickly, faster than expected

Thanks to the 1RTI cast: Automotive Tiger Team, Micro & Cert teams, Account teams, Legal, Finance, IT, Ops support, AUTOSAR team, Marketing, and many more...





Oct 23!

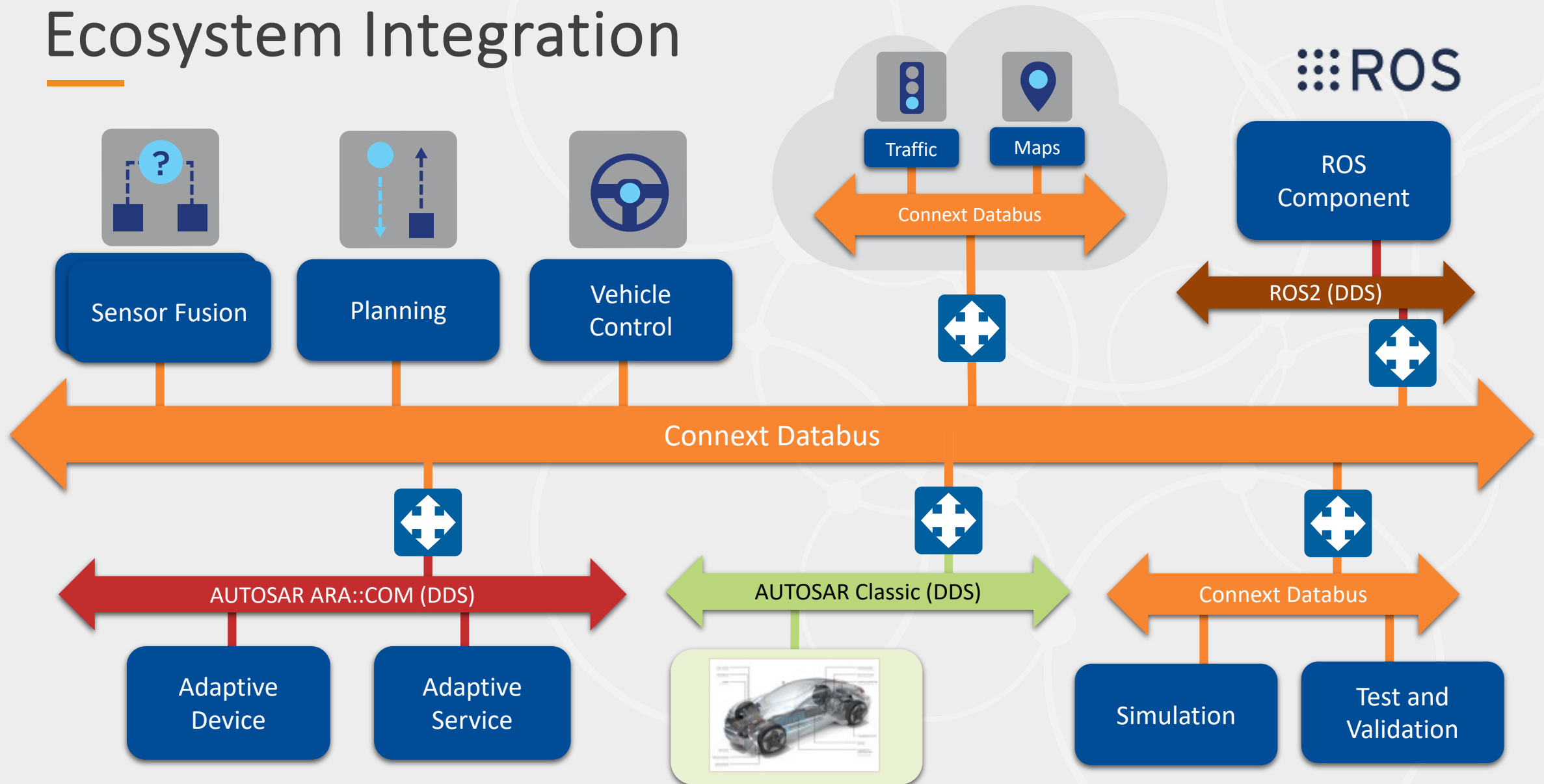






Courtesy TUM (Technical University of Munich)

# Ecosystem Integration



# Growing Partner Ecosystem

AdaCore

arm

bachmann.

BlackBerry | QNX

concurrent  
REAL-TIME

CORE AVI  
INNOVATING A SAFER TOMORROW

DASSAULT  
SYSTEMES

DDC-I

DYNAMIC GRID

ENERGID

ENSCO

EPIC  
GAMES

esol

Green Hills  
SOFTWARE

IBM

infineon

influxdata

ITTIA  
Database Software & Services

LYNX  
SOFTWARE TECHNOLOGIES

MathWorks  
Partner

MOCANA

ni

North Atlantic  
Industries

PARTNER  
PROGRAM  
NXP

PRESAGIS  
HMI Development

SIEMENS

SimBlocks.io

SimVentions  
Imagine. Create. Explore. Discover.  
Your Success is Our Honor

SoC e

splunk

SYSGO  
EMBEDDING INNOVATIONS

United  
Electronic  
Industries

unity

WINDRVR

WITTENSTEIN

XILINX  
ALLIANCE PROGRAM  
MEMBER



A C A D E M Y <sup>TM</sup>

# RTI Academy

The screenshot displays the RTI Academy course catalog, organized into three categories: Premium, Essential, and Basic. Each course card includes a star rating, a 'Not Started' or 'Enrolled' status, the course title, language (EN), and duration. Premium courses are 'Connex Architect Training' and 'Connex Developer Training', both with 3 stars and 'Not Started' status. Essential courses include 'Writing a Connex DDS Chat Application' (2 stars, 'New', 'FREE', 2h 05m), 'Understanding Connex DDS Secure' (1 star, 'New', 'FREE', 5h 00m), and 'Understanding Connex DDS Micro' (1 star, 'Not Started', 'FREE', EN). The Basic course is 'Fundamentals of RTI Connex' (1 star, 'ENROLLED', 6 courses, 2h 47m).

**Premium**

- Connex Architect Training (3 stars, Not Started, EN, E-Learning)
- Connex Developer Training (3 stars, Not Started, EN, E-Learning)

**Essential**

- Writing a Connex DDS Chat Application (2 stars, New, FREE, EN | 2h 05m, E-Learning)
- Understanding Connex DDS Secure (1 star, New, FREE, EN | 5h 00m, E-Learning)
- Understanding Connex DDS Micro (1 star, Not Started, FREE, EN, E-Learning)

**Basic**

- Fundamentals of RTI Connex (1 star, ENROLLED, 6 courses | 2h 47m, Learning Plan)

- Connex Developer & Architect Training
- Understanding Connex DDS Secure and Micro
- Over 10 hours of Connex product training



# 40 Xclerators Now Available!!...

<b>Learn</b> Connex DDS Professional Training Accelerate your understanding of the Connex connectivity framework <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Learn</b> Using Connex Tools to troubleshoot and debug Learn tools, utilities, tips and tricks phases of your project <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Learn</b> Using RTI Routing Service to bridge domains, LANs, and data <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Learn</b> Data-centric command and response Learn how to apply the most common patterns for command and response. <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Learn</b> RTI Connector Training Learn how to access the databus with Python and Javascript apps <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Learn</b> RTI We Learn how <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Apply</b> Understanding and utilizing common use case patterns Learn how to apply proven patterns for your data flows <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Apply</b> Design Mentoring & Applying Best Practices Focused guidance on how to use Connex DDS to meet your needs <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Apply</b> Architecture, Security, and System Planning Create an architectural strategy powered by Connex DDS <input type="checkbox"/> <a href="#">Learn more &gt;</a>	
<b>Learn</b> Admin Console, Monitor, Distributed Logger, and more Learn how to use the Connex graphical tools to understand your system <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Learn</b> Connex DDS Secure Train Learn security design to address threats faced by your system <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Learn</b> Optimize large data handling with Flat Data and Zero Copy Minimize latency when publishing and receiving large data samples <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Learn</b> RTI Database Integration Service Training Learn how your database can participate on the databus <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Learn</b> RTI Database Integration Service Training Learn how your database can participate on the databus <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Learn</b> Using extend plus Learn how <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Apply</b> Maintaining and evolving your deployed system Explore how to increase value and add new capability to your system <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Apply</b> System deployment readiness review Access expertise to analyze and review your system before deployment <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Apply</b> Designing RTI Routing Service adapters Learn how to integrate non-DDS communications using Routing Service <input type="checkbox"/> <a href="#">Learn more &gt;</a>	
<b>Learn</b> Connex DDS Micro Training Make your resource-constrained applications available on the databus <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Learn</b> RTI Persistence Service Training Learn how to persist data to optimize delivery <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Learn</b> Using ROS 2 with Connex DDS Learn how ROS 2 applications can maximize the power of Connex DDS <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Learn</b> Debugging RTI Connex DDS with Wireshark Using Wireshark to capture and analyze RTPS packets from Connex DDS <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Learn</b> Debugging RTI Connex DDS with Wireshark Using Wireshark to capture and analyze RTPS packets from Connex DDS <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Apply</b> HTTP A Learn how <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Apply</b> Security assessment Customized assessment of focusing on security with <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Apply</b> Optimizing Connex DDS discovery for your system <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Apply</b> Managing interoperability between Connex DDS and other DDS implementations <input type="checkbox"/> <a href="#">Learn more &gt;</a>	
<b>Learn</b> Custom Transports for RTI Connex DDS Create your own transport for custom networks or special protocols <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Learn</b> Working with large data Learn to achieve optimal performance when working with large data <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Learn</b> Using ROS 2 with Connex DDS Learn how ROS 2 applications can maximize the power of Connex DDS <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Learn</b> Debugging RTI Connex DDS with Wireshark Using Wireshark to capture and analyze RTPS packets from Connex DDS <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Learn</b> Debugging RTI Connex DDS with Wireshark Using Wireshark to capture and analyze RTPS packets from Connex DDS <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Apply</b> HTTP A Learn how <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Apply</b> Managing and conf QoS policies Create a strategy for effective organization of your QoS configuration <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Solve</b> Accelerating your development efforts Deploy our experienced engineers to accelerate your development <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Solve</b> Custom Mentoring Accelerate your team's efforts with help from an RTI expert <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Solve</b> Performance Analysis and Tuning Ensure Connex DDS satisfies your critical performance needs <input type="checkbox"/> <a href="#">Learn more &gt;</a>
<b>Apply</b> Increase application efficiency with smart filtering Exploit the databus to filter data and increase application efficiency <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Apply</b> Understanding the Connex DDS threading model Expert help when fine-grained thread control is required <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Apply</b> Reliability mentoring, and review Identify the optimal configuration for your critical data flows <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Apply</b> Accelerating your Proof-of-Concept Accomplish your PoC objectives with expert guidance <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Apply</b> Accelerating your Proof-of-Concept Accomplish your PoC objectives with expert guidance <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Apply</b> Reliability mentoring, and review Identify the optimal configuration for your critical data flows <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Apply</b> Reliability mentoring, and review Identify the optimal configuration for your critical data flows <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Apply</b> Reliability mentoring, and review Identify the optimal configuration for your critical data flows <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Apply</b> Reliability mentoring, and review Identify the optimal configuration for your critical data flows <input type="checkbox"/> <a href="#">Learn more &gt;</a>	<b>Apply</b> Reliability mentoring, and review Identify the optimal configuration for your critical data flows <input type="checkbox"/> <a href="#">Learn more &gt;</a>

# Customer Success Now Active

Move beyond what works. **Find what delights.**

You can't build a culture in pieces, any more than you can water a parking lot and call it a rainforest. Like our slogan, it has to *Work as One*.



***RTI's Product is  
Our Entire Ecosystem***



# Returning to Physical Events!



Autonomy



Agriculture, Mining & Construction

U.S. Army FACE  
Technical Interchange  
Meeting (TIM) Event

September 14

Aerospace  
& Defense



Aerospace  
& Defense

Air Missile Defence Technology Event  
November 17-18

Aerospace & Defense

Modeling,  
Simulation  
& Training



5 - 8 January 2022

Automotive



# Industry Insights!

## EMEA/APAC – October 19 & 20

- Dr.-Ing. Thomas Krueger, European Space Agency (ESA).
- Li Mu, Software Architect, Li Auto
- Rune Volden, Head of Dept ICT and Natural Science, NTNU
- Dr. Eyal Yoskovitz, our VP Products, 634AI

## US/Americas – October 26 & 27

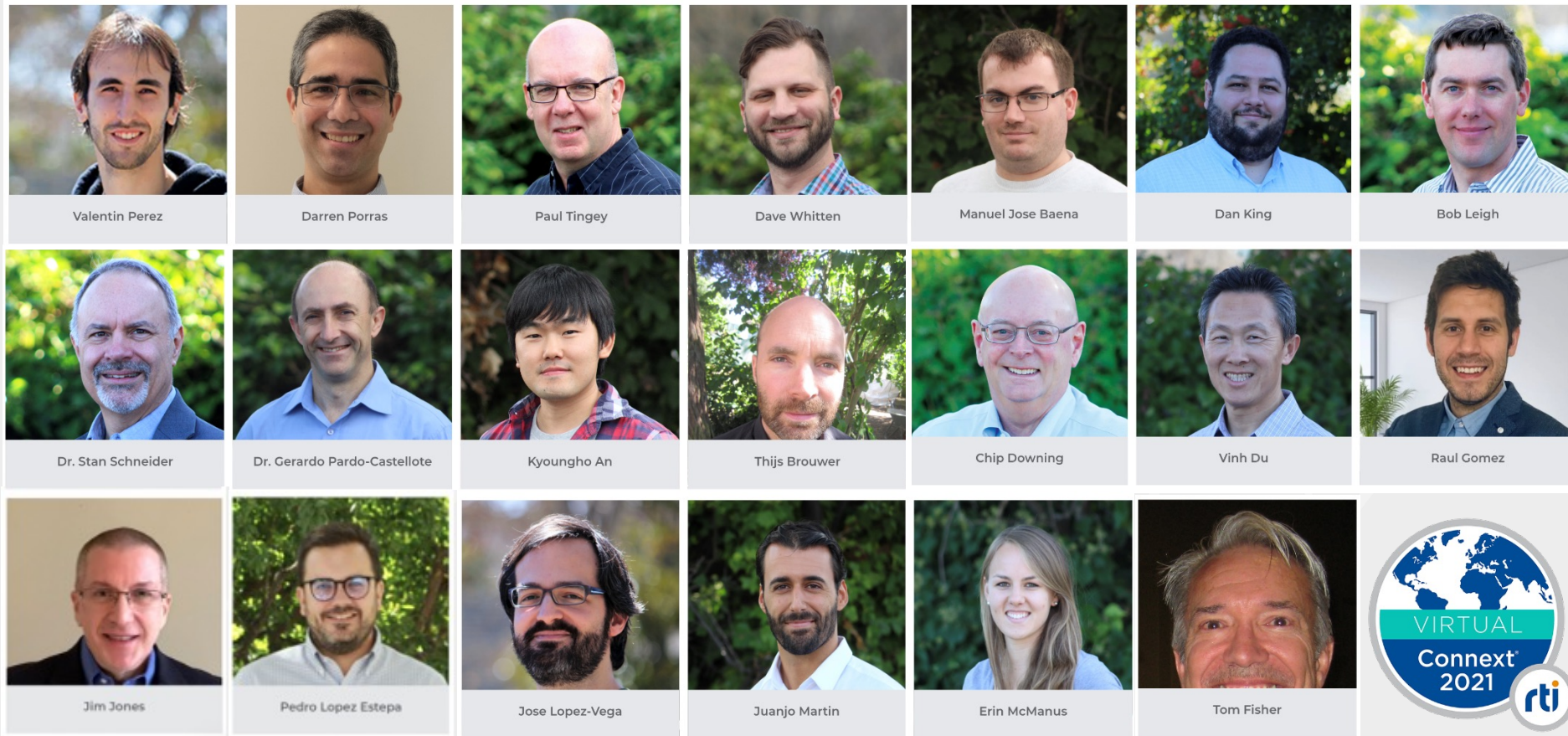
- Ryan Darnley, Engineer II, Carnegie Mellon University
- Richmund Fries, VP Technology, DocBox, Inc.
- Jac Stofberg, Principal Software Engineer, Schilling Robotics
- David Fidalgo, Founder & CEO @ Y-Mobility / VP & Founder @ AEVAC – Spanish AV Vehicle Association



# RTI Staff

Pics of presenters and support staff, esp thanking event organizers.

## RTI Experts:



## Event Organizers:



1RTI effort: P&M, Engineering, Services, CTO, Marketing, IT



# Autonomy is the Future



1rti

Runs a Smarter World

# Stay Connected



[rti.com](https://rti.com)  
*Free trial of Connex DDS*



[rtisoftware](https://www.facebook.com/rtisoftware)



[@rti\\_software](https://twitter.com/rti_software)



[connexpodcast](#)



[@rti\\_software](https://www.instagram.com/rti_software)



[rti.com/blog](https://rti.com/blog)

