

DDS Interoperability Demo



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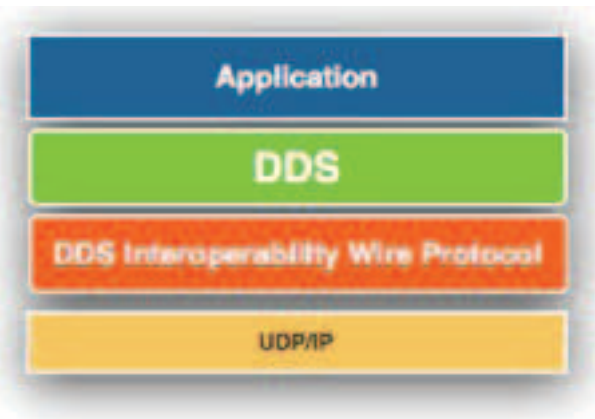
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The DDS the Standards History



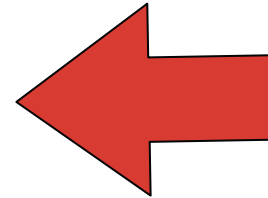
- Data Distribution Service for Real-Time Systems
 - API for Data-Centric Publish-Subscribe distributed systems
 - Adopted in June 2003
 - Finalized in June 2004
 - Revised June 2005, June 2006
 - Spec version 1.2: formal/07-07-01
- DDS-RTPS Interoperability Wire Protocol
 - Adopted in July 2006
 - Revised in July 2007
 - Spec version 2.1: formal/2009-01-05
- Related specifications
 - UML Profile for DDS
 - DDS for Light-Weight CCM
- Multiple (7+) Implementations





- Three vendors: PrismTech, RTI, and TwinOaks, have independently implemented the DDS-RTPS Interoperability Wire Protocol 2.1 Specification.
- First DDSI-Interoperability successfully demonstrated at the March 2009 OMG Meeting
- Today again together to showcase Interoperability!

Demo Participants



PrismTech Corporation

The World Leader in Open Source High Performance Middleware

- ▶ Global presence with active business in 50+ countries
- ▶ Supporting some of the most critical deployments around the globe, in Telco, Defense & Aerospace, Transportation, and Financial
- ▶ 110 Tech Jedi, including several Internationally acknowledged Middleware Experts, working hard to deliver you **Performance, Openness, and Freedom!**



HQ Sites

USA: Burlington, MA
EMEA: Edinburgh, Scotland

Engineering Centres

Newcastle, UK | Fort Wayne, IN
Berlin, Germany | Paris, France
Hengelo, Netherlands

Field Offices / Distributors

London, UK | Saddle Brook, NJ
Houston, TX | San Francisco, CA
Helsinki, Finland | Seoul, South Korea | Beijing, China

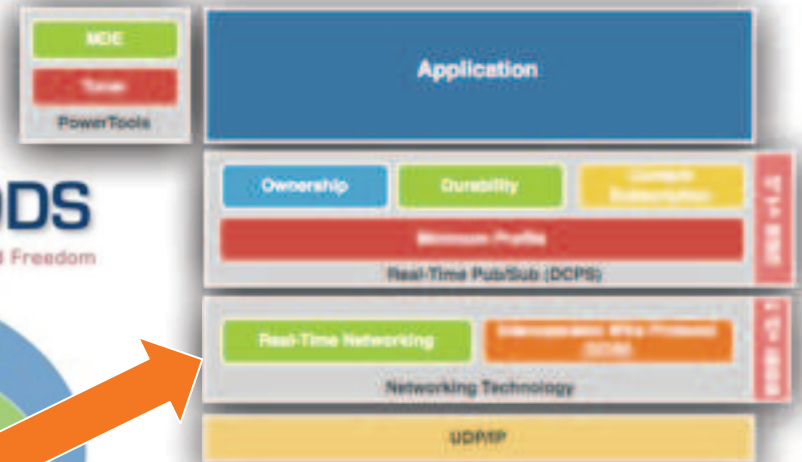


OpenSplice DDS Editions

Professional Edition



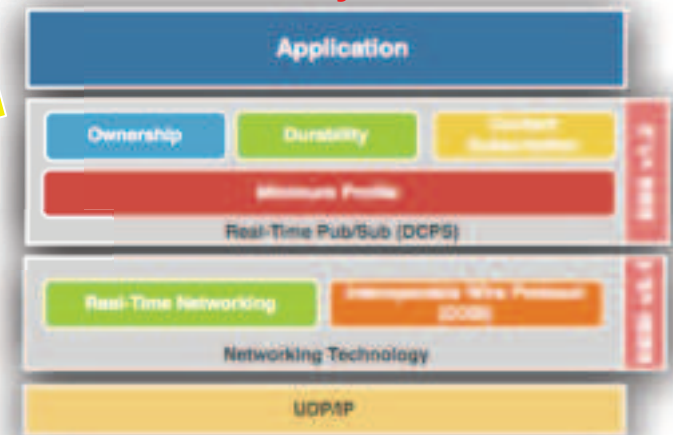
Compact Edition



Enterprise Edition



Community Edition

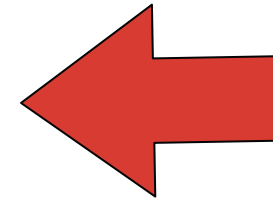


OpenSplice|DDS
Delivering Performance, Openness, and Freedom



- ▶ The previous demo demonstrated OpenSplice DDS **Commercial Editions**
- ▶ This demo will demonstrate the OpenSplice DDS **Open Source Edition**

Demo Participants



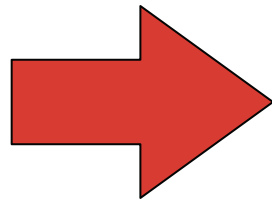
About RTI



- We are the DDS company
 - 100% focused on DDS
- Founded 1991 by researchers from Stanford Aerospace Robotics Lab
- Real-time middleware since 1996
- Over 500 unique applications
- Solid financials
 - Bootstrapped, no VC
 - History of profitability and growth
- <http://www.rti.com>



Demo Participants



About Twin Oaks Computing



- Small business based in Colorado
- Specializing in high-performance data communications
 - DDS, RTPS
 - Networking protocols
 - Device drivers
 - Embedded computing environments
 - Tactical data links
- CoreDX DDS implementation
 - Targeted at high-performance, space-constrained, embedded environments
- Staff with over 30 years experience developing and supporting DoD systems
- <http://www.twinoakscomputing.com>



What you will see today



- #1 Interoperability works!
- #2 This is not a “trivial” scenario or “toy” demo!
 - You will see interoperability along many dimensions:
 - Discovery
 - Different platforms (Linux, Windows)
 - Different Data-Types
 - Different Topics
 - Different Qos
 - Unicast & Multicast, both reliable and best efforts
 - One to Many and Many to one communications
 - Filters: time, content, ...
- #3 Interoperability does not compromise performance
 - Direct communication. No bridges!!



- Basic interoperability
- QoS Matching
- Quality of Service: DURABILITY
- Time Based Filters
- Quality of Service: RELIABILITY
- Intermittent Connectivity
- Multiple Topics, Keys & Content Filters

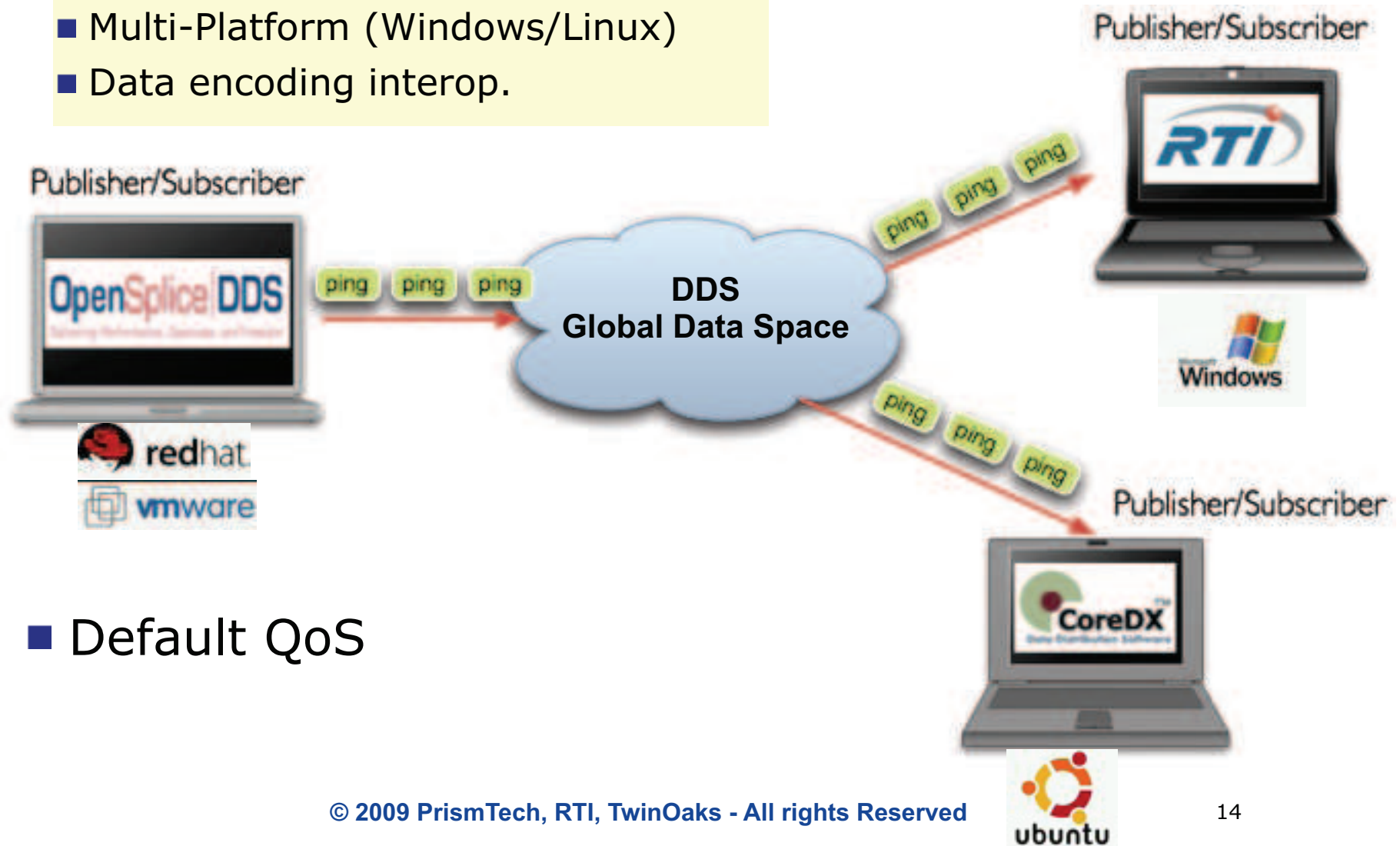
All this and more between multiple vendors across different platforms!!

Scenario I - Basic Interoperability



Key Highlights

- Dynamic Discovery
- Multi-Platform (Windows/Linux)
- Data encoding interop.



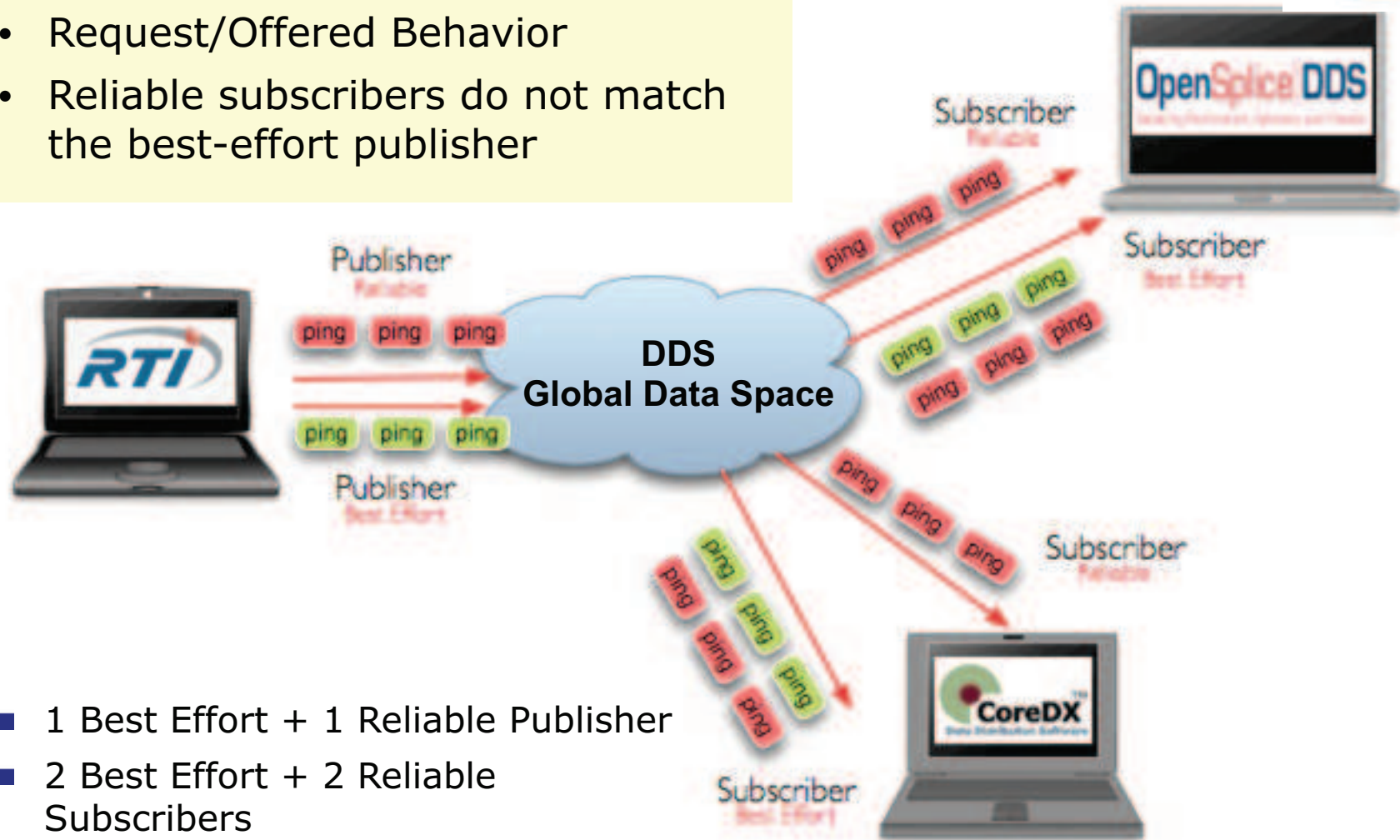
- Default QoS

Scenario II – RxO QoS Matching



Key Highlights

- Request/Offered Behavior
- Reliable subscribers do not match the best-effort publisher



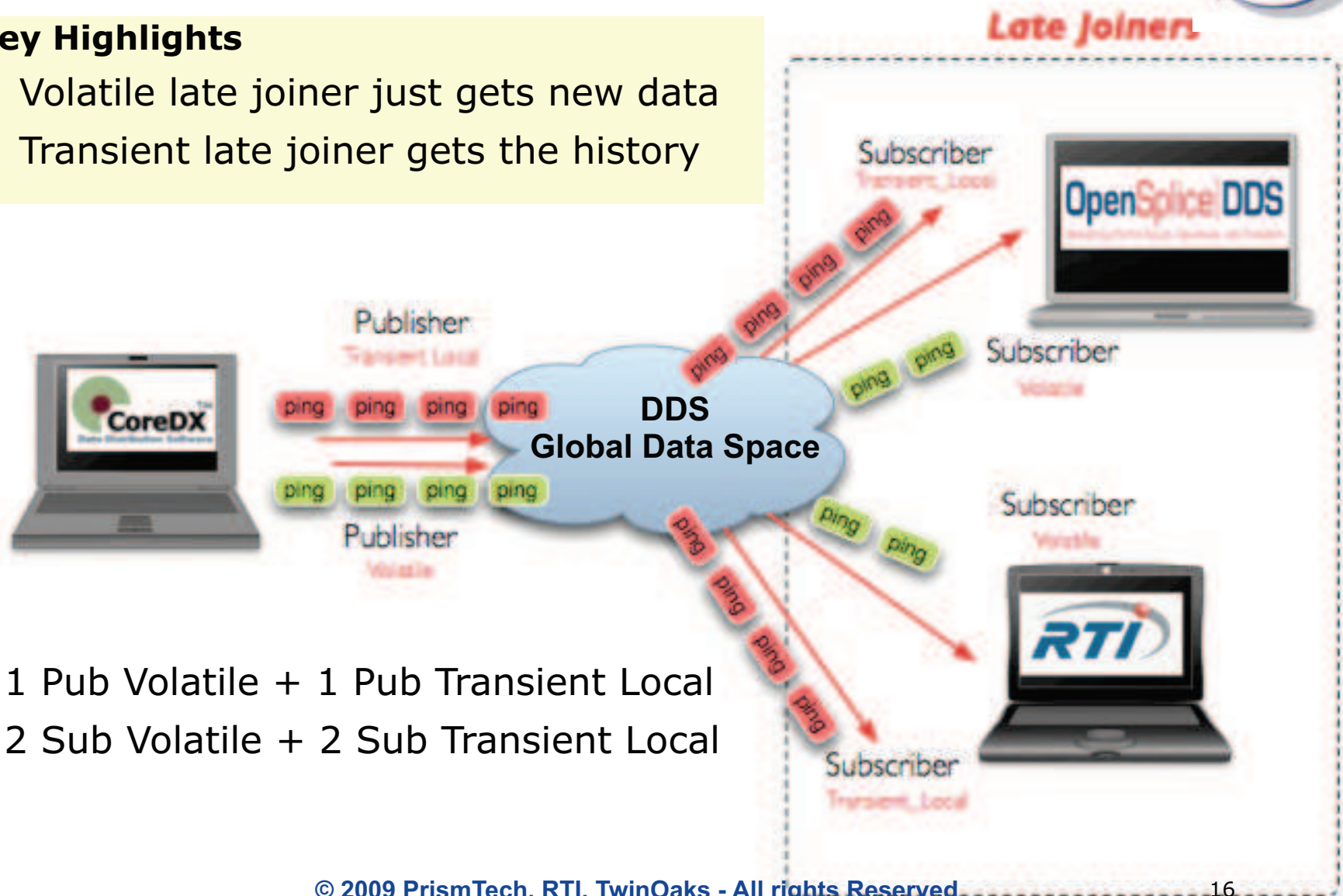
- 1 Best Effort + 1 Reliable Publisher
- 2 Best Effort + 2 Reliable Subscribers

Scenario III - Durability



Key Highlights

- Volatile late joiner just gets new data
- Transient late joiner gets the history



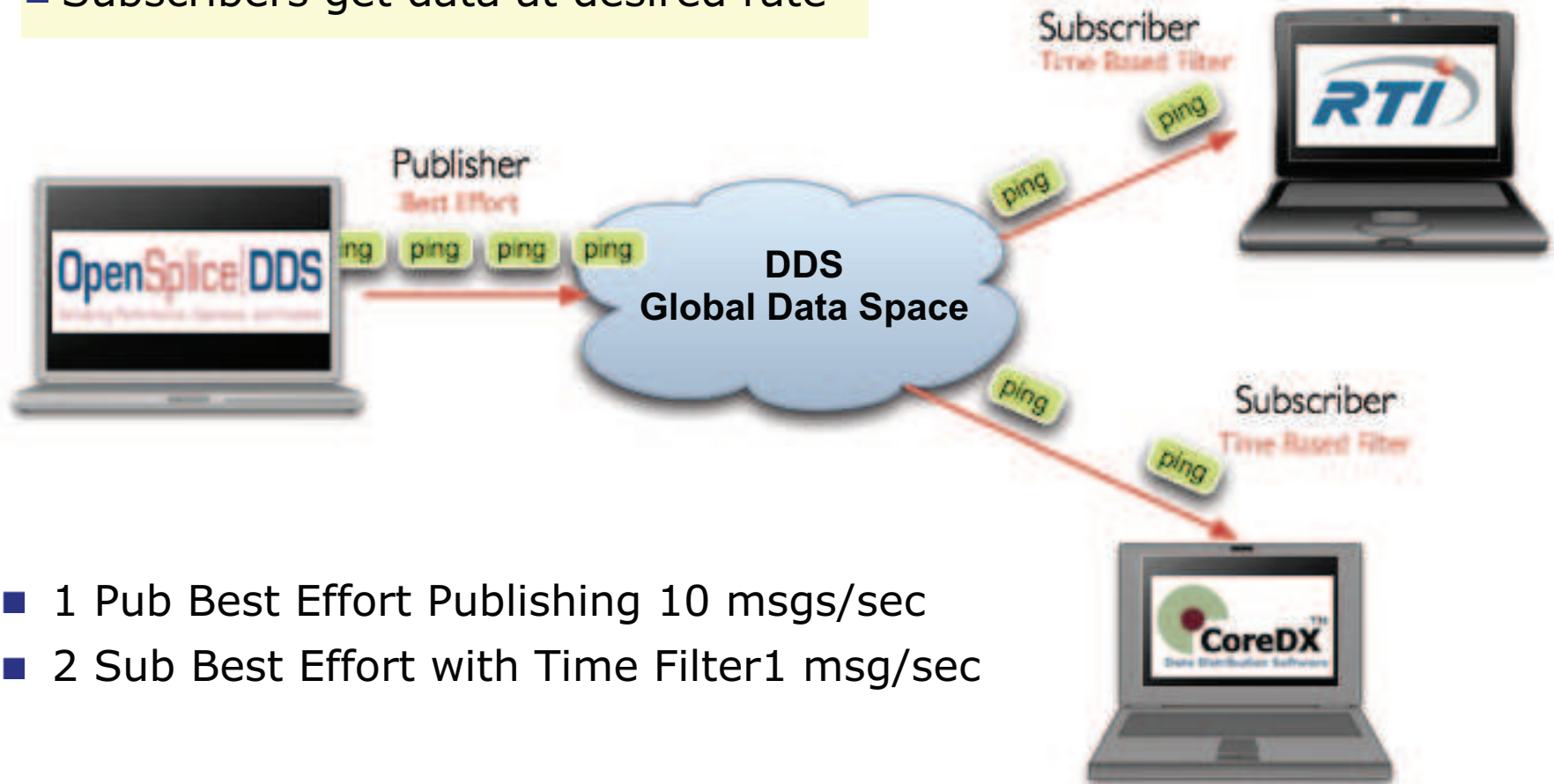
- 1 Pub Volatile + 1 Pub Transient Local
- 2 Sub Volatile + 2 Sub Transient Local

Scenario IV - Filtering / Time Base Filter



Key Highlights

- Subscribers get data at desired rate

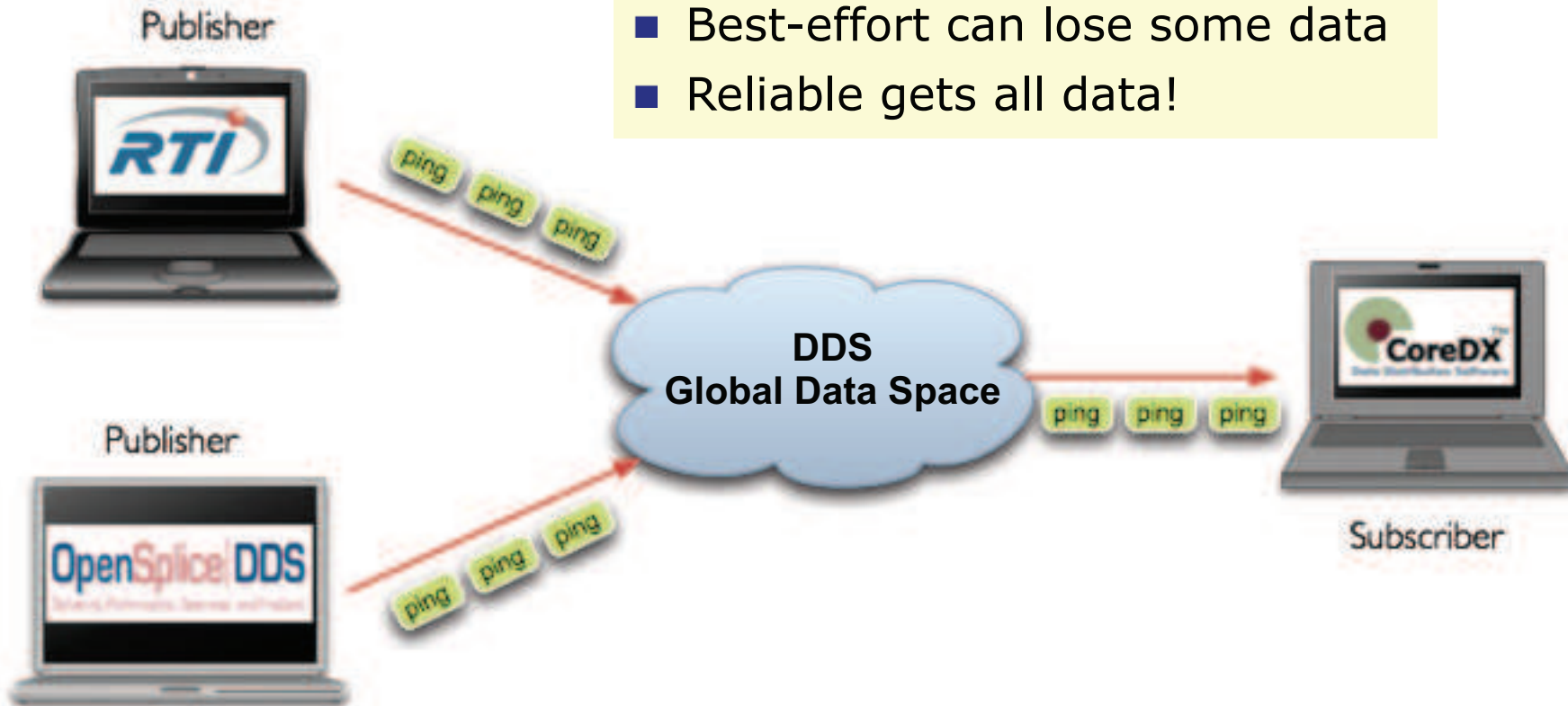


- 1 Pub Best Effort Publishing 10 msgs/sec
- 2 Sub Best Effort with Time Filter 1 msg/sec

Scenario V - Reliability



- **Key Highlights**
 - High data rate
 - Best-effort can lose some data
 - Reliable gets all data!

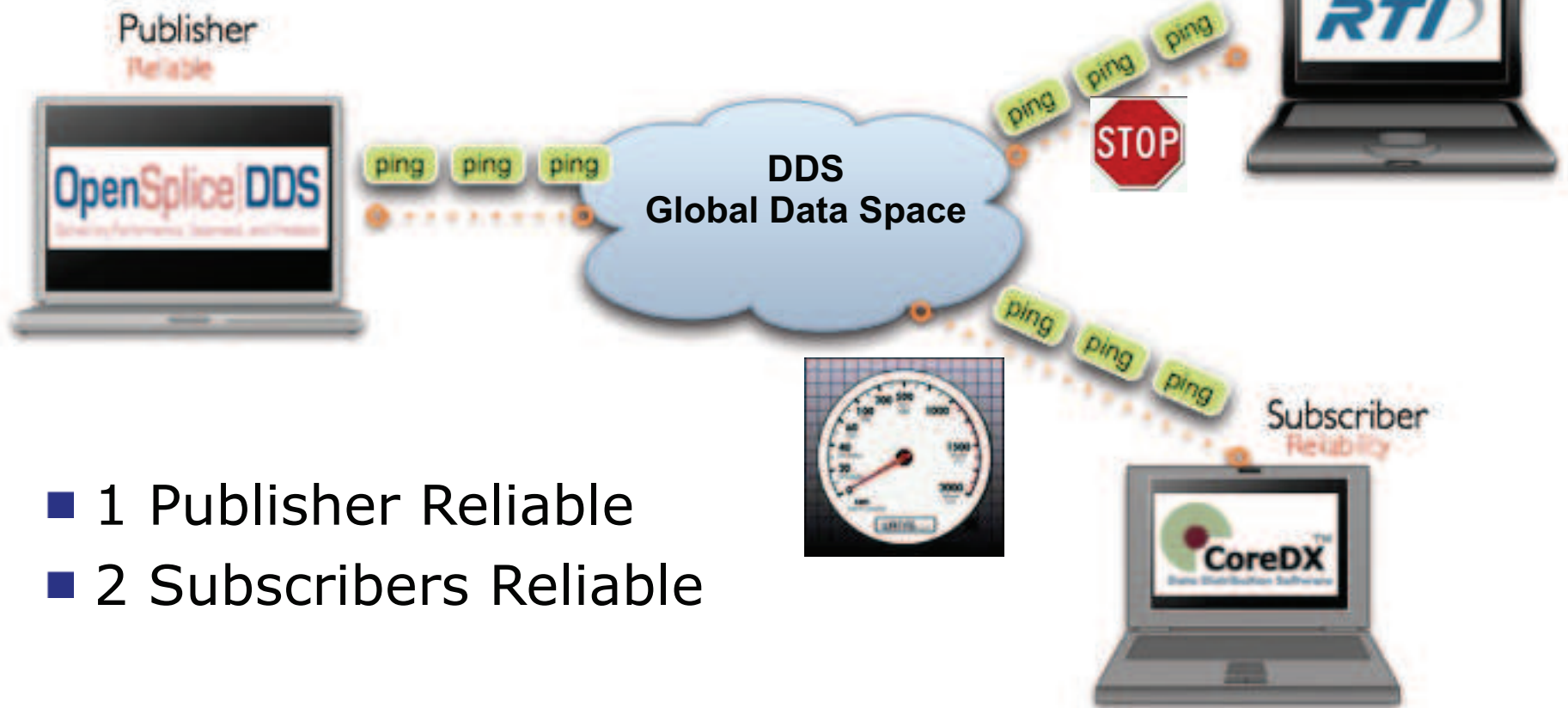


Scenario VI – Robustness to Net Interruption



Key Highlights

- Still-connected nodes are not effected by node leaving the network
- Node is re-discovered automatically



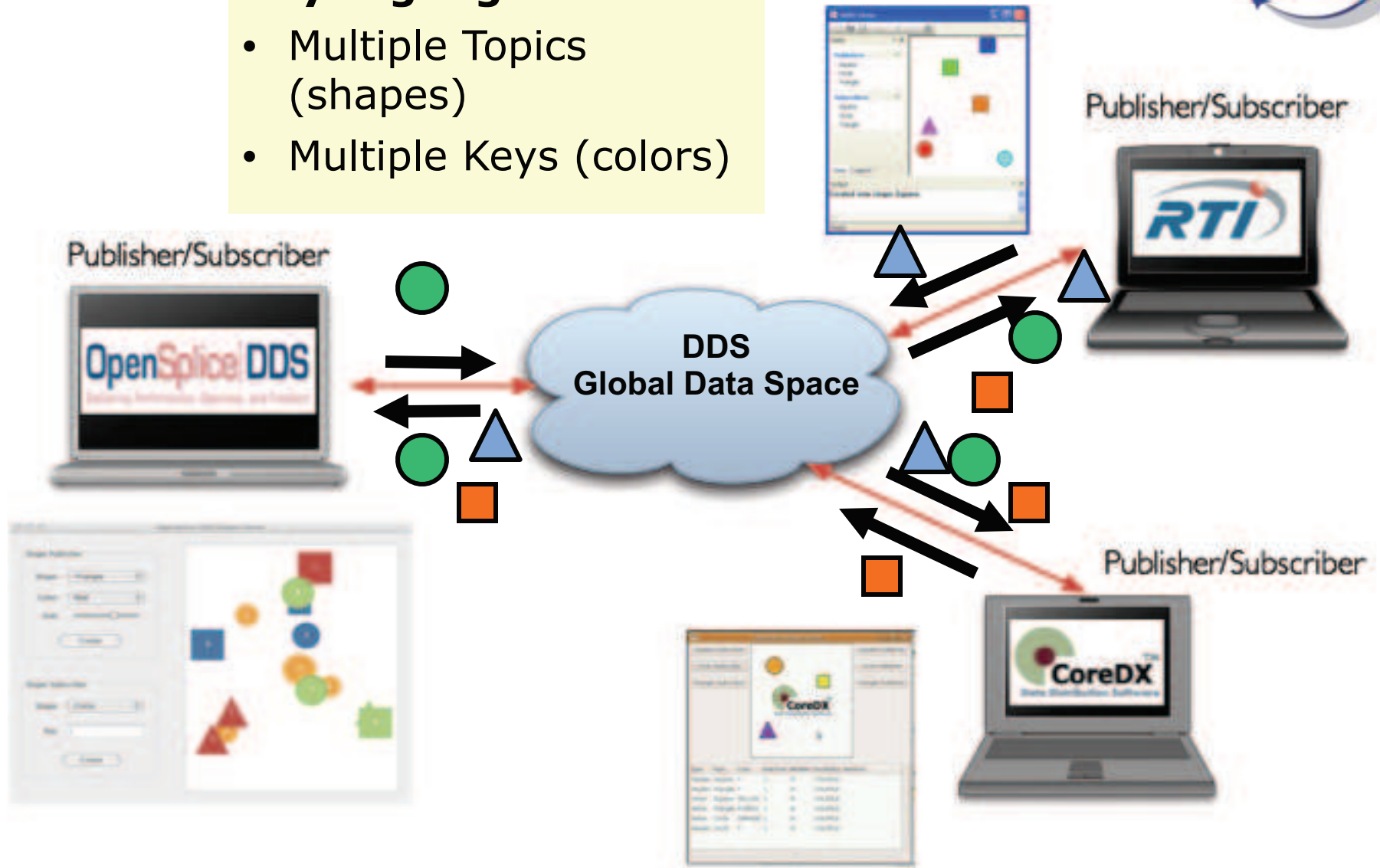
- 1 Publisher Reliable
- 2 Subscribers Reliable

Scenario VII – Multiple Topics and Instances



Key Highlights

- Multiple Topics (shapes)
- Multiple Keys (colors)

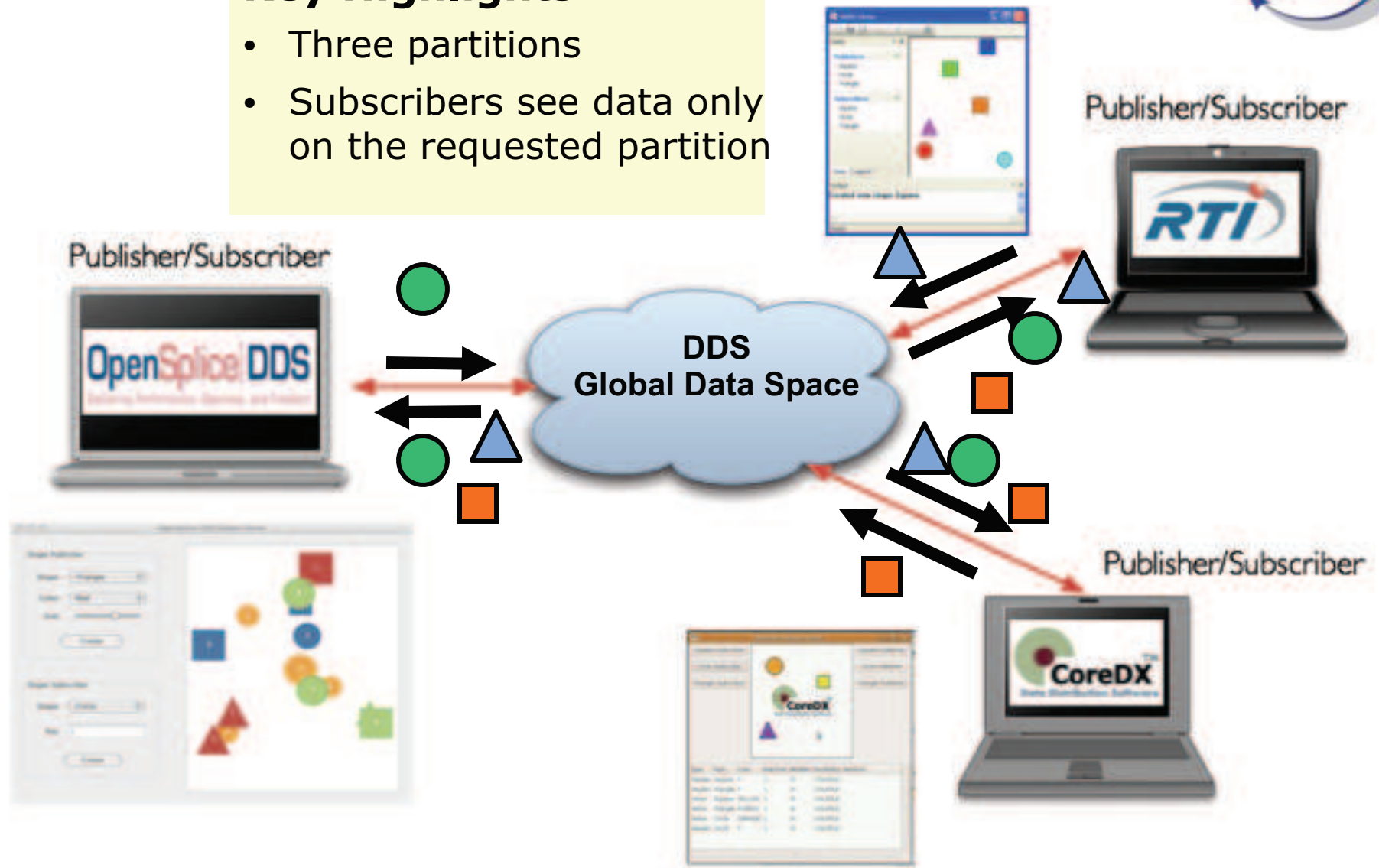


Scenario VIII – Multiple Partitions



Key Highlights

- Three partitions
- Subscribers see data only on the requested partition

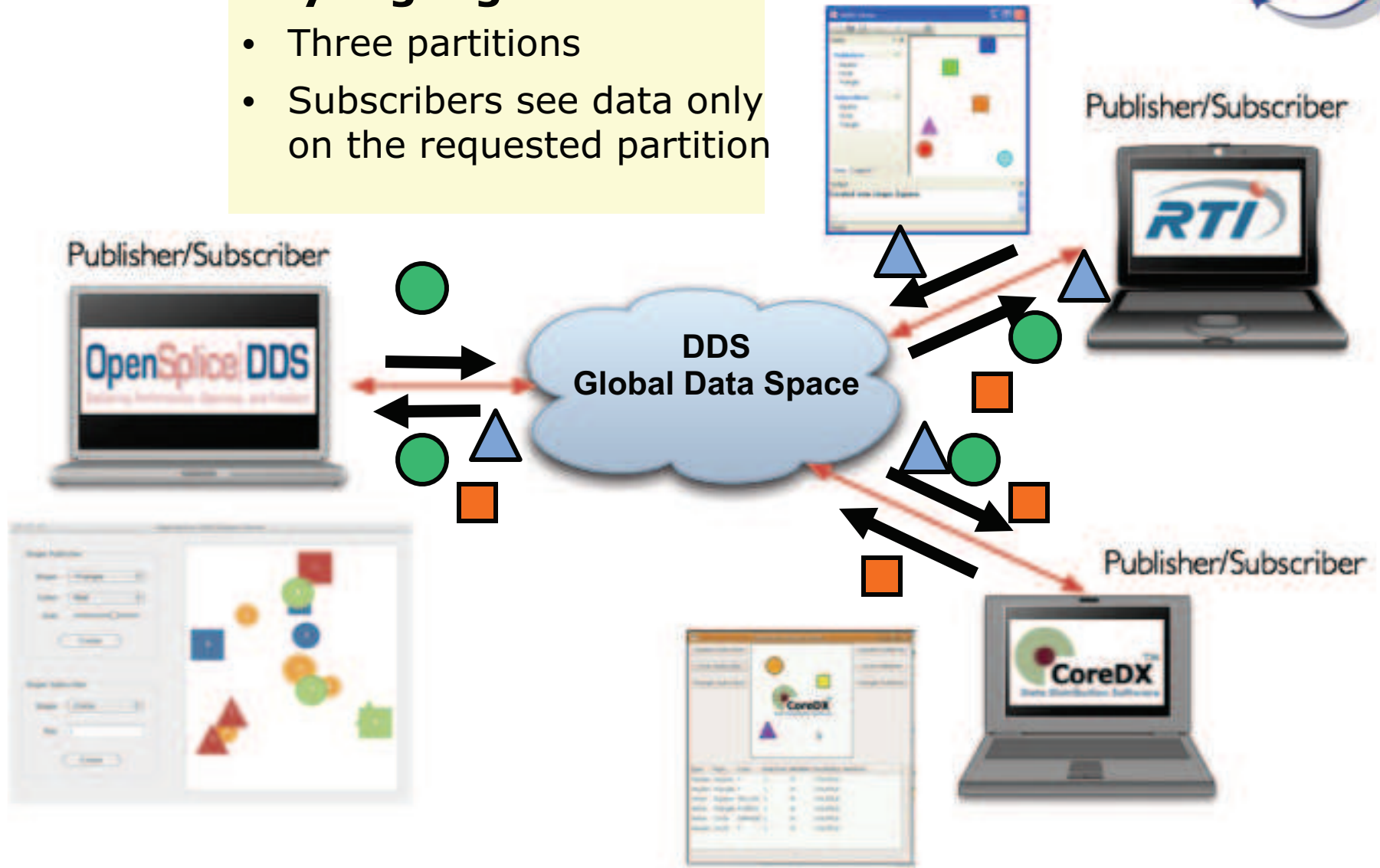


Scenario IX– Multiple Partitions



Key Highlights

- Three partitions
- Subscribers see data only on the requested partition

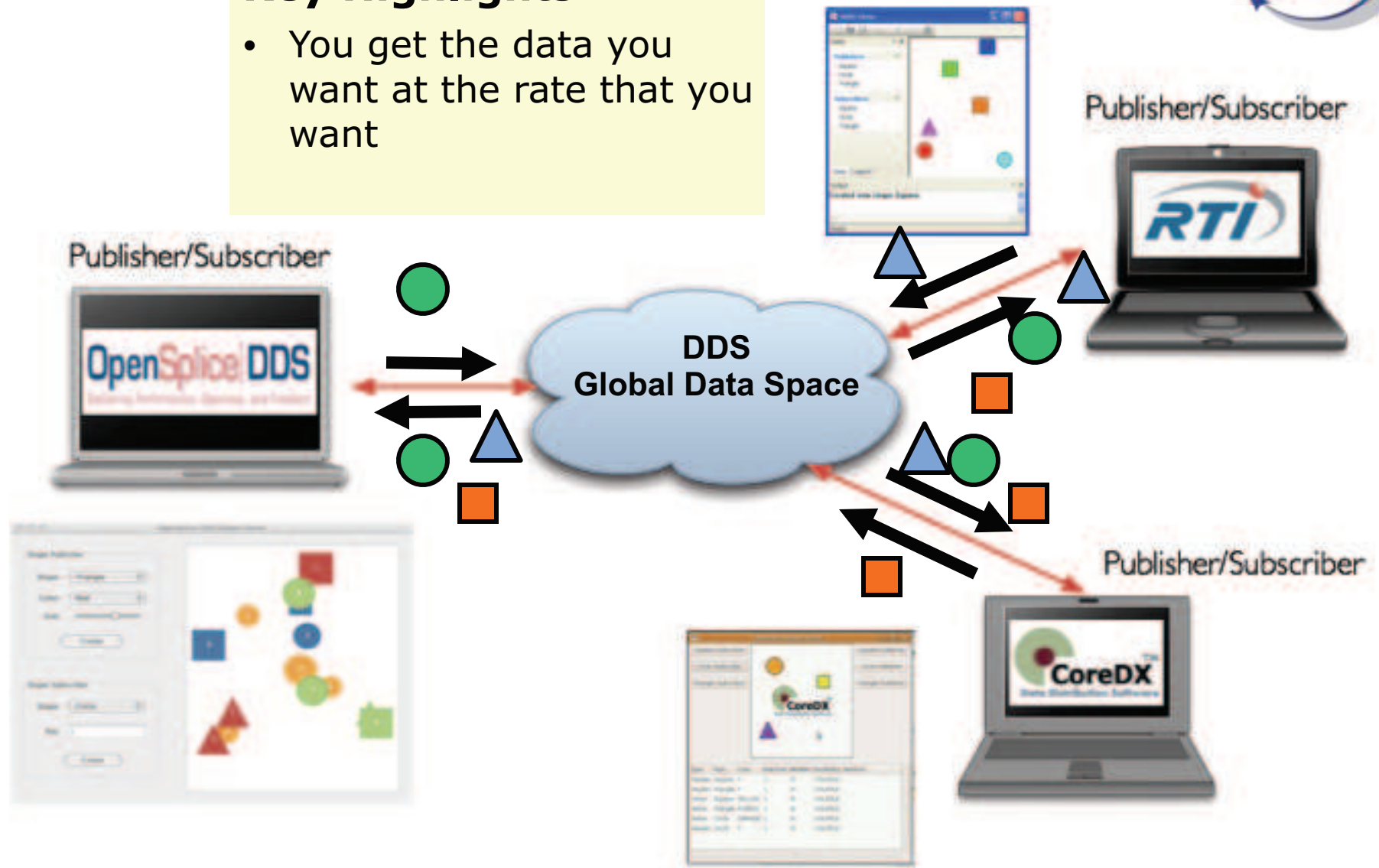


Scenario X- Time & Content Filters



Key Highlights

- You get the data you want at the rate that you want



Interoperability demonstrated along many dimensions



- Today we demonstrated:
 - Discovery
 - Different platforms (Linux, Windows)
 - Different Data-Types
 - Different Topics
 - Different Qos (RELIABILITY, DURABILITY)
 - Unicast & Multicast, both reliable and best efforts
 - One to Many and Many to one communications
 - Time Based Filters, Content Based Filter
 - Robustness to network interruption

Conclusions



- DDS Interoperability Works!!
 - This was first demo. We will continue working on additional scenarios
 - Vendors are committed to interoperability

- The DDS Standard and DDS-RTPS Interoperability Wire Protocol standards are complete and usable
 - A non-OMG vendor was able to use the OMG standard documents and produce an interoperable DDS product

- DDS truly is the most open interoperable publish-subscribe communications infrastructure

- Come see more at the booths!