WHITEPAPER

A Business Model for an Interoperable World

OVERVIEW

More than ever, program managers are elevating the goal of interoperability through a common, shared infrastructure to one of paramount importance in their mission-critical systems. This should come as no surprise. Interoperability and shared architectures have been shown to deliver real business benefits in multiple industries. But achieving interoperability is not just a technical challenge; it also requires a reconsideration of the licensing and pricing policies for key system software. In this whitepaper, RTI will explore the business challenges of achieving interoperability and introduce a new Infrastructure Community model that facilitates the development, integration and evolution of fully interoperable systems.

INTRODUCTION

Historically, developers of mission critical systems have given little priority to making their systems interoperable with systems and applications developed by others. While developers typically succeed admirably in meeting demanding performance, scalability, and reliability requirements, they have missed out on the advantages that accrue to interoperability and shared infrastructure. These benefits include reduced costs to develop and maintain systems over their lifetimes and the increased operational utility that results from the ability to seamlessly share information and services with other systems.

While development cost and time are critical factors, increased functionality is often the real goal of interoperability, which RTI defines as "the ability of systems to provide services to and accept services from other systems, and to use the services so exchanged to enable them to operate effectively together" (see RTI Interoperable Open Architecture (IOA) Whitepaper). When disparate systems integrate into a large, system-of-systems (SoS) architecture, it can increase the fundamental system utility. For instance, when a single ground control station can seamlessly communicate and share services across multiple unmanned aircraft, the whole becomes far greater than the sum of its parts. Users of an aircraft could choose ground stations competitively from multiple suppliers. These operational and procurement benefits overwhelm development costs. Users of interoperable systems can procure systems, perform tasks, and handle scenarios that are impossible without interoperability.

The above example is military, but interoperability benefits many industries. Industrial automation, medical electronics, and transportation face similar challenges. Fortunately, architects across these industries are getting a handle on the technical requirements for interoperability. Due to the acknowledged importance of a shared, data-centric architecture, the Object Management Group's Data Distribution Service (DDS) has become the key industry standard underpinning the drive toward interoperability. Successful DDS interoperability examples include the US's Unmanned UAS Control Segment (UCS) and the UK's Generic Vehicle Architecture (GVA) programs.

THE KEY BUSINESS CHALLENGE – LICENSING AND PRICING OF INFRASTRUCTURAL SOFTWARE

Now that the technical hurdles are being overcome, industry must tackle the primary business challenge that could impede further progress: the ability of teams across projects and programs to collaborate in the development of shared infrastructures and data models. This problem can manifest in both licensing restrictions and high costs associated with the use of key infrastructural software.

The issue stems from the fact that most suppliers of software infrastructure such as operating systems, middleware, and networking protocols have structured their business models around the notion of a project, meaning a concerted development effort by a distinct team of engineers. The project forms the scope of the license, which poses two potential problems for organizations pursuing interoperability and sharing: (1) software licenses typically preclude exchange of software between projects, which works directly against the goal of collaboration; and (2) most vendors provide volume-based pricing schedules for both development and deployment, meaning costs can skyrocket depending on how projects are defined. These issues have caused many to turn to open source, but the use of open source software comes with its own set of challenges that must be considered. Thus, it is imperative that we address these business challenges head on.

To do so, we must step back and reconsider the licensing and pricing models for infrastructural software with an eye toward enabling, rather than impeding, interoperability and commonality. An ideal model would start by removing the artificial barriers that get erected between projects and instead allow developers on those projects to share their innovations and collaborate in the development of a common infrastructure. This broadening of scope to encompass

multiple projects would in turn lead to economies of scale with respect to licensing costs as well as greater developer productivity through technology familiarity across projects. The goal with respect to costs should be twofold: first, to make license fees simple and predictable; and second, to scale with perceived value. For many program managers, this means costs should scale with the size of the development team rather than number of deployed systems. Finally, the model should not penalize small projects within a larger organization by placing important technologies out of reach of their limited budgets; after all, many innovations start with just a handful of developers working on a very specific problem.

THE INFRASTRUCTURE COMMUNITY: A BUSINESS MODEL FOR INTEROPERABILITY AND SHARED INFRASTRUCTURE

As the provider of the market-leading implementation of the DDS standard, RTI plays an important role in the move toward interoperability. As such, we have decided to undertake a bold initiative to address the business side of the equation by completely overhauling the licensing and pricing model for our RTI ConnextTM DDS products. We call this strategy our Infrastructure Community (IC) Program. An IC is any organization with a goal of adopting a common software infrastructure across groups, programs, systems or applications. Examples of IC's include entire government industry standards communities, individual companies or corporate divisions, development sites and multi-company joint efforts.

The IC model starts by providing the latest version of RTI Connext DDS to IC members entirely for free under an Open Community Source license. Developers receive library source code along with binaries for Linux and Windows operating systems that allow them to begin working immediately on a stable platform. The source code may be modified and shared within the IC, and there are no license fees for distributing binaries outside the IC as part of a customer application. This fosters interoperability through broad collaboration and sharing of software infrastructure.

At RTI, we've seen our products designed into more than 600 unique systems across a variety of industries around the world. We've learned through these experiences that real-world applications often need advanced infrastructural capabilities to meet their use cases as well as a rich set of tools for developing, testing, and tuning their systems. Any software provider targeting interoperability and shared infrastructure must address these needs.

In our case, we've applied the results of what we've learned to our commercially-licensed RTI Connext DDS products that include advanced functionality and value-added features. All RTI Connext DDS products are priced at a very low, flat fee per developer. Use of these products is governed by a standard commercial software license, and there are no royalties for deployment. We believe this two-pronged approach – a completely free core product combined with a family of low-cost commercial products, all without software royalties – is the right formula.

RTI believes we are at an important inflection point in the evolution of smart, distributed systems. Economic pressures, along with the never-ceasing demand for increased operational utility, dictate that we must change the way we build tomorrow's mission-critical systems. Notably, we must elevate the closely related goals of interoperability and shared infrastructures to a top level, non-negotiable requirement. A holistic approach is required. We must consider both technical and business issues in order to arrive at acceptable solutions and advance the state of industry.

Taken as a whole, we believe that the IC Program represents an important step forward in helping industries develop and deploy interoperable systems. The IC model makes RTI Connext DDS software available under an innovative, Open Community Source license; advanced commercial products are available for low, flat rate per-developer fees; and there are no royalties for distribution. The model is simple, predictable, and affordable for everyone. We hope other suppliers will follow suit and thus help ensure that we in the infrastructure software industry are doing our best to help enable the world's next generation of advanced, interoperable distributed systems.

ABOUT RTI

Real-Time Innovations (RTI) is the largest software framework provider for smart machines and real-world systems. The company's RTI Connext® product enables intelligent architecture by sharing information in real time, making large applications work together as one.

With over 1,500 deployments, RTI software runs the largest power plants in North America, connects perception to control in vehicles, coordinates combat management on US Navy ships, drives a new generation of medical robotics, controls hyperloop and flying cars, and provides 24/7 medical intelligence for hospital patients and emergency victims.

RTI is the best in the world at connecting intelligent, distributed systems. These systems improve medical care, make our roads safer, improve energy use, and protect our freedom.

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 headquarters in Spain and Singapore.

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

Your systems. Working as one.

CORPORATE HEADQUARTERS

232 E. Java Drive, Sunnyvale, CA 94089
Telephone: +1 (408) 990-7400
Fax: +1 (408) 990-7402
info@rti.com

rti.com
rti_software
rtisoftware
company/rti
connextpodcast
rti_software