RTI Connext What's New

Version 7.5.0

Contents

Chapter 1

What's New in 7.5.0 EAR

RTI® Connext® 7.5.0 is the second feature release in the Jackson Hole series of releases culminating in Jackson Hole LTS in 2026. This release is marked as an early access release (EAR), which means that customers can use it in development, but not in production environments.

This document highlights changes since *Connext 7.4.0*. See the Connext Releases page on the RTI website for more information on RTI's software release model.

Note: For backward compatibility information between 7.5.0 and previous releases, see the *Migration Guide* on the RTI Community Portal.

Table 1.1: Key Features of *Connext* 7.5.0

	*Remote Debugging with Admin Console (Experimental)* enables you to remotely debug your systems that are running in separate networks.
	*Productized Python RPC API* enables Python developers to bridge the gap between Python-based clients or servers and the rest of the distributed system.
	*AI Assistant in System Designer (Experimental)* leverages the *Connext Intelligence* platfrom grounded in RTI's vast knowledge base to help you design your system.
	*Easier Security Management for Reducing Operational Complexity* provides dynamic permissions and real-time updates to access control policies without system restarts.
	*Reduced Bandwidth Usage for Persistence Service Synchronization (Experimental)* guarantees eventual consistency at the DDS instance level using enhanced synchronization mechanisms.
	*Unbounded Types without Manual Configuration— Connext* performs automatic memory allocation based on actual sample sizes.
	*Achieve Faster Network Performance* with out-of-the-box UDP socket buffer sizes that have been increased to reduce sample losses and improve throughput performance.

For details about additional features and fixes in this release, see the release notes for a specific product:

- RTI Connext Core Libraries
- RTI Security Plugins
- RTI Admin Console
- RTI System Designer
- RTI Observability Framework
- RTI Code Generator
- RTI Routing Service
- RTI Cloud Discovery Service
- RTI Real-Time WAN Transport
- RTI Recording Service
- RTI Persistence Service
- RTI Web Integration Service
- RTI Launcher
- RTI DDS Spy
- RTI DDS Ping
- RTI Monitor
- RTI Shapes Demo

- RTI TLS Support

1.1 Remote Debugging with Admin Console (Experimental)

Admin Console can now participate in distributed systems, such as layered architectures and remotely deployed systems, allowing you to remotely debug your systems running in separate networks. For details, see What's New in 7.5.0 in the *Admin Console Release Notes*.

1.2 Productized Python RPC API

New Python support for RPC enables Python developers to bridge the gap between Python-based clients or servers and the rest of the distributed system. For details, see What's New in 7.5.0 in the *Connext Core Libraries Release Notes*.

1.3 AI Assistant in System Designer (Experimental)

Create and modify your systems using natural language through an AI assistant in *System Designer* that leverages the *Connext Intelligence* platform grounded in RTI's vast knowledge base. Ask questions, make changes, and get suggestions for improving your design. For details, see What's New in 7.5.0 in the *System Designer Release Notes*.

1.4 Easier Security Management for Reducing Operational Complexity

Enhance flexibility with dynamic permissions and enable real-time updates to access control policies without system restarts. OCSP stapling simplifies certificate revocation checks, improving the efficiency of authentication processes without affecting performance. For details, see the RTI Security Plugins Release Notes.

1.5 Reduced Bandwidth Usage for Persistence Service Synchronization (Experimental)

Enhanced synchronization mechanisms improve data sharing across *Persistence Service* instances, minimizing bandwidth usage. In most cases, each *Persistence Service* will receive a DDS sample only once. The new synchronization protocol guarantees eventual consistency at the DDS instance level. For details, see the Persistence Service Release Notes.

1.6 Unbounded Types without Manual Configuration

Manual configuration of buffer sizes is no longer necessary when working with unbounded data types; now we perform automatic memory allocation based on actual sample sizes. For details, see What's New in 7.5.0 in the *Connext Core Libraries Release Notes*.

1.7 Achieve Faster Network Performance

The out-of-the-box UDP socket buffer sizes have been increased to reduce sample losses and improve throughput performance. For details, see What's New in 7.5.0 in the *Connext Core Libraries Release Notes*.

1.8 Deprecations and Removals

See specific products' release notes for deprecations or removals, if any, in those products since 7.3.0. Find the release notes listed above under Table 1.1.

See also Deprecations and Removals in 7.3.0 LTS for deprecations and removals between release 6.1.2 and 7.3.0.

Deprecated means that the item is still supported in this release, but will be removed in a future release. *Removed* means that the item is discontinued or no longer supported.

Any deprecations or removals noted in RTI's documentation serve as notice under the Real-Time Innovations, Inc., Maintenance Policy #4220 and/or any other agreements by and between RTI and customer regarding maintenance and support of RTI's software. RTI's current standard terms and support and maintenance policies are available at https://www.rti.com/terms.

1.9 Product Availability

The following products are not included in 7.5.0:

- RTI Ada Language Support
- RTI Queuing Service
- RTI Limited Bandwidth Plugins

If you need these products, please use a previous release in which they were available. The latest release in which these products were available is 7.3.0 LTS.

Chapter 2

What's New in 7.4.0 EAR

RTI® Connext® 7.4.0 is the first feature release in the Jackson Hole series of releases culminating in Jackson Hole LTS in 2026. This release is marked as an Early Access Release (EAR), which means that customers can use it in development, but not in production environments.

This document highlights changes since *Connext* 7.3.0 LTS. See the Connext Releases page on the RTI website for more information on RTI's software release model.

Note: For backward compatibility information between 7.4.0 and previous releases, see the *Migration Guide* on the RTI Community Portal.

Table 2.1: Key Features of *Connext* 7.4.0

	*Easily Send Data of Any Size* without considering special QoS settings.
	*Default MTU Size for Real-Time WAN Transport* is now 1400 bytes, removing the need to manually adjust MTU sizes, to avoid IP fragmentation for most networks.
	*Productized Modern C++ RPC API* includes service discovery, simplifying the development of client-server architectures.
	*Streamlined Application Design in System Designer* offers pre-defined templates to create projects quickly, and uses categories and labels to help you discover QoS parameters more easily.
	*Granular Access Control and Security Permissions* in Security Plugins *(RTI Security Plugins)* enable you to better manage access and permissions in large-scale, dynamically grouped applications by using participant partition-based access control, domain tags, and explicit identity permissions.
	*Better Organized QoS* categorizes QoS fields (as related to performance, latency, memory management, and so on) in the API Reference documentation, making it easier to find the QoS for your use case.

Table 2.2: Additional Enhancements Available Since 7.3.0 LTS

	Connext Chatbot. Free, AI-based support tool that helps you navigate documentation, understand *Connext* features, generate sample code, and troubleshoot issues with *Connext* applications.
	Learn and Get Started with Connext Features Faster. New developer resources page offers self-contained, easy-to-follow tutorial modules that help you learn specific aspects of *Connext* and prototype faster.
	*Containerized Connext Products*. Container images in Docker™ Hub are now available for most *Connext* components.
	*Install Connext Using Debian Packages*. This new feature enables seamless integration with existing Linux based deployment tools and workflows.

For details about additional features and fixes in this release, see the release notes for a specific product:

- RTI Connext Core Libraries
- RTI Security Plugins
- RTI Admin Console
- RTI System Designer
- RTI Observability Framework
- RTI Code Generator
- RTI Routing Service

- RTI Cloud Discovery Service
- RTI Real-Time WAN Transport
- RTI Recording Service
- RTI Persistence Service
- RTI Web Integration Service
- RTI Launcher
- RTI DDS Spy
- RTI DDS Ping
- RTI Monitor
- RTI Shapes Demo
- RTI TLS Support

2.1 Easily Send Data of Any Size

Previously, to reliably send data using DDS fragmentation (data whose serialized size exceeds the configured transport maximum message size), it was necessary to enable Asynchronous Publish Mode on the *DataWriter*. In this release, setting asynchronous publishing for reliable data fragmentation transmissions is no longer required. **You can now send data of any size without needing any special QoS settings** for your *DataWriter*'s Publish Mode, based on your Reliability configuration.

Related to this change, RTI updated settings such as `nack_suppression_duration`, `min/max nack_response_delay`, and `max_bytes_per_nack_response` to now also apply to Negative Fragment Acknowledgments (NACK_FRAGs) to better manage missing data fragment repair traffic for synchronous *DataWriters*. Previously, the flow of repair data was assumed to be taken care of by whatever flow controller the asynchronous publish thread was configured to use.

See "Set up reliable communications for fragmented data more easily and with better performance, by removing asynchronous publishing requirement", in the RTI Connext Core Libraries Release Notes for more information.

2.2 New Default MTU Size for Real-Time WAN Transport Helps Avoid WAN Communication Issues

This release now sets a default MTU size of 1400 bytes (via the `message_size_max` property) for the *Real-Time WAN Transport* (UDPv4_WAN) in order to avoid IP fragmentation for WAN communications. IP fragmentation causes significant issues for UDP WAN communications, especially over cellular networks. See Disabling IP Fragmentation for Real-Time WAN Transport in the *RTI Connext Core Libraries User's Manual* for more information.

2.3 Productized Modern C++ API with Service Discovery Allows Writing Reliable RPC-Based Applications

This release promotes the RPC C++ API from experimental to productized, meaning the feature is stable, reliable, performant, and well-integrated into *Connext*. Although *Connext* 7.4.0 is an early-access release, if your project is currently in development and you expect to go to production with Jackson Hole LTS or later, we encourage the use of this RPC C++ API.

Note: The RPC Python API is still experimental and is not interoperable with the RPC C++ API.

An enhanced service discovery protocol in both the Request-Reply and RPC APIs now also allows client applications to reliably discover a service before making a call. Clients can call a new method, `wait_for_service()`, to ensure that a service has been discovered.

See the RTI Connext Core Libraries Release Notes for more information on RPC and Request-Reply enhancements. See Request-Reply Exchanges and Remote Procedure Calls (RPC) in the *Connext Core Libraries User's Manual* for information on the APIs.

Note: The RPC API is still not compliant with the OMG RPC-DDS standard; however, a future update of the OMG RPC-DDS standard will make it compliant.

2.4 Suggested QoS and Templates in System Designer Get Your Application Designed and Running Quickly

New project templates in *System Designer* provide guidance when building your system architecture. See Creating New Projects in the *RTI System Designer Getting Started Guide*.

As described in *Better Organized Quality of Service (QoS) for Easier Search*, RTI has categorized *Connext* QoS policies to make it easier to set up and adjust your system. *System Designer* displays the complexity categories, Basic or Advanced, to make it easier to browse the available policies. See Configuring Quality of Service (QoS) in the *RTI System Designer Getting Started Guide*.

2.5 Security Plugins Improvements Make it Easier to Secure Large Systems

This release of the Security Plugins introduces a series of features that help secure large systems. Now you can:

- **Apply permissions to a group of identities.** Every Identity Certificate represents one identity. The actions that an identity can take in your system are detailed in the Permissions Document. The Permissions Document contains a set of grants, each grant specifies a subject name and what the associated identity can do. In previous releases, each grant could only refer to one identity. The new

<subject_name_expression> element allows you to bind the permissions in a <grant> section with a group of identities. For example, your Identity Certificates can have subject names based on the roles their *DomainParticipants* should take in your system. Doing so will vastly simplify the management of your Permissions Documents.

- **Enforce permissions based on DomainParticipants.** You can limit the permissions of a <grant> so that it only applies to *DomainParticipants* that have partitions matching a specific pattern. Your system can adapt better, since *DomainParticipant* partitions are mutable at run-time.
- **Use domain tags in the Governance and Permissions Documents.** Domain tags provide isolation in large-scale systems where domain IDs may not be enough. Domain IDs are numbers associated with a physical port and are limited to about 200. Domain tags are string-based and overcome these limitations. You can now secure traffic and configure permissions based not only on the domain ID, but also on the (optional) domain tag subdivision. A rule will only apply to a *DomainParticipant* if its domain ID and tag match the rule.

See What's New in 7.4.0 in the *RTI Security Plugins Release Notes* for more details.

2.6 Better Organized Quality of Service (QoS) for Easier Search

RTI has simplified its QoS policies and settings, making it easier to set up and adjust your system:

- **Deprecated some QoS settings**. See Simplify QoS configuration by deprecating unnecessary or rarely used QoS settings and policies in the *RTI Connext Core Libraries Release Notes*.
- **Categorized QoS** in the documentation and in *System Designer*. See Discover relevant QoS more easily through categorizations added to API Reference HTML documentation in the *RTI Connext Core Libraries Release Notes* and *Suggested QoS and Templates in System Designer Get Your Application Designed and Running Quickly* in this document.
- **Adjusted the default MTU size** (via the **message_size_max** property) for the *Real-Time WAN Transport* to avoid IP fragmentation for WAN communications. See the RTI Real-Time WAN Transport Release Notes.

2.7 Deploy Connext Products in Docker Containers, Reducing Setup Time and Complexity

RTI is pleased to announce the release of RTI's Docker container images, now available on Docker Hub. This significant milestone provides enhanced flexibility and efficiency through Docker containers, facilitating the seamless integration of RTI *Connext*'s powerful software into your CI/CD and DevSecOps pipelines.

Currently, the following RTI products are available as images on Docker Hub. Click each product link on the Docker Hub to get information about each image:

- Observability Collector Service
- Persistence Service
- Routing Service

- Recording Service
- Replay Service
- Cloud Discovery Service
- Web Integration Service
- DDS Spy
- DDS Ping
- Perftest

These containerized products are already available for release 7.3.0. They are not yet available for 7.4.0, but are planned to be available later in the Jackson Hole series.

2.8 Install Connext via Debian Packages, for Easier Linux Deployment

RTI is excited to announce the availability of Debian packages for installing and deploying *Connext* products. These packages can be used independently or in combination with our newly released Docker images. This flexibility allows for seamless integration into your existing workflows, ensuring reliable and reproducible deployments across various environments. By using RTI's pre-built solutions, you can minimize setup time and complexity, enabling a more efficient and robust deployment process.

Debian packages for Linux installations of *Connext* are already available for *Connext* releases 6.1.2 and 7.3.0. They are not yet available for 7.4.0, but are planned to be available later in the Jackson Hole series.

For instructions on installing these packages, see RTI Connext 6.1.2 for Debian Linux and RTI Connext 7.3.0 for Debian Linux.

2.9 Platform and Build Changes

2.9.1 Support for macOS 14 and Ubuntu 24.04 LTS

RTI has validated that the existing libraries for macOS 11-13 also work on macOS 14 systems. Similarly, the existing libraries for Ubuntu 22.04 LTS have been validated on Ubuntu 24.04 LTS systems.

Table 2.3: New Platforms in *Connext* 7.4.0

OS	CPU	Compiler	RTI Architecture
macOS 14	ARM64	clang 15.0	arm64Darwin20clang12.0
Ubuntu 24.04 LTS	x64	gcc 7.3.0	x64Linux4gcc7.3.0

2.9.2 Enhanced performance for x64Linux4gcc7.3.0 by updating optimization flag to -O3

This release significantly enhances the performance of the x64Linux4gcc7.3.0 libraries by updating the compilation policy, resulting in faster final applications.

Previously, the libraries for this architecture was compiled with the **-O** optimization flag. Now RTI compiles the libraries with the highest stable optimization flag available. We first attempt to use **-O3** for maximum performance, falling back to -**O2** or **-O1** if necessary. For specific details for each library, see the *Library-Creation Details for Linux Architectures* table in the Linux Platforms chapter of the *RTI Connext Core Libraries Platform Notes*.

This change also applies to armv8Linux4gcc7.3.0, which will be available in a future release.

2.10 Deprecations and Removals

See specific products' release notes (listed above, beneath Table 2.2) for deprecations or removals, if any, in those products between 7.3.0 and 7.4.0. See Deprecations and Removals in 7.3.0 for deprecations and removals between release 6.1.2 and 7.3.0.

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2.11 Product Availability

The following products are not included in 7.4.0:

- RTI Ada Language Support
- RTI Queuing Service
- RTI Limited Bandwidth Plugins

If you need these products, please use a previous release in which they were available. The latest release in which these products were available is 7.3.0 LTS.

Chapter 3

Experimental Features

This software may contain experimental features. These are used to evaluate potential new features and obtain customer feedback. They are not guaranteed to be consistent or supported and they should not be used in production.

In the API Reference HTML documentation, experimental APIs are marked with **<<experimental>>**.

Experimental features are also clearly noted as such in the *User's Manual* or *Getting Started Guide* for the component in which they are included.

Disclaimers:

- Experimental features may be only available in a subset of the supported languages and for a subset of the supported platforms.
- Experimental features may change in the future.
- Experimental features may or may not appear in future product releases.
- Experimental features should not be used in production.

Please submit your comments and suggestions about experimental features to **support@rti.com** or via the RTI Customer Portal (https://support.rti.com/).

Chapter 4

Deprecations and Removals

Sometimes features or products are deprecated or removed in a *Connext* release. See individual product release notes for specific deprecations or removals in a release. Start with *Deprecations and Removals* in this document for links to those products/releases.

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Chapter 5

Additional Documentation

Many readers will also want to look at additional documentation available online. In particular, RTI recommends the following:

- **Connext Developer page** (https://community.rti.com/static/documentation/developers/) to explore short, independent modules that help you implement common distributed systems patterns (publish-subscribe, RPC, content filtering, data persistence, and so on) and design, debug, and deploy observable and secure systems.
- **RTI Customer Portal** (https://support.rti.com) to download RTI software and contact RTI Support. The RTI Customer Portal requires a username and password. You will receive this in the email confirming your purchase. If you do not have this email, please contact **license@rti.com**. Resetting your login password can be done directly at the RTI Customer Portal.
- **RTI Community Forum** (https://community.rti.com) for a wealth of knowledge to help you use *Connext*, including:
  - Documentation, at https://community.rti.com/documentation
  - Best Practices,
  - Example code for specific features,
  - Solutions to common questions,
  - A glossary,
  - Downloads of experimental software,
  - And more.
- **Performance benchmark results** for *Connext* are published online at http://www.rti.com/products/dds/benchmarks.html. Updated results for new releases are typically published within two months after general availability of that release.
- **Whitepapers and other articles** are available from http://www.rti.com/resources.

Chapter 6

Copyrights and Notices

Trademarks

Copy and Use Restrictions

Third-Party Software

Notices

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