



MAK RTI 5.0 Release Notes

This release note contains release-specific information for MAK RTI 5.0.

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Document ID: RTI-5.0-01-250702

Systems Supported and System Requirements

For information about platform and system support, see the Product Specifications & Dependencies page on the MAK website at: <https://www.mak.com/mak-one-specs>.

For hardware requirements, see <https://www.mak.com/mak-one/support/help/hardware-recommendations>.

 To use MAK RTI for VC14, compile with VS2015 Update 2 or later.

The MAK RTI supports Java on all platforms. We build using Java 8, but use Java 6 compliance levels. The MAK RTI is built using the Oracle JDK, but should work with all JDKs. The version of the JVM that you are using must match the bit level of the RTI that you are running (32 or 64).

Compiler Compatibility on Windows

MAK provides versions of product releases that have been compiled with different versions of Microsoft Visual C++. MAK ONE products built with VC 14 and later are binary compatible and will work together. When you run MAK ONE products together on the same computer, for example, the Logger and VR-Vantage, we strongly recommend that you run versions compiled with the same compiler or binary compatible compilers.

MAK RTI HLA 4 binary file names conform to the SISO-REF-075 standard, which includes a compiler marker to specify the compiler version. This which prevents HLA applications from loading binary files from non-compatible compilers. The MAK RTI HLA 4 libraries are built using the Video Studio 2017 compiler and use the vc141 compiler marker.

Disk Space Requirements

A full installation of MAK RTI requires approximately 2.5 GB of disk space.

License Manager

MAK RTI 5.0 uses FLEXlm 11.17.1. You must install the license management software to run MAK RTI.

The MAK License Manager files are not part of the MAK RTI installer. You can download them from the MAK ONE Product Downloads page (<https://www.mak.com/mak-one-downloads>).

Installation of the license manager is covered in the *MAK ONE Installation Guide*, available online at <https://mak.com/mak-one-installation-guide>. Support is also available at <https://www.mak.com/mak-one/support/portal>.

RTI Compatibility

Backward Compatibility

The MAK RTI 4.6.1 libraries are not run-time compatible with previous versions. (In other words, you cannot have a federation execution in which some federates use MAK RTI 4.6.1 and some use a previous version of the MAK RTI.) However, except as noted below, the MAK RTI 4.6.1 is link compatible with previous versions, so a federate does not need to be recompiled to use this version. We recommend that all federates use the same version of the RTI when operating within the same federation (or using the same rtiexec).

 HLA Evolved federates compiled with MAK RTI 4.0.4 or later are not link compatible with HLA Evolved federates compiled with MAK RTI 4.0 through 4.0.3.

Network Compatibility

The MAK RTI is not network compatible with other RTIs. (In general, no two RTI implementations are network compatible due to differences in the low-level network mechanisms that they use.) To participate in the same federation execution, all applications must use the same RTI implementation. Although a federation can easily switch from one RTI implementation to another between runs, all participants must agree on which RTI to use, much as they must also agree on which FOM to use.

HLA 4 introduces a new Federate Protocol (FP) API, which is a wire protocol that serializes HLA service calls, callbacks, and exceptions into network messages. An FP federate establishes a session with the RTI using a TCP connection and then uses it to exchange messages with that RTI to invoke service calls and callbacks. The messages are exchanged in a standardized format and are compatible between different RTI vendors, allowing FP federates to easily switch from one RTI implementation to another. However, despite the introduction of this wire standard, all participants in a federation must still agree on an RTI to use, for the reasons described above.

Compatibility with Other RTIs

For details about MAK RTI's compatibility, please see Section 1.2, "Compatibility with Other RTI Implementations", in the *MAK RTI Reference Manual*.

New Features and Updates

MAK RTI 5.0 has the following new features and updates.

- MAK RTI supports the new HLA 4 (IEEE HLA 1516-2025) interface specification. Note that many files related to HLA 4 use the naming convention 1516_2025.
- MAK RTI also supports the HLA 4 Federate Protocol standard and supplies a Federate Protocol server as well as a sample Federate Protocol client. See the help or the *MAK RTI Reference Manual* to learn more.
- Added support for Red Hat 9.
- Users are now encouraged to install PDBs. If the application crashes, a "mini-dumper" generates a *callstack.log* file that is useful for debugging the crash. For more information, see "Installing PDB Files for Debugging Purposes" in the Installing the MAK RTI chapter of the help or *MAK RTI User Guide*.
- The MAK RTI help is now in HTML5 format. It has a natural language search. (It still combines the information from both the *MAK RTI User Guide* and the *MAK RTI Reference Manual*.)

Fixed Bugs

Table 1. Fixed Bugs

Key	Summary	Release Notes	Fix versions
RTI-434	RTI can sometimes get into bad state and throw erroneous FOM merging errors	Added checks to prevent the RTI from occasionally getting into a bad state and throwing erroneous FOM merging errors.	RTI 4.6b, RTI 4.6.1, RTI 5.0
RTI-482	RTI Encoding not working for octets	Encoding helpers now correctly calculate padding bytes needed.	RTI 4.6a, RTI 4.6.1, RTI 5.0
RTI-498	Local Settings Designator not applied when using Assistant connection/RID settings	Modified the F18 example to add RID settings (for example, udp_port) via the LSD during connect in HLA Evolved. Set the RTI_RID_FILE to point to a file where configure with RID is set. The F18's RTI connection now uses the RID settings from the LSD. If you disable configure with RID and restart the F18, the F18 ignores the LSD and uses the Assistant's RTI connection and settings without any changes.	RTI 4.6b, RTI 4.6.1, RTI 5.0
RTI-499	Problem with ownership attribute reacquisition after federate that owns attributes has been killed.	New federate shadow feature supports recovering orphan attributes.	RTI 5.0
RTI-507	Fix crash in Java encoding helpers	Updated the Java encoding helpers to address some encoding issues and prevent crashes.	RTI 4.6b, RTI 4.6.1, RTI 5.0
RTI-509	Receive notifyAcquire with unrequested attrs	Fixed handling of request ownership to clean up pending requests and ensure that pending requests are not duplicated.	RTI 4.6b, RTI 4.6.1, RTI 5.0
RTI-511	Add more information on RID parameters	Added missing parameters to the user documentation: RTI_lrcMinidumperLevel, RTI_tcpPacketBundlingSize, and RTI_udpPacketBundlingSize.	RTI 5.0
RTI-512	RTI not closing FOM file handles: HLAe Connection Crash	Federates that disconnect and reconnect many times no longer exit during connect, create, or join after repeated cycles due to too many open file handles.	4.5.1a, RTI 5.0
RTI-521	FOM Module Sorting not working	FOM Module Sorting was not working. Added a step to parse and store FOM metadata to then use the information to sort FOM Modules. Also added steps to sort FOM Modules before calculating their CRC values and sending the Create or Join messages.	RTI 4.6c, RTI 4.6.1, RTI 5.0

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
RTI-523	FOM Sorting does not work correctly when creating multiple federations with single RTI Ambassador	FOM sorting was not working correctly when creating multiple federations with a single RTI Ambassador. Fixed this by adding extra testing and handling for duplicate FOM IDs and file names.	RTI 4.6.1, RTI 5.0
RTI-526	Subscribing to HLAfederation - currentFDD when using ImmediateCallback mode fails due to deadlock with IO receive thread	Added receivePackets to asynConnMgr tick to handle cases where receive thread must read messages in post-tick (which is part of the immediate processing of messages that are being recieved). This recursive receive packet is controlled by the post-tick counter and allowed only during post-tick processing, which has locked services. Also, prevent the FOM distributor thread from processing results if federate no longer exists (that is, the operation started and federate resigned before it completed).	RTI 4.6.1a, RTI 5.0
RTI-528	RTI fails merging RPR 2.0 FOM Modules with RPR 2.0 Single file FOM	Fixed issue where FOM Modules were merged in with scaffolding base classes when the class is already defined in the federation.	RTI 4.6d, RTI 4.6.1, RTI 5.0
RTI-530	Multiple LRC instances on same machine can cause delays in packet sending using Async mode	Multiple LRC instances on same machine could cause delays in packet sending using Async mode. This could cause a noticeable "jitter" effect in simulation objects. This is now fixed by removing the names of the events so they are forced to be local.	RTI 4.6.1, RTI 5.0
RTI-541	Installed examples will not build because of cmake dependency	There was a cmake dependency, which prevented users from running the examples included with the MAK RTI. This is fixed by adding a build option to suppress the cmake regeneration.	RTI 4.6.1, RTI 5.0
RTI-543	Some diagnostic output was squashed together	When printing out FOM modules after a merge fails, there are now white spaces and lines between each module to make the results easier to read.	RTI 4.6.1, RTI 5.0
RTI-584	Fix Silent and VerySilent install options	Updated to skip displaying the release notes when using SILENT or VERYSILENT for installation.	RTI 5.0
RTI-616	FOM identification replaces FOM filename when FOM modules have no dependencies	Fixed handling of FOMs with duplicate model identification when FOM sorting to use the filename when mapping the FOM instead of identification (which was incorrectly being retrieved from the map as the filename).	HLA4, RTI 5.0
RTI-617	Using FOM Sorting federate fails to join with new modules	Fixed encoding of FOM modules in join message and fixed full fed. distribution. Also added first/last FOM (not root or mom) object/interaction class to fomMgr and refactored synchronous distributor pullEntireFedFile	HLA4, RTI 5.0

Table 1. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix versions
RTI-630	FOM sorting fails to collect a single file of depth 1 when joining	Corrected the iteration through the FOM dependency map to include a depth "<=" the map size.	HLA4, RTI 5.0
RTI-638	HLA4 Attribute merging can cause crash when objects are discovered	In object instances, replaced representation of attribute info as simple allocated array to use std::map instead.	RTI 5.0
RTI-640	Forwarder command-line option forwarderToConnectTo connects only to the target forwarder and does not result in a fully connected mesh with the target's connections	A pending connection variable needed to be set with the forwarderToConnect address to ensure that, when connection was complete, the additional forwarders to connect with could be sent. The description of the "forwarderToConnectTo" command-line parameter for the RTI Forwarder has also been updated in the user documentation.	RTI 5.0, RTI 4.6.1c
RTI-674	Connection Failure from forwarder/exec corrupts federate	The connectionLost callback is now invoked for both the immediate and evoked callback models. For the evoked model, the evoke(Multiple)Callback(s) must be called in order to get the connectionLost callback.	RTI 5.0, RTI 4.6.1e

Feature List

Table 2. Feature List

Key	Summary	Release Notes	Fix versions
RTI-514	RTI installer should use MAK_INSTALL_DIR environment variable to determine install location.	You can use an environment variable, MAK_INSTALL_DIR, to specify a default location where all MAK ONE products are installed. Refer to the MAK RTI User Guide, the MAK ONE Installation Guide, or the help for details.	RTI 5.0
RTI-586	Package MAK-RTI_Build_Information.txt file with installer	The file is now included in the MAK RTI installation directory. It provides information about the MAK RTI build.	RTI 5.0
RTI-610	Message unit tests	Added internal autotests for messages.	RTI 5.0
RTI-612	Update Help to use new HTML5 format	The MAK RTI help is now in HTML5 format. It has a natural language search. (It still combines the information from both the MAK RTI User Guide and the MAK RTI Reference Manual.)	RTI 5.0
RTI-613	Create autotests for HLA 4 features	Added internal autotests to test specific HLA 4 functionality.	RTI 5.0
RTI-633	Handle dimension inheritance and applying new dimensions to inherited attributes	Added support for HLA 4 dimension inheritance. With HLA 4 FOMs, dimensions for DDM are now specified at the object class level instead of per attribute as with prior HLA versions.	HLA4, RTI 5.0
RTI-644	Add MOM service reporting to file	Added support for HLA 4 Service Reporting to a file feature. This can be enabled through a switch in the FDD or through the RTI API. The MAK RTI supports Service Reporting to a file in a MAK proprietary format.	HLA4, RTI 5.0
RTI-645	Add Red Hat 9 support	Added support for Red Hat 9.	RTI 5.0

Known Problems

Problems can arise with any product. MAK has a knowledge base of the problems that we know about, which is always changing as new problems are identified and new solutions are found. To learn how to address known problems with MAK RTI and other MAK ONE products, access the MAK ONE Product Support Knowledge Base:

<https://www.mak.com/knowledge>.

If the problem you are experiencing is not addressed in the knowledge base, contact support for assistance: <https://www.mak.com/mak-one/support/portal>.