



Red Hat Application Migration Toolkit

4.3

IDE Plugin Guide

Identify and resolve migration issues by running the Red Hat Application Migration Toolkit against your applications in your IDE.

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Abstract

This guide describes how to use the Red Hat Application Migration Toolkit IDE Plugin to simplify migration of Java applications.

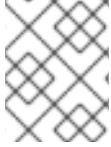
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CHAPTER 1. INTRODUCTION

1.1. ABOUT THE IDE PLUGIN GUIDE

This guide is for engineers, consultants, and others who want to use the IDE Plugin for Red Hat Application Migration Toolkit (RHAMT) to assist with migrating applications.



NOTE

This guide uses *Eclipse* to refer to an installation of Eclipse or Red Hat CodeReady Studio.

1.2. ABOUT RED HAT APPLICATION MIGRATION TOOLKIT

What is Red Hat Application Migration Toolkit?

Red Hat Application Migration Toolkit (RHAMT) is an extensible and customizable rule-based tool that helps simplify migration of Java applications.

RHAMT examines application artifacts, including project source directories and application archives, then produces an HTML report that highlights areas needing changes. RHAMT can be used to migrate Java applications from previous versions of *Red Hat JBoss Enterprise Application Platform* or from other containers, such as *Oracle® WebLogic Server* or *IBM® WebSphere® Application Server*.

How Does Red Hat Application Migration Toolkit Simplify Migration?

Red Hat Application Migration Toolkit looks for common resources and highlights technologies and known trouble spots when migrating applications. The goal is to provide a high-level view into the technologies used by the application and provide a detailed report organizations can use to estimate, document, and migrate enterprise applications to Java EE and Red Hat JBoss Enterprise Application Platform.

How Do I Learn More?

See the [Getting Started Guide](#) to learn more about the features, supported configurations, system requirements, and available tools in the Red Hat Application Migration Toolkit.

1.3. ABOUT THE IDE PLUGIN

The IDE Plugin for Red Hat Application Migration Toolkit provides assistance directly in Eclipse and Red Hat CodeReady Studio for developers making changes for a migration or modernization effort. It analyzes your projects using RHAMT, marks migration issues in the source code, provides guidance to fix the issues, and offers automatic code replacement when possible.

There is a RHAMT extension for Visual Studio Code and Eclipse Che. The extension is only available as a Minimum Viable Product and will be fully documented and supported in a future Release of RHAMT. For more information about [the extension](#), visit the Visual Studio Marketplace.

1.4. SUPPORTED CONFIGURATIONS

The IDE Plugin is tested in following development environments.

- Eclipse 2019-09
- Red Hat CodeReady Studio 12.13

CHAPTER 2. INSTALL THE IDE PLUGIN

Review the [supported configurations](#) to make sure that you are using a development environment that is compatible with the IDE Plugin.



NOTE

If you are running macOS, it is recommended to set the maximum number of user processes, **maxproc**, to at least **2048**, and the maximum number of open files, **maxfiles**, to **100000**.

If you do not already have an existing installation, download [Eclipse](#) or [Red Hat CodeReady Studio](#) and install it.



NOTE

This guide uses *IDE* to refer to an installation of Eclipse or Red Hat CodeReady Studio.

There is a RHAMT extension for Visual Studio Code and Eclipse Che. The extension is only available as a Minimum Viable Product and will be fully documented and supported in a future Release of RHAMT. For more information about [the extension](#), visit the Visual Studio Marketplace.

Prerequisites

- If you are using Eclipse, and not Red Hat CodeReady Studio, then you must [install JBoss Tools](#) before installing the IDE Plugin.

Install the Plugin

1. Launch Eclipse.
2. From the menu bar, select **Help** → **Install New Software**.
3. Add the RHAMT update site.
 - a. Next to the **Work with** field, click **Add**.
 - b. In the **Name** field, enter **RHAMT**.
 - c. In the **Location** field, enter **<http://download.jboss.org/jbosstools/photon/stable/updates/rhamt/>** and press **OK**.
 - d. Select all of the checkboxes under **JBoss Tools - RHAMT** and press **Next**.
4. Review the installation details and press **Next**.
5. Accept the terms of the license agreement and press **Finish** to install the plugin.
6. Restart your IDE for the changes to take effect.

Install the Plugin for an Offline Environment

1. Download the [IDE Plugin Repository](#).

2. Launch your IDE.
3. From the menu bar, select **Help** → **Install New Software**.
4. Add the RHAMT update site.
 - a. Next to the **Work with** field, click **Add**.
 - b. In the **Name** field, enter **RHAMT - Offline**.
 - c. Next to the **Location** field, click **Archive**.
 - d. Select the file downloaded in the first step and click **OK**.
 - e. Select all of the checkboxes under **JBoss Tools - RHAMT** and press **Next**.
5. Review the installation details and press **Next**.
6. Accept the terms of the license agreement and press **Finish** to install the plugin.
7. Restart your IDE for the changes to take effect.

CHAPTER 3. ACCESS THE RHAMT IDE TOOLS

Once the plugin is installed, the RHAMT IDE tools are available in the RHAMT perspective. To open the RHAMT perspective, navigate to **Window** → **Perspective** → **Open Perspective** → **Other**. Select **RHAMT** and press **OK**.

Review the [plugin components](#) and then get started [identifying and resolving migration issues](#). You can also view the embedded help for the plugin by selecting **Help** → **Getting Started** in your IDE.

3.1. IDE PLUGIN COMPONENTS

The following components are available in the RHAMT perspective when using the IDE Plugin to analyze projects.

Issue Explorer

This view allows you to explore the RHAMT issues for projects that have been analyzed.

If this view is not visible in the RHAMT Perspective, you can open it by selecting **Window** → **Show View** → **Issue Explorer**.

RHAMT Server

The RHAMT server is a separate process that executes the RHAMT analysis, flags the migration issues, and generates the reports.

You can start, stop, and view the status of the RHAMT server from the Issue Explorer.

Issue Details

This view shows detailed information about the selected RHAMT issue, including the hint, severity, and any additional resources.

If this view is not visible in the RHAMT Perspective, you can open it by selecting **Window** → **Show View** → **Issue Details**.

RHAMT Report


This view shows the HTML reports that are generated when RHAMT is executed. From the report landing page you can navigate to detailed reports, such as Application Details, Issues, and Dependencies.

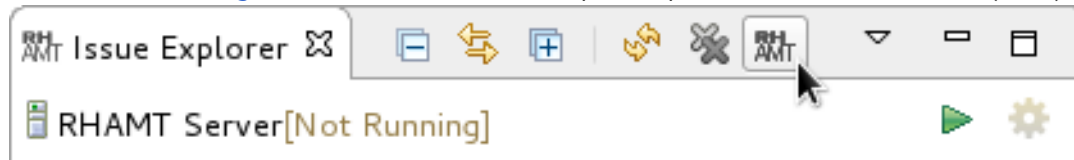
Note that the RHAMT run configuration used must have the **Generate Report** option selected in order for the RHAMT reports to be generated.

If this view is not visible in the RHAMT Perspective, you can open it by selecting **Window** → **Show View** → **RHAMT Report**.


CHAPTER 4. IDENTIFY AND RESOLVE MIGRATION ISSUES

Follow these steps to use the IDE Plugin to identify and resolve migration issues.


1. Import the project to analyze into your IDE.
2. [Create a run configuration](#). From the Issue Explorer, press the RHAMT button ().



At a minimum, select the project to analyze. Set additional options as needed.

3. Click **Run** to [execute RHAMT](#).
4. [Review RHAMT issues](#) listed in the Issue Explorer.
5. [Resolve RHAMT issues](#) by manually updating code or by using quick fixes when available.
6. Run RHAMT again as necessary. Use the drop down next to the **Run** button () to run an existing configuration.

4.1. CREATE AN RHAMT RUN CONFIGURATION

RHAMT run configurations can be created using the RHAMT button (). A run configuration specifies the project to analyze, migration path, and additional options for the execution. You can create multiple run configurations, and each must have a unique name.

Input

Migration Path

Select a migration path, which determines which RHAMT rulesets are used. The migration path defaults to **Anything to EAP 7**, but can be changed to any supported migration path.

Projects

Select one or more projects to analyze. Hold the **Ctrl** key to select multiple projects in the list.

Packages

Select one or more packages to scan. It is recommended to select only those packages that you need to analyze to reduce the overall RHAMT execution time. If no packages are selected, all packages in the project will be scanned. Hold the **Ctrl** key to select multiple packages in the list.

Options

Report

Check the **Generate Report** checkbox if you want to generate the RHAMT HTML report. The report will be shown in the **RHAMT Report** tab and can be found in the Issue Explorer when you group by **File**.

Options

Set additional RHAMT options. Any option that is a boolean flag, such as **enableTattletale**, should use **true** as the value. See the [RHAMT Command-line Arguments](#) section of the *CLI Guide* for a description of each RHAMT argument.


Rules

Custom Rules Repositories

Select custom rulesets to include during analysis if you have imported or created any custom RHAMT rules in the IDE Plugin. See [Add Custom Rules](#) for more information.

4.2. EXECUTE RHAMT

Once a run configuration has been created, you can execute RHAMT using that configuration in one of the following ways:

- Select the run configuration from the **Run Configurations** dialog and click **Run**.
- Select a recent run configuration from the drop down next to the **Run** button ().

If the RHAMT server is not currently running, it will start once a run configuration is executed.



NOTE

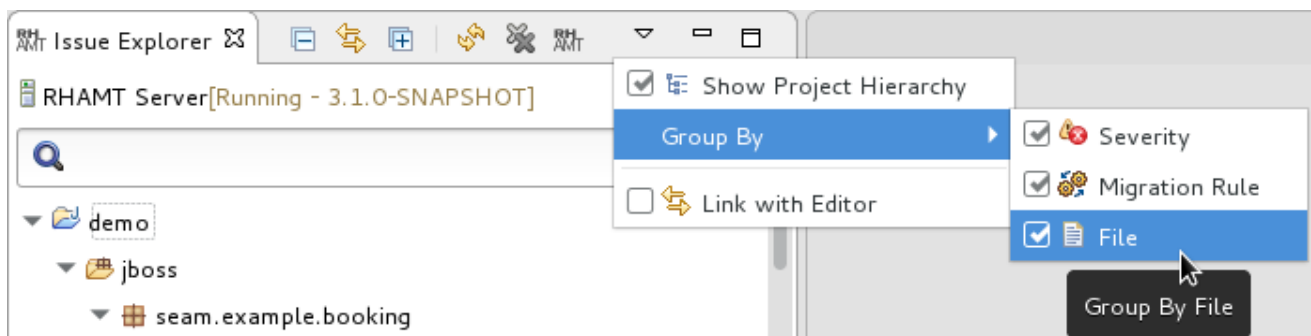
If you do not plan on running RHAMT in the near future, it is recommended to stop the RHAMT server to conserve memory on your machine.

Once execution is complete, the Issue Explorer will be populated with RHAMT issues.

4.3. REVIEW RHAMT ISSUES

Use the Issue Explorer to review migration issues identified by RHAMT. Different [icons](#) indicate the issue's severity and state.

Change how issues are grouped by adjusting the **Group By** selections: Severity, Migration Rule, and File.




Double-click the RHAMT issue in the Issue Explorer to open the associated line of code in an editor. Right-click and select **Issue Details** to view information about the RHAMT issue, including its severity and how to address it.

4.4. RESOLVE RHAMT ISSUES

You can resolve RHAMT issues by updating the code manually or by applying a quick fix when available.

4.4.1. Resolve an Issue Manually

Review the RHAMT issue details and additional resources and update the source code as necessary. When you update a line of code marked as an RHAMT issue, the RHAMT issue will be marked with the stale icon () until the next time that RHAMT is run on the project.

You can also manually mark an RHAMT issue as fixed, which will mark the issue with the resolved icon () until the next time that RHAMT is run on the project. To mark an issue as fixed, right-click the RHAMT issue in the Issue Explorer and select **Mark as Fixed**.

4.4.2. Resolve an Issue Using a Quick Fix

Some RHAMT issues provide a quick fix, which assists in making the necessary edits to address the issue. See the [icon legend](#) to see the icons that indicate the RHAMT issue has a quick fix available.

Preview a Quick Fix

Right-click the issue and select **Preview Quick Fix**. This will bring up a window that allows you to preview the change. From here, you can apply the fix or close the window.

Apply a Quick Fix

Right-click the issue and select **Apply Quick Fix**. This will update the source code as required and will mark the RHAMT issue as resolved.

CHAPTER 5. ADD CUSTOM RULES

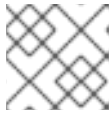
By default, the IDE Plugin comes with a core set of system rules for identifying migration and modernization issues. You can [browse the existing rules](#) from the IDE Plugin.

You can also create your own rules for identifying issues specific to your applications. You can either [import an existing custom ruleset](#) or [create a custom ruleset](#) directly in the IDE Plugin.

5.1. BROWSE RULES

You can view both system and custom rules from the IDE Plugin.

1. From the RHAMT perspective, open the **Rulesets** tab.
2. Expand the **System** item to view core system rules, or expand the **Custom** item to view custom rules.




NOTE

In order to view system rules, the RHAMT server must be started.

3. Expand the ruleset containing the rule you want to review.
4. Double-click the rule to open the rule in a viewer. You can select the **Source** tab to view the XML source of the rule.

5.2. IMPORT A CUSTOM RULESET

You can import an existing custom ruleset into the IDE Plugin to use during analysis of your projects.

1. From the RHAMT perspective, open the **Rulesets** tab.
2. Click the import ruleset icon ().
3. Browse to and select the XML rule file to import.



NOTE

The XML rule file must use the **.windup.xml** or **.rhamt.xml** extension in order to be recognized as an RHAMT rule.

4. The custom ruleset is now shown under the **Custom** item in the **Rulesets** tab.


This custom ruleset can now be selected in run configurations when analyzing projects.

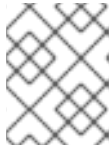
See the [Rules Development Guide](#) to learn more about creating custom XML rules.

5.3. CREATE A CUSTOM RULESET

You can create a new custom ruleset in the IDE Plugin to use during analysis of your projects.

1. From the RHAMT perspective, open the **Rulesets** tab.

2. Click the create ruleset icon ().
3. Select the project and directory to save the new ruleset in.
4. Enter the file name for the ruleset file.



NOTE

The XML rule file must use the **.windup.xml** or **.rhamt.xml** extension in order to be recognized as an RHAMT rule.


5. Enter a ruleset ID, for example, **my-ruleset-id**.
6. Optionally, check the **Generate quickstart template** checkbox to add basic rule templates to the ruleset file.
7. Select **Finish**.
8. The new ruleset file opens in an editor and you can add and edit rules in the file. You can also select the **Source** tab to edit the XML source for the ruleset file.

This new ruleset can now be selected in run configurations when analyzing projects.

See the [Rules Development Guide](#) to learn more about creating custom XML rules.

5.4. SUBMIT A CUSTOM RULESET

Once a custom ruleset has been created it can be submitted for inclusion within the official RHAMT rule repository. This allows your custom rules to be reviewed and included in subsequent releases of RHAMT, enhancing the applications and server configurations that RHAMT analyzes.









1. From the RHAMT perspective, open the **Rulesets** tab.
2. Click the dropdown icon ().
3. Click **Submit Ruleset** from the options that appear. This will launch a new page in your browser.
4. On the page that appears complete the following fields.
 - a. In the **Summary** field, enter in the purpose of the rule. This becomes the title of the submission.
 - b. In the **Code Sample** text field, enter an example of source code that the rule should run against.
 - c. Click **Choose Files** and navigate to the saved rule to attach it.
 - d. In the **Description** text field, enter in a brief description of the rule.
5. Once all information has been entered, click **Submit** to complete the submission.

APPENDIX A. REFERENCE MATERIAL

A.1. RHAMT ISSUE ICON LEGEND

In the Issue Explorer and file editors, RHAMT issues use an icon to indicate their severity level and status. The following table describes the meaning of the various icons.

Table A.1. RHAMT Issue Icons

Icon	Description
	The issue is mandatory to fix for a successful migration.
	The issue is optional to fix for migration.
	The issue may potentially be an issue during migration.
	The issue has been resolved.
	The issue is stale because the code marked as an issue has been modified since the last time that RHAMT was run on the project.
	A quick fix is available for this issue, which is mandatory to fix for a successful migration.
	A quick fix is available for this issue, which is optional to fix for migration.
	A quick fix is available for this issue, which may potentially be an issue during migration.

A.2. INSTALL JBOSS TOOLS INTO ECLIPSE

The IDE Plugin depends on JBoss Tools, and therefore these dependencies must be installed for RHAMT to function successfully. The following instructions detail installing JBoss Tools on an Eclipse installation.



NOTE

If you are using Red Hat CodeReady Studio, and not Eclipse, you do not need to install JBoss Tools separately.

Install JBoss Tools

1. From the menu bar, select **Help** → **Eclipse Marketplace**.

2. In the **Find** field, enter **JBoss Tools** and press **Enter** to search for the project.
3. Scroll down until you see **JBoss Tools** in the list and press **Install** next to this project.
4. Review the selected features and press **Confirm**. It is recommended to accept the defaults to install the required dependencies for RHAMT.
5. Ensure that the first radio button, **Keep my installation the same and modify the items being installed to be compatible**, is selected.
6. Review the selected packages and click **Confirm**.
7. Accept the terms of the license agreement and click **Finish**.
8. Click **Install anyway** to accept the certificates.
9. Click **Select all** to trust all of the specified certificates, and then click **Accept selected**.
10. Restart Eclipse for the changes to take effect.

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