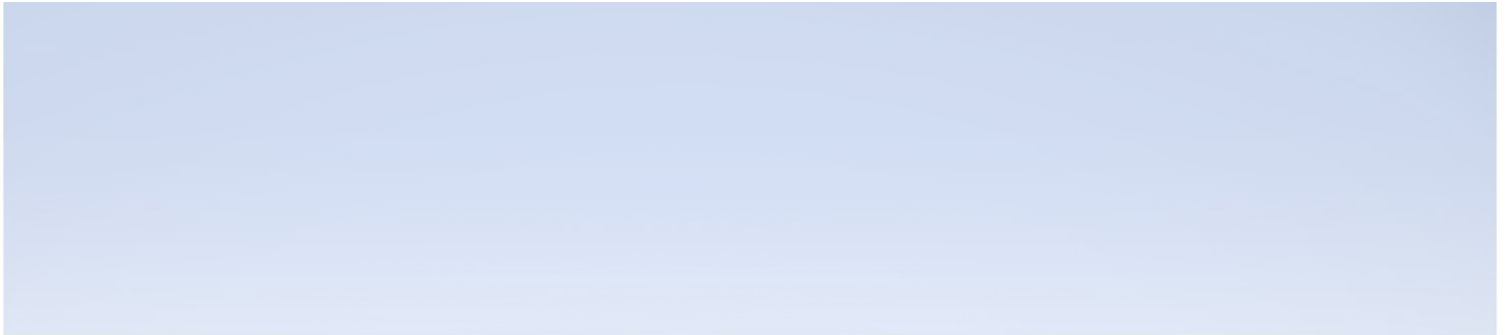**Hewlett Packard Enterprise**

Application Performance Management

Version 9.40, Released August 2017

RTSM Administration Guide

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Hewlett Packard Enterprise

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Contents

Part 1: Introduction

# Chapter 1: Run-time Service Model (RTSM)

This chapter includes:

RTSM Overview

The RTSM is the central repository for the configuration information that is gathered from the APM data collectors, the Data Flow Management (DFM) process, and the various third-party applications and tools.

The RTSM contains all the configuration items (CIs) and relationships created in HPE Application Performance Management (APM), whether created automatically from incoming data collector data or the DFM process, or created manually using IT Universe Manager. The CIs and relationships together represent a model of all the components of the IT Universe in which your business functions. The RTSM stores and handles the infrastructure data collected and updated by the various processes. (For more information about the DFM process, see the *HPE UCMDB Discovery and Integrations Content Guide*.)

The IT Universe model can be very large, containing millions of CIs. To facilitate their management, you work with the CIs in a view that provides a subset of the overall components in the IT Universe world.

You use factory views or views defined in the Modeling Studio to display and manage the CIs and relationships in the RTSM. The views enable you to focus on specific IT areas and are available via the CI Selector in different APM applications, such as Service Health and Service Level Management. An example of a view is shown in the following figure:
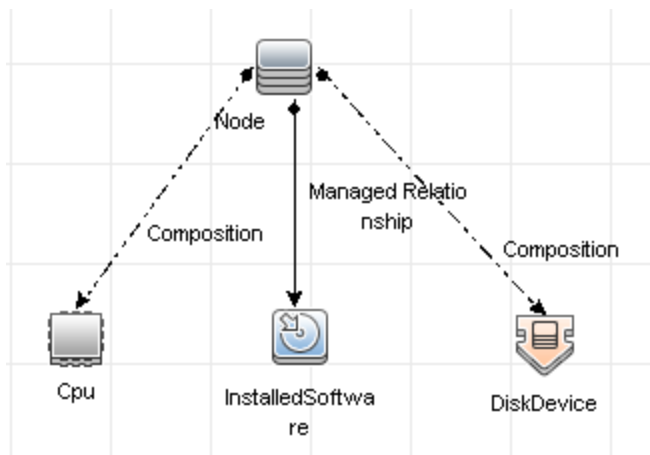
The RTSM also contains the TQL query definitions that are used to query and retrieve data from the RTSM for presentation in the views, and the configuration item type (CIT) model, a repository for the CI types used to define the CIs and relationships. For information on TQL queries, see Topology Query Language in the *RTSM Modeling Guide*.

In addition, the RTSM contains the object repositories for the various additional data added to CIs in Service Health and Service Level Management, such as KPIs, shortcut menus, and tooltips. For more information on these repositories, see Service Health in the APM Application Administration Guide.

> **Note:** To determine the RTSM version used in your APM:
>
> 1. In the APM application, click **Help > About**.
> 2. Click **The details of internal modules are available here** link. A list of the APM components and their version appears.
> 3. Locate the **Universal Configuration Management Database** component. This is the RTSM version used in your APM.

Configuration Items (CI)

A configuration item (CI) is a component of the RTSM that represents a physical or logical entity in the system, for example, hardware, software, services, business processes, and customers. The CIs are part of the IT Universe model in the RTSM, where they are organized into a hierarchical format based on the interdependencies in your organization's IT environment. The interdependencies in APM are called relationships.

Each CI belongs to a configuration item type (CIT). The CIT defines a category of CIs used in APM. The CITs provide templates for creating the CIs and associated properties in each category. You view and manage the CIs in the RTSM using views. Each view shines a spotlight on part of the IT Universe model.

For further details on working with CIs in APM, see "Working with CIs" in the *RTSM Modeling Guide*.

Query Nodes and Relationships

Query nodes are the components from which TQL queries are built in Enrichment Manager, Impact Analysis Manager, and the Modeling Studio. For details, see Creating TQL Queries in the RTSM Managers in the *RTSM Modeling Guide*.

Relationships are connections defined between CIs. Relationships are defined one at a time for each pair of query nodes in a TQL query. For details on working with relationships, see "Working with Relationships" in the *RTSM Modeling Guide*.

Configure RTSM Log Levels

This task describes how to specify the log level for RTSM log files.

1. On the RTSM server, launch the Web browser and enter the following address:
   http://localhost:21212/jmx-console.

   You may have to log in with a user name and password.
2. Click **UCMDB:service=Server Services** to open the JMX MBEAN View page.

3. Locate the **loggersLevels** method.

4. Click **Invoke**.

5. From the list next to each log file name for which you want to set the level, select the required log level (OFF, FATAL, ERROR, WARN, INFO, DEBUG, TRACE, or ALL).

6. Click **Update loggers**.

Download Zip File of Log Files and Thread Dumps

You can produce a zip file that includes all logs and thread dumps. You create the file either through a JMX operation on the client machine, or by running a batch file on the RTSM.

Thread dumps are created periodically: Once a minute, a thread dump snapshot is taken and is saved to a new file in the **<APM>\log\odb\threadDumps** folder. Thread dump files from the last hour are kept. This folder also holds the ad-hoc Server snapshots that are generated during the **logGrabber** execution.

To generate the zip file from the client machine:

1. Launch the Web browser and enter the server address, as follows: **http://<APM Server Host Name or IP>:21212/jmx-console**.

   You may have to log in with a user name and password.

2. Under UCMDB, click **UCMDB:service=Server services** to open the JMX MBEAN View page.

3. Locate the **executeLogGrabber** operation.

4. Click **Invoke**.

   A Server snapshot file with the name **LogGrabber_serverSnapshot_ <current date and time>.txt** is created in the following location: **<APM>\log\odb\threadDumps**. This is a thread dump that includes the threads of the Server framework only.

5. In the File Download dialog box, you can open the **logGrabber_<current time>.zip** file, or download it to the client machine.

Log Files

RTSMlog files enable you to perform basic troubleshooting of RTSM runtime problems. Additionally, by tracking the RTSM behavior in the log files, you can examine the effects of changes made in the system. The RTSM is composed of subsystems and each subsystem records to several log files.

Log files are located in the **<APM root directory>\log\odb** folder.

Quota Log Parameters

The log name is **cmdb.quota.log**.

Log File	Description
Purpose	Quota names, quota values, and current quota levels.
Information Level	Quota names and values set in the server and customer levels during a customer load.
Error Level	RTSM operations that fail because they exceed quota limits.

Log File	Description
Debug Level	A count collector runs every **n** minutes and gathers current counts for all quotas. Collected counts are logged.
Basic Troubleshooting	If operations fail because of quota limits, check the count growth and quota values.

CI Type Model Log

The log name is **cmdb.classmodel.log**.

Log File	Description
Purpose	CI Type Model errors and debug messages.
Information Level	When a CI Type Model is loaded, incorrect definitions are logged as informational messages. An example of an incorrect definition is `duplicate attributes`.
Error Level	Not available.
Debug Level	Every CI Type update includes the following: • original CIT in XML format • new CIT in XML format • differences between the CITs If the CI Type Model update is rejected, the reason is logged.
Basic Troubleshooting	Compares the differences that the server finds between the original CIT and the new CIT. This is useful to understand the following scenarios: • A CIT in a package failed • An action in the CIT browser applet failed • An action in the CIT browser applet succeeded when it should have failed

RTSM Notification Log

The log name is cmdb.notification.log.

Log File	Description
Purpose	Notification messages from the time of the component's creation in the RTSM until the client's listener receives a message. Most components receive configuration changes from the RTSM in push mode, by the notification mechanism, rather than in pull mode.
Information Level	• Startup and shutdown of publishers • Register and unregister remote and internal listeners
Error Level	• Errors when messages are published • Errors when messages are received

Log File	Description
Debug Level	• Unique message ID • Number of changes that a message includes as well as more details according to the type of the message (for example, the TQL result version) • JMS header properties
Basic Troubleshooting	If an application does not receive a notification, check whether: • A listener is registered with the appropriate notification filter • A message is published with data that matches this filter • A message is received by the listener (use the unique message ID to verify)

RTSM Model Audit Short Log

The log name is **cmdb.model.audit.short.log**.

Log File	Description
Purpose	Information about a CI Type operation: type of operation, data received as input, and what happened to the data in each CIT. Also contains information about the caller application, execution times, and persistency time.
Information Level	Operation details.
Error Level	Not available.
Debug Level	Not available.
Basic Troubleshooting	If there are no changes when there should be, check the following: • Whether the operation exists. • Whether the input is correct. • What happened to the data. There may have been a false update. This is especially useful when running DFM to trace the input.

RTSM Enrichment Log

The log name is **cmdb.enrichment.log**.

Log File	Description
Purpose	• Enrichment definitions: adding, updating, removing, and calculating. • Calculation results such as how many CIs were added, how many relationships were removed, and so forth. • Supplies the reason for a calculation failure. Failure in a model update, however, is not included since it is an asynchronous execution.

Log File	Description
Information Level	- Add, update, and remove enrichment definitions. - Add, update, and remove CIs or relationships to or from a model.
Error Level	Calculation failure.
Debug Level	Traces the enrichment calculation process.
Basic Troubleshooting	- If no calculation was carried out, check the definition of **add enrichment**. - If there are no results, check the **finish calculate** entry.

RTSM Plug-in Log

The log name is **cmdb.plugins.log**.

Log File	Description
Purpose	Plug-in input and output notification.
Information Level	Lifecycle of publisher.
Error Level	- No customer name exists in the customer ID - Publisher failure
Debug Level	Receive or send a change.
Basic Troubleshooting	If notification did not reach the destination, check that the plug-in received the input.

RTSM Dal Log

The log name is **cmdb.dal.log**.

Log File	Description
Purpose	Information about activity that occurred in the data access layer, the layer that works with the RTSM.
Information Level	Not available.
Error Level	- Connection pool errors - Database errors - Command execution errors
Debug Level	- All DAL commands executed - All SQL commands executed
Basic Troubleshooting	If you suspect that RTSM actions are taking too long, check the time spent on queries and updates in the DAL logs and operation logs. Exception details and ID are entered into the log. The exception ID appears in the exception itself.

RTSM Operation Statistics Log

The log name is **cmdb.operation.statistics.log**.

Log File	Description
Purpose	Statistics for all operations performed in the past 15 minutes including worst operation instances.
Information Level	Statistics per operation including operation class name, caller application, and customer ID. Default of 10 worst operation instances.
Error Level	Disables the statistics feature.
Debug Level	Not available.
Basic Troubleshooting	Check when there is a performance slowdown.

Configuration Log

The log name is **configuration.log**.

Log File	Description
Purpose	Contains basic environment details, including: • Server version and CUP version • Database vendor and version • Content pack version • High Availability configuration • Data Flow Probe version • Changes to settings (each setting is audited in the log)
Information Level	Information is written to the log when the system starts up or when a setting is changed.
Error Level	Not available.
Debug Level	Not available.
Basic Troubleshooting	Used by Customer Support to help reproduce customer problems.

Data Flow Management Log Files

Server log files store information about Server activity, including error messages, that occurs on the Server side.

mam.AutoDiscovery.log

Contains information about tasks running on the server. The server provides services to the user interface,

such as: activating jobs, processing results from the Probe, or creating tasks for the Probe. In a distributed environment, the file resides on the Data Processing server.

Level	Description
Error	All DFM process errors on the server side.
Information	Information about requests being processed.
Debug	Logs mainly for debugging purposes.

Basic Troubleshooting. Check this log when you have invalid user interface responses or errors you need to explore. This log provides information to enable you to analyze the problems.

discoveryServlet.log

This log receives messages from:

- **The Collectors Utilities Servlet.** The user interface connects to the server through this servlet.
- **The Collectors Servlet.** The Probe requests new tasks from the server through this servlet.
- **The Collectors Results Servlet.** The Probe sends new results through this servlet.
- **The Collectors Download Servlet.** The Probe downloads new server data through this servlet.

In a distributed environment, the file resides on the Gateway server.

Level	Description
Error	All errors in the servlet.
Information	Information about user requests and Probe task requests.
Debug	- User requests - Probe requests to read DFM tasks. - Probe access of the servlet.

Basic Troubleshooting

- User Interface – Server communication problems.
- Probe – Server communication problems.

Some processing problems may be written to this log instead of to **mamAutoDiscovery.log**.

mam.AutoDiscovery.Results.Stat.log

Contains the statistics of the results received from the Probe.

Log Severity Levels

Each log is set so that the information it records corresponds to a certain severity threshold. Because the various logs are used to keep track of different information, each is pre-set to an appropriate default level. For details on changing the log level, see "Changing Log Levels" on the next page.

Typical log levels are listed below from narrowest to widest scope:

- **Fatal.** The log records only events that prevent the system from functioning.

- **Error.** In addition to Fatal events, the log records events that adversely affect the immediate functioning of the RTSM. When a malfunction occurs, you can check if Error messages were logged and inspect their content to trace the source of the failure.

- **Warning.** The log's scope includes, in addition to Fatal and Error-level events, problems for which the RTSM is currently able to compensate and incidents that should be noted to prevent possible future malfunctions.

- **Info.** The log records all activity. Most of the information is normally routine and of little use and the log file quickly fills up.

- **Debug.** This level is used by HPE Software Support when troubleshooting problems.

> **Note:** The names of the different log levels may vary slightly on different servers and for different procedures. For example, **Info** may be referred to as **Always logged** or **Flow**.

Changing Log Levels

If requested by HPE Software Support, you may have to change the severity threshold level in a log, for example, to a debug level. For details on changing the log level, see "Log Configuration Dialog Box" on page 19.

RTSM User Interface

This section includes:

Annotation Tool

This tool enables you to annotate a snapshot of the screen you are viewing, to highlight important areas. It is available across all components of the system.

To access	Click the **Run Screen Capture Tool** button 📷 in the Status bar or select **Tools > Screen Capture** from the main menu.

Important information	- The annotation options are located on the left side of the annotation window.
	- When saving the annotation:
	   - The snapshot is saved in .png format.
	   - You cannot select the **New Folder** icon 📁 when saving in the **My Documents** directory or any of its subdirectories.

Annotation Options

The following user interface elements enable you to annotate your snapshot:

UI Element (A–Z)	Description
	Pan Tool. Click to navigate the snapshot.
	Select Tool. Click and drag to select a specific area of the snapshot.

	Shape Tool. Click and drag to add a shape to the snapshot. Clicking the shape tool button enables the following shape buttons:
	
	• **Rectangle.** Click and drag to mark an area of the snapshot with a rectangle.
	
	• **Filled Rectangle.** Click and drag to mark an area of the snapshot with a filled rectangle.
	
	• **Oval.** Click and drag to mark an area of the snapshot with an oval.
	
	• **Filled Oval.** Click and drag to mark an area of the snapshot with a filled oval.
	
	• **Rounded Rectangle.** Click and drag to mark an area of the snapshot with a round rectangle.
	
	• **Filled Rounded Rectangle.** Click and drag to mark an area of the snapshot with a filled round rectangle.
	
	Customization. After selecting this button, you can customize your line appearance through the following parts of the interface:
	
	• **Line Type.** Choose the type of line you want to add. Options include:
	   • Solid Line
	   • Jagged Line
	
	• **Line Width.** Select the width of the line, in pixels, in the annotation.

UI Element (A–Z)	Description

	Line Tool. Click and drag to enable the line tool, which marks the selected area of the snapshot with a line.
	
	Customization. After selecting this button, you can customize your line appearance through the following parts of the interface:
	
	• **Line Style.** Choose the style of line you want to add. Options include:
	  • Regular line
	  • Line with endpoints
	  • Line with arrows
	• **Line Type.** Choose the type of line you want to add. Options include:
	  • Solid Line
	  • Jagged Line
	• **Line Width.** Select the width of the line, in pixels, in the annotation.

	Text Tool. Click and drag to open a box where you can add text to the snapshot. **Example:** Add the syntax: `This is the problematic item` above a line marking an area of the snapshot.
Border and Fill Colors	Select the relevant square to choose the color of the border and fill of your annotations. The available squares are: • **Upper Square.** Click to choose the color of lines, as generated by the line tool and displayed in unfilled shapes. • **Lower Square.** Click to choose the color to fill shapes. Clicking either of the squares generates a dialog box with the following tabs where you choose the color: • Swatches • HSB • RGB
Opacity	Slide the opacity bar to choose the darkness level of the selected shape line, text line, or shape color in the annotation. **Note:** • A higher opacity percentage means that the selection appears darker. A lower opacity percentage means that the selection appears lighter. • This field is enabled when either the shape tool, line tool, or text tool button is selected.

Menu Bar

The following elements enable you to perform selected actions on your snapshot.

Important information	The menu bar contains elements which enable you to: • Change the appearance of the snapshot. • Customize the appearance of text annotated onto your snapshot. These elements are enabled only when the **Text Tool** button is selected.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Element (A–Z)	Description
	Save. Saves the snapshot on your local machine. **Note:** • The snapshot is saved in .png format. • You cannot select the **New Folder** icon when saving in the **My Documents** directory or any of its subdirectories.
	Select All. Selects all of the annotations added to your snapshot.
	Clear Selected. Clears all annotations.
	Undo. Rolls back the most recent action performed on the snapshot.
	Redo. Cancels the roll back of the most recent action performed on the snapshot.
	Zoom In. Brings the snapshot view closer.
	Zoom Out. Sets the snapshot view further away.
	Restore original size. Restores the snapshot to its original size.
	Print. Prints the snapshot.
	Bold. Bolds the text. **Note:** This field is enabled only when selecting the **Text Tool** button .
	Italic. Italicizes the text. **Note:** This field is enabled only when selecting the **Text Tool** button .
	Underline. Underlines the text. **Note:** This field is enabled only when selecting the **Text Tool** button .

UI Element (A–Z)	Description
A	**Anti-aliasing.** Adjusts the pixel reading of text or annotation lines so that they appear smoother. **Note:** This field is only enabled when selecting the **Text Tool** button [T] .
<Font Family>	Select the font for the text in the report. **Note:** This field is only enabled when selecting the **Text Tool** button [T] .
<Font Size>	Select the size of the font in the report. **Note:** This field is only enabled when selecting the **Text Tool** button [T] .

Log Configuration Dialog Box

This dialog box enables you to view RTSM logs and change the log level.

To access	In the Status bar, click **Log Level Configuration** .

User interface elements are described below:

UI Element	Description
Appender	The log appender of the selected log.
File	Click the link to open the log file in an editor.
Apply	Click to apply the selected log level to the log.
Loggers pane	An expandable list of RTSM logs. If you select the required log from the list, the details of the log appear in the lower pane.
Logger's appender	A string defining the log category. For internal use only.
Log level	Select a log level from the drop-down list.

Status Bar

This feature provides information on the RTSM application and enables you to configure certain aspects of your interface.

To access	Appears at the bottom of the screen on all pages in the RTSM.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Element	Description
Module	Indicates the manager currently selected. Click this item to display a page with descriptions for all of the managers.
User	Indicates the name of the current user. Click to display a balloon with the current user name and login time.
<Server status>	Indicates the current status of the server. Click to display a balloon with the server availability, time zone and time.
	Click **Configure User Preferences** to open the User Preferences dialog box, which enables you to reset system preferences.
	Click **Log Level Configuration** to open the Log Configuration dialog box, which enables you to set the log level for a selected log.
	Click **Run Screen Capture Tool** to take a screen capture of the application. The tool also enables you to annotate the screen capture, and save or print it. For details, see "Annotation Tool" on page 15.
Total heap size	Indicates the amount of memory that the application uses.
	Click **Run the Garbage Collector** to manually clean the memory (it runs automatically on a periodic basis).
	Click **Help on Status Bar** to access the APM Help.

Part 2: Administration

Chapter 2: Package Manager

This chapter includes:

Package Administration Overview

A package contains resources that are grouped together by defined criteria. For a list of the default resource types, see "Resource Types" on page 31.

Package Manager fulfills several functions:

- Enables the discovery of specific IT infrastructure assets. For example, APM deploys the SQL_Server package to discover Microsoft SQL servers.

- Enables you to define the CI Type model through the CI types that are included in the packages. For example, some of the CI types included in the Host_Resources_Basic package are File System, CPU, Process, and Print Queue.

- Enables you to move groups of resources from one system to another, for example, from a test to a production environment.

Package Types

There are two types of packages:

- **Factory package**. Contains resources that are deployed with the installation and are used to initialize APM.

  By default, factory packages are located in: **<APM root directory>\odb\conf\factory_packages** on the Data Processing server machine.

  > **Note:** Some of the factory packages that are deployed with the installation are not visible in the list of packages that appear in Package Manager. To display the hidden packages, right-click anywhere on the Package Manager page and select **Show Hidden Packages**.

- **Custom package**. A package that is user created. You may want to create a custom package if the factory packages do not contain the resources needed for the tool you are developing, or if you want to export resources from system to system. For details, see "Create Custom Package/Edit Package Wizard" on page 33.

  For example, you can use Package Manager to export APM configurations and data from one APM and import it to another.

  > **Caution:** If you create custom packages for the resources or tools you develop, do not place them in the **<APM root directory>\odb\conf\factory_packages** folder on the Data Processing server machine. This folder is only for factory packages.

Export and deployment of packages from system to system is performed through the Package Manager interface.

You can:

- Export some or all of a package's resources to your local directory. For details, see "Export a Package" on page 26.
- Deploy some or all of a package's resources to the RTSM from your local directory. For details, see "Deploy a Package" on page 25.

Package Locations

There are three pre-defined folders with out-of-the-box, automatically deployed packages under **<HPE APM root directory>\odb\content**:

- basic_packages
  Internal packages
- adapters
  Adapter packages
- CPx.zip
  Content Pack packages

There is an additional folder with packages relevant for APM located at **<HPE APM root directory>\odb\conf\factory_packages**.

Package Manager User Interface

Each package in the Package Manager User Interface includes the following:

- An **Icon** identifying the package as factory, hidden or user
- A **Package Name** representing the name of the .zip file (optional)
- The **Category** as allocated in the descriptor.xml file (optional)
- A **Readme** file that corresponds to the package (optional)
- A **Description** that corresponds to the description located in the descriptor.xml file

Package Zip File Contents and Format

A package's resources are stored in the RTSM. To export a package from system to system, you use the Package Manager interface (for details, see "Package Manager Page" on page 37). Package Manager creates a zip file containing the resources to enable the export of the resources.

When you export resources from the Package Manager to your local directory, the resource definitions are stored in various formats, for example, XML format.

In the sample **Network.zip** shown below, the **router.xml** file contains a Router CIT definition and the **Switch.xml** file contains a Switch CIT definition.
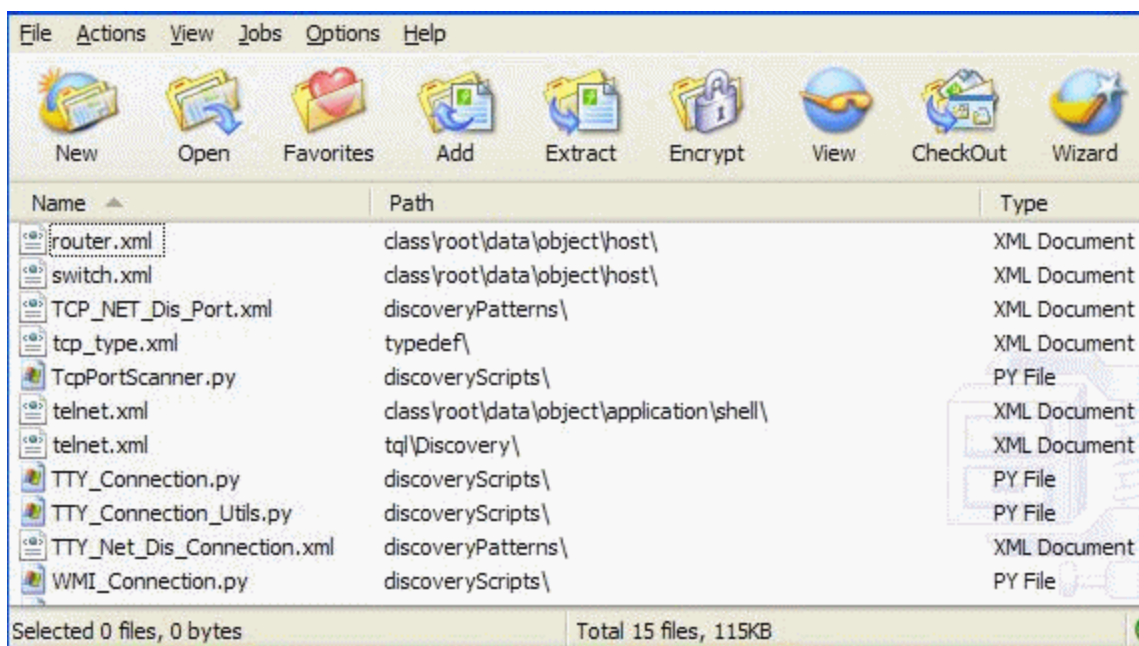
Packages for Integration Adapters

You deploy Integration adapters by creating a package and placing them in the appropriate folder. For details, see Add an Adapter for a New External Data Source in the *RTSM Developer Reference Guide*.

Create a Custom Package

When you create a new package, you give the package a unique name and description, and then select the resources you want included in the package. For details, see "Create Custom Package/Edit Package Wizard" on page 33.

Example of Resources Selected to Be Included in a Package:

The summary page in the Create Custom Package wizard displays the resources selected to be included in the package, as shown in the illustration below.

The package contains resources from the following resource groups:

- Relationships
- Valid Links
- Configuration Item Types

Selection Summary

View the resources to be included in the package.

Relationships:
applicationLink

Valid Links:
Service Desk Link: Siebel Application -> IT Incident

Configuration Item Types:
Business Service View

Deploy a Package

You can deploy some or all of a package's resources to the RTSM from your local directory. The package must be on your local directory in order to deploy its resources.

To deploy resources from packages on your local directory:

1. Click the ✛ button to open the Deploy Packages to Server dialog box.

2. Click the ✚ button to open the Deploy Packages to Server (from local disk) dialog box.

3. Select a package zip file and click **Open**. The package appears in the upper pane of the dialog box and its resources appear in the lower pane.

4. Select the resources from the package that you want to deploy. All the resources are selected by default.

5. Optionally, select another package zip file and select the relevant resources to deploy.

6. When you have selected all the resources you want to deploy from each selected package, click **Deploy**.

7. A status report appears indicating whether the deployment was successful for each resource selected.

Example of Deploying Only Specific Resources in a Package:

You want to deploy only some of the resources contained in the package called **ticket2.zip**. Click the ✛ button. In the Deploy Packages to Server dialog box, click the ✚ button, browse to the package's location and select the resources from the package you want to deploy. See the following illustration:
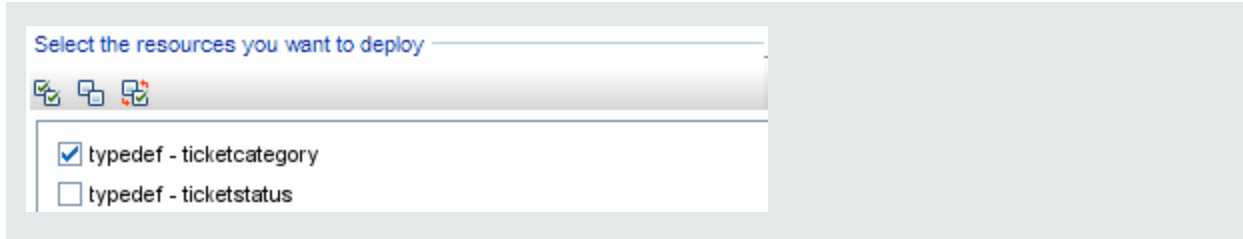
Deploying SiteScope Monitor without Monitored CIs View

A new view is available in RTSM that enables you to view SiteScope monitors that do not have related CIs.

To enable this new view, redeploy the SiteScope package via the Package Manager. However, due to a limitation in which deploying a package via the Package Manager can cause a mismatch between the old and new topology scripts in SiteScope, deploy only the following two files:

- cmdbview – SiteScope Monitor without Monitored CIs
- tql – SiteScope Monitor without Monitored CIs

To deploy the SiteScope Monitor without Monitored CIs View:

1. In APM, select **Admin > RTSM Administration**.
2. Click the **Administration** tab.
3. Click **Package Manager**.
4. Click **Deploy Packages to Server** .
5. Click **Add** .
6. Browse to **HPBSM\odb\conf\factory_packages** and select **sitescope.zip**.
7. Click **Open**.
8. Click the **sitescope.zip** file.
9. Select the following files:
   - **cmdbview – SiteScope Monitor without Monitored CIs**
   - **tql – SiteScope Monitor without Monitored CIs**
10. Click **Deploy**.

Export a Package

You can export some or all of a package's resources to your local directory. For details, see "Package Manager Page" on page 37.

Example of Exporting Only Specific Resources in a Package:

You want to export only some of the resources contained in a package called **ticket2.zip** to your local directory. Click the

 button. In the Export Package dialog box, select the **Export Resources** option and select the resources you want to export. See the following illustration:
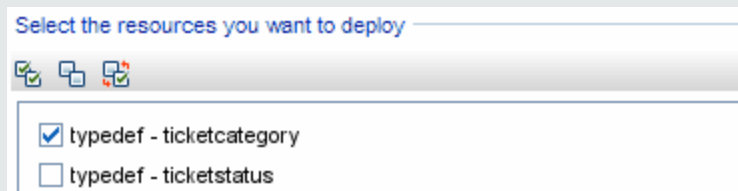
Use the JMX Console to Perform Package Manager Tasks

This section describes the Package Manager tasks you can perform using the JMX console.

Note:

- It is recommended that you use the Package Manager to perform these tasks instead of the JMX console.
- View Package Deployment History cannot be performed by the Package Manager.

This section includes the following tasks:

- "Deploy a Package" below
- "View Package Deployment History" on the next page
- "Undeploy a Package" on the next page
- "Display Currently Deployed Packages" on the next page
- "Export Packages" on the next page
- "Package Name Rules" on page 29

Deploy a Package

To deploy a package using the JMX console.

1. Launch your Web browser and enter the following address: **http://<server_name>:21212/jmx-console**, where **<server_name>** is the name of the machine on which APM is installed.

2. Under **UCMDB**, click **UCMDB:service=Packaging Services** to open the JMX MBEAN View page.

3. Locate **deployPackages**.

4. In the **Value** box for the parameter **customerID**, enter the <customer id>.

5. In the **Value** box for the parameter **dir**, enter the name of the folder that contains the package's zip file. Ensure that you include the full path to the folder.

   Note: To deploy the package from the **basic_packages** directory, leave this box empty.

6. In the **Value** box for the parameter **packagesNames**, enter the name of the packages. For details, see "Package Name Rules" on page 29.

7. Select **True** to override DFM job configurations changed in DFM. For details, see Advanced Mode

Window in the *RTSM Data Flow Management Guide*.

8. Click **Invoke** to deploy the package.

View Package Deployment History

Each time you deploy packages, a report is created displaying the deployment status of those packages. Use the JMX console to view the deployment status report.

1. Launch the Web browser and navigate to: **http://<server_name>:21212/jmx-console**, where **<server_name>** is the name of the machine on which APM is installed.

2. Under **UCMDB**, click **UCMDB:service=Packaging Services** to open the JMX MBEAN View page.

3. Locate **displayResourcesDeploymentHistory.**

4. In the **Value** box for the parameter **customerId**, enter the <customer id>.

5. In the **Value** box for the parameter **reportNum**, enter the number of the report you want to view.

6. Click **Invoke** to view the deployment status report of the packages.

Undeploy a Package

To undeploy a package using the JMX console.

1. Launch the Web browser and navigate to: **http://<server_name>:21212/jmx-console**, where **<server_name>** is the name of the machine on which APM is installed.

2. Under **UCMDB**, click **UCMDB:service=Packaging Services** to open the JMX MBEAN View page.

3. Locate **undeployPackages**.

4. In the **Value** box for the parameter **customerId**, enter the <customer id>.

5. In the **Value** box for the parameter **packagesNames**, enter the name of the package you want to remove. For details, see "Package Name Rules" on the next page.

6. Click **Invoke** to undeploy the package.

Display Currently Deployed Packages

To display currently deployed packages using the JMX console.

1. Launch the Web browser and navigate to: **http://<server_name>:21212/jmx-console**, where **<server_name>** is the name of the machine on which APM is installed.

2. Under **UCMDB**, click **UCMDB:service=Packaging Services** to open the JMX MBEAN View page.

3. Locate **displayDeployedPackages.**

4. In the **Value** box for the parameter **customerId**, enter the <customer id>.

5. In the **Value** box for the parameter **packagesNames**, specify the names of the packages you want to display. For details, see "Package Name Rules" on the next page.

6. Click **Invoke** to display the packages that are currently deployed.

Export Packages

To export resources from the RTSM to the server on which APM is installed using the JMX console.

1. Launch the Web browser and navigate to: **http://<server_name>:21212/jmx-console**, where **<server_name>** is the name of the machine on which APM is installed.

2. Under **UCMDB**, click **UCMDB:service=Packaging Services** to open the JMX MBEAN View page.

3. Locate **exportPackages**.

4. In the **Value** box for the parameter **customerId**, enter the <customer id>.

5. In the **Value** box for the parameter **packagesName**, enter the name of the package you want to export. For details, see "Package Name Rules" below.

6. In the **Value** box for the parameter **outputDir**, enter the name of the folder on the APMserver to which you want to export the package's zip file. Ensure that you include the full path to the folder.

7. In the **Value** box for the parameter **userOnly**, select one of the following:

   - **True**. Export only the custom packages.

   - **False**. Export both custom and factory packages.

8. Click **Invoke** to export the package.

Package Name Rules

The rules for entering a package name are as follows:

- Wildcard characters (*) are not supported.
- The package name is case sensitive.
- The package name must have a **.zip** extension.
- When deploying more than one package, separate the package names by commas.

Package Resources

This section contains a list of the resources a package can contain. For a list of the available resource types and their descriptions, see "Resource Types" on page 31.

- **acl**. The definition of a role such as Administrator or Guest. For details, see "User Management" in the *Platform Administration*.
- **adapter**. Contains a description and the capabilities of the deployed federated adapter.
- **adapterCode.** Contains compiled classes (normally a jar), based-on *.jar files, and configuration files needed for federated adapters. Place these files in the **adapterCode\<adapter ID>** folder in the zip package. For details, see Add an Adapter for a New External Data Source in the *RTSM Developer Reference Guide*.
- **calculatedlinks**. Contains the calculated super class for each of the calculated links defined.
- **calculatedlinkstriplets**. Contains the calculated relationships and their triplets as defined in the CI Type Manager.
- **categories**. Contains the State definitions used by Impact Analysis. For details on States, see "State Manager" on page 42. For details on Impact Analysis, see Impact Analysis Manager in the *RTSM Modeling Guide*.
- **class.** CI type descriptions, such as host, file, switch, and so on. For details, see CI Type Manager in the *RTSM Modeling Guide*.
- **cmdbview**. Contains the hierarchy rules defined for the base TQL query of each view. For details, see Modeling Studio in the *RTSM Modeling Guide*.
- **correlation**. Impact rule definitions. For details, see Impact Analysis Manager in the *RTSM Modeling Guide*.
- **datamodel.** Used to import CI instances into the system. If the CI does not exist in the RTSM, an instance of the CI is created. If a CI already exists in the RTSM, the values of the CI from the package resource overwrite the values of the CI in the RTSM.

- **datamodelcreateonly**. Used to import CI instances into the system. If the CI does not exist in the RTSM, an instance of the CI is created. If a CI already exists in the RTSM, the values of the CI from the package resource do not overwrite the values of the CI in the RTSM.

- **datamodelgenerateids**. Used to import CI instances into the system for CITs that require the ID to be calculated dynamically upon deployment (such as CITs with no key attributes).

- **dataStore**. Contains the integration point defintion.

- **discoveryConfigFiles**. Configuration files include properties and parameters that are needed to discover components on the system. For details, see Adapter Management in the *RTSM Data Flow Management Guide*.

- **discoveryJobs**. A Data Flow Management (DFM) job includes configuration data, scheduling information, and TQL assignments needed to activate discovery of components. For details, see Discovery Control Panel in the *RTSM Data Flow Management Guide*.

- **discoveryModules**. A DFM module includes all the jobs needed to discover a specific component in the system. For details, see Discovery Control Panel in the *RTSM Data Flow Management Guide*.

- **discoveryPatterns**. DFM adapters define which code to run and in which order, declare the input and output CI Types and parameters to be configurable on the DFM jobs related to them. The adapater can be used as an integration adapter or a Discovery adapter. For details, see Adapter Management in the *RTSM Data Flow Management Guide*.

- **discoveryResources**. External resources include all external resources that are needed in DFM, for example, a Visual Basic file, an additional jars file, and so on. For details, see Adapter Management in the *RTSM Data Flow Management Guide*.

- **discoveryScripts**. DFM Jython scripts populates the RTSM with data, either by performing Discovery on a network component or during integration with an external data repository. For details, see Adapter Management in the *RTSM Data Flow Management Guide*.

- **discoveryWizard**. Used to define the Discovery Wizard dialog box contents. For details, see Discovery Control Panel in the *RTSM Data Flow Management Guide*.

- **enrichment**. Enrichment rule definitions. For details, see Enrichment Manager in the *RTSM Modeling Guide*.

- **identification**. Contains the identification defintion of a specific CI type.

- **integrationUsers**. Used to define a user of type integration.

- **modelnotification**. Contains filter definitions for RTSM model notifications. The data model notification system gives notification of changes that occurred in the RTSM. For example, items in the RTSM that have been removed, updated, or added.

- **report**. Report rule definitions, as described in Topology Reports Overview in the *RTSM Modeling Guide*.

- **schedulerJob.** Tasks that have been defined to run in the Scheduler. For details, see "Scheduler" on page 44.

- **singletqlref**. Contains TQL template and perspective instances. For details, see Modeling Studio in the *RTSM Modeling Guide*.

- **tql**. TQL query definitions. For details, see Topology Query Language (TQL) Overview in the *RTSM Modeling Guide*.

- **typedef**. Predefined Enumeration definitions that relate to attributes of type Enumeration, such as severity levels, admin states, and so on. For details, see System Type Manager in the *RTSM Modeling Guide*.

- **users.** Defines user management roles. For details, see "Roles" in the Platform Administration.

- **validlinks.** All predefined, valid connections (relationships) between CITs.

Resource Types

This section contains a list of the available resource types and their descriptions. For a list of the resources a package can contain, see "Package Resources" on page 29.

Model

- **Configuration Item Types**. The CITs defined in the CI Type Manager. For details, see CI Types Overview in the *RTSM Modeling Guide*.
- **Identifications**. The configuration files containing the identification rules for CIs. For details, see Identification Configuration in the *RTSM Data Flow Management Guide*.
- **Relationships**. The relationships defined in the CI Type Manager. For details, see CI Type Relationships in the *RTSM Modeling Guide*.
- **Calculated Relationships**. Contains the calculated relationships and their triplets as defined in the CI Type Manager.
- **Valid Links**. All possible predefined valid connections (relationships) between the CITs that are defined in the CIT folder.
- **Service Models**. The pattern-based models defined in the Modeling Studio that were not defined over an existing model. For details, see "Pattern-based Models" in the *RTSM Modeling Guide*.

Query

- **Queries**. The TQL queries defined in the TQL Editor in the Modeling Studio. For details, see Topology Query Language in the *RTSM Modeling Guide*.
- **Views**. The views defined in the View Editor in the Modeling Studio. For details, see View Formats in the *RTSM Modeling Guide*.
- **Enrichments**. The Enrichment rules defined in the Enrichment Manager. For details, see Enrichment Manager in the *RTSM Modeling Guide*.
- **Impact Rules**. The Impact Analysis rules. For details, see Impact Analysis Manager in the *RTSM Modeling Guide*.

Settings

- **Type Definitions**. Predefined Enumeration definitions that relate to attributes of enumeration type, such as severity levels, admin states, and so on. For details, see System Type Manager in the *RTSM Modeling Guide*.
- **Job Scheduler**. Tasks that have been defined to run in the Scheduler. For details, see "Scheduler" on page 44.
- **Users**. The definition of user management roles. For details, see "Roles" in the Platform Administration.
- **State Categories**. The states defined in the State Manager. For details, see "State Manager" on page 42.
- **Integration Users**. Enables external applications such as APM, Release Control, and so on, to consume the UCMDB Java API (SDK), to communicate with UCMDBRTSM. Integration users should be deployed via packages and do not appear in the list of users.

Discovery

- **Adapters**. DFM adapters define which scripts need to be run and in which order, declare the input and output CI Types and the parameters to be configurable on the Discovery jobs related to them. For details, see Adapter Management in the *RTSM Data Flow Management Guide*.

- **Discovery Documents.** A Discovery document is a customized document describing the usage and functionality of a specific package. For details, see Attach Discovery Documentation to a Discovery Package in the *RTSM Data Flow Management Guide*.

- **Discovery Modules.** A Discovery module includes all the jobs needed to discover a specific component on the system. For details, see Discovery Modules Pane in the *RTSM Data Flow Management Guide*.

- **Discovery Jobs**. A Discovery job includes configuration data, scheduling information, and TQL assignments needed to activate discovery of components. For details, see Discovery Control Panel in the *RTSM Data Flow Management Guide*.

- **Discovery Configuration Files**. Configuration files include properties and parameters that are needed to discover components on the system. For details, see Resource Files in the *RTSM Data Flow Management Guide*.

- **Discovery Jython Script**. Discovery Jython Scripts are Jython scripts used by the discovery process to discover and map the various network entities.

- **Discovery External Resource**. Includes resources not used by the Data Flow Probe directly, but rather indirectly by the DFM scripts. It can contain binary executable files or DLLs, XML configuration files, or any other essential resource needed for the discovery to function properly. For details, see Adapter Management in the *RTSM Data Flow Management Guide*.

- **Discovery Wizard Resource**. Used to define the Discovery Wizard dialog box contents. For details, see Basic Mode Window in the *RTSM Data Flow Management Guide*.

Package Manager User Interface

This section includes (in alphabetical order):

Choose Resources to Export Dialog Box

This dialog box enables you to export an entire package or specific resources to your local directory.

To access	Select the **Export resources** button in the Export Package dialog box.

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Element	Description
\<List of resources \>	Displays the list of resources contained in the package. Select the resources you want to export to your local directory.

Create Custom Package/Edit Package Wizard

This wizard enables you to create a package using existing resources or edit an existing package.

To access	Click the **Create Custom Package** 🔆 button on the Package Manager page to create a new package or Select a package and click the **Edit Package** ✏️ button to edit an existing package.
Important information	When editing an existing package, this feature is not a wizard, but a dialog box. The dialog box contains two tabs: the Package Properties tab and the Resource Selection tab.
Relevant tasks	"Create a Custom Package" on page 24
Wizard map	The Create Custom Package/Edit Package Wizard contains: Package Properties Page > Resource Selection Page > "Selection Summary Page"

Package Properties Page

This wizard page enables you to define the properties of the package.

Wizard map	The Create Custom Package/Edit Package Wizard contains: **Package Properties Page** > Resource Selection Page > "Selection Summary Page"

User interface elements are described below:

UI Element (A-Z)	Description
Factory package	Indicates a default package that is deployed with the installation. **Note:** This check box is always disabled.
Hidden package	Indicates a package that is deployed with the installation but is not visible in the list of packages that appear in the Package Manager page. **Notes:** • This check box is always disabled. • To display the hidden packages, right-click anywhere in the Package Manager page and select **Show Hidden Packages**.
Package Category	A free text box for any notes you want to associate with the package.

UI Element (A-Z)	Description
Package Description	A description of the package.
Package Name	The name of the package.

Resource Selection Page

This wizard page enables you to add the required resources to the package. Select the required resources from the various resource types.

Important information	You can make multiple selections from each resource type.
Wizard map	The Create Custom Package/Edit Package Wizard contains:
	Package Properties Page > **Resource Selection Page** > "Selection Summary Page"

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Element (A-Z)	Description
✔	Appears in the left pane. Indicates that a resource has been added to the package.
−	Appears in the left pane. Indicates that no resource has been added to the package.
<Resource types in the left pane>	Contains the resource types from which you can choose the required resources to add to the package.
	For details of a list of the available resource types and their descriptions, see "Resource Types" on page 31.
	Note: A green dot appears on the resource type icon in the right pane, when one or more of its resources are selected to be included in the package.

UI Element (A-Z)	Description
<Resources in the right pane>	Select the resources you want to add to the package. You can select multiple resources. **Notes**: • A green check appears to the right of a Configuration Item Types, Relationships, or Calculated Relationships when one or more of its children in the resource tree are included in the package. • A folder's check box has a ▣ when only some of its resources are included in the package. (This does not apply to Configuration Item Types, Relationships, or Calculated Relationships.) • A folder's check box is selected when all its resources are included in the package. (This does not apply to Configuration Item Types, Relationships, or Calculated Relationships.) **Important information**: To add a calculated relationship to the package, select either the required calculated relationship together with one or more of its triplets, or the required triplets without selecting the calculated relationship itself. • If you select only specified triplets and not the calculated relationship, the triplets are added only if you already have an existing calculated relationship in the system. • If you select a calculated relationship together with one or more of its triplets, the property definitions of the calculated relationship are included in the package. If you already have a calculated relationship in the system, the property definitions of the existing calculated relationship are updated with the properties of the calculated relationship you are adding to the package. For details on triplets, see Triplets Page in the *RTSM Modeling Guide*.

Export Package Dialog Box

This dialog box enables you to export the selected package's resources to your local directory.

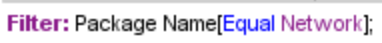|	
To access	Click the **Export Package to Local Directory** button 🗜 on the Package Manager page.
Important information	You can choose to export some or all the resources in the package.

User interface elements are described below:

UI Element (A-Z)	Description
Export to directory	Select the directory to which you want to export the resources.
Export resources	Export only some of the package's resources to your local directory. Opens the Choose Resources to Export dialog box.

UI Element (A-Z)	Description
Export whole package	Export all the resources in the package to your local directory.
File name	The name of the package. **Note**: The package name cannot be edited.

Filter Dialog Box

This dialog box enables you to display only specific packages on the Package Manager page.

To access	Click the **Filter** 🔻 button on the Package Manager page.
Important information	A description of the filter condition you defined appears above the table columns on the Package Manager page. For example, the following illustration shows that a filter condition was created to display a package called **Network**. **Filter:** Package Name[Equal Network];

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Element (A-Z)	Description
<Click a column header>	For details, see Sort Column Content Dialog Box in the *RTSM Modeling Guide*.
<Right-click a column header>	For details, see Sort Column Content Dialog Box in the *RTSM Modeling Guide*.
Condition	Click inside the box and select the required operator. For details, see Attribute Operator Definitions in the *RTSM Modeling Guide*.
Display Name	Filter the task list according to one of the following: • **Package name** • **Category** • **Readme** • **Version** • **Description** For details, see "Package Manager Page" on the next page.
Value	Click inside the box and enter the required value. **Note:** When using the **Like** or **Like ignore case** operators, include the wildcard (%) in the search value.

Find Dialog Box

This dialog box enables you to find a package that contains a specified resource.

To access	Click the **Find** 🔍 button on the Package Manager page.
See also	"Resource Types" on page 31

User interface elements are described below:

UI Element (A-Z)	Description
Case sensitive	Distinguish between uppercase and lowercase characters. When you select **Case sensitive**, search results find only those instances in which the capitalization matches the text you typed in the **Resource name** box.
Resource name	Enter a word or phrase contained in the resource for which you are looking.
Search Results	The search results. Displays the names of up to 30 resources containing the text entered in the **Resource name** box.
Topic	The subsysytem containing the resource you want the package to contain. For details, see "Resource Types" on page 31.

Package Manager Page

This page enables you to create a package out of existing resources or edit an existing package to suit your IT management needs.

To access	Select **Admin > RTSM Administration > Administration > Package Manager**.
Important information	This section discusses APM-specific content packs only. For information about the HPE Universal CMDB Discovery and Integration Content Pack, see **Admin > RTSM Administration > Administration > Package Manager**.
See also	"Package Administration Overview" on page 22

User interface elements are described below:

UI Element (A-Z)	Description
✳	Enables you to create a package out of existing resources. Opens the Create Custom Package Wizard. For details, see "Create a Custom Package" on page 24.
✏	Enables you to edit an existing package. Opens the Edit Package Wizard.
✖	Deletes a package from the Package Manager while the resources from the package remain in the system. The package that is deleted is removed from the list of packages on the Package Manager page.
🔍	View the resources included in the selected package. Opens the View package resources dialog box.

UI Element (A-Z)	Description
	Generate a report displaying a list of the packages that are deployed in the system. Choose the export format for the table data. The available options are: • **Excel**. The table data is formatted as an **.xls** (Excel) file that can be displayed in a spreadsheet. • **PDF.** The table data is exported in PDF format. **Note:** When exporting to PDF, select a reasonable number of columns to display to ensure that the report is legible. • **CSV.** The table data is formatted as a comma-separated values (CSV) text file that can be displayed in a spreadsheet. **Note:** For the CSV formatted table data to display correctly, the comma (,) must be defined as the list separator. In Windows, to verify or modify the list separator value, open Regional Options from the Control Panel, and on the Numbers tab ensure that the comma is defined as the List Separator value. In Linux, you can specify the list separator in the application that opens the CSV file. • **XML.** The table data is formatted as an XML file that can be opened in a text or XML editor. **Tip:** To extract HTML code from the report: • Save the file as HTML • Open the file in an HTML editor • Copy the relevant table into the target file
	Deploys a package's resources to the RTSM from your local directory. In the upper pane, click the ➕ button to open the Deploy Packages to Server dialog box. Browse to the required package. The resources from that package appear in the lower pane of the dialog box. Select the resources that you want to deploy. **Note**: When deployment is finished and it is not successful, a Deploy Package dialog box is displayed indicating which resources within the package are not successfully deployed.
	Deletes the resources from the system and removes them from the selected package. Opens the Undeploy Package Resource Wizard.
	Exports some or all of the package's resources to your local directory. Opens the Export Package dialog box.
	Finds a package that contains a specified resource. Opens the Find dialog box.
	Update the contents of the table.
	Click to view the version number of the current installed Content Pack and install the latest Discovery and Integration Content Pack. This button is enabled from Content Pack 7.00 onwards.
	Opens the Filter dialog box. You use the Filter dialog box to show only the packages you want displayed on the Package Manager page.

UI Element (A-Z)	Description
🗙	Clear the filter definitions you created in the Filter dialog box. This is enabled only if filter definitions were created.
🖱	Click the **Customize Columns** button to open the Select Columns dialog box and change the display order of the columns, hide a column, or display a hidden column. For details on the Select Columns dialog box, see Select Columns Dialog Box in the *RTSM Modeling Guide*.
▢	Represents a factory package.
¢/ə	Represents a hidden package.
📦	Represents a custom package.
Category	The free text you want to associate with the package, as displayed in the Package Properties page of the Create Custom Package Wizard.
Description	The description of the package, as displayed in the Package Properties page of the Create Custom Package Wizard.
Package Name	The name of the package.
Readme	Click to read a description of the package, as well as other relevant information.
Version	The version of the package.

Shortcut Menu

Menu Item	Description
Delete	Deletes a package from the Package Manager while the resources from the package remain in the system. The package that is deleted is removed from the list of packages on the Package Manager page.
Edit	Edit the selected package. Opens the Edit Package Wizard.
Export Package	Exports some or all of the package's resources to your local directory. Opens the Export Package dialog box.
Show hidden packages	Toggle between displaying and hiding hidden packages.
Undeploy	Deletes the resources from the system and removes them from the selected package. Opens the Undeploy Package Resource Wizard.
View package resources	View the resources included in the selected package. Opens the View package resources dialog box.

Undeploy Package Resource Wizard

This wizard deletes the resources from the system and removes them from the selected package.

To access	Click the **Undeploy resources** 🔧 button on the Package Manager page.
Important information	When you undeploy a package, the resources are removed from the system, and from the other packages that contain that resource. You can restore the resources only when a package containing those resources is deployed.
Wizard map	The Undeploy Package Resource Wizard contains: Remove Resources Page > Selection Summary Page

Remove Resources Page

This wizard page enables you to select the resources you want to delete.

Important information	If you delete all the resources from the package, the package is automatically deleted and removed from the list of packages on the Package Manager page.
Wizard map	The Undeploy Package Resource Wizard contains: **Remove Resources Page** > Selection Summary Page

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Element	Description
<List of resources contained in the selected package>	Displays the resources contained in the selected package. Select the resources you want to delete from the system.

Selection Summary Page

This wizard page enables you to view the resources you selected to be deleted.

Important information	When undeployment is finished and it is not successful, an Undeploy Package dialog box is displayed indicating which resources within the package are not successfully undeployed.
Wizard map	The Undeploy Package Resource Wizard contains: Remove Resources Page > **Selection Summary Page**

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Element	Description
<List of deleted resources>	Displays the resources that were selected to be deleted from the package.

Troubleshooting and Limitations

This section describes some of the troubleshooting issues that might arise when deploying and undeploying packages.

This section includes the following topics:

- "Datamodel Resources Cannot Be Undeployed" below
- "Additional Information on Package Deployment Failure" below
- "Package Creation and Deployment in a Non-English Locale" below

Datamodel Resources Cannot Be Undeployed

For a list of the package resources, see "Package Resources" on page 29.

Additional Information on Package Deployment Failure

If package deployment fails, you can check the Package Manager log files for additional information on why the deployment failure occurred.

Log files are located in the **<APM root directory>\odb\conf** folder.

Package Creation and Deployment in a Non-English Locale

This section describes the limitations when working in a non-English locale.

- You cannot deploy a package if the server locale is different than the client locale and the package name contains non-English characters.
- You cannot create a package that contains resources (for example, views and TQL queries) having non-English characters in their names, if the server locale is different from the client locale.

Chapter 3: State Manager

This chapter includes:

State Manager Overview

A state is based on a severity list called an Enumeration definition.

States are necessary for retrieving Impact Analysis results in IT Universe Manager. For details, see "IT Universe Manager" in the RTSM Modeling Guide.

To retrieve Impact Analysis results, you must create an Impact Analysis rule in Impact Analysis Manager, which is based on the Operation state. For details, see "Impact Analysis Manager" in the RTSM Modeling Guide.

State Manager contains two default states – Change and Operation. Each one is based on its own severity list.

You can use only the Operation state to retrieve Impact Analysis results in IT Universe Manager.

> **Note:** It is not recommended to define states without first consulting HPE Software Support.

Define a State

1. Click the **Add state** ⊕ button and enter a unique name and description for the state.
2. Click inside the **Type Definition** column to select the required Enumeration definition. The Type Definition list displays the Enumeration definitions that are defined in System Type Manager. For details, see "System Type Manager Dialog Box" in the *RTSM Modeling Guide*.
3. (Optional) You can create a new Enumeration definition by clicking the **New Enumeration** button. For details, see "State Manager Page" on the next page.

> **Note:** Only the Enumeration definitions whose list of key values begins with zero (0) appear in the State Manager.

Alternatively, you can create an Enumeration definition in System Type Manager. The Enumeration definition you create in System Type Manager appears in State Manager.

State Manager User Interface

This section includes:

State Manager Page

This page enables you to create a state based on a severity list (Enumeration definition).

To access	Select **Admin > RTSM Administration > Administration > State Manager.**
Important information	• The **change** and **operation** states are default states that cannot be edited. • It is recommended to consult with HPE Software Support before defining a state.
Relevant tasks	"Define a State" on the previous page
See also	Create an Enumeration Definition – Workflow in the RTSM Modeling Guide.

User interface elements are described below:

UI Element (A-Z)	Description
✚	Add a state.
✖	Delete a state.
Apply	Save the changes you have made.
New Enumeration	Creates an Enumeration definition. Opens the Create Enumeration Definition dialog box. For details, see "Create/Update List/Enumeration Definition Dialog Box" in the RTSM Modeling Guide. The Enumeration definition you have created appears in the System Type Manager dialog box, where you can edit it if required (for details, see "System Type Manager Dialog Box" in the RTSM Modeling Guide.
Description	(Optional) Click in the box and enter a description of the state.
Name	Click in the box and enter a unique name for the state.
Type Definition	Click in the box to display a list of the Enumeration definitions. **Note**: The **Type Definition** list only displays the Enumeration definitions whose list of key values begins with zero (0) (and not List definitions) that are defined in the System Type Manager.

Chapter 4: Scheduler

This chapter includes:

Define Tasks That Are Activated on a Periodic Basis

This task describes how to run jobs on a periodic basis.

This section includes the following tasks:

- "Create a Job Definition" below
- "Choose an Action" below
- "Schedule a Task" below

1. **Create a Job Definition**

   Define a job definition. Add actions to the job you created and define how often they run. The Job Definition dialog box displays the tasks that are defined. For details, see "Job Definition Dialog Box" on page 47.

   Example of a Job Definition

   The illustration below shows that an Enrichment rule is set to run every week on Sunday at 7:30 AM.

Active	Name	Job Definition	Schedule	Last Run Time	Next Run Time
☑	CUSTOM_ENRICHMENT_JOB	Run an Enrichment rule	Weekly ([Sunday][07:30])		Sun Apr 25 2010 07:30 ...

   ---

2. **Choose an Action**

   Select the actions that you want the Scheduler to run. For details, see "Action Definition Dialog Box" on the next page.

3. **Schedule a Task**

   Set the schedule for activating a task in the Scheduler pane. For details, see "Job Definition Dialog Box" on page 47.

   Note: When updating a schedule for a task, all jobs run, by default, immediately upon saving the change. If you do not want jobs to run immediately upon updating the schedule, but rather when they are due to run, do the following:

   a. Select **Admin > Platform > Setup and Maintenance > Infrastructure Settings**.

   b. Click **Foundations** and select **RTSM** from the drop-down list.

   c. Under **RTSM - Integration Settings**, locate **Enable Scheduled Jobs Auto Run** and set the value to **false** (ID: enable.scheduled.jobs.auto.run).

Example of a Scheduled Task

The illustration below shows that the Scheduler is set to run an Enrichment rule called **SAP_Old_ Transports** every day at 1:00 AM and 6:00 AM.

Name	
Run an Enrichment rule	SAP_Old_Transports

Scheduler

○ Once   ○ Interval   ⦿ Daily   ○ Weekly   ○ Monthly   ○ Cron

Time zone: US/Central   ▼   Reset server time zone

Invocation hour   01:00, 06:00   >>

Scheduler User Interface

This section includes (in alphabetical order):

Action Definition Dialog Box

This dialog box enables you to select a required action in a list of actions that can be run by the Scheduler.

To access	Click the **Add** ➕ button in the Actions pane in the Job Definition dialog box.
Important information	After selecting the required action, click **Next** to display a list of actions. The list of action details depends on which action you choose. For example, if you select **Run an Enrichment Rule**, a list of the existing Enrichment Rules appears. Select the required Enrichment rules. You can select up to 15 items.
Relevant tasks	"Define Tasks That Are Activated on a Periodic Basis" on page 44

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Element (A-Z)	Description
<Click a column header>	For details, see Sort Column Content Dialog Box in the *RTSM Modeling Guide*.
<Right-click a column header>	For details, see Sort Column Content Dialog Box in the *RTSM Modeling Guide*.
Actions	For a list of actions that can be run by the Scheduler, see "Scheduler Actions" below.

Scheduler Actions

This section contains a list of actions that can be run by the Scheduler.

- **Rerun Discovery on View**. Runs discovery on the CIs in a selected view. This enables you to configure a general discovery for the entire infrastructure on a less frequent basis, such as once a week, while updating the CIs in important views more frequently, for example, on a daily basis.

- **Run an Enrichment Rule**. Activates the selected Enrichment rule according to its set schedule. Click **Next** to display a list of the available Enrichment rules and select the required ones. For details, see Enrichment Manager in the *RTSM Modeling Guide*.

Filter Dialog Box

This dialog box enables you to filter the tasks displayed on the Job Scheduler page.

To access	Click the **Filter** 🔽 button on the Job Scheduler page.
Relevant tasks	"Define Tasks That Are Activated on a Periodic Basis" on page 44

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Element (A-Z)	Description
<click a column header>	For details, see Sort Column Content Dialog Box in the *RTSM Modeling Guide*.
<right-click a column header>	For details, see Sort Column Content Dialog Box in the *RTSM Modeling Guide*.

UI Element (A-Z)	Description
Condition	Click inside the box and select the required operator. For details, see Attribute Operator Definitions in the *RTSM Modeling Guide*.
Display Name	Filters the task list according to one of the following: • **Active** • **Job Definition** • **Last Run Time** • **Name** • **Next Run Time** • **Schedule** For details, see the Job Scheduler page.
Value	Click inside the box and either enter or select the required value.

Job Definition Dialog Box

This dialog box enables you to add actions to the job you created and define how often they run.

To access	Click the **Add** ✚ button on the Job Scheduler page.
Relevant tasks	"Define Tasks That Are Activated on a Periodic Basis" on page 44

User interface elements are described below:

UI Element (A-Z)	Description
Job Definition	(Optional) A description for this job.
Name	The name of the job.

Actions Pane

This area enables you to add the required actions to the task you created.

Relevant tasks	"Define Tasks That Are Activated on a Periodic Basis" on page 44

User interface elements are described below:

UI Element (A-Z)	Description
✚	Adds an action to the task. Opens the Action Definition dialog box.
✏	Edits an existing action.

UI Element (A-Z)	Description
✖	Deletes an action.
⬆	Moves a selected row up.
⬇	Moves a selected row down.
Action Definition	Displays the action details you selected in the Action Definition dialog box for the action added.
Name	Displays the name of the action that was added to the job.

Scheduler Pane

This area enables you to set the schedule for activating a task.

Important information	When updating a schedule for a task, all jobs run, by default, immediately upon saving the change. If you do not want jobs to run immediately upon updating the schedule, but rather when they are due to run, do the following:
	1. Select **Admin > Platform > Setup and Maintenance > Infrastructure Settings**.
	2. Click **Foundations** and select **RTSM** from the drop-down list.
	3. Under **RTSM - Integration Settings**, locate **Enable Scheduled Jobs Auto Run** and set the value to **false** (ID: enable.scheduled.jobs.auto.run).
Relevant tasks	"Define Tasks That Are Activated on a Periodic Basis" on page 44
See also	Cron Expressions

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Element (A-Z)	Description
Reset server time zone	Automatically set the time zone to the correct one for the server.
Validate Expression	(Appears when you choose **Cron**) Click to validate the Cron expression you entered.

UI Element (A-Z)	Description
\<Schedule options\>	Select the required option for scheduling the task. The available options are: • **Once.** Activates the task only once. • **Interval.** Activates the action at a set time interval. • **Daily.** Runs a task on a daily basis. • **Weekly.** Runs a task on a weekly basis. • **Monthly.** Runs a task on a monthly basis. • **Cron.** Use a Cron expression to schedule a job. For a description of the fields used in Cron expressions and examples of how to use them, see Cron Expressions in the *RTSM Modeling Guide*.
Cron Expression	Enter a Cron expression in the proper format. For a description of the fields used in Cron expressions and examples of how to use them, see Cron Expressions in the *RTSM Modeling Guide*.
Days of month	(Appears when you choose **Monthly**) Click the button to the right of the **Days of month** box to choose the day of the month on which you want to run the action. Opens the Select Days dialog box.
Days of the week (Sunday - Saturday)	(Appears when you choose **Weekly**). Select the day or days on which you want the action to run.
End by	(Does not appear when you select **Once**) Choose the date and time when you want the action to stop running by selecting the **End by** check box and then clicking the down-arrow to the right of the box. **Note**: This step is optional. If you do not want to specify an ending date, leave the **End by** check box unselected.

UI Element (A-Z)	Description

Invocation Hour	Choose the time to activate the action. Click the ⟦ >> ⟧ button to the right of the **Invocation Hour** box to open the Select Hours dialog box. For details, see the Select Hours dialog box.
	
	 Note: You can enter the time manually in the **Invocation hour** box once you have chosen a time using the Select Hours dialog box. You can assign more than one time. Each time is separated by a comma.
	
	 The manually entered action times are not restricted to the hour and half hour only; they can be assigned any hour and minute combination. Use the 24:00 format.
	
	 For example:
	
	 `11:15 AM is 11:15`
	
	 `11:15 PM is 23:15`
	
	 Note: This box is only available when you want to schedule a task to run on a daily, weekly, or monthly basis.

Invocation Time	(Appears when you choose **Once**) Choose the date and time you want the action to begin running by clicking the down-arrow to the right of the box.
Months of the year (January - December)	(Appears when you choose **Monthly**). Select the month or months in which you want the action to run.
Repeat every	(Appears only when you select **Interval**) Type a value for the interval between successive runs and then choose the required unit of time measurement (Minutes, Hours, or Days).
Start at	(Does not appear when you select **Once**) Choose the date and time when you want the action to begin running by selecting the **Start at** check box and then clicking the down-arrow to the right of the box. **Note**: This step is optional. If you do not want to specify a beginning time, leave the **Start at** check box unselected.
Time Zone	Set the required time zone.

Job Scheduler Page

This page enables you to define tasks that are activated on a periodic basis. For example, you can define a task that generates a Topology report on a daily basis at 3:00 PM. Or, you can define a schedule for taking snapshots of a specific view on a daily basis.

To access	Select **Admin > RTSM Administration> Administration > Scheduler**.
Relevant tasks	"Define Tasks That Are Activated on a Periodic Basis" on page 44

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Element (A-Z)	Description
✚	Creates and schedules a job. Opens the Job Definition dialog box.
✎	Edits a task. Opens the Job Definition dialog box.
✖	Deletes a job. **Note:** The user cannot delete a job scheduler linked to a pattern-based model.
▼	Opens the Filter dialog box which enable you to filter the scheduled jobs displayed on the Job Scheduler page.
▼✖	Clears the filter definitions you created in the Filter dialog box.
▥	Changes the display order of the columns, hide a column, or displays a hidden column. Opens the Select Columns dialog box. For details, see Select Columns Dialog Box in the *RTSM Modeling Guide*.
⟳	Refresh the display of the jobs in the Job Scheduler page.
<Click a column header>	For details, see Sort Column Content Dialog Box in the *RTSM Modeling Guide*.
<Right-click a column header>	For details, see Sort Column Content Dialog Box in the *RTSM Modeling Guide*.
Active	Select the check box to activate the scheduled job.
Job Definition	A description of the scheduled job as defined in the **Job Definition** box in the Job Definition dialog box.
Last Run Time	The last time the job was run.
Name	The name of the scheduled job.
Next Run Time	The next time the job is scheduled to run.
Schedule	How often the job is scheduled to run. For details, see the "Scheduler Pane" on page 48.

Select Days Dialog Box

This dialog box enables you to choose the day on which to activate the action.

To access	Click **Monthly** in the Job Definition dialog box, and then click the ⟩⟩ button to the right of the **Days of month** box.
Relevant tasks	"Define Tasks That Are Activated on a Periodic Basis" on page 44

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Element (A-Z)	Description
<List of days from 1-31>	Choose the required days by selecting the required check boxes. You can select multiple days. The selected days appear in the **Days of month** box. For details, see Scheduler pane in the Job Definition dialog box.

Select Hours Dialog Box

This dialog box enables you to choose the time at which to activate the action.

To access	In the Job Definition dialog box, click **Daily, Weekly, or Monthly**, and then click the ⟫ button to the right of the **Invocation hour** box.
Relevant tasks	"Define Tasks That Are Activated on a Periodic Basis" on page 44

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Element (A-Z)	Description
<List of times by the hour and half hour>	Choose all the required times by selecting the required check box. You can select multiple times. The selected hours appear in the **Invocation hour** box. For details, see "Scheduler Pane" on page 48.

Chapter 5: CI Lifecycle and the Aging Mechanism

This chapter includes:

The Aging Mechanism Overview

After your system has been running for some time, previously discovered CIs may no longer exist. Such CIs should be removed from the RTSM to keep it up to date.

Data Flow Management (DFM) runs periodically and, default, updates the last access time for all CIs and relationships that it discovers. This process is known as "touching," and prevents CIs and relationships that represent active components in the system from becoming deletion candidates. If DFM does not discover a CI that exists in the RTSM, the last access time is not updated, so after some predefined time (by default, 20 days) the CI becomes a deletion candidate. The aging period is set per CI type as a static attribute in the CI Type Manager (**Deletion Candidate Period**).

Deletion candidates are reviewed and managed in the CI Lifecycle module.

If the CI remains untouched for a longer period of time (by default, 40 days), the aging mechanism deletes the CI from the system. In other words, aging deletes CIs and relationships that are no longer relevant, that is, have not been accessed for a specified period of time (by default, 40 days).

The deletion of large quantities of CIs and relationships creates a significant load for the RTSM and database servers and can impact the overall RTSM performance. To reduce this performance impact, the aging mechanism divides the objects to be deleted into chunks. A delay between chunks lowers the database load and enables other tasks to continue working. For faster work, you can shorten the delay, but the default delay value is the recommended delay. For details, see "Aging Parameters" on page 60.

> **Note:**
>
> - Touch parameters are defined in the **DiscoveryProbe.properties** file. For details, see the Probe Manager Configurations section in DiscoveryProbe.properties File in the *RTSM Data Flow Management Guide*.
>
> - The aging mechanism is enabled by default.
>
> - Aging operations are run only on CIs and relationships that have **Enable Aging** set to **true**. By default, CIs and relationships added by out-of-the-box DFM adapters are created with **Enable Aging** set to **true**. (For details, see **Enable Aging** in the Configuration Item Properties Dialog Box in the

> *RTSM Modeling Guide.*) This behavior can be changed in the **Enable aging** check box in DFM in the Adapter Configuration tab (in the Results Management pane). For details, see "Results Management Pane" in the *RTSM Data Flow Management Guide* and "Enable Aging" on page 57.

CI Lifecycle – Overview

The CI Lifecycle application enables you to view a list of CIs and relationships that are candidates for deletion by the aging mechanism, and to initiate the aging procedure. You can also select specific CIs or relationships and postpone their deletion or mark them as deletion-proof.

For each CIT, you can set the time period before a specific CI becomes a candidate for deletion or before it is actually deleted. For details, see Actual Deletion Period, Deletion Candidate Period, and Enable Aging in the Configuration Item Properties Dialog Box in the *RTSM Modeling Guide*.

Enable and Run the Aging Mechanism

This task describes how to enable aging and run the aging mechanism.

This task includes the following steps:

- "Enable Aging" below
- "First Aging Run" below

1. **Enable Aging**

    Access the Aging Status tab on the CI Lifecycle page (**Admin > RTSM Administration > Administration > CI Lifecycle**). Select the **Enable Aging** check box. For details, see "Aging Status Tab" on page 56.

    > **Note:** When aging is turned on or off (that is, enabled or disabled), you must restart the server for the changed setting to take effect.

    To turn on aging for an existing CI, access the CI in IT Universe Manager, right-click it and select **Properties**. Set the **Enable Aging** property to **True** and click **OK**.

    To set aging to be enabled by default for all new CIs of a specific type, access the CI type in the Attributes tab of CI Type Manager, select the **Enable Aging** attribute and click **Edit**. In the Edit Attribute dialog box, select **True** for the **Default Value** and click **OK**.

2. **First Aging Run**

    After your system has been running for some time, there are probably many CIs that need deleting. You should perform this step in the procedure to keep the RTSM up to date.

    If the number of CIs to be deleted is greater than 10,000, a confirmation message is displayed.

    CI Lifecycle divides the number of CIs and/or relationships that must be deleted into chunks (to avoid overloading the database), deletes them, and adds the information to the History database. Chunk size is determined by the value in the **Aging Chunk Size** field in the Infrastructure Settings Manager.

    This method of deletion updates the History database with the information and there is no server downtime.

Generate CI Lifecycle Data and Filter the Results

This task describes how to generate a list of CIs that are candidates for deletion, and to filter the results.

This task includes the following steps:

- "Generate CI Lifecycle Data" below
- "Filter the CI Lifecycle Results" below

1. **Generate CI Lifecycle Data**

   To generate CI Lifecycle results for CIs or relationships, select either the **CIs** tab or the **Relationship** tab. Select the time period in which to search, using the drop-down calendars in the **From** and **To** fields, and click **Generate**. For details, see "CI Lifecycle Page" on page 59.

   CI Lifecycle displays a list of CIs that are candidates for deletion.

   > **Tip:** If no results are generated, try extending the time period further into the future.

2. **Filter the CI Lifecycle Results**

   To filter the CI Lifecycle data, click the **Filter** button ![filter icon] to open the Filter dialog box. For each column by which you want to filter, select a condition from the drop-down list and fill in the value column, either by entering a value, selecting from a drop-down list, or using the calendar. Click **OK** to apply your filter.

   To clear the filter and restore the original results, click the **Clear** button ![clear icon] . For details, see "Filter Dialog Box" on page 60.

Enable Manual Load Balancing for Multiple Probes

When multiple Data Flow Probes send touch information simultaneously to the UCMDB Server, the Server may become overloaded. To enable a manual load balancing between the multiple Data Flow Probes running against the UCMDB Server, you can set the time at which each Probe reports the touch:

1. Open the **DiscoveryProbe.properties** file in a text editor.

2. Locate the lines beginning with **# Is touch window mechanism active**:

   ```
   "# Is touch window mechanism active
   appilog.agent.probe.touchWindowMechanism.isActive = false
   "# Defines the time when the touch window starts (HH:MM - 00:00-23:59)
   appilog.agent.probe.touchWindowMechanism.startTime = 10:00
   "# Defines the time when the touch window ends (HH:MM - 00:00-23:59)
   appilog.agent.probe.touchWindowMechanism.endTime = 23:59
   ```

3. Change the **appilog.agent.probe.touchWindowMechanism.isActive** parameter to **true**.

4. Set the time at which the Probe should report the touch.

5. Save the file.

These parameters enable the Probes to perform "touching" in non-overlapping time frames. For details on touching, see "The Aging Mechanism Overview" on page 53.

CI Lifecycle User Interface

This section includes (in alphabetical order):

Aging Run Statistics Dialog Box

This dialog box enables you to view statistics for the five previous runs of the aging mechanism.

To access	Click the **Statistics** button on the CI Lifecycle page.
Relevant tasks	"Enable and Run the Aging Mechanism" on page 54

User interface elements are described below:

UI Element (A-Z)	Description
Aging Runs	**Run at**. The start and finish time of the run. **Deleted**. The number of CIs that have been deleted. **Failed**. The number of CIs that have not been deleted.
Errors	**ID**. The IDs of the failed CIs, that is, of the CIs that could not be deleted. **Error message**. A message describing the cause of failure.

Aging Status Tab

This dialog box enables you to enable the aging mechanism and to run the mechanism for the first time.

To access	Select **Admin > RTSM Administration > Administration > CI Lifecycle**.
Important information	This tab displays information about the number of CIs that are candidates for deletion, and functions as follows, if you select the **Enable Aging** check box: • If the number of CIs for deletion is larger than 10,000, you can choose to use the aging mechanism to delete the CIs in chunks, or to use the database aging tool. For details on which procedure to use, see "First Aging Run" on page 54. • If the number of CIs for deletion is smaller than 10,000, the estimated time for deletion is displayed and the CIs are immediately deleted. A progress bar shows the stage of the deletion.
Relevant tasks	"Enable and Run the Aging Mechanism" on page 54

User interface elements are described below:

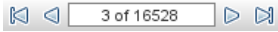| UI Element (A-Z)	Description
Enable Aging	• To enable aging, select the check box. The frequency and size of the chunks that are marked as candidates for deletion are determined in Infrastructure Settings. For details, see "Aging Parameters" on page 60. • To disable aging, clear the check box.
Run results	**Total CIs to delete**. The number of CIs or relationships that are delete candidates and that are being deleted by the aging mechanism. **Deleted**. The number of CIs or relationships that have been deleted. **Failed**. CIs or relationships that could not be deleted. If any failures exist, click the **Failed** link to view their details.

CI Lifecycle and Relationship Tabs

This area enables you to display a list of CIs and relationships that are candidates for deletion, and to manage the list (for example, to delete or prevent or postpone deletion of specific CIs, to view statistics, and to filter the list).

To access	Select **Admin > RTSM Administration > Administration > CI Lifecycle**.
Relevant tasks	"Generate CI Lifecycle Data and Filter the Results" on page 55
See also	Working with CIs in the *RTSM Modeling Guide*

User interface elements are described below (unlabeled elements are shown in angle brackets):

UI Element (A-Z)	Description
	Click to delay the deletion of a CI by one aging period. It disappears from the list of candidates for deletion. (If the CI is not touched again for a full aging period, it again becomes a candidate for deletion.)
	Click to prevent a CI or relationship from being deleted. It disappears from the list of candidates for deletion.
	Click to delete a selected CI or relationship.
	Click to view statistics (such as the start and finish time of each run and the number of deleted CIs), for the previous five runs of the aging mechanism. For details, see "Aging Status Tab" on the previous page.
	Click to select or clear all rows of data on the current page.
	Click to update the data displayed.

UI Element (A-Z)	Description
(filter icon)	Click to open the Filter dialog box, which enables you to customize the filter. For details, see "Filter Dialog Box" on page 60.
(clear filter icon)	Click to clear the filter and display the full results.
(select columns icon)	Click to open the Select Columns dialog box, which enables you to change the display order of the columns, hide a column, or display a hidden column. For details, see Select Columns Dialog Box in the *RTSM Modeling Guide*.
30 ▼	Click the arrow to define the number of rows that should appear on each display page.
◁ ◁ 3 of 16528 ▷ ▷|	Click to navigate through the results page by page or to jump to the first or last page.
📄 Generate	Generates data for a selected period. **Tip**: If no results are generated, try extending the time period further into the future (the **To** field).

(export icon)	Click **Export Data to File** to choose the export format for the table data. The available options are:
	
	• **Excel.** The table data is formatted as an .xls (Excel) file that can be displayed in a spreadsheet.
	• **PDF.** The table data is exported in PDF format.
	  Note: When exporting to PDF, select a reasonable number of columns to display to ensure that the report is legible.
	• **CSV.** The table data is formatted as a comma-separated values (CSV) text file that can be displayed in a spreadsheet.
	  Note: For the CSV formatted table data to display correctly, the comma (,) must be defined as the list separator. In Windows, to verify or modify the list separator value, open Regional Options from the Control Panel, and on the Numbers tab ensure that the comma is defined as the List Separator value.
	• **XML.** The table data is formatted as an XML file that can be opened in a text or XML editor.

<Right-click a CI>	For details on the menu options, see "IT Universe Manager Shortcut Menu" in the *RTSM Modeling Guide*.
<Right-click a column header>	For details, see Sort Column Content Dialog Box in the *RTSM Modeling Guide*.

UI Element (A-Z)	Description
CIs/Relationships tabs	Select to see a list of CIs or relationships that are candidates for deletion: **Select**. Select the check box to select a CI or relationship before performing an operation on it (such as Delete or Postpone Deletion). **End1**. The query node at one end of the relationship (relevant only for relationships). **Display Label**. The name of the CI or relationship as it appears in the Topology Map. **End2**. The query node at the second end of the relationship (relevant only for relationships). **CI Type**. The type of the CI or relationship. **Last Access Time**. The last time that the CI or relationship was accessed, whether it was updated or discovered by the DFM process. **Updated by**. The administrator or process that updated the CI or relationship. **Actual Delete Time**. The date and time when the CI or relationship is deleted.
From	Click the arrow and use the calendar to select the beginning date and time for the CI Lifecycle results.
Relationships tab	Select to see lifecycle results for relationships.
Rows per page	Select the number of rows per page from the drop-down list.
To	Click the arrow and use the calendar to select the end date and time for the CI Lifecycle results.

CI Lifecycle Page

This page enables you to enable and run the aging mechanism. It also enables you to display a list of CIs and relationships that are candidates for deletion and to manage the list (for example, to delete, prevent, or postpone deletion of specific CIs, to view statistics, and to filter the list).

To access	Select **Admin > RTSM Administration > Administration > CI Lifecycle**.
Important information	The CI Lifecyle page includes the following tabs: ● **Aging Status**. Use this tab to enable the aging mechanism and to run aging. For details, see "Aging Status Tab" on page 56. ● **CIs**. Use this tab to display a list of CIs that are candidates for deletion. For details, see "CI Lifecycle and Relationship Tabs" on page 57. ● **Relationships**. Displays the same information as the CIs tab, with the addition of the **End1** and **End2** columns. The tab that is displayed by default depends on whether aging is enabled or disabled: ● **If aging is enabled**, the CIs tab is displayed. ● **If aging is disabled**, the Aging Status tab is displayed.

| Relevant tasks | • "Enable and Run the Aging Mechanism" on page 54
• "Generate CI Lifecycle Data and Filter the Results" on page 55 |
|---|---|
| See also | Working with CIs in the *RTSM Modeling Guide* |

Filter Dialog Box

This dialog box enables you to filter the list of CIs that are candidates for deletion.

To access	Click **Filter** on the CI Lifecycle page.
Relevant Tasks	"Generate CI Lifecycle Data and Filter the Results" on page 55

User interface elements are described below:

UI Element (A-Z)	Description
Condition	Click in the **Condition** column and select an option.
Display Name	The columns displayed for the CIs or relationships on the CI Lifecycle page.
Value	Click in the **Value** column to set a value for the selected condition. Depending on the condition selected, you can select a value from a drop-down list, select a date and time from the calendar, or click the ellipsis button [...] to open an editing dialog box where you can enter a value. When the conditions **Like** or **Like ignore case** are selected in the **Condition** column, you can use a wildcard (%) before and after the string for which you are searching. **Note:** You must select a condition before entering a value.

Aging Parameters

Aging parameters are defined in Infrastructure Settings (**Admin > Platform > Setup and Maintenance > Infrastructure Settings > Foundations > RTSM > RTSM - Aging Settings**):

- **Aging Chunk Size**. The number of CIs or relationships that are sent to the aging mechanism at one time. The default is 5,000.
- **Aging Scheduler Hour of the First Run.** Defines at what time aging first runs after server startup (for example, 2=2:00 AM).
- **Aging Scheduler Interval.** Defines the interval between aging runs. The interval value is in hours.
- **Aging Time Unit.** The time unit applicable to the Deletion Candidate Period and the Actual Deletion Period. The default unit is days.
- **Delay Between Chunks in Milliseconds**. The period between one chunk being deleted by the aging mechanism and the next chunk being sent to the aging mechanism to be deleted. The default is 30 seconds, that is, 30,000 milliseconds.
- **Threshold for running storage optimization**. The threshold for running storage optimization during the

aging operations (for example, each N deleted CIs). As database operations could take considerable time (several minutes), this option enables the technical organization of the schema to reduce this time.

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