

HP Business Service Management

for the Windows and Linux operating systems

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RTSM Administration

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Table of Contents

Welcome to This Guide	9
How This Guide Is Organized	9
Who Should Read This Guide	10
How Do I Find the Information That I Need?	10
Additional Online Resources.....	13
Documentation Updates	14

PART I: INTRODUCTION

Chapter 1: Run-time Service Model (RTSM).....	17
RTSM – Overview.....	18
Configuration Items (CI).....	20
Query Nodes and Relationships	20
How to Configure RTSM Log Levels.....	21
How to Download Zip File of Log Files and Thread Dumps.....	21
RTSM Log Files.....	23
Data Flow Management Log Files	30
Log Severity Levels	32
RTSM User Interface	33
Troubleshooting and Limitations	40

PART II: ADMINISTRATION

Chapter 2: Package Manager.....43
Package Administration Overview44
Package Zip File Contents and Format.....46
Packages for Integration Adapters.....47
How to Create a Custom Package48
How to Deploy a Package.....49
How to Export a Package.....50
How to Use the JMX Console to Perform Package Manager Tasks.....50
Package Resources.....55
Resource Types58
Package Manager User Interface.....60
Troubleshooting and Limitations74

Chapter 3: State Manager.....77
State Manager Overview.....78
How to Define a State.....79
State Manager User Interface.....80

Chapter 4: Scheduler.....83
How to Define Tasks That Are Activated on a Periodic Basis84
Scheduler User Interface.....87

PART III: CI LIFECYCLE

Chapter 5: CI Lifecycle and the Aging Mechanism99
The Aging Mechanism Overview100
CI Lifecycle – Overview101
How to Enable and Run the Aging Mechanism.....102
How to Generate CI Lifecycle Data and Filter the Results.....104
How to Enable Manual Load Balancing for Multiple Probes.....105
Aging Parameters.....106
CI Lifecycle User Interface.....106

PART IV: GLOSSARY OF RTSM TERMINOLOGY

Chapter 6: Glossary117
Index.....127

Welcome to This Guide

This guide explains how to configure the Run-time Service Model (RTSM).

This chapter includes:

- How This Guide Is Organized on page 9
- Who Should Read This Guide on page 10
- How Do I Find the Information That I Need? on page 10
- Additional Online Resources on page 13
- Documentation Updates on page 14

How This Guide Is Organized

The guide contains the following chapters:

Part I Introduction

Describes the RTSM (the central repository for the configuration information that is gathered from the Data Flow Management processes and the various third-party applications and tools).

Part II Administration

Describes how to configure the Run-time Service Model, how to deploy packages (that contain resources needed by Data Flow Management), how to define schedules for tasks that are activated on a periodic basis, and use System Health to monitor the servers and databases as part of your system.

Part III CI Lifecycle

Describes how to view a list of CIs and relationships that are candidates for deletion by the aging mechanism, and how to initiate the aging procedure.

Part IV Glossary of RTSM Terminology

Contains a list of Run-time Service Model terminology.

Who Should Read This Guide

This guide is intended for the following users:

- ▶ Business Service Management administrators
- ▶ Business Service Management platform administrators
- ▶ Business Service Management application administrators
- ▶ Business Service Management data collector administrators

Readers of this guide should be knowledgeable about enterprise system administration, have familiarity with ITIL concepts, and be knowledgeable about Business Service Management in general and the Operational Database technology specifically.

How Do I Find the Information That I Need?

This guide is part of the HP Business Service Management Documentation Library. This Documentation Library provides a single-point of access for all Business Service Management documentation.

You can access the Documentation Library by doing the following:



- In Business Service Management, select **Help > Documentation Library**.
- From a Business Service Management Gateway Server machine, select **Start > Programs > HP Business Service Management > Documentation**.



Topic Types

Within this guide, each subject area is organized into topics. A topic contains a distinct module of information for a subject. The topics are generally classified according to the type of information they contain.

This structure is designed to create easier access to specific information by dividing the documentation into the different types of information you may need at different times.

Three main topic types are in use: **Concepts**, **Tasks**, and **Reference**. The topic types are differentiated visually using icons.

Topic Type	Description	Usage
Concepts 	Background, descriptive, or conceptual information.	Learn general information about what a feature does.
Tasks 	<p>Instructional Tasks. Step-by-step guidance to help you work with the application and accomplish your goals. Some task steps include examples, using sample data.</p> <p>Task steps can be with or without numbering:</p> <ul style="list-style-type: none"> ▶ Numbered steps. Tasks that are performed by following each step in consecutive order. ▶ Non-numbered steps. A list of self-contained operations that you can perform in any order. 	<ul style="list-style-type: none"> ▶ Learn about the overall workflow of a task. ▶ Follow the steps listed in a numbered task to complete a task. ▶ Perform independent operations by completing steps in a non-numbered task.
	<p>Use-case Scenario Tasks. Examples of how to perform a task for a specific situation.</p>	Learn how a task could be performed in a realistic scenario.

Topic Type	Description	Usage
 Reference	General Reference. Detailed lists and explanations of reference-oriented material.	Look up a specific piece of reference information relevant to a particular context.
	User Interface Reference. Specialized reference topics that describe a particular user interface in detail. Selecting Help on this page from the Help menu in the product generally open the user interface topics.	Look up specific information about what to enter or how to use one or more specific user interface elements, such as a window, dialog box, or wizard.
 Troubleshooting and Limitations	Troubleshooting and Limitations. Specialized reference topics that describe commonly encountered problems and their solutions, and list limitations of a feature or product area.	Increase your awareness of important issues before working with a feature, or if you encounter usability problems in the software.

Additional Online Resources

Troubleshooting & Knowledge Base accesses the Troubleshooting page on the HP Software Support Web site where you can search the Self-solve knowledge base. Choose **Help > Troubleshooting & Knowledge Base**. The URL for this Web site is <http://h20230.www2.hp.com/troubleshooting.jsp>.

HP Software Support accesses the HP Software Support Web site. This site enables you to browse the Self-solve knowledge base. You can also post to and search user discussion forums, submit support requests, download patches and updated documentation, and more. Choose **Help > HP Software Support**. The URL for this Web site is www.hp.com/go/hpsoftwaresupport.

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Part I

Introduction

1

Run-time Service Model (RTSM)

This chapter includes:

Concepts

- ▶ RTSM – Overview on page 18
- ▶ Configuration Items (CI) on page 20
- ▶ Query Nodes and Relationships on page 20

Tasks

- ▶ How to Configure RTSM Log Levels on page 21
- ▶ How to Download Zip File of Log Files and Thread Dumps on page 21

Reference

- ▶ RTSM Log Files on page 23
- ▶ Data Flow Management Log Files on page 30
- ▶ Log Severity Levels on page 32
- ▶ RTSM User Interface on page 33

Troubleshooting and Limitations on page 40

Concepts

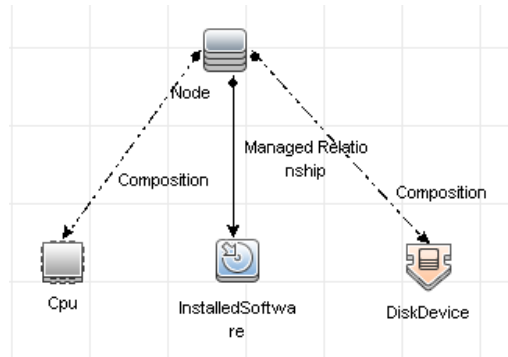
RTSM – Overview

The RTSM is the central repository for the configuration information that is gathered from the BSM 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 HP Business Service Management, 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 *HP Universal CMDB Discovery and Integration Content Guide* PDF.)

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 HP Business Service Management 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 "Repositories Overview" in *Using Service Health*.

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 HP Business Service Management are called relationships.

Each CI belongs to a configuration item type (CIT). The CIT defines a category of CIs used in HP Business Service Management. 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.

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.

Relationships are connections defined between CIs. Relationships are defined one at a time for each pair of query nodes in a TQL query.

Tasks

How to 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:8080/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**.

How to 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 **C:\hp\UCMDB\UCMDBServer\runtime\log\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://<BSM 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:

C:\hp\UCMDB\UCMDBServer\runtime\log\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.

To generate the zip file from the RTSM:

- 1** Access the following folder on the RTSM:
C:\hp\UCMDB\UCMDBServer\tools\logGrabber
- 2** Run the **logGrabber.bat** file.

A Server snapshot file with the name **LogGrabber_serverSnapshot_<current date and time>.txt** is created in the following location:

C:\hp\UCMDB\UCMDBServer\runtime\log\threadDumps. This is a thread dump that includes the threads of the Server framework only.

Reference

RTSM Log Files

RTSM log 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 <HP Business Service Management root directory>\log\odb folder.

This section includes the following topics:

- "Quota Log Parameters" on page 23
- "CI Type Model Log" on page 24
- "RTSM Notification Log" on page 25
- "RTSM Model Audit Short Log" on page 26
- "History Database Log" on page 26
- "RTSM Enrichment Log" on page 27
- "RTSM Plug-in Log" on page 28
- "RTSM Dal Log" on page 28
- "RTSM Operation Statistics Log" on page 29

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.

Log File	Description
Error Level	RTSM operations that fail because they exceed quota limits.
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 <code>duplicate attributes</code> .
Error Level	Not available.
Debug Level	Every CI Type update includes the following: <ul style="list-style-type: none"> ▶ 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: <ul style="list-style-type: none"> ▶ 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	<p>Notification messages from the time of the component's creation in the RTSM until the client's listener receives a message.</p> <p>Most components receive configuration changes from the RTSM in push mode, by the notification mechanism, rather than in pull mode.</p>
Information Level	<ul style="list-style-type: none"> ▶ Startup and shutdown of publishers ▶ Register and unregister remote and internal listeners
Error Level	<ul style="list-style-type: none"> ▶ Errors when messages are published ▶ Errors when messages are received
Debug Level	<ul style="list-style-type: none"> ▶ 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	<p>If an application does not receive a notification, check the following:</p> <ul style="list-style-type: none"> ▶ 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: <ul style="list-style-type: none"> ▶ The operation exists ▶ 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.

History Database Log

The log name is `cmdb.history.log`.

Log File	Description
Purpose	<ul style="list-style-type: none"> ▶ Records which CITs are found by the History database when the database is initialized from an existing topology. ▶ Records what is to be saved in the History database. ▶ Tracks events saved in the History database. ▶ Records when the History database was purged.
Information Level	<ul style="list-style-type: none"> ▶ When the last purge was carried out. ▶ Information about initialization of the History database.

Log File	Description
Error Level	Lists errors that occur when event information is inserted in the History database.
Debug Level	<ul style="list-style-type: none"> ▶ Details about CITs inserted during initialization of the History database. ▶ Details about changes in the TQL results saved in the History database.

RTSM Enrichment Log

The log name is `cmdb.enrichment.log`.

Log File	Description
Purpose	<ul style="list-style-type: none"> ▶ 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.
Information Level	<ul style="list-style-type: none"> ▶ 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	<ul style="list-style-type: none"> ▶ 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	<ul style="list-style-type: none"> ▶ 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	<ul style="list-style-type: none"> ▶ Connection pool errors ▶ Database errors ▶ Command execution errors
Debug Level	<ul style="list-style-type: none"> ▶ All DAL commands executed ▶ All SQL commands executed
Basic Troubleshooting	<p>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.</p> <p>Exception details and ID are entered into the log. The exception ID appears in the exception itself.</p>

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.

Data Flow Management Log Files

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

This section includes the following topics:

- ▶ "mam.AutoDiscovery.log" on page 30
- ▶ "discoveryServlet.log" on page 30
- ▶ "mam.AutoDiscovery.Results.Stat.log" on page 31

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	<ul style="list-style-type: none"> ➤ 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 page 33.

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 HP 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 HP 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 38.



RTSM User Interface

This section includes (in alphabetical order):

- Annotation Tool on page 33
- Log Configuration Dialog Box on page 38
- Status Bar on page 39

Annotation Tool










This tool enables you to annotate a snapshot of the screen you are viewing, to highlight important areas.



To access	Click the Run Screen Capture Tool  button in the Status bar.
Important information	<ul style="list-style-type: none"> ➤ The annotation options are located on the left side of the annotation window. ➤ When saving the annotation: <ul style="list-style-type: none"> ➤ 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 various annotation options enable you to annotate your snapshot.

User interface elements are described below:


UI Element (A–Z)	Description
	<p>Pan Tool. Navigates to the snapshot.</p>
	<p>Select Tool. Click and drag to select a specific area of the snapshot.</p>
	<p>Shape Tool. Click and drag to add a shape to the snapshot. Clicking the shape tool button enables the following shape buttons:</p> <ul style="list-style-type: none"> ➤  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. <p>Customization. After selecting this button, you can customize your line appearance through the following parts of the interface:</p> <ul style="list-style-type: none"> ➤ Line Type. Choose the type of line you want to add. Options include: <ul style="list-style-type: none"> ➤ Solid Line ➤ Jagged Line ➤ Line Width. Select the width of the line, in pixels, in the annotation.

UI Element (A–Z)	Description
	<p>Line Tool. Click and drag to enable the line tool, which marks the selected area of the snapshot with a line.</p> <p>Customization. After selecting this button, you can customize your line appearance through the following parts of the interface:</p> <ul style="list-style-type: none"> ▶ Line Style. Choose the style of line you want to add. Options include: <ul style="list-style-type: none"> ▶ Regular line ▶ Line with endpoints ▶ Line with arrows ▶ Line Type. Choose the type of line you want to add. Options include: <ul style="list-style-type: none"> ▶ Solid Line ▶ Jagged Line ▶ Line Width. Select the width of the line, in pixels, in the annotation.
	<p>Text Tool. Click and drag to open a box where you can add text to the snapshot.</p> <p>Example: Add the syntax: This is the problematic item above a line marking an area of the snapshot.</p>















UI Element (A–Z)	Description
<p>Border and Fill Colors</p>	<p>Select the relevant square to choose the color of the border and fill of your annotations. The available squares are:</p> <ul style="list-style-type: none"> ➤ Upper Square. Chooses the color of lines, as generated by the line tool and displayed in unfilled shapes. ➤ Lower Square. Chooses the color to fill shapes. <p>Clicking either of the squares generates a dialog box with the following tabs where you choose the color:</p> <ul style="list-style-type: none"> ➤ Swatches ➤ HSB ➤ RGB
<p>Opacity</p>	<p>Slide the opacity bar to choose the darkness level of the selected shape line, text line, or shape color in the annotation.</p> <p>Note:</p> <ul style="list-style-type: none"> ➤ 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.

<p>Important information</p>	<p>The menu bar contains elements which enable you to:</p> <ul style="list-style-type: none"> ➤ 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
	<p>Save. Saves the snapshot on your local machine.</p> <p>Note:</p> <ul style="list-style-type: none"> ▶ 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.
	<p>Select All. Selects all of the annotations added to your snapshot.</p>
	<p>Clear Selected. Clears all annotations.</p>
	<p>Undo. Rolls back the most recent action performed on the snapshot.</p>
	<p>Redo. Cancels the roll back of the most recent action performed on the snapshot.</p>
	<p>Zoom In. Brings the snapshot view closer.</p>
	<p>Zoom Out. Sets the snapshot view further away.</p>
	<p>Restore original size. Restores the snapshot to its original size.</p>
	<p>Print. Prints the snapshot.</p>
	<p>Bold. Bolds the text.</p> <p>Note: This field is enabled only when selecting the Text Tool  button.</p>
	<p>Italic. Italicizes the text.</p> <p>Note: This field is enabled only when selecting the Text Tool  button.</p>

UI Element (A-Z)	Description
	Underline. Underlines the text. Note: This field is enabled only when selecting the Text Tool  button.
	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.
	Select the font for the text in the report. Note: This field is only enabled when selecting the Text Tool  button.
	Select the size of the font in the report. Note: This field is only enabled when selecting the Text Tool  button.

Log Configuration Dialog Box

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

To access	Click Log Level Configuration  in the Status bar.
-----------	--

User interface elements are described below:



Status Bar





UI Element	Description
Appender file	Click the link to open the log file in an editor.
Apply	Applies the selected log level to the log.
Loggers pane	An expandable list of RTSM logs. 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.

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. Displays a balloon with the current user name and login time.
<Server status>	Indicates the current status of the server. Displays 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.

UI Element	Description
	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 33.
	Click Help on Status Bar to access the Business Service Management Help.
Total heap size	Indicates the amount of memory being used by the application.
	Click Run the Garbage Collector to manually clean the memory (it runs automatically on a periodic basis).

Troubleshooting and Limitations

This section describes troubleshooting and limitations for RTSM.

If you are having trouble accessing the RTSM Administration pages, check that the value for all the Virtual Server URL for Application Users field (Gateway and Data Processing Server) are correctly formatted. They should have the following format: **http://myhost.mydomain.com:<port>**. You access this setting in **Admin > Platform > Setup and Maintenance > Infrastructure Settings > Platform Administration - Host Configuration table**.

Part II

Administration

2

Package Manager

This chapter includes:

Concepts

- ▶ Package Administration Overview on page 44
- ▶ Package Zip File Contents and Format on page 46
- ▶ Packages for Integration Adapters on page 47

Tasks

- ▶ How to Create a Custom Package on page 48
- ▶ How to Deploy a Package on page 49
- ▶ How to Export a Package on page 50
- ▶ How to Use the JMX Console to Perform Package Manager Tasks on page 50

Reference

- ▶ Package Resources on page 55
- ▶ Resource Types on page 58
- ▶ Package Manager User Interface on page 60

Troubleshooting and Limitations on page 74

Concepts

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 58.

Package Manager fulfills several functions:

- ▶ Enables the discovery of specific IT infrastructure assets. For example, HP Business Service Management 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.

There are two types of packages:

- ▶ **Factory package.** Contains resources that are deployed with the installation and are used to initialize HP Business Service Management.

By default, factory packages are located in: **<HP Business Service Management 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 62.

Caution: If you create custom packages for the resources or tools you develop, do not place them in the <HP Business Service Management 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 "How to Export a Package" on page 50.
- Deploy some or all of a package's resources to the RTSM from your local directory. For details, see "How to Deploy a Package" on page 49.

Package Locations

There are three pre-defined folders with out-of-the-box, automatically deployed packages under <HP BSM 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 BSM located at <HP BSM root directory>\odb\conf\factory_packages.

Package Manager User Interface

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

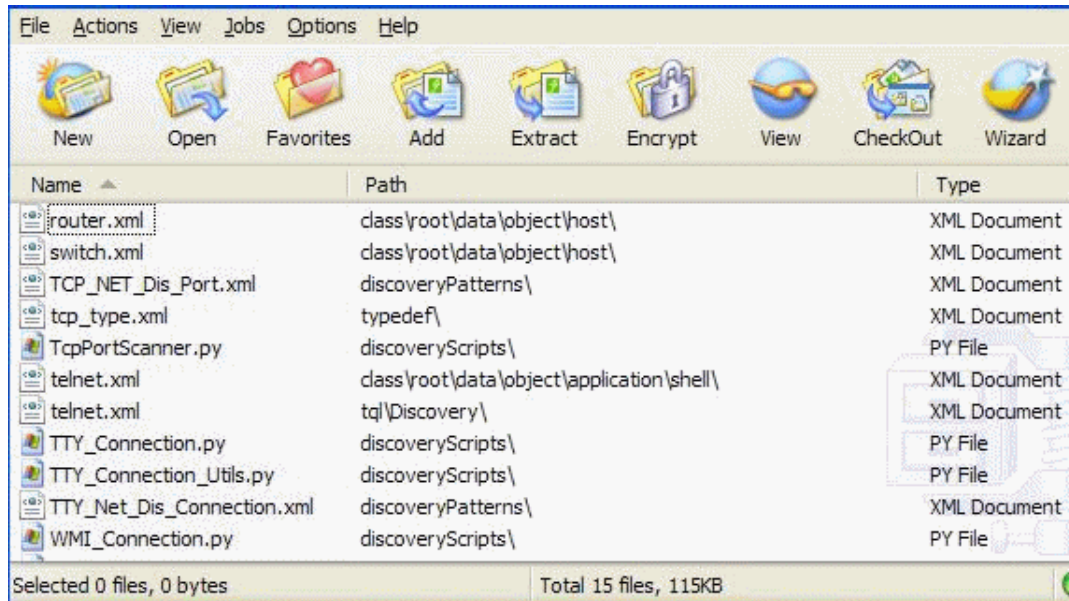
- ▶ An **Icon** identifying the package as factory, hidden or user
- ▶ A **Package Name** representing the name of the .zip file (optional)
- ▶ The **Category** as allocated in the descriptor.xml file (optional)
- ▶ A **Readme** file that corresponds to the package (optional)
- ▶ A **Description** that 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 69). 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** 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 "How to Add an Adapter for a New External Data Source" in the *RTSM Developer Reference Guide*.

Tasks

How to 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 62.

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



How to Deploy a Package

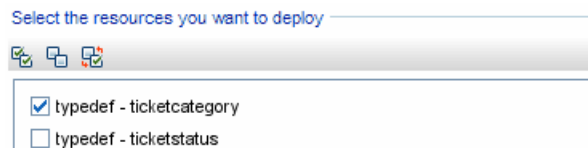
You can deploy some or all of a package's resources to the RTSM from your local directory. The package must be on your local directory in order to deploy its resources.

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:

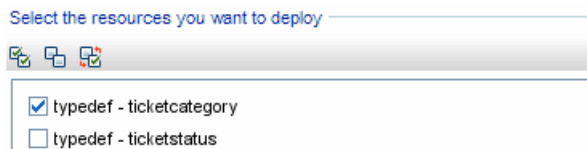


How to Export a Package

You can export some or all of a package's resources to your local directory. For details, see "Package Manager Page" on page 69.

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:



How to 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" on page 51
- ▶ "View Package Deployment History" on page 52

- "Undeploy a Package" on page 52
- "Display Currently Deployed Packages" on page 53
- "Export Packages" on page 53
- "Package Name Rules" on page 54

Deploy a Package

Follow these steps 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 HP Business Service Management 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 54.
- 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 HP Business Service Management 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

Follow these steps 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 HP Business Service Management 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 page 54.
- 6 Click **Invoke** to undeploy the package.

Display Currently Deployed Packages

Follow these steps 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 HP Business Service Management 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 page 54.
- 6** Click **Invoke** to display the packages that are currently deployed.

Export Packages

Follow these steps to export resources from the RTSM to the server on which HP Business Service Management 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 HP Business Service Management 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 **packageName**, enter the name of the package you want to export. For details, see "Package Name Rules" on page 54.

- 6 In the **Value** box for the parameter **outputDir**, enter the name of the folder on the HP Business Service Managementserver 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.

Reference

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 58.

- ▶ **acl.** The definition of a role such as Administrator or Guest. For details, see "User Management" in *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 "How to 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 77. 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 overwrites 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 does 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 definition.
- ▶ **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 adapter 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 definition 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 83.
- ▶ **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**. The definition of a user and the user's role. For details, see "User Management" in *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 55.

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.

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 83.
- ▶ **Users.** The definition of a user and the user's role. For details, see "User Management" in *Platform Administration*.
- ▶ **State Categories.** The states defined in the State Manager. For details, see "State Manager" on page 77.
- ▶ **Integration Users.** Enables external applications such as Business Service Management, Release Control, and so on, to consume the UCMDB Java API (SDK), to communicate with RTSM. 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 "How to 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 on page 61
- ▶ Create Custom Package/Edit Package Wizard on page 62
- ▶ Export Package Dialog Box on page 66
- ▶ Filter Dialog Box on page 67
- ▶ Find Dialog Box on page 68
- ▶ Package Manager Page on page 69
- ▶ Undeploy Package Resource Wizard on page 73

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 (A-Z)	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  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	"How to Create a Custom Package" on page 48
Wizard map	The Create Custom 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: <ul style="list-style-type: none"> ▶ 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.
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 58. 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>	<p>Select the resources you want to add to the package. You can select multiple resources.</p> <p>Notes:</p> <ul style="list-style-type: none"> ▶ 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 <input type="checkbox"/> icon 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.) <p>Important information:</p> <p>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.</p> <ul style="list-style-type: none"> ▶ 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. <p>For details on calculated relationships and triplets, see "Impact Modeling" in the <i>RTSM Modeling Guide</i>.</p>

Selection Summary Page

This wizard page enables you to view the resources to be included in 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 (unlabeled elements are shown in angle brackets):

UI Element (A-Z)	Description
<Selected resources>	Displays the resources that were selected to be part of the package.

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.


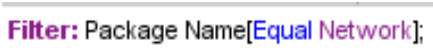
User interface elements are described below:

UI Element	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	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 . 


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 <i>RTSM Modeling Guide</i> .
<Right-click a column header>	For details, see "Sort Column Content Dialog Box" in the <i>RTSM Modeling Guide</i> .
Condition	Click inside the box and select the required operator. For details, see "Attribute Operator Definitions" in the <i>RTSM Modeling Guide</i> .

UI Element (A-Z)	Description
Display Name	Filter the task list according to one of the following: <ul style="list-style-type: none"> ➤ Package name ➤ Category ➤ Readme ➤ Version ➤ Description For details, see "Package Manager Page" on page 69.
Value	Click inside the box to open the Edit box. Enter the required value. <p>Note: When using the Like or Like ignore case operators, include the wildcard (%) in the search value.</p>

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 58

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.





UI Element (A-Z)	Description
Search Results	The search results. Displays the names of up to 30 resources containing the text entered in the Resource name box.
Topic	The subsystem containing the resource you want the package to contain. For details, see "Resource Types" on page 58.




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 .
See also	"Package Administration Overview" on page 44

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 "How to Create a Custom Package" on page 48.
	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
	<p>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:</p> <ul style="list-style-type: none"> ▶ 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: <ul style="list-style-type: none"> ▶ Save the file as HTML ▶ Open the file in an HTML editor ▶ Copy the relevant table into the target file
	<p>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.</p> <p>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.</p>

UI Element (A-Z)	Description
	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.
	Installs 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.
	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 <i>RTSM Modeling Guide</i> .
	Represents a factory package.
	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.


UI Element (A-Z)	Description
Package Name	The name of the package.
Readme	Click to read a description of the package, as well as other relevant information.

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 (A-Z)	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 (A-Z)	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" on page 74
- ▶ "Additional Information on Package Deployment Failure" on page 75
- ▶ "Package Creation and Deployment in a Non-English Locale" on page 75

Datamodel Resources Cannot Be Undeployed

For a list of the package resources, see "Package Resources" on page 55.

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 <HP Business Service Management 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.

3

State Manager

This chapter includes:

Concepts

- ▶ State Manager Overview on page 78

Tasks

- ▶ How to Define a State on page 79

Reference

- ▶ State Manager User Interface on page 80

Concepts

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 HP Software Support.

Tasks

How to Define a State



- 1** In the State Manager, 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 page 80.

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.

Reference

State Manager User Interface

This section includes:



- ▶ State Manager Page on page 80


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	<ul style="list-style-type: none"> ▶ The change and operation states are default states that cannot be edited. ▶ It is recommended to consult with HP Software Support before defining a state.
Relevant tasks	"How to Define a State" on page 79
See also	"How to Create an Enumeration Definition – Workflow" in the <i>RTSM Modeling Guide</i>

User interface elements are described below:

UI Element (A-Z)	Description
	Add a state.
	Delete a state.

UI Element (A-Z)	Description
	<p>Creates an Enumeration definition. Opens the Create Enumeration Definition dialog box.</p> <p>For details, see "Create/Update List/Enumeration Definition Dialog Box" in the <i>RTSM Modeling Guide</i>.</p> <p>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" in the <i>RTSM Modeling Guide</i>).</p>
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	<p>Click in the box to display a list of the Enumeration definitions.</p> <p>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.</p>

4

Scheduler

This chapter includes:

Tasks

- ▶ How to Define Tasks That Are Activated on a Periodic Basis on page 84

Reference

- ▶ Scheduler User Interface on page 87

Tasks

How to 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" on page 84
- "Choose an Action" on page 85
- "Schedule a Task" on page 85

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 89.

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
<input checked="" type="checkbox"/>	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 page 87.

3 Schedule a Task

Set the schedule for activating a task in the Scheduler pane. For details, see "Job Definition Dialog Box" on page 89.

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:

In the **Administration module > Infrastructure Settings Manager > Integration Settings** set the value for **Enable Scheduled Jobs Auto Run** 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	
<input type="radio"/> Once <input type="radio"/> Interval <input checked="" type="radio"/> Daily <input type="radio"/> Weekly <input type="radio"/> Monthly <input type="radio"/> Cron	
Time zone:	<input type="text" value="US/Central"/> <input type="button" value="Reset server time zone"/>
Invocation hour	<input type="text" value="01:00, 06:00"/> <input type="button" value=">>"/>

Reference


Scheduler User Interface

This section includes (in alphabetical order):

- Action Definition Dialog Box on page 87
- Filter Dialog Box on page 88
- Job Definition Dialog Box on page 89
- Job Scheduler Page on page 93
- Select Days Dialog Box on page 95
- Select Hours Dialog Box on page 95

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	"How to Define Tasks That Are Activated on a Periodic Basis" on page 84

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 <i>RTSM Modeling Guide</i> .
<Right-click a column header>	For details, see "Sort Column Content Dialog Box" in the <i>RTSM Modeling Guide</i> .
Actions	For a list of actions that can be run by the Scheduler, see "Scheduler Actions" on page 88.


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	"How to Define Tasks That Are Activated on a Periodic Basis" on page 84

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 <i>RTSM Modeling Guide</i> .
<right-click a column header>	For details, see "Sort Column Content Dialog Box" in the <i>RTSM Modeling Guide</i> .
Condition	Click inside the box and select the required operator. For details, see "Attribute Operator Definitions" in the <i>RTSM Modeling Guide</i> .
Display Name	Filters the task list according to one of the following: <ul style="list-style-type: none"> ➤ 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	<ul style="list-style-type: none"> ➤ "Choose an Action" on page 85 ➤ "Schedule a Task" on page 85

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	"Choose an Action" on page 85
-----------------------	-------------------------------

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.
	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: In the Administration module > Infrastructure Settings Manager > Integration Settings set the value for Enable Scheduled Jobs Auto Run to false (ID: enable.scheduled.jobs.auto.run).
Relevant tasks	"Schedule a Task" on page 85
See also	"Cron Expressions" on page 563

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

UI Element (A-Z)	Description
	Automatically set the time zone to the correct one for the server.
	(Appears when you choose Cron) Validates the Cron expression you entered.
<Schedule options>	Select the required option for scheduling the task. The available options are: <ul style="list-style-type: none"> ▶ 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 <i>RTSM Modeling Guide</i>.

UI Element (A-Z)	Description
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 <i>RTSM Modeling Guide</i> .
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.
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.








UI Element (A-Z)	Description
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	"How to Define Tasks That Are Activated on a Periodic Basis" on page 84

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 <i>RTSM Modeling Guide</i> .
	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 <i>RTSM Modeling Guide</i> .
<Right-click a column header>	For details, see "Sort Column Content Dialog Box" in the <i>RTSM Modeling Guide</i> .
Active	Select the check box to activate the scheduled job.
Job Definition	A description of the scheduled job as defined in the Definitions 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 91.

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	"How to Define Tasks That Are Activated on a Periodic Basis" on page 84

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	"How to Define Tasks That Are Activated on a Periodic Basis" on page 84

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 "Invocation Hour" on page 92.

Part III

CI Lifecycle

5

CI Lifecycle and the Aging Mechanism

This chapter includes:

Concepts

- ▶ The Aging Mechanism Overview on page 100
- ▶ CI Lifecycle – Overview on page 101

Tasks

- ▶ How to Enable and Run the Aging Mechanism on page 102
- ▶ How to Generate CI Lifecycle Data and Filter the Results on page 104
- ▶ How to Enable Manual Load Balancing for Multiple Probes on page 105

Reference

- ▶ Aging Parameters on page 106
- ▶ CI Lifecycle User Interface on page 106

Concepts

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 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 106.

Note:

- ▶ 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 *RTSM Data Flow Management Guide* and "Enable Aging" on page 109.
-

 **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*.

Tasks

How to 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" on page 102
- "First Aging Run" on page 103

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 108.

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.

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. Choose between the following options:

- ▶ 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 is the preferred method of deletion because the History database is updated with the information and there is no server downtime.

- ▶ You run the database aging tool, located at **C:\HPBSM\odb\tools\dbscripts\dbtool.bat**. If you choose this option, you must stop the RTSM service.

You would choose this second option if you needed a fast system of deletion: the database aging tool is an order of magnitude faster than the aging mechanism.

Caution: Before running this option, be aware of the following:

- ▶ You must completely shut down the server before running the tool, that is, there will be server downtime.
 - ▶ After running the database aging tool, run **clearProbeData.bat** on every Data Flow Probe. This file resides in the following location: **C:\hp\UCMDB\DataFlowProbe\tools**.
 - ▶ No information is written to the History database.
-

To run the database aging tool:

- a** Back up the RTSM database schemas. This step is mandatory.
- b** Run the tool in a testing environment before running it in a production environment. This step is recommended.
- c** Stop the Data Processing server.
- d** Run the **dbtool.bat** file from the file system.
- e** Restart the Data Processing server.
- f** Return to the Aging Status tab and enable aging.
- g** Invoke **clearProbeData.bat** on every Data Flow Probe connected to the UCMDB Server.

How to 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" on page 104
- ▶ "Filter the CI Lifecycle Results" on page 105

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 113.

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 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. For details, see "Filter Dialog Box" on page 114.

How to 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 100.

Reference

Aging Parameters

Aging parameters are defined in Infrastructure Settings (**Admin > Platform > Setup and Maintenance > Infrastructure Settings > 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.

CI Lifecycle User Interface


This section includes (in alphabetical order):

- ▶ Aging Run Statistics Dialog Box on page 107
- ▶ Aging Status Tab on page 108
- ▶ CI Lifecycle and Relationship Tabs on page 109

- CI Lifecycle Page on page 113
- Filter Dialog Box on page 114

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	"How to Enable and Run the Aging Mechanism" on page 102

User interface elements are described below:

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

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	<p>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:</p> <ul style="list-style-type: none"> ▶ 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 103. ▶ 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	"How to Enable and Run the Aging Mechanism" on page 102

User interface elements are described below:











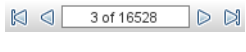
UI Element (A-Z)	Description
Enable Aging	<ul style="list-style-type: none"> ▶ To enable aging, select the check box. The frequency and size of the chunks that are marked as candidates for deletion are determined in Infrastructure Settings. For details, see "Aging Parameters" on page 106. ▶ To disable aging, clear the check box.
Run results	<p>Total CIs to delete. The number of CIs or relationships that are delete candidates and that are being deleted by the aging mechanism.</p> <p>Deleted. The number of CIs or relationships that have been deleted.</p> <p>Failed. CIs or relationships that could not be deleted. If any failures exist, click the Failed link to view their details.</p>



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	"How to Generate CI Lifecycle Data and Filter the Results" on page 104
See also	"Working with CIs" in the <i>RTSM Modeling Guide</i>

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

UI Element (A-Z)	Description
	Delays 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.)
	Prevents a CI or relationship from being deleted. It disappears from the list of candidates for deletion.
	Deletes 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 page 108.
	Selects or clears all rows of data on the current page.
	Updates the data displayed.
	Opens the Filter dialog box, which enables you to customize the filter. For details, see "Filter Dialog Box" on page 114.
	Clears the filter and display the full results.
	Opens 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 <i>RTSM Modeling Guide</i> .
	Click the arrow to define the number of rows that should appear on each display page.
	Navigates through the results page by page or to jump to the first or last page.

UI Element (A-Z)	Description
	<p>Generates data for a selected period.</p> <p>Tip: If no results are generated, try extending the time period further into the future (the To field).</p>
	<p>Click Export Data to File to choose the export format for the table data. The available options are:</p> <ul style="list-style-type: none"> ▶ 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>	<p>For details on the menu options, see "IT Universe Manager Shortcut Menu" in the <i>RTSM Modeling Guide</i>.</p>
<Right-click a column header>	<p>For details, see "Sort Column Content Dialog Box" in the <i>RTSM Modeling Guide</i>.</p>

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



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	<p>The CI Lifecycle page includes the following tabs:</p> <ul style="list-style-type: none"> ▶ Aging Status. Use this tab to enable the aging mechanism and to run aging. For details, see "Aging Status Tab" on page 108. ▶ 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 109. ▶ Relationships. Displays the same information as the CIs tab, with the addition of the End1 and End2 columns. <p>The tab that is displayed by default depends on whether aging is enabled or disabled:</p> <ul style="list-style-type: none"> ▶ If aging is enabled, the CIs tab is displayed. ▶ If aging is disabled, the Aging Status tab is displayed.
Relevant tasks	<ul style="list-style-type: none"> ▶ "How to Enable and Run the Aging Mechanism" on page 102 ▶ "How to Generate CI Lifecycle Data and Filter the Results" on page 104
See also	"Working with CIs" in the <i>RTSM Modeling Guide</i>

Filter Dialog Box

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

Description	Click Filter on the CI Lifecycle page.
Included in Tasks	"How to Generate CI Lifecycle Data and Filter the Results" on page 104

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	<p>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.</p> <p>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.</p> <p>Note: You must select a condition before entering a value.</p>

Part IV

Glossary of RTSM Terminology

6

Glossary

This chapter lists terminology that is used throughout the RTSM documentation.

adapter

An entity in RTSM responsible for retrieving or updating data in a remote system (data that is not saved in the RTSM database). The adapter is aware of how specific data is modeled and knows the vendor-specific protocol for communicating with the repository. An adapter can be used either for setting up integrations (integration adapter) or for performing discovery tasks (discovery adapter).

Adapter Management

The application module that enables you to manage the adapters needed to run discovery or set up integrations.

calculated relationship

A calculated relationship represents the connection between the source and target CI, whose path meets the conditions defined for the triplets on which it is based in the CI Type Manager. The direction of the calculated relationship is not always the same direction as the physical relationship taken from the CI Type model. You can use calculated relationships to create TQL queries just like any other relationship in the CI Type model. This enables you to base Enrichment rules, Impact Analysis rules, and views on calculated relationships.

CI Selector

A tool used in various applications for displaying, managing, and searching within the CI views.

CMS

The central RTSM server and the authority for configuration management in the multiple CMDBs solution.

compound relationship

Represents a path in the topological graph. You use a compound relationship to define the allowed steps in the path between a source and target CIs.

configuration item (CI)

A component of the RTSM that represents a physical or logical entity in the system. For example, CIs can represent hardware, software, services, or business processes. The CIs are organized into a hierarchical format based on the dependencies in your organization's IT environment.

configuration item type (CIT)

The category for each configuration item (CI). Each CIT provides a template for creating the CI and its associated properties.

Configuration Item Type Manager

Enables you to view the information in the CI Type model, which contains the definitions of all configuration item types (CITs) defined in the system and the relationships that define the connections between them. Each CIT has its own attributes, as well as the attributes inherited from its parent CIT.

configuration management database (CMDB)

The core information repository of Business Service Management. The CMDB stores and handles the infrastructure information as CIs and relationships. The CMDB is called the Run-time Service Model (RTSM) in Business Service Management.

credentials

The user names and passwords provided by the user to enable Data Flow Management to connect to remote systems.

data flow

The flow of information, either into the RTSM or outwards to an external repository.

Data Flow Management

The management capabilities provided by the RTSM to control data flows.

Data Flow Probe

The main data flow component responsible for requesting tasks from the Business Service Management server, executing them, and sending the results back to the RTSM. The Probe includes two components: the Probe Gateway and the Probe Manager. The Gateway provides communication (http or https) between the Manager and the RTSM, for processes such as downloading tasks and returning task results. The Manager executes the task provided by the RTSM. The Gateway communicates with the Manager using RMI. One Gateway can connect to several Managers. By default, the Manager and the Gateway run as one process.

Data Flow Probe Setup

The application module that enables you to configure Probes and credentials.

Data Flow Probe Status

The application module that enables you to view current information on all active jobs running on the Probes.

data push

A data flow of type Data Push sends information from the RTSM outwards to an external system.

data source

A BSM data source represents a possible source of information for the BSM TQL engine. A data source can be either the RTSM itself (including all the data populated into it by either discovery or integrations), or any integration of type Federation.

discovery

The mechanism that enables you to collect information about the IT infrastructure resources on your system and their interdependencies.

discovery adapter

An adapter that is used by Data Flow Management to collect information about the IT infrastructure resources on your system and their interdependencies.

Discovery Control Panel

The application module that is used to control the discovery process. Using the Discovery Control Panel, you can select which discovery jobs to activate, as well as track the ongoing discovery process.

discovery job

Discovery jobs are based on discovery adapters, and may override parameters, scheduling information, and trigger TQL assignments. All customization resides in the job, which means that one adapter can be used for different schedules and with different parameters.

discovery job execution policy

A set of parameters that defines when discovery jobs are allowed to run.

discovery module

One or more discovery jobs that together enable the discovery of a specific technology or application.

discovery protocol

Communication credentials that are used to establish connections with remote systems such as SNMP, WMI, SSH, Telnet, and so on.

domain

A logical term for a customer site where each IP address is individual, that is, each domain must contain unique IP addresses. There are two types of domains: **customer**, for a specific customer site that contains private IP addresses; **external**, for the Internet (public) domain that contains all the IP addresses that are not included in the customer site.

external class

A class defined in the Business Service Management data model whose instances are stored in external data repositories and not in Business Service Management.

federation

The ability of the RTSM to bring in data from external data sources. That is, the data is not stored in the CMDB, but remains in the external data source. Each time the data is queried, BSM brings the data on the fly to the RTSM from the external data source.

federated data source

Represents an external data repository from which BSM is capable of federating data. Federated data sources are created within the Integration Studio by setting up Integration Points of type Federation.

fuse

Represents the limits defined for different operations in the system.

global ID

A unique CI ID, generated by the CMS, that identifies that CI throughout the system, making it easier to work in multiple RTSM environments.

hierarchy rule

The hierarchy of a view defines the organizational structure of CIs in the topology map, by displaying selected CIs at different levels (layers). When no hierarchy rules are defined, the topology map displays all CIs included in a query result on one level. For example, if a query result includes a CI and its child, both CIs are displayed on the same layer in the topology map.

HP Business Service Management

HP's solution for real-time performance and availability monitoring from a business perspective, service level management, end-user management, system availability management, and custom reporting.

inheritance relationship

CITs that inherit the attributes and behavior (such as the label function) of the parent CIT.

integration

A BSM integration enables the setting up of data flows, either from the RTSM to some external system (data push) or from an external system into the RTSM (population/federation).

integration adapter

An adapter that is used to integrate CIs and relationships between the RTSM and external data repositories. Available integration flows are population, federation, and data push.

IT Universe model

Part of the RTSM, responsible for holding the CIs and the relationships between the CIs. The IT universe model is organized into a hierarchical format that represents your organization's IT environment.

JMX Console

A portal that displays the operations and properties of all active, registered MBeans as a web interface, using HTML controls.

job execution policy

A set of parameters that defines when discovery jobs are allowed to run.

mapping engine

A component in the federation flow that connects CIs from different data repositories, when those data repositories are connected with a virtual link. By default, the connection is made using the BSM reconciliation engine.

mapping file

An XML file used by integrations in RTSM to map CI and Relationship types in UCMDB to CI and Relationship types in a target data store.

modeling

The process of mapping the complex relationships between servers, network, storage, and software, and logical elements such as business services, VPNs, and end users.

module

One or more discovery jobs that together enable the discovery of a specific technology or application.

multinode

An artificial entity defined in an adapter for reconciliation. For example, if reconciliation is done by a host CI, a host multinode is defined and all fields used for reconciliation are mapped to columns in the database.

package

A subset of resources defined by certain criteria, logically grouped together, which is used to add content to the RTSM. This content can include the discovery of IT infrastructure, integrations, CITs, views, and so on.

Package Manager

The application module that is responsible for dispatching user or system requests for resource operations such as export, import and delete. It enables you to deploy some or all of a package's resources to the RTSM from your local directory, as well as export some or all of a package's resources in the Package Manager to your local directory.

Package Repository

Packages and their resources are modeled in the RTSM as instances of CI types: *deployedpackage* and *deployedresource*.

Package Resource

Each entity available in the RTSM is a CI type, TQL query, view, report, impact rule, discovery job, adapter, or schedule.

Package Subsystem

In terms of the Package Manager, a subsystem is a logical type of resource such as: class model, data model, view, type definition, discovery job, and so on.

pattern view

Enables a query to the RTSM by defining topology query language (TQL) queries.

perspective

A pattern to be applied to a model or a collection of CIs to create a perspective based view using the Modeling Studio.

population

A data flow of type Population populates information from some external system as CIs and relationships, which are stored and managed within the RTSM.

protocol

Communication credentials that are used to establish connections with remote systems such as SNMP, WMI, SSH, Telnet, and so on.

reconciliation

The process of resolving data conflicts, either by resolving to a common naming schema or resolving data overlap differences within the records to a single answer. Reconciliation is composed of two parts: the first is identification of the CIs and relationships according to data entering the RTSM, and the second is the decision taken of which reported data is to be considered authoritative, in case of data conflicts (reconciliation priority).

resources

Applications, databases, network devices (hardware and software), and servers that are discovered and managed by HP Business Service Management.

subgraph

A graph that represents additional TQL query data related to a specific CI.

topology

A TQL result that describe CIs and the relationships between them (graph result).

Topology Query Language (TQL)

A language and tool for discovering, organizing, and managing IT infrastructure data. It is used to create queries that retrieve specific data from the RTSM and display that data in a graphical manner. TQL enables you to draw conceptual relationships between CIs and create visual images of IT infrastructure resources.

trigger CI

A CI (or set of CIs) that is used as a trigger to create a task from a discovery job.

trigger node

A node can be defined as a trigger node in Impact Analysis Manager. Impact Analysis Manager enables you to simulate how infrastructure changes you want to make impact your system. A node defined as a trigger node is the root cause node, or the node that represents the changes you want to make to the system.

trigger TQL

A TQL query that is assigned to a discovery job and automates the process of adding trigger CIs to that job.

triplet

The allowed steps in a path in a topology graph leading from the source CI to the target CI when creating a subgraph definition, a compound relationship, or a calculated relationship.

view

A collection of CIs and relationships represented by icons. These CIs and relationships are the result of a TQL query to the RTSM, and are displayed as a view according to display and organizational rules that are assigned to them. Each CI/relationship can be presented in multiple views or by multiple icons in different view layers.

virtual relationship

A relationship between two graph nodes that come from different data repositories. The instances of these relationships do not exist in any data repository and are created during TQL calculation.

Index

A

- Action Definition dialog box
 - Scheduler 87
- adapters
 - packages 47
- aging
 - and the CI Lifecycle 99
 - Dashboard 99
 - overview 100
 - parameters 106
 - Solutions and Integrations 99
 - System Availability Management 99
 - TransactionVision 99
- Aging Run Statistics dialog box 107
- Aging Status tab
 - in CI Lifecycle window 108
- attribute states
 - defining 79

C

- Choose Resources to Export dialog box
 - Package Manager 61
- CI Lifecycle
 - aging 99
 - Aging Status tab 108
 - and relationships 109
 - Filter dialog box 114
 - filter results 104
 - generate data 104
 - overview 101
 - page 113
- CI Type log 24
- CMDB
 - audit short log 26
 - DAL Log 28
 - enrichment log 27

- log files 23
- notification logs 25
- Operation Statistics Log 29
- plug-in log 28
- configuration items 20
- Create Custom Package/Edit Package wizard
 - Package Manager 62
- Create New Package/Edit Package wizard
 - Package Properties page 62
 - Resource Selection page 63
 - Selection Summary page 66

D

- Dashboard
 - aging 99
- Data Flow Management
 - logs running on the server 30
- Data Flow Probe
 - load balancing 105
 - touching 105
- documentation updates 14

E

- Export Package dialog box
 - Package Manager 66

F

- Filter dialog box
 - CI Lifecycle 114
 - Package Manager 67
 - Scheduler 88
- Find dialog box
 - Package Manager 68

G

glossary 117

H

History database log 26
HP Software Support Web site 13
HP Software Web site 14

J

JMX console
 deploying packages 51, 53
 export packages 53
 undeploy packages 52
Job Definitions dialog box
 Scheduler 89
Job Scheduler page
 Scheduler 93

K

Knowledge Base 13

L

Log Configuration dialog box 38
log levels
 configuring 21
logs 23
 changing log levels 33
 DFM running on the server 30
 downloading in zip file 21
 quota log parameters 23
 severity levels 32

O

ODB
 concepts 17
online resources 13

P

Package Manager
 Choose Resources to Export dialog
 box 61
 Create Custom Package/Edit Package

 wizard 62

 Export Package dialog box 66
 Filter dialog box 67
 Find dialog box 68
 page 69
 user interface 60

Package Properties page
 Create New Package/Edit Package
 wizard 62

packages

 administration overview 44
 contents and format 46
 create 48
 deploy 49
 deploying using the JMX console 51
 displaying deployed using the JMX
 console 53
 export 50
 export using the JMX console 53
 for integration adapters 47
 resources 55
 troubleshooting and limitations 74
 undeploying using the JMX console
 52

Q

Query nodes and relationships 20

R

Remove Resources page
 Undeploy Package Resource wizard 73
Resource Selection page
 Create New Package/Edit Package
 wizard 63

S

Scheduler
 Action Definition dialog box 87
 define tasks to run periodically 84
 Filter dialog box 88
 Job Definitions dialog box 89
 Job Scheduler page 93
 Select Days dialog box 95
 Select Hours dialog box 95

- user interface 87
- Screen Capture tool 33
- Select Days dialog box
 - Scheduler 95
- Select Hours dialog box
 - Scheduler 95
- Selection Summary page
 - Create New Package/Edit Package wizard 66
 - Undeploy Package Resource wizard 74
- Solutions and Integrations
 - aging 99
- State Manager
 - dialog box 80
 - overview 78
 - user interface 80
- Status bar 39
- System Availability Management
 - aging 99

T

- tasks
 - run periodically with Scheduler 84
- thread dumps
 - downloading in zip file 21
 - location 21
- TransactionVision
 - aging 99
- Troubleshooting and Knowledge Base 13

U

- Undeploy Package Resource wizard 73
 - Remove Resources page 73
 - Selection Summary page 74
- updates, documentation 14

