HP Universal CMDB

For the Windows and Red Hat Enterprise Linux operating systems

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Administration Guide

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Introduction

Chapter 1

Configuration Management Database (CMDB)

This chapter includes:

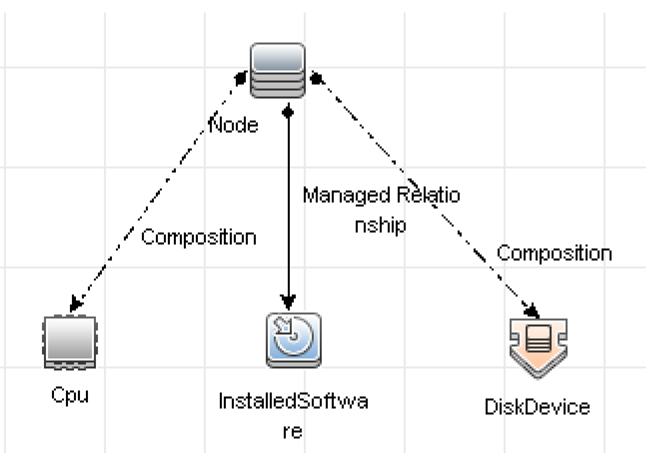
CMDB Overview

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

The CMDB contains all the configuration items (CIs) and relationships created in HP Universal CMDB, whether created automatically from the DFM process or inserted manually. The CIs and relationships together represent a model of all the components of the IT Universe in which your business functions. The CMDB stores and handles the infrastructure data collected and updated by the DFM process. For more information about the DFM process, see the *HP Universal CMDB Discovery and Integration Content Guide*.

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

You use factory views or views defined in the Modeling Studio to display and manage the CIs and relationships in the CMDB. The views enable you to focus on specific IT areas and are available via the CI Selector. An example of a view is shown in the following figure:



The CMDB also contains the TQL query definitions that are used to query and retrieve data from the CMDB, 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 *HP Universal CMDB Modeling Guide*.

Configuration Items (CI)

A configuration item (CI) is a component of the CMDB 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 CMDB, where they are organized into a hierarchical format based on the interdependencies in your organization's IT environment. The interdependencies in HP Universal CMDB are called relationships.

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

For further details on working with CIs in HP Universal CMDB, see "Working with CIs" in the *HP Universal CMDB Modeling Guide*.

Query Nodes and Relationships

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

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

History Storage and Purging in UCMDB

History Storage

HP Universal CMDB stores history for all CIs and relationships. By default, history is stored for all attributes of a CI or relationship. You can configure specific CIT attributes to be excluded from history storage by selecting the **Not Tracked for History** qualifier for those attributes. For details on editing CIT attributes, see Add/Edit Attribute Dialog Box in the *HP Universal CMDB Modeling Guide*.

Baseline Process

Stored history events for CIs and relationships are grouped by CI type. For each CI type, the history events for each CI instance are stored by monthly periods with a separate database table for each monthly period. At the beginning of each table, the current data for all CIs and relationships is recorded. Such history entries are known as a **baselines**. The **Baseline Process** is the mechanism that creates a new table and records the baseline entries in the history.

The Baseline Process runs at the date and time fixed as the start time of a period. This value is defined using the **history.baseline.defined.start.date setting** in the **override.properties file** located in the **hp\UCMDB\UCMDBServer\conf** folder. The setting stores the day of the month in the first 2 digits and the hour in the last 2 digits (with a space between the day and the hour). The setting applies to all CI types, and the Baseline Process runs at the specified hour on the specified day in each month. The default value for the setting is **10 00**, which means that by default, the Baseline Process runs at midnight on the 10th of each month.

> **Caution:** The start time definition must be set prior to the first startup of the server (or prior to running an upgrade). It cannot be changed after the server has been started.

If the server was down at the start time of the period, the Baseline Process runs at the predefined baseline hour on the next day that the server is running, and creates all the required tables. If the Baseline Process failed to run at the start of a new period, and a new table was not yet created, then all history events after the start of the new period are temporarily stored in the previous period's table. The events are moved to the appropriate monthly table the next time the Baseline Process runs and creates a table for the new period.

> **Note:**
>
> - Values between 01 and 28 are valid for the day of the month setting; values between 00 and 23 are valid for the hour setting.
> - The starting hour of the Baseline Process should not be the same as the starting hours of the History Purging or Aging processes.
> - Because the Baseline Process affects the population integration performance, schedule the Baseline Process to run at an appropriate distance from the discovery process time.

History Purging

HP Universal CMDB purges the stored history data periodically. The default setting schedules purging once every 24 hours at night. You can configure the purging schedule using the following history infrastructure settings:

- **History Scheduler Hour Of The First Run.** The scheduled time of the first purge.
- **History Scheduler Interval.** The number of hours between purges.

When purging runs, it permanently deletes all history data prior to a certain time, except for the CIs and relationships that were removed from the CMDB. The removed CI and relationship data is stored in a different table for an additional specified period of time. You can configure the number of months of historical data to store using the following history infrastructure settings:

- **History Months To Save Back.** The number of months of historical data to save. Any data older than this is purged.
- **History purging extra months to save back removed data.** The number of extra months to store the removed CI and relationship data after it is purged. If this value is set to 0, the data is not saved for an additional period.

> **Note:** Purging cannot be disabled. It begins running according to the set schedule immediately after server startup.

Server Administration

This chapter includes:

Basic Administration Tasks

This section provides a checklist for basic administration and configuration tasks. You use this checklist to review the basic administration tasks required to set up the HP Universal CMDB system.

1. **Set up Data Flow Management (DFM).**

   Licensed DFM users can run the discovery process to identify IT resources in the network infrastructure. For details, see the *HP Universal CMDB Data Flow Management Guide*.

2. **When setting up DFM, request the following from the system administrator:**

   - Operating system credentials
   - Network protocol credentials
   - Application credentials

3. **Set up users and roles**

   Define users and roles and assign roles to users to grant permissions for views, TQL queries and other components. For details, see "User Permissions Workflow" on page 104 for a single tenant environment and "Multi-Tenancy Workflow" on page 112 for a multi-tenancy environment.

4. **Configure recipients of scheduled reports, including method of delivery.**

   For details, see "Reports" in the *HP Universal CMDB Modeling Guide*.

5. **Manually build your IT universe model by defining configuration items (CIs) and CI relationships in the model.**

   Divide the model into views that represent logical subsets of the overall model. Add CIs based on discovered network resources or manually define infrastructure components.

   For details, see:

- "IT Universe Manager" in the *HP Universal CMDB Modeling Guide*
- "Modeling Studio" in the *HP Universal CMDB Modeling Guide*

Manage UCMDB Licenses Using the JMX Console

You can manage the product licenses from the JMX Console.This task describes how to install a license.

1. On the UCMDB 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=Licensing Services** to open the JMX MBEAN View page.
3. Locate the **addLicense** method.
4. Enter your customer ID and the license key.
5. Click **Invoke**.

There are additional JMX methods available on the same page for the following functions:

- Installing a license from a file
- Displaying all active licenses
- Displaying all licenses (including expired licenses)
- Displaying a summary of active licenses
- Removing all licenses

Disable High Availability Mode Using the JMX Console

UCMDB starts in High Availability mode by default. To disable it, follows these steps:

1. On the UCMDB 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=Settings Services** to open the JMX MBEAN View page.
3. Locate the **setSettingValue** method.
4. In the name box, enter **enable.high.availability**.
5. In the value box, enter **false**.
6. Click **Invoke**.

Change the Root Context for UCMDB Components

The default root context for all HP Universal CMDB components is **/**. This root context can be configured in the Infrastructure Settings Manager.

To change the root context:

1. Go to **Administration > Infrastructure Settings Manager** and select the **Root context** setting under **General Settings**.
2. Edit the setting and save your changes.
3. Restart HP Universal CMDB.

One application of this feature is the ability to access multiple UCMDB servers using one reverse proxy server. Each UCMDB server can be configured with its own root context.

> **Caution:** After changing the root context from its default value, all UCMDB components are only available using the new root context. For example, if the new root context is /ucmdb1, the user interface will be accessible from the following url: **http://<server name or IP address>.<domain name>:8080/ucmdb1/ucmdb-ui**.
>
> For Configuration Manager users: If you change the root context, you must update the UCMDB access URL field in Configuration Manager accordingly (**Administration > Settings > Integrations > UCMDB Foundation**).

Configure UCMDB Log Levels

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

1. On the UCMDB 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**.

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 UCMDB Server.

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://<UCMDB Server Host Name or IP>:8080/jmx-console**.

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

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

4. Locate the **executeLogGrabber** operation.

5. 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.

6. 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 UCMDB Server:

1. Access the following folder on the UCMDB Server: **C:\hp\UCMDB\UCMDBServer\tools\logGrabber**.

2. Run the **logGrabber.bat** file.

   The **LogGrabber_<current time>.zip** file is created in the following location: **C:\hp\UCMDB\UCMDBServer\runtime**. This is a thread dump that includes the threads of the Server framework only.

Log Files

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

Log files are located in the **C:\hp\UCMDB\UCMDBServer\runtime\log** folder.

This section includes the following topics:

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- "CMDB Dal Log" on page 24
- "CMDB Operation Statistics Log" on page 24
- "Configuration Log" on page 24
- "CMDB Authorization Management Log" on page 25
- "CMDB Authorization Permissions Log" on page 25
- " Client-side Applet Logs" on page 26

Quota Log Parameters

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

Log File	Description
Purpose	Quota names, quota values, and current quota levels.
Information Level	Quota names and values set in the server and customer levels during a customer load.
Error Level	CMDB 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 `duplicate attributes`.
Error Level	Not available.
Debug Level	Every CI Type update includes the following: • original CIT in XML format • new CIT in XML format • differences between the CITs If the CI Type Model update is rejected, the reason is logged.
Basic Troubleshooting	Compares the differences that the server finds between the original CIT and

Log File	Description
	the new CIT. This is useful to understand the following scenarios: • a CIT in a package failed • an action in the CIT browser applet failed • an action in the CIT browser applet succeeded when it should have failed

CMDB Notification Log

The log name is **cmdb.notification.log**.

Log File	Description
Purpose	Notification messages from the time of the component's creation in the CMDB until the client's listener receives a message. Most components receive configuration changes from the CMDB in push mode, by the notification mechanism, rather than in pull mode.
Information Level	• Startup and shutdown of publishers • Register and unregister remote and internal listeners
Error Level	• Errors when messages are published • Errors when messages are received
Debug Level	• Unique message ID • Number of changes that a message includes as well as more details according to the type of the message (for example, the TQL result version) • JMS header properties
Basic Troubleshooting	If an application does not receive a notification, check the following: • 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)

CMDB 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.

Log File	Description
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: • 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 Log

The log name is **history.log**.

Log File	Description
Purpose	Records general history events
Information Level	• Auto completion events • Auto complete table lock/unlock messages • Tenants bitmask column size handling • Delete customer fuse notice
Debug Level	• Auto completion details • History Root table handling messages

History Audit Update Log

The log name is **history.update.audit.log**.

Log File	Description
Purpose	Tracks events saved in the History tables
Information Level	• Details all events stored in the history tables • Event statistics
Debug Level	Database statistics

History Partition Log

The log name is **history.partition.log**.

Log File	Description
Purpose	• Records history partition data. • Records the Baseline process events.
Information Level	• Add/Remove partition history tables • Baseline events • Baseline statistics
Error Level	• Table partition failures • Baseline process failures

Query History Log

The log name is **history.queries.log**.

Log File	Description
Purpose	Records all the queries performed on the history tables.
Information Level	• Query condition • Query results summary
Error Level	Fuse exceeded
Debug Level	• Query condition details • Query result details

History Class Model Changes Log

The log name is **history.classmodel.changes.log**.

Log File	Description
Purpose	Tracks all the class model changes that affect the history tables.
Information Level	Class aligning messages
Error Level	Errors that occurred during class aligning

History Purging Log

The log name is **history.purge.log**.

Log File	Description
Purpose	Records the History purging process events

Log File	Description
Information Level	Purging process information
Error Level	Errors that occurred during the purging process
Debug Level	Details about purged data

CMDB Enrichment Log

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

Log File	Description
Purpose	• Enrichment definitions: adding, updating, removing, and calculating. • Calculation results such as how many CIs were added, how many relationships were removed, and so forth. • Supplies the reason for a calculation failure. Failure in a model update, however, is not included since it is an asynchronous execution.
Information Level	• Add, update, and remove enrichment definitions. • Add, update, and remove CIs or relationships to or from a model.
Error Level	Calculation failure.
Debug Level	Traces the enrichment calculation process.
Basic Troubleshooting	• If no calculation was carried out, check the definition of **add enrichment**. • If there are no results, check the **finish calculate** entry.

CMDB Plug-in Log

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

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

CMDB 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 CMDB.
Information Level	Not available.
Error Level	• Connection pool errors • Database errors • Command execution errors
Debug Level	• All DAL commands executed • All SQL commands executed
Basic Troubleshooting	If you suspect that CMDB actions are taking too long, check the time spent on queries and updates in the DAL logs and operation logs. Exception details and ID are entered into the log. The exception ID appears in the exception itself.

CMDB Operation Statistics Log

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

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

Configuration Log

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

Log File	Description
Purpose	Contains basic environment details, including:

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

CMDB Authorization Management Log

The log name is **security.authorization.mangement.log**.

Log File	Description
Purpose	Audit all modifications related to the authorization model.
Information Level	• Creation and modification of tenants, users, user groups, roles, and resource groups. • Changes in user role assignments. • Changes in resource tenant assignments.
Error Level	Failure to create or modify authorization resources, such as trying to create a user with an existing name.
Debug Level	Web services login requests.
Basic Troubleshooting	May be used to track why a user no longer has a specific permission.

CMDB Authorization Permissions Log

The log name is **security.authorization.permissions.log**.

Log File	Description
Purpose	Debug authorization permissions queries.

Log File	Description
Debug Level	Print all existing permission for the user currently logged in, whenever they are queried in the server.
Basic Troubleshooting	To check a specific permission issue,turn on the debug level, perform the action in the UI, turn the debug level off, and check the log for the existing permissions of the user. It is not recommended to keep this log at debug level, because it generates a large amount of printed output.

Client-side Applet Logs

The following client side applet logs are also available:

- **applet-operations.log.** Tracks the operations that are executed from the CMDB UI to the UCMDB server.
- **applet-general.log.** General log for the UI.
- **applet-cacheStatistics.log.** Tracks statistics of the UI cache.
- **applet-missing_resources.log.** Missing resources log.
- **applet-applet-tasks.log.** Logs task executions.
- **applet-timeMeasure.log.** Log for measuring performance.
- **applet-memoryTracker.log.** Tracks the memory usage of the UI.
- **applet-errors.log.** Logs the errors that occurred in the UI

Data Flow Management Log Files

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

mam.AutoDiscovery.log

Contains information about tasks running on the server. The server provides services to the user interface or the Probe Gateway, such as: activating jobs, processing results from the Probe, or creating tasks for the Probe.

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.

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

Basic Troubleshooting

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

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

mam.AutoDiscovery.Results.Stat.log

Contains the statistics of the results received from the Probe.

Autodiscovery Dal Log

The log name is **mam.autodiscovery.dal.log**.

Log File	Description
Purpose	Holds information on queries and other actions taken on the server's database tables as part of the discovery process.
Information Level	A summary of actions taken and their results on the database (such as retrieving information, deleting records, etc.).
Error Level	All critical errors that occurred during the attempt to access the database.
Debug Level	Detailed information on query parameters and/or the results that are retrieved from them
Basic Troubleshooting	If there are any database errors or failures (such as connection failed, technical error in the query, etc.), the error log is included in this log file also.

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" below.

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 CMDB. 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 CMDB 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" below.

Log Configuration Dialog Box

This dialog box enables you to view HP Universal CMDB logs and change the log level.

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

User interface elements are described below:

UI Element	Description
Appender file	Click the link to open the log file in an editor.
Apply	Click to apply the selected log level to the log.
Loggers pane	An expandable list of HP Universal CMDB 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.

Troubleshooting and Limitations

This section describes troubleshooting and limitations for UCMDB.

- If the **wrapper.java.additional.10=-XX:+HeapDumpOnOutOfMemoryError** parameter in the **wrapper.conf** file is set, then every time the server fails with an Out of Memory error, it dumps the full memory to the disk. Since the memory contents could be very large, you should delete these files to avoid disk space problems.

UCMDB Browser

This chapter includes:

UCMDB Browser Overview

UCMDB Browser is a lightweight web-based client to access UCMDB data. The UCMDB Browser provides a simple and intuitive search for Configuration Items (CIs) in the UCMDB and displays important data in the context of the selected CI. It is an ideal tool for providing quick access to specific CI information.

For a CI that is found as a result of a search query, relevant data is presented and gathered into information widgets (for example, Properties, Environment, and Impact widgets). Data is presented by default in a Preview mode, with the option to view more comprehensive data in an Expanded mode.

The Browser has a lightweight UI that ensures simple access to UCMDB information. No user administration is required (this is handled by the UCMDB UI), and no upgrades are needed when updating to a newer version. The Browser has backward compatibility and works with different versions of the UCMDB server by using only the UCMDB SDK.

The UCMDB Browser is HTML-based and runs on the following web browsers: IE8, IE9, FireFox, and Chrome. It also runs on a Safari browser on an iPad 2 tablet with iOS 4 or iOS 5, and a Chrome browser on a Motorola Xoom tablet with Android 3.1 OS (Honeycomb).

> **Note:** When running the UCMDB Browser on the Xoom tablet with the Chrome browser, the optimal text size resolution is Normal.

The UCMDB Browser is targeted for the following customers:

- **Non-UCMDB administrators,** such as business owners or subject matter experts.
- **Mobile device users,** such as tablet users, wishing to take advantage of mobility and the more intuitive UI found on those devices.
- **UCMDB administrators,** who need quick CI access.

> **Note:** UCMDB Browser version 1.7 is provided with UCMDB version 10.00. If you update your version of UCMDB Browser from the released versions on HP Live Network, refer to the updated documentation provided with the UCMDB Browser installation for the latest information.

Change the UCMDB Integration User Credentials

The UCMDB Browser connects to the UCMDB server through the API using the UCMDB UI integration user credentials. If you changed the UCMDB UI integration user credentials from the initial default settings, perform the following steps:

1. Create a file **credentials.txt** and put it in the same directory as **ucmdb_browser_config.xml**.
2. In the file **credentials.txt**, enter the following content:
   - user=<user-name>
   - password=<user-password>

   Where **user-name** is the integration user's user name and **user-password** is the integration user's password.
3. Restart the Tomcat server.

   > **Caution:** For Multiple UCMDB configurations (as described in "Configure Multiple UCMDB Servers" on page 32), the same integration user should be defined on all UCMDB servers.

   > **Note:** After starting the Tomcat server, a new encrypted file **credentials.bin** is created and the file **credentials.txt** is removed.

Configure the UCMDB-UI Server URL

If the UCMDB is deployed in a distributed configuration (in the case of Business Service Management users, when the Gateway and Data Processing servers are not on the same machine), the UCMDB-UI server URL should be defined to allow correct access by direct links.

To configure the UCMDB UI server URL, add the following section to **ucmdb_browser_config.xml**:

<ucmdb_ui_url>http://[ucmdb-ui-server-name]:[ucmdb-ui-port]/ucmdb-ui/</ucmdb_ui_url>

Where **[ucmdb-ui-server-name]** is the UCMDB-UI server name and **[ucmdb-ui-port]** is the UCMDB-UI server port.

Configure LW-SSO

To configure LW-SSO for the UCMDB Browser:

1. Configure all external applications that integrate with the UCMDB Browser with LW-SSO settings, as described in the section LW-SSO Authentication Overview in the interactive *HP Universal CMDB Deployment Guide*.

   > **Note:** If you access the UCMDB Browser by IP (not by FQDN), you should add the UCMDB Browser IP to the UCMDB's trusted hosts. You can do this from the JMX console by finding the method **LW-SSO Configuration Management : addTrustedIPs** and invoking it with the UCMDB Browser IP value.

2. Open the file **ucmdb_browser_lwsso_config.xml** in the **/conf** folder in an XML editor and make the following changes:

   - For the **domain** tag, enter the domain name of the UCMDB Browser (for example, **net** or **domain-name.com**).
   - For the value of **initString**, enter the exact value of **initString** that is defined for the UCMDB Server and is retrieved when performing the procedure described in the section Retrieve Current LW-SSO Configuration in Distributed Environment in the interactive *HP Universal CMDB Deployment Guide*.

> **Note:**
> - In the case of an embedded UCMDB Browser, configure LW-SSO through the infrastructure setting in the UCMDB. In the UCMDB, go to **Administration > Infrastructure Settings Manager > General Settings** and configure settings that start with LW-SSO.
> - The UCMDB server name in **ucmdb_browser_config.xml** (under tag <host_name>) should be the full DNS name (for example **ucmdb-server.com**).
> - When working with LW-SSO, the URL of the UCMDB Browser should also contain the domain name (for example http://UCMDB-SERVER.com:8088/ucmdb-browser/).

Configure SSL

To install and configure SSL support on Tomcat:

1. Create a keystore file to store the server's private key and self-signed certificate by executing one of the following commands:

- For Windows: **%JAVA_HOME%\bin\keytool -genkey -alias tomcat -keyalg RSA**
- For Unix: **$JAVA_HOME/bin/keytool -genkey -alias tomcat -keyalg RSA**

For both commands, use the password value **changeit** (for all other fields in the console dialog that opens, you can use any value).

2. Remove comments from the entry **SSL HTTP/1.1 Connector** in **$CATALINA_BASE/conf/server.xml**, where **$CATALINA_BASE** is the directory in which you installed Tomcat.

   Note: For a full description on how to configure **server.xml** to use SSL, see the Apache Tomcat official site: http://tomcat.apache.org/tomcat-7.0-doc/ssl-howto.html

3. Restart the Tomcat server.

To use the HTTPS protocol for connection to the UCMDB server:

1. In **ucmdb_browser_config.xml**, assign the value **https** to the tag**<protocol>** and assign the UCMDB server HTTPS port value (8443 by default) to the tag **<port>.**
2. Download the UCMDB Server public certificate to the UCMDB Browser machine (if you use SSL on the UCMDB-Server, the UCMDB administrator can provide you with this certificate), and import it into the **cacerts** trust store on the JRE that is going to connect to the server by executing the following command:

   "%JAVA_HOME%\bin\keytool" -import -alias ucmdb -trustcacerts -file <UCMDB-Server-certificate-file> -keystore "%JAVA_HOME%\jre\lib\security\cacerts"

   where **<UCMDB-Server-certificate-file>** is the full path to the UCMDB Server public certificate file.

3. Restart the Tomcat server.

Configure Multiple UCMDB Servers

It is possible to configure the UCMDB Browser to work with multiple UCMDB Servers. This is done by replicating the section **<ucmdb_configuration>…</ucmdb_configuration>** in the **ucmdb_browser_config.xml** file, as shown in the following example:

<ucmdb_configuration name="configuration-1">

<protocol>http</protocol>

<host_name>ucmdb-server-1</host_name>

<host_port>8080</host_port>

<context_name>/</context_name>

</ucmdb_configuration>

<ucmdb_configuration name="configuration-2">

<protocol>http</protocol>

<host_name>ucmdb-server-2</host_name>

<host_port>8080</host_port>

<context_name>/</context_name>

</ucmdb_configuration>

There is no limit to the number of UCMDB Servers that you can add in this manner.

If the configuration file contains more than one configuration section, the Browser login page shows a drop-down list where you select the UCMDB Server that you want to use with the Browser. The name that appears in the drop-down list is taken from the name attribute of the `ucmdb_configuration` tag. If the name is omitted in this tag, the name is taken from the `host_name` tag.

> **Caution:** If you have launched the UCMDB Browser with a given UCMDB Server, you can not open another instance of the UCMDB Browser with a different UCMDB Server with the same web browser. You can, however, open another instance of the UCMDB Browser with a different UCMDB Server if you use a different web browser. For example, if you opened the UCMDB Browser with Internet Explorer with a given UCMDB Server, you can open the UCMDB Browser using Google Chrome with another UCMDB Server.

> **Note:**
>
> - The same LW SSO settings from the **ucmdb_browser_lwsso_config.xml** file are used for all UCMDB configurations.
> - For each UCMDB Server configuration you have the option to define widget configurations in boundaries of **<ucmdb_configuration name="configuration-2"></ucmdb_configuration>**.

Change the Default Port of the Tomcat Server

It is possible that the default port value (8080) of the Tomcat Server conflicts with an existing application (for example, another web application already uses this port). If such a conflict exists, change the default port as follows:

1. Locate the file **server.xml** in **$CATALINA_BASE/conf/** where **$CATALINA_BASE** is the directory in which you installed Tomcat.
2. In **server.xml**, find a statement similar to the following:

```
<Connector port="8080" maxHttpHeaderSize="8192"
   maxThreads="150" minSpareThreads="25" maxSpareThreads="75"
   enableLookups="false" redirectPort="8443" acceptCount="100"
   connectionTimeout="20000" disableUploadTimeout="true" />
```

   or

```
<Connector port="8080" protocol="HTTP/1.1"
```

```
   connectionTimeout="20000"
   redirectPort="8443" />
```

3. Change the Connector port=”8080″ port to any other port number.

   For example:

```
<Connector port="8181" protocol="HTTP/1.1"
   connectionTimeout="20000"
   redirectPort="8443" />
```

4. Save the **server.xml** file and restart the Tomcat server.

Deploy the UCMDB Browser with a Different Root Context

It is possible to change the default root context name **/ucmdb-browser**. To do this, rename **ucmdb-browser.war** under **<Tomcat installation path>\webapps**.

For example, if you want to change the context name to **/nice-application,** rename **ucmdb-browser.war** to **nice-application.war**.

You can also create a multilevel context name. For example, if you want to change the context name to **/very/very/nice-application,** rename **ucmdb-browser.war** to **very#very#nice-application.war**.

Upgrade the UCMDB Browser

If you have a version of the UCMDB Browser that is older than the current version, you can upgrade to the latest version as follows:

1. Download the file **ucmdb-browser-install.zip** from HPLN (labeled **UCMDB Browser without Tomcat** on HPLN).
2. Stop the web application (Tomcat or UCMDB Server).
3. Delete the old **ucmdb_browser.war** file as follows:
   - **If Browser is installed on the same machine that runs the UCMDB Server:** Delete the file **ucmdb-api-ucmdb-browser.war** from the folder **%UCMDB-Server%deploy-api/**, where **%UCMDB-Server%** is the UCMDB server root folder.
   - **For all other installations:** Delete **ucmdb_browser.war** from **<Tomcat installation path>\webapps**. Also, in **<Tomcat installation path>\webapps** delete the **ucmdb_browser** folder.
4. Copy the new **ucmdb_browser.war** file to the appropriate locations as follows:

- **If Browser is installed on the same machine that runs the UCMDB Server:** Change the file name to **ucmdb-api-ucmdb-browser.war** and copy it to **%UCMDB-Server%deploy-api/**.
- **For all other installations:** Copy **ucmdb_browser.war** to **<Tomcat installation path>\webapps**.

5. Read the release notes for the latest version to determine which features and functionality you want to use and update your Browser settings accordingly.
6. Start the Tomcat server or UCMDB Server (depending on your installation).

   All features and functionality from the previous installation are active in the new installation, as well as the new features and functionality for the latest version.

Configure an Environment to Use Multiple Reverse Proxies

When clients are connected to the same UCMDB Browser instance through multiple reverse proxies, the UCMDB Browser needs to know each client's frontend URL to build correct direct links to the HP Enterprise Collaboration, HP Configuration Manager, and HP Service Manager servers. For example, a client who accesses the UCMDB Browser by reverse proxy https://reverse-proxy-1 should get a direct link by the same https://reverse-proxy-1.

Therefore, a configuration based on relative URLs instead of full URLs should be implemented. When the UCMDB-Browser receives a request with a header X-Reverse Proxy, it relates to application URLs as relative URLs and concatenates part of the header with a relative URL. To use this solution the customer should:

1. Configure each reverse proxy in the environment to append header X-Reverse-Proxy with the Reverse Proxy's frontend URL.
2. Use a relative URL for all servers behind the reverse proxy in the UCMDB-Browser configuration.

To perform the actual configuration:

1. Configure reverse proxy to append header X-Reverse-Proxy with the reverse proxy URL for Apache-server. To do this, open file %apache-home-directory%\conf\httpd.conf (where %apache-home-directory% is the Apache server home directory), and add the following lines:
   - LoadModule headers_module modules/mod_headers.so
   - RequestHeader set X-Reverse-Proxy **http://srp-server-front-end-url**

   Where **http://srp-server-front-end-url** is the entire reverse proxy's frontend URL.
2. The UCMDB Browser configuration file should use relative URLs instead of full URLs. For example, instead of http://cm-server/cnc, use /cnc. Specifically, it is very important that the value of tag **<ucmdb_ui_url>** is defined and uses a relative path.

Enable/Disable the Search Engine

In order for the search engine to work, it must be enabled in the UCMDB. By default, it is enabled (unless it was disabled during UCMDB installation).

To change the enable/disable setting:

1. Go to the JMX Console > UCMDB:service=Settings Services > setSettingValue.
2. In the name field, enter **cmdb.search.enabled**.
3. In the value field, enter:

   true: if you want the search enabled

   false: if you want the search disabled
4. Click **Invoke**.
5. Restart the UCMDB server.

Note: If you disable the Enhanced Search Engine, the UCMDB Browser automatically reverts to the legacy search engine.

Chapter 2

Login Troubleshooting

This chapter includes:

Troubleshooting and Limitations

Use the following information to troubleshoot possible causes of failure to log in.

UCMDB

Possible Causes for Failure to Log In to UCMDB

Use the following information to troubleshoot possible causes of failure to log into HP Universal CMDB.

Problem/Possible Causes	Solutions
HP Universal CMDB is not started successfully. **Indication:** The **jboss_boot.log** file does not include the following line: ======== server is up ========	**Solution 1:** Verify that the HP Universal CMDB Server is up and running by accessing the Web console **http://<Server name>:8080/web-console** where **<server name>** is the name of the HP Universal CMDB Server to which you are connecting. **Solution 2:** Check the database connection: To check that the database server is up and running: 1. Launch the Web browser and navigate to: **http://<Server name>:8080/jmx-console**, where **<Server name>** is the name of the machine on which HP Universal CMDB is installed. 2. Under **UCMDB**, click **UCMDB:service=Dal Services** to open the JMX MBean View. 3. Invoke the function **getDbContext** with a **customerID** parameter value of **1**. 4. Check that the operation result shows no problems. **Solution 3:** Check that the database connection parameters are correct. Ensure that you can log into Oracle Server or Microsoft SQL Server using the credentials you provided during the installation procedure.

Problem/Possible Causes	Solutions
	Solution 4: Use the log file **C:\hp\UCMDB\UCMDBServer\runtime\log\cmdb.dal.log** to verify the database connections. **Solution 5:** To verify that the database connection is valid, in the Windows command interpreter (cmd.exe), type `sqlplus cmdb/cmdb@skazal.`
The CMDB is corrupted (for example, a user record may have been deleted accidentally from the CMDB).	Import a previously backed up database file. For details, see the *HP Universal CMDB Database Guide*. **Important:** The HP Universal CMDB server must be down while importing the database. **Note:** When you import a previously backed up database file, you lose all data previously existing in the system.
The HP Universal CMDB login fails. This may be due to an incorrect login name/password combination.	Ensure that you enter a correct login user name/password combination.
HP Universal CMDB login fails due to unexpected errors.	**Solution 1**: Select **Start > Programs > HP UCMDB > HP Universal CMDB Server Status** and ensure that the service is running. **Solution 2**: Look for errors in the following log files: • **C:\hp\UCMDB\UCMDBServer\runtime\log\error.log** • **C:\hp\UCMDB\UCMDBServer\runtime\log\ui-server.log** If you find errors that are unfamiliar to you, contact HP Software Support.

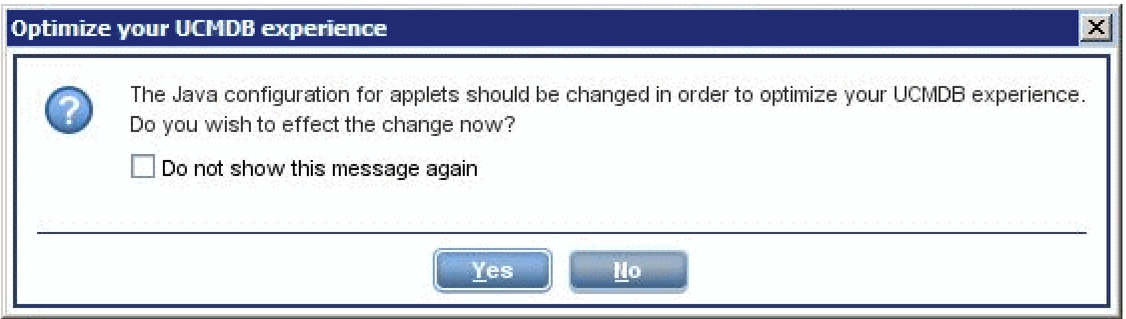
Java Not Installed on Client Machine

If Java is not installed on your machine or you have an version older than 6.u10, during login a message is displayed asking you whether to install the correct Java Runtime Environment version. JRE is needed to view HP Universal CMDB applets.

Click the relevant button to allow HP Universal CMDB to install Java from either oracle.com or the HP Universal CMDB Server.

Updating the Java Configuration

The following message is displayed when HP Universal CMDB detects problems with initial memory:



> **Note:** From Java version 6 update 10, this message is no longer displayed as it is no longer relevant.

Configuration Manager

Problem. You have been assigned the appropriate permissions for Configuration Manager but you are not able to log in.

Solution. Verify that the following parameters are configured correctly in UCMDB:

- LW-SSO init string: This string must not be empty.
- LW-SSO domain: Must be set to the same domain as UCMDB.
- LW-SSO trusted DNS domains: The Configuration Manager domain must be listed here, even if it is the same as the UCMDB domain.

Problem. There is an error in the UCMDB connection.

Solution. One of the following may be the cause:

- The UCMDB server is down. Restart Configuration Manager after UCMDB is fully up (verify that the UCMDB server status is **Up**).
- The UCMDB server is up but the Configuration Manager connection credentials or URL is wrong.

Problem. After changing UCMDB connection settings (such as changes to: host/port/protocol/SRP), the Configuration Manager server fails to start.

Solution. Reconfigure Configuration Manager and specify the UCMDB connection settings that reflect your latest changes. The reconfiguration wizard (**HPCM_10.00.exe**) is located in the **<Configuration Manager installation directory>_installation** folder.

Problem. Changes to the UCMDB class model are not detected in Configuration Manager.

Solution. Restart the Configuration Manager server.

Problem. The Configuration Manager log contains a **UCMDBExecution timeout expired** error.

Solution. This occurs when the UCMDB database is overloaded. To correct this, increase the connection timeout as follows:

1. Create a **jdbc.properties** file in the **UCMDBServer\conf** folder.
2. Enter the following text: `QueryTimeout=<number in seconds>`.
3. Restart the UCMDB server.

Problem. Configuration Manager does not allow you to add a view to be managed.

Solution. When a view is added to be managed, a new TQL is created in UCMDB. If the maximum limit of active TQLs is reached, the view cannot be added. Increase the limit of active TQLs in UCMDB by changing the following settings in the Infrastructure Settings Manager:

- Max Number Of Active TQLs In Server
- Max Number Of Customer Active TQLs

Problem. The HTTPS Server certificate is not valid.

Solution. One of the following may be the cause:

- The validation date of the certificate has passed. You need to get a new certificate.
- The certification authority on the certificate is not a trusted authority. Add the certification authority to your Trusted Root Certification Authority list.

Problem. When logging in from the Configuration Manager login page, you get a login error or access denied page.

Solution. Check that the LW-SSO settings are correct. For details, see the general LW-SSO reference in the *HP UCMDB Hardening Guide*.

Problem. The Configuration Manager server does not start due to entering incorrect database credentials.

Solution. If you made a change to the database credentials and the server fails to start, the credentials may be wrong. You need to re-encrypt the database password and enter new credentials in the configuration file. Proceed as follows:

1. From a command line, run the following command to encrypt the updated database password:

   ```
   <Configuration Manager installation directory>\bin\encrypt-
   password.bat –p <password>
   ```

   which returns an encrypted password.

2. Copy the encrypted password (including the `{ENCRYPTED}` prefix), into the **db.password** parameter in **<Configuration Manager installation directory>\conf\database.properties**.

Problem. The Configuration Manager Tomcat server does not start due to a bind port issue.

Solution. Try one of the following:

- Run the Post install wizard and replace the Configuration Manager server ports.
- Abort the other process that occupies the Configuration Manager ports.
- Manually change the ports in Configuration Manager configuration files by editing the following file: **<Configuration Manager installation directory>\servers\server-0\conf\server.xml** and updating the relevant ports:

- HTTP (8180): line 69
- HTTPS (8143): lines 71, 90

Problem. You receive an "out of memory" message.

Solution. Do the following to change the server startup parameters:

1. Run the following batch file:

   <Configuration Manager installation directory>/bin/edit-server-0.bat

2. Change the following settings:

   -Dapplication.ms=<inital memory pool size>
   -Dapplication.mx=<maximum memory pool size>

Problem. Changes in CIs in UCMDB are not reflected in Configuration Manager.

Solution. Configuration Manager runs an offline asynchronous analysis process. The process may not yet have processed the latest changes in UCMDB. To resolve this, try one of the following:

- Wait a few minutes. The default interval between analysis process executions is 10 minutes. It is configurable in **Administration > Settings**.
- Execute a JMX call to run the offline analysis calculation on the relevant view.
- In **Policies**, click the **Recalculate Policy Analysis** button. This invokes the offline analysis process for all views (which may take some time). You may also need to make an artificial change to one policy and save it.

Chapter 3

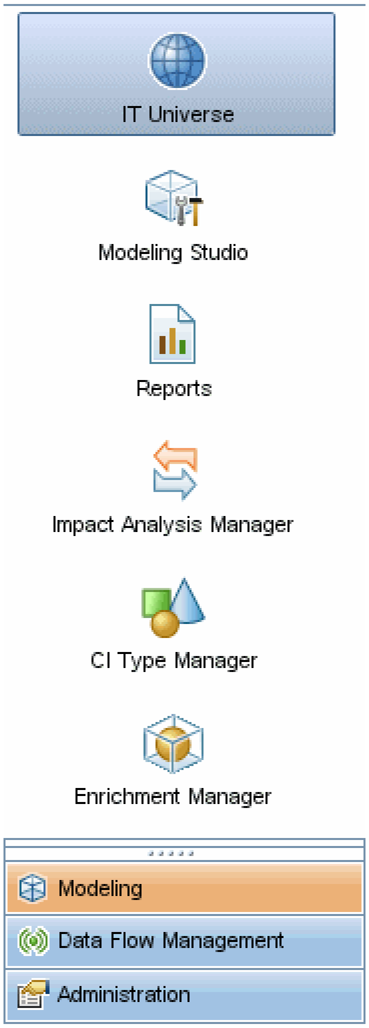
Navigating HP Universal CMDB

This chapter includes:

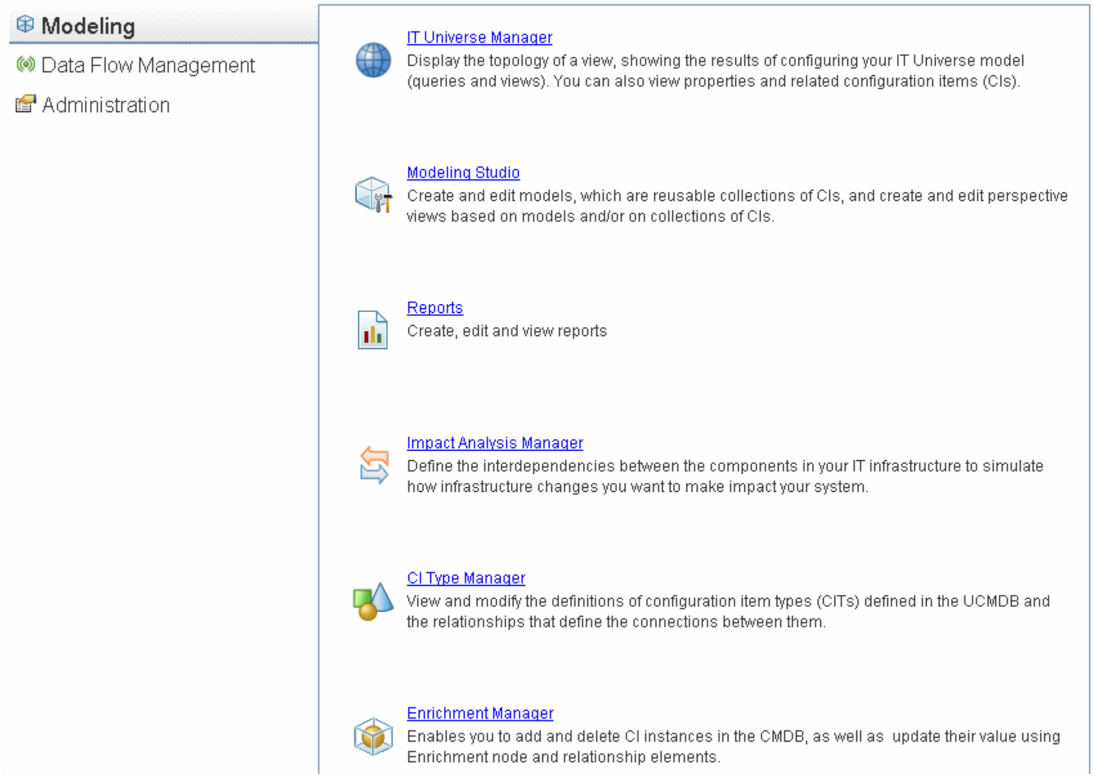
Navigating the HP Universal CMDB User Interface

HP Universal CMDB runs in a Web browser. You move around HP Universal CMDB using the following navigation functions:

- **Navigation Bar.** Enable quick navigation between modules. Click the category in the lower part of the bar and select the module from the icons in the upper part of the bar.


IT Universe
Modeling Studio
Reports
Impact Analysis Manager
CI Type Manager
Enrichment Manager
Modeling
Data Flow Management
Administration

- **Orientation Map.** For each category, you can display a map with brief descriptions of each of the modules included by selecting **Managers > Orientation Map**.



- **Status Bar.** Provides information on the CMDB application and enables you to configure certain aspects of your interface.

- **Collapse/Expand Arrows.** Enable collapsing and expanding of panes with a single click.

Note: The Web browser **Back** function is not supported in HP Universal CMDB. Using the **Back** function does not always revert the current context to the previous context. To navigate to a previous context, use the breadcrumb function.

Cancel Feature for Extended Operations

If an operation involving a request to the server, such as searching for CIs, is taking a long time to complete, you can click the **Cancel** button that appears while the operation is executing. Canceling the operation restores the user interface, enabling you to continue working. The Cancel feature is available for the following operations:

- Previewing a query, view, or model in the Modeling Studio
- Calculating the query result count in the Modeling Studio
- Searching for CIs in the CI Selector

- Displaying related CIs in IT Universe Manager
- Displaying Element Instances in the Modeling Studio and the CIT Manager

Suggested Values in Dialog Boxes

When working in a multi-tenancy environment, the suggested values are only taken from CIs that the user has permission to view (at least one tenant associated with the View CIs permission assignment for the user is included among the CI's owner tenant or consumer tenants).

In some dialog box text fields in HP Universal CMDB, such as the New CI dialog box and the Query Node Properties dialog box, suggested attribute values for entered data are automatically provided when you begin to enter an attribute value. The suggested values match the text entered up to this point and are taken from existing values for the same attribute for the selected CIT or any of its children. The values are sorted alphabetically and a number appears next to each suggested value indicating the number of occurrences of that value. If the number of suggested values exceeds a set maximum limit, no suggestions are displayed. You can set the maximum by changing the **Maximum CI Count for Attribute Value Suggestions** setting in the Infrastructure Settings Manager.

> **Note:** This feature is only relevant for the following attribute types: string, integer, long, double, and float.

Menus and Options

The following categories are available in the lower part of the Navigation Bar:

Category	Description
Modeling	Click to open the Modeling menu, where you build and manage a model of your IT universe in the CMDB. For details, see "Modeling" in the *HP Universal CMDB Modeling Guide*.
Data Flow Management	Click to open the Data Flow Management (DFM) menu, where you set up and run the DFM process to populate the IT Universe model with configuration items (CIs), and where you work with Integration Studio. For details, see the *HP Universal CMDB Data Flow Management Guide*. For details on DFM content, see the *HP Universal CMDB Discovery and Integration Content Guide*.
Administration	Click to open the Administration menu, where you configure infrastructure settings, users, roles, permissions, and schedules and work with the Package Manager.

Help Menu

You access the following online resources from the HP Universal CMDB Help menu:

- **Help on this page.** Opens the UCMDB Help to the topic that describes the current page or context.
- **UCMDB Help.** Opens the home page. The home page provides quick links to the main help

topics.

- **Troubleshooting & Knowledge Base.** Opens the HP Software Support Web Site directly to the HP Software Self-solve knowledge base landing page. The URL for this Web site is **http://support.openview.hp.com**.
- **HP Software Support**. Opens the HP Software Support Web Site. This site enables you to browse the knowledge base and add your own articles, post to and search user discussion forums, submit support requests, download patches and updated documentation, and more. The URL for this Web site is **http://support.openview.hp.com**.
- **HP Software Web Site.** Opens the HP Software Web site, which contains information and resources about HP Software products and services. The URL for this Web site is **http://www.hp.com/managementsoftware**.
- **What's New?** Opens the What's New document, which describes the new features and enhancements of the version.
- **Discovery and Integrations Content Help.** Describes the default, out-of-the-box content: what is being discovered, the credentials required in discovery, how to troubleshoot the discovery results, and how to work with integration adapters.
- **UCMDB Best Practices.** Opens an HTML page with direct links and information about the following:
  - HP Live Network where the Best Practice documentation is accessed.
  - Support site where all documentation and knowledge base articles can be accessed.
  - Guidance videos and feature movies.
  - HP UCMDB online documentation.
- **About HP Universal CMDB.** Opens the HP Universal CMDB dialog box, which provides version, license, patch, and third-party notice information.

Status Bar

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

To access	Appears at the bottom of the screen on all pages in HP Universal CMDB.

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 and the login time. Click to edit the user profile.
<Server status>	Indicates the current status of the server. Click to display a balloon with the server availability, time zone and time.
	Click **Configure User Preferences** to open the User Preferences dialog box, which enables you to reset system preferences.
	Click **Log Level Configuration** to open the Log Configuration dialog box, which enables you to set the log level for a selected log.
	Click **Run Screen Capture Tool** to take a screen capture of the application. The tool also enables you to annotate the screen capture and save or print it. For details, see "Annotation Tool" below.
	Click to refresh the user's authentication.
<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).
	Click **Help on Status Bar** to access the HP Universal CMDB Help.

Annotation Tool

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

To access	Click the **Run Screen Capture Tool** button in the Status bar or select **Tools > Screen Capture...** from the main menu.
Important information	• The annotation options are located on the left side of the annotation window. • When saving the annotation: ▪ The snapshot is saved in .png format. ▪ You cannot select the **New Folder** icon when saving in the **My Documents** directory or any of its subdirectories.

Annotation Options

The following elements enable you to annotate your snapshot.

User interface elements are described below:

UI Element (A–Z)	Description
	**Pan Tool.** Click to navigate the snapshot.
	**Select Tool.** Click and drag to select a specific area of the snapshot.
	**Shape Tool.** Click and drag to add a shape to the snapshot. Clicking the shape tool button enables the following shape buttons: •  **Rectangle.** Click and drag to mark an area of the snapshot with a rectangle. •  **Filled Rectangle.** Click and drag to mark an area of the snapshot with a filled rectangle. •  **Oval.** Click and drag to mark an area of the snapshot with an oval. •  **Filled Oval.** Click and drag to mark an area of the snapshot with a filled oval. •  **Rounded Rectangle.** Click and drag to mark an area of the snapshot with a round rectangle. •  **Filled Rounded Rectangle.** Click and drag to mark an area of the snapshot with a filled round rectangle. **Customization.** After selecting this button, you can customize your line appearance through the following parts of the interface: • **Line Type.** Choose the type of line you want to add. Options include: ▪ Solid Line ▪ Jagged Line • **Line Width.** Select the width of the line, in pixels, in the annotation.
	**Line Tool.** Click and drag to enable the line tool, which marks the selected area of the snapshot with a line. **Customization.** After selecting this button, you can customize your line appearance through the following parts of the interface: • **Line Style.** Choose the style of line you want to add. Options include: ▪ Regular line

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

Menu Bar

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

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

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

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

UI Element (A–Z)	Description
<Font Size>	Select the size of the font in the report. **Note:** This field is only enabled when selecting the **Text Tool** button .

Administration

Chapter 4

Infrastructure Settings Manager

This chapter includes:

Infrastructure Settings Manager Overview

You can define the value of settings that determine how HP Universal CMDB and its applications run.

> **Caution:** By modifying certain settings, you may adversely affect the performance of HP Universal CMDB. It is strongly recommended not to modify any settings without first consulting HP Software Support or your HP Services representative.

Infrastructure Settings Manager User Interface

This section includes (in alphabetical order):

Change Default Value Dialog Box

This dialog box enables you to edit the default values of the infrastructure settings.

To access	Select **Infrastructure Settings Manager** from the Navigation Menu or select **Managers > Administration > Infrastructure Settings Manager**, select the required setting, and then click the **Change Default Value** button.
Important information	Note that the default values for global settings cannot be altered.

User interface elements are described below:

UI Element (A-Z)	Description
Default Value	The modified default value.
Factory Value	The default value initially provided by HP Universal CMDB.

Infrastructure Settings Manager Page

This page enables you to view and edit infrastructure settings.

To access	Select **Infrastructure Settings Manager** from the Navigation Menu or select **Managers > Administration > Infrastructure Settings Manager**.

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

UI Element (A-Z)	Description
	**Save**. Saves the changes you have made.
	**Properties.** Enables you to view the infrastructure properties for the selected setting. Opens the Properties window.
	**Restore default value for selected settings.** Restores the previous default value of the selected infrastructure setting.
	**Change Default Value.** Enables you to edit an infrastructure setting. Opens the Change Default Value dialog box.
Categories pane	Contains a list of the infrastructure setting categories. You can either select a category to view the infrastructure settings connected with that category, or alternatively select **<All>** to display all the infrastructure settings.
Description	A description of the infrastructure setting.
Filter by	Enables you to define the criteria for which infrastructure settings you want to appear in the Infrastructure Settings Manager page. • In the **Filter** box, select the required filter criteria. • In the **by** box, enter the text or part of the text for which to search. **Note:** If you want to filter the parameter settings by **<Was modified>**, do the following: • Enter **false** in the **by** box to display the parameters which were not modified. • Enter **true** in the **by** box to display the parameters which were modified.
Name	The name of the infrastructure setting.
Refresh Rate	Indicates when the change takes effect in HP Universal CMDB after an infrastructure setting value is modified.
Value	The value of the infrastructure setting.

UI Element (A-Z)	Description
Was modified	Indicates if the parameter was modified. If the parameter was not modified, the row in the column for the relevant parameter remains empty. If the parameter was modified, an asterisk appears in the row of the relevant parameter.

Chapter 5

Package Manager

This chapter includes:

Package Administration Overview

A package contains resources that are grouped together by defined criteria. For a list of the default resource types, see "Resource Types" on page 66.

Package Manager fulfills several functions:

- Enables the discovery of specific IT infrastructure assets. For example, HP Universal CMDB 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 Universal CMDB.

By default, factory packages are located in: **C:\hp\UCMDB\UCMDBServer\content\basic_packages**.

> **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 68.

> **Caution:** If you create custom packages for the resources or tools you develop, do not place them in the **C:\hp\UCMDB\UCMDBServer\content\basic_packages** folder. This folder is only for factory packages.

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

You can:

- Export some or all of a package's resources to your local directory. For details, see "Export a Package" on page 60.
- Deploy some or all of a package's resources to the CMDB from your local directory. For details, see "Deploy a Package" on page 59.

Package Locations

There are three pre-defined folders with out-of-the-box, automatically deployed packages under **C:\hp\UCMDB\UCMDBServer\content**:

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

Package Manager User Interface

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

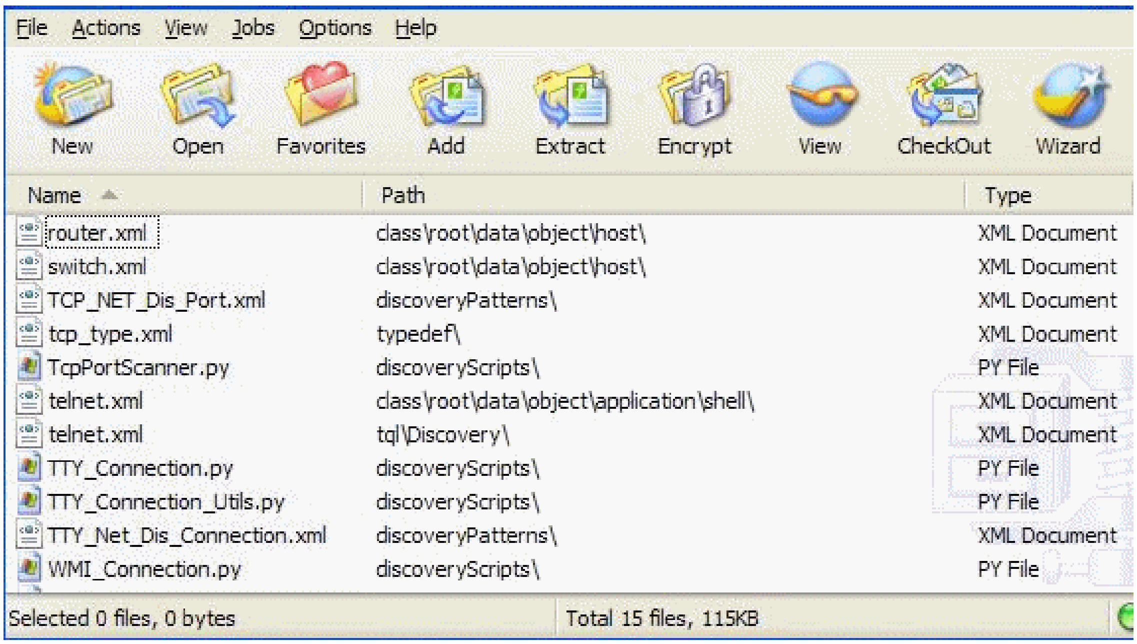
- An **Icon** identifying the package as factory, hidden or user
- A **Package Name** representing the name of the .zip file (optional)
- The **Category** as allocated in the descriptor.xml file (optional)
- A **Readme** file that corresponds to the package (optional)
- A **Description** that corresponds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

Package Zip File Contents and Format

A package's resources are stored in the CMDB. To export a package from system to system, you use the Package Manager interface (for details, see "Package Manager Page" on page 73). 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 Add an Adapter for a New External Data Source in the *HP Universal CMDB Developer Reference Guide*.

Create a Custom Package

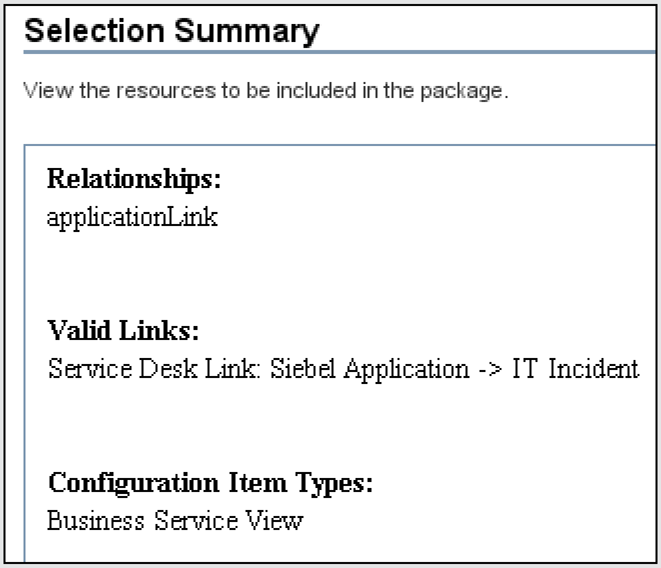
When you create a new package, you give the package a unique name and description, and then select the resources you want included in the package. For details, see "Create Custom Package/Edit Package Wizard" on page 68.

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 (CITs)



Deploy a Package

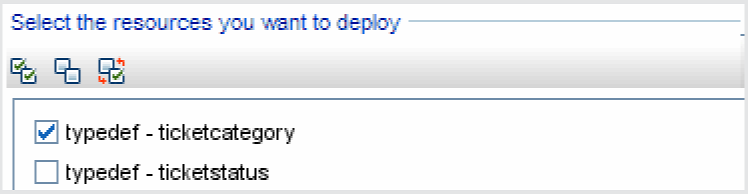
You can deploy some or all of a package's resources to the CMDB from your local directory. The package must be on your local directory in order to deploy its resources.

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:



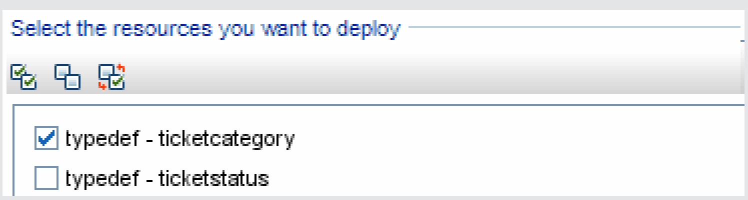
Note: Every time a package related to a change in the class model is deployed or undeployed, a zip file is generated in the **runtime\log\package_reports\customer_1\classModel** folder. The zip file contains the class model file before the change, the class model file after the change, and the package deployment report.

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 73.

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:



Exporting User Permissions in a Package

If you want to export users from your UCMDB instance, along with their permissions, to another UCMDB instance, you can create a custom package containing the users and roles and export the package to the required location. The package must contain the selected users, the roles that are assigned to them, and also the role assignments (the association between a user and a role). You can select each of these entities in the **Resource Selection** tab of the Edit Package dialog box, under **Administration**. When you select **Role Assignments** in the left pane, all available combinations of users and assigned roles are displayed in the right pane. If a user has more than one role assigned, you must include each role and each role assignment in the package, to retain the user's permissions. If the users and the roles already exist on the target UCMDB instance, you can export a package containing only the relevant role assignments.

For details on selecting resources for a package, see "Resource Selection Page" on page 70.

Install a Discovery and Integration Content Pack

HP Universal CMDB is released together with the latest version of Discovery and Integration Content Pack. You can install a later Content Pack release by performing the following procedure:

1. Access the Content Pack on the HP Live Network site. To access the site: **Data Flow Management > DDM Community**.
2. Download the zip file and extract it to the HP Universal CMDB Server root folder.
3. In UCMDB, access Package Manager: **Administration > Package Manager**. Click **Install Content Pack** to open the **Install Content Pack** dialog box. For details, see "Package Manager Page" on page 73.
4. Select the Content Pack to install and click **Install**.
5. Answer **OK** to the message.

   UCMDB begins to install the Content Pack.

   When installation is complete, a message is displayed with the results of the installation.

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

Follow these steps to deploy a package using the JMX console.

1. Launch your Web browser and enter the following address: **http://<server_name>:8080/jmx-console**, where **<server_name>** is the name of the machine on which HP Universal CMDB 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 next page.

7. Select **True** to override DFM job configurations changed in DFM. For details, see Advanced Mode Window in the *HP Universal CMDB 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>:8080/jmx-console**, where **<server_name>** is the name of the machine on which HP Universal CMDB 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>:8080/jmx-console**, where **<server_name>** is the name of the machine on which HP Universal CMDB 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

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>:8080/jmx-console**, where **<server_name>** is the name of the machine on which HP Universal CMDB 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" below.
6. Click **Invoke** to display the packages that are currently deployed.

Export Packages

Follow these steps to export resources from the CMDB to the server on which HP Universal CMDB is installed using the JMX console.

1. Launch the Web browser and navigate to: **http://<server_name>:8080/jmx-console**, where **<server_name>** is the name of the machine on which HP Universal CMDB is installed.
2. Under **UCMDB**, click **UCMDB:service=Packaging Services** to open the JMX MBEAN View page.
3. Locate **exportPackages**.
4. In the **Value** box for the parameter **customerId**, enter the <customer id>.
5. In the **Value** box for the parameter **packagesName**, enter the name of the package you want to export. For details, see "Package Name Rules" below.
6. In the **Value** box for the parameter **outputDir**, enter the name of the folder on the HP Universal CMDBserver to which you want to export the package's zip file. Ensure that you include the full path to the folder.
7. In the **Value** box for the parameter **userOnly**, select one of the following:
   - **True**. Export only the custom packages.
   - **False**. Export both custom and factory packages.
8. Click **Invoke** to export the package.

Package Name Rules

The rules for entering a package name are as follows:

- Wildcard characters (*) are not supported.
- The package name is case sensitive.

- The package name must have a **.zip** extension.
- When deploying more than one package, separate the package names by commas.

Package Resources

This section contains a list of the resources a package can contain. For a list of the available resource types and their descriptions, see "Resource Types" on page 66.

- **acl**. The definition of a role such as Administrator or Guest. For details, see "Roles Manager" on page 129.
- **adapter**. Contains a description and the capabilities of the deployed federated adapter.
- **adapterCode.** Contains compiled classes (normally a jar), based-on *.jar files, and configuration files needed for federated adapters. Place these files in the **adapterCode\<adapter ID>** folder in the zip package. For details, see Add an Adapter for a New External Data Source in the *HP Universal CMDB 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 79. For details on Impact Analysis, see Impact Analysis Manager in the *HP Universal CMDB Modeling Guide*.
- **class.** CI type descriptions, such as host, file, switch, and so on. For details, see CI Type Manager in the *HP Universal CMDB Modeling Guide*.
- **cmdbview**. Contains the hierarchy rules defined for the base TQL query of each view. For details, see Modeling Studio in the *HP Universal CMDB Modeling Guide*.
- **correlation**. Impact rule definitions. For details, see Impact Analysis Manager in the *HP Universal CMDB Modeling Guide*.
- **datamodel.** Used to import CI instances into the system. If the CI does not exist in the CMDB, an instance of the CI is created. If a CI already exists in the CMDB, the values of the CI from the package resource overwrites the values of the CI in the CMDB.
- **datamodelcreateonly**. Used to import CI instances into the system. If the CI does not exist in the CMDB, an instance of the CI is created. If a CI already exists in the CMDB, the values of the CI from the package resource does not overwrite the values of the CI in the CMDB.
- **datamodelgenerateids**. Used to import CI instances into the system for CITs that require the ID to be calculated dynamically upon deployment (such as CITs with no key attributes).
- **dataStore**. Contains the integration point defintion.
- **discoveryConfigFiles**. Configuration files include properties and parameters that are needed to discover components on the system. For details, see Adapter Management in the *HP Universal CMDB 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 *HP Universal CMDB 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 *HP Universal CMDB Data Flow Management Guide*.
- **discoveryPatterns**. DFM adapters define which code to run and in which order, declare the input and output CI Types and parameters to be configurable on the DFM jobs related to them. The adapater can be used as an integration adapter or a Discovery adapter. For details, see Adapter Management in the *HP Universal CMDB 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 *HP Universal CMDB Data Flow Management Guide*.
- **discoveryScripts**. DFM Jython scripts populates the CMDB 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 *HP Universal CMDB Data Flow Management Guide*.
- **discoveryWizard**. Used to define the Discovery Activity dialog box contents. For details, see the section on discovery activities in the *HP Universal CMDB Discovery and Integration Content Guide*.
- **enrichment**. Enrichment rule definitions. For details, see Enrichment Manager in the *HP Universal CMDB Modeling Guide*.
- **identification**. Contains the identification defintion of a specific CI type.
- **integrationUsers**. Used to define a user of type integration.
- **modelnotification**. Contains filter definitions for CMDB model notifications. The data model notification system gives notification of changes that occurred in the CMDB. For example, items in the CMDB that have been removed, updated, or added.
- **report**. Report rule definitions, as described in Topology Reports Overview in the *HP Universal CMDB Modeling Guide*.
- **schedulerJob.** Tasks that have been defined to run in the Scheduler. For details, see "Scheduler" on page 82.
- **singletqlref**. Contains TQL template and perspective instances. For details, see Modeling Studio in the *HP Universal CMDB Modeling Guide*.
- **tql**. TQL query definitions. For details, see Topology Query Language (TQL) Overview in the *HP Universal CMDB 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 *HP Universal CMDB Modeling Guide*.
- **users.** The definition of a user and the user's role. For details, see "Users and Groups" on page 118.
- **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 64.

Model

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

Query

- **Queries**. The TQL queries defined in the TQL Editor in the Modeling Studio. For details, see Topology Query Language in the *HP Universal CMDB Modeling Guide*.
- **Views**. The views defined in the View Editor in the Modeling Studio. For details, see View Formats in the *HP Universal CMDB Modeling Guide*.
- **Enrichments**. The Enrichment rules defined in the Enrichment Manager. For details, see Enrichment Manager in the *HP Universal CMDB Modeling Guide*.
- **Impact Rules**. The Impact Analysis rules. For details, see Impact Analysis Manager in the *HP Universal CMDB 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 *HP Universal CMDB Modeling Guide*.
- **Job Scheduler**. Tasks that have been defined to run in the Scheduler. For details, see "Scheduler" on page 82.
- **State Categories**. The states defined in the State Manager. For details, see "State Manager" on page 79.

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 *HP Universal CMDB Data Flow Management Guide*.

- **Discovery Documents.** A Discovery document is a customized document describing the usage and functionality of a specific package. For details, see Attach Discovery Documentation to a Discovery Package in the *HP Universal CMDB 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 *HP Universal CMDB 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 *HP Universal CMDB 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 *HP Universal CMDB 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 *HP Universal CMDB Data Flow Management Guide*.
- **Discovery Wizard Resource**. Used to define the Discovery Activity dialog box contents. For details, see the section on discovery activities in the *HP Universal CMDB Discovery and Integration Content Guide*.
- **Software Application Library**. Contains software application and version descriptions that are used to identify files that are discovered during the inventory discovery process. For details, see the Software Application Index section in the *HP Universal CMDB Discovery and Integration Content Guide*.
- **Inventory Scanner Configuration**. Configuration settings that control how inventory is collected, which information is gathered, and the level of detail to be included. For details, see the section on the Scanner Generator in the *HP Universal CMDB Discovery and Integration Content Guide*.
- **Scanner Package for Scanner Generator**. The base file used by the Scanner Generator to build a manually-deployed executable scanner file. For details, see the section on the Scanner Generator in the *HP Universal CMDB Discovery and Integration Content Guide*.

Administration

- **Users.** The users defined in the Users and Groups module. For details, see "Users and Groups" on page 118.
- **User Groups.** The user groups defined in the Users and Groups module. For details, see "Users and Groups" on page 118.

- **Resource Groups.** The resource groups defined in the Resource Groups module. For details, see "Resource Groups" on page 140.
- **Roles.** The roles defined in the Roles Manager module to assign permissions to users. For details, see "Roles Manager" on page 129.
- **Tenants.** The tenants added in the Tenants Management module. For details, see "Tenants Management" on page 151. (Only available when multi-tenancy is enabled.)
- **Role Assignments.** The role assignments to users defined in the Users and Groups module. For details, see "Users and Groups" on page 118.

Package Manager User Interface

This section includes (in alphabetical order):

Choose Resources to Export Dialog Box

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

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

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

UI Element (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	"Create a Custom Package" on page 58
Wizard map	The "Create Custom Package/Edit Package Wizard" contains: "Package Properties Page" > "Resource Selection Page" > "Selection Summary Page"

Package Properties Page

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

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

User interface elements are described below:

UI Element (A-Z)	Description
Factory package	Indicates a default package that is deployed with the installation. **Note:** This check box is always disabled.
Hidden package	Indicates a package that is deployed with the installation but is not visible in the list of packages that appear in the Package Manager page. **Notes:** • This check box is always disabled. • To display the hidden packages, right-click anywhere in the Package Manager page and select **Show Hidden Packages**.
Package Category	A free text box for any notes you want to associate with the package.
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 66. **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.
<Resources in the right pane>	Select the resources you want to add to the package. You can select multiple resources. **Notes**: • A green check appears to the right of a Configuration Item Types, Relationships, or Calculated Relationships when one or more of its children in the resource tree are included in the package. • A folder's check box has a when only some of its resources are included in the package. (This does not apply to Configuration Item Types, Relationships, or Calculated Relationships.) • A folder's check box is selected when all its resources are included in the package. (This does not apply to Configuration Item Types, Relationships, or Calculated Relationships.) **Important information**: To add a calculated relationship to the package, select either the required

UI Element (A-Z)	Description
	calculated relationship together with one or more of its triplets, or the required triplets without selecting the calculated relationship itself. • If you select only specified triplets and not the calculated relationship, the triplets are added only if you already have an existing calculated relationship in the system. • If you select a calculated relationship together with one or more of its triplets, the property definitions of the calculated relationship are included in the package. If you already have a calculated relationship in the system, the property definitions of the existing calculated relationship are updated with the properties of the calculated relationship you are adding to the package. For details on calculated relationships and triplets, see "Using Calculated Relationships" and "Triplets Page" in the *HP Universal CMDB Modeling Guide*.

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 (A-Z)	Description
Export to directory	Select the directory to which you want to export the resources.

UI Element (A-Z)	Description
Export resources	Export only some of the package's resources to your local directory. Opens the Choose Resources to Export dialog box.
Export whole package	Export all the resources in the package to your local directory.
File name	The name of the package. **Note**: The package name cannot be edited.

Filter Dialog Box

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

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

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

UI Element (A-Z)	Description
<Click a column header>	For details, see Sort Column Content Dialog Box in the *HP Universal CMDB Modeling Guide*.
<Right-click a column header>	For details, see Sort Column Content Dialog Box in the *HP Universal CMDB Modeling Guide*.
Condition	Click inside the box and select the required operator. For details, see Attribute Operator Definitions in the *HP Universal CMDB Modeling Guide*.

UI Element (A-Z)	Description
Display Name	Filter the task list according to one of the following: • **Package name** • **Category** • **Readme** • **Version** • **Description** For details, see "Package Manager Page" below.
Value	Click inside the box to open the Edit box. Enter the required value. **Note:** When using the **Like** or **Like ignore case** operators, include the wildcard (%) in the search value.

Find Dialog Box

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

To access	Click the **Find** button on the Package Manager page.
See also	"Resource Types" on page 66

User interface elements are described below:

UI Element (A-Z)	Description
Case sensitive	Distinguish between uppercase and lowercase characters. When you select **Case sensitive**, search results find only those instances in which the capitalization matches the text you typed in the **Resource name** box.
Resource name	Enter a word or phrase contained in the resource for which you are looking.
Search Results	The search results. Displays the names of up to 30 resources containing the text entered in the **Resource name** box.
Topic	The subsysytem containing the resource you want the package to contain. For details, see "Resource Types" on page 66.

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 Package Manager from the **Administration** module in the Navigation Menu or select **Managers > Administration > Package Manager**.
See also	"Package Administration Overview" on page 56

User interface elements are described below:

UI Element (A-Z)	Description
	Enables you to create a package out of existing resources. Opens the Create Custom Package Wizard. For details, see "Create a Custom Package" on page 58.
	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.
	Generate a report displaying a list of the packages that are deployed in the system. Choose the export format for the table data. The available options are: • **Excel**. The table data is formatted as an .xls (Excel) file that can be displayed in a spreadsheet. • **PDF.** The table data is exported in PDF format. **Note:** When exporting to PDF, select a reasonable number of columns to display to ensure that the report is legible. • **CSV**. The table data is formatted as a comma-separated values (CSV) text file that can be displayed in a spreadsheet. **Note:** For the CSV formatted table data to display correctly, the comma (,) must be defined as the list separator. In Windows, to verify or modify the list separator value, open Regional Options from the Control Panel, and on the Numbers tab ensure that the comma is defined as the List Separator value. In Linux, you can specify the list separator in the application that opens the CSV file. • **XML.** The table data is formatted as an XML file that can be opened in a text or XML editor. **Tip:** To extract HTML code from the report: ▪ Save the file as HTML ▪ Open the file in an HTML editor ▪ Copy the relevant table into the target file

UI Element (A-Z)	Description
	Deploys a package's resources to the CMDB from your local directory. In the upper pane, click the button to open the Deploy Packages to Server dialog box. Browse to the required package. The resources from that package appear in the lower pane of the dialog box. Select the resources that you want to deploy. **Note**: When deployment is finished and it is not successful, a Deploy Package dialog box is displayed indicating which resources within the package are not successfully deployed.
	Deletes the resources from the system and removes them from the selected package. Opens the Undeploy Package Resource Wizard.
	Exports some or all of the package's resources to your local directory. Opens the Export Package dialog box.
	Finds a package that contains a specified resource. Opens the Find dialog box.
	Update the contents of the table.
	Click to install the latest Discovery and Integration Content Pack. This button is enabled from Content Pack 7.00 onwards. For details, see "Install a Discovery and Integration Content Pack" on page 61.
	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 *HP Universal CMDB Modeling Guide*.
	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:

- "Gold Master Reports Cannot be Deployed by Package Manager" below
- "Datamodel Resources Cannot Be Undeployed" on next page
- "Additional Information on Package Deployment Failure" on next page
- "Package Creation and Deployment in a Non-English Locale" on next page

Gold Master Reports Cannot be Deployed by Package Manager

If you export a package's resources from Package Manager that includes a Gold Master report definition, and then export those resources again to another system, the Gold Master report definition is not deployed.

Datamodel Resources Cannot Be Undeployed

For a list of the package resources, see "Package Resources" on page 64.

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

Package Creation and Deployment in a Non-English Locale

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

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

Chapter 6

State Manager

This chapter includes:

State Manager Overview

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

States are necessary for retrieving Impact Analysis results in IT Universe Manager. For details, see "IT Universe Manager" in the *HP Universal CMDB 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 *HP Universal CMDB 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.

Define a State

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

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

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

State Manager User Interface

This section includes:

State Manager Page

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

To access	Select **State Manager** from the **Administration** module in the Navigation Menu or select **Managers > Administration > State Manager.**
Important information	• 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	"Define a State" on previous page
See also	Create an Enumeration Definition – Workflow in the *HP Universal CMDB Modeling Guide*

User interface elements are described below:

UI Element (A-Z)	Description
	Add a state.
	Delete a state.
	Save the changes you have made.
	Creates an Enumeration definition. Opens the Create Enumeration Definition dialog box. For details, see "Create/Update List/Enumeration Definition Dialog Box" in the *HP Universal CMDB Modeling Guide*. The Enumeration definition you have created appears in the System Type Manager dialog box, where you can edit it if required (for details, see "System Type Manager Dialog Box" in the *HP Universal CMDB Modeling Guide*.
Description	(Optional) Click in the box and enter a description of the state.
Name	Click in the box and enter a unique name for the state.
Type Definition	Click in the box to display a list of the Enumeration definitions.

UI Element (A-Z)	Description
	Note: The **Type Definition** list only displays the Enumeration definitions whose list of key values begins with zero (0) (and not List definitions) that are defined in the System Type Manager.

Chapter 7

Scheduler

This chapter includes:

Define Tasks That Are Activated on a Periodic Basis

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

This section includes the following tasks:

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

1. ### Create a Job Definition

   Define a job definition. Add actions to the job you created and define how often they run. The Job Definition dialog box displays the tasks that are defined. For details, see "Job Definition Dialog Box" on page 85.

   Example of a Job Definition

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

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

2. ### Choose an Action

   Select the actions that you want the Scheduler to run. For details, see "Action Definition Dialog Box" on page 84.

3. ### Schedule a Task

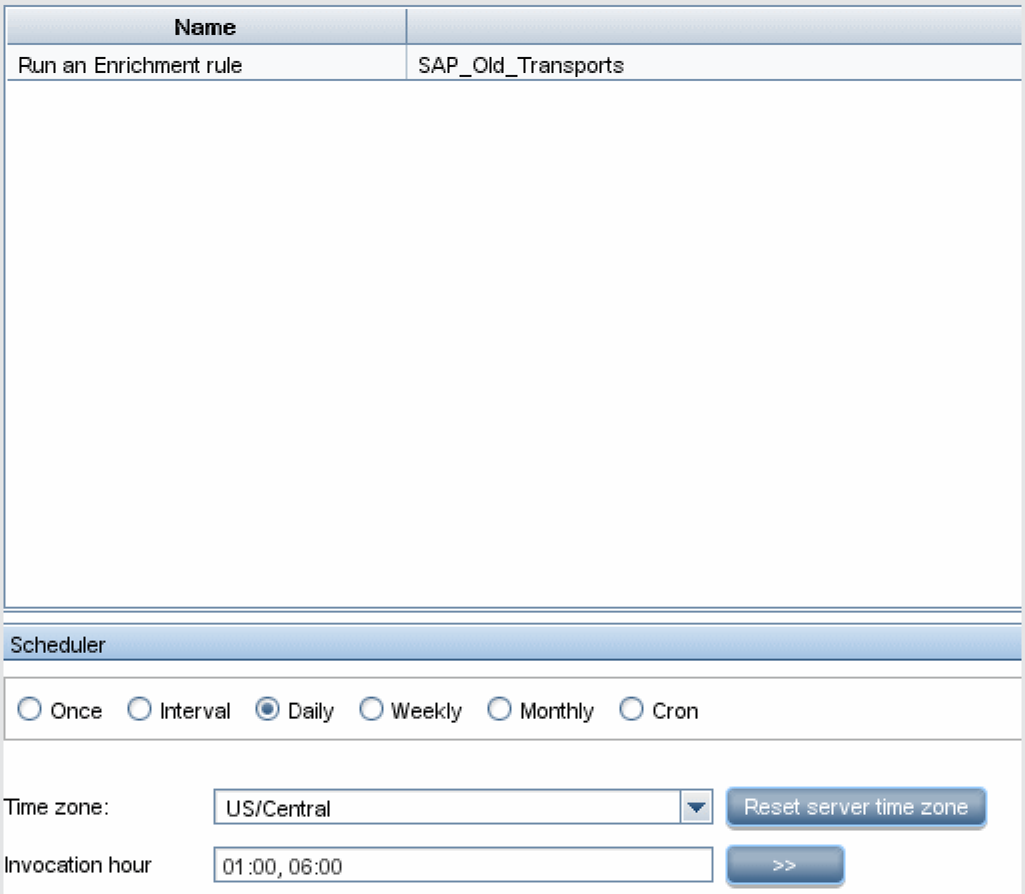
   Set the schedule for activating a task in the Scheduler pane. For details, see "Job Definition Dialog Box" on page 85.

   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.



Scheduler User Interface

This section includes (in alphabetical order):

Action Definition Dialog Box

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

To access	Click the **Add** button in the Actions pane in the Job Definition dialog box.
Important information	After selecting the required action, click **Next** to display a list of actions. The list of action details depends on which action you choose. For example, if you select **Run an Enrichment Rule**, a list of the existing Enrichment Rules appears. Select the required Enrichment rules. You can select up to 15 items.
Relevant tasks	"Define Tasks That Are Activated on a Periodic Basis" on page 82

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 *HP Universal CMDB Modeling Guide*.
<Right-click a column header>	For details, see Sort Column Content Dialog Box in the *HP Universal CMDB Modeling Guide*.
Actions	For a list of actions that can be run by the Scheduler, see "Scheduler Actions" below.

Scheduler Actions

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

- **Rerun Discovery on View**. Runs discovery on the CIs in a selected view. This enables you to configure a general discovery for the entire infrastructure on a less frequent basis, such as once a week, while updating the CIs in important views more frequently, for example, on a daily basis.
- **Run an Enrichment Rule**. Activates the selected Enrichment rule according to its set schedule. Click **Next** to display a list of the available Enrichment rules and select the required ones. For details, see Enrichment Manager in the *HP Universal CMDB Modeling Guide*.

Filter Dialog Box

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

To access	Click the **Filter** button on the Job Scheduler page.
Relevant tasks	"Define Tasks That Are Activated on a Periodic Basis" on page 82

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 *HP Universal CMDB Modeling Guide*.
<right-click a column header>	For details, see Sort Column Content Dialog Box in the *HP Universal CMDB Modeling Guide*.
Condition	Click inside the box and select the required operator. For details, see Attribute Operator Definitions in the *HP Universal CMDB Modeling Guide*.
Display Name	Filters the task list according to one of the following: • **Active** • **Job Definition** • **Last Run Time** • **Name** • **Next Run Time** • **Schedule** For details, see the Job Scheduler page.
Value	Click inside the box and either enter or select the required value.

Job Definition Dialog Box

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

To access	Click the **Add** button on the Job Scheduler page.
Relevant tasks	"Define Tasks That Are Activated on a Periodic Basis" on page 82

User interface elements are described below:

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

Actions Pane

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

Relevant tasks	"Define Tasks That Are Activated on a Periodic Basis" on page 82

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	"Define Tasks That Are Activated on a Periodic Basis" on page 82
See also	Cron Expressions

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**) Click to validate the Cron expression you entered.
<Schedule	Select the required option for scheduling the task. The available options are:

UI Element (A-Z)	Description
options>	• **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 *HP Universal CMDB Modeling Guide*.
Cron Expression	Enter a Cron expression in the proper format. For a description of the fields used in Cron expressions and examples of how to use them, see Cron Expressions in the *HP Universal CMDB Modeling Guide*.
Days of month	(Appears when you choose **Monthly**) Click the >> button to the right of the **Days of month** box to choose the day of the month on which you want to run the action. Opens the Select Days dialog box.
Days of the week (Sunday - Saturday)	(Appears when you choose **Weekly**). Select the day or days on which you want the action to run.
End by	(Does not appear when you select **Once**) Choose the date and time when you want the action to stop running by selecting the **End by** check box and then clicking the down-arrow to the right of the box. **Note**: This step is optional. If you do not want to specify an ending date, leave the **End by** check box unselected.

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`

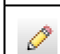
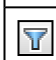
UI Element (A-Z)	Description
	Note: This box is only available when you want to schedule a task to run on a daily, weekly, or monthly basis.
Invocation Time	(Appears when you choose **Once**) Choose the date and time you want the action to begin running by clicking the down-arrow to the right of the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

Job Scheduler Page

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

To access	Select Scheduler from the **Administration** module in the Navigation Menu or select **Managers > Administration > Scheduler**.
Relevant tasks	"Define Tasks That Are Activated on a Periodic Basis" on page 82

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.

UI Element (A-Z)	Description
	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 *HP Universal CMDB Modeling Guide*.
	Refresh the display of the jobs in the Job Scheduler page.
<Click a column header>	For details, see Sort Column Content Dialog Box in the *HP Universal CMDB Modeling Guide*.
<Right-click a column header>	For details, see Sort Column Content Dialog Box in the *HP Universal CMDB Modeling Guide*.
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 86.

Select Days Dialog Box

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

To access	Click **Monthly** in the Job Definition dialog box, and then click the  button to the right of the **Days of month** box.
Relevant tasks	"Define Tasks That Are Activated on a Periodic Basis" on page 82

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

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

Select Hours Dialog Box

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

To access	In the Job Definition dialog box, click **Daily, Weekly, or Monthly**, and then click the  button to the right of the **Invocation hour** box.
Relevant tasks	"Define Tasks That Are Activated on a Periodic Basis" on page 82

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

UI Element (A-Z)	Description
<List of times by the hour and half hour>	Choose all the required times by selecting the required check box. You can select multiple times. The selected hours appear in the **Invocation hour** box. For details, see "Scheduler Pane" on page 86.

Chapter 8

Recipients Manager

This chapter includes:

Recipients Manager Overview

The Recipients Manager enables you to define the recipients who can automatically receive scheduled reports through email, at regular intervals, from the Reports module. For details, see Reports in the *HP Universal CMDB Modeling Guide*.

Define an Email Recipient

You create a new email recipient by clicking the **Add** button on the Recipients Manager page and entering the recipients name and email address. For details, see "Add Mail Recipient Dialog Box" below.

Recipients Manager User Interface

This section includes (in alphabetical order):

Add Mail Recipient Dialog Box

This dialog box enables you to create a new email recipient or edit the properties of an existing one.

To access	• To create a new email recipient, click the **Add** button on the Recipients Manager page. • To edit the properties of an existing recipient, select the required recipient and click the  button.
Relevant tasks	"Define an Email Recipient" above

User interface elements are described below:

UI Element (A-Z)	Description
	Click to add an email address for the recipient. You can add more than one email address.
	Click to delete the selected email address.
Name	Enter the name of the email recipient.

Recipients Manager Page

This page enables you to create new email recipients or edit the properties of existing email recipients.

To access	Select **Recipients Manager** from the **Administration** module in the Navigation Menu or select **Managers > Administration > Recipients Manager**.
Important information	The recipients that appear in the Recipients Manager page are updated with the email recipients defined in Reports (click the **Open Address Book** button in the **Send to** box in the Schedule Report dialog box to open the Message Recipients dialog box).
Relevant tasks	Only the recipients whose email addresses are defined here can automatically receive scheduled reports through email from the Reports module.

User interface elements are described below:

UI Element (A-Z)	Description
	Define a new email recipient.
	Edit the selected recipient.
	Delete the selected recipient.
E-mail(s)	The email addresses of the email recipient.
Name	The name of the email recipient.

Chapter 9

CI Lifecycle and the Aging Mechanism

This chapter includes:

The Aging Mechanism Overview

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

Data Flow Management (DFM) runs periodically and, default, updates the last access time for all CIs and relationships that it discovers. This process is known as "touching," and prevents CIs and relationships that represent active components in the system from becoming deletion candidates. If DFM does not discover a CI that exists in the CMDB, 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 CMDB and database servers and can impact the overall CMDB 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 101.

Note:

- Touch parameters are defined in the **DataFlowProbe.properties** file. For details, see the Probe Manager Configurations section in DataFlowProbe.properties File in the *HP*

Universal CMDB Data Flow Management Guide.

- The aging mechanism is enabled by default.
- Aging operations are run only on CIs and relationships that have **Enable Aging** set to **true**. By default, CIs and relationships added by out-of-the-box DFM adapters are created with **Enable Aging** set to **true**. (For details, see **Enable Aging** in the Configuration Item Properties Dialog Box in the *HP Universal CMDB Modeling Guide*.) This behavior can be changed in the **Enable aging** check box in DFM in the Adapter Configuration tab (in the Results Management pane). For details, see Results Management Pane in the *HP Universal CMDB Data Flow Management Guide* and "Enable Aging" on page 98.

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 *HP Universal CMDB Modeling Guide*.

Enable and Run the Aging Mechanism

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

This task includes the following steps:

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

1. **Enable Aging**

   Access the Aging Status tab on the CI Lifecycle page (**Managers > Administration > CI Lifecycle**). Select the **Enable Aging** check box. For details, see "Aging Status Tab" on page 97.

   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 CMDB 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. 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 is updated with the information and there is no server downtime.

- You run the database aging tool, located at **C:\hp\UCMDB\UCMDBServer\tools\dbscripts\dbtool.bat**. If you choose this option, you must stop the UCMDB server 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 saved in the History.

To run the database aging tool:

a. Back up the CMDB 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 UCMDB server.

d. Run the **dbtool.bat** file from the file system.

e. Restart the UCMDB 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.

Generate CI Lifecycle Data and Filter the Results

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

This task includes the following steps:

- "Generate CI Lifecycle Data" below
- "Filter the CI Lifecycle Results" on next page

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 100.

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 101.

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 **DataFlowProbe.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 93.

CI Lifecycle User Interface

This section includes (in alphabetical order):

Aging Run Statistics Dialog Box

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

To access	Click the **Statistics** button on the CI Lifecycle page.
Relevant tasks	"Enable and Run the Aging Mechanism" on page 94

User interface elements are described below:

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

Aging Status Tab

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

To access	Select **CI Lifecycle** from the Navigation Menu or select **Administration > CI Lifecycle**.
Important information	This tab displays information about the number of CIs that are candidates for deletion, and functions as follows, if you select the **Enable Aging** check box: • If the number of CIs for deletion is larger than 10,000, you can choose to use the aging mechanism to delete the CIs in chunks, or to use the database aging tool. For details on which procedure to use, see "First Aging Run" on page 94. • If the number of CIs for deletion is smaller than 10,000, the estimated time for deletion is displayed and the CIs are immediately deleted. A progress bar shows the stage of the deletion.
Relevant tasks	"Enable and Run the Aging Mechanism" on page 94

User interface elements are described below:

UI Element (A-Z)	Description
Enable Aging	• To enable aging, select the check box. The frequency and size of the chunks that are marked as candidates for deletion are determined in Infrastructure Settings. For details, see "Aging Parameters" on page 101. • To disable aging, clear the check box.
Run results	**Total CIs to delete**. The number of CIs or relationships that are delete candidates and that are being deleted by the aging mechanism. **Deleted**. The number of CIs or relationships that have been deleted. **Failed**. CIs or relationships that could not be deleted. If any failures exist, click the **Failed** link to view their details.

CI Lifecycle and Relationship Tabs

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

To access	Select **Administration > CI Lifecycle**.
Relevant tasks	"Generate CI Lifecycle Data and Filter the Results" on page 95
See also	Working with CIs in the *HP Universal CMDB Modeling Guide*

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

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

UI Element (A-Z)	Description
	Click to update the data displayed.
	Click to open the Filter dialog box, which enables you to customize the filter. For details, see "Filter Dialog Box" on page 101.
	Click to clear the filter and display the full results.
	Click to open the Select Columns dialog box, which enables you to change the display order of the columns, hide a column, or display a hidden column. For details, see Select Columns Dialog Box in the *HP Universal CMDB Modeling Guide*.
	Click the arrow to define the number of rows that should appear on each display page.
	Click to navigate through the results page by page or to jump to the first or last page.
	Generates data for a selected period. **Tip**: If no results are generated, try extending the time period further into the future (the **To** field).
	Click **Export Data to File** to choose the export format for the table data. The available options are: • **Excel.** The table data is formatted as an .xls (Excel) file that can be displayed in a spreadsheet. • **PDF.** The table data is exported in PDF format. **Note:** When exporting to PDF, select a reasonable number of columns to display to ensure that the report is legible. • **CSV.** The table data is formatted as a comma-separated values (CSV) text file that can be displayed in a spreadsheet. **Note:** For the CSV formatted table data to display correctly, the comma (,) must be defined as the list separator. In Windows, to verify or modify the list separator value, open Regional Options from the Control Panel, and on the Numbers tab ensure that the comma is defined as the List Separator value. • **XML.** The table data is formatted as an XML file that can be opened in a text or XML editor.
<Right-click a CI>	For details on the menu options, see "IT Universe Manager Shortcut Menu" in the *HP Universal CMDB Modeling Guide*.
<Right-click a column header>	For details, see Sort Column Content Dialog Box in the *HP Universal CMDB Modeling Guide*.
CIs/Relationships tabs	Select to see a list of CIs or relationships that are candidates for

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

CI Lifecycle Page

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

To access	Select **Administration > CI Lifecycle**.
Important information	The CI Lifecyle page includes the following tabs: • **Aging Status**. Use this tab to enable the aging mechanism and to run aging. For details, see "Aging Status Tab" on page 97. • **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 98. • **Relationships**. Displays the same information as the CIs tab, with the addition of the **End1** and **End2** columns.

	The tab that is displayed by default depends on whether aging is enabled or disabled: • **If aging is enabled**, the CIs tab is displayed. • **If aging is disabled**, the Aging Status tab is displayed.
Relevant tasks	• "Enable and Run the Aging Mechanism" on page 94 • "Generate CI Lifecycle Data and Filter the Results" on page 95
See also	Working with CIs in the *HP Universal CMDB Modeling Guide*

Filter Dialog Box

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

To access	Click **Filter** on the CI Lifecycle page.
Relevant Tasks	"Generate CI Lifecycle Data and Filter the Results" on page 95

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 Lifecyle page.
Value	Click in the **Value** column to set a value for the selected condition. Depending on the condition selected, you can select a value from a drop-down list, select a date and time from the calendar, or click the ellipsis button ... to open an editing dialog box where you can enter a value. When the conditions **Like** or **Like ignore case** are selected in the **Condition** column, you can use a wildcard (%) before and after the string for which you are searching. **Note:** You must select a condition before entering a value.

Aging Parameters

Aging parameters are defined in Infrastructure Settings (**Administration > Infrastructure Settings Manager > 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.
- **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.

Configuring Security

User Permissions for UCMDB

This chapter includes:

User Permissions in a Single Tenant Environment

Note: When working in a multi-tenancy environment, refer to "User Permissions in a Multi-Tenancy Environment" on page 107.

All resources (queries, views, impact rules, and custom reports),are assigned a **resource owner**. The resource owner is defined as the user who created the resource and cannot be changed to a different resource owner. However it is possible to delete the ownership of the resource, which results in a resource with no resource owner.

Users are assigned roles which define the permissions they have. A user's permission to perform a specific action on a specific resource is determined by the following factors:

- The user who is the resource owner of a resource has all permissions for that resource.
- For a user who is not the resource owner, the user must be assigned a role that includes the requested permission for that resource.

Folders are also considered resources and follow the same permissions rules as other resources. The permissions applied to a folder automatically apply to all the resources contained in the selected folder. In order to delete or update a folder, you need delete or update permission on its parent folder.

An additional type of permission that is relevant for folders is **Create** permission, which enables you to create resources in that folder. **Create** permission can be selected for queries, views, Impact rules, and custom reports. **Create** permission for a folder also enables you to create sub-folders in that folder.

There are also general actions that are not linked to specific resources, such as the general action **Data Update**, which permits the user to update CIs in any view for which he has **Update** permission.

It is often necessary for a user to have a set of different permissions to enable him to perform a specific operation. Thus, for a user to view the CIs in a specific view in IT Universe Manager, he requires the following permissions:

- Permission to access the IT Universe Manager module.
- View permission for the specific view (or for all views). If he is lacking this permission, he will not see the view at all.
- Permission for the general action **View CIs**. If he is lacking this permission, he will see an empty view.

For details on the available resource permissions and general actions, see "Permissions Summary" on page 135.

User Permissions Workflow

> **Note:** When working in a multi-tenancy environment, refer to "Multi-Tenancy Workflow" on page 112.

The following task describes a typical workflow in a single-tenant environment:

1. ### Create Resource Groups

   If relevant, create resource groups in the Resource Groups module to assist in defining permissions during role creation. For details, see "Define a Resource Group" on page 140.

2. ### Create Roles

   Create roles in the Roles Management module defining the permissions you want to assign to different users. For details, see "Create a New Role and Define Permissions for the Role" on page 130.

3. ### Create Users and Groups and Assign Roles to Them

   Create users and user groups in the Users and Groups module. Assign roles to the users and groups according to the permissions you want to grant each one. For details, see "Users and Groups Workflow" on page 119.

4. ### Review the Role Assignments

   Review the roles assigned to each user and group to ensure that the users have been granted the required permissions. Check the **Permissions Overview** tab in the Users and Groups module. For details, see "Users and Groups Page" on page 125.

Multi-Tenancy Overview

> **Note:** This section is only relevant when multi-tenancy is enabled.

This section includes the following topics:

- "Introduction" below
- "Owner and Consumer Tenants" below
- "Resource Owner" below
- "Default Tenants for Users and Groups" on next page
- "User Ownership and Tenancy Rules" on next page
- "Default Tenant Rules - Advanced Information" on page 107

Introduction

Multi-tenancy is the ability for multiple customers or tenants to use the same shared UCMDB environment. UCMDB enables multiple tenants to use an implementation of the UCMDB with layered permissions. This enables tenant users to access only that data and those resources that are relevant to that tenant. This includes CI data and resources such as TQLs, views, reports, snapshots, and so forth. Multi-tenancy is a method of working in UCMDB which allocates the CIs in your IT Universe and the resources in your system to various tenants.

There are two main layers to multi-tenancy, tenants and users. Permissions are applied across UCMDB based on the tenant assigned and the user's permission levels. Both the tenant level and the user's permission level determines what can be created and accessed in the system.

Owner and Consumer Tenants

Each CI, view, query, custom report, or Impact rule can belong to one particular tenant, known as the **owner tenant** of the resource. Other tenants can be designated as **consumer tenants** of the same resource.

Owner tenant status is associated with full permission for the resource (view, update, and delete). Consumer tenant status is associated with partial permission (view only). The owner tenant of a resource is also automatically included as a consumer tenant of that resource.

The owner tenant and consumer tenants can be updated in the Assign Tenants dialog box. When you assign an owner tenant or consumer tenant to a folder, all of the resources in that folder are assigned that tenant as an **inherited owner tenant** or an **inherited consumer tenant** respectively. (Inherited tenants are not relevant for CIs.) There can thus be one owner tenant assigned to a resource, but it can have several inherited owner tenants from its containing folders. A resource can have several consumer tenants and it is possible to select all existing tenants as consumer tenants for a resource.

For details on assigning tenants to resources, see "Assign Tenants Dialog Box" on page 113.

Resource Owner

Every resource, other than CIs, is also assigned a **resource owner**, which is independent of the resource's owner tenant. The resource owner is defined as the user who created the resource and cannot be changed to a different resource owner. However it is possible to delete the ownership of the resource, which results in a resource with no resource owner (the tenancy of the resource is unaffected).

The resource owner is an additional property not related to the tenant property that enables the user that created a resource to 'own' that resource. For example, if a user belonging to a specific tenant has permissions to create TQLs but may not have general view and updates permissions, the user as the resource owner has permissions to view and update only the TQL he created.

Default Tenants for Users and Groups

Every UCMDB user and user group can be assigned a default tenant. The default tenant of the user or the user's group can be used to define the owner tenant and consumer tenants of CIs and resources created by that user.

You can set the default tenant for a user or group by clicking the **Set Default Tenant** button  in the toolbar of the Users and Groups module, or select the tenant in the wizard during creation of the user or group.

For rules and additional information on the default tenant, see "Multi-Tenancy Overview" on previous page.

User Ownership and Tenancy Rules

The following table summarizes the user ownership and tenancy rules for CIs and other resources:

Term	Description	As Applied to Resources	As Applied to CIs
Resource owner	The user that created the resource.	• Resource can have only one • Automatically defined as the user logged in at the time of creation • Cannot be changed (but can be deleted)	N/A
Owner tenant	The tenant that has full permission on the resource or CI.	• Can have one assigned owner tenant and multiple inherited owner tenants • Automatically defined based on the user logged in at the time of creation • Can be updated, but there must be an owner tenant defined	• Only one • Automatically defined based on the user logged in at the time of creation • Can be updated, but there must be an owner tenant defined
Consumer tenant	The tenant or tenants that can consume or use the resource or CI.	• Can be multiple	• Can be multiple

Term	Description	As Applied to Resources	As Applied to CIs
		• Automatically defined based on the user logged in at the time of creation • Can be updated or deleted	• Automatically defined based on the user logged in at the time of creation • Can be updated or deleted

Default Tenant Rules - Advanced Information

The initial owner tenant and consumer tenants of a new CI or resource are determined according to the following rules:

- When a user creates a resource, the initial owner tenant and consumer tenant of that resource are defined as the user's default tenant.

  > **Note:** The same tenant is used for both the initial owner tenant and consumer tenant of the created resource.

- If the user has no default tenant defined and the user is a member of one or more groups, UCMDB checks the default tenant of each group (including a recursive check of the parent groups). If a single default tenant is shared in common by the groups, that tenant is used for the resource.

  > **Note:** If some of the user's groups share a common default tenant, and the other groups have no default tenant defined, the common tenant is used for the resource. If any group has a different default tenant, neither tenant is used for the resource.

- If neither of the above criteria were satisfied, UCMDB checks all of the user's role assignments. If all of the role assignments for the user are in connection with the same tenant, that tenant is defined as the initial owner tenant and consumer tenant of the created CI or resource.
- If none of the above conditions are satisfied, the initial owner tenant and consumer tenant are configured in the CMDB settings.

User Permissions in a Multi-Tenancy Environment

> **Note:** This section is only relevant when multi-tenancy is enabled. When working in a single-tenant environment, refer to "User Permissions in a Single Tenant Environment" on page 103.

This section includes the following topics:

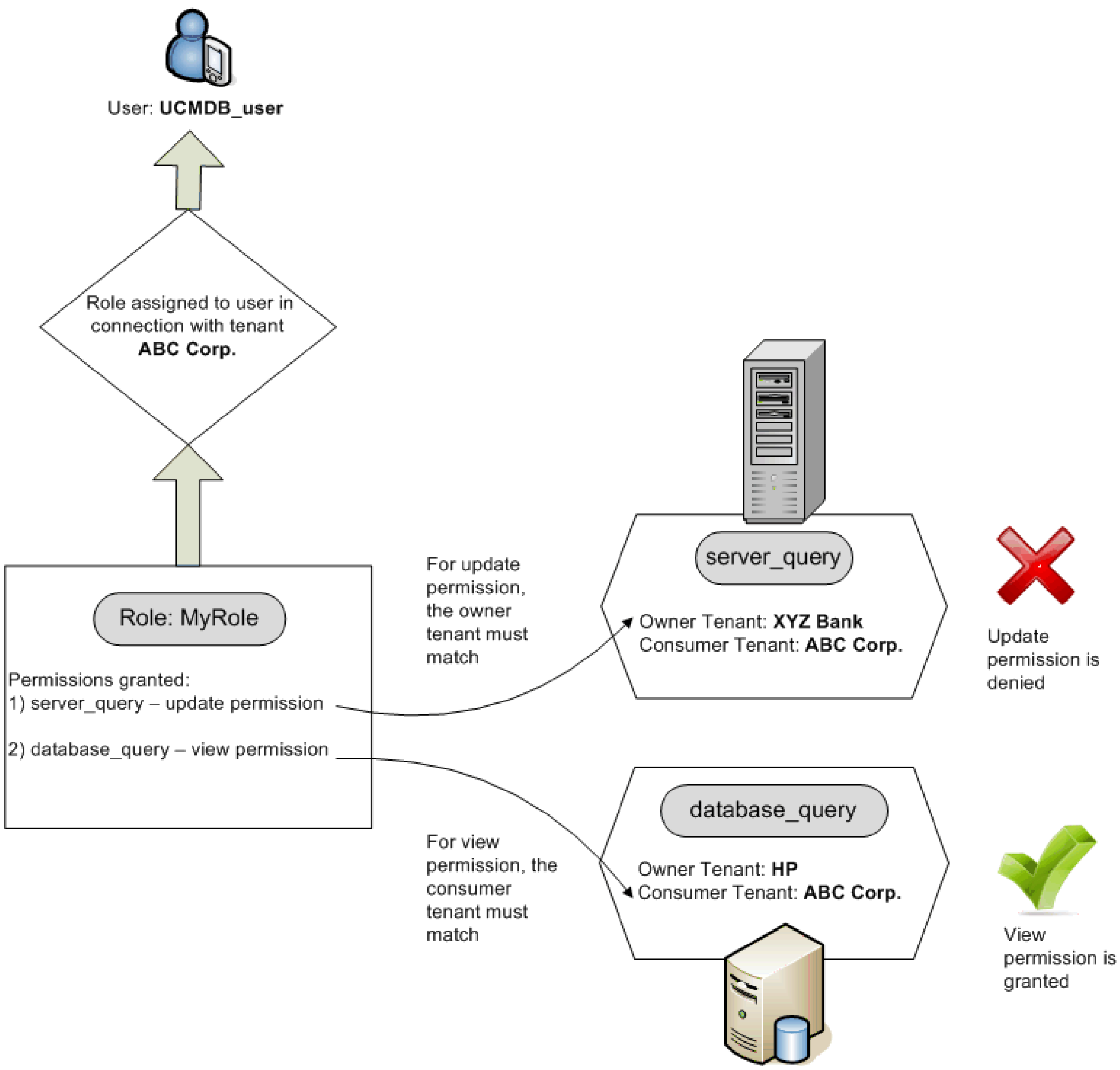
Required Permissions for Resources

Users are assigned roles which define the permissions they have. The role assignments are defined in connection with specific tenants.

A user's permission to perform a specific action on a specific resource is determined by several factors:

- The user who is the resource owner of a resource has all permissions for that resource (except for permission to change the tenant assignment).
- For a user who is not the resource owner, the following conditions must be satisfied for permission to perform a requested action:
  - The user is assigned a role that includes the requested permission for that resource.
  - The tenant associated with that role assignment matches the relevant tenant of the resource. For view permission, it must match one of the consumer tenants (or inherited consumer tenants) of the resource. For update or delete permission, it must match the owner tenant (or one of the inherited owner tenants) of the resource.

For example, consider a role that grants update permission for the query `server_query` and view permission for the query `database_query`. You assign this role to the user `UCMDB_user` in connection with the tenant `ABC Corporation`. (`UCMDB_user` is not the resource owner of either query.) `ABC Corporation` is among the consumer tenants of both `server_query` and `database_query`, but it is not the owner tenant or inherited owner tenant of either query. `UCMDB_user` can thus view `database_query`, because the role grants him view permission in connection with a consumer tenant of that query. However, he cannot update `server_query` despite the update permission granted by the role, because the role was not assigned in connection with the owner tenant of that query.



Folders are also considered resources and follow the same permissions rules as other resources. The permissions applied to a folder automatically apply to all the resources contained in the selected folder. In order to delete or update a folder, you need delete or update permission on its parent folder.

An additional type of permission that is relevant for folders is **Create** permission, which enables you to create resources in that folder. **Create** permission can be selected for queries, views, Impact rules, and custom reports. **Create** permission for a folder also enables you to create sub-folders in that folder. For a user to create resources in a folder, the role assigned to him must be associated with the tenant that is the owner tenant (or inherited owner tenant) of the selected folder. Thus if the owner tenant of a folder is `ABC Corporation` and a user is assigned a role with **Create Views** permission for that folder in connection with the tenant `XYZ Bank`, he is unable to create any views in that folder.

Note: For UI Module and CIT Menu Item permissions, the tenant assignment is not relevant.

User Permissions for General Actions

A similar requirement is applied for determining a user's permissions for most general actions. If a user is granted permission for the general action **View CIs** in connection with a specific tenant, he can only view CIs that include that tenant among its consumer tenants or owner tenant. If a user is granted permission for the general action **Update Data** in connection with a specific tenant, he can only update CIs whose owner tenant matches that tenant.

For example, suppose a user is assigned a role which grants him permission for the general actions View CIs and Update Data in connection with tenant_A. The following are the tenancy assignments for three CIs in a view:

- **DB_1.** Owner tenant: tenant_A, Consumer tenants: tenant_A, tenant_B
- **DB_2.** Owner tenant: tenant_C, Consumer tenants: tenant_A, tenant_C
- **CPU_1.** Owner tenant: tenant_B, Consumer tenants: tenant_B, tenant_C

The user thus has update and view permission for DB_1, but view permission only for DB_2. He has no permissions for CPU_1 (the CI is not visible to him).

It is often necessary for a user to have a set of different permissions to enable him to perform a specific operation. Thus, for a user to view the CIs in a specific view in IT Universe Manager, he requires the following permissions:

- Permission to access the IT Universe Manager module. The tenant assignment is not relevant for this permission.
- View permission for the specific view (or for all views) in connection with a tenant that is among the consumer tenants of that view. If he is lacking this permission, he will not see the view at all.
- Permission for the general action **View CIs** in connection with a tenant that is among the consumer tenants of each CI in the view. If he is lacking this permission, he will see an empty view. If he has this permission in connection with a tenant that is included among the consumer tenants of only some of the view's CIs, he will see only those CIs.

> **Note:** For some general actions, such as **Access to SDK**, the tenant assignment is not relevant.

Required Permissions for Tenant Assignments

To view the tenant assignments for a resource or CI, permission for the general action **View Tenant Assignment** is required, in connection with the owner tenant or inherited owner tenant of the resource. If a user is assigned a role with this permission, he can view the owner tenant and consumer tenants of the resource, but he will only see the resource's consumer tenants that are associated with the role assignment.

For example, a user has permission for the general action View Tenant Assignment in connection with tenants T1 and T2. The following are the tenancy assignments for two resources:

- **Query_1** has owner tenant T1 and consumer tenants T1, T2, and T3.
- **Query_2** has owner tenant T3 and consumer tenants T1, T2, and T3.

The user can view the tenant assignments for Query_1, however he only sees T1 and T2 as the consumer tenants (he has no permission in connection with T3). He cannot view the tenant assignments for Query_2 because his View Tenant Assignment permission is not associated with the owner tenant of that resource.

To modify the tenant assignment for a resource or CI, permission for the general action **Reassign Tenant** is required, in connection with the owner tenant or inherited owner tenant of the resource and with the tenants being modified.

Multi-Tenancy in Package Manager

In a multi-tenancy environment, tenants are considered resources that can be included in a package and then deployed and exported. In addition, when a resource, such as a query, view, or impact rule, is added to a package, the tenant assignment for that resource is also included in the package.

For details on Package Manager, see "Package Manager" on page 56

Tenant Association Rules

Note: This section is only relevant when multi-tenancy is enabled.

When working in a multi-tenancy environment, it is often necessary to apply the same tenancy definitions to many CIs. A convenient way to do this is by using **Tenant Association rules**, which are a form of Enrichment rules. You define Tenant Association rules in the Enrichment Manager in the same way that you define Enrichment rules.

The Tenant Association rule you define for a query node determines the tenant to be associated with that query node. When the rule is run, all CIs in your IT Universe that match the topology of the Tenant Association rule are assigned the specified owner tenant or consumer tenants, according to the rule definition. The frequency with which a Tenant Association rule runs is determined by the priority assigned to the rule.

The following Tenant Association rules are provided out-of-the-box:

- **SetOwnerTenantOfComposedCI.** Overwrites the owner tenant of the Composed CI with the owner tenant of the Container CI.
- **AppendConsumerTenantsToComposedCI.** Appends the consumer tenants of the Container CI to the consumer tenants of the Composed CI.
- **SetConsumerTenantsOfComposedCI.** Overwrites the consumer tenants of the Composed CI with the consumer tenants of the Container CI.
- **AppendOwnerTenantToImpactedCI.** Appends the owner tenant of the Impacted By CI to the consumer tenants of the Impacted CI.
- **AppendConsumerTenantsToImpactedCI.** Appends the consumer tenants of the Impacted By CI to the consumer tenants of the Impacted CI.

These Tenant Association rules are templates which you can use to build a customized rule for your IT environment.

Note: The out-of-the-box Tenant Association rules are inactive by default. To activate a rule, select the **Rule is Active** check box in the Tenant Association Rule Properties wizard. It is not recommended to activate the out-of-the-box rules in their original configuration, due to the large

> size of the query results. First, modify a rule to limit its results and then activate it.

For details on defining Tenant Association rules, see "Define a Tenant Association Rule" in the *HP Universal CMDB Modeling Guide*.

Multi-Tenancy Workflow

> **Note:** This section is only relevant when multi-tenancy is enabled.

The following task describes a typical workflow in a multi-tenancy environment:

1. **Add Tenants**

   Begin by adding tenants to the tenant repository in the Tenants Management module. For details, see "Tenants Management Page" on page 152.

2. **Create Resource Groups**

   If relevant, create resource groups in the Resource Groups module to assist in defining permissions during role creation. For details, see "Define a Resource Group" on page 140.

3. **Create Roles**

   Create roles in the Roles Management module defining the permissions you want to assign to different users. For details, see "Create a New Role and Define Permissions for the Role" on page 130.

4. **Create Users and Groups and Assign Roles to Them**

   Create users and user groups in the Users and Groups module. If relevant, assign default tenants to the users and groups. For details, see "Multi-Tenancy Overview" on page 105. Assign roles to the users and groups according to the permissions you want to grant each one. For details, see "Users and Groups Workflow" on page 119.

   When assigning a role to a user, select the tenants associated with that assignment, as described in "Role Association Page" on page 124.

5. **Review the Role and Tenant Assignments**

   Review the roles assigned to each user and group and the tenants associated with each role assignment to ensure that the users have been granted the required permissions. Check the **Permissions Overview** tab in the Users and Groups module. For details, see "Users and Groups Page" on page 125.

6. **Change the Tenant Assignment for a Resource or a CI**

   When a resource or CI is created, the owner tenant and consumer tenant are automatically assigned based on the tenant of the user who created the resource or CI. For details, see "Multi-Tenancy Overview" on page 105.

   You can change the automatic assignments for a resource or CI. For details, see "Change the Tenant Assignment for a Resource or a CI" on next page.

7. ### Define a Tenant Association Rule - Optional

   For advanced users working with large amounts of data, you can define rules that determine how tenants are associated with resources and CIs. For details, see Define a Tenant Association Rule.

Change the Tenant Assignment for a Resource or a CI

> **Note:** This section is only relevant when multi-tenancy is enabled.

The following task describes how to change the owner tenant and consumer tenants for a resource or a CI:

1. ### Locate the Required Resource or CI

   For views and queries, go to Modeling Studio and select the required resource in the Resources tab of the left pane. For impact rules, go to Impact Analysis Manager and select the required impact rule. For custom reports, go to the Reports module and select the required custom report. Right click the resource and select Assign Tenants.

   For CIs, go to IT Universe Manager and select the required CI. Right click the CI and select Assign Tenants.

2. ### Update the Owner Tenant

   In the Assign Tenants dialog box, select a tenant from the drop-down list in the **Owner Tenant** field. The selected tenant becomes the owner tenant of the resource or CI. For details, see "Assign Tenants Dialog Box" below.

3. ### Update the Consumer Tenants

   In the **Consumer Tenants** section of the dialog box, select the consumer tenants. The selected tenants become the consumer tenants of the resource or CI. For details, see "Assign Tenants Dialog Box" below.

4. ### Save the Changes

   Click **Save** to save your changes to the tenant assignment.

User Permissions User Interface

This section includes (in alphabetical order):

Assign Tenants Dialog Box

This dialog box enables you to update the owner tenant and consumer tenants of a resource or a CI.

> **Note:** This section is only relevant when multi-tenancy is enabled.

To access	In Modeling Studio, click the **Assign Tenants** button in the toolbar of the TQL Query Editor or right click a resource in the Resources tab and select **Assign Tenants** from the shortcut menu. In the Reports module, click the **Assign Tenants** button in the Custom Reports toolbar or right click a custom report and select **Assign Tenants** from the shortcut menu. In Impact Analysis Manager, click the **Assign Tenants** button in the toolbar or right click an Impact rule and select **Assign Tenants** from the shortcut menu. In IT Universe Manager, right click a CI and select **Assign Tenants** from the shortcut menu.
Important information	The Consumer Tenants section has different functionality depending on the number of resources selected: • When a single resource is selected, move the required tenants from the **Available Tenants** pane to the **Selected Tenants** pane using the arrow buttons. Alternatively, select **All tenants** to select all the available tenants. • When multiple resources are selected, select the check boxes in the Assigned column to assign the required tenants to all the selected resources. Alternatively, select **All tenants** to assign all the available tenants to all the selected resources. **Note:** When updating the owner tenant or consumer tenants using the Assign Tenants dialog box, be aware that there may be a Tenant Association rule defined which overrides your manual tenant assignment. In that case the tenant assignments defined in the rule will take effect the next time that the rule runs.
Relevant tasks	"Change the Tenant Assignment for a Resource or a CI" on previous page

User interface elements are described below:

UI Element (A-Z)	Description
<Arrow buttons>	The following arrow buttons are available: • Select tenants in the Available Tenants pane and click **Add** to move them to the Selected Tenants pane. • Click **Remove** to remove the specified tenants from the Selected Tenants pane.

UI Element (A-Z)	Description
	• Click **Add All** to move all the tenants in the Available Tenants pane to the Selected Tenants pane. • Click **Remove All** to remove all the tenants from the Selected Tenants pane. **Note:** These buttons are only available when a single resource is selected.
All tenants	Select **All tenants** to assign all tenants to the resource. **Note:** When you select All tenants, the Consumer Tenants section becomes disabled.
Assigned	The check boxes indicate the assignment status of each tenant as follows: • A selected check box (a blue arrow) indicates that the tenant is assigned to each selected resource as a consumer tenant. • A blank check box indicates that the tenant is not assigned to any selected resource. • A triangle in the check box indicates a mixed status: the tenant is assigned to at least one selected resource, but not to all of them. Select a check box to assign that tenant to all of the selected resources as a consumer tenant. Clear a check box to remove the tenant assignment from all the selected resources. If you leave the mixed status indicator in a check box, the previous consumer tenant assignments for that tenant remain unchanged. If one of the selected resources has **All tenants** selected, and others do not, the **All tenants** check box has a mixed indicator and the Consumer Tenants section is disabled. You can clear the check box to enable the Consumer Tenants section, modify the consumer tenant assignments, and then re-select the **All tenants** check box. The resource with All tenants remains unchanged, but the consumer tenant assignments of the other resources are updated. If a tenant is an inherited consumer tenant for at least one of the selected resources, the check box is disabled. **Note:** This item is only available when multiple resources are selected.
Available Tenants	Displays the available tenants. **Note:** This item is only available when a single resource is selected.
Description	Displays the descriptions of the available tenants. **Note:** This item is only available when multiple resources are selected.
Inherited Owner Tenants	Click the arrow button to expand the pane displaying the inherited owner tenants for the selected resource(s). These are owner tenants of the parent folders of the resource(s). The inherited owner tenants are displayed in tree

UI Element (A-Z)	Description
	format (with the relevant resources appearing under each tenant, in the case of multiple resources). **Note:** This feature only appears in the Assign Tenants dialog box for resources, not for CIs.
Name	Displays the names of the available tenants. **Note:** This item is only available when multiple resources are selected.
Owner Tenant	Select the owner tenant of the resource from the drop-down list. When multiple resources with different owner tenants are selected, **Multiple Tenants Assigned** is the displayed option. If you leave this option selected, the previous owner tenant assignments of the resources remain unchanged.
Selected Tenants	Displays the selected tenants. Inherited consumer tenants appear in gray and cannot be selected. **Note:** This item is only available when a single resource is selected.

Assign Resources to Roles and Resource Groups Dialog Box

This dialog box enables you to assign specific resources to roles and resource groups from within the resource managers.

To access	In Modeling Studio, click the **Manage Security** button in the toolbar of the TQL Query Editor or right click a resource in the Resources tab and select **Manage Security** from the shortcut menu. In the Reports module, click the **Manage Security** button in the Custom Reports toolbar or right click a custom report and select **Manage Security** from the shortcut menu. In Impact Analysis Manager, click the **Manage Security** button in the toolbar or right click an Impact rule and select **Manage Security** from the shortcut menu.
Important information	You can also assign resources to roles and resource groups in the Security modules. For details, see "Roles Manager" on page 129 and "Resource Groups" on page 140. **Note:** You need permission for the **Administration** general action to assign resources to roles and resource groups.

Roles Pane

User interface elements are described below:

UI Element (A-Z)	Description
<Permissions>	Select the check boxes for the required permissions in the appropriate rows to assign specific permissions for the resource to the required roles.
Assigned	A green check mark indicates that at least one permission for the resource has been assigned to that role. If you access the dialog box while selecting multiple resources, a square in a permission check box indicates that the relevant permission has been assigned for at least one of the selected resources, but not for all of them.
Description	Displays descriptions of the available roles.
Name	Displays the names of the available roles. **Note:** Read-only roles do not appear in the list, since they cannot be modified.

Resource Groups Pane

User interface elements are described below:

UI Element (A-Z)	Description
Assigned	Select the check box in the appropriate rows to assign the resource to the required resource groups. If you access the dialog box while selecting multiple resources, a square in a check box indicates that at least one of the selected resources has been assigned to the resource group, but not all of them.
Description	Displays descriptions of the available resource groups.
Name	Displays the names of the available resource groups. **Note:** The All Resources group does not appear in the list (it already includes all of the resources).

Chapter 10

Users and Groups

This chapter includes:

Users and Groups Overview

The Users and Groups module enables you to create users and user groups and to assign roles to them. The roles assigned to a user or group, along with the tenants associated with each assignment (in a multi-tenancy environment), determine the permissions granted to the user or the members of the group.

A user can be associated with more than one group. The roles assigned to a group are automatically assigned to each user in the group. A user's roles include the roles assigned to the individual user, known as **assigned roles**, and the roles assigned to the user's groups, known as **inherited roles**.

It is also possible to associate a group with a parent group. In such a case, the child group inherits the roles of the parent group and the users in the child group inherit the roles of both groups.

Resources, actions, and modules for which a user is not granted permission are not visible to that user or are disabled in the user's environment.

> **Note:** The Users and Groups module is available only to those logged in with administration access rights.

Out-of-the-Box Users

The following users are defined out-of-the-box by UCMDB:

- **Admin.** The UCMDB administrator.
- **Sysadmin.** The system administrator (used to login to the JMX console).
- **UISysadmin.** The user used for running tasks on the server.

> **Note:** Out-of-the-box users appear in bold in the Users pane. You can update their user details but you cannot modify their role assignments.

Merge Users

You can merge two users into a single user. In the Merge Users dialog box, select one of the users to be the master. The merged user takes the name of the master and includes the role assignments of both users.

In a multi-tenancy environment, the merged user gets the default tenant of the user selected as master. If each of the original users were assigned the same role in connection with different tenants, the merged user is assigned the role in connection with the tenants of both users.

Note:

- Out-of-the-box users cannot be merged.
- The Merge Users functionality is only relevant when exactly two users are selected.

Users and Groups Workflow

The following steps describe a typical workflow for defining users and groups in your system:

1. **Define a New Group**

   Select the Groups tab and create a new group using the New Group wizard. Assign a role or multiple roles to the group on the Roles Association page. For details, see "New Group Wizard" on next page.

2. **Define a New User**

   Select the Users tab and create a new user using the New User wizard. If relevant, associate the user with at least one group on the Group Association page. For details, see "Group Association Page" on page 123.

3. **Assign Roles to the User**

   Assign roles to the user on the Roles Association page. For details, see "Role Association Page" on page 124.

4. **Review the User's Roles**

   In the User tab, select the user you created. In the Roles tab of the right pane, confirm that the roles you assigned to the user appear in the Assigned Roles section and the roles assigned to the user's groups appear in the Inherited Roles section.

5. **Edit a User's Details**

   If a change occurs in a user's details, you can edit his details, including his password, time zone preference, and locale (user interface language). Select the user in the left pane and edit his details in the Details tab.

   You can edit the details for the user currently logged in using the User Profile dialog box. Select **Tools > User Profile...** to access the dialog box.

Users and Groups User Interface

This section includes (in alphabetical order):

- "New Group Wizard" on next page
- "New User Wizard" on page 122

- "Select Tenants for Role Dialog Box" on page 125
- "Users and Groups Page" on page 125

New Group Wizard

This wizard enables you to create a user group.

To access	Select **Users and Groups** from the **Security** module in the Navigation Menu or select **Managers > Security > Users and Groups > Groups tab**. Click the **New Group** button.
Relevant tasks	"Users and Groups Workflow" on previous page
Wizard map	The "New Group Wizard" contains: "Group Details Page" > "Group Association Page" > "Roles Association Page" > "Default Tenant Page"

Group Details Page

This wizard page enables you to add the details of the group.

Wizard map	**The "New Group Wizard" contains:** **"Group Details Page"** > "Group Association Page" > "Roles Association Page" > "Default Tenant Page"

User interface elements are described below:

UI Element (A-Z)	Description
Description	Enter a description of the user group. **Note:** This field is optional.
Group Name	Enter a name for the new user group.

Group Association Page

This wizard page enables you to associate a user group with one or more parent groups.

Important information	Use the arrow buttons to move the required groups from the Available Groups pane to the Selected Groups pane.
Wizard map	The "New Group Wizard" contains: "Group Details Page" > **"Group Association Page"** > "Roles Association Page" > "Default Tenant Page"

User interface elements are described below:

UI Element (A-Z)	Description
Available groups	Displays the available groups.
Selected groups	Displays the groups selected for association with the new group.

Roles Association Page

This wizard page enables you to associate a user group with one or more roles.

Important information	Use the arrow buttons to move the required roles from the Available Roles pane to the Selected Roles pane. If multi-tenancy is enabled, the Select Tenants for Role dialog box appears, which enables you to associate tenants with the role assignment.
Wizard map	The "New Group Wizard" contains: "Group Details Page" > "Group Association Page" > **"Roles Association Page"** > "Default Tenant Page"

User interface elements are described below:

UI Element (A-Z)	Description
Available Roles	Displays the available roles
Role's Assigned Tenants	Displays the tenants associated with the role selected in the Selected Roles pane. **Note:** This area is only available when multi-tenancy is enabled.
Selected Roles	Displays the roles selected for assignment to the new group.

Default Tenant Page

This wizard page enables you to assign a default tenant to the group.

Important information	This wizard page is only available when multi-tenancy is enabled.
Wizard map	The "New Group Wizard" contains: "Group Details Page" > "Group Association Page" > "Roles Association Page" > **"Default Tenant Page"**

User interface elements are described below:

UI Element (A-Z)	Description
Select tenant	Select a tenant from the drop-down list to be the default tenant of the new group.

New User Wizard

This wizard enables you to create a user.

To access	Select **Users and Groups** from the **Security** module in the Navigation Menu or select **Managers > Security > Users and Groups > Users tab**. Click the **New User** button.
Relevant tasks	"Users and Groups Workflow" on page 119
Wizard map	The "New User Wizard" contains: "User Name and Password Page" > "User Details Page" > "Group Association Page" > "Role Association Page" > "Default Tenant Page"

User Name and Password Page

This wizard page enables you to assign a name and password for the user.

Important information	When creating a new user, you can either enable the password policy, in which UCMDB automatically assigns the default password to the user, or assign a password of your own. To enable the password policy, go to **Managers > Administration > Infrastructure Settings Manager**, select **Passwords must use default policy** and set the value to **True**. When the password policy is enabled, new users created are given the password defined in the **Default user password** setting. The new users must change the password on first login (you can also change the password in the wizard). The default user password is `welcome`. The default password policy requires the UCMDB password to include at least three types of characters from among the following types: • Uppercase alphabetic characters • Lowercase alphabetic characters • Numeric characters • Symbol characters It also requires the password to adhere to the minimum length, which is set by the setting **Password minimum length**.
Wizard map	The "New User Wizard" above contains: **"User Name and Password Page"** > "User Details Page" on next page > "Group Association Page" on next page > "Role Association Page" on page 124 > "Default Tenant Page" on page 124

User interface elements are described below:

UI Element (A-Z)	Description
Confirm Password	• If the **Passwords must use default policy** setting in **Managers > Administration > Infrastructure Settings Manager** is set to **True**, UCMDB automatically confirms the password defined in **Default user password**. • If the **Passwords must use default policy** setting is set to **False**, confirm the password you entered in the **Password** box.
Password	• If the **Passwords must use default policy** setting in **Managers > Administration > Infrastructure Settings Manager** is set to **True**, UCMDB automatically assigns the password defined in **Default user password**. • If the **Passwords must use default policy** setting is set to **False**, assign a password of your own.
User Name	Enter a unique user name.

User Details Page

This wizard page enables you to add the details of the user.

Wizard map	The "New User Wizard" contains: "User Name and Password Page" > **"User Details Page"** > "Group Association Page" > "Role Association Page" > "Default Tenant Page"

User interface elements are described below:

UI Element (A-Z)	Description
<User details>	Enter the user's information. Use the **Locale** field to select the language of the user interface for the user.If no locale is selected, the locale of the web browser is used to define the language. If no locale is selected for the browser, the Operating System locale is used. If the locale specified in the browser or Operating System is not supported by UCMDB, the default language of the user interface is English.

Group Association Page

This wizard page enables you to associate a user with one or more groups.

Important information	Use the arrow buttons to move the required groups from the Available Groups pane to the Selected Groups pane.
Wizard map	The "New User Wizard" contains:

	"User Name and Password Page" > "User Details Page" > **"Group Association Page"** > "Role Association Page" > "Default Tenant Page"

User interface elements are described below:

UI Element (A-Z)	Description
Available groups	Displays the available groups.
Selected groups	Displays the groups selected for association with the new user.

Role Association Page

This wizard page enables you to associate a user with one or more roles.

Important information	Use the arrow buttons to move the required roles from the Available Roles pane to the Selected Roles pane. If multi-tenancy is enabled, the Select Tenants for Role dialog box appears, which enables you to associate tenants with the role assignment.
Wizard map	The "New User Wizard" contains: "User Name and Password Page" > "User Details Page" > "Group Association Page" > **"Role Association Page"** > "Default Tenant Page"

User interface elements are described below:

UI Element (A-Z)	Description
Available Roles	Displays the available roles
Role's Assigned Tenants	Displays the tenants associated with the role selected in the Selected Roles pane. **Note:** This area is only available when multi-tenancy is enabled.
Selected Roles	Displays the roles selected for assignment to the new user.

Default Tenant Page

This wizard page enables you to assign a default tenant to the user.

Important information	This wizard page is only available when multi-tenancy is enabled.
Wizard map	The "New User Wizard" contains: "User Name and Password Page" > "User Details Page" > "Group Association Page" > "Role Association Page" > **"Default Tenant Page"**

User interface elements are described below:

UI Element (A-Z)	Description
Select tenant	Select a tenant from the drop-down list to be the default tenant of the new user.

Select Tenants for Role Dialog Box

This tab enables you to select tenants to associate with the role assigned to a user or group.

To access	Click the **Edit** link in the Assigned Roles section of the Roles tab. Select a role or roles in the Available Roles pane and move it to the Selected Roles pane using the arrow buttons. The dialog box opens. Alternatively, when you run the New User wizard or the New Group wizard, the dialog box opens when you move roles to the Selected Roles pane.
Important information	This dialog box is only available when multi-tenancy is enabled.

User interface elements are described below:

UI Element (A-Z)	Description
All Tenants	Select **All Tenants** to associate all tenants with the role assigned to the user or group.
Available Tenants	The list of all available tenants.
Selected Tenants	The tenants selected for the role assignment to the user or group.
Specified Tenants	Select **Specified Tenants** to associate only the specified tenants with the role assigned to the user or group.

Users and Groups Page

This tab enables you to define new users and groups or edit existing ones.

To access	Select **Users and Groups** from the **Security** module in the Navigation Menu or select **Managers > Security > Users and Groups**.
Relevant tasks	"Users and Groups Workflow" on page 119

Left Pane

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

UI Element (A-Z)	Description
	**New User/New Group.** When the Users tab is selected, enables you to create a user. When the Groups tab is selected, enables you to create a user group. **Note:** When LDAP is enabled, the users created with the **New User** button are integration users.
	**Edit User/Edit Group.** Edit the name of the selected user or group.
	**Delete.** Deletes the selected user or group.
	**Reset Password.** Opens the Reset Password dialog box. This dialog box is only available for administrators. It enables you to change the user's password without entering the old password. **Note:** This button is only relevant when the Users tab is selected.
	**Set Default Tenant.** Enables you to change the default tenant of the user or group. **Note:** This button is only available when multi-tenancy is enabled.
	**Refresh.** Refresh the list of users or groups.
	**Save.** Saves the changes you have made.
<List of users>	Contains the list of default and custom users. LDAP users are indicated by a green check mark in the **External User** column.
<Search feature>	To search for a phrase in the list of users or groups, enter the phrase in the **Find** box. Use the arrow buttons to find the next and previous occurrences of the phrase. Click the **Highlight** button to highlight all occurrences of the phrase.
Groups tab	Displays the existing groups.
Users tab	Displays the existing users.

The following options are available by right-clicking a user or group:

UI Element (A-Z)	Description
Delete	Delete the selected user or group.
Edit User/Edit Group	Edit the name of the selected user or group.

UI Element (A-Z)	Description
Merge Users	Merge the selected users into one user. In the Merge Users dialog box, select one of them to be the master. The merged user takes the name of the master and includes the role assignments of both users. **Note:** This option is only available when two users are selected.
New User/New Group	Create a new user or group.
Refresh	Refresh the list of users or groups.
Reset Password	Opens the Reset Password dialog box. This dialog box is only available for administrators. It enables you to change the user’s password without entering the old password. **Note:** This option is only available for users.
Save	Save the changes you have made.
Set Default Tenant	Enables you to change the default tenant of the user or group. **Note:** This option is only available when multi-tenancy is enabled.

Right Pane

User interface elements are described below:

UI Element (A-Z)	Description
Details tab	When the **Groups** tab is selected, displays details for the selected group. When the **Users** tab is selected, displays details for the selected user. The **Change Password** button enables you to change the user password. Enter the user’s old password and the new one in the Change User Password dialog box. Use the **Locale** field to select the language of the user interface for the user. If no locale is selected, the locale of the web browser is used to define the language. If no locale is selected for the browser, the Operating System locale is used. If the locale specified in the browser or Operating System is not supported by UCMDB, the default language of the user interface is English. Under **Time Zone Preferences**, you can change the time zone for the selected user. **Note:** When you update the time zone for the user currently logged in, the change takes effect after 5 minutes. When you update the time zone using the User Profile dialog box (accessed by **Tools > User Profile...**), the change takes effect immediately. Under **Server Administrator Privileges**, you can select the **Enabled** check box to grant the user permission to access the JMX console.

UI Element (A-Z)	Description
Permissions Overview	Displays a summary of the selected user or group's permissions. Select a resource type in the **Resource Types** pane. The resources of the selected type are displayed in the **Permissions Summary** pane. If you select a resource in the tree, the roles from which the permissions derive are displayed in the **Permission Origin** pane.
Roles tab	The following areas are displayed: • **Assigned Roles.** Displays the roles assigned directly to the selected user or group. Click the **Edit** link to edit the assigned roles. For details on assigning roles, see "Role Association Page" on page 124. • **Inherited Roles.** Displays the roles assigned to a parent group of the selected user or group. • **Parent Groups.** Displays the parent groups of the selected user or group. Click the **Edit** link to edit the parent groups. For details on associating groups, see "Group Association Page" on page 123. • **Group Members.** Displays the members of the selected group (only relevant for the Groups tab). Click the **Edit** link to edit the members. Use the arrow buttons to move users or groups from the Available Users/Groups pane to the Selected Users/Groups pane.

Chapter 11

Roles Manager

This chapter includes:

Roles Manager Overview

Roles enable you to assign permissions to users according to their responsibilities in the organization. You define roles in the Roles Manager module and assign roles to users in the Users and Groups module. You can assign multiple roles to a user, which grants him the combined permissions of all the assigned roles.

There are several ways to define the permissions of a role:

- You can select specific actions for specific resources, such as view, update, and delete permission for one TQL query and view only permission for another one.
- You can select specific actions for the resources in a previously defined resource group, such as view and update permission for all TQL queries in the resource group and view and delete permission for all the custom reports in the resource group. Resource groups are defined in the Resource Groups module.
- You can select general actions such as Create Views.

It is possible to define permissions using combinations of the above options. For details on defining the permissions of a role, see "Roles Manager Page" on page 131.

> **Note:** The Roles Manager module is available only to those logged in with administration access rights.

Merge Roles

You can merge two roles into a single role. In the Merge Roles dialog box, select one of the roles to be the master. The merged role takes the name of the master and includes the permissions of both roles. Users that were assigned either of the original roles are now assigned the merged role.

In a multi-tenancy environment, the tenants associated with the role assignment of the merged role to a user are the same as the tenants associated with the original role to that user. If a user was assigned both of the original roles in connection with different tenants, he is assigned the merged role in connection with the tenants of both role assignments.

> **Note:**
>
> - Out-of-the-box roles cannot be merged.
> - The Merge Roles functionality is only relevant when exactly two roles are selected.

Create a New Role and Define Permissions for the Role

The following task describes how to create a role and define permissions for it:

1. ### Create a Role

   Click the **New Role** button in the Roles pane to open the New Role dialog box. Enter the name and description for the role and click **OK**. For details, see "New Role Dialog Box" on next page.

2. ### Define Permissions for the Role Using the Resources Tab

   Your new role is selected by default in the Roles pane. Select the **Resources** tab in the right pane and follow these steps:

   a. Select a resource type in the Resource Types pane (for example, Views).

   b. Select a resource (for example, a specific view from the view tree in the Available View pane) and click the right arrow button. The Set Permissions dialog box opens. (For UI Modules and CIT Menu Items, the Set Permissions dialog is not relevant.)

   c. In the Set Permissions dialog box, select the required permissions for the resource you selected. You can choose **Select All** to assign all the available permissions. Click **Apply**.

   d. Your selected resource appears in the right pane with the check boxes for the assigned permissions selected.

   e. Repeat this procedure for other resources of this type and for other resource types, as required.

   For details, see "Resources Tab" on page 133.

3. ### Define Permissions for the Role Using the Resource Groups Tab

   Select the **Resource Groups** tab in the right pane and follow these steps:

   a. Select a resource group in the Resource Groups pane.

   b. Select actions from the tree in the Available Actions pane (for example, Update permission under Views) and click the right arrow button.

   > **Note:** You can make multiple selections using the CTRL button.

   c. The actions you selected appear in the Selected Actions pane. Each selection defines permission for that action for every resource of that type in the resource group (for example, Update permission for every view in the resource group).

   For details, see "Resource Groups Tab" on page 134.

4. ### Define Permissions for the Role Using the General Actions Tab

   Select the **General Actions** tab in the right pane and follow these steps:

   a. Select actions in the Available Actions pane.

   > **Note:** You can make multiple selections using the CTRL button.

   b. Click the right arrow button to move them to the Selected Actions pane.

   c. The general actions selected are permitted for the role (they are not linked to a specific resource or resource type).

   For details, see "General Actions Tab" on page 134.

5. ### Save the Role

   Click the **Save** button in the Roles pane to save your changes.

Roles Manager User Interface

This section includes (in alphabetical order):

- "New Role Dialog Box" below
- "Roles Manager Page" below

New Role Dialog Box

This dialog box enables administrators to create roles.

To access	Click the **New Role** button in the Roles tab.
Relevant tasks	"Create a New Role and Define Permissions for the Role" on previous page

User interface elements are described below:

UI Element (A-Z)	Description
Description	Enter a description of the role you are defining.
Role Name	Enter a unique name for the role.

Roles Manager Page

This page enables you to create and delete roles and to edit their permissions.

To access	Select **Roles Manager** from the **Security** module in the Navigation Menu or select **Managers > Security > Roles Manager**.
Important information	For each role, you can assign permissions for actions on resources using the following tabs:

	• **Resources.** Select specific actions for specific resources. • **Resource Groups.** Select specific actions for the resources in specific resource groups. • **General Actions.** Select specific general actions (such as Run Discovery and Integrations or Create Views). You can select actions for permissions from each tab. The role is assigned permissions based on the combined results of selections in all of the tabs. The **Role Details** tab displays the name and description of the selected role. The **Permissions Overview** tab displays the selected role's permissions.
Relevant tasks	"Create a New Role and Define Permissions for the Role" on page 130

Roles Pane

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

UI Element (A-Z)	Description
	**New Role.** Creates a role. Opens the New Role dialog box.
	**Edit Role.** Edit the name of the selected role.
	**Delete.** Removes the selected role(s). **Note:** You can make multiple selections to delete multiple roles.
	**Refresh.** Refresh the list of roles.
	**Save.** Saves the changes you have made.
<List of roles>	Displays the names of the existing roles.
<Search feature>	To search for a phrase in the list of roles, enter the phrase in the **Find** box. Use the arrow buttons to find the next and previous occurrences of the phrase. Click the **Highlight** button to highlight all occurrences of the phrase.

The following options are available by right-clicking a role:

UI Element (A-Z)	Description
Delete	Removes the selected role(s).
Edit Role	Edit the name of the selected role.
Merge Roles	Merge the selected roles into one role. In the Merge Roles dialog box, select one of them to be the master. The merged role takes the name of the master. Users that were assigned either of the original roles are now

UI Element (A-Z)	Description
	assigned the merged role. **Note:** This option is only available when two roles are selected.
New Role	Create a new role.
Refresh	Refresh the list of roles.
Save	Save the changes you have made.

Right Pane

The Right Pane contains the Resources tab, the Resource Groups tab, the General Actions tab, and the Role Details tab.

Resources Tab

Important information	Select a Resource type and use the arrow buttons to move resources from the Available <resources> pane to the Selected <resources> pane to assign permissions for those resources to the current role. When moving resources, you must select the permissions for the selected resources, using the Set Permissions dialog box.

User interface elements are described below:

UI Element (A-Z)	Description
Available <Resource>	Displays the available resources for the selected resource type in tree format.
Resource Types	Select a resource type from the list.
Selected <Resource> with Permissions	Displays the selected resources and their respective permissions for the current resource type. The available permissions differ for different resource types, as follows: • **Queries** have view, update, delete, and snapshot permissions. • **Views** have view, update, delete, snapshot, and archive permissions. • **Impact Analysis** and **Custom Reports** have view, update, and delete permissions. • **UI Modules** have access permission. • For **CIT Menu Items**, you select a CIT from the tree and then select specific actions from the Available Actions pane and move them to the Selected

UI Element (A-Z)	Description
	Actions pane. You can also right-click a CIT and select the actions from the pop-up dialog box. If no permissions are assigned for any CIT, all the menu items are permitted by default (in accordance with the permissions granted in the General Actions tab).

Resource Groups Tab

Important information	Select a resource group and use the arrow buttons to move actions from the Available Actions pane to the Selected Actions pane to assign permissions for those actions for the resources in the selected resource group to the current role.

User interface elements are described below:

UI Element (A-Z)	Description
Available Actions	Displays the available actions per resource. **Note:** Permissions for folders cannot be assigned using the Resource Groups tab. To assign permissions for folders, go to the Resources tab and select the required folders.
Resource Groups	Displays the available resource groups. Resource groups used by the selected role are marked with a green asterisk.
Selected Actions	Displays the permitted actions selected for the resources in the selected resource group for the current role.

General Actions Tab

Important information	Use the arrow buttons to move actions from the Available Actions pane to the Selected Actions pane to assign them to the current role.

User interface elements are described below:

UI Element (A-Z)	Description
Available Actions	Displays the available general actions.
Selected Actions	Displays the general actions selected for permissions for the current role.

Role Details Tab

User interface elements are described below:

UI Element (A-Z)	Description
Description	Enter a description of the role. **Note:** This field is optional.
Name	Displays the role name.

Permissions Overview Tab

Important information	Displays a summary of the selected role's permissions. Select a resource type in the **Resource Types** pane. The resources of the selected type are displayed in the **Permissions Summary** pane. If you select a resource in the tree, the roles from which the permissions derive are displayed in the **Permission Origin** pane.

Permissions Summary

The following section describes the hierarchy of required permissions for working in UCMDB. It begins with the most fundamental permission and continues through the different levels of permission needed for various actions. At each level of permission, the permissions of all the previous levels are also required.

- The most basic permission required is the general action **Access to UI** permission. Without this permission, the user cannot log in. This permission is added by default when a new role is created.
- The next level of permission needed to use UCMDB functionality is the permission for the individual UI modules, located in the Resource Types pane of the Resources tab. If a user lacks permission for a specific module, that module is not visible to him.

  Note: For some modules, you can assign permission for specific subsections of the module. For example, under Modeling Studio, you can select Views, Queries, and Models each individually for permission in the role.

- The next level of permission depends on the specific functionality required. These are assigned by the general actions described in the table below and by the permissions granted for individual resources in the Resources tab.

One specific general action, **View CIs** permission, is necessary for a broad category of functionality, including other general actions such as View History and Allow Search. Without this permission, the user cannot see the CIs in a view even if he has permission for that view. This permission is also added by default when a new role is created.

Note:

- For queries, views, impact rules, and custom reports, **view** permission is the base permission. For all other permissions (update, delete, snapshot, and archive), you must also assign view permission for the selected resource.
- If a role includes view permission for a view or an impact rule, it also automatically includes view permission for the base query of the view or impact rule. If the role includes update permission for a view or impact rule, it does not automatically include update permission for the base query.
- **View** permission for a view includes permission to view a saved snapshot of the view or an archived report of the view. When multi-tenancy is enabled, the CIs visible in the snapshot or archived report are the ones whose tenant assignments at the time of the snapshot or archive, match the current tenant assignment of the user's View permission (even though there may have been changes in both tenant assignments).
- Instance-based models are treated as ordinary CIs in terms of permissions. **View CIs** permission enables a user to view such models and **Data Update** permission enables him to create, modify, and delete them.
- A user with **View CIs** permission can view pattern-based models. When multi-tenancy is enabled, the permission is only for pattern-based models whose tenants match the tenant assignment for the permission. He is automatically granted **view** permission for the queries that the pattern-based models are based on. **Data Update** permission enables him to create, modify, and delete the models, but he needs **update** permission for the query to modify it. To create a model based on a new query, he must have **Create Queries** permission for the folder where the query will reside. To create a model based on an existing query, he must have **view** permission for that query.
- If a user has **Create Views** permission on a specific folder, he can create views in the folder based on existing TQL queries for which he has view permission as well as views based on new queries.
- All permissions for HP Universal CMDB Configuration Manager are managed in the UCMDB Security modules.

Resources Tab Permissions

The following table specifies the actions permitted for the selected resources by the Set Permissions options in the Resources tab:

Permission	Actions Permitted
Create	Create resources in the selected folders.
View	View the selected queries, views, impact rules, or custom reports.
Update	Modify the selected queries, views, impact rules, or custom reports.
Delete	Delete the selected queries, views, impact rules, or custom reports.

Permission	Actions Permitted
Create Snapshot	Create and view snapshots of the selected queries or views. **Note:** Snapshots for views can be created from the UI. Snapshots for queries can be created using the API.
Archive	Archive the topology reports of the selected views.
Manage	Manage, unmanage, and edit the selected views in HP Universal CMDB Configuration Manager.
Authorize	View and authorize changes to the selected views in HP Universal CMDB Configuration Manager.

Create permission is only relevant for folders. If you create a new resource, you can only save it in a folder for which you have **Create** permission.

The other permissions can be applied to individual resources or to folders. When they are applied to a folder, they automatically apply to all the resources contained in the selected folder.For example, **View** permission for a folder enables you to view all the resources contained in that folder.

General Actions Permissions

The following table specifies the actions permitted by the different general actions permissions.

Permission	Actions Permitted
Gold Master Archive	Archive a Gold Master report.
Allow Search	Search for CIs in the Search tab of the CI Selector.
Get Related CIs	Access the Related CIs functionality.
Run Impact Analysis	Run Impact Analysis in the IT Universe Manager.
Run Query by Definition	Preview a view in the Modeling Studio.
View Recipients	View recipients in the Recipients Manager.
View UI Scheduler Jobs	View Scheduler jobs in the Scheduler.
Access to SDK	Run the Java API.
Access to UI	Access the UCMDB UI.
Run Legacy API	Run the client APIs.
Settings Management	Update the infrastructure settings using the API.

Permission	Actions Permitted
Administration	Create users, groups, roles, resource groups and assign roles to users and groups.
View Tenant Assignment	View the tenant assignment for a resource or CI in the Assign Tenants dialog box. **Note:** This permission is only available when multi-tenancy is enabled.
Reassign Tenant	Change the tenant assignment for a resource or CI in the Assign Tenants dialog box. **Note:** This permission is only available when multi-tenancy is enabled.
Data Update	Create, update, and delete CIs and relationships.
View CIs	View CIs.
View History	View CI History.
Remote Deployment	Deploy a package that exists on the local UCMDB to a remote UCMDB server that is defined by the selected Integration Point.
Run Discovery and Integrations	Run Discovery in the Discovery Control Panel module and integrations in the Integration Studio.
Class Model Modifier	Add, delete, and update CI types in the CI Type Manager.
Deploy Packages	Deploy packages in Package Manager.
Automation Setup	Configure Operations Orchestration flows in Configuration Manager (only relevant for HP Universal CMDB Configuration Manager).
Automation Execution	Execute any Operations Orchestration flow in Configuration Manager (only relevant for HP Universal CMDB Configuration Manager.
Automation Policies	Define automation policies in Configuration Manager (only relevant for HP Universal CMDB Configuration Manager.
Policies Admin	Create, edit, and delete baseline, topology, and similarity policies in HP Universal CMDB Configuration Manager.

Out-of-the-Box Roles

The following roles are provided out-of-the-box by UCMDB for assigning to different users:

- **DataConsumer.** Read only permission for resources and CIs and access to IT Universe Manager and the Reports module only.
- **Discovery and Integrations Admin.** Full permission for all Data Flow Management modules, without tenant assignment permissions. Includes permissions for all actions that are required to perform any discovery-related flows and to deploy packages on remote integration points. It also

includes permission for discovery-related tasks such as managing probes, credentials, and adapters and for viewing discovery-related reports.

- **SuperAdmin.** All permissions for all modules.

When multi-tenancy is not enabled, the following additional out-of-the-box roles are available:

- **Viewer.** Read only permission for resources and CIs and access to all Modeling modules except for Enrichment Manager, without tenant assignment permission (only relevant when multi-tenancy is not enabled).
- **Admin.** Full permission for resources and CIs and access to all Modeling modules except for Enrichment Manager, without tenant assignment permission (only relevant when multi-tenancy is not enabled). Also includes all permissions associated with HP Universal CMDB Configuration Manager.

When multi-tenancy is enabled, the following additional out-of-the-box roles are available:

- **TenantViewer.** Read only permission for resources and CIs and access to all Modeling modules except for Enrichment Manager. Also includes read only permission for tenant assignment (only relevant when multi-tenancy is enabled).
- **TenantAdmin.** Full permission for resources and CIs and access to all Modeling modules except for Enrichment Manager, including tenant assignment permission (only relevant when multi-tenancy is enabled).

Chapter 12

Resource Groups

This chapter includes:

Resource Groups Overview

A **resource group** is a collection of resources that you define for the purpose of assigning permissions to users. The Resource Groups module enables you to select specific resources of different types and define the collection as a resource group. When you assign permissions to roles in the Roles Manager, you can select a resource group, along with specific actions, as the permission for that role. This can be useful when you need to assign permissions for the same collection of resources to several different roles.

There is one default, out-of-the-box resource group, the **All Resources Group**, which includes all the existing resources. This resource group cannot be edited.

For details on defining resource groups, see "Resource Groups Page" on next page.

> **Note:** The Resource Groups module is available only to those logged in with administration access rights.

Define a Resource Group

The following task describes how to define a new resource group:

1. **Create a New Resource Group**

   Click the **New Resource Group** button in the Resource Groups pane to open the New Resource Group dialog box. Enter a name and description for your resource group. For details, see "New Resource Group Dialog Box" on next page.

2. **Select Resources**

   In each tab, select the resources you want to include in the resource group. For details, see "Resource Groups Page" on next page.

   > **Note:** Select the **All Resources** check box to include all the resources of the tab in the resource group, including resources of the selected type created in the future.

3. **Save the Resource Group**

   Click the **Save** button in the Resource Groups pane to save your changes.

Resource Groups User Interface

This section includes (in alphabetical order):

New Resource Group Dialog Box

This dialog box enables you to define a new resource group.

To access	Click the **New Resource Group** button in the Resource Groups pane.
Relevant tasks	"Define a Resource Group" on previous page

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

UI Element (A-Z)	Description
Description	Enter a description of the resource group you are defining.
Resource group name	Enter a unique name for the resource group.

Resource Groups Page

This page enables you to create, edit, and delete resource groups.

To access	Select **Resource Groups** from the **Security** module in the Navigation Menu or select **Managers > Security > Resource Groups**.
Important information	Select a resource group in the Resource Groups pane and select the specific resources to include in the group from the resource tabs in the right pane.
Relevant tasks	"Define a Resource Group" on previous page

Resource Groups Pane

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

UI Element (A-Z)	Description
	New Resource Group. Creates a resource group. Opens the New Resource Group dialog box.

UI Element (A-Z)	Description
	**Edit Resource Group.** Edit the name of the selected resource group.
	**Delete.** Removes the selected resource group(s). **Note:** You can make multiple selections to delete multiple resource groups.
	**Refresh.** Refresh the list of resource groups.
	**Save.** Saves the changes you have made.
<List of resource groups>	Contains the names of the existing resource groups.
<Search feature>	To search for a phrase in the list of resource groups, enter the phrase in the **Find** box. Use the arrow buttons to find the next and previous occurrences of the phrase. Click the **Highlight** button to highlight all occurrences of the phrase.

Right Pane

Important information	The tabs represent different resources. The following tabs are available: • Queries • Views • Impact Analysis • Custom Reports • UI Modules In each tab, use the arrow buttons to move resources from the Available Resources pane to the **Selected Resources** pane.

User interface elements are described below:

UI Element (A-Z)	Description
All Resources	Select **All Resources** to move all available resources to the Selected Resources pane. **Note:** Selecting this option ensures that resources of the selected type that are created in the future are also included in the Selected Resources.
Available Resources	Displays the available resources for the selected tab.
Selected Resources	Displays the selected resources for the selected tab.

Chapter 13

Ownership Management

This chapter includes:

Ownership Management Overview

The Ownership Management module provides a directory of resources and their user owners. The user owner is automatically defined as the user logged in at the time the resource is created. The user owner of a resource cannot be changed, but you can delete the ownership of resource. In such a case, the resource remains without a user owner.

When working in a multi-tenancy environment, note that resource ownership is independent of tenancy. For details on multi-tenancy, see "Multi-Tenancy Overview" on page 105.

Note: The Ownership Management module is available only to those logged in with administration access rights.

Ownership Management User Interface

This section includes:

Ownership Management Page

This page enables you to view the resource ownership data and to delete the ownership for a resource.

To access	Select **Ownership Management** from the **Security** module in the Navigation Menu or select **Managers > Security > Ownership Management**.

User interface elements are described below:

UI Element (A-Z)	Description
	**Delete Selected Item(s).** Removes the ownership from the selected resource. You can make multiple selections.

UI Element (A-Z)	Description
	**Refresh displayed data.** Refreshes the list of resources.
	**Clear Filter.** Clears the text entered in any of the filters.
Resource Name	Enter a resource name to filter the displayed resources by name.
Resource Type	Select a resource type from the drop down list to filter the displayed resources by type.
User Name	Select a user name from the drop down list to filter the displayed resources by user owner.

Chapter 14

LDAP Mapping

This chapter includes:

LDAP Mapping Overview

When using the LDAP server to authorize users, it is necessary to map user groups on the LDAP server to user groups in HP Universal CMDB.

You can associate HP Universal CMDB groups with LDAP groups using the LDAP Mapping module in the Security section of the Navigation bar. The LDAP Mapping module only appears if the user has the required permissions. For details, see "Roles Manager" on page 129.

For details on synchronizing LDAP groups with HP Universal CMDB groups, see "Synchronize HP Universal CMDB User Groups with LDAP Groups" below.

For details on configuring LDAP authentication, see the section on enabling LDAP authentication in the *HP UCMDB Hardening Guide*.

Synchronize HP Universal CMDB User Groups with LDAP Groups

This task describes how to synchronize LDAP user groups with HP Universal CMDB user groups:

1. **Configure infrastructure settings to set an LDAP synchronization strategy**

   To set up an LDAP authentication synchronization, you must first modify the settings in the Infrastructure Settings Manager.

   > **Note:** Any changes you make for **LDAP General** > **Enable LDAP Authentication** and **LDAP General** > **Enable User Permissions Synchronization** remain in effect for all future Web sessions.

   a. Select **Managers > Administration > Infrastructure Settings**.

   b. Select **LDAP General**, and then in the **LDAP server URL** setting, enter the URL of the

LDAP server in the following format:

```
ldap://<ldapHost>:<port>/<baseDN>??scope
```

c. Select **LDAP Group Definition**, and then in the **Groups base DN** setting, enter the distinguished name of the general group.

d. Select **LDAP Group Definition**, and then in the **Root groups base DN** setting, enter the distinguished name of the root group.

e. Select **LDAP General**, and then in the **Enable User Permissions Synchronization** setting and verify that the value is set to **True.**

> **Caution:** In addition to the LDAP settings described in this step, it is highly recommended that you verify all LDAP settings. Some of the default values that come with the other LDAP settings may not be appropriate for your needs.

f. Select **Managers** > **Security** > **LDAP Mapping** and verify that the list of the LDAP groups that are configured on the LDAP server appear in the LDAP Repository pane. If the list of LDAP groups do not appear, verify your LDAP settings.

For details on Infrastructure Settings, see "Infrastructure Settings Manager Overview" on page 53.

> **Note:** It is also possible to configure these settings using the JMX console. For details, see "Configure LDAP Settings Using the JMX Console" in the *HP UCMDB Hardening Guide*.

2. ## Create HP Universal CMDB groups

You can create HP Universal CMDB user groups and assign roles to them. For details on creating groups, see "Users and Groups" on page 118.

3. ## Map LDAP groups to HP Universal CMDB groups

You map user groups on the LDAP server to groups in HP Universal CMDB to synchronize the groups and enable management of your HP Universal CMDB groups via the LDAP server, as follows:

a. Select **Managers > Security > LDAP Mapping**.

b. In the LDAP Repository pane, select a remote group.

c. Move the required groups from the Available groups pane to the Selected groups pane using the arrow buttons or by dragging and dropping the required groups into the Selected groups pane.

d. Click the **Save** button to save your changes.

> **Caution:** When defining mappings, make sure to map at least one LDAP group to an Admin group in the CMDB before logging out. If this is not done, you may not have any remaining group with administration permissions.

4. **Log out and log in to HP Universal CMDB**
   a. Select **LDAP General > Enable LDAP authentication** and set the value to **True.**
   b. Log out of HP Universal CMDB and then log in again with the LDAP user name and password.

Configure LDAP for Active Directory

This task describes how to configure LDAP for Active Directory.

To enable LDAP login and user synchronization, edit the following parameters in Infrastructure Settings:

Note: For all other parameters, you can use either the default values or, if required, LDAP-specific values.

LDAP Integration Settings	Comment
Distinguished Name of Search-Entitled User	CN=AD Connector CN=Users DC=consult DC=example DC=com
Enable User Permissions Synchronization	**true:** Enables permission synchronization for LDAP group mapping with HP Universal CMDB user groups (when **Enable LDAP Authentication** is set to **true**).
Group class object	group
Groups base DN	CN=Users DC=consult DC=example DC=com
Groups member attribute	member
Groups search filter	(|(objectclass=groupOfNames) (objectclass=group) (objectclass=groupOfUniqueNames)(objectclass=groupOfUrls)(objectclass=access Group)(objectclass=accessRole))

LDAP Integration Settings	Comment
LDAP server URL	The URL to your LDAP server, including port: ldap://LDAP-SERVER:389/ DC=consult,DC=example, DC=com??sub
Password of Search-Entitled User	*****
Remote users repository mode	Enable LDAP authentication.
Root groups base DN	Defines the parent LDAP node of all users to be synchronized. A Synchronization User List base DN includes all users in that DN—unless the users are excluded by the Synchronization User List's filter or the user's DN is matched in a more specific Synchronization User List. CN=Users DC=consult DC=example DC=com
Root groups filter	(|(objectclass=groupOfNames) (objectclass=group) (objectclass=groupOfUniqueNames)(objectclass=groupOfUrls)(objectclass=access Group)(objectclass=accessRole))
Users filter	Defines an LDAP filter used to include or exclude users from a Synchronization User List: (&(sAMAccountName=*) (objectclass=user))
Users object class	user
UUID attribute (User Unique ID attribute)	sAMAccountName

LDAP Mapping User Interface

This section includes:

LDAP Groups to UCMDB Groups Mappings Dialog Box

This dialog box displays all the LDAP user groups that have been mapped to HP Universal CMDB user groups.

To access	Click the **Show LDAP Groups to UCMDB Groups Mapping**  button in the toolbar.

User interface elements are described below:

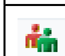
UI Element (A-Z)	Description
LDAP Group	The name of the LDAP user group.
UCMDB Groups	The HP Universal CMDB user roles that are mapped to the corresponding LDAP group.

LDAP Mapping Page

This page enables you to map groups configured in HP Universal CMDB to groups configured on the LDAP server.

To access	Select **LDAP Mapping** from the **Security** module in the Navigation Menu or select **Managers > Security > LDAP Mapping.**

User interface elements are described below:

UI Element (A-Z)	Description
	**Save Mapping.** Click to save your changes to the LDAP mapping.
	**Show Users.** Enables you to view the list of users associated with the selected LDAP group. Opens the Remote Group Users dialog box. **Note:** You can also select this option by right-clicking a group.
	**Show LDAP Groups to UCMDB Groups Mappings.** Displays the LDAP groups that have been mapped to UCMDB groups.
	Toggle between displaying all LDAP groups and displaying only groups with mapped UCMDB groups.

LDAP Repository Pane

UI Element (A-Z)	Description
<List of the LDAP Groups>	Displays a list of the LDAP groups that are configured on the LDAP server.

UCMDB Groups For LDAP Group: <group name> Pane

This enables you to select the HP Universal CMDB groups to map to the selected LDAP group.

User interface elements are described below:

UI Element (A-Z)	Description
Available Groups	Displays the available UCMDB groups
Selected Groups	Displays the UCMDB groups selected for mapping to the selected LDAP group.

Remote Group Users Dialog Box

This dialog box displays all the users in the selected LDAP group.

To access	Click the **Show Users** button in the toolbar.

User interface elements are described below:

UI Element (A-Z)	Description
Login Name	Displays the login names of the user in the group.
User Name	Displays the user name of the users in the group.

Chapter 15

Tenants Management

This chapter includes:

Note: The Tenants Management module is only available when multi-tenancy is enabled.

Tenants Management Overview

The Tenants Management module enables you to manage your tenants. You can add new tenants, delete tenants, and edit existing tenants.

For details on multi-tenancy, see "User Permissions for UCMDB" on page 103.

Note: The Tenants Management module is available only to those logged in with administration access rights.

Tenants Management User Interface

This section includes (in alphabetical order):

- "New Tenant/Edit Tenant Dialog Box" below
- "Tenants Management Page" on next page

New Tenant/Edit Tenant Dialog Box

This dialog box enables administrators to create and edit tenants.

To access	Click the **Add new tenant** button in the **Tenants** tab to open the New Tenant dialog box. Click the **Edit tenant description** button in the **Tenants** tab to open the Edit Tenant dialog box.

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

UI Element (A-Z)	Description
Description	Enter a description of the tenant you are defining.
Tenant Name	Enter a unique name for the tenant.

Tenants Management Page

This tab enables you to create, edit, and delete tenants.

To access	Select **Tenants Management** from the **Security** module in the Navigation Menu or select **Managers > Security > Tenants Management**.
Important information	The multi-service provider default tenant appears in bold in the list of tenants.

Tenants Pane

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

UI Element (A-Z)	Description
	**Add new tenant.** Creates a tenant. Opens the New Tenant dialog box.
	**Edit tenant description.** Opens the Edit Tenant dialog box.
	**Delete Selected Item(s).** Removes the selected tenant. You can make multiple selections.
	**Refresh displayed data.** Refreshes the list of tenants.
	Denotes a tenant.
<List of tenants>	Displays the name and on-board date for each existing tenant.
<Search feature>	To search for a phrase in the list of tenants, enter the phrase in the **Find** box. Use the arrow buttons to find the next and previous occurrences of the phrase. Click the **Highlight** button to highlight all occurrences of the phrase.

Shortcut Menu

Menu Option (A-Z)	Description
Delete	Removes the selected tenant.
Edit	Opens the Edit Tenant dialog box.

Details Pane

User interface elements are described below:

UI Element (A-Z)	Description
Description	Displays a description for the selected tenant.