HP Enterprise Maps Workbench

Software Version: 1.00

Report Editor User Guide

Document Release Date: January 2014

Software Release Date: January 2014

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About this Guide

Welcome to the *Report Editor User Guide*. This guide explains how to use Report Editor as part of HP Enterprise Maps (HP EM).

This guide contains the following chapters:

- "Report Editor " (on page 9)

  Provides an overview of the main features of Report Editor.

- "Getting Started " (on page 14)

  Describes the installation of the main features, and shows you how to create an reporting project in Report Editor.

- "Designing Reports " (on page 20)

  Explains how to create, edit, and add data to reports usingReport Editor.

- "Using DQL" (on page 23)

  Shows how to use DQL to creates queries in Report Editor.

- "Exploring the Database " (on page 42)

  Shows how to setup and access your database in Report Editor.

- "Deploying Reports " (on page 48)

  Shows how to create and apply extensions to deploy reports created in Report Editor.

- "Example: Failure Impact Report for the Reports Tab " (on page 54)

  Demonstrates how to build the report shown in the Report Editor use case.

- "Dialog Boxes " (on page 57)

  Dialog boxes reference.

- "Troubleshooting " (on page 58)

  Tips for resolving common problems in Report Editor.

Report Editor

Workbench includes Report Editor enabling you to create and deployment new reports easily and simply. The relationship between Report Editor and the HP EM Reporting Service is shown in “HP EM Reporting Framework”.

HP EM Reporting Framework

HP EM Report Editor is an implementation of the Built-In Reporting Tool (BIRT), an open source Eclipse-based reporting system. The Help menu includes the BIRT documentation. The *BIRT Report Developer Guide* describes the general use of BIRT to create reports. The Report Editor Guide adds to this by explaining how to use this functionality in conjunction with HP EM.

This chapter introduces Report Editor in the following sections:

- "Workbench Suite" (on page 10)
- "Overview " (on page 10)
- "User Interface " (on page 11)
- "Use Cases " (on page 13)

Workbench Suite

HP EM Workbench is a suite of editor tools enabling you to customize your deployment of HP EM.

Workbench consists of the following editor tools, distributed as a single Eclipse development platform:

- Customization Editor

  Customizes the underlying SOA Definition Model (SDM) within HP EM.

- Taxonomy Editor

  Customizes the taxonomies used to categorize artifacts in HP EM.

- Assertion Editor

  Customizes the conditions applied by your business policies within HP EM.

- Report Editor

  Customizes report definitions for use with HP EM.

Overview

Report Editor interacts with HP EM, enabling you to access existing report definitions, create customized reports, and deploy them to the HP EM server.

To access, create, and deploy reports with HP EM, follow this process:

1. Create a reporting project.

   For details, see "Configuring a Reporting Project " (on page 16).

2. Create and modify reports.

   For details, see "Designing Reports " (on page 20).

3. Deploy your reports to HP EM.

   For details, see "Deploying Reports " (on page 48).

4. Access your reports in HP EM.

   For details, see:

   - "Use Cases " (on page 13)
   - "Accessing Reports " (on page 48)
   - "Example: Failure Impact Report for the Reports Tab " (on page 54)
   - *HP Enterprise Maps User Guide*

User Interface

The default platform perspective is split into a number of views with menu options across the top, as shown in image below.

The perspective consists of the following views:

- **Project Explorer**

  The tree view of your reporting project. For details, see "Project Explorer " (on page 11).

- **Data Explorer**

  The view of the data sources and data sets for a particular report. For details, see "Data Explorer " (on page 11).

- **Server Explorer**

  A list of HP EM servers connected to Workbench. For details, see "Server Explorer " (on page 13).

- **Editor Views**

  The main area of the perspective contains report editor views. In this view you can edit the layout and properties of your report definition.

Data Explorer

The Data Explorer displays the sources and sets of data used by the particular report you are working with, as shown in the Data Explorer View.

Data Explorer contains the following elements:

- **Data Sources**

  Open the context menu and select **New Data Source** to access a database.

  For details, see "Adding a Data Source to a Report " (on page 20).

- **Data Sets**

  Open the context menu and select **New Data Set** to define the data used by the report.

  For details, see "Creating a Data Set " (on page 21).

Project Explorer

The Project Explorer, as shown below, is a view of the projects in your workspace and the report definitions they contain. This view is also an interaction point with HP EM.

Each project contains a set of report definitions and the HP EM library.

Each report definition contains the following sections:

- **Overview**

  Double-click to open a properties editor view enabling you to change the name and description, and to mark the report as **Shared** to all users or leave the report as user specific.

- **Report Design**

Double-click to open a layout editor view enabling you to change the appearance and content of the report definition.

The Project Explorer contains additional context menu options enabling you to interact with a running HP EM server. Right-click the project name or a particular report definition, and select **HP EM** to view the options listed in “Project Context Menu Options” and “Report Definition Context Menu Options”.

Project Context Menu Options

Option	Function
Download Reports	Import report definitions from HP EM. For details, see "Importing Report Definitions " (on page 19).
Upload to Server	Export a report to the default HP EM server. For details, see "Deploying a Report to HP EM " (on page 49).
Update from Server	Update report definitions from HP EM.
Remove from Server	Delete reports from HP EM.
Upload To Other Server	Export a report to a specified HP EM server.
Build Extension	Create a reporting extension for HP EM containing all the reports in your project. For details, see "Creating a Reporting Extension " (on page 48).

Report Definition Context Menu Options

Option	Function
Upload to Server	Export a report to the default HP EM server. For details, see "Deploying a Report to HP EM " (on page 49).
Update from Server	Update report definitions from HP EM. For details, see "Importing Report Definitions " (on page 19).
Remove from Server	Delete the report from HP EM.
Upload To Other Server	Export a report to a specified HP EM server.
Build Extension	Create a reporting extension for HP EM containing all the reports in your project. For details, see "Creating a Reporting Extension " (on page 48).

Server Explorer

The Server Explorer displays the HP EM servers connected to Workbench, as shown in “Server Explorer View”. The functionality is shared by all the Workbench editors.

Right-click a server in the Server Explorer to open the context menu described in “Server Explorer Context Menu Options”.

Server Explorer Context Menu Options

Option	Function
New Server	Add a server for downloading assertions and taxonomies (Assertion Editor, Taxonomy Editor, and Customization Editor).
Remove Server	Delete a server from the Server Explorer.
Download Taxonomy	Download a taxonomy from a platform server (Taxonomy Editor and Customization Editor).
Download Assertion	Download assertions from a platform server (Assertion Editor).
Download Report	Download reports from a reporting server (Report Editor).
Properties	View and edit the server name, URL, username, and password.

Use Cases

HP EM enables you to add custom BIRT reports created in Report Editor to the Reports tab.

To create and use a custom BIRT report in HP EM:

1. Create a new report definition.

   For details, see "Creating a Report Definition " (on page 21).

2. Add a data source for the report.

   For details, see "Adding a Data Source to a Report " (on page 20).

3. Create a data set for the report,

   For details, see "Creating a Data Set " (on page 21).

4. Deploy the report to HP EM.

   For details, see "Deploying a Report to HP EM " (on page 49).

5. Add the report to the HP EM Reports Tab.

   For details, see the "Custom Birt Reports" section of the *HP Enterprise Maps User Guide*.

For a step-by-step walkthrough demonstrating this use case, see "Example: Failure Impact Report for the Reports Tab " (on page 54).

Getting Started

HP EM is distributed with a set of predefined reports and various ways to access them.

Report Editor provides a mechanism to customize these existing reports, and also enables you to create new report definitions from scratch.

This chapter describes the setup of Report Editor in the following sections:

- "Installing Workbench" (on page 14)
- "Workbench Suite" (on page 10)
- "Installing a Report Development Environment " (on page 15)
- "SSL Configuration" (on page 15)
- "Configuring a Reporting Project " (on page 16)

Installing Workbench

HP EM is an Eclipse development platform distributed as a zip file, `hp-em-workbench-1.00-win64.zip`.

Note: For supported platforms and known issues, see `release-notes.doc` alongside the archive.

Note: HP EM requires Java SE Development Kit (JDK) 1.7.0 (64 bit version only) or higher. You must include the path to this version of the JDK in the `JAVA_HOME` environment variable.

To Start HP EM Workbench:

- Execute **WB_HOME/workbench/start.exe**.

The first time you start Workbench, the welcome screen opens.

Select one of the options to open one of the editor tools, start a new editing project, or view the documentation set.

You can return to the welcome screen from any of the editor tools by selecting **Help>Welcome** from the menu options.

By default, Workbench runs in 'normal' mode which prevents users from uploading system taxonomies (IDs start with `uddi:systinet.com:soa:model:taxonomies`) and the Report Editor `.rptlibrary` file to HP EM servers. If you need to work with system taxonomies or want to upload the `.rptlibrary` file you can switch Workbench into 'admin' mode.

Caution: Be extremely careful when working with system taxonomies, HP EM uses some hard-coded values from system taxonomies, changing or removing them may cause errors.

To Switch Workbench to Admin Mode

1. Open `WB_HOME/configuration/config.ini` with a text editor.
2. Add `mode=admin` to `config.ini`.
3. Restart Workbench.

Tip: HP EM Workbench is memory-intensive. If you experience performance issues, HP recommends increasing the memory allocation.

To increase the memory allocation for HP EM Workbench:

1. Open `WB_HOME/workbench/start.ini` for editing.
2. Set these new values:
   - `-Xms128m`
   - `-Xmx1024m`
3. Save your changes.
4. Restart Workbench.

Tip: HP EM Workbench downloads from HP EM may time out. If you experience issues, HP recommends increasing the time out.

To increase the time out for HP EM Workbench:

1. Open `WB_HOME/workbench/start.ini` (or `eclipse.ini` for stand-alone installation) for editing.
2. Set the new value:

   `-Dorg.systinet.platform.rest.Client.timeout=200000`

   The value is in milliseconds with a default value of 120000 (2 minutes).
3. Save your changes.
4. Restart Workbench.

SSL Configuration

By default, Workbench trusts all HP EM server certificates. You may want Workbench to verify HP EM certificates.

To Verify HP EM Server Certificates:

- Add the following options to `WB_HOME/workbench/start.ini`:

```
-Dcom.hp.systinet.security.ssl.verifyCert=true
-Djavax.net.ssl.trustStore=USER_TRUSTSTORE
-Djavax.net.ssl.trustStorePassword=TRUSTSTORE_PASS
-Djavax.net.ssl.trustStoreType=TRUSTSTORE_FORMAT
```

If HP EM is configured for 2-way SSL, you must provide Workbench certificates to HP EM.

To Provide Workbench Client Certificates to HP EM:

- Add the following options to `WB_HOME/workbench/start.ini`:

```
-Djavax.net.ssl.keyStore=USER_KEYSTORE
-Djavax.net.ssl.keyStorePassword=KEYSTORE_PASS
-Djavax.net.ssl.keyStoreType=KEYSTORE_FORMAT
```

Installing a Report Development Environment

This section describes a setup to develop and test reports on a single computer.

For supported platforms, see `readme.txt` in the installation folder.

A typical report development environment consists of the following:

- PC or notebook with at least 2GB RAM and at least 5GB free disk space
- Windows XP or Windows 2000
- Oracle eXpress Edition (XE)

  For deployment details, see "Oracle XE Account Setup " (on page 16).

  You do not need to install XE if you have dba-level access to deployed HP EM environment using Oracle 10g.
- Java 1.5_9 or higher

  For deployment details, see "Java Environment Setup " (on page 16).
- HP EM deployed to JBoss

  You do not need to install HP EM if you have access to a test environment.
- Oracle Developer

  HP Software recommends this tool for tuning SQL queries.

Java Environment Setup

After installing Java, you must set an environment variable, JAVA_HOME.

To set the JAVA_HOME environment variable:

1. In Windows, click through **Control Panel>System>Advanced>Environment Variables**.

   The Environment Variables dialog box opens.
2. In the User Variables section, click **New**.
3. Input Variable Name, **`JAVA_HOME`**, and set Variable Value to the installation folder for Java.
4. Click **OK** to exit each dialog box.

Oracle XE Account Setup

If you install Oracle XE, you must create a user account.

To create an Oracle XE account:

1. Open the XE web console and log on as the system user.
2. Create a new user, **`platform`**, with the password **`changeit`**, then grant the new user all available privileges.

Configuring a Reporting Project

To use Report Editor with HP EM, you must create or import a project, and import any report definitions you want to modify.

These procedures are described in the following sections:

- "Creating a Reporting Project " (on page 17)

- "Importing a Reporting Project " (on page 18)
- "Importing Report Definitions " (on page 19)

In addition you can configure Report Editor in the following ways:

- "Rebranding HP EM Reports " (on page 19)
- "Configuring the Model " (on page 17)
- "Configuring the Reporting Logging Level " (on page 17)

Configuring the Reporting Logging Level

HP EM reporting uses the BIRT engine for report execution which uses standard JDK logging with root logger `org.eclipse.birt`. You can configure the logging in that same way as any other component that uses JDK logging, typically using a configuration file passed with the **-Djava.util.logging.config=** switch.

The default logging level is set to SEVERE, but this is overidden if you specify the logging level in a logging configuration file..

For details about JDK logging, see http://java.sun.com/j2se/1.5.0/docs/guide/logging/overview.html.

Configuring the Model

HP EM divides the architecture model into a public and system model. By default, Report Editor accesses the public model which means that you can only create reports that access these public artifact types.

If you need to access system artifact types in your reports then you must modify the library.

To Extend the Reporting Model to access System Artifacts:

1. Open the `s2_default.rptlibrary` file in your workspace in a text editor.
2. Locate the `oda-data-source` element with `name="dqlDatabase` in the file.
3. Edit the `property name="odaURL"` element, adding `|model=sys` to the property value.
4. Save `s2_default.rptlibrary`.

Creating a Reporting Project

The Report Editor organizes your work into project folders in your workspace.

To create a reporting project:

1. Do one of the following:
   - In the Workbench Welcome page, select **Create Report Project**.
   - From the menu, select **File>New>Report Project**.
   - Press **Alt+Shift+N**, and then press **R**. Expand **HP EM**, select **Report Project**, and then click **Next**.

   The New Report Project Wizard opens.
2. In the New Report Project dialog box, enter the following parameters:

Parameter	Definition
Project Name	The name of your report project.
Create from Existing Extension	Select this option if you want to create a new project from a previous report extension. If selected, input the path or browse for the location of the report extension.
Use Default Location	If selected, Report Editor stores the project in your default workspace. If unselected, input the path or browse for an alternative workspace.

3. Do one of the following:
   - Select **Create a New Server**, and then click **Next**.

     Continue to Step 4.
   - Select **Use an Existing Server**, select the server from the list and input its credentials, and then click **Next**.

     Continue to Step 5.
4. In the New Server dialog box, add the parameters you require, and then click **Next**.

   For parameters descriptions, see "New Report Project Wizard: New Server " (on page 58).
5. If needed, in the New Data Source dialog box, click **Manage Drivers** to add a JDBC driver.

   For details, see "Adding a JDBC Driver " (on page 42).
6. In the New Data Source dialog box, add the parameters you require.

   For parameters descriptions, see "New Report Project Wizard: Default Library Configuration - Create a new data source " (on page 58).

   If your database server is running, click **Test Connection** to check if your settings are correct.
7. Click **Next** to set project options.
8. Do one of the following:
   - To create a generalized reporting project, click **Finish** and exit the wizard.
   - To create a project associated with a specific report category, click **Next** and continue this procedure.

     The HP EM server must be running to access report definitions.
9. Select a report category for your reporting project, and then click **Next**.
10. Select report definitions from the selected category to download to the Report Editor, and then click **Finish**.

Importing a Reporting Project

You can import a reporting project created elsewhere into your Workbench installation.

To import a reporting project:

1. Copy the project folder to your local files ystem.
2. From the menu, select **File>Import**.

   The Import dialog box opens.
3. Expand **General** and select **Existing Projects into Workspace**.
4. Use **Browse**, select the project from your local file system, and then click **OK**.
5. Click **Finish** to import the reporting project.

Importing Report Definitions

The HP EM server contains all the report definitions for HP EM. To modify existing reports, you must import their definitions from the HP EM server.

To import HP EM report definitions:

1. In the Project Explorer, open the context menu for the project, and do one of the following:
   - Select **HP EM>Download Reports** to import from the current HP EM server.
   - Select **Import>Report**, and then select a reporting server.

     The HP EM server must be running.
2. Select the report category, and then click **Next**.
3. Select the report definitions you require, and then click **Finish**.

Rebranding HP EM Reports

By default, most HP EM reports include an HP branded logo. You can replace this image with your own company-specific image.

To rebrand HP EM reports:

1. Open `s2_default.rptlibrary` for editing.
2. In the Outline view, expand Embedded Images.
3. Open the context menu for `logoHP.gif` and select **Delete**.
4. Open the context menu for Embedded Images, and select **New Embedded Image**.
5. Upload your new company branded image which must be named `logoHP.gif`.
6. Save `s2.default.rptlibrary`.
7. Redeploy all reports that use this image to HP EM. For details, see "Deploying Reports " (on page 48).

Designing Reports

This chapter describes the functionality of Report Editor in conjunction with HP EM.

This chapter contains the following sections:

Creating a report:

- "Creating a Report Definition " (on page 21)
- "Adding a Data Source to a Report " (on page 20)
- "Creating a Data Set " (on page 21)
- "Designing a Report Layout " (on page 22)
- "Shared and User-Specific Reports " (on page 22)
- "Modifying Existing Report Definitions " (on page 22)

Adding a Data Source to a Report

By default, new reports contain DQL and SQL data sources setup during project creation. If you need to use a different one, you must add it to the report.

HP EM only supports the default datasources. Reports using user-created datasources work within Report Editor but do not display when the report executes on the HP EM server.

To add a data source to a report:

1. Open the report definition editor view.
2. In the Data Explorer, open the Data Sources context menu and select **New Data Source**.

   The New Data Source dialog box opens.
3. Do one of the following:
   - To add a datasource for DQL queries, select **DQL JDBC Data Source**.
   - To add a datasource for SQL queries, select **JDBC Data Source**..
4. Click **Next**.

   If required, in the Data Source dialog box, click **Manage Drivers** to add a JDBC driver (the DQL driver is pre-installed and there should never be a requirement to add one.

   For details, see "Adding a JDBC Driver " (on page 42).
5. In the Data Source dialog box, add the parameters you require.

   For parameter descriptions, see "New Report Project Wizard: Default Library Configuration - Create a new data source " (on page 58).

   If your database server is running, click **Test Connection** to check if your settings are correct.
6. Click **Finish** to add the data source to your report.
7. Press **Ctrl+S** to save your changes to the report definition.

Creating a Data Set

Each report is associated with one or more queries that each return a data set.

To create a data set:

1. From the Report Design perspective, open the report definition view for the report requiring the new data set.

   If you need to use an alternative data source, see "Adding a Data Source to a Report " (on page 20).

2. In the Data Explorer, open the Data Sets context menu, and select **New Data Set**.

   The **New Data Set** dialog opens.

3. In the New Data Set dialog box, add the parameters you require.

   For parameters descriptions, see "New Data Set " (on page 57).

4. Click **Next** to open the **Query** dialog box.

5. Do one of the following:

   - Copy a query from your development tool to the query editor.

     Skip to Step 8.

   - Create your query in Report Editor as described in Step 6 to Step 7.

6. Use **Schema** (SQL only), **Filter**, and **Type**, and then click **Apply Filter** to focus on the data you require in Available Items.

   For SQL queries, Workbench limits the amount of data collected. To change the settings, see "Changing the Data Collection Settings " (on page 42).

7. Browse Available Items to find the data items you require. Drag and drop items from Available Items to the query editor and construct your query.

   For portability to different HP EM installations using different schemas, remove the schema name from the variables in your query if your database schema does not require them.

8. Click **Finish** to add the data set to the report definition.

9. Press **Ctrl+S** to save your changes.

For details about writing DQL queries, see "Using DQL" (on page 23).

For details about the database structure and writing SQL queries, see "Exploring the Database " (on page 42).

For an example of this procedure, see "Example: Failure Impact Data Set " (on page 54).

Note: If possible, use only one dataset per report definition. If you need more datasets in one report (for example, multiple properties in one table row), use JavaScript to build one table.

Creating a Report Definition

The first step in defining a report is to create the report definition.

To create a report definition:

1. Select **File>New>Report** from the menu.
2. Input a name and description for the report, and then click **Next**.
3. Select the project folder, and then click **Finish** to create the report definition.
4. Press **Ctrl+S** to save the report definition.

See Step 1 of "Example: Failure Impact Report Layout " (on page 55) for an example of this procedure.

Designing a Report Layout

Select **Help>Help Contents** to view the guides included with Workbench.

For an example, see "Example: Failure Impact Report Layout " (on page 55).

Modifying Existing Report Definitions

Report definitions that already exist in HP EM can be modified.

Procedure 5. To modify existing report definitions:

1. Import the report definition.

   For details, see "Importing Report Definitions " (on page 19).
2. To open the report definition, in the Project Explorer, double-click the report definition *rptdesign*.
3. Make your modifications, as described in "Creating a Report Definition " (on page 21).
4. Press **Ctrl+S** to save your changes.
5. Redeploy the report definition to HP EM.

   For details, see "Deploying a Report to HP EM " (on page 49).

Shared and User-Specific Reports

The Report Editor enables you to determine the security of report output. A report can be marked as shared to show the same data to all users or not shared. If a report is not shared, then each user only sees the data they have read permission for in the report output.

The default value for a new report is shared.

To mark a report as shared or user-specific:

1. In the **Project Explorer**, expand the report you want to categorize and double-click **Overview** to open a view of the report definition.
2. The General Information section displays a Shared check-box.

   Select **Shared** to show the same report output to all users. De-select **Shared** to make the report output restricted according to the user read permissions.
3. Press **Ctrl+S** to save your changes.

Using DQL

The DQL query language provides a simple query solution for the SOA Definition Model (SDM). It enables you to query all aspects of the model – artifacts, properties, relationships, governance, and compliance.

This chapter describes DQL in the following sections:

- "Introduction to DQL" (on page 23)
- "DQL Reference" (on page 33)
- "DQL with 3rd Party Products" (on page 30)

Introduction to DQL

DQL is an SQL-like language that enables you to query the repository of artifacts in HP EM defined by the SDM model. DQL preserves SQL grammar, but uses artifacts instead of tables, and artifact properties instead of table columns. As DQL is based on SQL you can apply your SQL knowledge to DQL.

A simple example is to return the name and description of all business service artifacts.

```
select name, description
  from businessServiceArtifact
```

In HP EM, you can use DQL queries in the following use cases:

- To create reports in HP EM Report Editor.
- To customize pages of the HP EM user interface.
- You can also use DQL in any SQL designer using the DQL JDBC driver. For more details, see "DQL in SQL Designers" (on page 31)

The following sections contain DQL examples:

- "Primitive Properties" (on page 27)
- "Complex Properties" (on page 25)
- "Artifact Inheritance" (on page 23)
- "Categorization Properties" (on page 24)
- "Fixing Multiple Properties" (on page 26)
- "Relationships" (on page 28)
- "Modifiers" (on page 27)
- "Virtual Properties" (on page 29)
- "Embedding SQL Queries" (on page 25)

Artifact Inheritance

Artifacts in HP EM form a hierarchy defined by the SDM model. Artifacts lower in the hierarchy inherit properties from higher abstract artifact types. `artifactBase` is the root abstract artifact type in the SDM hierarchy. All other artifacts are below it in the hierarchy and inherit its properties.

You can query abstract artifacts and return a result set from all the instances of artifact types lower in the hierarchy.

Property groups function in a similar way, querying a property group returns results from all artifact types that inherit properties from the group.

The following query returns results from all implementation artifacts; SOAP Services, XML Services, and Web Applications.

```
select name, serviceName
  from implementationArtifact
```

Notice that in this query, serviceName is a specific property of SOAP Service artifacts. In the result set, name is returned for all implementation artifacts but serviceName is only returned for SOAP service artifacts. For other implementation types, the serviceName is NULL.

Caution: Different artifact types may define the same properties with different cardinalities. In cases where two artifact types define the same property with different cardinality, querying a shared parent abstract artifact for these properties may fail. Examples that fail include **SELECT environment FROM artifactBase** and **SELECT accessPoint FROM artifactBase**.

Categorization Properties

Categorization properties are a special case of complex properties.

Categorization properties have the following sub-properties:

- `val` - machine readable name of the category.
- `name` - human readable name of the category.
- `taxonomyURI` - identifies the taxonomy defining the category set.

  Note: taxonomyURI is not defined for named category properties.

HP EM uses categorization properties in the following ways:

- **Named category properties** (for example, business service criticality).

  The following query returns the names, descriptions, and versions of all business service artifacts which are categorized using the named criticality categorization property with a high failure impact.

  ```
  select name, description, version
    from businessServiceArtifact
    where criticality.val =
          'uddi:systinet.com:soa:model:taxonomies:impactLevel:high'
  ```

  Note: taxonomyURI is not defined for named category properties. The name of the category property implies the taxonomy.

- **categoryBag**

  `categoryBag` is a complex property that includes sub-property `categories` which is a categorization property and `categoryGroups`. `categoryGroups` also contains categorization sub-property `categories` and a `taxonomyURI` defining the meaning of the

group. HP recommends querying `_category` instead of `categoryBag` to ensure that all categories are queried.

The following query returns the names, descriptions, and versions of all business service artifacts which are categorized by the Gift certificate category (14111608) of the `uddi:uddi.org:ubr:categorization:unspsc` taxonomy.

```
select name, description, version
  from businessServiceArtifact
  where categoryBag.categories.taxonomyURI =
        'uddi:uddi.org:ubr:categorization:unspsc'
    and categoryBag.categories.val = '14111608'
```

- **identifierBag**

  `identifierBag` is a complex property similar to `categoryBag` that includes sub-property `categories`. `identifierBag` does not contain the `categoryGroups` subproperty. HP recommends querying `_category` instead of `identifierBag` to ensure that all categories are queried.

- **_category**

  This generic categorization property holds all categorizations from `categoryBag`, `identifierBag`, and all named categorization properties from the given artifact type.

  The following query returns the names, descriptions, and versions of all business service artifacts which are categorized with a high failure impact.

```
select name, description, version
  from businessServiceArtifact
  where _category.val =
        'uddi:systinet.com:soa:model:taxonomies:impactLevel:high'
    and _category.taxonomyURI =
        'uddi:systinet.com:soa:model:taxonomies:impactLevel'
```

  Caution: When you use the generic `_category` property you must specify the taxonomy using the `_category.taxonomyURI` sub-property. When you use a named categorization property the taxonomy is implicitly known and does not need to be specified.

Complex Properties

Complex properties are composed of one or more single or multiple-valued sub-properties (for example, address contains sub-properties addressLines in multiple cardinality, country in single cardinality, and so on. The sub-property addressLines is also a complex sub-property, containing a value and useType.). It is only possible to query the sub-property components of primitive types. Components of sub-properties are separated by **.** (in MS Access you can use **$** as a separator).

```
select address.addressLines.value, address.country
  from personArtifact
  where address.city = 'Prague'
```

Embedding SQL Queries

DQL works with SDM entities (artifacts and properties) only and cannot directly access database tables. In some cases it is necessary to obtain values from outside the SDM (for example, system

configuration). You can use an SQL subquery in a NATIVE clause of a DQL query. By default, DQL expects SQL to return an unnamed single column of values.

The following example returns business services owned by the administrator using the name defined during installation:

```
select name,description, version
  from businessServiceArtifact
  where _owner in (
    native {select svalue from systemConfiguration
              where name='shared.administrator.username'})
```

You can use NATIVE clauses instead of expressions, as a condition in WHERE clauses, as a column in SELECT clauses, and as a artifact reference in FROM clauses. For details, see "DQL Grammar" (on page 33) .

If you use a NATIVE clause to formulate part of a FROM clause, you must specify parameters to bind columns defined by SQL to properties used by DQL.

Each parameter consists of the following:

- The property name defines how DQL addresses columns returned from the NATIVE SQL statement.
- The property type which may be returned by the metadata of a column is optional and if not specified is assumed to be a text string.

The parameters are enclosed in brackets in the native clause, delimited by commas, and the type is separated from the name using whitespace.

The following example shows a query with NATIVE SQL in a DQL FROM clause.

```
select B.p_id, B.s_val, A.name, B.state_index
  from (
    native(s_val, s_name, state_index integer, p_name, p_id)
      {select S.val as s_val, S.name as s_name, S.state_index as
state_index,
              P.name as p_name, P.id as p_id
         from rylf_state S, rylf_process P
         where S.fk_rylf_process=P.id and P.name='Application
Lifecycle'}) B
  left join artifactBase A on A._currentStage.val = B.s_val
  order by B.p_id, B.state_index
```

The NATIVE statement returns the following columns; `s_val`, `s_name`, `p_name`, and `p_id` of type String, and `state_index` of type Integer.

Note: Native clauses can not contain variables (? or :<variable>).

Fixing Multiple Properties

Consider a business service with keywords, 'Finance' and 'Euro'. The intuitive query for finding a 'Euro Finance' service is as follows:

```
select name, description, version
  from businessServiceArtifact b
```

```
  where b.keyword.val = 'Finance'
    and b.keyword.val = 'Euro'
```

This query does not work as a single instance of keyword can never be both 'Finance' and 'Euro'

The solution is to fix instances of multiple properties as shown in the following query:

```
select name, description, version
  from businessServiceArtifact b, b.keyword k1, b.keyword k2
  where k1.val = 'Finance'
    and k2.val = 'Euro'
```

Modifiers

Modifiers define primary sets of objects (artifacts and their revisions) to query. If no modifier is specified, the last revisions of undeleted artifacts for which the user has read access are queried.

The following modifiers are available:

- Revision related modifiers (mutually exclusive):
  - **all_rev** - queries all revisions of artifacts.
  - **last_approved_revision** - queries the last approved revisions of artifacts.
- Security related modifiers (mutually exclusive):
  - **my** - queries artifacts belong to the user.
  - **writable** - queries artifact the user has write permission for.
  - **no_acl** - queries all artifacts regardless of security.
- Other modifiers:
  - **include_deleted** - queries all instances, including deleted artifacts.

You can use multiple comma-separated modifiers.

The following query returns all business services that you own that are marked as deleted.

```
select b.name, b.version, b.keyword.name
  from businessServiceArtifact b (my, include_deleted)
  where _deleted = '1'
```

Primitive Properties

Primitive properties are simple properties, such as numbers, characters, and dates, that may occur once or multiple times for an artifact depending on the cardinality as defined in the SDM.

For example, in the SDM Model, each person is represented by a person artifact. The person artifact includes a name property with single cardinality and an email property with multiple cardinality.

The following query returns the name and all emails for each person in the repository.

```
select name, email
  from personArtifact
```

Instances of primitive properties with multiple cardinality are all returned as comma separated values. For example, all the emails for a person return as a concatenated, comma-separated string. If there is no instance of the property for an artifact, a null value is returned.

The following query returns the name, description, and version of all business service artifacts whose version is 2.0.

```
select name, description, version
  from businessServiceArtifact
  where version = '2.0'
```

Note: By default, DQL queries return the latest revisions of artifacts unless you specify revision modifiers. For details, see "Modifiers" (on page 27).

Relationships

A relationship is a special kind of complex property pointing to another artifact. HP EM uses relationships to join artifacts.

The following queries are semantically identical and return all business services and the contact details of their provider. These queries do not return business services that do not have providers.

- The following query is an example of an *SQL92-like* join which uses the USING clause.

  ```
  select b.name, b.version, b.keyword.name, p.name as contact, p.email
    from businessServiceArtifact b
    join personArtifact p using provides
  ```

  The relationship property `provides` leads from person artifacts to business service artifacts is specified after the `using` keyword.

- The following query is an example of an *SQL92-like* join which uses the ON clause.

  ```
  select b.name, b.version, b.keyword.name, p.name as contact, p.email
    from businessServiceArtifact b
    join personArtifact p on bind(provides)
  ```

  The relationship property `provides` leads from person artifacts to business service artifacts is specified with the `bind` predicate in the `WHERE` clause.

- The following query is an example of an *old-style* join which uses the BIND predicate.

  ```
  select b.name, b.version, p.name as contact, p.email
    from businessServiceArtifact b, personArtifact p
    where bind(p.provides, b)
  ```

  The BIND predicate specifies that the provides relationship of the person artifact points to business service artifacts.

The following query also returns all business services and the contact details of their provider. This query is an example of a LEFT JOIN. The LEFT JOIN extends the previous queries by also returning business services that do not have providers.

```
select b.name, b.version, p.name as contact, p.email
  from businessServiceArtifact b
  left join personArtifact p using provides
```

Each relationship has the following sub-properties which you can query:

- rType - the SDM QNames of the relationship type.
- useType - the values of the useType relationship property
- target - the UUIDs of the artifact the relationship points to (deprecated).

It is possible to specify a particular provider type using useType. The following queries return all business services and their contact details where the provider is an architect.

```
select b.name, b.version, p.name as contact, p.email
  from businessServiceArtifact b, personArtifact p
  where bind (p.provides, b)
    and p.provides.useType = 'architect'
```

```
select b.name, b.version, p.name as contact, p.email
  from businessServiceArtifact b
  join personArtifact p on bind(p.provides, b)
    and p.provides.useType = 'architect'
```

It is possible to traverse several relationships using several old-style joins or SQL-92-like join clauses in the same query. The following example queries business services in applications, which are also part of a project.

```
select b.name, b.description, a.name as Application, p.name as Project
  from businessServiceArtifact b
  join hpsoaApplicationArtifact a using hpsoaProvidesBusinessService
  join hpsoaProjectArtifact p using contentRelationshipType
```

In cases where artifacts may be joined by multiple properties, you can use a generic `_relation` property together with the additional `rType` condition.

```
select A.name as A_name, B.name as B_name
  from hpsoaApplicationArtifact A left join artifactBase B on bind(A._
relation)
    and A._relation.rType in (
        '{http://systinet.com/2005/05/soa/model/property}
hpsoaProvidesBusinessService',
        '{http://systinet.com/2005/05/soa/model/property}r_
providesBusinessProcess'
      );
```

You can use the `target` relationship sub-property to bind the source and target of a relationship.

```
select b.name, b.version, p.name as contact, p.email
  from businessServiceArtifact b, personArtifact p
    where p.provides.target = b._uuid
```

Caution: The `target` property and this style of comparison is deprecated and its use is not recommended. Use the `bind` predicate instead.

Virtual Properties

DQL defines virtual properties, that are not defined by the SDM. HP EM stores or calculates these properties enabling DQL to query meta information about artifacts. These virtual properties provide information about lifecycle, compliance, domains, etc.

The following example returns lifecycle details from the last approved revisions of all business service artifacts, ordered by lifecycle stage.

```
select name, _lastApprovedStage.name Stage, _revision
  from businessServiceArtifact(last_approved_revision)
  order by Stage
```

The following example returns the name and compliance status of last approved revisions of all business services which a compliance status of at least 80%.

```
select b.name, b._complianceStatus
  from businessServiceArtifact b (last_approved_revision)
  where b._complianceStatus >= 80
```

HP EM repository content exists within a domain structure where each artifact exists within only one domain. The default functionality of DQL queries all domains but HP EM provides virtual properties enabling you to query artifacts within a particular domain. The following example returns business service names and the domain details of all business service artifacts that exist within the EMEA domain.

```
select A.name, A._domainId, A._domainName
  from businessServiceArtifact A
  where A._domainId="EMEA"
```

DQL provides the following macros for querying within domain hierarchies:

- **#SUBDOMAINS('*domainId*')**

  Queries the specified domain and all its sub-domains.

- **#SUPERDOMAINS('*domainId*')**

  Queries the specified domain and all its parent domains.

The following query returns all business services in the EMEA domain and any of all of its sub-domains.

```
select A.name
  from businessServiceArtifact A
  where A._domainId in #SUBDOMAINS('EMEA')
```

The following query returns the name and virtual properties artifactTypeName and owner from the latest revisions of consumer properties (the property group for all consuming artifact types).

```
select name, _artifactTypeName, _owner
  from consumerProperties
```

For details of all virtual properties, see "Properties in DQL" (on page 39).

DQL with 3rd Party Products

DQL is provided by a JDBC driver which you can use with common SQL designers supporting 3rd-party JDBC drivers (or ODBC with an ODBC-JDBC bridge).

The following sections describe the driver and its use with third-party products:

- "DQL JDBC Driver" (on page 32)
- "DQL in SQL Designers" (on page 31)
- "DQL in MS Access" (on page 31)

DQL in MS Access

MS Access 2007 can execute DQL queries using an ODBC-JDBC bridge. Before using MS Access, you must configure the ODBC datasource in Windows.

To configure an ODBC-JDBC bridge:

1. Download and install an ODBC-JDBC bridge. For example, *Easysoft ODBC-JDBC Gateway*.
2. Configuration typically consists of:
   - JDBC driver configuration using the properties described in "DQL JDBC Driver" (on page 32).
   - Bridge configuration. For details, see the documentation for the bridge software.

DQL syntax varies from the examples given in "Introduction to DQL" (on page 23) in the following cases:

- Complex properties must use $ notation and be enclosed by [ ].

  ```
  personArtifact.[address$addressLines$value], personArtifact.
  [address$country]
  ```

- To use modifiers such as (include_deleted) use the Pass-Through option in MS Access.
- Left Joins do not work. Use plain joins instead.
- For fixed properties, use the Pass-Through option in MS Access.
- For timestamps, use the Pass-Through option in MS Access.
- Native queries do not work in MS Access.
- For property aliases, do not use quoted aliases.

DQL in SQL Designers

SQL Designer software can use the DQL driver if the designer is JDBC-aware.

To configure a JDBC-aware SQL Designer:

1. Add the DQL JDBC JAR files to the classpath.
2. Create a JDBC connection using the properties described in "DQL JDBC Driver" (on page 32).

After you establish the DQL JDBC connection, the following functionality should be available in your SQL Designer:

- Schema introspection, browsing the list of artifact types and property groups as tables, and their properties as columns.
- DQL query execution.

DQL JDBC Driver

The DQL JDBC driver translates DQL queries into SQL queries and executes them using the underlying JDBC driver for the used database. The translation is provided by a remote invocation of HP EM.

All the required JAR files for the DQL driver are available in `EM_HOME/client/lib/jdbc`:

- `pl-dql-jdbc.jar`
- `hessian-version.jar`
- Database driver JAR files are copied here during installation (for example, `ojdbc6.jar`).

The following table describes the driver configuration required to use the driver with 3rd party products.

DQL JDBC Driver Configuration

Property	Description
Connection String	jdbc:systinet:http(s)://<username>@<host:port>/<context>[|schema=schema name][|model=list of allowed models] • `<username>` is the HP EM username who executes the DQL query using HP EM permissions security. • `<host:port>` are the connection details of your HP EM installation (for example, localhost:8080 for HTTP or secure:8443 for HTTPS. • `<context>` is the application server context, the default is `em`. • `|schema=schema name` is the schema of the user who owns HP EM database tables. This parameter is optional. When omitted it is supposed that the user account used to access the database is also the owner of HP EM tables. In case a common user or read-only user is used, use the power user schema name, unless the DQL JDBC Driver cannot provide metadata regarding artifacts and properties. • `|model=list` of allowed models is optional and represents a comma-separated list of models. Only artifacts from allowed models are provided in JDBC metadata as tables. The available models are `sys` and `public`. By default, only artifacts from the public model are provided. For example, `jdbc:systinet:http://admin@demoserver.acme.com:8080/soa|schema=SOA320`
DB Credentials	The database username and credentials used for direct access to the HP EM database. In most cases it is the user who owns all tables for HP EM - called the *power user*. In case of "Manual Database Arrangement" with a power user and a common user (who has only read/write access to tables, but can not create other tables), use the common user account. In case the common user is still too powerful to be shared, the DB administrator can create another - "read-only user" with read-only access to HP EM tables. Note that the read-only user must also have created synonyms/aliases for HP EM tables to pretend that HP EM tables are in the schema

Property	Description
	of the read-only user. For more details, see "Database Installation Types" in the *Installation and Configuration Guide*.
DQL JDBC Class-name	com.hp.systinet.dql.jdbc.DqlDriver

Note: The DQL JDBC driver must be able to connect to the database from the client. Use the full hostname for your database used during installation or setup. In the event of connection problems, verify the firewall settings between the local server and the database server.

DQL Reference

This section provides a reference to properties and DQL grammar in the following sections:

- "Properties in DQL" (on page 39)
- "DQL and SQL" (on page 38)
- "DQL Grammar" (on page 33)

DQL Grammar

A DQL query consists of the following elements with their grammar explained in the following sections:

- "Select" (on page 38)
- "FROM Clause" (on page 36)
- "Conditions" (on page 34)
- "Expressions" (on page 35)
- "Lexical Rules" (on page 37)

Typographical Conventions

Convention	Example	Description
KEYWORDS	**SELECT**	A reserved word in DQL (case-insensitive).
parsing rules	*expr*	Name of a parsing rule. A parsing defines a fragment of DQL which consists of keywords, lexical rules, and other parsing rules.
LEXICAL RULES	*ID*	Name of a lexical rule. A lexical rule defines a fragment of DQL which consists of letters, numbers, or special characters.
[ ]	[**AS**]	Optional content.
[...]	[, *select_item*, ...]	Iterations of optional content.

Convention	Example	Description
|	**ASC** | **DESC**	Alternatives.
{}	{+|-}	Group of alternatives.
..	0..9	A range of allowable characters.

Conditions

```
condition :
  condition_and [ OR                          condition_and ... ]

condition_and :
  simple_condition [ AND                          simple_condition ... ]

simple_condition :
  (condition)
  | NOT                         simple_condition
  | exists_condition
  | like_condition
  | null_condition
  | in_condition
  | simple_comparison_condition
  | native_sql
  | bind

simple_comparison_condition :
  exprcomparison_opexpr

comparison_op :
 = | <> | < | > | <= | >=

like_condition :
  expr [ NOT ] LIKE                          like_expression [ ESCAPE
                  STRING ]

like_expression :
  STRING
  | variable_ref

null_condition :
  expr                        IS [ NOT ] NULL

in_condition :
  expr [ NOT ] IN( { subquery | expression_list } )
  | macro

exists_condition :
```

```
  EXISTS(subquery)

bind :
  BIND(property_ref [ , alias ] )

macro :
  macro_name [ (expression_list) ]

macro_name :
  #ID
```

Explanation:

- Conditions can be evaluated to true, false, or N/A. *condition* consists of one or more *condition_and* that are connected by the **OR** logical operator.
- *condition_and* consists of one or more *simple_condition* connected by the **AND**
- *simple_condition* is one of following:
  - *condition* in parentheses.
  - Negation of *simple_condition*.
  - *exists_condition*
  - *like_condition*
  - *null_condition*
  - *in_condition*
  - *simple_comparison_condition*
  - *native_sql*
- *simple_comparison_condition* is a comparison of two expressions using one of the comparison operators: =, <>, <, >, <=, >=
- *like_condition* compares an expression with a pattern. Patterns can contain wildcards:
  - **_** means any character (including numbers and special characters).
  - **%** means zero or more characters (including numbers and special characters).
  - **ESCAPE** *STRING* is used to prefix _ and % in patterns that should represent those characters and not the wildcard.
- *alias* references the target artifact.

Expressions

```
expr :
  term [ { + | - | CONCAT } term ... ]

term :
  factor [ { * | / } factor ... ]

factor :
```

```
  (select)
  | (expr)
  | { + | - } expr
  | case_expression
  | NUMBER
  | STRING
  | NULL
  | function_call
  | variable_ref
  | property_ref
  | native_sql

case_expression :
  CASE                          case_item [ case_item ... ]
    [ ELSE                          expr ]
  END

case_item :
  WHEN                          condition                         THEN
                 expr

function_call :
  ID( [ DISTINCT ] { [ * ] | [ expression_list ] } )

property_ref :
  { ID | QUOTED_ID } [ { . | $ } { ID | QUOTED_ID } ... ]

expression_list :
  expr [ ,expr ... ]

variable_ref :
  ? | :ID
```

Explanation:

- Variables are of two kinds:
  - Positional variables - ? in DQL.
  - Named variables - :<name_of_variable>
- When variables are used in DQL, each variable must have a value bound to the variable.

FROM Clause

```
from_clause_list :
  { artifact_ref | subquery_ref | fixed_property | native_sql }
  [ from_clause_item ... ]

from_clause_item :
  , { artifact_ref | subquery_ref | fixed_property | native_sql }
  | [ LEFT [ OUTER ] ] JOIN
```

```
    { artifact_ref | subquery_ref } join_condition

artifact_ref :
  artifact_name [ alias ] [ (artifact_modifiers) ]

subquery_ref :
  (subquery)alias

fixed_property :
  property_refalias

artifact_modifiers :
  ID [ ,ID ... ]

artifact_name :
  ID

join_condition :
  | USINGproperty_ref
```

Lexical Rules

```
CONCAT :
  ||

STRING :
  [ N | n ] ' text '

NUMBER :
  [ [ INT ] . ] INT

INT :
  DIGIT [ DIGIT ... ]

DIGIT :
  0..9

ID :
  CHAR [ { CHAR | DIGIT } ... ]

CHAR :
  a..z | A..Z | _
```

Explanation:

- *ID* is sequence of characters, numbers and underscores beginning with a character or underscore.
- *QUOTED_ID* is text in quotes.
- *CONCAT* means a concatenation of strings - syntax **||**

Select

```
select :
  subquery [ ORDER BY                          order_by_item [, order_
by_item ...]]

subquery :
  subquery [ set_operatorsubquery ...]
  | (subquery)
  | native_sql
  | subquery_base

subquery_base :
  SELECT [ DISTINCT ] select_item [, select_item ...]
  FROM                          from_clause_list
  [ WHERE                          condition ]
  [ GROUP BY                          expression_list
    [ HAVING                          condition ]
  ]

select_item :
  expr [ [ AS ] alias ]

alias :
  ID | QUOTED_ID

order_by_item :
  expr [ ASC | DESC ]

set_operator :
  UNION ALL | UNION | INTERSECT | EXCEPT

native_sql :
  NATIVE [ (column_name [ column_type ] [ , ... ] ) ]
  { sql_select }
```

Explanation:

- The { } around the sql_select are required and sql_select is an SQL query.
- The column_name and column_type specify parameters to pass from the SQL query to the DQL query.

DQL and SQL

DQL supports most features of SQL with the following exceptions:

- SELECT * is not supported.
- RIGHT and FULL OUTER JOIN are not supported.
- It is not possible to use properties with multiple cardinality in GROUP BY, HAVING, or ORDER BY clauses.

Properties in DQL

Artifact (property group) properties hold values which may be queried in DQL expressions.

DQL recognises the following properties:

- SDM Properties

  Properties defined in the SDM Model.

- Virtual, System, and Other Properties

  Properties holding metadata about artifact instances.

Properties may be one of the following:

Property Kind	Description
Primitive	Holds string, number, or boolean values. For example, name, description, version. A primitive property is defined in DQL statements by the artifact type name or alias, the property delimiter (. or $), followed by the property name. For example, personArtifact.name. The artifact name or alias is optional (with the delimiter) when the property is specific to a single artifact type in the query.
Complex	Hold complex structures such as address. Only primitive sub-properties of complex properties may be queried. Properties and sub-properties are separated by **.** or **$**. For example, `personArtifact.address.city`.
Categorization	Hold categorization data and are handled in a similar way to complex properties. Categories consist of `name`, `val`, and `taxonomyURI` components. For example, `businessServiceArtifact.criticality.name`.
Relationships	Properties that specify a directional relationship to other artifacts.

All values that you can query are of a particular data type. The following table describes these data types, and gives examples of how to use them in a query.

Data Type	Description	Example
Number	Numeric values	_revision = 1
String	Text values	_revisionCreator = 'admin'
Date Time	Date and Time (ms since 00:00 1/1/1970)	_revisionTimestamp > 1274447040124 /* revisions made since 15:04 21/5/2010 */
Boolean	True or False flags	_deleted = '1'

Properties may have the following cardinalities:

Property Cardinality	Description
Single	Only one instance of the property exists for an artifact and it may be

Property Cardinality	Description
	optional or required.
Multiple	The property is a list of values and so occurs multiple times for an artifact. In WHERE clauses, using multiple properties returns particular artifacts if any instance of the multiple property matches the condition. In SELECT clauses, using multiple properties returns all instances of the multiple property as a concatenated, comma-separated string.

DQL uses the following system properties:

System Property	Description
_artifactTypeName	The human readable name of the artifact type (the SDM label of the artifact). HP recommends using _sdmName in conditions, and _ artifactTypeName in SELECT clauses.
_category	All categorizations for an artifact with `name`, `val`, and `taxonomyURI` components.
_deleted	The deletion marker flag (boolean).
_id	The database ID of an artifact instance (number, deprecated - use _ uuid).
_longDescription	HP EM supports a long description including HTML tags up to 25000 characters by default. HP recommends using the `description` property in DQL queries instead as queries using _longDescription may affect performance and the HTML tags may corrupt report outputs. `description` contains only the first 1024 text characters of `_ longDescription` (may vary according to your database type). **Note**: The `platform.repository.max.description.length` property determines the maximum length of _longDescription. You can modify this property in `EM_ HOME/conf/setup/configuration-propeties.xml`. DB2 has an absolute limit of 32672 characters which is sufficient for descriptions containing ASCII (single-byte encoding) characters but may be exceeded, for example by Japanese descriptions, leading to description truncation.
_owner	The user, group, or role designated as the artifact owner.
_ownerName	The human readable name of the user (taken from the use profile), group, or role artifact.
_path	Legacy REST path of the artifact (string, deprecated - use _uuid).
_relation	A generic virtual property that may be used to specify all outgoing relationships.
_revision	The revision number of an artifact instance.

System Property	Description
_revisionCreator	The user who created the revision of the artifact.
_revisionTimestamp	The date and time the revision was created.
_sdmName	The local name of the artifact type. HP recommends using _sdmName in conditions, and _artifactTypeName in SELECT clauses.
_uuid	The unique artifact identifier.

DQL uses the following virtual properties:

Property Class	Property	Description
UI Property	_isFavorite	Marked by the user as favorite flag (boolean).
	_rating	The average rating of the artifact (double).
Security Property	_shared	Indicates that the artifact is shared and visible to users in the Sharing Principal role (boolean).
	_writable	User write permission flag (boolean). **Note**: Using this property may have a performance impact. If possible, use the **writable** modifier instead. For details, see "Properties in DQL" (on page 39).
Contract Property	_enabledConsumer	The artifact is a valid consumer artifact type.
	_enabledProvider	The artifact is a valid provider artifact type. The artifact must also be marked as 'Ready for Consumption'.
Domain Property	_domainId	Value of the `domainId` property defined for the domain artifact that the artifact belongs to.
	_domainName	The readable name of the domain.
Lifecycle Property	_currentStage	Current working stage of an artifact.
	_governanceProcess	process applicable to the artifact.
	_isApproved	Lifecycle approval flag (boolean).
	_lastApprovedRevision	Revision number of the last approved revision (number).
	_lastApprovedStage	The name of the last approved stage.
	_ lastApprovalTimestamp	Timestamp for the last approval (number, ms since 00:00 1/1/1970).
	_lifecycleStatus	The status of the current lifecycle stage.
Policy Manager Property	_complianceStatus	Compliance status as a percentage (number).

Exploring the Database

The functionality of Report Editor relies on interaction with the database.

This chapter describes how to examine and setup the database in the following sections:

- "SDM to Database Mapping Tool " (on page 43)
- "Adding a JDBC Driver " (on page 42)
- "Changing the Data Collection Settings " (on page 42)
- "Optimizing the Database " (on page 42)
- "Writing SQL Queries " (on page 43)

Adding a JDBC Driver

To connect to a database you must specify a JDBC driver.

To add a JDBC driver:

1. In the Database Connections dialog box, click **Manage Drivers**.

   The Manage JDBC Drivers dialog box opens.

2. Click **Add** to browse your filesystem for a driver.

   HP Software recommends using the same JDBC driver used during HP EM installation.

3. Select the driver, and then click **Open** to add it to the list of drivers in the **Manage JDBC Drivers** dialog box.

Changing the Data Collection Settings

By default, the editor limits the amount of data collected to 20 schemas and 100 tables in the Query dialog box.

To change the data collection settings:

1. From the menu, select **Windows>Preferences**.
2. Expand **Report Design>Data Set Editor**, and then select **JDBC Data Set**.
3. Change the number of schemas and tables as required, and then click **OK**.

Optimizing the Database

If you frequently use particular fields for joins in your queries, create an index for that field to improve performance.

To create an Oracle index:

1. Log on to the sqlplus or isqlplus console as the system user.
2. Enter the following command:

   create index ix_docrel_optimize2 on ry_docRel(sourceId, rtype);

As a minimum optimization, HP Software recommends the following:

- **create index ix_res_optimize1 on ry_resource(fk_artifactType, m_deleted, id, m_ path);**
- **create index ix_docrel_optimize2 on ry_docRel(sourceId, rtype);**

SDM to Database Mapping Tool

Artifacts in HP EM are stored in the form of XML documents. Their structure is defined by the SOA Definition Model (SDM). Artifacts are serialized into a database over a standard serialization layer. The serialization of data may differ from the norm, based on customer specific extensions or modifications.

The sdm2dbmap tool is a mapping tool that generates a report containing the mapping between your SDM and database tables.

To generate the report, execute the following command:

EM_HOME/lib/sdm/bin/sdm2dbmap

The mapping report is output to the following file:

`EM_HOME/lib/sdm/build/sdm2dbmap.html`

The output consists of the following parts:

- A top level 1:1 mapping between SDM artifacts and DB tables. Each artifact listed, maps directly to one table.
- A list of artifacts. Each artifact in the report maps each SDM property to a specific column in the table. There are also associated tables and foreign keys, joined using the primary key of the artifact table.
- A report documenting the DB schema for all database tables coming from the SDM. Tables with names ending in _Rev are used to store older revisions.

Writing SQL Queries

Although it is possible to use the query editor in Workbench, it is often more convenient to use a specialized tool to develop queries.

This section describes some typical methods and provides examples to help you design your queries.

These examples were created using Oracle Developer for use with an Oracle Database. Changes may be required to use these queries with other database types.

This section contains the following methods and examples:

- "Joining Tables in Queries " (on page 47)
- "Example: Business Service SELECT " (on page 45)
- "Example: Contract SELECT " (on page 46)
- "Example: Combined Business Service and Contract SELECT " (on page 45)
- "Example: Business Service SELECT " (on page 45)

Example: Accepted Contract Count for a Business Service

This example returns business service details and the number of accepted contracts for each service:

```
SELECT
    bsn.id bsn_id,
       bsn.name_val bsn_name,
       bsnRes.m_path bsn_path,
       bsn.serviceVersion_val bsn_version,
       bsn.description_val bsn_description,
       bsn.productionStage_name bsn_productionStage,


       ( -- Contracts --
       SELECT count (0)
       FROM ry_contract contract
               INNER JOIN ry_docrel providerContractRel ON
           (
                       providerContractRel.rtype = '
{http://systinet.com/2005/05/soa/model/property}providerContractor'

                       AND providerContractRel.obsolete='0'
                       AND providerContractRel.deleted='0'
                       AND providerContractRel.targetDeleted='0'
                       AND providerContractRel.sourceId = contract.id
           )
        INNER JOIN ry_resource contractRes ON
               (
                       contractRes.id =contract.id
                       AND contractRes.m_deleted='0'
               )
       WHERE  contract.contractState_val =
'uddi:sy-
stinet.com:soa:model:taxonomies:contractAgreementStates:accepted'

           AND providerContractRel.targetId = bsn.id
       ) ctrct_count


       FROM ryga_bsnService bsn
               INNER JOIN ry_resource bsnRes ON
               (
                       bsnRes.id = bsn.id
                       AND bsnRes.m_deleted = '0'
               )

WHERE bsn.readyForConsumption_val ='1'
ORDER BY lower(bsn.name_val)
```

Example: Business Service SELECT

This example query returns details for business services that are marked as ready for consumption:

Table ry_bsnService contains the main fields for business services.

Table >ry_resource contains general information about every artifact (for all artifact types).

The inner join to ry_resource in the FROM clause excludes deleted artifacts.

```
SELECT
    bsn.id bsn_id,
       bsn.name_val bsn_name,
       bsnRes.m_path bsn_path,
       bsn.serviceVersion_val bsn_version,
       bsn.description_val bsn_description,
       bsn.productionStage_name bsn_productionStage,

FROM ryga_bsnService bsn
       INNER JOIN ry_resource bsnRes ON
       (
          bsnRes.id = bsn.id
          AND bsnRes.m_deleted = '0'
       )

WHERE bsn.readyForConsumption_val ='1'
ORDER BY lower(bsn.name_val)
```

Example: Combined Business Service and Contract SELECT

"Example: Business Service SELECT " (on page 45) and "Example: Contract SELECT " (on page 46) can be combined to list the names of the contracts and the business service to which they apply.

```
SELECT
       contract.id ctrct_id,
       contract.name_val ctrct_name,
       bsn.id bsn_id,
       bsn.name_val bsn_name

FROM ryga_bsnService bsn
       INNER JOIN ry_resource bsnRes ON
       (
              bsnRes.id = bsn.id
              AND bsnRes.m_deleted = '0'
       ),
       ry_contract contract
       INNER JOIN ry_docrel providerContractRel ON
       (
              providerContractRel.rtype = '
{http://systinet.com/2005/05/soa/model/property}providerContractor'
```

```
                AND providerContractRel.obsolete='0'
                AND providerContractRel.deleted='0'
                AND providerContractRel.targetDeleted='0'
                AND providerContractRel.sourceId = contract.id
        )
        INNER JOIN ry_resource contractRes ON
        (
                contractRes.id =contract.id
                AND contractRes.m_deleted='0'
        )

WHERE bsn.readyForConsumption_val ='1'
        AND  contract.contractState_val =
'uddi:sy-
stinet.com:soa:model:taxonomies:contractAgreementStates:accepted'
        AND providerContractRel.targetId = bsn.id
ORDER BY lower(bsn.name_val)
```

By merging the queries you create an n:1 relationship between contracts and business services.

Example: Contract SELECT

This example query returns details for contracts that have been accepted:

```
SELECT
        contract.id ctrct_id,
        contract.name_val ctrct_name,
        contract.description_val ctrct_description,
        contract.contractstate_name ctrct_state,
        providerContractRel.targetpath ctrct_targetpath

FROM ry_contract contract
        INNER JOIN ry_docrel providerContractRel ON
        (
            providerContractRel.rtype = '
{http://systinet.com/2005/05/soa/model/property}providerContractor'
            AND providerContractRel.obsolete='0'
            AND providerContractRel.deleted='0'
            AND providerContractRel.targetDeleted='0'
            AND providerContractRel.sourceId = contract.id
        )
        INNER JOIN ry_resource contractRes ON
        (
            contractRes.id =contract.id
            AND contractRes.m_deleted='0'
        )

WHERE contract.contractState_val =
```

```
'uddi:sy-
stinet.com:soa:model:taxonomies:contractAgreementStates:accepted'
```

Table ry_contract contains the main fields for contracts.

Table ry_docrel contains artifact relationship details.

The inner join to ry_docrel in the FROM clause excludes contracts where the provider-contract relationship is obsolete, deleted, or where the provider does not exist.

Joining Tables in Queries

To join tables in your queries, add the following to the WHERE clause of your SELECT statement:

- Key or foreign key condition
- Discriminator expression
- Check the deleted flag (0 means false)

Example:

```
WHERE ryga_bsnService.id = rygt_ctgryPty.fk_resource_id
      AND rygt_ctgryPty.discriminator = 'bsnPolicy_iBag'
      AND bsnRes.m_deleted = '0'
```

Deploying Reports

When your report is ready, you must deploy it to the HP EM server.

Report Editor offers two methods:

- Deploy a report directly to the HP EM server.

  For details, see "Deploying a Report to HP EM " (on page 49).

- Deploy a set of reports as an extension to the HP EM server.

  This process consists of the following steps:

  a. "Creating a Reporting Extension " (on page 48)

  b. "Applying Extensions " (on page 50)

  c. "Redeploying EAR File" (on page 50)

After deployment, you can access your report in various ways.

For details, see "Accessing Reports " (on page 48).

You can remove custom reports from the HP EM server.

For details, see "Removing Report Definitions from HP EM " (on page 50).

Accessing Reports

"Use Cases " (on page 13) describes how HP EM uses specific functionality in the UI for each report category.

It is also possible to directly access the reports in the HP EM server and obtain alternative outputs.

In your browser, the following URLs use the Service Portfolio report as an example:

- `https://hostname:port/em/reporting/rest/reports/`
- `https://hostname:port/em/reporting/rest/reports/service_portfolio?alt=text/plain`
- `https://hostname:port/em/reporting/rest/reports/service_portfolio/documents/`
- `https://hostname:port/em/reporting/rest/reports/service_portfolio/documents/1/?alt=text/plain`

The last URL is an instance of the report. The page source contains alternate URLs. Change the URL to return a comma separated output of the report as follows:

- `https://hostname:port/em/reporting/rest/reports/service_portfolio/documents/1/content?alt=text/csv`

Creating a Reporting Extension

You can also deploy a set of reports as an extension.

To create a reporting extension:

1. In the Project Explorer, open the context menu for the project you want to deploy and select **HP EM>Build Extension**.

   The Build Extension Wizard opens.

2. In the Build Extension Wizard, input the parameters you require.

   For parameter descriptions, see "Build Extension Wizard " (on page 57).

3. Click **Finish** to create the extension.

Deploy the extension to the HP EM server using the Setup Tool.

For details, see "Applying Extensions " (on page 50).

Deploying a Report to HP EM

The HP EM plug-ins for Report Editor enable you to deploy your report directly to the HP EM server.

To deploy a report to HP EM:

1. Make sure that the HP EM server is running.
2. In the Project Explorer or Navigator view, open the context menu for the report design you want to deploy, and select **HP EM>Upload to Server**.

   You will be asked if you want to publish the default library. If you do not want to be asked again, you can set this preference in the Preference menu of Report Editor.

   Expand **Window>Preferences>HP EM>Report Editor** and select whether you want Assertion Editor to prompt you every time you publish, always publish the default library, or never publish the default library.

Custom Policy Manager reports do not contain **Notify** functionality by default. To add this functionality you must add the report name to the notification context file.

To add notify functionality to custom PM reports:

1. Deploy your report to HP EM as described above.
2. Open `EM_HOME\deploy\hp-em.ear\lib\pm-persistence.jar\META-INF\pmNotificationContext.xml` with a text editor.
3. Add a `value` element containing the report definition name to the file.

   For example:

```
<bean id="pm-persistence.systemReportChecker"

class="com.hp.systinet.policy.notification.SystemReportChecker">
   <property name="reports">
      <set>
         <!-- Systinet system reports - report definition IDs -->
                <value>acs_basic</value>
                ...
                <value>MyTestReport</value>
         </set>
   </property>
```

```
</bean>
```

4. Save `pmNotificationContext.xml`.
5. Restart the HP EM server.

Redeploying EAR File

After using the Setup Tool to apply extensions or updates, you must redeploy the EAR file to the application server. For JBoss, you can do this using the Setup Tool.

To redeploy the EAR file to JBoss:

1. Stop the application server.
2. Start the Setup Tool by executing the following command:

   EM_HOME/bin/setup.bat(sh).
3. Select the **Advanced** scenario, and click **Next**.
4. Scroll down, select **Deployment**, and then click **Next**.

   When the Setup Tool validates the existence of the JBoss Deployment folder, click **Next**.
5. Click **Finish** to close the Setup Tool.
6. Restart the application server.

Removing Report Definitions from HP EM

You can remove custom report definitions from HP EM.

To remove a single report, use the context menu option.

To remove custom reporting extensions:

1. Remove any custom report extensions from `EM_HOME/extensions`.
2. Execute the Setup Tool using the apply extensions scenario.

Applying Extensions

You can extend HP EM by adding libraries or JSPs to the deployed EAR files, by modifying the data model, by configuring the appearance of the UI, and by importing prepackaged data.

Extensions to HP EM come from the following sources:

- **Customization Editor**

  Typical extensions created by Customization Editor contain modifications to the data model and artifact appearance, and possibly data required by the customization (taxonomies). They may also contain new web components, which may include custom JSP and Java code.

  If your extension contains new artifact types, HP EM does not create default ACLs for them. Set default ACLs for the new artifact types in HP EM.

- **Assertion Editor, Report Editor, and Taxonomy Editor**

  These extensions contain assertion, reporting, and taxonomy data only. They do not involve changes to the data model.

The Setup Tool opens the EAR files, applies the extensions, and then repacks the EAR files.

Apply extensions according to one of the following scenarios:

- "Single-Step Scenario " (on page 52)

  The Setup Tool performs all the processes involved in applying extensions, including any database alterations, as a single step.

- "Decoupled DB Scenario " (on page 52)

  Database SQL scripts are run manually. The Setup Tool performs the other processes as individual steps that are executable on demand. This scenario is useful in organizations where the user applying extensions does not have the right to alter the database, which is done by a database administrator.

  In some specific circumstances (underscores and numbers in property names), extension application may fail because HP EM cannot create short enough database table names (31 character maximum for most databases).

  The error in `setup.log` resembles the following:

```
[java] --- Nested Exception --- [java] java.lang.RuntimeException:
cannot reduce length of identifier   'ry_c_es_Artifact02s_c_
priEspPty01Group_c_priEspPty01',   rename identifier elements or
improve the squeezing algorithm [java] at
com.systinet.platform.rdbms.design.decomposition.naming.impl.
BlizzardNameProviderImpl.getUniqueLimitedLengthName
(BlizzardNameProviderImpl.java:432) [java] at
com.systinet.platform.rdbms.design.decomposition.naming.impl.
BlizzardNameProviderImpl.filterTableName
(BlizzardNameProviderImpl.java:374)
```

  If you do not require backward compatibility with these older versions, you can change the table naming algorithm.

  To change the table naming algorithm:

  1. Open `EM_HOME/lib/pl-repository-old.jar#META-INF/rdbPlatformContext.xml` with a text editor.
  2. In the `rdb-nameProvider` bean element, edit the following property element:

     <property name="platform250Compatible" value="false"/>
  3. Save `rdbPlatformContext.xml`

  This solution only impacts properties with multiple cardinality. If the problem persists, then review the property naming conventions in your extension.

Decoupled DB Scenario

Follow this scenario if the user who applies extensions does not have permission to modify the database.

To apply extensions and modify the database separately:

1. Make sure that all extensions are in the following directory:

   `EM_HOME/extensions`

   The Setup Tool automatically applies all extensions in that directory.
2. Stop the server.
3. Start the Setup Tool by executing the following command:

   EM_HOME/bin/setup -a.
4. Select the **Apply Extensions** scenario, and click **Next**.
5. Click **Next**, to execute the extension application, and exit the Setup Tool.
6. Provide the scripts from `EM_HOME/sql` to the database administrator.

   The database administrator can use `all.sql` to execute the scripts that drop and recreate the database schema.
7. Execute the Setup Tool in command-line mode to finish the extension application:

   EM_HOME/bin/setup -c
8. Redeploy the EAR file:
   - **JBoss**

     The Setup Tool deploys the EAR file automatically.

     If you need to deploy the EAR file to JBoss manually, see "Redeploying EAR File" (on page 50).
   - **Other Application Servers**

     You must deploy the EAR file manually.

Single-Step Scenario

Follow this scenario if you have permission to alter the database used for HP EM.

To apply extensions to HP EM in a single step:

1. Make sure that all extensions are in the following directory:

   `EM_HOME/extensions`

   The Setup Tool automatically applies all extensions in that directory.

   If you are applying extensions to another server, substitute the relevant home directory for `EM_HOME`
2. Stop the server.

3. Start the Setup Tool by executing the following command:

   EM_HOME/bin/setup.bat(sh)

4. Select the **Apply Extensions** scenario, and click **Next**.

   The Setup Tool automatically validates the step by connecting to the server, copying the extensions, and merging the SDM configuration.

5. Click **Next** for each of the validation steps and the setup execution.

   This process takes some time.

6. Click **Finish** to end the process.

7. Deploy the EAR file:

   - **JBoss**

     The Setup Tool deploys the EAR file automatically.

     If you need to deploy the EAR file to JBoss manually, see "Redeploying EAR File" (on page 50)

   - **Other Application Servers**

     You must deploy the EAR file manually.

8. Restart the server.

   Applying an extension that modifies the SDM model may drop your full text indices.

   `EM_HOME/log/setup.log` contains the following line in these cases:

   ```
   Could not apply alteration scripts, application will continue with
   slower DB drop/create/restore scenario. ... .
   ```

   In these cases, reapply full text indices.

Example: Failure Impact Report for the Reports Tab

To demonstrate the Reports Tab use case described in "Use Cases " (on page 13), follow this example:

To create a Failure Impact Report and add it to the a Reports Tab:

1. Create the failure impact report definition.

   Follow the procedure described in "Creating a Report Definition " (on page 21) with the following inputs:

Parameter	Definition
Name	Failure Impact
Description	Summary of Business Service Failure Impact Status

2. Create the Failure Impact data set.

   For details, see "Example: Failure Impact Data Set " (on page 54).

3. Create the Failure Impact Report layout.

   For details, see "Example: Failure Impact Report Layout " (on page 55).

4. Deploy the Failure Impact Report to HP EM.

   For details, see "Deploying a Report to HP EM " (on page 49).

5. Add the Failure Impact Report to the HP EM Reports Tab.

   For details, see the "Custom Birt Reports" section of the *HP Enterprise Maps User Guide*.

   Select **Failure Impact** from the list.

Example: Failure Impact Data Set

To demonstrate the reporting tool use case described in "Creating a Data Set " (on page 21), follow this example.

To create the Failure Impact data set:

1. Follow the procedure described in "Creating a Data Set " (on page 21) with the following inputs.
2. In the New Data Set dialog box, input the following parameters:

Parameter	DQL Option	SQL Option
Data Set Name	Failure Impact	
Data Source	dqlDatabase	Database
Data Set Type	DQL Select Query	SQL Select Query

3. Use the filter to only display the data that you want to use.

   For SQL queries, all standard tables in HP EM begin with RYGA.

4. Use Available Items to explore the data and identify the tables and columns you need for your query.

   For this report all the information required is for business services:

   - For DQL, artifact type **businessServiceArtifact**.
   - For SQL, table **RYGA_BSNSERVICE**.

5. Construct your query by typing in the query input area and dragging and dropping items from **Available Items**.

   For this report the DQL query is:

   ```
   select bs.criticality.name as "Failure Impact Status",
   count (bs.criticality.name) as "No. of Services"  from
   businessServiceArtifact bs  group by bs.criticality.name
   ```

   For this report the SQL query is:

   ```
   select RYGA_BSNSERVICE.CRITICALITY_NAME as "Failure Impact Status",
              count(RYGA_BSNSERVICE.CRITICALITY_NAME) as "No of
   Services"  from RYGA_BSNSERVICE  group by RYGA_
   BSNSERVICE.CRITICALITY_NAME
   ```

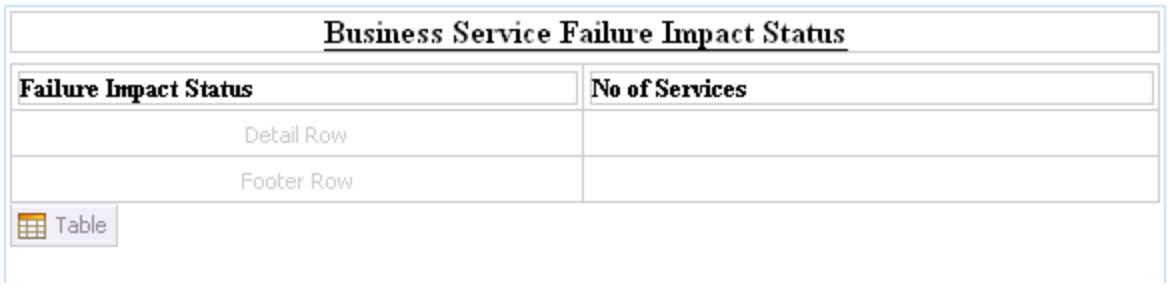
6. Click **Finish** to complete your query and view the Output Columns for the data set.
7. Click **Preview Results** to view the actual data in your database.
8. Click **OK** and press **Ctrl+S** to save the data set as part of the report.

Example: Failure Impact Report Layout

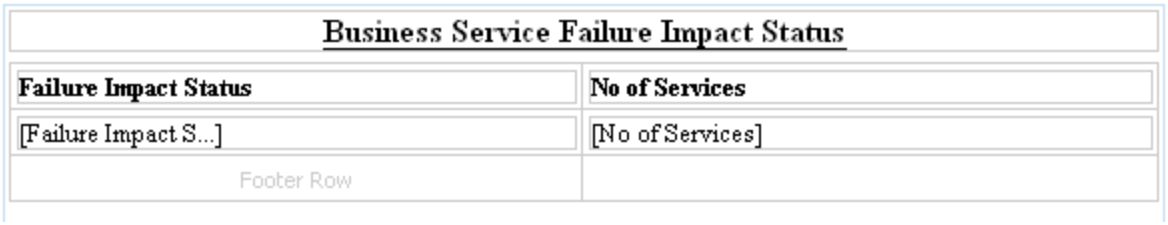
To demonstrate the reporting tool use case referred to in "Designing a Report Layout " (on page 22), follow this example.

To Create the Layout of the Failure Impact Report:

1. In the failure_impact.rptdesign editor view, right-click and select **Insert>Label**.
2. Type the report heading **`Business Service Failure Impact Status`**.
3. Use the Property Editor view to change the format of the heading.
4. In a blank area of the failure_impact.rptdesign editor view, right-click and select **Insert>Table**.
5. Input the table parameters and select the data set. In this case, 2 columns and the **Failure Impact** data set.
6. Select the left column header row, right-click and select **Insert>Text**. Input column header **`Failure Impact Status`**, and then click **OK**. Repeat for the right column header, **`No of Services`**.



7. In the Data Explorer, expand **Data Sets>Failure Impact**.
8. Drag **Failure Impact Status** from the Data Explorer to the left detail cell. Repeat for **No of Services** and the right detail cell.



9. In a blank area of the failure_impact.rptdesign view, right-click and select **Insert>Chart** to open the New Chart dialog box.
10. This report requires a pie chart, select **Pie Chart**, and then click **Next**.
11. Under Select Data Set, select **Use Data Set** and **Failure Impact** from the drop-down list.
12. Drag **Failure Impact Status** from **Data Preview** to the **Category Definition** input.
13. Drag **No of Services** from **Data Preview** to the **Slice Size Definition** input.
14. Click **Next** to format the chart appearance.
15. Select **Chart Area**, amend **Chart Title** to `Business Service Failure Impact Status`, and then click **Finish** to add the chart to the report definition.
16. Drag the chart area outline to the size you require, and then press **Ctrl+S** to save the report definition.
17. Select the **Preview** tab to view the report with data from your data source.

Dialog Boxes

Each Report Editor input dialog is described in the following sections:

- "Build Extension Wizard " (on page 57). Creating a report extension.
- "New Data Set " (on page 57) Creating a new data set.
- "New Report Project Wizard " (on page 57) Creating a new report project.

Build Extension Wizard

Enter general parameters for the report extension.

Option	Definition
Name	The name of the reporting extension.
Description	A description for the reporting extension.
Include library in extension	Select this check-box if you want to include the default library in the extension.
Folder	The location of the reporting extensions folder.
Filename	The filename of the reporting extension.

New Data Set

Enter a name, then enter a source and type for the new data set.

Parameter	Definition
Data Set Name	Input a name for the data set.
Data Source	Select the data source from the drop-down list. The selection of a DQL or SQL datasource determines the exact query language required for your query.
Data Set Type	Choose one of the options from the drop-down list: • Select Query • Stored Procedure Query

New Report Project Wizard

The New Report Project Wizard consists of the following stages depending on the options you select:

1. "New Report Project Wizard: New Server " (on page 58)
2. "New Report Project Wizard " (on page 57)

New Report Project Wizard: Default Library Configuration - Create a new data source

Configure the new data source and specify your login credentials.

Parameter	Definition
Server URL	The location of the HP EM server.
Server Username	Your HP EM login.
Driver Class	Automatically filled with the corresponding data base name on the server.
Database Username and Password	Your database credentials.
Database Schema	The database schema name.
Manage Drivers	Add, delete, or restore JAR files, and edit drivers.
Test Connection	Test the server connection using the specified parameters.

New Report Project Wizard: New Server

Create a new server for the project and optionally specify your authentication credentials.

Parameter	Definition
Name	The name of the server to display in the report editor.
URL	The location of the HP EM server.
Username and Password	Credentials for access to the HP EM server.
Save credentials	Select to store the input credentials.
Validate connection	Select to validate the server connection. The HP EM server must be running to validate.

Troubleshooting

This appendix describes some common problems and their resolutions:

- "Workbench Looks Different from the Pictures in the Documentation " (on page 60)
- "The Platform Perspective is Missing Views " (on page 59)
- "Incomplete Table List " (on page 59)
- "Oracle Developer Queries Cause Errors in Workbench " (on page 59)
- "Workbench Displays Scrambled Table Names " (on page 60)
- "The Report Result does not Appear " (on page 59)

Incomplete Table List

Problem

The list of tables is incomplete. Workbench limits the number of schemas and tables accessed for performance reasons.

Solution

Change the settings, as described in "Changing the Data Collection Settings " (on page 42).

The Platform Perspective is Missing Views

Problem

There are views missing from the Platform perspective. The most likely reason for this is that some of the views are closed.

Solution

Reset the perspective:

- From the menu, select **Window>Reset Perspective**.

The Report Result does not Appear

Problem

The report result is not deployed to the HP EM server.

Solution

Check the report result:

1. In your browser, navigate to the latest report instance page. For example, `https://hostname:port/reporting/reports/service_portfolio/documents/1/?alt=text/plain`.
2. Check the following status elements:
   - `<category label="finished" scheme="urn:com:systinet:reporting:execution:status" term="finished"/>`
   - `<category label="report document" scheme="urn:com:systinet:reporting:kind" term="urn:com:systinet:reporting:kind:document"/>`

   A correctly finished report contains the *`finished`* value.

If the report execution does not finish, check the JMS settings, JMS queue, or the reporting service logs to analyze the bottleneck.

Oracle Developer Queries Cause Errors in Workbench

Problem

Workbench returns errors for imported queries. The most likely reason is that your table names do not include the schema.

Solution

Include the schema name in the **FROM** clause of your query. For example, `soadb.ry_docrel`.

SQL Error on Report Previews

Problem

When viewing the Preview page of a report, the following SQL error is shown:

```
ReportDesign (id = 1):
+ Cannot get the result set metadata.
SQL statement does not return a ResultSet object.
SQL error #1: Invalid column name ROWNUM
```

This error occurs because the Preview is not aware of the database type that the query is applicable to.

Solution

Check the database type parameter:

1. In the Preview page, click **Show Report Parameters**.
2. Verify that the database-type parameter matches the database you use.

Workbench Looks Different from the Pictures in the Documentation

Problem

Workbench does not look exactly as depicted in the user documentation. The most likely reason for this disparity is that you are in the wrong perspective.

Solution

Switch to the Platform perspective:

- From the menu, select **Window>Open Perspective>Platform**.

Workbench Displays Scrambled Table Names

Problem

The tables names are unreadable. These are most likely to be deleted tables stored in Oracle 10gR2.

Solution

Either change the maximum number of tables to 3000, as described in "Changing the Data Collection Settings " (on page 42), or purge the deleted tables.

To purge deleted tables:

1. Log on to the sqlplus ot isqlplus console as the system user.
2. Enter the following commands:
   - **PURGE RECYCLEBIN**
   - **PURGE DBA_RECYCLEBIN**