NetIQ® Identity Manager

Administrator's Guide to Identity Reporting and Identity Manager Data Collection Services

February 2017

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About this Book and the Library

The *Identity Reporting Administrator Guide* describes the reporting functionality for Identity Manager and how you can use the features it offers, including user interface and custom report definitions. For installation instructions, see the Setup Guide for your platform at Identity Manager documentation website (https://www.netiq.com/documentation/identity-manager-47/).

Intended Audience

This book provides information for individuals responsible for understanding administration concepts and implementing a secure, distributed administration model.

Other Information in the Library

For more information about the library for Identity Manager, see the Identity Manager documentation website.

About NetIQ Corporation

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Our Viewpoint

Adapting to change and managing complexity and risk are nothing new

In fact, of all the challenges you face, these are perhaps the most prominent variables that deny you the control you need to securely measure, monitor, and manage your physical, virtual, and cloud computing environments.

Enabling critical business services, better and faster

We believe that providing as much control as possible to IT organizations is the only way to enable timelier and cost effective delivery of services. Persistent pressures like change and complexity will only continue to increase as organizations continue to change and the technologies needed to manage them become inherently more complex.

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1 Exploring Identity Reporting

Identity Reporting generates reports that show critical business information about various aspects of your Identity Manager configuration, including information collected from Identity Vaults and managed systems such as Active Directory or SAP. Identity Reporting provides a set of predefined report definitions you can use to generate reports. In addition, it gives you the option to import custom reports defined in a third-party tool. The user interface for Identity Reporting makes it easy to schedule reports to run at off-peak times to optimize performance.

NOTE: For details about the predefined reports, see *NetIQ Identity Reporting: User's Guide to Running Reports*.

The core of Identity Reporting is the *Identity Information Warehouse*, an intelligent repository of information about the actual state and the desired state of the Identity Vault and the managed systems within an organization. By querying the warehouse, you can retrieve all the information you need to ensure that your organization is in full compliance with relevant business laws and regulations. The warehouse gives you a 360-degree view of your business entitlements, providing the knowledge you need to see the past and present state of authorizations and permissions granted to identities in your organization. With this knowledge, you can answer even the most sophisticated Governance Risk and Compliance (GRC) queries.

The Identity Information Warehouse uses the following drivers to collect data about an organization:

- Data Collection Service Driver
- Managed System Gateway Driver

The Data Collection Service Driver uses a push model to collect data about changes made to user accounts, roles, resources, group memberships, and other objects in the vault. The Managed System Gateway Driver can pull information from any managed system that has been enabled for data collection in Identity Manager, as long as it supports entitlements. In addition to maintaining data about identities that are under the full control of the Identity Manager engine, the Identity Information Warehouse collects data about identities that the engine does not manage.

Identity Reporting provides several open integration points. For example, to collect data about third-party applications that are not connected to Identity Manager, you can implement a custom REST endpoint to collect data from these applications. In addition, you can customize the data that the Identity Vault sends to . To do this, you add a filter to the Data Collection Service Driver to add custom objects or attributes, causing these additional pieces of information to be stored in the warehouse. When this data is available, you can write custom reports to see the information.

NOTE: The Data Collection Services page can be accessed directly from the Identity Application user interface from this release onwards. Data Collection Services (DCS) will not be a part of the Reporting (IDMRPT) page from this release onwards.

Components for Identity Reporting

Identity Reporting has the following components:

Component	Description
Identity Reporting	Browser-based application that generates reports by making calls to the Reporting Service.
Predefined Reports	Set of predefined report definitions you can use to generate reports. You can also import custom reports you define in a third-party tool. For details about the predefined reports, see *NetIQ Identity Reporting: User's Guide to Running Reports*.
Report Packaging Tool	Facilitates the process of creating new reports. You can customize reports in iReport and use the Report Packaging Tool to package them for use within Identity Reporting. For more information, see "Starting the Report Packaging Tool" on page 54.
Reporting Service	Service that retrieves the data needed to generate reports from the Identity Information Warehouse, which contains all report management information (such as report definitions and schedules), database views, and configuration information required for reporting To produce reports, the Reporting Service invokes the JasperReports engine, which compiles and executes report definitions according to schedules that the Report Administrator defines.
Identity Information Warehouse	Repository for the following kinds of information: ◆ Report management information (such as report definitions, report schedules, and completed reports), database views used for reporting, and configuration information. This information is stored in tables within the `idm_rpt_cfg` schema. ◆ Identity data collected by the Managed System Data Collector, IDM Event-Driven Data Collector, and Application Collector. This data is stored in tables within the `idm_rpt_data` schema. ◆ Auditing data, which includes events that the Sentinel Log Management for IGA collects and are stored in the public schema within the warehouse The Identity Information Warehouse stores its data in the Security Information and Event Management (SIEM) database.

Component	Description
Managed System Gateway Driver	Driver that collects information from managed systems. To retrieve the managed system data, the driver queries the Identity Vault. The driver retrieves the following information: ◆ List of all managed systems ◆ List of all accounts for the managed systems ◆ Entitlement types, values, and assignments (groupings), and user account profiles for the managed systems
Security Service	Service that controls access to all other services within Identity Reporting. The Security Service includes these key components: ◆ A **stand-alone authentication service** that provides several functions through REST, including programmable authentication, token validation, token expiration notification, and attribute retrieval for an identity. ◆ An **authentication module within the core service** that performs internal functions such as performing authentication within the scope of the core service and retrieving additional identity attributes. ◆ An **authorization module within the core service** that controls what an authenticated user can do with reporting resources. This module defines access control policies for resources and determines the permissions based on attributes of the authenticated user, access control policy, and the resource being accessed.
Sentinel Log Management for Identity Governance and Administration	Captures log events associated with actions performed in several NetIQ products, including Identity Reporting, the identity applications, and the Identity Vault. These events are stored in the public schema within the warehouse. You have the option to create a Sentinel link. For information about setting up the Sentinel link, see Sentinel Link Overview Guide.
Identity Vault Data Sources	Repositories for identity information. Identity Reporting allows you to report on state information in the Identity Vault, such as which users have been provisioned with particular resources, or which users have been assigned to particular roles. You can report on current and past data from the Identity Vault. The **Identity Vault Data Sources** page allows you to specify which Identity Vaults you want to report on, and provide information about where Identity Reporting can find these vaults. You can include data sources for one or more Identity Vaults on the **Identity Vault Data Sources** page.

Component	Description
Managed Systems and Applications	A system in an enterprise that is connected to the Identity Vault with an Identity Manager driver. Identity Reporting allows you to report on state information about the managed systems. For example, the reports allow you to determine that a particular user known to the Identity Vault exists in Active Directory. Identity Reporting allows you to report on current and past data from managed systems.

Basic Setup and Configuration

The prerequisites and configuration for installing Identity Reporting are described in "Considerations for Installing Identity Reporting Components" in the *NetIQ Identity Manager Setup Guide for Linux*.

Working in Identity Reporting

Identity Reporting requires a Web browser to present information and allow users to perform actions quickly and easily.

How styles are rendered: Identity Reporting uses a set of default styles to control the appearance of the user interface. However, you can provide your own styles to customize the interface. The reporting client WAR supports customization through a file called `custom.css`. It looks for this file in a directory called `novl_rpt_custom` within the home directory of the user that started the application server on the server where the application server is running. For example, with a SLES install, this would be `root`, so the home directory is `/root`. If that file exists, the reporting client uses it to override any styles for the reporting user interface.

To customize the user interface using the `custom.css` file:

1. Create a new directory in the home directory of the user running the server.

   For example, if you are running as `root`, run the following command:

   ```
   mkdir /root/novl_rpt_custom
   ```

2. Add your `custom.css` file to the novl_rpt_custom folder created in Step 1.
3. If the application server is already running, refresh your browser to see the changes. Otherwise, restart the application server and clear the cache from your browser.

You can determine whether the file can be found by entering the following URL:

```
http(s)://[report.server]:<port>/IDMRPT/custom/custom.css
```

How the Back button functions: In Identity Reporting, the **Back** button takes you to your previous application or to the last Web site you loaded, not to the last page you visited within Identity Reporting. All navigation within Identity Reporting takes place within the initially loaded page.

Security Considerations

This section describes security considerations to be aware of when working with Identity Reporting.

Authentication Token Exposure

On Windows, the authentication token used for login operations is exposed as a URL parameter in the Internet Explorer address bar when users open PDF files for reports. This happens because the browser handles links to PDFs instead of JavaScript handling the links.

Do not copy and paste links to report PDFs. If the token has not yet expired and the user has not logged out, the link receiver, who might not be a legitimate user, is able to access Identity Reporting by using the token given to the legitimate user.

IMPORTANT: Do not try to copy and send links within Identity Reporting, because this action might potentially expose your login information.

Installation

Identity Reporting is a component of Identity Information Warehouse (the Warehouse). The installation process for Information Warehouse includes all components needed for the application:

- NetIQ Identity Reporting
- Identity Manager Managed System Gateway Driver (MSGW driver)
- Identity Manager Data Collection Service Driver (IDM DCS driver)
- Identity Manager Data Collection Service
- NetIQ Sentinel Log Management for IGA

For installation information, see "Installing Identity Manager " in the *NetIQ Identity Manager Setup Guide for Linux*.

Accessing Identity Reporting

You can launch Identity Reporting from the identity applications or access it directly from a browser.

By default, Identity Manager uses One SSO Provider (SSO) for single sign-on access to Identity Manager components. When you install Identity Reporting, you specify the basic settings for user authentication. However, you can also configure the OSP authentication server to accept authentication from the Kerberos ticket server or SAML IDP. For example, you can use SAML to support authentication from NetIQ Access Manager.

- "Launching Identity Reporting from the Identity Manager Applications Page" on page 16
- "Starting Identity Reporting Directly with a URL" on page 16

NOTE: To access Identity Reporting, LDAP users must be a Report Administrator and be able to read all the attributes in their own user object. Therefore, grant the user read trustee rights to the user's own `nrfMemberOf` attribute.

Launching Identity Reporting from the Identity Manager Applications Page

The Applications page of the identity applications includes a link to Identity Reporting for all Identity Manager users and administrators. Log in to the identity applications using the OSP login as a Report Administrator. You can access the Applications page with any supported Web browser, from either a computer or a tablet. For more information, see Technical Information for Identity Manager page.

Starting Identity Reporting Directly with a URL

To access Identity Reporting and Data Collection Services directly, open a Web browser and go to the address (URL) for the module (as supplied by your system administrator). The URL will follow this pattern:

```
http(s)://server:<port>/IDMRPT/
```

Exploring Identity Reporting

After you log in, Identity Reporting shows a left navigation menu that provides access to various pages that let you perform reporting actions. To navigate to a particular page, click the menu item for the page you want to view.

The following menu choices are available:

- *Overview* (which is open by default)

  To learn about this tab and how to work with it, see "About the Overview Page" on page 17.
- *Repository*

  To learn about this tab and how to work with it, see "Managing the Report Repository" on page 19.
- *Import*

  To learn about this tab and how to work with it, see "Using the Import Page" on page 25.
- *Calendar*

  To learn about this tab and how to work with it, see "Using the Calendar Page" on page 26.
- *Reports*

  To learn about this tab and how to work with it, see "Using the Completed and Running Reports Page" on page 31.
- *Settings*

  To learn about this tab and how to work with it, see "Configuring Settings and Data Collection" on page 34.
- *Data Sources*

  To learn about this tab and how to work with it, see "Configuring Settings and Data Collection" on page 34.

Getting Help

While working in Identity Reporting, click the **Help** link to display the online version of this guide.

Token Timeout

Instead of timing out when a user session is idle, Identity Reporting implements a token timeout strategy to manage user logins. The token associated with each user login times out automatically after a specified period of time, regardless of what the user does. After a token timeout occurs, Identity Reporting preserves the user's data. The user can log in again and resume work without losing any data.

The administrator can set the token timeout value at installation time or configure it later by using the post-installation utility provided with Identity Reporting.

The token timeout feature reduces the risk that an unauthorized user could impersonate a user who had previously logged in to Identity Reporting. After a timeout occurs, the token is no longer valid and cannot be reused. This is not the case with many applications that rely on a conventional session timeout mechanism, because another person can reuse the session information.

Using the Overview Page

This section provides instructions about using the **Overview** page in Identity Reporting.

- "About the Overview Page" on page 17
- "Viewing the Report Summary" on page 18
- "Searching for Report Definition" on page 18
- "Viewing the List of Recently Completed Reports" on page 18
- "Viewing the List of Scheduled Reports" on page 18
- "Viewing the Configurations" on page 18

About the Overview Page

The **Overview** page is the first page you see when you log in to Identity Reporting. This page provides an overview of the data in the system. The top of the page includes summary information, such as the number of report definitions and the number of started, failed, and completed reports. The page also includes a search facility that provides a quick way to find report definitions by name.

Below the report summary area, the page shows several additional sections. These sections give you a convenient way to see a list of the most recently completed reports and the reports scheduled to be run. At the bottom of the page, you can find details about Identity Reporting configuration, such as the number of Identity Vaults and non-managed applications configured, and the current setting for data retention.

Viewing the Report Summary

The top of the **Overview** page provides a summary count of the number of report definitions, reports generated today, and completed reports in the system at the current time.

To see a list of the report definitions on the **Repository** page, click the text that shows the summary count (for example, **17 Report Definitions**).

To see a list of the completed reports on the **Completed and Running Reports** page, click the text that shows the count (for example, **64 completed reports**).

Searching for Report Definition

1. Type a search string in the **Search report definitions** text field.

   For complete details about entering a search string, see "Searching for Report Definition" on page 24.

2. Click **Go**.

   The interface displays the **Repository** page with a list of the reports that satisfy your search criteria.

   You can clear the current search criteria and refresh the display by clicking **Overview** on the left navigation menu, or by clearing the **Search report definitions** field and clicking the **Go** button again.

Viewing the List of Recently Completed Reports

The **Recently Completed Reports** section of the page lists the reports that finished most recently.

To open the generated PDF (or CSV) file for a particular report in the list, click the text that shows the report name (for example, **Resource Assignments by Resource - 10/1/2010 3:04 PM**).

Viewing the List of Scheduled Reports

The **Upcoming Reports** section of the page lists the next five reports that are scheduled to run.

To see a particular scheduled report on the **Calendar** page, click the text that shows the schedule date for the report (for example, **Scheduled on 5/6/2017**).

Viewing the Configurations

The **Configurations** section of the page shows all of the managed systems and Identity Vaults that have been configured for the reporting system, as well as the retention period specified for the collected data and the date that the data was last collected.

To see the settings for the configured Identity Vaults on the **Identity Vault Data Sources** page, click the text that shows the number of vaults configured (for example, **1 Identity Vault(s))**. To see the settings for the non-managed applications, click the text that shows the number of applications configured (for example, **0 configured Applications**).

Managing the Report Repository

This section provides instructions about managing the **Repository** in Identity Reporting page.

- "Viewing the Report Definitions" on page 19
- "Modifying a Report Definition" on page 19
- "Creating a Custom Report Definition Based on an Existing Definition" on page 23
- "Running a Report on Demand" on page 23
- "Deleting a Report Definition" on page 23
- "Performing Bulk Actions" on page 23
- "Searching for Report Definition" on page 24
- "Sorting the List of Reports" on page 25

Viewing the Report Definitions

When you click **Repository** in the left navigation menu, the Repository shows the list of reports that have been imported into Identity Reporting.

For each report definition, the list shows the report name and description, as well as any tags that have been specified for the report. The reports that ship with the product include one version with both historical and current state information and one version with only current state information. The reports that include only current state information include "Current State" in the report name.

The Repository includes a special report called **Template**. This report is included as a subreport within other reports added to the system. It displays a header and footer in any report with which it is included. You cannot delete this report and you should not run it by itself. In addition, this report does not show a check box next to it in the list, because it cannot be included in bulk actions. When you edit the **Template** item, you do not see the **Output Format**, **Default Notifications**, **Schedule**, and **Run Now** controls.

Identity Reporting ships with a set of predefined reports. Import these into . After you import them, the reports are included in the list on the **Repository** page. You can define a new report by copying one of the predefined report definitions and giving it a new name.

For details about the predefined reports, see NetIQ Identity Reporting: User's Guide to Running Reports.

You cannot create a new report from scratch on the **Repository** page. To create a new report definition from scratch, design the report layout outside of Identity Reporting, and use the Import facility to import the report into Identity Reporting.

Identity Reporting stores all report definitions, report schedules, and completed reports in the Identity Information Warehouse. These objects are stored in tables within the `idm_rpt_cfg` schema in the SIEM database.

Modifying a Report Definition

1. Click the name of the report definition in the list on the **Repository** page.

Alternatively, you can mouse over the report definition (or select the check box beside the name) and click **Edit**.

When you edit a report definition, a page displays to allow you to make changes to the definition.

The fields at the top of the page allow you to modify the name, description, tags, comments, and output format (PDF or CSV) for the report. Use tags to organize reports according to common words or phrases that suggest how the reports are related. Tag names share a common namespace for all users, so specify tag names that make sense for all users. Tag names cannot be localized.

You can specify one or more tags for a report definition. If you specify multiple tags, separate them with commas. Defined tags are shown in the list displayed on the **Repository** page, and in the Detail dialog box for a report listed on the **Completed and Running Reports** page. In the list displayed on the **Repository** page, the tags are alphabetized to allow for sorting.

NOTE: The next time you edit the report definition, the tags appear in alphabetical order, regardless of how they were originally entered. The tags are also alphabetized in the **Repository** list, even if you did not alphabetize them when you first entered them.

The other fields on the page are organized into the following sections:

- **Criteria**
- **Default Notifications**
- **Schedule**

2 To edit the criteria for the report, open the **Criteria** section and make changes as necessary.

The **Criteria** section does not appear unless the imported definition included one or more report parameters.

The number of fields displayed in the **Criteria** section and the way these fields behave depend on how they were specified in the original report definition object imported into Identity Reporting.

Identity Reporting supports the following data types for criteria fields:

- String
- String with Options
- Date
- Integer
- Boolean
- Lookup

The control displayed for each data type varies depending on how the parameter is defined in the report definition. For multivalued options, a multi-select control is displayed, but a single value control is displayed for a parameter that only accepts a single value.

Some criteria fields are required by the report definition, but others are optional. If you do not provide a value for a required field, the user interface displays an error message.

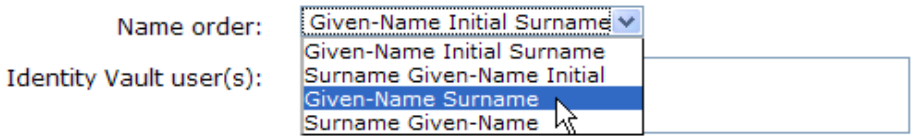
The following criteria parameters are available with most of the reports installed with Identity Reporting:

Parameter	Description
Data Source	Defines the data source on which you want to report. This parameter is required for all reports. To run a report on multiple data sources, copy the report and then select the desired data source when you define the report criteria for the copied reports. For information about copying a report, see "Creating a Custom Report Definition Based on an Existing Definition" on page 23. For a data source to be available for reports, you must first add it on the **Data Sources** page. For more information, see "Managing Data Sources" on page 34.
Language	Defines the target language for the report.
Date Range	Allows you to define a range of dates for the data included in the report. The following choices are available: ◆ Current Day ◆ Previous Day ◆ Week to Date ◆ Previous Week ◆ Month to Date ◆ Previous Month ◆ Custom Date Range
From Date	Allows you to specify a fixed start date for the report data. This parameter is only enabled if you selected **Custom Data Range** for the **Data Range** parameter.
To Date	Allows you to specify a fixed end date for the report data. This parameter is only enabled if you selected **Custom Data Range** for the **Data Range** parameter.
Limit Results	Controls the maximum number of rows that will be included in the report data.

If a report definition includes one or more fields for defining dates, such as **Date Range**, **From Date**, and **To Date**, be aware that the date range you specify affects the data returned with the report, not the dates on which the report is run. Therefore, if a report is run monthly, do not define a custom date range that fixes the dates in the **From Date** and **To Date** fields. It does not make sense for a monthly scheduled report to report on a fixed date range (such as 3/10/2017 - 3/17/2017). To report on a fixed date range, schedule the report to run only once. For a monthly report, use one of the relative date range settings included in the **Date Range** field, such as **Month to Date**. This ensures that the data in the report is updated each month.

Some criteria fields support automatic completion, which allows you to type several characters and then select an item from a list of possible choices. For example, an **Identity Vault user(s)** field might allow you to type the first few characters of a user's name and then select the user from a list of users whose names contain the characters you have typed.

Some reports allow you to define the display name order used by other criteria fields that support the auto complete feature. For example, a report definition might include a **Name order** field that lets you specify the name order pattern used for the **Identity Vault user(s)** criteria field. The **Name order** field allows you to select one of the following name order patterns:



3 To edit the e-mail settings associated with the report definition, open the **Default Notifications** section and make changes as necessary.

4 To add a new schedule for the report definition, click the **Add** button on the far right side of the **Schedule** section.

- **4a** Provide a name for the schedule in the **Schedule Name** field.

  The name for a schedule must be unique within the report definition, but does not need to be unique within Identity Reporting as a whole.

- **4b** (Conditional) If you want the name of the report definition to be added to the beginning of the schedule name, select the **Prepend Report Definition Name** field.

  This option allows you to see which report has been scheduled with each schedule instance in the **Calendar** page. This option is enabled by default.

- **4c** Click in the **Start Date** field to display a simplified calendar for selecting dates.

- **4d** Select the date in the calendar on which you want to initiate the first run of the report.

- **4e** Select the approximate time of day for each run in the **Time of day** field. The time of day is based on the clock on the server where the report is executed. The actual execution time depends on server activity.

- **4f** In the **Frequency** field, type the repeat interval (a number that specifies how often the report will run) and select the time period for report runs, such as Month(s), Week(s), or Day(s).

- **4g** Click in the **End date** field to display the calendar. Select the date in the calendar after which no more runs should occur. Note that the last report run may not actually occur on this date. For example, if you choose October 15 as the start date, and specify a repeat interval of two weeks and an end date of November 1, the report will be run on October 15 and October 29. In this case, October 29 is the last run.

- **4h** If you want Identity Reporting to execute a data collection procedure prior to report generation, select the **Attempt data collection before scheduled run** check box.

  The report runs at its scheduled time, regardless of whether the data collection completed successfully.

5 To edit an existing schedule, open the **Scheduled Run** section for the schedule you want to edit and make any changes you like.

6 To save the report definition and schedule, click **Save**.

7 To queue a report to run immediately, click **Run Now**.

Creating a Custom Report Definition Based on an Existing Definition

To create a new report definition by making a copy of an existing report definition, mouse over the report definition (or select the check box next to the name) and click **Copy**.

The interface displays the report definition editing page with a message indicating that the new report was created. The name of the new report definition has a number appended to the name of the original report used for the copy operation.

After the editing page appears, you can make changes to the definition just as you would to any other report definition in the repository. Because the default report name is not very informative, change the name to something more meaningful.

Running a Report on Demand

To queue a report to run immediately from the Repository list view, mouse over the report definition (or select the check box next to the name) and click **Run Now**.

Startup process requires extra time before reports can be generated When you first start Identity Reporting, wait 5 minutes before running a report. The startup process consumes a lot of memory, leaving less memory for the report generation. If you do not wait 5 minutes, you might encounter memory errors.

Deleting a Report Definition

To delete a report definition, mouse over the report definition (or select the check box next to the name) and click **Delete**.

Performing Bulk Actions

To run (or delete) several reports at once:

1 Select the check box to the left of each report definition you want to run or delete.

2 Select the operation (**Run Now** or **Delete**) in the **Bulk Actions** drop-down list.

3 Click **Apply**.

Bulk actions apply to the current page only. If you select several items on one page, then navigate to the next page to select some additional items, a subsequent attempt to perform a bulk action such as **Run Now** or **Delete** only applies to the second set of items you selected. The previous selections are retained and still appear selected if you navigate back to the first page. However, the bulk action is not performed on these items.

Searching for Report Definition

To search for a report definition in the Repository:

1 Type a search string in the **Search** text field.

The search facility allows you to pass in search strings for any of the following items:

Filter Value	Description
Name	Performs a contains search. The search is case insensitive, and it uses the locale of the user.
Description	Performs a contains search. The search is case insensitive, and it uses the locale of the user.
Tags	Performs an exact string search. The search is case insensitive. Pass in a single tag only.

You can enter one or more words in the **Search** field, with or without quotes:

- If you enter multiple words without quotes, the search results include reports that contain all of the words anywhere in the Name or Description, or that have all of the words as tags (that match exactly).

  For example, suppose you enter the following:

  ```
  identity users
  ```

  In this case, the following report definitions are in the results:

  - Reports with a Name containing the words `identity` and `users` anywhere in the string
  - Reports with a Description containing the words `identity` and `users` anywhere in the string
  - Reports with Tags having both `identity` and `users` as exact tags

- If you enter multiple words surrounded by double quotes, the search results include reports that include the entire phrase anywhere in the Name or Description, or that have a tag that matches the entire phrase.

  For example, suppose you enter the following:

  ```
  "identity users"
  ```

  In this case, the following report definitions are in the results:

  - Reports with Name containing the phrase “identity users”.
  - Reports with Description containing the phrase “identity users”.
  - Reports with a Tag that exactly matches “identity users”.

2 Click **Search**.

You can clear the current search criteria and refresh the display by clicking **Repository** on the left navigation menu, or by emptying the **Search** field and clicking the **Search** button again.

Sorting the List of Reports

To sort the list of reports, click the header for the column on which you want to sort.

The pyramid-shaped sort indicator shows you which column is the new primary sort column. When the sort is ascending, the sort indicator is shown in its normal, upright position. When the sort is descending, the sort indicator is upside down.

Using the Import Page

The Import page lets you import report definitions into Identity Reporting. After the reports have been imported, these definitions are available for use throughout Identity Reporting. You can add scheduled runs for the imported definitions and make changes to the settings associated with the report definitions, such as the criteria, default notifications, and configuration. You can also add scheduled runs for the imported report definitions, or use the imported report to create a new report definition.

If you make changes to the Template report, you need to restart the server after importing the new definition. If you don't restart the server, your changes are not visible in Identity Reporting.

The Import Report Definitions page allows you to import a single report definition (in an RPZ file) or an archive that contains multiple report definitions (in an SPZ file). You can include multiple RPZ and SPZ files in a single import procedure.

To import a report definition:

1. Go to the NetIQ download site.
2. Download the `IDM_`*`Version`*`_Downloads.zip` file.
3. Extract the file.

   The extracted file contains the following items for each bundled report:

   - `RPZ file` containing report definition
   - Zip file containing SQL files for the supported databases and a Readme file (`Readme.html`) that outlines the instructions to run the report.
   - Additional source zip file (`src.zip`) of the report.
4. Log in to the Identity Reporting application.
5. Click Import.
6. Click **Choose file** and choose the `<Report name>_4.8.0.0.rpz`.
7. Click **Import** to begin the import procedure.

   NOTE: To overwrite an existing report, enable the **Overwrite existing reports** check box.

After importing one or more report definitions, you can see the reports and make changes to them on the Repository page.

Perform the following actions to execute the views on the database that are necessary to run the reports and populate data.

1. Unzip `<Report name>_4.8.0.0.zip` file.
2. Follow the instructions mentioned in the `Readme.html` file from the extracted file.

You can successfully be able to run the reports from the Repository screen in IDMRPT. If a report fails to run, ensure that you have correctly followed the instructions from the Readme file for the report. For example, execute SQL statements appropriate to your SQL database to update or create the required views.

NOTE: Identity Manager 4.8 reports are not published on the Download page. To import the reports, see "Using the Import Page" on page 25.

Using the Calendar Page

This section provides instructions on using the Calendar page.

- "Viewing the Calendar" on page 26
- "Checking the Status of a Schedule Instance" on page 27
- "Editing the Summary Information for a Schedule Instance" on page 27
- "Viewing a Completed Report" on page 28
- "Editing a Schedule Instance" on page 28
- "Deleting a Schedule Instance" on page 29
- "Moving a Single Schedule Instance" on page 30
- "Moving All Schedule Instances" on page 30

Viewing the Calendar

This section provides instructions for viewing the calendar.

Displaying the Calendar Page

To display the calendar, click **Calendar** in the left navigation menu.

The Calendar page shows scheduled reports, as well as reports that have been initiated with the **Run Now** button. In addition, it shows finished reports, reports that are still in progress, and reports that failed during execution. Finished reports, reports that are still in progress, and failed reports are shown with a gray background, and reports that have not been executed yet appear with a white background. All days that have already passed are shown with a gray background.

The Calendar page presents a continuous view of the calendar, rather than a simple month-by-month view. This means that the data is not separated based on calendar months. Instead, it is presented in chunks of several weeks at a time, where each row corresponds to a week. You can adjust the number of weeks displayed by setting the **Calendar Options** for the page.

The Calendar page shows scheduled runs in the user's time zone, not the server's time zone. However, scheduled runs are executed according to the server's time zone, and the time stamp on an executed report reflects the time on the server at the time of the run.

The scroll bar for the browser lets you scroll within the current view, but does not move forward to show additional weeks in the calendar.

Scrolling within the Calendar Display

To include an additional row (move forward one week) in the calendar view, press the down-arrow key.

To remove a row (go back one week) in the calendar view, press the up-arrow key.

To scroll down to the next set of weeks in the calendar view, press Ctrl+down-arrow.

You can also scroll down by clicking the **Go forward** icon.

Alternatively, you can use the mouse wheel to scroll weeks in the calendar view.

To scroll up to the next set of weeks in the calendar view, press Ctrl+up-arrow or click the **Go back** icon.

Viewing the Schedule for Today

When you first display the Calendar page, today's report runs are shown in the display. If you scroll away from today's schedule, you might need to return to it later. If so, click the **Today** button.

Checking the Status of a Schedule Instance

To check the status of a particular schedule instance in the calendar:, mouse over the schedule name.

If the schedule instance is still running, the Calendar shows **In Progress** under the schedule name.

If the schedule instance has completed processing, the **View** and **Delete** links appear under the schedule name.

If the schedule instance has not run yet because it is scheduled for some time in the future, the **Edit** and **Delete** links appear under the schedule name.

If the report failed during execution, only the **Delete** link appears under the schedule name.

Editing the Summary Information for a Schedule Instance

The Calendar page displays a pop-up window showing the description, status, and comments for the report, as well as the date and time on which it was run, and the name of the user who ran the report.

If the report failed during execution, the pop-up window indicates this in the status and also provides the reason for the failure.

Viewing a Completed Report

To view a generated report, click **View** under the schedule name.

When you view a report, the generated report appears in a new window. The report is shown in PDF or CSV format, depending on how the report was defined.

Editing a Schedule Instance

To edit a schedule instance for a report that has not been run yet:

1. Click **Edit** under the schedule name.

   You can also click the report schedule.

   Identity Reporting displays a page that lets you edit the report definition and schedule. The page opens to the schedule instance you selected in the Calendar page. However, you can work on a different schedule instance, or create a new one from the editing page. In addition, you can make modifications to the report definition.

   The report definition has a one-to-many relationship with schedules, which means that a report definition can have one or more schedules, but a schedule can only be associated with a single report definition.
2. To edit the settings for the schedule, scroll down to the **Schedule** section of the page and open the section for this scheduled run.
3. Make changes as necessary to the scheduled run.

Schedule Property	Description
Start date	Specifies the date in the calendar on which you want to initiate the first run of the report. This property also determines the date for all subsequent runs. You can change the start date for a schedule after it has been created, even if the calendar already includes one or more scheduled runs. If you change the start date for a schedule, all of the runs for this schedule shift to the new date.
Time of day	Specifies the approximate time of day for each report run. The time of day is based on the clock on the server where the report is executed. The actual execution time depends on server activity. The run time specified for each schedule instance is set to the hour or the half hour (for example, 1:00 AM or 1:30 PM). You can change the time of day for a schedule after it has been created. If you change the time of day, all of the runs for this schedule execute at the new time.
Frequency	Specifies the repeat interval (a number that specifies how often the report will run) and the time period for report runs: (Month(s), Week(s), or Day(s). You cannot modify the frequency for a schedule after the schedule has been created.
End date	Specifies the date in the calendar after which no more runs should occur. Note that the last report run may not actually occur on this date. For example, if you choose October 15 as the start date, and specify a repeat interval of two weeks and an end date of November 1, the report will be run on October 15 and October 29. In this case, October 29 is the last run. You can change the end date for a schedule after it has been created.
Use default notifications	Specifies the e-mail settings associated with the schedule instance.

4 Click **Save**.

Deleting a Schedule Instance

To delete a particular scheduled instance, mouse over the scheduled instance and click **Delete**.

If you delete the first run in a schedule, the Start date for the schedule is changed to the next upcoming run date. If you delete the last run, the End date for the schedule is not modified.

Moving a Single Schedule Instance

The Calendar page allows you to move a single schedule instance by dragging and dropping the item from one date to another within the calendar. However, when you move a single schedule instance, the Calendar page automatically creates a new schedule with a new name and places the moved schedule instance on the new date that you selected as a the target for the move operation.

After you have moved a schedule instance, this run is effectively deleted from the original schedule definition, and is now added to the new schedule definition. All of the text-based attributes from the original schedule instance are copied to the new schedule instance.

The name you specify for the new schedule need not be unique across all of the report definitions within Identity Reporting. However, it does need to be unique within the list of schedules for the report definition.

You cannot move a schedule instance into the past (before the current date and time) or to a day that already has a run scheduled for the same report definition.

To move a single schedule instance to a new date:

1. Select the schedule instance you want to move and drag it to the desired date.

   The **Calendar** page displays the Confirm Move Schedule dialog box.
2. Click **Move This**.
3. Specify a name for the new schedule and click **Move This**.

   The Calendar page creates the new schedule, moves the scheduled instance, and displays a confirmation message.

Moving All Schedule Instances

The Calendar page also allows you to move all of the scheduled runs for a schedule simply by dragging and dropping a particular run within the schedule from one date to another within the calendar. When you move all schedule instances for a particular schedule, the Calendar page retains the original repeat pattern specified in the **Frequency** field, but updates the start date to reflect the new date for execution of the report.

The target date for the move need not be within the original start and end period dates specified for the schedule. If you move outside the original range of the schedule, the schedule start and end dates change accordingly.

To move all of the scheduled runs for a schedule:

1. Select the schedule instance you want to move and drag it to the desired date.
2. Click **Move All**.

   The Calendar page shifts all of the scheduled runs to align with the new run date.

Using the Completed and Running Reports Page

This section provides instructions for using the Completed and Running Reports page in Identity Reporting.

- "Viewing the List of Completed and Running Reports" on page 31
- "Viewing a Completed Report" on page 31
- "Viewing the Details for a Report" on page 31
- "Deleting a Report" on page 32
- "Searching for a Report" on page 32
- "Sorting the List of Reports" on page 33

Viewing the List of Completed and Running Reports

To view a list of completed and running reports, click **Reports** in the left navigation menu.

The Completed And Running Reports page shows all reports that have completed processing, as well as reports that are still in progress or have failed during execution. The list of reports includes reports that were scheduled, as well as reports that were initiated with the **Run Now** button. For each report listed, the page shows the report name, data source on which you ran the report, description, run date, and status icon.

If a report is run multiple times very quickly (each run is within a fraction of a second of the other runs), the time format shows one or more periods after AM or PM. For example, you might see "PM." or "PM.." after the time the report was run.

Viewing a Completed Report

To view a completed report, click the **View** link below the report you want to display.

When you view a report, the generated report appears in a new window. The report is shown in PDF or CSV format, depending on how the report was defined.

IMPORTANT: You must not try to copy and send links to files within Identity Reporting, because this action might potentially expose your login information.

The **View** link is not available for reports that are still in progress or have failed.

Viewing the Details for a Report

1 Click the **Details** link below the report for which you want to see the details.

   The details are displayed in a pop-up window.

   If the report definition includes one or more parameters, a **Criteria** section is added to the page that shows the parameters.

   The fields shown in the pop-up window are not editable, because the report has already been submitted to be run.

The Run By user is the logged-in user who creates a schedule or clicks **Run Now**. If the user `cblack` creates a schedule, and then `mmackenzie` logs in and modifies the schedule, the Run By user is still the original creator, `cblack`. If `mmackenzie` moves the item by clicking **Move This**, thereby creating a new schedule, `mmackenzie` is the creator for the report generated by that one-off schedule.

2 If the report has completed processing, you can display the generated report from this window by clicking the **View** link next to the status icon at the top of the window.

   This link is not available if the report is still in progress or has failed.

3 To return to the report list, click **Close**.

   This window is non-modal, so you can continue to work outside the window while it is still open.

Deleting a Report

To delete several reports at once:

1 Select the check box to the left of each report definition you want to run or delete.

2 Select the operation (**Delete**) in the **Bulk Actions** drop-down list.

3 Click **Apply**.

Bulk actions apply to the current page only. If you select several items on one page, then navigate to the next page to select some additional items, a subsequent attempt to perform a bulk delete only applies to the second set of items you selected. The previous selections are retained and still appear checked if you navigate back to the first page. However, the bulk action is not performed on these items.

Searching for a Report

To search for a report definition:

1 Type a search string in the **Search** text field.

   The search facility allows you to pass in search strings for any of the following items:

Filter Value	Description
Name	Performs a contains search. The search is case insensitive, and it uses the locale of the user.
Description	Performs a contains search. The search is case insensitive, and it uses the locale of the user.
Tags	Performs an exact string search. The search is case insensitive. You need to pass in a single tag only.
Run By	Performs a search on the first name and last name of the creator of the schedule. The creator is the logged-in user who creates a schedule or clicks **Run Now**. If the user `cblack` creates a schedule, and then `mmackenzie` logs in and modifies the schedule, the Run By user is still the original creator, `cblack`. If `mmackenzie` moves the item by clicking **Move This**, thereby creating a new schedule, `mmackenzie` is the creator for the report generated by that one-off schedule.

You can enter one or more words in the **Search** field, with or without quotes:

- If you enter multiple words without quotes, the search results include reports that contain all of the words anywhere in the Name or Description, or that have all of the words as tags (that match exactly).

  For example, suppose you enter the following:

  ```
  chris black
  ```

  In this case, the following report definitions are in the results:

  - Reports with a Name containing the words `chris` and `black` anywhere in the string
  - Reports with a Description containing the words `chris` and `black` anywhere in the string
  - Reports with Tags having `chris` and `black` as exact tags
  - Reports with Run By having a first name or last name of `chris` and last name or first name of `black`.

- If you enter multiple words surrounded by double quotes, the search results include reports that include the entire phrase anywhere in the Name or Description, or that have a tag that matches the entire phrase.

  For example, suppose you enter the following:

  ```
  "margo mackenzie"
  ```

  In this case, the following report definitions are in the results:

  - Reports with Name containing the phrase “margo mackenzie”.
  - Reports with Description containing the phrase “margo mackenzie”.
  - Reports with a Tag that exactly matches “margo mackenzie”.
  - Reports with Run By having “margo mackenzie” as the first name and last name or last name and first name.

2. Click **Search**.

You can clear the current search criteria and refresh the display by clicking **Reports** on the left navigation menu, or by emptying the **Search** field and clicking the **Search** button again.

Sorting the List of Reports

To sort the list of reports on the Completed and Running Reports page, click the header for the column you want to sort on.

The pyramid-shaped sort indicator shows you which column is the new primary sort column. When the sort is ascending, the sort indicator is shown in its normal, upright position. When the sort is descending, the sort indicator is upside down.

Configuring Settings and Data Collection

This section provides instructions on configuring settings for Identity Reporting.

- "Defining the General Settings" on page 34
- "Managing Data Sources" on page 34

Defining the General Settings

The General Settings page allows you to define global settings that control the behavior of Identity Reporting.

1. Click **Settings** in the left navigation menu.
2. To specify how long completed reports should be retained, specify the unit of time (days, weeks, or months) and a number in the **Delete generated reports after** field.
3. To save your changes, click **Save**.

Archiving reporting data If you want to archive data in the reporting database, you need to use the archiving tools provided with PostgreSQL. For more information, see the PostgreSQL documentation (https://www.postgresql.org/docs/).

Managing Data Sources

The Data Sources page allows you to add, modify, and remove PostgreSQL and Oracle data sources on which you want to run reports. You can select data sources from a pre-defined list of installed Java Naming and Directory Interface (JNDI) data sources that the reporting server manages or define new, external Java Database Connectivity (JDBC) data sources. For a data source to be available when you run reports, you must first add it using this page.

After you add a pre-defined JNDI data source, you can use the Data Sources page to modify the display name. For JDBC data sources, you can modify the display name and the password that Identity Reporting uses to connect to the data source.

You cannot remove the pre-defined data source named `IDMRPTCfgDataSource`Identity Reporting. This is the default data source that Identity Reporting uses to run reports against the internal database.

To add a data source:

1. Click **Data Sources** in the left navigation menu.
2. Click **Add**.
3. Select the appropriate method for connecting to the data source.
   - Provide database details: Enter connection information to an external data source
   - Provide Sentinel details: Enter connection information to an Sentinel data source
   - Select from predefined list: If you are adding a pre-defined data source, select the **Identifier** from the list of source.

4 (Optional) To test whether Identity Reporting can connect to the data source, click **Test Connection**.

   A successful connection is not required to add the data source.

5 Click **Save**.

To remove a data source:

1 Click **Data Sources** in the left navigation menu.

2 Click **Remove** next to the data source you want to remove.

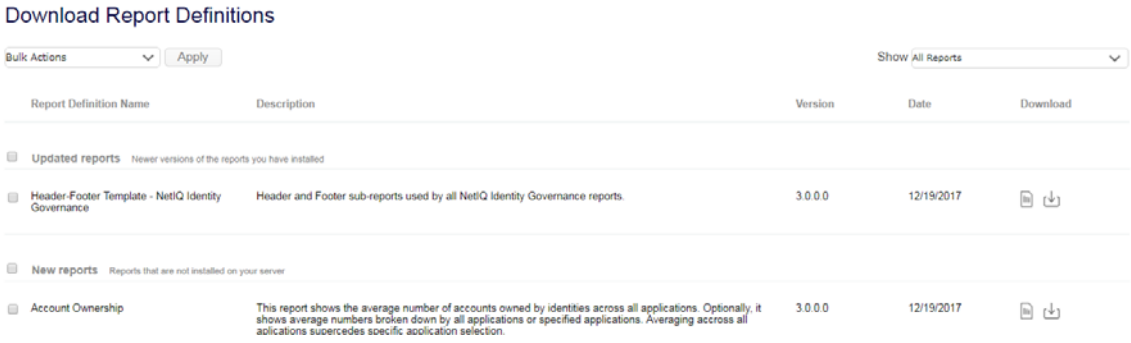
   After you remove a data source, it is no longer available for running reports.

Download Report Definitions

Identity Reporting provides the ability to download a set of predefined report definitions and Sentinel views.

1 Click **Download** in the left navigation menu.

2 Find the report definition you want to use in the list and click the icon under the **Download** heading for that report.



   To download the report definition in a `.RPZ` file, click icon:

   To download the source for a report definition in a `.ZIP` file, click icon:

3 Save the file.

After you download a report definition archive, you can import the report definition into the Repository by using the Import page. For details, see "Using the Import Page" on page 25.

For details on the predefined reports, see *NetIQ Identity Reporting: User's Guide to Running Reports*.

Setting Up a Local Repository to Download Report Definitions

You can setup your local `http` server as a local repository to store the required report definitions and then configure the repository with Identity Reporting. The advantage of using a local repository is that you can directly download the report definitions without connecting to the Internet.

1. In the local `http` server, copy the content of the required reporting definitions.

   For example, copy the content from `https://nu.novell.com/designer/idmrpt600/` to `https://<local-server-IP-address:Port>/IDM_Reports/idmrpt600`.

2. Stop the Identity Reporting server.
3. Modify the `com.netiq.rpt.download.server.url` property in the `ism-configuration.properties` file to look similar to the following:

   ```
   com.netiq.rpt.download.server.url=https://<local-server-IP-address:Port>/IDM_Reports/idmrpt550
   ```

   By default, `ism-configuration.properties` file is located at

   ```
   /opt/netiq/idm/apps/tomcat/conf
   ```

4. Start the Identity Reporting server.
5. Log in to Identity Reporting and download the configured report definitions to verify the changes.

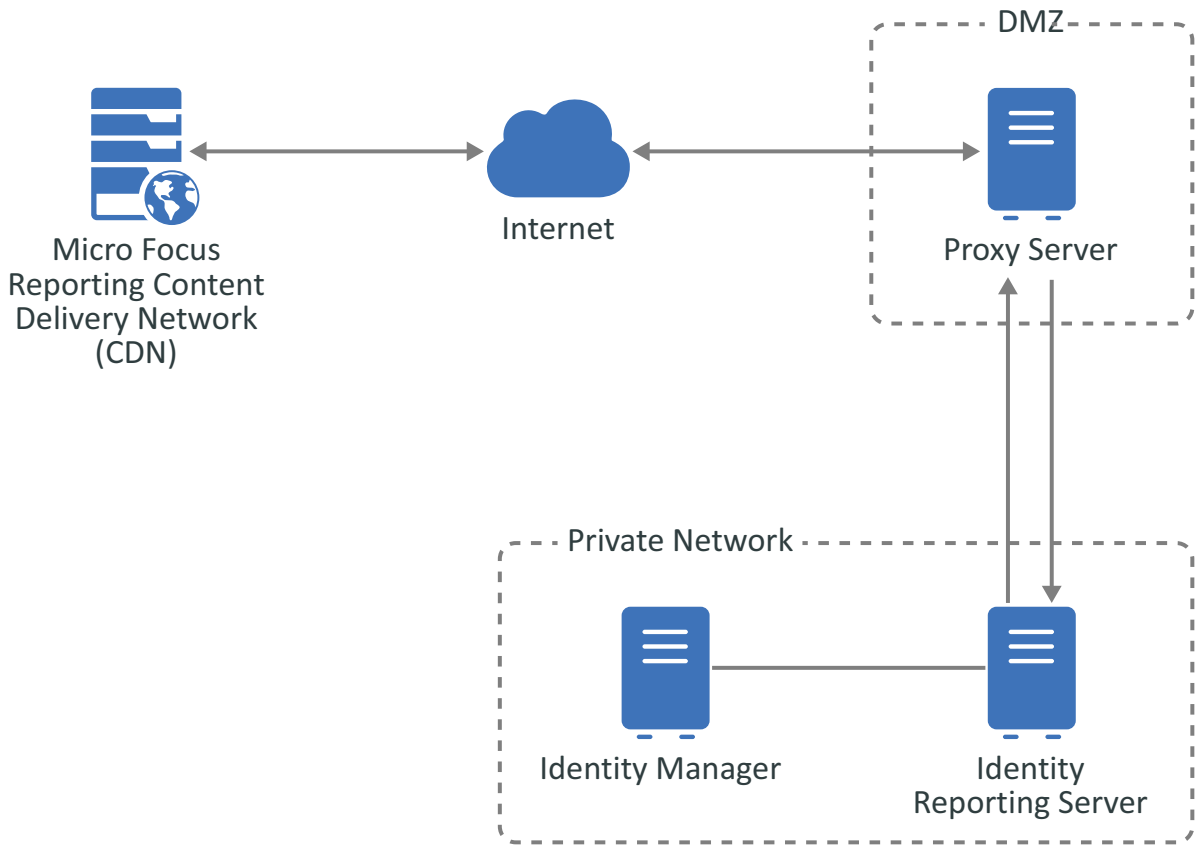
NOTE: NetIQ recommends to use Reverse Proxy Server over Local Repository for downloading reports from Identity Manager 4.8.1 onwards. For more information on configuring reverse proxy, see "Configuring the Identity Reporting Server to Use Reverse Proxy Server" on page 37.

Configuring the Identity Reporting Server to Use Reverse Proxy Server

(Conditional) This section applies only if you are using Identity Manager 4.8.1 or later versions.

You can configure Identity Reporting to use a reverse proxy server. If you do need a reverse proxy server, ensure that it is installed and configured so that it can communicate with the Identity Reporting server. This allows to isolate the Identity Reporting server from the Internet.

Figure 1-1 *Identity Reporting Server Using a Proxy Server*



You must use the Identity Manager Configuration Update utility to enable the Identity Reporting server to send the request for the Micro Focus Reporting CDN through the reverse proxy server.

To configure the Identity Reporting server to use a reverse proxy server for the updated reports requests:

1. Log in to the Identity Reporting server as an administrator user on a Windows server or as a user with root access on a Linux server.
2. From a command prompt, access the Identity Manager Configuration Update utility directory.
   - **Linux**: `/opt/netiq/idm/apps/configupdate`
   - **Windows**: `C:\netiq\idm\apps\configupdate`

3. Launch the Identity Manager Configuration Update utility.
   - **Linux**: `./configupdate.sh`
   - **Windows**: `configupdate.bat`
4. Click the **Reporting** tab.
5. In the lower left corner, click **Show Advanced Options**.
6. Scroll towards the bottom of the page and find the **Outbound Proxy** section.
7. Specify the hostname or IP address, the port, and if you are using SSL or not of the reverse proxy server.
8. Click **OK** to save the changes and the Identity Manager Configuration Update utility automatically closes.
9. Restart Apache Tomcat. For more information, see Section 3.4.3, Starting and Stopping Apache Tomcat.

NOTE: Identity Reporting 6.6 and its later versions enables you to use Reverse Proxy Server.

Customizing the Reporting Client WAR on Windows Server

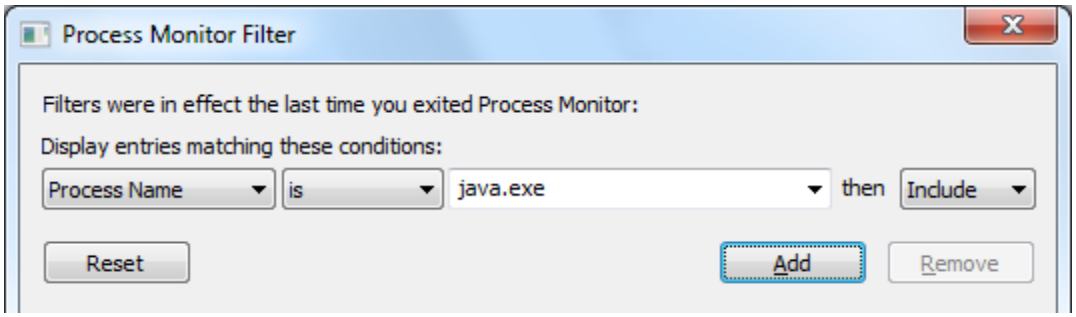
The reporting client WAR supports customization through the `custom.css` file. To customize the user interface, set the location of the `custom.css` file using the `com.netiq.rpt.css.custom.dir` property.

NOTE: The Reporting server process must have read permissions on the `custom.css` file.

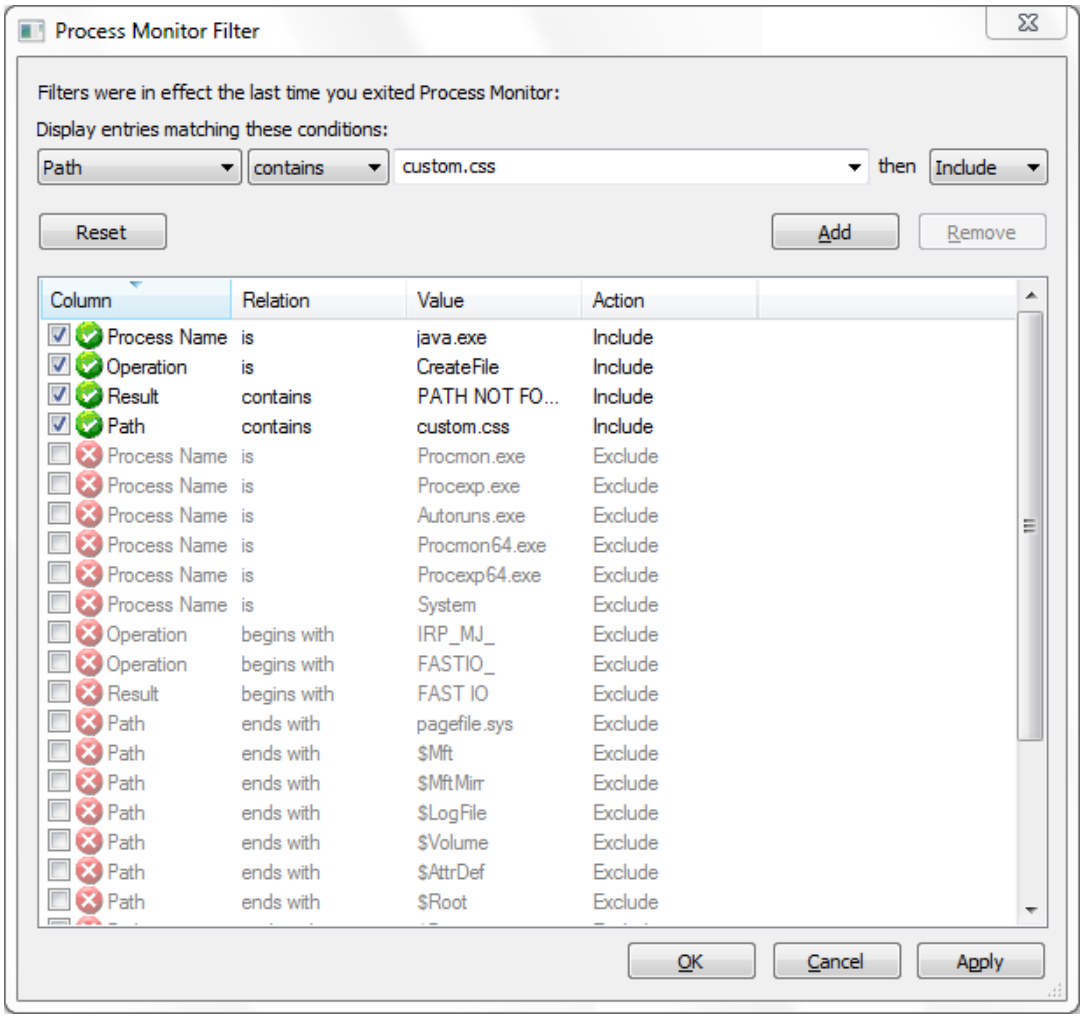
To determine where to place the `custom.css` file on Windows, use Process Monitor to set up the following filter:

- Process name: java.exe
- Operation: CreateFile
- Result contains: PATH NOT FOUND
- PATH contains custom.css

1. Download the `ProcessMonitor.zip` file from the Microsoft website to a temporary location on your computer.
2. Extract the contents of the unzipped file.
3. Navigate to the folder where you extracted the file, execute the Procmon.exe file.
4. Click the **App-V** icon to display the Process Monitor Filter page.
5. In the Process Monitor Filter page, set up the filter.
   1. Create a rule that says **Process name is jave.exe**, then click **Add**.



2. Create a rule that says **Operation is CreateFile**, then click **Add**.
3. Create a rule that says **Result contains PATH NOT FOUND**, then click **Add**.
4. Create a rule that says **Path contains custom.css**, then click **Add**.
5. Deselect the entries that are not added from the list, then click **Apply**.
6. Click **OK** to exit the Process Monitor Filter page.



6 Log in to Identity Reporting in a browser.

7 Look back at Process Monitor to see the path where your Windows system expects to see `custom.css`.

8 Create the `novl_rpt_custom` folder in this location, if needed, and copy the `custom.css` file to the folder.

9 Restart Tomcat.

2 Exploring Identity Manager Data Collection Services

The Identity Manager Data Collection Services page allows you to configure settings for the managed systems (referred to as connected systems) that you want to report, and provide information for Identity Reporting where it can find the Identity Vaults associated with these managed systems. Identity Reporting can work with data sources for one or more Identity Vaults.

NOTE: Starting from this release, access to the Data Collection Services functionality has changed. It is no longer part of the Identity Reporting page. You can directly launch it from the identity applications user interface or access it directly from a browser.

Components for Data Collection Services

The Data Collection Services has the following components:

Component	Description
Data Collection Service	Service that collects information from various sources within an organization. The Data Collection Service includes three subservices: ◆ The **Managed System Data Collector** uses a pull design model to retrieve data from one or more Identity Vault data sources. The collection runs on a periodic basis, as determined by a set of configuration parameters. To retrieve the data, the collector calls the Managed System Gateway Driver. ◆ The **IDM Event-Driven Data Collector** uses a push design model to gather event data that the Data Collection Service Driver captures. ◆ The **Application Data Collector** retrieves data from one or more non-managed applications by calling a REST endpoint written specifically for each application. Non-managed applications are applications within your enterprise that are not connected to the Identity Vault. **NOTE:** This page can be accessed directly from the Identity Application user interface from this release onwards. Data Collection Services will not be a part of the Reporting page from this release onwards.

Component	Description
Data Collection Service Driver	Driver that captures changes to objects stored in an Identity Vault, such as accounts, roles, resources, groups, and team memberships. The Data Collection Service Driver registers itself with the Data Collection Service and pushes change events (such as data synchronization, add, modify, and delete events) to the Data Collection Service. The information that the driver captures records changes to these objects: ◆ User accounts and identities ◆ Roles and role levels (hierarchical relationships between roles) ◆ Groups **NOTE:** Identity Reporting does not support dynamic groups and only generates reports on static group data. ◆ Group memberships ◆ Provisioning Request Definitions (PRDs) ◆ Separation of Duties (SoDs) definitions and violations ◆ User entitlement associations ◆ Resource definitions and resource parameters ◆ Role and resource assignments ◆ Identity Vault entitlements, entitlement types, and driver
Managed System Gateway Driver	Driver that collects information from managed systems. To retrieve the managed system data, the driver queries the Identity Vault. The driver retrieves the following information: ◆ List of all managed systems ◆ List of all accounts for the managed systems ◆ Entitlement types, values, and assignments (groupings), and user account profiles for the managed systems **NOTE:** This driver is not supported for Standard Edition.

Component	Description
Security Service	Service that controls access to all other services within Identity Reporting. The Security Service includes these key components: ◆ A **stand-alone authentication service** that provides several functions through REST, including programmable authentication, token validation, token expiration notification, and attribute retrieval for an identity. ◆ An **authentication module within the core service** that performs internal functions such as performing authentication within the scope of the core service and retrieving additional identity attributes. ◆ An **authorization module within the core service** that controls what an authenticated user can do with reporting resources. This module defines access control policies for resources and determines the permissions based on attributes of the authenticated user, access control policy, and the resource being accessed.
Sentinel Log Management for Identity Governance and Administration	Captures log events associated with actions performed in several NetIQ products, including Identity Reporting, the identity applications, and the Identity Vault. These events are stored in the public schema within the warehouse. You have the option to create a Sentinel link. For information about setting up the Sentinel link, see Sentinel Link Overview Guide.
Identity Vault Data Sources	Repositories for identity information. Identity Reporting allows you to report on state information in the Identity Vault, such as which users have been provisioned with particular resources, or which users have been assigned to particular roles. You can report on current and past data from the Identity Vault. The **Identity Vault Data Sources** page allows you to specify which Identity Vaults you want to report on, and provide information about where Identity Reporting can find these vaults. You can include data sources for one or more Identity Vaults on the **Identity Vault Data Sources** page.
Managed Systems and Applications	A system in an enterprise that is connected to the Identity Vault with an Identity Manager driver. Identity Reporting allows you to report on state information about the managed systems. For example, the reports allow you to determine that a particular user known to the Identity Vault exists in Active Directory. Identity Reporting allows you to report on current and past data from managed systems.

Accessing Identity Manager Data Collection Services

You can launch Identity Manager Data Collection Services directly from a browser.

By default, Identity Manager uses One SSO Provider (SSO) for single sign-on access to Identity Manager components. When you install Data Collection Services, you specify the basic settings for user authentication. However, you can also configure the OSP authentication server to accept authentication from the Kerberos ticket server or SAML IDP. For example, you can use SAML to support authentication from NetIQ Access Manager.

- "Launching Data Collection Services from Identity Manager Application Page" on page 44
- "Starting Data Collection Services Directly with a URL" on page 44

Launching Data Collection Services from Identity Manager Application Page

The Applications page of the identity applications includes a link to Data Collection Service for all Identity Manager users and administrators. Log in to the identity applications using the OSP login as a Report Administrator. You can access the Applications page with any supported Web browser, from either a computer or a tablet. For more information, see Technical Information for Identity Manager page.

Starting Data Collection Services Directly with a URL

To access Data Collection Services directly, open a Web browser and go to the address (URL) for the module (as supplied by your system administrator). The URL will follow this pattern:

```
http(s)://server:<port>/idmdcs/
```

Exploring Identity Manager Data Collections Services

After you log in, the following tabs on the Identity Manager Data Collection Services page allow you to perform various actions:

- *Overview* (which is open by default)

  To learn about this tab and how to work with it, see "About the Overview tab" on page 45.
- *Identity Vaults*

  To learn about this tab and how to work with it, see "About the Identity Vault tab" on page 45.
- *Settings*

  To learn about this tab and how to work with it, see "About the Settings Tab" on page 47.

Getting Help

While working in Identity Manager Data Collection Services, click the **Help** link or ⓘ to display the online version of this guide.

About the Overview tab

When you click the **Overview** tab, it displays the Overview page. This page displays all of the managed systems and Identity Vaults that have been configured for the reporting system, as well as the retention period specified for the collected data and the date that the data was last collected.

The Overview page displays configuration details such as:

- Data Retention Period: Indicates the duration to retain the reporting data for mentioned number of days/weeks/months (Read Only).
- Last Data Collection: Displays the date when the data was last collected from connected system. (Read Only).
- Next Data Collection: Displays the date when the data will next be collected from connected system. (Read Only).

About the Identity Vault tab

When you click the Identity Vault tab, it displays the Identity Vault page. This page allows you to configure settings for the managed systems. Each Identity Vault you work with on this page must have a separate registration for each of the following drivers:

- Identity Manager Driver for Data Collection Service
- Identity Manager Managed System Gateway Driver

To view the Identity Vaults:

1 Click **Identity Vaults** tab.

NOTE: If you have more than one Identity Vault registration, you might need to scroll down to view the other Identity Vaults.

2 The details about each Identity Vault are tabulated:

Driver	Identity Vault Settings	Description
Data Collection Service Driver	Vault address	The network address of the Identity Vault. (Read only)
	Driver name	The name given to the Data Collection Service Driver. (Read only)
	Enable Event Collection	Controls whether the Data Collection Service Driver collects event data for this data source. Ordinarily, this check box should be enabled, unless you need to shut down event collection in order to perform a system maintenance procedure that might conflict with the collection of data.
Managed System Gateway Driver	Username	The user name required to authenticate to the driver. (Read only)
	Collection state	Indicates the status of the data source: ◆ Initialized - This status is displayed as soon as the driver is created. ◆ Active - To start Data Collection, manually change to this status. ◆ Running - Indicates that the data collection is in progress. ◆ Suspended - Indicates that the data collection has stopped.

3 To start the data collection, set the **Collection state** for the Managed System Gateway driver as **Active**.

4 Click **Save**.

About the Settings Tab

If a system is connected to the Identity Vault with an Identity Manager driver, it is referred to as a managed system.

When you click the **Settings** tab, it displays the Setting page. This page allows you to configure applications that are not connected to the Identity Vault through Identity Managed drivers. The ability to access managed systems (connected systems) is controlled through the Identity Vaults, which are configured on the Identity Vaults page.

The Settings page has the following tabs:

- General Settings
- Data Sync Policies
- "About the General Settings tab" on page 47
- "About the Data Sync Policies tab" on page 49

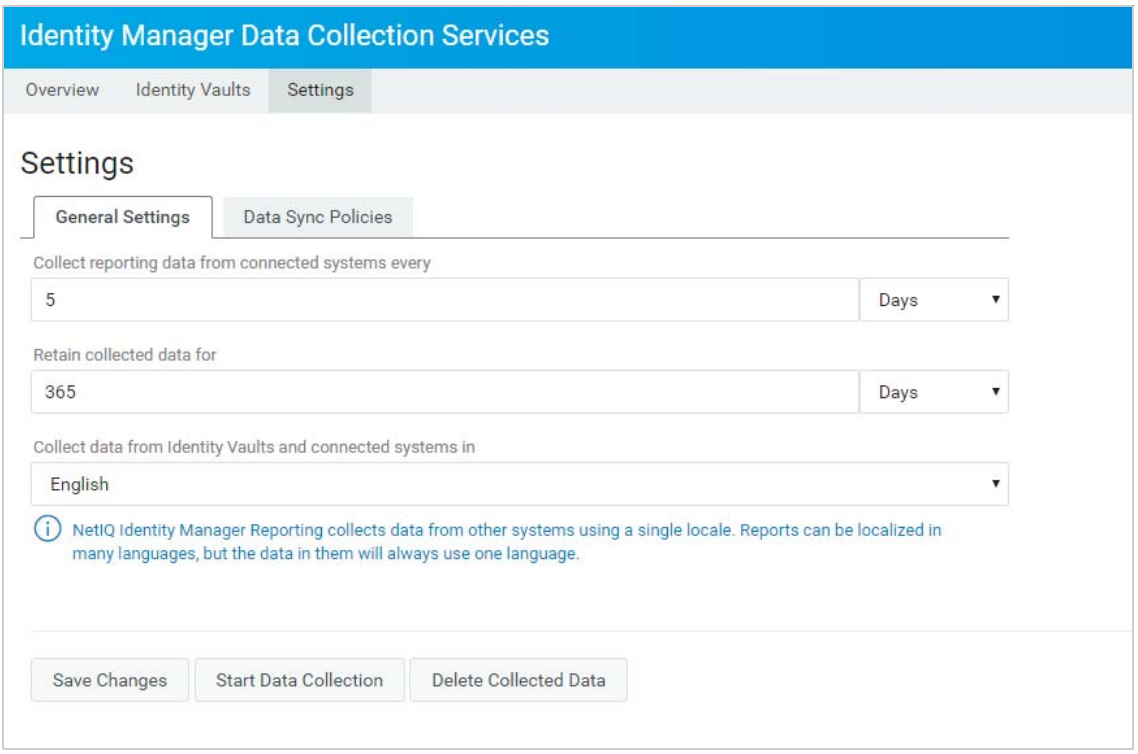
About the General Settings tab

Perform the following actions to define the settings for an application:

1 Click **Settings > General Settings** and provide the following details:

Settings	Description
Collect reporting data from connected systems	Indicates the duration to collect the reporting data from connected system in number of days/weeks/months.
Retain collected data	Indicates the duration to retain the reporting data for mentioned number of days/weeks/months.
Collect data from Identity Vaults and connected systems	Select the preferred language from the drop down menu in which you wish to collect the reporting data from Identity Vaults and connected systems. **NOTE:** NetIQ Identity Manager Reporting collects data from other systems using a single locale. Reports can be localized in many languages, but the data in them will always use one language.

2 Click **Save Changes**.



3 Click **Start Data Collection** to begin the data collection of the selected driver or click **Delete Collected Data** to delete the selected data. The data collection status provides the following details:

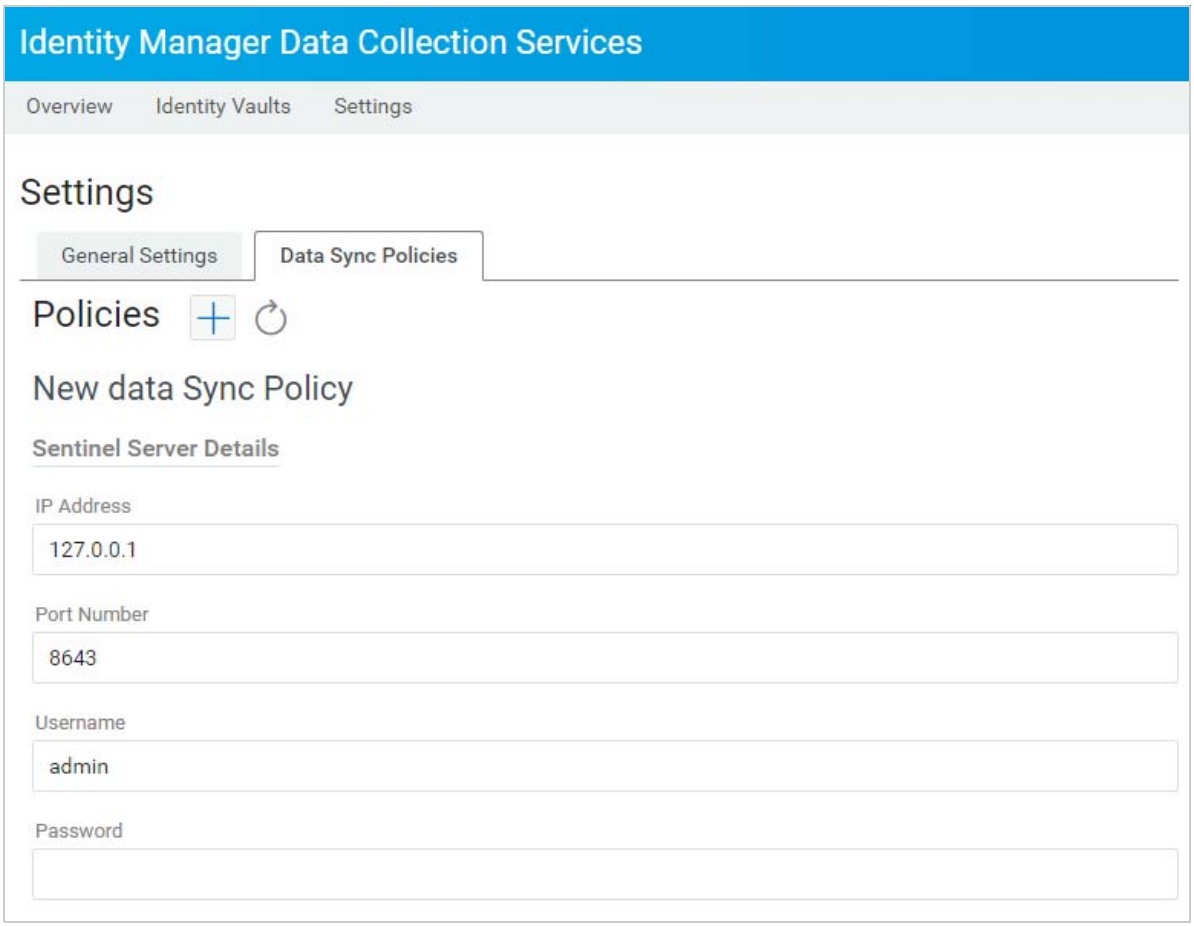
Field	Description
State	Indicates if the driver is active or suspended. (Read Only)
Last Collection	Displays the date when the data was last collected from connected system. (Read Only)
Next Collection	Displays the date when the data will next be collected from connected system. (Read Only)

NOTE: If Reporting is installed in Standard Edition, the Manage System Gateway driver is not supported. Hence, Data Collection option is not available.

NOTE: When you install Identity Applications with Identity Reporting, the default locale set for User Application driver must be same as that on the Identity Reporting server. A mismatch of locales on these two components may result in errors while collecting the reporting data from Identity Vault and connected systems. For more information on how to set the preferred locale on Identity Application driver, see "Specifying the Default Locale" in the *NetIQ Identity Manager - Administrator's Guide to Designing the Identity Applications*

About the Data Sync Policies tab

To sync data, click the **Settings** > **Data Sync Policies** tab. The synced policies are listed in this page. In case there are no policies available, click + to add new policy.



Enter the following details:

Server Details	Settings	Description
Sentinel Server Details	IP Address	The network address of the Sentinel server.
	Port Number	The port number of the server. The default port is 8643.
	Username	The username required to authenticate to the server.
	Password	The password required to authenticate to the server.
	Event Retention Period	Specify the duration for the events to persist in the database before they are deleted. The default is 90 days.
Database Server Details	Type	Select the type of databases from the drop-down menu. **NOTE:** If **Oracle** is selected, the default user name is `idm_rpt_data`.
	IP Address	The network address of the Database server.
	Port Number	The port number of the Database instance.
	Username	The username required to authenticate to the Database instance.
	Password	The password required to authenticate to the Database instance.
	Name	A text string you use to identify the application within Identity Reporting.

Click **Show Advanced** to edit the following parameter:

Database Server Details

Type

POSTGRES

IP Address

127.0.0.1

Port Number

5432

Username

postgres

Password

Name

idmrptdb

Show Advanced

Create Cancel

- Sentinel Event Table Payload Data: Contains a JSON document for creating the data synchronization table through REST APIs. The authentication information is substituted when a request is sent for creating the data synchronization table.
- Sentinel Data Sync Policy Payload Data: Contains a JSON document for creating the policy on Sentinel.

NOTE: To add additional fields to the data synchronization policy, modify the JSON document in **Sentinel Data Sync Policy Payload**. Ensure that the changes are present in both event table and the data synchronization policy. Otherwise, the policy creation fails.

Click **Create**.

This creates `sentinel_events` table in your database. You need to manually add the corresponding views for the following reports:

- Authentication by server
- Authentication by User
- Available-Permissions-Current-State
- Correlated resource assignment events by user
- Database-Statistics
- Identity_Vault_User_Report
- Identity_Vault_User_Report_Current_State
- Object_Provisioning
- Password_Resets
- Resource_Assignments_by_Resource_Current_State

- Resource_Assignments_by_Resource
- Self_Password_Changes
- User entitlements
- User password changes event summary
- User_Password_Changes_within_the_Identity_Vault
- User_Status_Changes_within_the_Identity_Vault
- Access requests by recipient
- Access requests by resource
- Access requests by requester

To generate these reports, see "Adding Views for a Data Sync Policy" on page 52.

NOTE: Policies created in Identity Manager 4.7 will not appear on upgrading to Identity Manager 4.8. You need to recreate the policy after deleting the old policy from SLM.

Adding Views for a Data Sync Policy

Perform the following actions to manually add views to generate reports.

1. Download the `IDM_4.8.0.0_Downloads.zip` file from `https://nu.novell.com/designer/idmrpt600`.
2. Unzip the `IDM_4.8.0.0_Downloads.zip` file.
3. Browse to the directory with the report name and unzip it.

   Example: `<ReportName>.zip`
4. Copy the SQL file to the server running the reporting database.
   - **4a** Open the database administration tool, such as `pgadmin` or `sqldeveloper` with administrator credentials.
   - **4b** Establish a connection to the server running the reporting database.
   - **4c** Open a new SQL Editor window.
   - **4d** Paste the SQL file content that you copied in Step 4 in the SQL Editor window.
   - **4e** Run the SQL query.

   This will list the views under `idm_rpt_data`
5. To start Data Collection Services for these views:
   - **5a** Log in to Identity Manager Data Collection Services.
   - **5b** Goto **Identity Vaults**.
   - **5c** In **Manage System Gateway Driver**, set **Collection State** to **Active**.
   - **5d** Click **Save**.
6. Login to Identity Reporting and run the reports.

3 Creating Custom Report Definitions

This section provides instructions for creating custom report definitions.

- "About Custom Report Definitions" on page 53
- "Starting the Report Packaging Tool" on page 54
- "Creating a New Report Template" on page 54
- "Configuring Your JDBC Connection in Jaspersoft Studio" on page 54
- "Setting the Description and Other Strings for Your Report" on page 57
- "Setting the Report Definition Parameters" on page 57
- "Customizing the Report in Jaspersoft Studio" on page 61
- "Displaying Parameters and Selected Criteria in the Report" on page 65
- "Building Your Report" on page 66

For more information about the Identity Reporting schema, see Identity Reporting Schema Documentation.

About Custom Report Definitions

Identity Reporting ships with a set of predefined report definitions. You can use them as is, or customize them to suit the requirements of your organization. You can also create new report definitions if you prefer to design your reports from scratch.

Skills requirement: To create custom report definitions, you need to have a background in Structured Query Language (SQL). SQL is used to construct the database query for a report.

To facilitate the process of creating new reports, NetIQ provides the NetIQ Identity Manager Report Packaging Tool. You can customize reports in Jaspersoft Studio and use the Reporting Packaging Tool to package them. The NetIQ Identity Manager Report Packaging Tool is installed on the same server where you install .

You can use Jaspersoft Studio to customize your report definitions. Jaspersoft Studio is a free, open source tool made available by the Jasper Reports project. It is available for Windows and Linux. You need to download and install Jaspersoft Studio before you begin customizing reports.

You can find the TIBCO Jaspersoft Studio download at this location:

https://community.jaspersoft.com/project/jaspersoft-studio/releases

On Linux, you need to unpack the TAR file to your home directory. On Windows, you need to run an executable installer.

Starting the Report Packaging Tool

The NetIQ Identity Manager Report Packaging Tool is installed in the `root` folder or Identity Reporting installation folder, depending on your environment. By default, the `reportpkg.jar` file is located in the `/opt/netiq/idm/apps/IDMReporting/reportUtils` folder.

To start the NetIQ Identity Manager Report Packaging Tool on Linux, execute this command:

```
java -jar reportpkg.jar
```

On Windows, simply double-click the JAR file.

Creating a New Report Template

The Report Packaging Tool has three primary functions:

- Creating new report templates
- Building existing templates
- Deploying built templates

The first step in the process is to create a new report template.

1. Select **Create** in the left navigation menu.
2. On the Create New Report screen, specify the report name and description.
3. Select the location for the report.
4. Click the **Create** button.

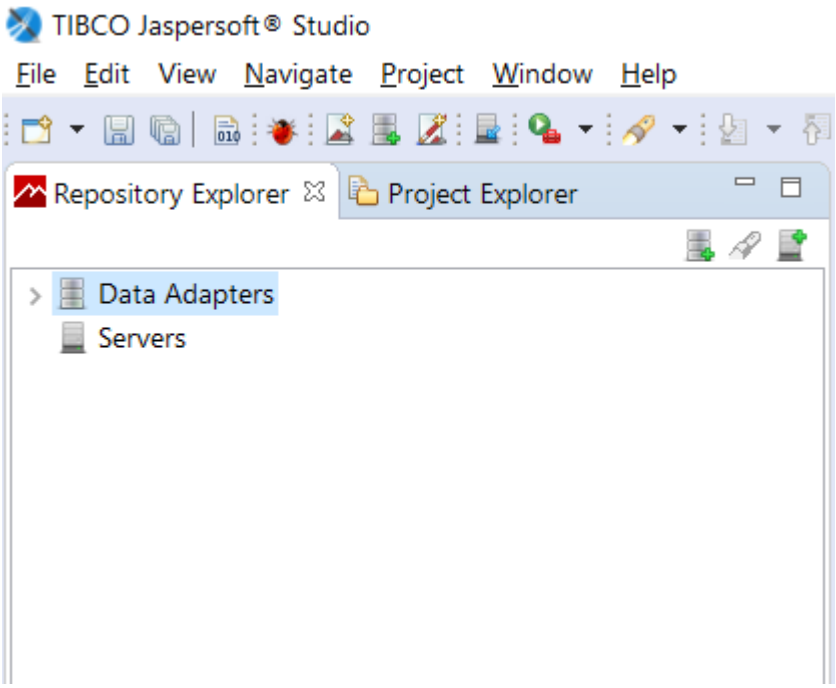
   The report contents are written to the location specified for the report.
5. In Jaspersoft Studio, open the JRXML report.

   This file will always be called `TemplateReport.jrxml` and be located in the `IDM/6.1` directory. You cannot change the name or the location. You can specify the file by this name and location.

Configuring Your JDBC Connection in Jaspersoft Studio

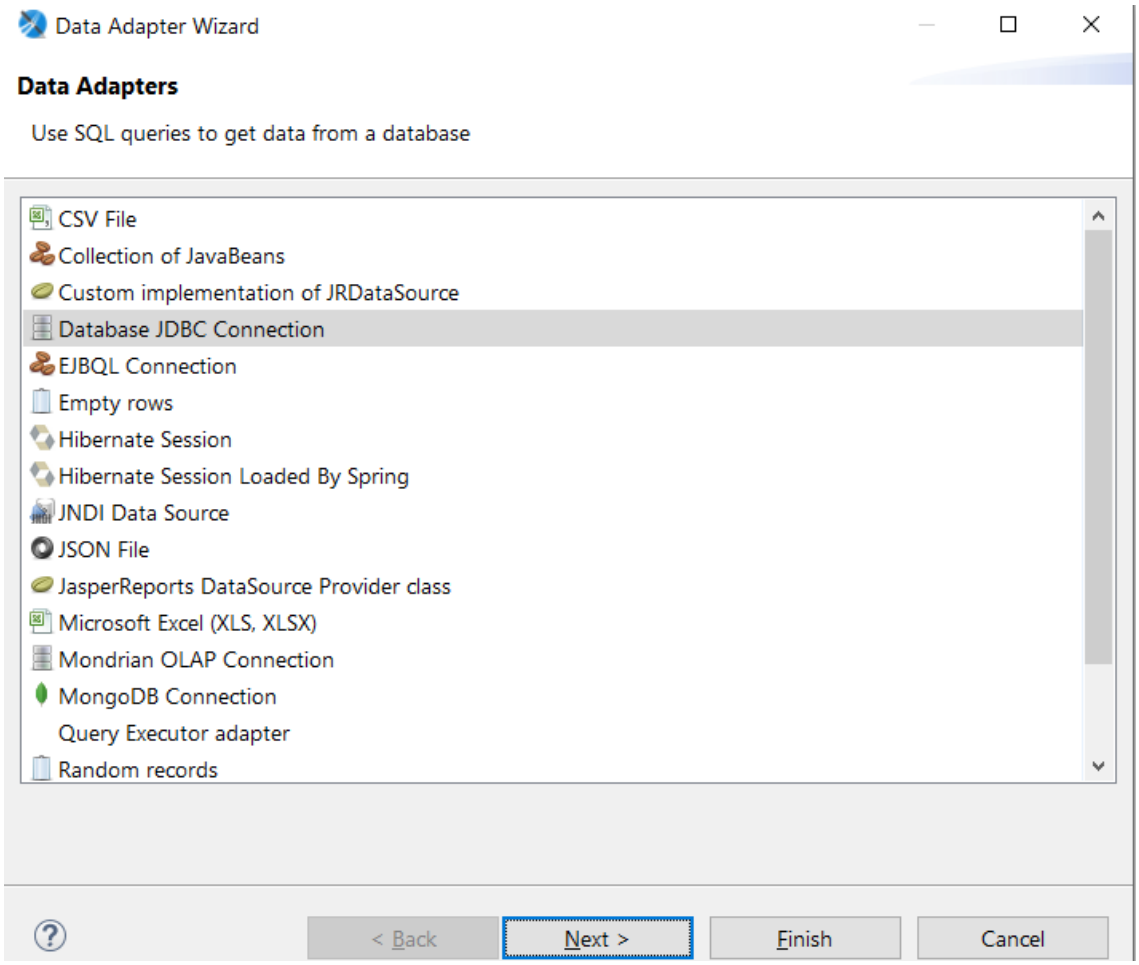
Before customizing your report, you need to configure a new datasource for the reporting PostgreSQL database within Jaspersoft Studio. You only need to perform this step once.

1. Launch Jaspersoft Studio, if you have not done so already.
2. Click the **Repository Explorer** button on the main toolbar to open the Connections/Datasources dialog box.



3 Right-click on **Data Adapters** and select **Create Data Adapter.**

4 Select **Database JDBC Connection** and click **Next** to advance to the Database JDBC connection page.



5 Configure the PostgreSQL JDBC connection:

- **5a** Select the **PostgreSQL (org.postgresql.Driver)** JDBC driver.
- **5b** Specify the database URL to your database **(jdbc:postgresql://localhost:5432/REPORTING_DB_NAME)**.
- **5c** Supply your database username and password.

  NOTE: Specify the database username as idmrptuser and password you use for your PostgreSQL database.

- **5d** Click the **Test** button to test your database connection.
- **5e** Click **OK** to close the message box.
- **5f** Save the database connection information.

6 Close the JDBC configuration dialog box.

Setting the Description and Other Strings for Your Report

The description for your report, and other strings it uses, are defined in the `TemplateReport.properties` file in the `6.1` directory of your new report. This file contains a set of keys and values for the string that appear in the report. The strings in the `TemplateReport.properties` file make it possible for your report to support multiple languages.

NOTE: The `TemplateReport.properties` file must end with a blank line. When you build your report archive, the localized strings defined for the report are appended to the `TemplateReport.properties` file, so a blank line is necessary to avoid having two lines merged.

To set the report description, you would need to edit the DESC1 key:

```
DESC1=This report shows all [authentication attempts] by users captured by
@CATEGORY@ within the selected date range, grouped by the [domain within
which the user account exists] and then grouped by the [account name].
MAXROWS=Maximum Rows
MAXROWSDESC=Specifies the maximum number of rows to return for this query
USER_DISPLAY_NAME=IDV User(s)
USER_DESCRIPTION=List of Identity Vault users to report on
```

Edit these properties to change your report description or any other string. You must rebuild and redeploy your report each time you change this file.

Setting the Report Definition Parameters

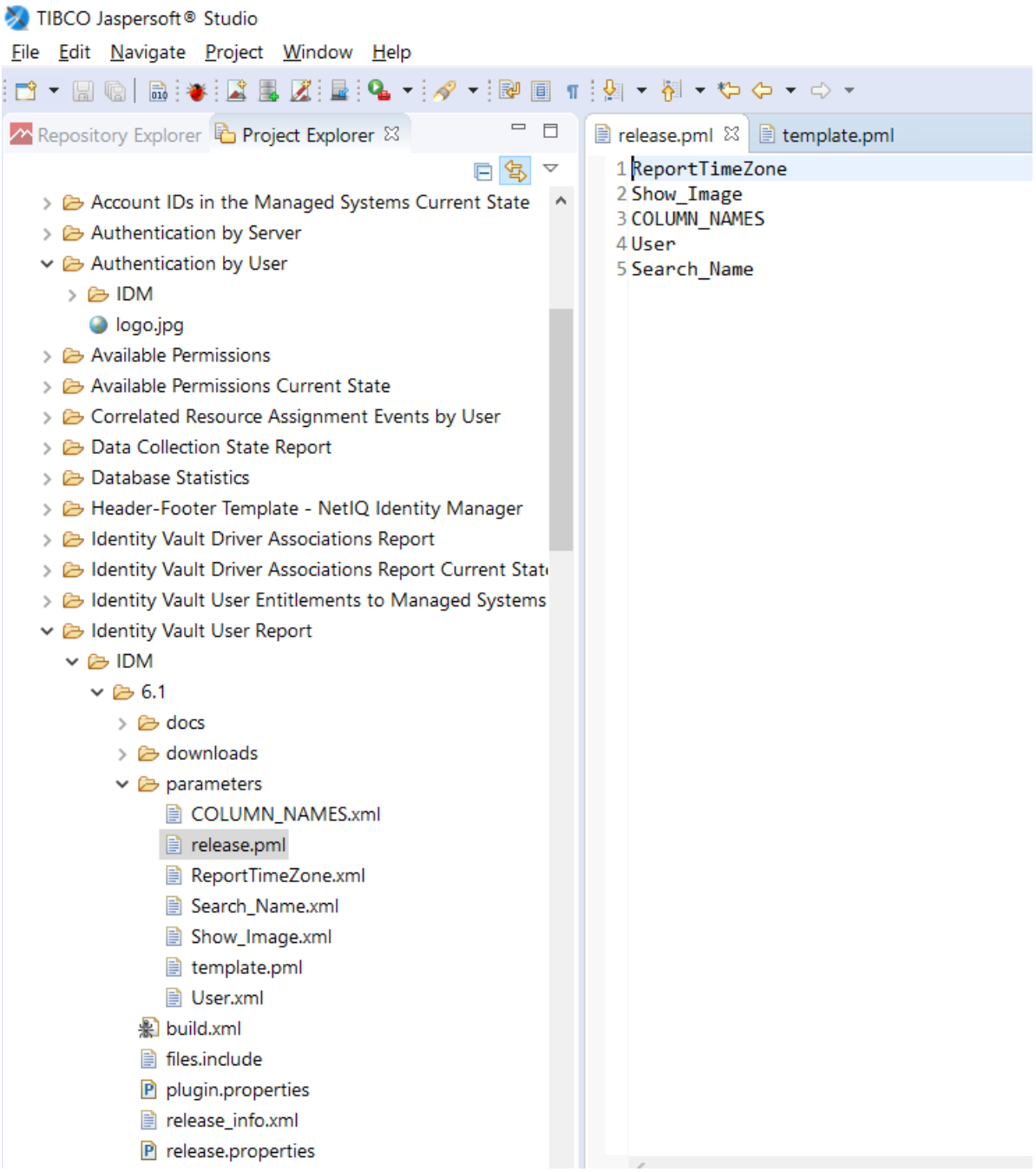
Reports support runtime parameters that allow users to specify values when they run a report. This section provides instructions for defining runtime parameters.

- "Defining the Parameter XML File" on page 58
- "Defining the Type for a Parameter" on page 59
- "Defining an OptionQuery Parameter" on page 60

Defining the Parameter XML File

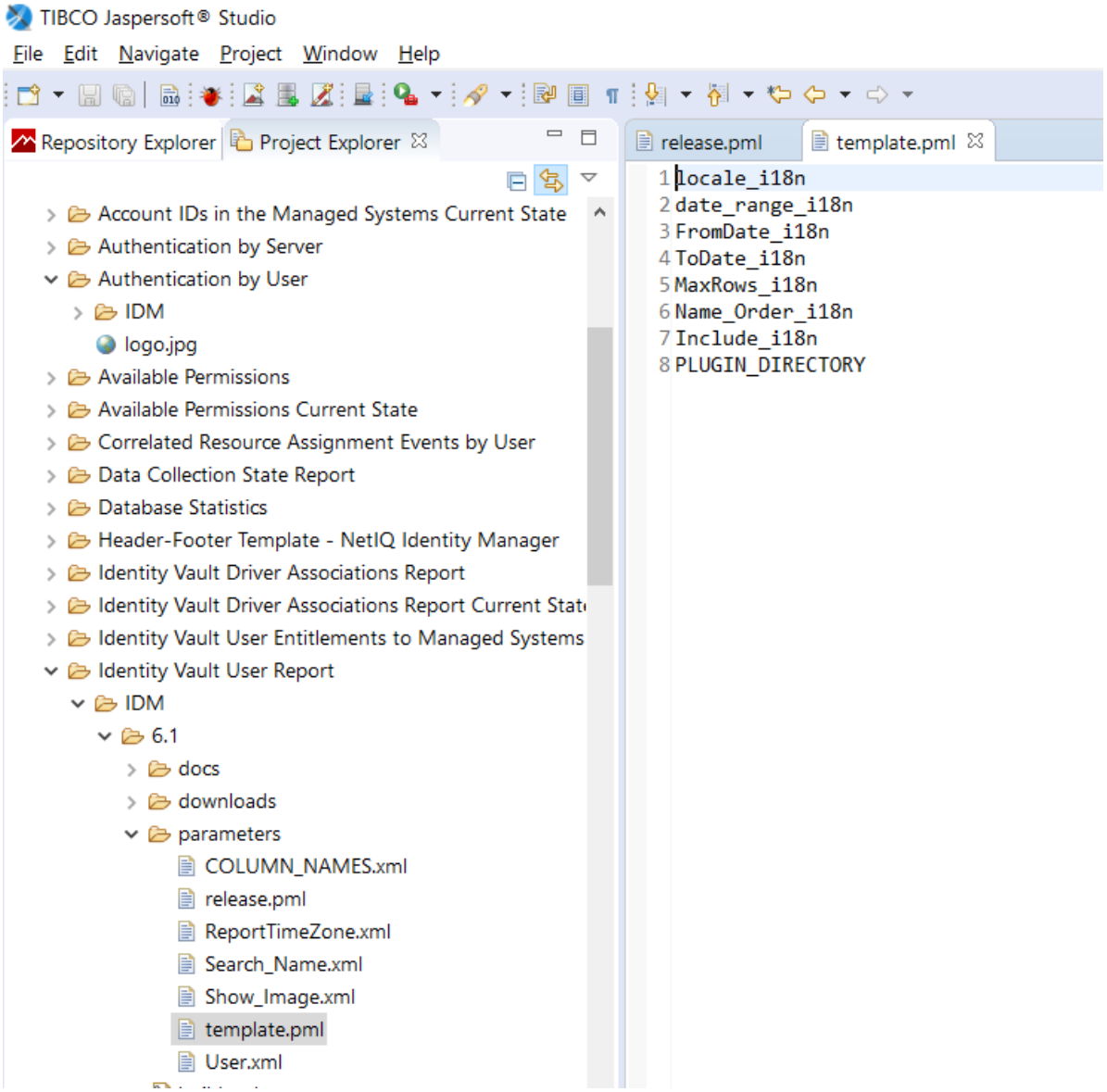
Parameters specific to your report are located in the `6.1/parameters` directory for your report. Each parameter is in its own XML file. Each of these XML files must be referenced in the `release.pml` file in the order in which you want them to appear. The `release.pml` file lists the parameters by name (without the file extension), as shown below:

Figure 3-1 *Release.pml file*



The `template.pml` file lists commonly shared parameters:

Figure 3-2 *Template.pml file*



Defining the Type for a Parameter

Identity Reporting supports the following values for <Type>:

- String
- Date
- Integer
- Boolean

The user interface shows a specific control for each data type:

Table 3-1 Controls for Parameter Data Types

Data Type	Control
String	TextBox
String with Options	ListBox
String with OptionQuery	Autocompleter
Date	DatePicker
Integer	IntegerTextBox
Boolean	Checkbox

All of the parameters need to have this setting:

```
<IsForPrompting>1</IsForPrompting>
```

If you know that your report cannot run without a particular value specified, you can mark a parameter as required with the following setting:

```
<Required>1</Required>
```

To make an Options parameter or OptionQuery parameter allow for multiple values, you should include these two settings:

```
<OptionMultivalue>1</OptionMultivalue>
<OptionMultivalueDelimiter>;</OptionMultivalueDelimiter>
```

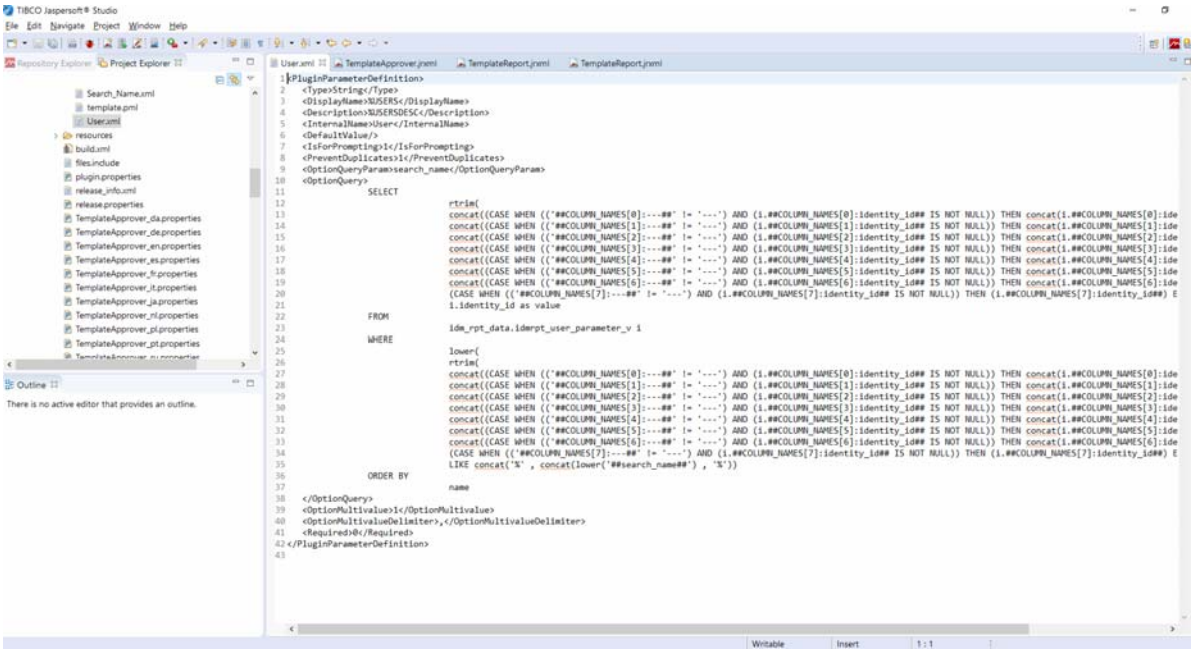
Defining an OptionQuery Parameter

Suppose you want to generate a report that shows role information, and you want to allow the role as a parameter, so that the definition can be scoped at runtime. In this case, you can use an OptionQuery so that Identity Reporting shows you a list and allows for typeahead automatic completion, based on the roles that are stored in the database on which to report. To provide support for this capability, you need to follow a specific syntax that uses cascaded parameters. The syntax *##parameter_name##* within the OptionQuery references another parameter definition. NetIQ provides shared common parameters that serve this purpose already, `Role.xml` and `Search_Role.xml`. They can be reused by specifying them in the `template.pml` or copied into your local parameters folder and modified to suit your needs.

The `User.xml` and `Search_Name.xml` are the respective parameters for allowing Identity Vault user to be a parameter. The `User.xml` parameter also demonstrates the ability to include a special cascaded parameter, *##NAME_ORDER##*. This allows you to localize the Name Order of a name (Given-name Surname vs. Surname Given-name), or allow for a Middle Initial in the name. If you would like your OptionQuery to make use of this feature, follow the name order example shown below.

The User.xml file is shown below:

Figure 3-3 *User.xml file*



For this example to work properly, the ##NAME_ORDER## cascaded parameter must match the <InternalName>NAME_ORDER</InternalName> of the name order parameter.

All OptionQuery parameters *must* have a cascaded parameter such as a search_name, where the OptionQuery SQL is using it as its WHERE clause. Its internal name does not matter, as long as it is unique and is used in the SQL appropriately. It should have these settings:

```
<DefaultValue></DefaultValue>
<IsForPrompting>0</IsForPrompting>
```

Customizing the Report in Jaspersoft Studio

1. In Jaspersoft Studio, open the new JRXML file that you generated by using the Report Packaging Tool.

   The JRXML file should be located in the `IDM/6.1` subdirectory under the directory where when you created the report template.

2. After you have opened the report in Jaspersoft Studio, you can make the necessary customizations:

   2a Define a SQL query to get the data for your report.

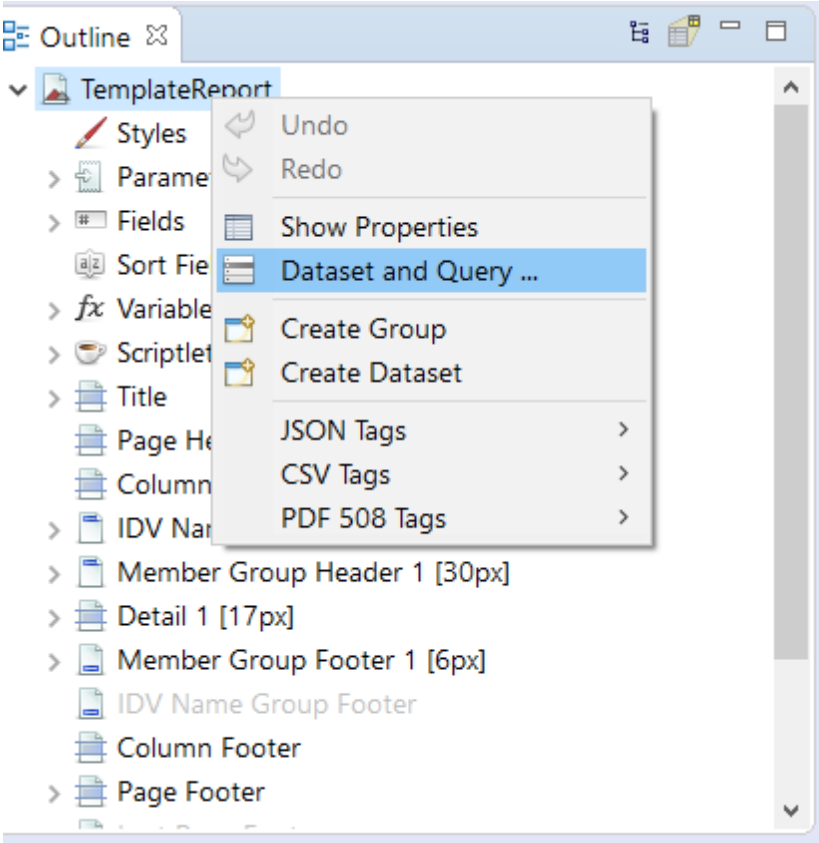
   To provide data for your custom reports, you need to use database views. The core database views that ship with the product include both current state and history information for reporting. In addition to these views, there is a separate set of views that includes only the current state information, thereby providing a slight improvement in reporting performance. For example, the “idmrpt_approver_v” view provides both current state and history information, whereas the “idmrpt_approver_cs_v” view provides just the

current state information. The structure of the two views is identical, so the columns used are exactly the same. Only the view names are different. The name for each current state view includes "_cs" before the "_v" suffix.

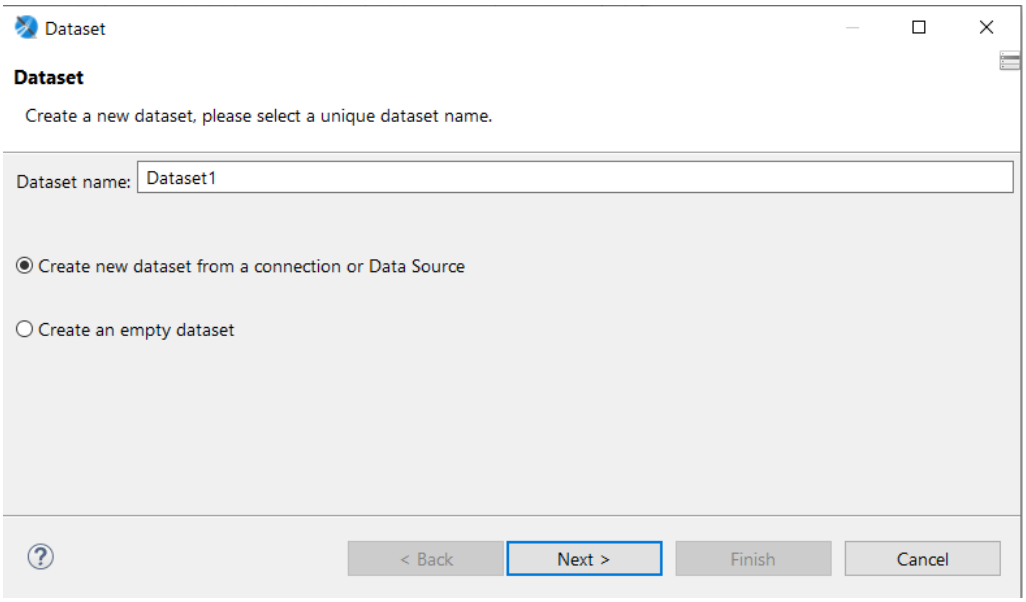
For most applications, you can use the views that provide both current state and history information.

NOTE: You can only use views in custom reports. If you use your root username to log into the database, Jaspersoft Studio will let you select data from the tables. However, the report will fail when you deploy it and try to run it.

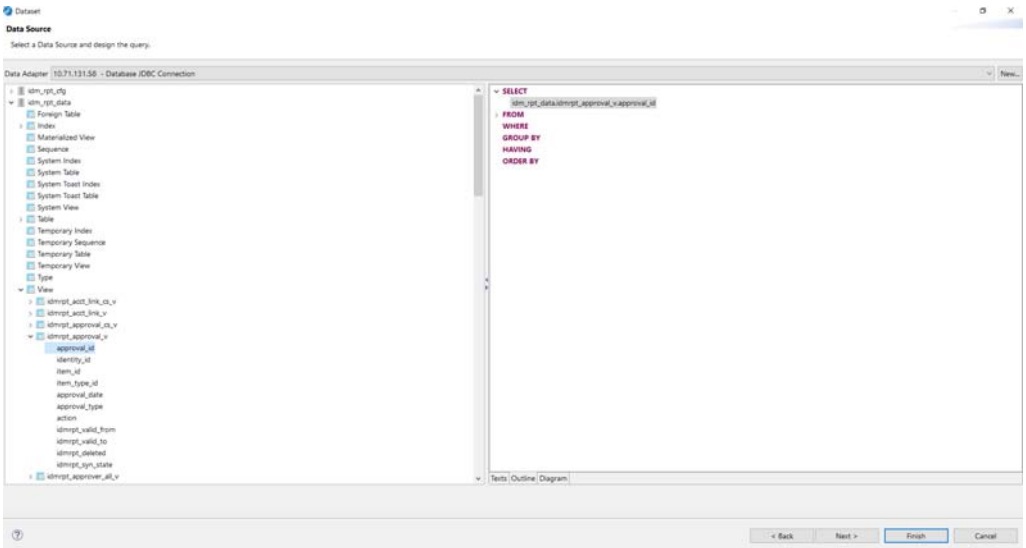
2a1 To define the SQL query for a report, right-click on **TemplateReport**.jrxml in the **Outline** tab. Click the **Database and Query ...** option to open the **Dataset** page.



2a2 Specify a Dataset name, select the **Create new dataset from a connection or Data Source** option, and then click **Next** to advance to the **Data Source** page.

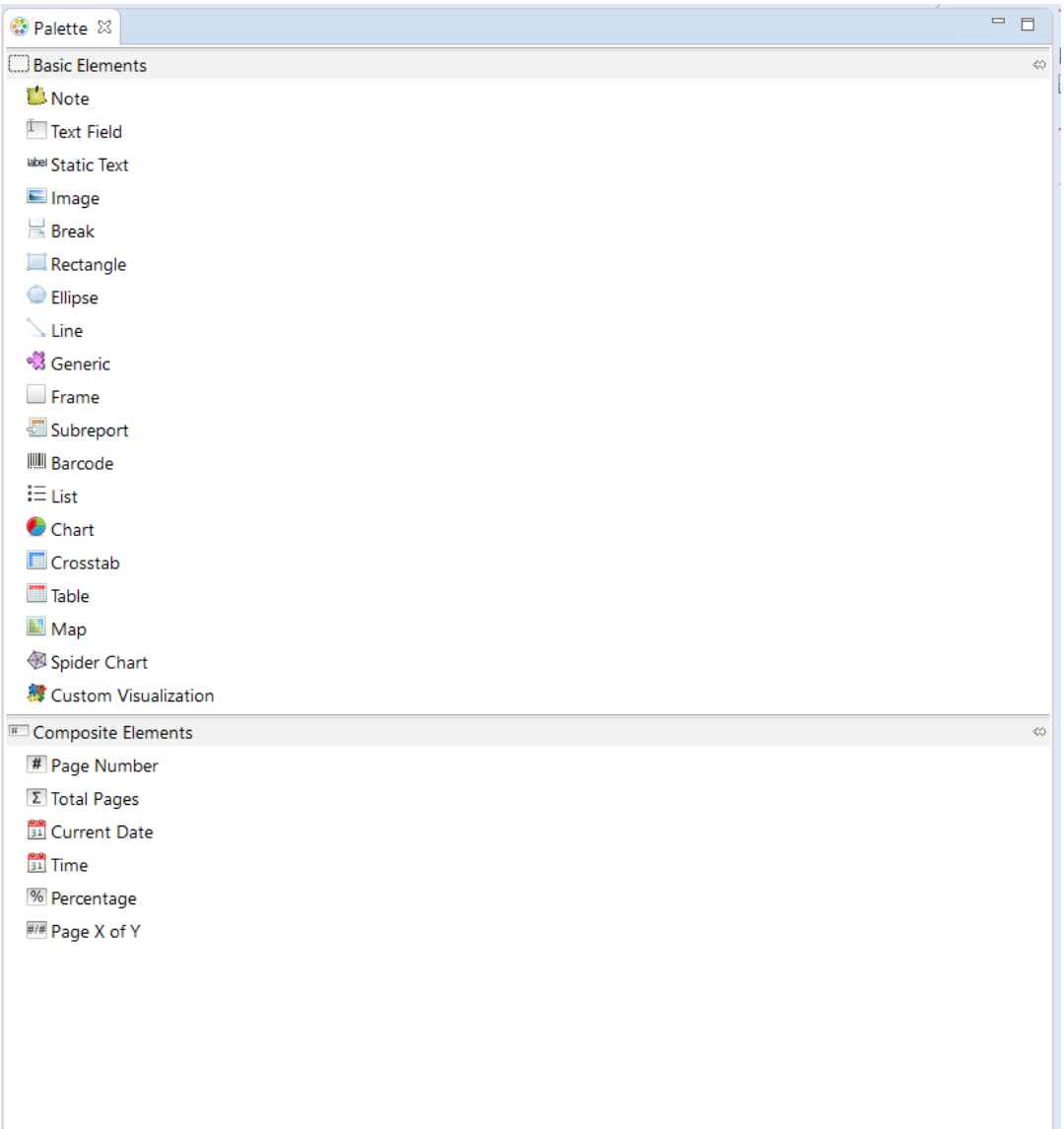


2a3 Select the Data Adapter that you have created while configuring JDBC Connection in the beginning and then expand the content of database. After expanding the views and tables, drag the fields to the SELECT query. Customize the SQL query and click the **Finish** button.



2b Define the report layout.

To define the report layout, you need to add elements to the report definition. Jaspersoft Studio supports many different types of report elements. You can choose the elements you need from the **Basic Elements** section of the **Palette**.

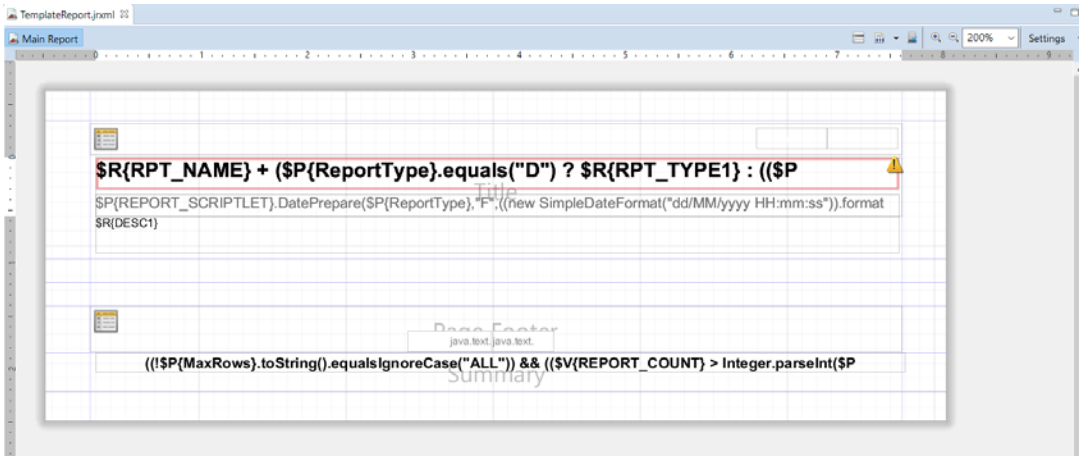


For example, to add a column header, drag the **Text Field** icon from the **Palette** onto the header band of the report layout canvas.

To add a data field, drag the field name from the **Fields** node in the **Report Inspector** onto the detail band of the report layout canvas.

When you drag a field onto a report, Jaspersoft Studio creates an expression to bind the display element to the appropriate database value.

Once you've added the fields you need, you can format the fields to suit your requirements by stretching them or moving them on the report canvas.



3 Save your report.

After saving your report, you need to package the report before you can import or deploy it. For details on packaging the report, see "Building Your Report" on page 66.

Displaying Parameters and Selected Criteria in the Report

You can display parameters and selected criteria in a report. To do this, you need to make some changes in the JRXML file.

First, locate the textField-2 of the `TemplateReport.jrxml` file, which has "$P{REPORT_SCRIPTLET}.DatePrepare..." showing. This text field is where the selected values of report parameters are displayed. The generated `TemplateReport.jrxml` file automatically displays the Date/Time Range of the report and the MaxRows parameter and selected value.

```
$P{REPORT_SCRIPTLET}.DatePrepare($P{ReportType},"F",((new
SimpleDateFormat("dd/MM/yyyy HH:mm:ss")).format($P{FromDate})),"D") + " "
+ $R{HEADER6} + " "  +
$P{REPORT_SCRIPTLET}.DatePrepare($P{ReportType},"T",((new
SimpleDateFormat("dd/MM/yyyy HH:mm:ss")).format($P{ToDate})),"D") + "\n" +
java.text.MessageFormat.format($R{MAXROWS_COLON}, new
Object[]{
$P{MaxRows}.equals("ALL") ? $R{ALL} :
$P{MaxRows}
})
```

To add more parameters, simply append to this text field by right-clicking the field and selecting **Edit Expression**. Add a + "\n" + parameter's label and value for each parameter. To add a label, add the localized label to the properties file as a parameterized string, such as USERS_COLON=Users: {0}. Then, use java.text.MessageFormat to fill in the value.

When the parameter is an OptionQuery, you must also pass the cascaded search name parameter to the JRXML. Then, you can use that value to display on the report for readability instead of showing the IDs. For example, this is the value of textField-2 in the Role Assignments by Member report:

```
$P{REPORT_SCRIPTLET}.DatePrepare($P{ReportType},"F",((new
SimpleDateFormat("dd/MM/yyyy HH:mm:ss")).format($P{FromDate})),"D") + " "
+ $R{HEADER6} + " "  +
$P{REPORT_SCRIPTLET}.DatePrepare($P{ReportType},"T",((new
SimpleDateFormat("dd/MM/yyyy HH:mm:ss")).format($P{ToDate})),"D") + "\n" +
java.text.MessageFormat.format($R{MAXROWS_COLON}, new
Object[]{
$P{MaxRows}.equals("ALL") ? $R{ALL} :
$P{MaxRows}
}) + "\n" +
java.text.MessageFormat.format($R{NAME_ORDER_COLON}, new
Object[]{
$P{NAME_ORDER}.equals("lfm") ? $R{NAME_ORDER_LFM} :
$P{NAME_ORDER}.equals("fl") ? $R{NAME_ORDER_FL} :
$P{NAME_ORDER}.equals("lf") ? $R{NAME_ORDER_LF} : $R{NAME_ORDER_FML}
}) + "\n" +
java.text.MessageFormat.format($R{USERS_COLON}, new Object[]{
(($P{User} != null && $P{User}.size() > 0) ? $P{search_name} : $R{ALL})
}) +
"" + ($P{Only_Show_SOD}.booleanValue() ? "\n" + $R{SHOW_SOD} : "")
```

The Role Assignments by Member parameters displayed are:

- Data Range
- Max Rows
- Name Order
- Users
- Separation of Duties information only

Building Your Report

Before you deploy your report, you need to build it. The source of the report is a set of properties, images, and the JRXML file. You must bundle these files into a report archive before you can deploy the report template.

The process of building the report archive creates an RPZ file. This is a report definition archive containing your report and the report metadata. There might also be additional files such as images or properties that your report depends on.

1. Select **Build** in the left-navigation menu in the Report Packaging Tool.
2. On the Build Report screen, specify the report definition.

   This is the JRXML file generated when you created your report.
3. Specify the location of your report archive.
4. Select the type of report.
5. Select the template to use for the report header and footer.
6. (Optional) Select to build the report using data source constraints, and then click **Next**.

Data source constraints declare the tables, views, and databases that the report requires to run successfully and allow Identity Reporting to inform the user that a target data source does not have the required schema to run the report successfully. Data source constraints are not required.

You can also specify SQL test constraints that test whether a report and data source are compatible beyond simply checking for the required views and tables. For example, you can check that a required function or columns in a table exist.

7 (Conditional) Select the type of constraint to add, then specify the constraint name and schema name, if required.

The schema name is optional for tables and views, and required for databases.

For example, if a report requires the `idmrpt_role_v` view in the `idm_rpt_cfg` schema, select the **View** type, enter `idmrpt_role_v` for the name, and enter `idm_rpt_cfg` for the schema.

8 (Optional) Add SQL test constraints.

Provide a syntactically correct SQL statement and, optionally, the expected result. For example, to verify that the identity_cleanup function exists, enter the following SQL statement:

```
SELECT routine_name FROM Information_schema.Routines WHERE
Specific_schema = 'public'
AND routine_name = 'identity_cleanup'
AND Routine_type = 'FUNCTION'
```

9 Click the **Build** button to build the RPZ file for your report definition.

After you have built your report, you must import the report in order to use the report. For more information, see "Using the Import Page" on page 25.

4 REST Services for Reporting

Identity Reporting incorporates several REST APIs that enable different features within the reporting functionality. Identity Reporting provides support for the following REST APIs:

- Non-Managed Application REST API
- Managed Application REST API
- Authentication REST API
- Reporting REST API

The REST APIs for reporting use the OAuth2 protocol for authentication.

The installation program deploys a special API WAR file, `rptdoc.war`, which contains the documentation of REST services needed for reporting. The `rptdoc.war` is automatically deployed when Identity Reporting is installed on Tomcat application server.

To access the REST API documentation on the server where Identity Reporting is installed, specify the path of `/rptdoc` in the address bar of your browser. For example, if you installed Identity Reporting on a host called `servername` on port 8180, you can access the REST API documentation at `http://servername:8180/rptdoc`. If you installed Identity Reporting using `https`, substitute `https` for `http`.

Be aware that while working in a staging or production environment, you must manually delete the `rptdoc.war` files and folders from your environment on Tomcat.

5 Troubleshooting

This section describes many of the most common issues that you may encounter while working with the reporting functionality.

- "Troubleshooting Drivers" on page 71
- "REST Endpoint Troubleshooting" on page 77
- "Troubleshooting Reporting Database" on page 78
- "Not Able to Log In After Upgrading" on page 81

Troubleshooting Drivers

This section describes many of the most common issues that arise in the driver configuration and provides tips for resolving these issues.

Issue: No Identity Vaults Presented on the Identity Vaults Screen

If you look at the Identity Vaults screen in Identity Reporting, you may notice that no Identity Vaults are listed. You will also see an error message at the top of the screen.

Here are some of the possible causes for this problem:

- The Data Collection Service driver is not configured or started.
- The Data Collection Service driver is configured incorrectly. Here are some things that may be not be properly defined:
  - You have specified an invalid user account, account password, or the account does not have sufficient privileges (is not assigned as Report Administrator).
  - The reporting connection configuration is wrong.

Here are some troubleshooting tips:

- Verify that the Data Collection Service driver is configured and running. To do this:
  - Check in Identity Console that the driver is present and that the driver state is **Running**. If it is not running, start the driver.
  - Check in Designer that the driver configuration points to the reporting services and has a valid account and password configured. If you need to modify the configuration settings, make your changes in Designer. Stop the driver before you redeploy, and start the driver after a successful deployment. NetIQ recommends that you synchronize the driver prior to modifying and redeploying it.

- Verify that the identity applications are installed and the Report Administrator role assignment has been processed and assigned to the user account configured in the reporting connection parameters for the Data Collection Service driver.

  To verify the role assignment, log into the identity applications with the Role Administrator account. Then, go to the Work Dashboard and look at the list of assigned roles for accounts used by the Data Collection Service driver. If you don't see the role assigned, verify that the Role and Resource driver has been started.

If the Data Collection Service configuration seems correct, enable DS Trace for the Data Collection Service driver at level 5, and verify that there are no communication or connection errors in the log.

Verify that the Data Collection Service driver is sending registration events to the REST services. The best way to do this is to add the following trace to the idmrptcore_logging.xml file and tail the console log (by using `tail -f server.log`). You should see trace messages with recognizable DNs, names, and so forth.

```
<logger name="com.novell.idm.rpt.core.server.events.rptdriver"
level="TRACE" additivity="true"/>
```

Issue: Reports Are Missing Identity Vault Data

If you notice that some of your reports are missing Identity Vault data, you should look at the following list of possible causes:

- Report definition is out of date.
- The Data Collection Service driver or Identity Reporting is not started.
- The Data Collection Service driver was not migrated. If the driver has not been migrated, the objects are not synchronized into the Identity Information Warehouse.
- The timeout setting on the Data Collection Service driver is set too high and the events are not immediately propagated into the database. This could appear to be a problem if you don't wait until the event is sent and processed.
- The Data Collection Service driver is not configured correctly. Here are some things to look at:
  - Objects are missing from the Filter Policy.
  - Objects are not under the Data Collection Service scope.

Here are troubleshooting tips:

- Verify that the data missing from the reports is present in the idm_rpt_data schema tables:
  - If the data is present in the database, verify that you have the latest report definitions installed. On the detail page of each report is a field showing the data it was built or customized. You need to compare the date on the detail for that report with the data on the download page http://cdn.novell.com'cached/designer/idmrpt/.
  - If the data is missing from the database, verify that the Data Collection Service driver is sending events to the REST services and that they are being processed correctly:
    1. Make sure there are no errors in event processing. View the JBoss console log (server.log) and look for errors (for example, `grep -i "error" server.log`)
    2. If there are no errors, make sure that the events are being received from the Data Collection Service driver.

Add the following trace to the idmrptcore_logging.xml file and tail the console log (by using `tail -f server.log`). You should see trace messages with recognizable DNs, names, and so forth.

```
<logger name="com.novell.idm.rpt.core.server.events.rptdriver"
level="TRACE" additivity="true"/>
```

- Verify that the Data Collection Service driver is configured and running:
  - Check in Identity Console to see that the driver was deployed and the driver state is **Running**.
  - Check the following settings for the Data Collection Service driver in Identity Console:
    - Reporting connection information
    - Reporting access account
    - Data Collection Service driver filter policy
    - Data Collection Service driver scope
    - Data Collection Service driver event processing settings

      Look at the **Time interval between submitting events** and the **Number of events to be sent in batch**. Set these to lower values for more immediate results.

When you are confident that your configuration is correct, and you still don't see the expected data populated, you need to check for Data Collection Service driver errors. Check the DS Trace from the driver to see if there are errors:

- Check the DS Trace from the driver to see if there are any errors.
- Enable the driver trace at level 5.
- Delete the old trace file (if one exists) and restart the Data Collection Service driver. (The trace file can become very large.)

Issue: Object Already Exists Error

In your server log (server.log), you may see the following error:

```
Associated object already exists in database with GUID:...
```

Here are some common causes for this error:

- The Data Collection Service driver was removed and re-added/ When you remove the Data Collection Service driver, you must also refresh the database. Otherwise, the new Data Collection Service driver will attempt to re-add the objects that already exist in the database.
- There is an overlap in scope between two Data Collection Service drivers. They are both trying to synchronize objects in the database.

Issue: MSGW Driver is Missing from Identity Vaults Screen

If you see that the Managed System Gateway Driver is missing from the Identity Vaults screen in Identity Reporting, look at the following list of possible causes:

- The Managed System Gateway driver has not been configured and deployed.
- The Data Collection Service driver is not configured to register the Managed System Gateway driver.
- The Data Collection Service driver is not running or cannot connect to Identity Reporting. The connection may fail if the account that the Data Collection Service driver is configured with does not have sufficient privileges, or if the reporting connection information is wrong in the Data Collection Service driver.

Here are some troubleshooting tips:

- Verify in Identity Console that the Managed System Gateway driver is configured and deployed to the Identity Vault.
- Verify that the Data Collection Service driver settings are correct:
  - In Identity Console or Designer, verify that the Data Collection Service state is **Running**.
  - In Designer, verify that the Managed System Gateway driver parameter section of the Data Collection Service driver is set to register the Managed System Gateway driver.
  - Verify that the reporting connection information is correct in the Data Collection Service driver configuration. Check the connection URL, account, and password.

Issue: Managed System Data is Missing from Reports

If you notice that some of the managed system data is missing from the reports, look at the following list of possible causes:

- Reports are not up-to-date.
- Pulled data collection has not been activated for the Data Collection Service driver.
- The next data collection time is in the future. Data has been changed in the managed system between data collections.
- The Managed System Gateway driver is not running.
- The Identity Manager driver for the managed system (Active Directory, SAP, and so forth) is not running.
- The managed system can be reached by the Identity Manager driver.
- The data collection process was suspended because of errors.

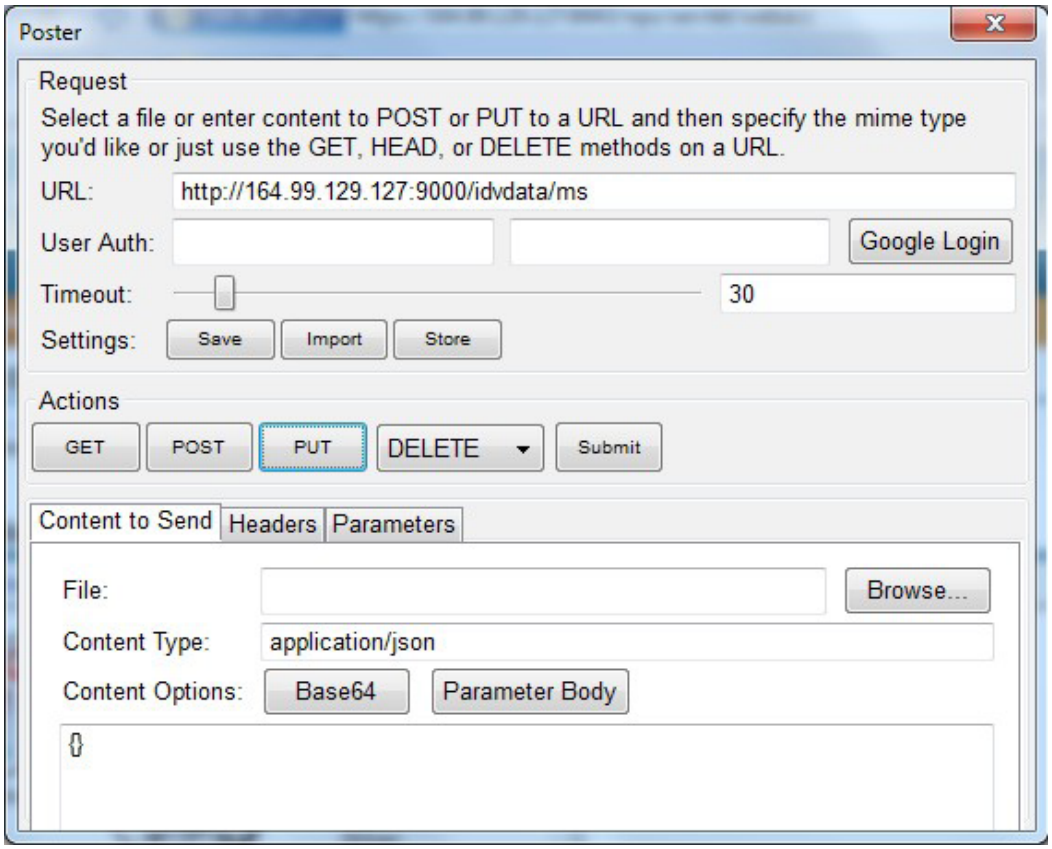
Here are some troubleshooting tips:

- Check to see if data missing from the report is present in the Identity Information Warehouse.
  - The data collection services use the idm_rpt_data schema space. Tables starting with the idmrpt_ms_ prefix are used to store data retrieved from the Managed System Gateway driver.
  - If the data is present, verify that the report definitions are up-to-date. Down, import, and rerun the report that is missing data.

- Verify that the Managed System Gateway driver is running. Check in Identity Console to see that the driver is present and the driver state is **Running**. If it is not running, start the driver and activate the data collection process on the Identity Vaults screen.
- Verify that the Managed System Gateway driver is accessible from the machine that Identity Reporting is running on. If Identity Reporting and Identity Manager are not running on the same box, verify that the Managed System Gateway driver configuration references the real IP address, rather than 127.0.0.1 (the default setting).
- Verify that the Managed System Gateway connection information is correct.
  - In Designer, check the Managed System Gateway Registration section of the Data Collection Service driver.
  - Check that the proper configuration information is reflected in the idm_rpt_data.idmrpt_ms_collector table.

    ```
    select * from idm_rpt_data.idmrpt_ms_collector
    ```

- Verify that you can connect to the Managed System Gateway driver and get a response using Poster or the RESTClient Firefox plug-in.



- Check the data collection status:
  - Log in to Identity Reporting. Then navigate to the Identity Vaults screen and verify the status of data collection for the Managed System Gateway driver.

- If the collection status is **Initialized**, activate data collection. Then, wait until it completes, and check if the data is present.
- If the collection status is Suspended, see "Issue: Status of Data Collection is Suspended" on page 76 for details on what to do.

- Verify that the managed system can be reached:
  - Check if the Identity Manager driver for the managed system is running.
  - Check to see if there are any errors in the log for the Identity Manager driver for the managed system. If there are errors, enable driver trace and reactivate data collection.

Issue: Status of Data Collection is Suspended

You may see that the data collection status is Suspended on the Identity Vaults screen.

In this case, you should look at the following list of possible causes:

- The Managed System Gateway driver is not running.
- The Managed System Gateway driver has incorrect connection information.
- Errors have occurred in collection services for the Data Collection Service driver.

Here are some troubleshooting tips:

- Look at the database to see if it provides any clues about what might be causing the suspension:
  - The data collection status and failure reasons are stored in the idm_rpt_data.idmrp_ms_collect_state table.
  - The Managed System Gateway driver registration is stored in the idm_rpt_data.idmrpt_ms_collector table.
  - The Data Collection Service driver registration is stored in the idm_rpt_data.idmrpt_rpt_driver table:

    ```
    select ms_collect_id, ms_query_api, ms_collect_time,
    ms_collect_error from idm_rpt_data.idmrpt_ms_collect_state where
    idm_rpt_data.idmrpt_ms_collect_state.ms_collect_state = FALSE;
    ```

- If you see a failure to connect error:
  - Verify that the Managed System Gateway driver is running. In Identity Console, check that the driver is present and the current status is running. If not, start the driver and activate data collection on the Identity Vaults screen.
  - Verify that the Managed System Gateway driver is accessible from the machine that Identity Reporting is running on. If Identity Reporting and Identity Manager are not running on the same server, verify that the Managed System Gateway driver configuration references the real IP address, rather than 127.0.0.1 (the default setting).

    Also, check the Managed System Gateway parameter section.

    Check that the proper configuration information is reflected in the idm_rpt_data.idmrpt_ms_collector table.

    ```
    select * from idm_rpt_data.idmrpt_ms_collector;
    ```

  - If you see an HTTP status other than 200, verify that you can execute a query from a different tool such as Poster or RESTClient.

- If you see other kinds of errors, enable logging and reactive data collection.
  - Enable Managed System Gateway driver trace logging at level 5. Delete the old trace file (if one exists) and restart the Data Collection Service driver.
  - Enabled pulled Data Collection Service driver trace logging.

    Add the following trace to the idmrptcore_logging.xml file and tail the console log (by using `tail -f server.log`). You should see trace messages with recognizable DNs, names, and so forth.

    ```
    <logger
    name="com.novell.idm.rpt.core.server.service.DataCollectMgrService"
    level="TRACE" dditivity="true"/>
    <logger name="com.novell.idm.rpt.core.server.dc" level="TRACE"
    additivity="true"/>
    ```

Issue: Status 400 Returned for Status Query

You may see a status 400 returned for a status query REST call (/idvdata/results/{requestId}/status Query). This error may occur when you execute a query with a large data set. With a large data set, a query may cause the Managed System Gateway driver to restart, which resets the session, and causes the data collection to fail.

To fix this problem, set the publisher heartbeat interval to zero.

Issue: Driver Errors Occur in Multi-Driver Set Environment

If you see Data Collection Service errors occur in a multiple driver set environment, the cause may be that the driver scope is not correctly configured.

To correct this problem, verify the driver scope settings, and make changes as necessary.

REST Endpoint Troubleshooting

To troubleshoot problems with the REST endpoints, you can use any of the following tools:

- Poster (Firefox plug-in)

  To install this tool, click on **Tools > Add Ons**. Then search for Poster. Select this plug-in from the list and click **Add to Firefox...** button.
- RESTClient (Firefox plug-in)

  To install this tool, click on **Tools > Add Ons**. Then search for RESTClient. Select this plug-in from the list and click **Add to Firefox...** button.
- Curl command line client

  ```
  curl -XGET http://myserver:8180/IDMRPT/version
  ```

Troubleshooting Reporting Database

To troubleshoot the reporting database, you need to clear the reporting database on Role Based Provisioning Dashboard (RBPM). To clear the reporting database, perform the following steps:

1. Stop the DCS and the MSGW drivers. Perform the following steps to stop the drivers:
   - **1a** Click the **IDM Administration** tab from the Identity Console home screen.
   - **1b** Select the driver set where DCS and MSGW drivers are running.
   - **1c** Click the **Actions menu** icon on the DCS driver and select **Stop Driver**.
   - **1d** After stopping the DCS driver, click the **Actions menu** icon on the DCS driver again, then click **Startup Option > Disabled > OK**.
   - **1e** Repeat Step 1c to Step 1d for the MSGW driver.
   - **1f** Logout of the Identity Console server.
2. Suspend Data Collection in the reporting module. Perform the following steps to suspend data collection:
   - **2a** Open a new browser and login to the Reporting Module.
   - **2b** Select **Identity Vaults** from the left-hand navigation.
   - **2c** Under **Data Collection Service Driver**, uncheck **Enable event collection**.
   - **2d** Under the **Managed System Gateway Driver**, press the stop button in the Collection state area.
   - **2e** Press the Save button.
   - **2f** Select **Applications** from the left-hand navigation.

     NOTE: Suspend any non-managed applications which is defined.

     - **2f1** Press the stop button in the **Application state** section.
   - **2g** Press the **Save** button to save the configuration settings.
   - **2h** Logout of the Reporting Module and close the browser.
3. Issue the clean-up/purge request using REST. Perform the following steps to issue the clean-up/purge request
   - **3a** Get the Authorization Token from the OSP module. You can use any browser tool to get an authorization token, such as Poster (Firefox) or Advanced REST Client (Chrome). Perform the following steps to get an authorization token:
     - **3a1** Enter the following parameters in the browser tool:
       - **URL:** `http://myserver.novell.com:8180/osp/a/idm/auth/oauth2/grant`
       - **Method/Action:** POST
       - **Headers:** Select any of the following parameters:
         - **Name:** `Content-Type`
         - **Value:** `application/x-www-form-urlencoded`
         - **Name:** `Authorization`

- **Value:** BASIC (b64string in the format cn:password, using the SSO parameters from the DCS driver). For example:

  ```
  BASIC ZGNzZHJ2OmRyaXZlcgAA
  ```

- **Body Content:** `grant_type=password&username=<FDN in URLencode format>&password=<password>`

  For example:

  ```
  grant_type=password&username=cn%3Duaadmin%2Cou%3Dsa%2Co%3Ddata&password=novell
  ```

3a2 Press the **Execute**/**Send Request** button.

3a3 You should see a status message **200 Success**, along with the token. A sample status message along with the token is displayed below:


```
{
"access_token":"eHwAIEb42ZjiO4qTQM1G1sRshoy3SfaiGnSl6RCEdAxkyGY
wVplLjetsKo6ComvKgOpF8N@mHf9hv3VuSxEOjiDjQdeiUv@RiERfa8qiOoZxtF
1w9gf8ceVDfxGBAAWpDpCeS9NeYEM4nyoHT6QxgZQIzD4f5fAr@yOsyHTu5A@10
HwNO8bIogd/KvwbkTR84pPG6um4hIbcUKaMLO7HVOhnOcA~",
"token_type":"bearer",
"expires_in":120,
"refresh_token":"eHwAIC9STVVKIDBDSNi3/
yaCafvY5caU6iQPDYZNk9sSNtE55zlXdpfeJfdkPjTLEQ9ovPbM705DkdNkiOD9
NJYEa5CJTP7snqYV0Eijq8NHUFg39gf8ceVDfxGBAAWpDpCeS9NeYEM4nyoHT6Q
xgZQIzD4f5fAr@yOsyHTu5A@10HwNO8bIogd/
KvwbkTR84pPG6jzW4Os8NPmfRab0lyXKrOdI4hVLNAUuXSkTO88@I1@Ro5DZYqf
2fzrKIATu14znlw~~"
}
0
```


3b Now issue the database clear request using any Browser tool, such as Poster (Firefox) or Advanced REST Client (Chrome). Performing the following steps to issue the database clear request:

3b1 Enter the following parameters in the browser tool:

- **URL:** `http://myserver.novell.com:8180/IDMDCS-CORE/rpt/collectors/data`
- **Method/Action:** DELETE
- **Headers:** Select any of the following parameters:
  - **Name:** `Authorization`
  - **Value:** `bearer %Token-value-from-above%`

    For example:

    ```
    bearer
    eHwAIEb42ZjiO4qTQM1G1sRshoy3SfaiGnSl6RCEdAxkyGYwVplLjets
    Ko6ComvKgOpF8N@mHf9hv3VuSxEOjiDjQdeiUv@RiERfa8qiOoZxtF1w
    9gf8ceVDfxGBAAWpDpCeS9NeYEM4nyoHT6QxgZQIzD4f5fAr@yOsyHTu
    5A@10HwNO8bIogd/KvwbkTR84pPG6um4hIbcUKaMLO7HVOhnOcA~
    ```

3b2 Press the **Execute**/**Send Request** button.

3b3 You should see a status message **200 OK**. A message is displayed in the server.log. We have shown a sample message below:

```
<date> <time> INFO
[com.novell.idm.rpt.core.server.logging.naudit.LogEvent] (http-
0.0.0.0-8180-6) [RPT-CORE] [Data_Cleanup_Requested] Initiated by
cn=uaadmin,ou=sa,o=data; Data Collector UUID ALL
```

4 Now wait until the table `idm_rpt_data.idmrpt_identity` has 0 records. This may take a few minutes.

4a You can check the table content by issuing the SQL request. Run the following command to check the table content:

4a1 `SELECT count(*) FROM idm_rpt_data.idmrpt_identity`

4b If you see 0 records after the clean up, jump to the next step.

5 Using the Identity Console, remove all processed associations from the DCS driver.

5a Open a new browser and login to Identity Console.

5b Click the **IDM Administration** tab, then select the driver set where DCS driver is present.

5c Select the DCS driver and click **Inspector > Driver Inspector**.

5d Click on the **Actions** menu, change the option to **Filter for Processed' associations**.

5e Select the listed associations and click the **Delete associations** icon. Repeat this step until there are no processed associations left.

5f Click on the **Actions** menu, change the option to **Show all associations**.

6 Start DCS and MSGW Drivers. Perform the following steps to start the DCS and MSGW drivers:

6a Login to the Identity Console.

6b Click the **IDM Administration** tab from the Identity Console home screen.

6c Select the driver set where DCS and MSGW drivers are running.

6d Click the **Actions menu** icon on the DCS driver, then click **Startup Option > Auto start > OK**.

6e Check the **Do not automatically synchronize the driver** option. The driver migrates all the objects only for the time interval when the driver was disabled. If you wish to migrate all the data, go to Step 8.

6f Click the **Actions menu** icon on the DCS driver and select **Start Driver**.

6g Repeat Step 6d to Step 6f for the MSGW driver.

6h Logout of the Identity Console server and close the browser.

7 Enable Data Collection in the reporting module. Perform the following steps to enable data collection:

7a Open a new browser and login to the Reporting Module.

7b Select **Identity Vaults** from the left-hand navigation.

7c Under **Data Collection Service Driver**, check the **Enable event collection** checkbox.

7d Under the **Managed System Gateway Driver**, press the start button in the Collection state area.

7e Press the Save button.

7f Select **Applications** from the left-hand navigation.

NOTE: Enable any non-managed applications which is defined.

7f1 Press the start button in the **Application state** section.

7g Press the **Save** button to save the configuration settings.

7h Logout of the Reporting Module and close the browser.

8 Perform Migrate from the Identity Vault in the DCS Driver.

9 Perform Data Collection.

Not Able to Log In After Upgrading

Identity Manager recommends you to use a secure (SSL) connection between OSP and Identity Vault. If you are using a non-SSL connection, you cannot log into the reporting application after upgrading it.

This issue occurs because the Identity Vault upgrade process sets the **Require TLS for Simple Bind with Password** setting to **true**. This setting configures Identity Vault to disallow clear passwords and other data. If you make a secure connection to port 636 and have a simple bind, the connection is already encrypted. No one can view passwords, data packets, or bind requests.

You can workaround this issue in one of the following ways:

- Configure SSL between OSP and Identity Vault.
- Set **Require TLS for Simple Bind with Password** setting to **false** after upgrading the Identity Vault.

6 String Customization

This section outlines the procedure for customizing strings in Identity Reporting.

- "About String Customization in Identity Reporting" on page 83
- "Customizing the Strings for Identity Reporting" on page 84

About String Customization in Identity Reporting

You can customize the strings for Identity Reporting into any of several supported languages. These are the supported languages:

Table 6-1 *Supported Languages*

Locale Code	Language
da	Danish
de	German
en	English
es	Spanish
fr	French
it	Italian
ja	Japanese
nl	Dutch
pt	Portuguese
ru	Russian
sv	Swedish
zh-CN	Chinese (China)
zh-TW	Chinese (Taiwan)

The strings for Identity Reporting are contained with a set of language-specific JAR files associated with the three main WARs used by Identity Reporting:

- Client WAR
- Core WAR

The language-specific JAR files follow this pattern:

```
IDMRPT-CORE_language.jar
IDMRPT_language.jar
```

For example, the following JAR files apply to strings in French:

```
IDMRPT-CORE_fr.jar
IDMRPT_fr.jar
```

Customizing the Strings for Identity Reporting

To customize the strings for one of the supported languages:

1. Customize the appropriate language-specific properties JAR file.
2. Add the new JAR file to the appropriate WAR's WEB-INF/lib directory using the `jar` command.

A Payload Schema Information

This section provides reference information for the payload schemas used with the reporting REST APIs.

Results Payload Schema

Table A-1 *JSONObject Fields*

Field	Description
SIDX	**Integer** - Starting Index. All results sets begin at index "0"
EIDX	**Integer** - Ending Index. The last result in the set is at index "EIDX – 1". When obtaining batched results, EIDX should be used as the SIDX for subsequent calls.
MORE	**Integer** - (0 or 1). Indicates if more results are available.
Results	**JSONArray** containing 0 or more JSONObject results

Fault Status Payload Schema

Table A-2 *JSONObject Fields*

Field	Description
Fault	**JSONObject** containing fault "Code" and "Reason"
Fault/Code	**JSONObject** containing fault "Value" and "Subcode"
Fault/CodeValue	**String** – Indicates if problem lies with the "Sender" or "Receiver"
Fault/Code/Subcode	**JSONObject** containing application service-specific error code or message type "Value"
Fault/Code/Subcode/Value	**String** – application service-specific error code
Fault/Reason	**JSONObject** containing descriptive "Text"
Fault/Reason/Text	**String** – Details of reason for the fault

Here is some sample output:

```
{
  "Fault":
  {
    "Code":
    {
      "Value":"Sender",
      "Subcode":
      {
        "Value":"Managed System data does not exist"
      }
    },
    "Reason":
    {
      "Text":"Managed System information is not available"
    }
  }
}
```

Managed System Information Schema

Table A-3 *JSONObject Fields*

Field	Description
GUID	**String** - Namespace Unique identifier for the non-managed application. This field is used as the Primary Key for identifying the system data in the Reporting application. The identifier must be in the 32-character hexadecimal format expected for a GUID (globally unique identifier). If the identifier does not conform to this format, you may get an exception of the type `com.novell.idm.rpt.core.server.spi.exception.DCException`. **NOTE:** This value will also be used by the Identity Manager Reporting Service as the <identifier> for all query operations to the application service.
Name	**String** - Common Name for the non-managed application
Description	**String** - Description for the application
Type	**String** - Type of application (ie. Enterprise, Email, DB, etc)
Classification	**String** - Sensitivity classification (ie. Critical, Departmental, etc.)
Vendor	**String** - Application vendor
Version	**String** - Application version
BusinessOwner	**String** - Business Owner of the application. If the owner has an account in the application, the account ID should be used in this field

Field	Description
ApplicationOwner	String - IT Owner of the application If the owner has an account in the application, the account ID should be used in this field
Location	String - Physical Location of the application
Environment	String - Type of application environment (ie Production, Test, Dev)
AuthenticationIPAddress	String
AuthenticationPort	String
AuthenticationID	String - Account ID that will be used to obtain application data
Hierarchical	String - Indicates if the application uses a hierarchical namespace

The following fields are present if the application service supports the concept of a Logical System:

Table A-4 *Fields for Application Services that Support a Logical System*

Field	Description
LogicalInstance:ID	Similar to GUID. **NOTE:** This value(s) will also be used by the Identity Manager Reporting Service as the <ls-identifier> for all query operations to the application service.
LogicalInstance:Name	Similar to Name
LogicalInstance:Description	Similar to Description
LogicalInstance:Type	Similar to Type
LogicalInstance:Classification	Similar to Classification
LogicalInstance:Vendor	Similar to Vendor
LogicalInstance:Version	Similar to Version
LogicalInstance:BusinessOwner	Similar to BusinessOwner
LogicalInstance:ApplicationOwner	Similar to ApplicationOwner
LogicalInstance:Location	Similar to Location
LogicalInstance:Environment	Similar to Environment
LogicalInstance:AuthenticationIPAddress	Similar to AuthenticationIPAddress
LogicalInstance:AuthenticationPort	Similar to AuthenticationPort
LogicalInstance:AuthenticationID	Similar to AuthenticationID

Entitlements Types Schema

Table A-5 JSONObject Fields

Field	Description
ENT_ID	String – Application-specific identifier of the entitlement type. This may be an object class name, well-known identifier, etc.
ENT_TYPE	String – Type of entitlement
ENT_TYPE_DISPLAY_NAME	String – User readable form of ENT-TYPE
ENT_CATEGORY	String – general categorization of entitlement (ie. Group, Security Profile, ACL, etc.)
ENT_DESCRIPTION	String – Description of entitlement
ENT_DISPLAY_NAME	String – User readable form of ENT-ID

Entitlements Information Schema

Table A-6 JSONObject Fields

Field	Description
MS_ENT_VAL	String – Entitlement value (ie. Group name, Role Name, etc)
MS_ENT_DESC	String – Description of entitlement
MS_ENT_VAL_DISP_NAME	String – User-readable form of entitlement (Useful if MS_ENT_VAL is a GUID)

Entitlements Assignments Schema

Table A-7 JSONObject Fields

Field	Description
MS_ENT_VAL	String – For valued entitlements, the name of the particular entitlement assigned. For non-valued entitlements, the entitlement type identifier (ENT_ID)
MS_MEMBER	String – The ID of the application Account that has been assigned the entitlement
MS_MEM_IDV_ASSOC	String – Identity Vault Association value for the account in the connected system. **NOTE:** This field exists for use by NetIQ Identity Manager. It should be omitted from Results from non-managed application systems.

Accounts Rule Schema

Table A-8 *Field Description*

Field	Description
Order	**Integer** – indicates the evaluation priority of the rule when more than one result is present.
MatchAttrName	**String** – contains one or more comma-separated attribute names that will be used for matching accounts with accounts information collected from other systems.

Account Information Schema

Table A-9 *JSONObject Fields*

Field	Description
ACCT_ID_VALUE	**String** - Account Identifier in application. This value is generally the application Primary Key value in the IDM Reporting database. Once a Primary key attribute is used for the account, the application service must use that value for the ACCT_ID_VALUE in the /profiles API results.
ACCT_ID_TYPE	**String** - Type of Account (ie. USER, EMAIL, etc.)
Managed	**Boolean** – Indicates if the account is within a connected system being managed by NetIQ Identity Manager. A non-managed system should return false.
APP_NAME	**String** – Name to be used to identify the application (See "Name" in the Managed System Information Schema)
Synchronized	**Boolean** – Indicates if the account is being synchronized using NetIQ Identity Manager. A non-managed system should return false
ACCT_STATUS	**Enum** – Status of the account in the application: ◆ "A" – Active ◆ "I" – Inactive ◆ "U" – Undefined
MS_ACCT_GLOBAL_IDENTIFIER	**String** – This field should ONLY be used if a single GUID is used to identify multiple accounts in the application. If it IS used, this value will be used as the Primary Key in the Reporting database. Once a Primary key attribute is used for the account, the application service must use that value for the ACCT_ID_VALUE in the /profiles API results.

Field	Description
IDV_ASSOCIATION	**String** – Identity Vault Association value for the account in the connected system. **NOTE:** This field exists for use by NetIQ Identity Manager. It should be omitted from Results from non-managed application systems.
IDV_ACCT_STATUS	**Enum** – Status of the account in the application: ◆ "A" – Active ◆ "I" – Inactive ◆ "U" – Undefined **NOTE:** This field exists for use by NetIQ Identity Manager. It should be omitted from Results from non-managed application systems.
IDV_ACCT_DN	**String** – Identity Vault distinguished name for the associated account. **NOTE:** This field exists for use by NetIQ Identity Manager. It should be omitted from Results from non-managed application systems.

Profile Information Schema

Table A-10 *JSONObject Fields*

Field	Description
ACCT_ID_VALUE	**String** - Account ID for Identity
FIRST_NAME	**String**
LAST_NAME	**String**
MIDDLE_INITIAL	**String**
FULL_NAME	**String**
JOB_TITLE	**String**
DEPARTMENT	**String**
LOCATION	**String**
EMAIL_ADDRESS	**String**
OFFICE_PHONE	**String**
CELL_PHONE	**String**
PRIVATE_PHONE	**String**
IM_ID	**String**

Field	Description
PHOTO	**Octet-String**
GEN_QAL	**String** – Generational Qualifier
PREFIX	**String** – Salutory prefix (ie. Mr., Mdm., Dr., etc.)
PREFERRED_NAME	**String**
PREFERRED_LANG	**String** – 2 character Language ISO code
JOB_CODE	**String**
WORKFORCE_ID	**String**
COST_CENTER	**String**
EMPLOYEE_STATUS	**String**
EMPLOYEE_TYPE	**String**
COMPANY	**String**
DEPARTMENT_NUMBER	**String**
MAILSTOP	**String**
SUITE_NUMBER	**String**
STREET_ADDRESS	**String**
CITY	**String**
POSTAL_CODE	**String**
STATE	**String**
COUNTRY	**String**
PAGER_NUMBER	**String**
IS_MANAGER	**String**
MANAGER_WF_ID	**String** – Manager Workforce ID
HIRE_DATE	**String**
TRANSFER_DATE	**String**
TERMINATION_DATE	**String**
FIRST_WRK_DAY	**String**
LAST_WRK_DAY	**String**
IDENTITY_DESC	**String** – Description