IBM TRIRIGA Application Platform
Version 3 Release 5.3

Reporting User Guide

Note
Before using this information and the product it supports, read the information in "Notices" on page 31.

This edition applies to version 3, release 5, modification 3 of IBM TRIRIGA Application Platform and to all subsequent releases and modifications until otherwise indicated in new editions.

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Chapter 1. IBM TRIRIGA Report Manager

You use the Report Manager to filter, search, and sort reports. You can also link to other reports. You can use the **Report Builder** tool to generate and modify reports.

In IBM® TRIRIGA®, for action buttons instead of links, set the SYSTEM_ACTION_STYLE property in the `TRIRIGAWEB.properties` folder.

Report types

In the Report Manager, you create reports that you can use to search, filter, sort, and link to other reports. You use reports to show data.

The following list describes the report types:

Report
A basic tabular report.

Graphic
Uses a query and information from web graphics that are based on computer-aided design (CAD) drawings.

Chart Shows the data in a chart, such as a pie, bar, line, and stacked bar chart.

Summary
A tabular report that shows the totals without the detail records.

Hierarchy
Uses a query to show information in a hierarchical structure.

Metric Aggregates instance data or fact tables in a table or chart that has drill paths, filters, and related reports.

Building reports

You use the Report Builder to create reports that can filter, sort, and search. If you created a report or if a report is shared by a group that you are a member of, you can see the report in the **My Reports** tab.

Creating reports

You create reports in the **My Reports** tab. There are multiple types of reports.

Procedure

1. In the **My Reports** tab, specify the name of the report. The naming convention is to use a three-letter prefix, such as `tri_myreport` or `cst_myreport`.
2. Specify the ID. Use **Custom** or your company's numbering standards for reports.
3. Specify the header.
4. Specify a tag to use an extra grouping for filtering.
5. Complete the report description.
6. Select the type of report.
7. Optional: Select the **Track History** check box to see the report history in the **History** tab.

8. Optional: On the **Order & Group** tab, organize the layout of the report.

Adding business objects to reports

The business objects that are in a report identify the data that is available for a report. The report works only with data from the specified business objects.

Procedure

1. On the **Business Object** subtab, select **Add Business Object**.
2. Select a module.
3. Select one or more business objects.

   Tip:

   A report query against multiple business objects reads the metadata from the base business object. For datetime values to work correctly, the Relative property on the field on the base business object must match the other business objects in the same module.
4. Select one or more forms. Only the data that is associated with the forms that are specified are included in the report.
5. Save the report.
6. Optional: To add a child business object, select the parent business object and select **Add Business Object**.
7. Select one or more associate options.
8. Optional: To expand the data that you see in the report, clear the **Show only Associations defined in Data Modeler** check box.
9. To designate the object as the primary associated business object, select the **Primary Associated Business Object** check box. The primary associated business object is at the top of a hierarchical structure. If you clear the check box, the next associated business object in the hierarchical structure is the primary associated business object.
10. Save the report.

Adding related reports

A related report is a self-contained report that has its own definition and format. It shows additional information that the viewer might find relevant. A main report can have more than one related report. A related report cannot have another related report.

About this task

If you add a related report to a query section that has an alternative form, the related report will use the alternative form. For example, if the original query in the query section is on employee and the selected related report is on employee, the related report will use the alternate form. However, if the selected related report is on building, the related report will use the form defined for the record.

Procedure

1. On the **Related Reports** subtab, select **Add**.
2. Select the module.
3. Select the related reports and select **OK**.
4. Save the report.

Setting security access for reports

The **Security** subtab specifies the groups that can access a report. The owner of the report has full access privileges.

Procedure

1. In the Security Access section, select **Add**.
2. Select the groups that can access the report and select **Accept**. Users in groups where the most permissive access to My Reports is Read can only run reports, unless the report's **Security** tab has **Edit** selected, in which case users can edit the report.
3. Select **Save**.

Defining report columns

The **Columns** tab defines which fields are used in the report. The fields that you select are shown as the columns in the report.

About this task

The information in the **Columns** tab is organized into sections. The Business Object section indicates the source business objects. The Columns section identifies which fields in the selected business object to include in the report. The Display columns section specifies the order in which the selected fields are presented and the labels that are used to identify them.

Procedure

1. Select the business objects.
2. In the Columns section, select the check box for each field to include in the report.
3. In the Display Columns section, edit the text in the **Report Label** text box.
4. To specify a percentage for the display space for a field, specify a numerical value in the **Width** text box.
5. Select **Save**.

Applying filters to a report

On the **Filters** tab, you specify the fields, operators, and values that determine the results that are shown in a report. The selected filters run sequentially. Reports run faster if the filter that filters out the most records is specified first, followed by the one that filters out the next highest number of records

Procedure

1. Select a business object.
2. In the Columns section, for each field that is used as a filter, select the check box in the User or System column.
3. In the User Filter Columns section and System Filter Columns section, select a field and change the sequence in which the filters are applied.
4. To change the label that is shown for a filter, edit the text in the **Report Label** text box. If the field is a time field, input the time in milliseconds or as a string in hh:mm:ss format.
5. From the **Filter Operator** drop-down box, select the comparison filter operator.
6. From the **Conditional** drop-down box, select the conditional option. If you select `Yes`, the system filter is ignored in the query results when the filter input is empty.

7. For system filters with a value for run time, specify the value that must be matched. To filter a **Boolean** field, use the values `TRUE` or `FALSE`.
8. Select the **Join Operator** to organize system filters in sets to further refine the order that the filters are applied.
9. Select **Save**.

Filtering records based on associations

You use the **Advanced** tab to define the type of associated records that are used to filter the results of the report.

Procedure

1. On the Association Filters section bar, select **Add**.
2. Select the module.
3. Select the business object.
4. Select the association type.
5. Use the **Filter Type** field and the **Record/Query** field to specify which records to use to filter. You can specify a filtering record with special name values.
6. Save the report.

Comparing revisions of a report

When you modify and save a report, a revision is created for the report. You can use the revision to track the changes that you make to the report.

Procedure

1. Select **Revisions** to review the revisions of the report.
2. Select two revisions of a report and select **Compare Revisions** to compare the revisions. You can also compare the report with a report of a different name by selecting **Compare Objects**.
3. View the results in the Comparison Results section. If you want to revert to a previous revision of the report, select the revision and select **Publish**.

Specifying aggregation settings for metric reports

Metric reports aggregate data into a table or chart.

Procedure

1. Open the metric report.
2. On the **Columns** tab, in the Aggregation Settings section, select **Add**.
3. Specify a label for the report
4. Select a function.
5. Specify a sequence number.
6. Select **Field1** to specify the field where the aggregation occurs.
7. Select a target axis to identify where the aggregated data is shown.
8. Select a color to represent the aggregation.
9. Select **Save**.

Drilling through metric reports

You can create a metric graphic report to drill through to the underlying data in a report. After you create a metric report that represents the underlying records, you can associate the metric report with the metric graphic report. You can create a metric report by creating a report with a type that is metric.

When you pick a data point in a report, the system filters the records based on that data point. For example, you might have a metric graphic report that represents the sum of the original budget by status. If you select the Active status data point in the metric graphic chart, only underlying records with an Active status are shown. Then, you can drill through from the metric report chart to the base record.

You create a metric graphic report the same way as you create a metric report. After you define the metric report, you associate it with the target metric graphic report. To associate the reports, open the target graphic report and go to the **Order & Group** tab.

Tip: To drill through to a particular record on a metric tabular report, the first column of the report must represent the record ID of the record to be opened when clicked. The **System Record ID** is an example of a field that can be added as the first column.

System reports

In the Report Manager, system reports are IBM TRIRIGA standard reports. A system administrator can designate system reports as community reports.

You can create and view system reports in the **System Reports** tab. If a system report is defined as a community report, you can also view it in the **Community** tab.

You can create a system report in any of the basic reports types, such as chart or metric, or you can create a system report that is one of the following types:

External
A report that was created with a third-party software, such as BIRT.

Reserve Legacy
A query that returns the results of available resources only.

Reserve
A query that acts like the Reserve Legacy query, but also uses a calendar to determine the availability of resources.

Chapter 2. Advanced reporting in IBM TRIRIGA

You use IBM TRIRIGA Advanced Reporting for report presentations. IBM TRIRIGA Advanced Reporting uses the Eclipse BIRT application and an IBM TRIRIGA plug-in for the BIRT application. Form reports show the contents of a single record. Query reports show multi-record reports.

The BIRT application layout is grid-based, and every element must exist in an element of the BIRT layout grid. Grid layouts align report elements onto lines, align elements vertically into columns, and size the columns to fit the contents. You can use grids to create a report by dragging elements into the report design.

Important: You must follow BIRT and IBM TRIRIGA reporting guidelines and consider memory allocations if you run complex reports. The Java heap size is a critical parameter when you design, build, and run reports.

Before you can develop BIRT reports for an IBM TRIRIGA application, you must install the BIRT Report Designer and configure it to work with IBM TRIRIGA.

Installing the BIRT application

You install the BIRT Report Designer once. Before you begin the installation, ensure that a supported version of the Java™ JRE is installed locally.

About this task

For the supported versions, see the Client Compatibility section of the IBM TRIRIGA Application Platform Compatibility Matrix.

Procedure

1. Go to http://download.eclipse.org/birt/downloads/ and download BIRT Designer All-in-One to a local directory. The directory name cannot include any spaces.
2. In the folder where you downloaded BIRT, extract the compressed file, open the Eclipse folder, and select the `eclipse.exe` file.
3. Select the workplace location where Eclipse stores your project files and select **OK**.

Configuring BIRT Process Servers

You can configure an IBM TRIRIGA server as a BIRT process server to offload and process BIRT reports. If you do not configure a separate process server, BIRT report processing is done on the application server.

Procedure

1. Locate the `TRIRIGAWEB.properties` file for the server being configured as the BIRT process server.
2. Set the `BIRT_PROCESS_SERVER_LISTENING_PORT` property to the TCP port that communicates between the two IBM TRIRIGA servers. The server detects BIRT requests on this port.

3. Set the `BIRT_PROCESS_SERVER_HOST_NAME` property to the host name or IP address of the BIRT process server.
4. Set the `BIRT_PROCESS_SERVER_PORT` property to the listening port that you configured on the BIRT process server.
5. Save the `TRIRIGAWEB.properties` file.
6. Restart the BIRT process server.

Installing the IBM TRIRIGA plug-in for BIRT

For IBM TRIRIGA Advanced Reporting, you must have the IBM TRIRIGA plug-in for BIRT installed.

Procedure

1. Open the BIRT application, and select **Help** > **Install New Software**.
2. In the **Work With** field, specify the following URL for the IBM TRIRIGA plug-in software site: *http://[server:port]/[context path]/eclipse*. Use the *[context path]* only if the server is configured with a context path.
3. Select the **IBM TRIRIGA BIRT Features**.
4. Select the details and select **Next** twice.
5. Review and accept the licenses, and select **Finish**.
6. Restart the BIRT application.
7. In the **Workspace** field, select the workspace and select **OK**.
8. In the Eclipse application, select **Window** > **Preferences** > **IBM TRIRIGA BIRT Preferences** and specify the information to connect to the IBM TRIRIGA server. The IBM TRIRIGA application server is located at *http://[server:port]/[context path]/eclipse/remote*.
9. Select **Test Connection** and in the Connected dialog box, select **OK**.
10. Optional: Configure update notifications.
    a. Select **Window** > **Preferences**, expand **Install/Update**, and select **Automatic Updates**.
    b. Select **Automatically find new updates and notify me**.
    c. Select the **Update schedule**, **Download options**, and **When updates are found** options.
    d. Select **Apply** > **OK**.

Upgrading the IBM TRIRIGA plug-in

When a new IBM TRIRIGA release is available, you update the IBM TRIRIGA plug-in in the BIRT Eclipse environment.

Procedure

1. Open the BIRT application, and select **Help** > **About Eclipse**.
2. Select **Installation Details**.
3. In the **Installed Software** tab, select **IBM TRIRIGA BIRT Feature**.
4. Select **Update**.

BIRT report process

Report writers create BIRT reports. BIRT reports are a type of advanced report for report presentations.

The following steps describe the BIRT report process:

1. Create a starter report in IBM TRIRIGA.
2. Import a starter report to the BIRT Report Designer.
3. Develop a BIRT report.
4. Preview a BIRT report.
5. Export a BIRT report.
6. Upload a BIRT report to IBM TRIRIGA.
7. Associate the BIRT report with an IBM TRIRIGA access point.

Starter reports in IBM TRIRIGA

Starter report files are downloaded from the IBM TRIRIGA application. You can create reports from an existing query report or from a form.

Creating starter reports from query reports

You can create a starter report from a new or existing IBM TRIRIGA query report. Query reports can contain data from top-level records. They can also contain multiple levels of detail that are accessible by using associated business objects and records. Most often, query reports show multi-record reports.

Procedure

1. In the IBM TRIRIGA Report Manager System Reports, go to the query to use as a model.
2. Select the **Advanced** tab and select the **BIRT Report** link.
3. Select the location for the download of the compressed starter file and select **Save**.

Creating starter reports from forms

You can create a starter report from a new or existing IBM TRIRIGA form. Form reports typically contain data from a top-level record. They can contain data from one or more associated records. In the **Reports** tab of a record, you can select form reports. You can also run a form report to display the form for multiple top-level records.

Procedure

1. In the IBM TRIRIGA Form Builder, go to the form to use as a model.
2. Select the **Layout** tab and select the **BIRT Report** link.
3. Select the location for the download of the compressed starter file download location and select **Save**.

Importing starter reports into BIRT

You import starter reports from IBM TRIRIGA into the BIRT Report Designer.

About this task

If your compressed file extraction tool allows it, you can open the `.zip` file and in the BIRT Report Designer Navigator pane, drag the files into a report project.

Procedure

1. In BIRT, select **File** > **New** > **Project**.
2. In the **Business Intelligence and Reporting Tools** folder, select **Report Project** > **Next**.
3. Specify the name of the project and select **Finish**.
4. In the Report Design window, select the **Navigator** tab, right-click the project, and select **Import**.
5. In the import wizard, select **General** > **Archive File**.
6. Select the compressed file that you downloaded when you created a starter report in IBM TRIRIGA and select **Finish**.
7. Verify that the starter report shows in the **Navigator** tab.

Creating BIRT reports

To create a BIRT report, you use the BIRT Report Designer to modify the imported `.rptdesign` file.

Adding data sources

In BIRT reports, all data is accessed through data sources. A starter report includes a single data source that is named TRIRIGA. TRIRIGA is a scripted data source. All data sets that obtain their data from an IBM TRIRIGA server must use this data source.

About this task

If the TRIRIGA data source does not provide all the data that you need, you can use the data access methods that BIRT supports, including JDBC and XML. Use a JDBC data source for direct access to the IBM TRIRIGA database. Note that this method does not go through the IBM TRIRIGA meta-layer and does not include built in business logic around security. You must add a JDBC data source manually, and it must be named `TRIRIGA_DB`. At run time, the report is modified so that it interacts with the IBM TRIRIGA database that is associated to the server that the report is running on.

Procedure

1. In BIRT, select **Data Explorer**.
2. Right-click **Data Sources** and select **New Data Source**.
3. Select **JDBC Data Source** and in the **Data Source Name** field specify `TRIRIGA_DB`.
4. Select **Next**.
5. Optional: Select **Driver Class**.
6. Specify the database URL, the user name, and the password.
7. In the **JNDI URL** field, enter `jdbc/local/Datasource-TRIRIGA-data`, and select **Finish**.
8. Right-click **Data Sets** and select the new data set name.
9. Specify the SQL statement.
10. Optional: Add parameters.
11. Select **Finish**.

Data sets

A starter report contains at least one data set. The data set models the IBM TRIRIGA report or form that was the source of the starter report.

The name of the data set represents the IBM TRIRIGA report or form. For example, a data set that models the report triFiscalPeriods - Find - Years is named [v2QRY]Classification_triFiscalPeriods_triFiscalPeriods_-_Find_-_Years.

A starter report that is exported from an IBM TRIRIGA query has one data set. The data set has columns that correspond to the columns in the IBM TRIRIGA query. For example, the IBM TRIRIGA report triFiscalPeriods - Find - Years has the following columns: Name, Start Date, End Date, and Hierarchy Path.

A starter report that is exported from an IBM TRIRIGA form can have multiple data sets. One data set that has the prefix [v2BO] exists in the starter report. The data set represents the top-level data of the form and has columns that correspond to the business object fields for the form's top-level business object. The system - record IDs input parameter specifies the records to retrieve for the [v2BO] data set.

Every smart section in the business object of a form is represented as a data set that has the prefix [v2SS]. These smart section data sets have columns that correspond to the business object fields in those sections. The **system__parentRecordId** input parameter specifies the data to retrieve for this data set.

Every query section in the form is represented as a normal query data set and has the prefix [v2QRY]. The **system__parentRecordId** input parameter specifies the data to retrieve for this data set.

In the starter report, the **system__parentRecordId** input parameters are not bound to the top-level business object data set. You must bind the parameters inside the report layout.

Data types

To preserve data that is from IBM TRIRIGA, the system returns all business object field data from IBM TRIRIGA in the form of Java Objects. All starter reports have output columns that are modeled as Java Objects.

Use the following guidelines for Java objects:

- When you use a value in the report, you must know the BIRT Type to map it to.
- If you use values frequently, more scripting is required.
- When you drag an IBM TRIRIGA element directly onto a report, the element shows in the report.

To use the output column for something other than display, you can access the SQL value from the output column in any BIRT expression by using the object's getNativeValue() method.

For example, in the Expression Builder, enter the following value:
`row["Classification_triFiscalPeriods_triStartDA"].getNativeValue()`.

If the Java object has additional methods, you can access them by using any BIRT expression. When binding one of these expression results to a report element, select the appropriate BIRT type to access all the built-in BIRT functions.

When you put the output column on the report, BIRT automatically uses the toString() method. To access the value, use the following minor script:
`row["Classification_triFiscalPeriods_triStartDA"].getNativeValue()`.

When you export a starter report, all data is mapped to Java Objects inside BIRT. Every Java Object minimally has the getNativeValue() and toString() methods.

Java objects:

When you export a starter report, all data is mapped to Java Objects inside BIRT. Every Java Object has the getNativeValue() and the toString() methods.

The following table provides information for additional methods for Java object and the business object field type.

Table 1. Java objects

Business object field type	getNativeValue() result	Considerations for toString()	Additional methods	Suggested BIRT binding if you use the native value
Text	java.lang.String	N/A	N/A	String
Number Financial rollup	java.math.Big Decimal	UOM metadata and BO field masks	getUom().getUom TypeCode() getUom.getUom Value() Has Uom() returns false if there is no UOM.	Decimal
Classification Rollup	java.math.Big Decimal	BO field masks	N/A	Decimal
Date	java.sql.Date	User's timezone and preferred display format	N/A	Date
DateTime	java.sql.Date	User's timezone and preferred display format	N/A	Date Time
Time	java.sql.Time	Is displayed as hours/minutes/ seconds with no timezone considerations.	N/A	Time for meaningful results from this value, use a GMT calendar.
Locator	java.lang.String	N/A	N/A	String
Duration	java.lang.Long A single value that encodes the Duration components into a single value. It is stored in the IBM TRIRIGA database to represent a particular duration value. This value might not represent the total number of milliseconds for the particular duration.	Formats that use IBM TRIRIGA-preferred format and considers the user's language.	N/A	Decimal
Classification	java.lang.String (nontranslated value)	BO field option full hierarchy path and user's language	N/A	String

Table 1. Java objects (continued)

Business object field type	getNativeValue() result	Considerations for toString()	Additional methods	Suggested BIRT binding if you use the native value
List	java.lang.String (nontranslated	User's language	N/A	String
Boolean	java.lang.Boolean	N/A	N/A	Boolean
Image	byte[]	Returns path to image as stored in IBM TRIRIGA database	N/A	Image
Binary	byte[]	String representation of the content ID, the key of the DM_CONTENT table	N/A	Blob
UOM	java.lang.String (Non-translated value)	getUomValue() translated to the current user's language	getUom().getUom TypeCode() getUom.getUom Value() getUomValue() is NULL if there is no value	String
Password	java.lang.String	N/A	N/A	String
SystemField_Bo RecordId	java.lang.Long	N/A	N/A	Decimal
SystemField_	java.lang.Long	N/A	N/A	Decimal
SystemField_ ModifiedDate Time	java.sql.Date	User's timezone and preferred display format.	N/A	Date Time
SystemField_ CreatedDate Time	java.sql.Date	User's timezone and preferred display format	N/A	Date Time
SystemField_ Modified DateTimeNumber	java.sql.Date	User's timezone and preferred display format	N/A	Date Time
SystemField_ ProjectId	java.lang.Long	N/A	N/A	Decimal
SystemField_ BoTypeId	java.lang.Long	N/A	N/A	Decimal
SystemField_Parent	java.lang.Long	N/A	N/A	Decimal

Parameters

In IBM TRIRIGA, queries have parameters that filter the data that is returned. In the Report Manager, you use user filters to configure query filters.

If a BIRT data set uses an IBM TRIRIGA query and that query has user input filters, each filter is shown in a starter report. The filters are shown in the **Data Explorer** tab as a top-level entry in the Report Parameters folder. This report parameter defines the user prompt that occurs prior to the report execution. The filters also are shown in the Parameters section as a parameter of the data set that models the IBM TRIRIGA query. The entry passes the report parameter value that you specify to the data set.

When a filter is required, the user filter in the IBM TRIRIGA query appears as a user prompt and filters the results based on the IBM TRIRIGA query definition.

The default label for a field is the business object field's label. You can add a custom label and help text for these report parameters.

If a report has multiple user filters on the same field, all filters are shown in the report. BIRT identifies parameters by using a suffix that corresponds to their positions in the query.

BIRT provides no means to differentiate between a filter to ignore and a NULL filter value. If you select NULL for a report parameter that maps to an IBM TRIRIGA query filter, the filter is not used.

For parameter types that are text, you can specify a value of NULL, and the IBM TRIRIGA query engine uses NULL as the filter value.

The IBM TRIRIGA BIRT integration processes the Time parameter filter correctly only when you use a String data type for the Time parameter. If you use a Time data type for the Time parameter filter, the TRIRIGA BIRT viewer does not display an error, but it does not filter the results properly.

The IBM TRIRIGA BIRT integration processes non-English date and date time formats on the Date and Date Time filter parameters only if they are set as a String data type.

Context for data requests

In IBM TRIRIGA, you must add context to data requests. Context is required for the current user, the record, and the project.

The BIRT preview environment provides the user context from the IBM TRIRIGA BIRT preferences. The IBM TRIRIGA runtime environment gets the user context from the user that is signed in.

In both the BIRT preview and IBM TRIRIGA runtime environments, record context passes through the BIRT report as a report parameter and down to the data sets.

A starter report for a query has a non-required, hidden **system__parentRecordId** report parameter. For the query data set, it has a **system__parentRecordId** input parameter. When the report runs, if a nonzero value is passed through the parameter to IBM TRIRIGA, it becomes the `$$RECORDID$$` value when the IBM TRIRIGA query runs.

In a starter report for a form, the **system__recordIds** parameter is a required report parameter. The **system__recordIds** parameter is a comma-delimited list of record IDs that the form report renders. You can use multiple IDs for bulk-reporting requirements.

In a BIRT preview environment, a prompt is used to collect the **system__recordIds** value to preview the form report. The following are examples: 1590609, 1345105, 1295530.

In a report definition, even though the report has a parameter that is configured as not-hidden, the prompt is not shown inside an IBM TRIRIGA runtime environment, because the runtime environment provides the value.

In the BIRT preview environment, you can specify a project context in the IBM TRIRIGA BIRT Preferences section by using the project ID input. The BIRT preview environment uses the project ID input to provide project context for any IBM TRIRIGA requests.

System fields

Some fields that are built into a BIRT report do not have corresponding IBM TRIRIGA business object fields.

The following table contains system fields with special names that have special meaning to the IBM TRIRIGA-BIRT integration.

Table 2. System fields

System field	Usage	Description
system__recordIds	Data set input parameter for business object data sets. Report input parameter for form reports.	Comma-delimited list of record IDs that control the records that are returned from form reports. Required if you do not use the **system_recordId** input parameter.
system__recordId	Data set input parameter for business object data sets.	Numeric value that represents a single record to return from a business object data set. For a query report, this field is required. For a form report, this field is required if you do not use the **system_recordIds** input parameter.
system_parentRecordId	Data set input parameter for query data sets. Data set input parameter for smart section data sets. Report input parameter for query report.	Provides record context to reports and data sets. For smart sections, **system_parentRecordId** is a required value that controls which record's section data to return. For query data sets, the **system_parentRecordId** provides the *$$RECORDID$$* and *$$PARENT* variables that are used in an IBM TRIRIGA query definition.
system__recordId	Output column for all types of IBM TRIRIGA data sets.	Every IBM TRIRIGA data set has an output column named **system_recordId**. The column contains the record ID of the returned record. The only case where this column is returned with a NULL value is for a non-pass through reference with modified smart section. In that case, there is no corresponding IBM TRIRIGA record.

Table 2. System fields (continued)

System field	Usage	Description
system__sourceRecordId	Data set output column for smart section data sets.	Every smart section data set has an output column that is named **system_sourceRecordId**. The value holds the data that a smart section record was initialized from, which is called the source record. The **system_sourceRecordId** helps to differentiate the section record from the source record.

Globalization

Starter reports and the IBM TRIRIGA-BIRT integration have features to assist with the globalization of reports. Before you export labels for BIRT reports, make sure that these reports are set up in IBM TRIRIGA.

The display string for any IBM TRIRIGA Date or DateTime field is formatted in the user's preferred date format. In addition, the formatDate() custom function and the formatDateTime() custom function present a BIRT Date or DateTime in the IBM TRIRIGA user's preferred date format.

IBM TRIRIGA translates all labels in the BIRT report. The starter report includes all labels that are needed to translate the business object field labels in a report.

A starter report is associated to a resource properties file with a `tririgalabels.properties` extension. You can view this association in the Resources section in the **Property Editor – Report** tab. This report resource points to a properties file that contains label keys for every business object field that was built into the report.

In the starter report, each key is already associated to its corresponding data set output column in BIRT. If you use the Data Explorer as a canvas, you can drag elements onto the canvas without having to re-associate the display keys for those elements. If you do not drag elements onto the canvas, you can use all of the labels in the properties file on any report element. You use the labels in the properties file when you select a report element in the layout and navigate to the Localization Properties section in the **Properties** tab of the **Property Editor – Label** tab. At run time, text that uses these keys is translated based on the current user's language.

If you need a label in your report that is not available from the starter report properties file, you can add keys and labels to the file. Key names cannot begin with the [FIELD] special prefix. IBM TRIRIGA can translate any label that you create.

A BIRT report library can house reusable report elements, including labels. You create a properties file with the `tririgalabels.properties` extension and refer to that properties file as a library resource. To view a properties file for a BIRT report library, select the library in the BIRT navigator, and view the properties in the **Property Editor – Library** tab. To read the library, each BIRT report must reference the library before you export and upload the report to IBM TRIRIGA.

Subreports

You can build subreports into the top level of a report or put them in separate `.rptdesign` files.

For example, a report might show purchase order headers. For each header, a report can show line items for that particular purchase order. In this case, the purchase order line items are shown as a subreport of the purchase order header data.

You can build subreports into the `.rptdesign` file as the main report. A single report might show fiscal years and fiscal quarters, where fiscal years are the parent records and the report displays the fiscal quarters for each fiscal year.

Use the following guidelines for single reports:

- A record ID is returned for each result of a parent data set.
- The child IBM TRIRIGA query filters results based on the parent record.
- The child data set takes a parent ID as a parameter. If BIRT sends a **`system_parentRecordId`** with a default value of 0, the IBM TRIRIGA system ignores it.
- In the report layout's child table, the data set parameter binding binds the parent record's ID to the child data set's input parameter.

You can build subreports into different `.rptdesign` files. For example, you can show all fiscal years in a single list that uses a hyperlink to take the user to the quarters for the selected year. In this case, the fiscal quarters is a separate `.rptdesign` file.

Use the following guidelines for separate report files:

- At the top level of any compressed file that you import into IBM TRIRIGA, there must be at least one `.rptdesign` file. Any subreports in other `.rptdesign` files must be in a child directory.
- When you configure a hyperlink, the **`system__recordId`** from the top-level report must be bound to the **system__parentRecordId** report parameter of the subreport. An example of this includes fiscal years and fiscal quarters.

Custom functions

Custom functions assist you with particular use cases. The custom functions are in the **TRIRIGA** category of the BIRT Expression Builder.

The following table describes the custom functions:

Table 3. Custom functions

Name	Description	Inputs	Return
formatNumber	Uses IBM TRIRIGA to format a number.	number - BigDecimal: Number value to format unitOfMeasure - TriResultUom: Unit of Measure that is used for formatting the number. Can use a NULL value if no UOM is available, but must use the encodedBoFieldName input. encodedBoFieldName - String [optional]: BO field from which this number came. Use where applicable, because a field metadata can affect number formatting.	String: the formatted number.
formatDate	Uses IBM TRIRIGA to format a date. Uses the format that is specified in your user profile record.	date - java.util.Date: Date to format	String: the formatted date.
formatDateTime	Uses IBM TRIRIGA to format a datetime. Uses the format that is specified in your user profile record.	dateTime - java.util.Date: DateTime to format	String: the formatted DateTime.
getProjectIdFor-Record	Returns the record ID of the project that the record is in. Returns NULL if the record is not in a project.	ID of the record. Typically the **system__recordId** value of an IBM TRIRIGA result record.	Decimal: the ID of the project that the record is in.
getRootOrganiza-tionId	Returns the record ID of the root organization.	N/A	Decimal: the ID of IBM TRIRIGA's root organization record.
getCompany-LogoId	Returns the ID of the company logo document.	N/A	Decimal: the ID of the company logo document.
getProjectLogoId	Returns the ID of the current project's logo document.	N/A	Decimal: the ID of current project's logo document.
getUserId	Returns the ID of the currently signed-in user.	N/A	Decimal: the ID of the current user.

Table 3. Custom functions (continued)

Name	Description	Inputs	Return
getProjectId	Returns the ID of the current project. Returns NULL if the user is not currently in a project.	N/A	Decimal: the ID of current project.

Preview BIRT reports

You preview reports by using **Run** > **View Report** in the BIRT Report Designer. In the BIRT application, you set values in the IBM TRIRIGA BIRT Preferences section to pass context from IBM TRIRIGA to a BIRT report during preview execution. You set the preference values when you specify the connection information to the IBM TRIRIGA server.

You can pass the following types of context:

Current user
Set when you specify the IBM TRIRIGA app server, user name, and password field values.

Active project
Set when you specify the record ID of a project. The active project causes the preview to simulate execution within the context of the specified capital project.

Input parameters
Prompted by the BIRT application. When you preview the report, the BIRT application prompts you for any input parameters that are defined on the report. Those values also serve as context to the report execution.

Exporting BIRT reports

You export BIRT reports back to IBM TRIRIGA so that the IBM TRIRIGA environment can use the reports.

Packaging BIRT reports

Before you export the BIRT report back to IBM TRIRIGA, you package the report as a `.zip` file.

Procedure

1. In BIRT, right-click the report project and select **Export**.
2. Expand the General folder, select **Archive File**, and select **Next**.
3. Select the `.rptdesign` and `tririgalabels.properties` files.
4. In the **To archive file** field, browse to the upload location and name the new `.zip` file.
5. In Options, select **Create only selected directories** and other options that you want to use.
6. Select **Finish**.

Uploading reports to IBM TRIRIGA

You use the Document Manager to upload the packaged `.zip` file to IBM TRIRIGA.

Procedure

1. In IBM TRIRIGA, open the Document Manager.

2. Select or create the upload folder. You can use a folder name that corresponds to the module of the starter report and IBM TRIRIGA query.
3. Select **New Document**, select **Select File for Upload**, and select the BIRT report file.
4. Specify a document name.
5. Optional: Specify field values.
6. Select **Submit**.

Report libraries

A report library is a BIRT construct that holds reusable components that you share across multiple reports.

You upload a report library in the same way you upload a report. Upload the report libraries into the `\ROOT\TRIRIGA\BIRT Libraries` folder. If this folder structure does not exist in your system, create the folder. The report library can be uploaded either as a single `.rptlibrary` file or as a `.zip` file. The name of the IBM TRIRIGA document must be the same as the name of the `.rtplibrary` file. If the report library contains labels, the `.rptlibrary` file can reference a `tririgalabels.properties` file that can have translatable labels.

Associating documents to IBM TRIRIGA

To make a BIRT report usable, you associate the IBM TRIRIGA document to an IBM TRIRIGA access point. Access points are either a query report or form report.

Associating documents to query reports

You create an IBM TRIRIGA query as an external query. The query acts as a link to the BIRT `.zip` file that you uploaded to the Document Manager. In the Document Manager, you select the BIRT report. You can use the report in many places throughout IBM TRIRIGA, such as form sections and portal sections.

Procedure

1. In IBM TRIRIGA, open the Report Manager.
2. Select **System Reports** > **New**.
3. In the **General** tab, set the **Type** to **External**.
4. In the **Business Objects** tab, select the module, business object, and form for the report. These values might be the same as the values selected to create the starter report.
5. In the **Options** tab, in the **Document** field, search for the name of the compressed BIRT report file that you uploaded.
6. Optional: Select **Queued**. The report runs asynchronously and the user is notified when the report is ready to view.
7. Select **Save & Close**.

Associating documents to forms

You can use reports in many places in IBM TRIRIGA, such as form sections, portal sections, and the **Reports** tab in most forms.

About this task

To use a BIRT report in a form section, add the report to the **Layout** tab and the **Includes/Forms** tab of a form. In the **Includes/Forms** tab, associate the BIRT report to the IBM TRIRIGA form. As a result, the labels on the BIRT report can be exported for translation from the Globalization Manager.

Procedure

1. In IBM TRIRIGA, go to the Form Builder and open the form for which you developed the form report..
2. Optional: Revise the form.
3. Select the **Layout** tab and select the **Show Reports** property to ensure that the report appears in the **Reports** tab of a form.
4. Select the **Includes/Forms** tab and select **Add**.
5. Select the report file that you uploaded into the Document Manager and select **OK**.
6. In the forms section, select the report file.
7. Select **Layout** and select **Publish**.

Configuring bulk print actions after object migration

In the IBM TRIRIGA application, bulk print report actions use URLs that have hardcoded numerical document IDs. After you apply an object migration package, the document ID of a document can change, and the bulk print action no longer works. You can manually update each document ID and associate each document with the related form.

Configuring bulk print actions in maintenance forms

You can configure actions in maintenance forms for a bulk print.

Procedure

1. Sign in to IBM TRIRIGA as an administrator.
2. In the Document Manager, select **TRIRIGA** > **Task**.
3. Right-click one of the documents in the following table and select **Properties** to get the document ID. Repeat this step for each document in the following table:

Document Name	Bulk Print Action
Condition Assessment Work Task Record (BIRT)	Print Condition Assessment Work Task
Contract Review Record (BIRT)	Print Contract Review
Inspection Task Record (BIRT)	Print Inspection Task
Inventory Count Work Task Record (BIRT)	Print Inventory Count Work Task
Inventory Pick Work Task Record (BIRT)	Print Inventory Pick Work Task
Key Work Task Record (BIRT)	Print Key Work Task
Material Order Task Record (BIRT)	Print Material Order Task
Punchlist Task Record (BIRT)	Print Punchlist Task
Reserve Work Task Record (BIRT)	Print Reserve Work Task
Schedule Task Record (BIRT)	Print Schedule Task
Submittal Task Record (BIRT)	Print Submittal Task
Work Task Record (BIRT)	Print Work Task

4. From the **Tools** menu, select **Builder Tools** > **Form Builder**.
5. Select the `triMaintenance` module, select the `triMaintenanceManager` form, and revise the form.
6. In the form navigation, select **triSchedule** > **Work** > **My Tasks**.

7. Select the bulk print action. In the action properties, replace the old document ID with the new document ID. Repeat this step for each action in the previous table.
8. After you update all of the document ID values, publish the form.
9. From the **Tools** menu, and select **Builder Tools** > **Form Builder**.
10. Select the `triTask` module. Open a task form from the following table and revise the form.
11. Select the **Includes/Forms** tab and in the Forms section, select **Add**. Locate the document and publish the form. Repeat this step for each form in the following table.

Task Form	Document Name
triConditionAssessmentWorkTask	Condition Assessment Work Task Record (BIRT)
triContractReviewTask	Contract Review Record (BIRT)
triInventoryCountWorkTask	Inventory Count Work Task Record (BIRT)
triInventoryPickWorkTask	Inventory Pick Work Task Record (BIRT)
triKeyWorkTask	Key Work Task Record (BIRT)
triMaterialOrderTask	Material Order Task Record (BIRT)
triPunchlistTask	Punchlist Task Record (BIRT)
triReserveWorkTask	Reserve Work Task Record (BIRT)
triScheduleTask	Schedule Task Record (BIRT)
triSubmittalTask	Submittal Task Record (BIRT)
triWorkTask	Work Task Record (BIRT)

Configuring bulk print actions in invoice forms

You can manually configure bulk print actions in invoice forms.

Procedure

1. Sign in to the IBM TRIRIGA application as an administrator.
2. In the Document Manager, navigate to **TRIRIGA** > **Contract**.
3. Right-click a document from the following table, and select **Properties** to get the document ID. Repeat this step for each document in the following table:

Document Name	Bulk Print Action
Asset Invoice Summary Bulk Print (BIRT)	Bulk Print Asset Invoices
RE Invoice Summary Bulk Print (BIRT)	Bulk Print RE Invoices

4. From the **Tools** menu, select **Builder Tools** > **Form Builder**.
5. Go to the `triPayment` module, select the `triProcessInvoices`, and revise the form.
6. In the form navigation, select **triGeneral** > **AR Invoices**.
7. In the AR invoices properties, select one of the bulk print actions. In the action properties, replace the old document ID with the new document ID. Repeat this step for each action in the previous table.
8. After you update all of the document ID values, publish the form.
9. Go to the **Tools** menu and select **Builder Tools** > **Form Builder**.

10. Select the `triPayment` module. Open an invoice form from the following table and revise the form.
11. Select **Includes/Forms** and in the forms section, select **Add**. Locate the document and publish the form. Repeat this step for each form in the following table:

Invoice Form	Document Name
triAssetInvoice	Asset Invoice Summary Bulk Print (BIRT)
triREInvoice	RE Invoice Summary Bulk Print (BIRT)

Report maintenance

You can change existing reports that do not involve data sets and you can change existing reports that do involve data sets.

Modifying reports without data set changes

To modify a BIRT report that does not involve data set changes, you use the Document Manager to check out the report file. After you change the report, check in the file by using the Document Manager.

Procedure

1. In the Document Manager, check out the file.
2. Create a starter report in IBM TRIRIGA and import the starter report into BIRT.
3. Make any needed changes to the report and save the file. If you change a standard BIRT report, rename the report before you load it into the Document Manager to protect your customized version in the case of an IBM TRIRIGA upgrade.
4. Check the file back into the Document Manager.

Modifying reports with data set changes

Use the Document Manager to check out the report file, change the report file, and check in the report file.

Procedure

1. Generate a starter report that is based on the same model that you used for the existing BIRT report.
2. Do one of the following options:

Options	Modifying reports with data set changes
Select updates from script-data-set elements	Select the updates to include from the script-data-set elements in the current BIRT report and in the new `.rtpdesign` file.
Replace the script-data-set elements	Replace the script-data-set elements of the current `.rptdesign` file with the new script-data-set elements that are generated in the new `.rptdesign` file. Import the starter report into a project, copy the data set from the new starter report, and paste it in the data sets of the existing `.rptdesign` file.

What to do next

If you add fields or user filters to the IBM TRIRIGA query, you must also change the report. After you update the data set, if that data set is used to join inside BIRT, you must rejoin the data set, and rebind the elements in the BIRT report that references that data set.

Chapter 3. Filter operators

The values for filter operators depend on the field type of the selected field.

The following table lists and describes the values that you can use:

Table 4. Filter operators

Operator	Description
After	Available for date, date and time, and time fields. If the value of the specified field is after the specified value, it is true.
Before	Available for date, date and time, and time fields. If the value of the specified field is before the specified value, it is true.
Contains	Available for Text, UOM, and Boolean fields. If the value of the specified field contains the specified value, it is true.
Contains – Case Sensitive	Available for Text, UOM, and Boolean fields. If the value of the specified field contains the specified value, case-sensitivity included, it is true.
Does Not Contain	Available for Text, UOM, and Boolean fields. If the value of the specified field does not contain the specified value, it is true.
Does Not Contain – Case Sensitive	Available for Text, UOM, and Boolean fields. If the value of the specified field does not contain the specified value, case-sensitivity included, it is true.
End With	Available for Text, UOM, and Boolean fields. If the value of the specified field ends with the specified value, it is true.
End With - Case Sensitive	Available for Text, UOM, and Boolean fields. If the value of the specified field ends with the specified value and it is case-sensitive, it is true.
Equals	If the value of the specified field is equal to the specified value, it is true.
In	If the value of the specified field is one of the specified values, it is true. For string and numeric values, the specified values should be comma-separated literal values that are wrapped in single quotation marks, for example: 'Tom','Jerry','Paul','1','2','3'.
Less Than	Available for number fields. If the value of the specified field is less than the specified value, it is true.
Less Than or Equals	Available for number, date, date and time, and time fields. If the value of the specified field is less than or equal to the specified value, it is true.
More Than	Available for number fields. If the value of the specified field is greater than the specified value, it is true.
More Than or Equals	Available for number, date, date and time, and time fields. If the value of the specified field is greater than or equal to the specified value, it is true.
Not Equals	If the value of the specified field is not equal to the specified value, it is true.

Table 4. Filter operators (continued)

Operator	Description
Not In	If the value of the specified field is not one of the specified values, it is true. For string and numeric values, the specified values should be comma-separated literal values that are wrapped in single quotation marks. For example: 'Tom','Jerry','Paul','1','2','3'. **Tip:** For performance, avoid using Not In statements. With the In statement instead, an index can then be placed on the column for better performance.
Start With	Available for Text, UOM, and Boolean fields. If the value of the specified field begins with the specified value, it is true.
Start With - Case Sensitive	Available for Text, UOM, and Boolean fields. If the value of the specified field begins with the specified value and it is case-sensitive, it is true. If you have query that is used in a locator field or a smart section and you notice that autocomplete takes a long time to run, consider changing the filter Operator from *contains* to *starts with*.

Chapter 4. Special values

In addition to using numbers and text in the **Value** field, you can use special values.

Some special values can be followed by a + or - and a whole number. For example, `$$TODAY$$+1` is tomorrow, `$$THISWEEK$$-1` is last week, and `$$THISYEAR$$+5` is five years after the current year. The following table lists and describes the special values:

Table 5. Special values that can be followed by a + or a -.

Value	Description
$$TODAY$$	Used to compare a date to the current date. For example, if you do not want to show training courses that were in the past, specify: `General::Start Date After $$TODAY$$`
$$THISWEEK$$	Used to compare a date to the current week. For example, to see training courses that start in the current week, specify: `General::Start Date Equals $$THISWEEK$$`
$$THISMONTH$$	Used to compare a date to the current month.
$$THISYEAR$$	Used to compare a date to the current year.

The following table lists and describes other special values:

Table 6. Special Values

Value	Description
$$RUNTIME$$	The `$$RUNTIME$$` special value allows the user to specify a value for the filter when the report is run. If the user does not specify a value, the filter is ignored. The `$$RUNTIME$$` special value works well with most data types and comparison operators. However, for text data, the `$$RUNTIME$$` special value works with the `Contains` operator. Instead of using the `$$RUNTIME$$` special value, you can identify fields for user input by selecting the **User** check box in the **Filters** tab.
$$USERID$$	The `$$USERID$$` special value is a valid field filter in queries. A record passes the filter if it represents the current user.

Table 6. Special Values (continued)

Value	Description
$$USERID::SectionName::FieldName$$	The `$$USERID::SectionName::FieldName$$` special value is a valid filter in queries. Setting the Value field to the `$$USERID::SectionName::FieldName$$` special value indicates that a value is compared with the field name `FieldName` in the `SectionName` section of the record of the current user.
$$PERSONID$$	The `$$PERSONID$$` special value is a valid field filter in queries. When the `$$PERSONID$$` special value is used, it resolves to the smart object ID of the person that is associated to the current user. If the current user is not associated to a person, an error is displayed. Similar to the `$$USERID$$` special value, it supports section and field access. The following example is a valid notation to resolve the first name of the current person: `$$PERSONID::Detail::triFirstNameTX$$`.
$$PARENT::SectionName$$	The `$$PARENT::SectionName$$` special value is a valid field filter in queries. Setting the Value field to the `$$PARENT::SectionName$$` special value indicates that a value is compared with the `SectionName` section of the record that contains the query section or smart section.
$$PARENT::SectionName ::FieldName$$	You can indicate a filter that compares a value in the record that is filtered with a value in the record that contains the smart section. To indicate that a value is compared with the `FieldName` field in the `SectionName` section of the record that contains the query section or smart section, use the following value field: `$$PARENT::SectionName::FieldName$$`. When the value of the `$$PARENT` special value is empty, it resolves to an `IS NULL` criteria.

Chapter 5. Special names in the record field

In the record field, you can use special names to filter for an association with special records.

The value of a record or query field must be the same as the name of the other query. If the value of the filter type field is query, set the appropriate record or query.

If the value of the filter type field is record, the value of the record or query field determines whether the association that the filter requires is directly with the context record, with another record that is associated with the context record, or an unassociated record.

The following table contains special names for the record field:

Table 7. Special names in the record field

Value	Description
$$USERID$$	When the query is run, the `$$USERID$$` value resolves to the record ID of the user that started the query.
$$PERSONID$$	When the query is run, the `$$PERSONID$$` value resolves to the record ID of the People record that is associated with the user who started the query.
$$RECORDID$$	Useful for queries that are used in query sections and for find action queries for data sections. Queries that are used in query sections and find queries are often required to return only records that are associated with the record that contains the section. When you set the record field to the `$$RECORDID$$` value, if the top-level records are associated directly with the context record, then the top-level records pass this filter.
$$GROUPID$$	If you set the record field to the `$$GROUPID$$` value, if the top-level records are associated with a record that represents a group that the user is a member of, then the top-level records pass the filter. When the record field is set to the `$$GROUPID$$` value, also set the Module field to `Group` and the Business Object field to `All`.
$$PROJECTID$$	When you set the record field to the `$$PROJECTID$$` value and if the top-level records are associated with a record that represents the active project, then the top-level records pass the filter. When the record field is set to `$$PROJECTID$$`, also set the Module field to `triProject` and the Business Object field to `All`.

Table 7. Special names in the record field (continued)

Value	Description
$$PARENT$$	Use `$$PARENT$$` to specify that top-level records pass this filter if they are associated with a record that has a direct or indirect association with the context record. It works by specifying a path from the context record to another record through record sections or locator fields. For example, if a context record is an employee record, the report should include employee records for employees who have the same supervisor as the context record. Employee records have a locator field that is named `triReportsToTX` that references the record that corresponds to an employee's supervisor. If `triReportsToTX` is in the general section, the value of the record field for the example is `$$PARENT::General::triReportsToTX$$`. If the reference was a smart section, the value of the record field would be `$$PARENT::triReportsToTX$$`. When the value of `$$PARENT$$` is empty, it resolves to an `IS NULL` criteria.
$$PARENT::SECTIONNAME$$	Use to filter a find section based on values in another section. `PARENT` is always the word PARENT. `SECTIONNAME` is the name of the section that contains the values that you want to filter. Make sure that you use the name and not the label of the section.
$$PARENT::SECTIONNAME::FIELDNAME$$	Use to filter a find section based on the value of a field in another section. `PARENT` is always the word PARENT. `SECTIONNAME` is the name of the section that contains the field that contains the values by which you want to filter. `FIELDNAME` is the name of the field by which you want to filter. Make sure that you use the name and not the label of the section and the field.
$$ORGANIZATIONID$$	Use to filter a portal query section based on the organizations of the user who is logged in.
$$ORGANIZATIONIDWITHCHILDREN$$	Use to filter a portal query section based on the organizations, including all dependent child organizations, of the user who is logged in.
$$GEOGRAPHYID$$	Use to filter a portal query section based on the geography of the user who is logged in.
$$GEOGRAPHYIDWITHCHILDREN$$	Use to filter a portal query section based on the geography and all child geographies of the user who is logged in.

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