

ActuateOne™

One Design
One Server
One User Experience

Using Actuate BIRT Java Components

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Contents

About <i>Using Actuate BIRT Java Components</i>iii
Chapter 1	
Introducing Actuate Java Components	1
Using Actuate Java Components	2
About Actuate Deployment Kit	3
Chapter 2	
Managing files and folders	5
Getting started with Actuate Java Components	6
Navigating BIRT Deployment Kit	7
About the banner	8
About the side menu	8
About the main display area	8
Browsing the Documents page	8
Getting detailed information about files and folders	9
About functionality levels	10
Working with files	10
Deleting a file	11
Using filters	12
Enabling the filter option	12
Filtering items on a Documents page	12
Removing filter selections	13
Setting your locale	13
Chapter 3	
Running jobs	15
Running a job	16
Running a BIRT report job	16
Running a Run and View Spreadsheet report job	16
Using parameters	17
Understanding parameter types	18
Using multiple-value parameters	19
Making expressions for ad hoc parameters	19
Using a dynamic filter operator	20
Using Query by Example operators	23
Using data types with Query by Example	26
Using a special character to match one or more characters in a QBE string	27
Index	31

A b o u t U s i n g A c t u a t e B I R T J a v a C o m p o n e n t s

Using Actuate BIRT Java Components includes the following chapters:

- *About Using Actuate BIRT Java Components.* This chapter provides an overview of this guide.
- *Chapter 1. Introducing Actuate Java Components.* This chapter explains online reporting and how Actuate Java Components work.
- *Chapter 2. Managing files and folders.* This chapter explains how to access Deployment Kits and manage files.
- *Chapter 3. Running jobs.* This chapter provides information on generating and viewing documents using Actuate Java Components.

1

Introducing Actuate Java Components

This chapter contains the following topics:

- Using Actuate Java Components
- About Actuate Deployment Kit

Using Actuate Java Components

In a diverse and global business enterprise, corporations need a way to create, publish, and distribute content on a regular basis to a variety of users. These users require access to information distributed in various network environments, such as the internet, intranets, and extranets.

To meet these requirements, the Actuate business reporting system creates, publishes and distributes reports with executable report files. Actuate Java Components include:

- Actuate BIRT Viewer to display generated information simultaneously at any location in a network
- Actuate BIRT Studio, BIRT Data Analyzer, and Interactive Viewer to edit and update files remotely or locally
- Deployment Kits to organize and publish information that can be regenerated or edited as often as needed

Actuate reports provide an efficient, scalable, highly searchable, and easily updated alternative to static web pages or traditional, paper-based reporting.

Figure 1-1 shows the default Actuate Java Components landing page, which lists the Actuate Java Components, including the Deployment Kits. The landing page looks different if your company has customized the page.



Figure 1-1 Actuate Java Components landing page

Each product on this list is a separately licensed Java Component.

About Actuate Deployment Kit

An Actuate Deployment Kit is an end-user product that you use to run, view, and print reports. Deployment Kit connects to and stores the reports on the file system. It also integrates with other Java Components—the report viewers and BIRT Studio.

Deployment Kit is not an authoring tool for reports. Actuate report design tools, like BIRT Spreadsheet Designer or BIRT Designer Professional, create the reports. Typically, your Deployment Kit administrator publishes reports to the file system. Deployment Kit is therefore not dependent upon a particular report design tool, freeing report developers to create reports in their own fashion. Deployment Kit handles file management, security, and versioning manually.

All you need is a web browser and the command to access Deployment Kit. To use Deployment Kit, you must use Internet Explorer 7.x or later, Mozilla Firefox 3.x or later, Apple Safari 3.x or later, or Google Chrome.

You manage, generate, and view Actuate reports remotely or locally using the Files and Folders page in a web browser. Locally, any of the Actuate report design tools can perform these tasks as well.

When you are using Deployment Kit, the Files and Folders page appears as shown in Figure 1-2.

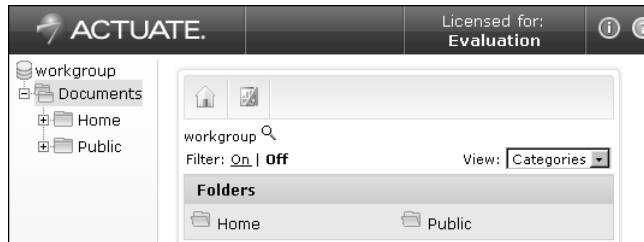


Figure 1-2 Files and Folders page

Figure 1-3 shows a high-level view of how client applications interact with Deployment Kit. The shaded areas indicate the tools with which you work.

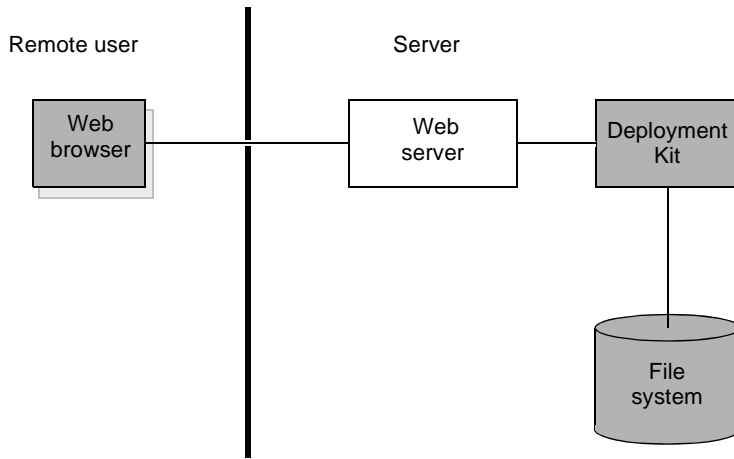


Figure 1-3 Actuate reporting architecture

Managing files and folders

This chapter contains the following topics:

- Getting started with Actuate Java Components
- Using filters
- Setting your locale

Getting started with Actuate Java Components

To access reports using a Java Component, you open the Actuate Java Components web application using a hyperlink or a web address similar to the following URL:

`http://actuate1:8080/ActuateJavaComponents`

where

- `actuate1:8080` is the web server and TCP port that runs the deployed web service.
- `ActuateJavaComponents` is the context root to Actuate web application. The context root is set by the web server administrator.

Figure 2-1 shows the default Actuate Java Components landing page. The landing page looks different if your company has customized the page.



Figure 2-1 Actuate Java Components landing page

Each product on this list is a separately licensed Java Component. How you access files depends upon which licenses you have:

- If you have purchased a Deployment Kit license, you can access reports using a Deployment Kit link.

- If you have not purchased a license for Deployment Kit, but purchased a license for BIRT Report Studio, BIRT Data Analyzer, or BIRT Interactive Viewer, you access the reports using a URL for the Documents page. The Documents page has identical functionality to that of the Deployment Kit Documents page.
- If you have only purchased a license for BIRT Viewer, you do not have access to the Documents page and only view reports for which you have a direct URL.

This manual uses the BIRT Deployment Kit as an example. The Documents page for each product has the same appearance and functionality. The pages for each Deployment Kit have the same appearance and functionality.

Navigating BIRT Deployment Kit

To open the Deployment Kit landing page, choose a Deployment Kit link on the Actuate Java Components landing page. The Deployment Kit landing page appears, as shown in Figure 2-2.

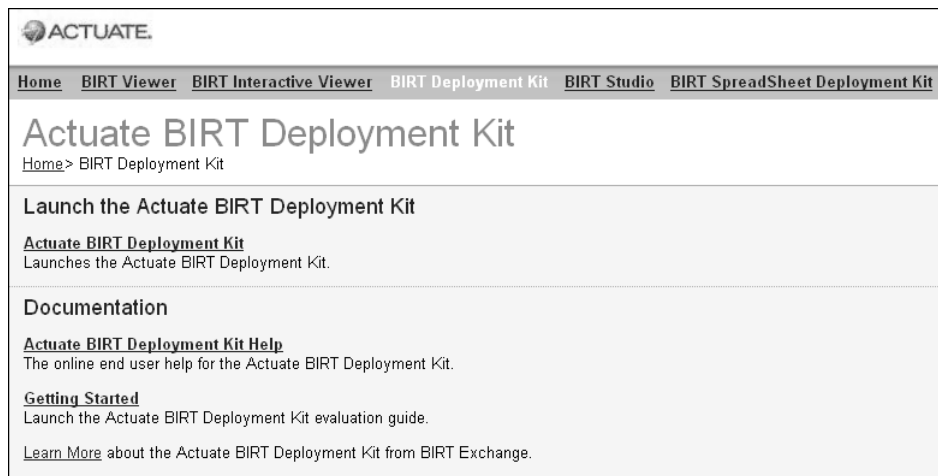


Figure 2-2 Deployment Kit landing page

Choose the launch link to open the Deployment Kit Documents page. Figure 2-3 shows an example Documents page. The Documents page looks different if it has been customized by an administrator or developer.



Figure 2-3 Deployment Kit Documents page

About the banner

The banner at the top of the page displays one or more of the following elements:

- Company logo. By default, the Actuate logo appears.
- A link to the About page, which contains license and version information about Deployment Kit.
- Help to access online help files.

About the side menu

The Treeview skin provides a side menu from which you can choose a Documents link to browse the folders and files to which you have access.

About the main display area

The main display area shows the content relevant to a specific page. For example, the main display area of a Documents page shows the contents of a folder. You also enable the filter option from the main display area.

Browsing the Documents page

Choose Documents from the side menu to access links to folders and files. On a Documents page, you can choose a folder link to access folder contents. A Documents page displays the contents of the current folder. For example, choose Public to see the contents of the Public folder. You can access your home folder, if you have one, and folders within the Public folder.

By default, a Documents page organizes the contents of a folder by categories. Depending on the contents of the current folder, you see some, all, or none of the following categories:

- Folders, which shows the subfolders within the current folder

- Documents You Can View, which shows the reports you can open for viewing, such as report document (.rptdocument) files, BIRT data design (.data) files, and spreadsheet (.xls) files
- Items You Can Run, which shows the files that you can run to generate new reports, such as report design (.rptdesign) files and spreadsheet executable (.sox) files

Figure 2-4 shows an example of a Documents page.

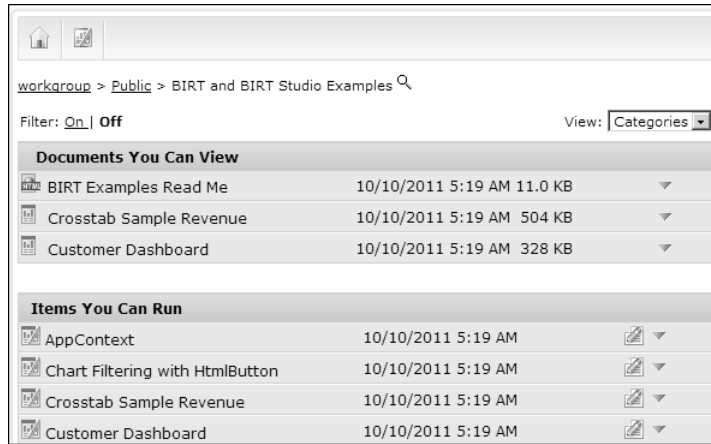


Figure 2-4 A Documents page

Getting detailed information about files and folders



To view details about a folder, choose the Details icon. When you choose this icon, Actuate Deployment Kit displays a Detail page that includes information about the creator of the folder and the location of the folder in the file system. Figure 2-5 shows the details of a folder.

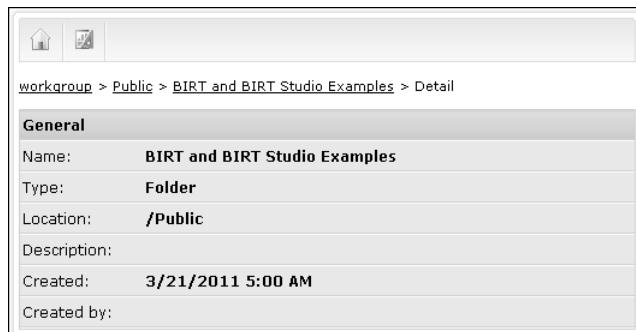


Figure 2-5 Viewing folder details

To view details about a file, open the file menu and select Details, as shown in Figure 2-6.



Figure 2-6 Selecting Details from the file menu



Choose Details to display a Detail page that includes information about the creator of the file and the location of the folder in the file system. Figure 2-7 shows the details of a folder.

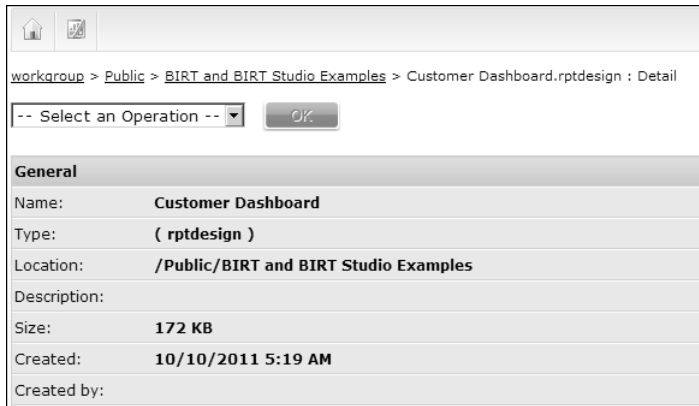


Figure 2-7 Viewing file details

About functionality levels

Functionality levels determine the Deployment Kit user interface features available to users. Functionality levels control the options to delete folders, share files, customize the interface, and search the file system. If you are not able to use a feature, request a functionality-level change from an administrator.

Working with files

Using the default display settings, files appear in the following categories:

- **Documents You Can View.** When you choose a file from Documents You Can View, Actuate Deployment Kit opens it for viewing. For information about operations you can perform while viewing a report, see *Working with Actuate BIRT Viewers*.

You use Microsoft Excel to view spreadsheet reports. If a spreadsheet executable requires parameters, you select them before you can view the report document.

You use BIRT Data Analyzer to view BIRT data designs and cube view files. For information about operations you can perform while viewing a BIRT data design, see *Using BIRT Data Analyzer*.

- **Items You Can Run.** When you choose a file from Items You Can Run, Actuate Deployment Kit displays a page for submitting a run request.
- The document pages that display folder contents show these files in separate sections. Depending on which files you can access, you see some, all, or none of these categories.

From the document pages, you can perform the following additional file operations:

- Get detailed information about a file.
- Delete files that you own.

Table 2-1 lists the available default set of file types.

Table 2-1 Deployment Kit file types

File type	Description
cubeview	BIRT cube view file
htm or html	HTML document
rptdesign	Actuate BIRT report design
rptdocument	Actuate BIRT report document
rptlibrary	Actuate BIRT report design library
rpttemplate	Actuate BIRT report design template
soi	Actuate Spreadsheet
sod	Actuate Spreadsheet design
sox	Actuate Spreadsheet executable
data	BIRT data design
xls	Microsoft Excel spreadsheet
xlsx	Microsoft Excel open XML format spreadsheet

Deleting a file

You can delete a file from your home folder.

How to delete a file



- 1 From the file menu, choose Details. File detail appears.
- 2 On the Detail page, choose Delete from the drop-down list in Select an Operation, as shown in Figure 2-8.

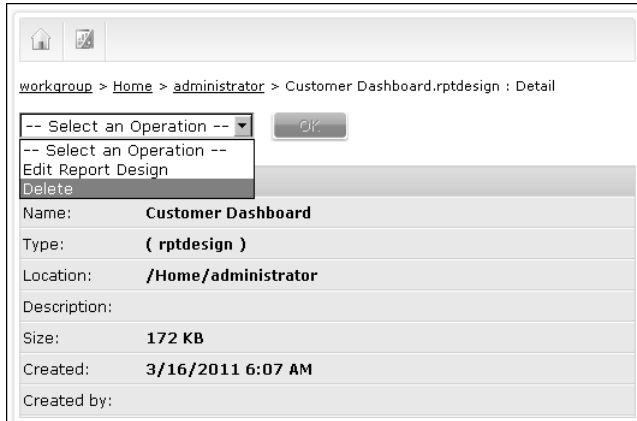


Figure 2-8 Deleting a file

- 3 Choose OK. At the confirmation prompt, choose OK to confirm the deletion.

Using filters

You can filter the list of items that appear on a Documents page. Typically, you filter items on a page when:

- The lists of documents are too long to view conveniently. Files appear in alphabetical order and you cannot change the sort order.
- You need to view a list of items that match specified conditions. For example, you can use the filter to display only viewable reports, or only reports that begin with the letters Sales.
- The number of items exceeds 500. Actuate Deployment Kit displays a maximum of 500 items.

Enabling the filter option

To filter, you must first enable the filter option. The filter options vary for each page, depending on which items appear. For example, on Documents, you can filter files and folders. When you enable the filter option, it is enabled until you disable it.

Filtering items on a Documents page

By default, Documents displays all the contents of the current folder, including subfolders and all versions of report documents and report object executable files. Using the filter option, you select what folder contents to display.

How to filter items on a Documents page

- 1 Choose Filter On. The available filter options appear on Documents, as shown in Figure 2-9.



Figure 2-9 Choosing filter options

- 2 Select the items to display:
 - Folders. This item is selected by default. If it is not selected, folders do not appear.
 - Documents. This item is selected by default. If it is not selected, viewable documents do not appear.
 - Executables. This item is selected by default. If it is not selected, report object executable files do not appear.
- 3 To filter items by certain characters, type a string in the text field. You can use the asterisk (*) wildcard character in the string. For example, to display all reports that start with the word detail, type:
`detail*`
The string applies to all items that you selected for display in step 2. If you selected folders and documents, only folders and documents matching the string appear.
- 4 Choose Apply to run the filter. The resulting page displays the filtered items.

Removing filter selections

The filter selections that you set on a page remain in effect until you reset the filter or log out of Actuate Deployment Kit. Choose Reset to revert to the default filter and display all items. Just as you can set filter selections on a page-by-page basis only, you reset filter selections on a page-by-page basis.

Setting your locale

Your administrator can implement a page with fields to set the language and time zone for Deployment Kit. This interface provides login capabilities as well. If you use login credentials, Actuate Deployment Kit provides a home folder for your

personal reports. By default only you and the administrator can access your personal home folder. You own your home folder and have full privileges for it. You can choose My Folder to open your home folder.

How to set a locale

Use this procedure if the locale interface is enabled for Deployment Kit.

- 1** To open the Actuate Deployment Kit login page, complete one of the following tasks:
 - If your company has a web site with a link to the Actuate Deployment Kit locale page, start your web browser, then choose the link.
 - Start your web browser, then provide the URL for the Actuate Deployment Kit login page supplied by your system administrator.
- 2** Supply locale information and login credentials:
 - Type the user name and password that the system administrator assigned to you.
 - Select a language from the drop-down list. Your selection determines the language for the Actuate Deployment Kit user interface and the formatting of dates, times, currency, and numbers. The user interface appears in US English if a resource file for the language you select is not available.
 - Select a time zone from the drop-down list. Your selection determines the time stamp for files.
- 3** Choose Log In.

3

Running jobs

This chapter contains the following topics:

- Running a job
- Using parameters

Running a job

You run a report executable when you want Actuate Deployment Kit to generate a report with the most current data. A report executable file contains compiled code that specifies how the server generates a report and what data it retrieves for the report. A specific run of a report executable or opening of a document file is called a job. You run BIRT report design (.rptdesign) files and open BIRT report documents (.rptdocument) files using Actuate BIRT Deployment Kit. You run spreadsheet executable (.sox) files and open spreadsheet document (.soi) files using Actuate BIRT Spreadsheet Deployment Kit.

When you run a job, Deployment Kit provides some default settings. You change these settings to filter report data by report parameters.

Running a BIRT report job

Running a job instructs the server to process a report executable or open a document immediately. When the job successfully finishes, the generated output appears. If the job takes a few minutes to finish, Actuate Deployment Kit displays the completed pages as they become available.

How to run a job

This procedure describes how to run a BIRT report design executable (.rptdesign) file.

- 1 In Items You Can Run, navigate to the folder that contains the .rptdesign file.
- 2 Choose the link to the report. You can choose either the file name or the version name. If the report executable uses parameters, Run—Parameters appears, as shown in Figure 3-1.

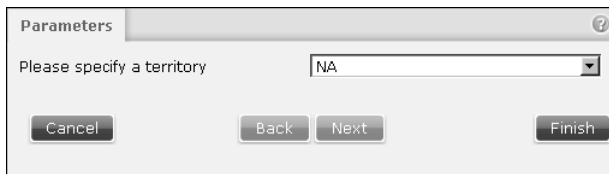


Figure 3-1 Run—Parameters

- 3 Select values for the parameters if the report uses parameters. When you complete filling the blanks, choose Finish.

Running a Run and View Spreadsheet report job

Selecting Run and View in BIRT Spreadsheet Deployment Kit instructs the server to process a spreadsheet executable (.sox) or document (.soi) immediately and

display the result in the selected format. When the job successfully finishes, the generated report appears.

Use the run and view report job when you want to:

- Generate the report immediately.
- View the report in a specific format.
- Create a temporary report that is not saved.

When you choose to run and view a report, Deployment Kit waits a fixed amount of time, 20 seconds by default, for the server to respond. If a job takes longer than the designated wait period to generate, Actuate Deployment Kit stops waiting for the report and displays a time-out message.

How to run a Run and View report job

The following procedure assumes that you are using Deployment Kit. This procedure describes how to run a spreadsheet object executable (.sox) file and view the resulting report document as a PDF file.

1 Navigate to the folder that contains the SOX file.



2 In Items You Can Run, choose the Run and View icon at the right of the report. The view format options appear in a context menu, as shown in Figure 3-2.

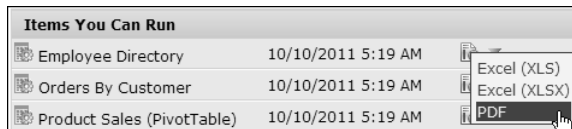


Figure 3-2 Run and View—View format context menu

3 Select PDF. The Deployment Kit processes the job and displays the generated report.

Using parameters

A parameter is an element in reports or dashboard gadgets that provides input to the select data used in a file job. Report developers use parameters to request report data from users for processing, formatting, and determining aspects such as:

- Which records are retrieved
- The sorting sequence of the data
- The output format

If an Actuate file has parameters, the user either sets the parameter values when running the file job, uses the default parameter values, if available, or can use a

report parameter file that starts a report and loads the report parameters with predefined values.

Understanding parameter types

The parameter types are:

- **Ad hoc**
An ad hoc parameter uses patterns to retrieve or filter data from a document's data source. This data is then used by the document in its tables, charts, maps, or other presentation formats built in to the document. Ad hoc parameters are supported for spreadsheet reports. They are not supported for BIRT reports.
- **Cascading**
Parameter choices depend on other parameters. For example, a parameter to select from a list of cities is empty until the country is selected first.
- **Multiple-value**
A multiple-value parameter accepts more than one value to filter the document data. For example, a report that provides sales information of products sold can request the user to select multiple products.
- **Optional**
A user can select or group the data presented in a report by typing values or conditions into the optional parameter. If a user does not specify a value for an optional parameter, the document job uses a value chosen by the document designer.
- **Required**
A required parameter must have a value before the document job can run. For example, a report that accesses a database can require a user name and password or require a user to select a city before running a city report. Typically, a document designer supplies a default value for a required parameter.
- **Single-value**
A single-value parameter accepts one value to filter the document data. For example, a report that provides sales information by customer requires the user to select a customer from a list of existing customers.

The example in Figure 3-3 shows Parameters prompting input of values for several parameter types.

The screenshot shows a 'Parameters' dialog box with the following fields and options:

- Product Line: No Condition (dropdown)
- Order Date: No Condition (dropdown)
- Credit Limit: No Condition (dropdown)
- ReleaseDate: 3/21/2011 (text field with calendar icon) No value
- InternalOnly: Yes No *
- Comments: none (text field) No value
- City: No Condition (dropdown)
- Order Number: (empty text field) No value

*: Required.

Buttons: Cancel, Back, Next, Finish

Figure 3-3 Parameters page

Using multiple-value parameters

Multiple-value parameters are drop-down lists, radio buttons, or checklists. The values you select in a multiple-value parameter restrict the resulting document data to the elements with the selected values for that parameter. For example, if you select specific years from a multiple-value parameter for years, then only data from those selected years is generated for the report.

Making expressions for ad hoc parameters

The value of an ad hoc parameter can be a single value or an expression. Expressions use special characters called operators to select a group or range of values. For example, a greater than sign (>) specifies matching a value that is greater than the value that follows the symbol, as in >10. In this example, the greater than sign is the operator and 10 is the value.

There are two types of ad hoc parameters available, Dynamic Filters and Query by Example (QBE). Dynamic Filters requests users to build simple expressions using a single operator. Query by Example (QBE) syntax requests users to select one or more operators to build simple and complex expressions.

Examples of using expressions in an ad hoc parameter:

- A single value, such as 10.
- A relational expression, such as >10.
- A range of values, such as 10–20.2
- A list of values, expressions, or ranges, separated by pipe signs, such as 10 | 20–30 | >50. Some locales also accept a comma as a list separator.

- A group of values, such as (abc | xyz), that a Boolean expression can combine, such as (abc | xyz)&bbb.

Dynamic filters are used in BIRT design and document files. QBE ad hoc parameters are used in BIRT Spreadsheet files.

Using a dynamic filter operator

When an Actuate file prompts the user to select from a list of operators, the user selects one of the operators and supplies a value for the operator to use. This expression is used to select data to display in the document.

Figure 3-4 shows an example of using dynamic filter operators.

Figure 3-4 Using dynamic filters

Dynamic filters are available in BIRT design and document files. Table 3-1 lists the operators that are available in Actuate files. Developers select which operators are presented to users of the file.

Table 3-1 Dynamic filter operators

Operator	Usage
Between	Find data that is between two specific values.
Equal to	Find data equal to a specific value.
Greater than	Find data greater than the specific value.
Greater than or equal to	Find data greater than or equal to the specific value.
In	Find data that matches any of the selected values.
Is false	Find data that equals zero.
Is not null	Find data that does not have a null value.
Is null	Find data that has a null value.
Is true	Find data that does not equal zero.
Less than	Find data less than the specific value.

Table 3-1 Dynamic filter operators

Operator	Usage
Less than or equal	Find data less than or equal to the specific value.
Like	Find data matching the value's string pattern.
Match	Find data matching the value's string expression.
No condition	Find all values for this parameter.
Not between	Find data that is not between two specific values.
Not equal to	Find data not equal to a specific value.
Not in	Find data that does not match any of the selected values.
Not like	Find data not matching the value's string pattern.
Not match	Find data not matching the value's string expression.

The Like operator supports the following special characters:

- % matches zero or more characters. For example, %ace% matches any value that contains the string ace, such as Ace Corporation, Facebook, Kennedy Space Center, and MySpace.
- _ matches exactly one character. For example, t_n matches tan, ten, tin, and ton. It does not match teen or tn.

The Match operator is case-sensitive and supports special metacharacters that can be combined to form text patterns called regular expressions. Metacharacters can be combined to form complex matches. For example, using ^H.*(Gifts | Collectables)\$ to search through a list of company names matches all companies whose name starts with the letter H, has one or more letters after H and includes the word Gifts or Collectables at the end of the name.

If you need to match on a metacharacter itself, a backslash (\) followed by the metacharacter causes the search to interpret the metacharacter as a normal character. For example, if \$ is part of the data to be found, it must be entered as \\$ because \$ is a metacharacter.

Table 3-2 lists the metacharacters that can be used to form regular expressions with the Match operator.

Table 3-2 Regular expression metacharacters

Metacharacter	Usage
.	Matches any single character.
*	Matches the previous character zero or more times. For example, po* matches Liverpool and Leipzig.
!	Matches everything not equal to the search expression.

(continues)

Table 3-2 Regular expression metacharacters (continued)

Metacharacter	Usage
()	Matches all characters in the set between the parentheses.
	Matches if any one of multiple conditions is true.
[]	Matches any character in the set between the brackets.
[^]	Matches any character not in the set between the brackets.
+	Matches the previous character one or more times. For example, po+ matches Singapore and Liverpool but not Leipzig.
?	Matches the previous character zero or one times. For example, po? matches Singapore and Leipzig.
x{y}	Matches the previous character exactly y times. For example, o{2} matches Liverpool but not Lyon.
^	Matches the start of the string. For example, ^A matches Australia but does not match Los Angeles.
\$	Matches the end of the string. For example, n\$ matches Lyon.
\	Used with a metacharacter to make it a literal character. For example, to search for a string containing the \$ sign, search for \\$.
\A	Matches the start of a string.
\b	Matches the edge of a word, beginning or end.
\B	Matches any place inside a word, but not the edge of a word.
\d	Matches any decimal digit.
\D	Matches any non-digit character.
\s	Matches a space.
\S	Matches a non-space.
\w	Matches a word that is made of letters, numbers, or an underscore.
\W	Matches a non-word.
\Z	Matches the end of a string.

Table 3-3 provides examples of dynamic filter expressions.

Table 3-3 Example results for dynamic filter expressions

Operator	Values	Matches	Does not match
Between	'A'	'Barcelona'	'Zurich'
	'D'	'Dublin'	'Seattle'

Table 3-3 Example results for dynamic filter expressions

Operator	Values	Matches	Does not match
Greater than	'Oslo'	'Oulu' 'Paris'	'Oslo' 'NYC'
In	'Lyon' 'New York'	'Lyon' 'New York'	'London' 'New Haven'
Is false		'0'	'11'
Like	'A%'	'Amsterdam' 'Auckland'	'Zurich'
Like	'B__'	'Bern'	'Berlin' 'Boston'
Like	'Be%n'	'Berlin' 'Bern'	'Bergamo'
Like	'%& Co%n'	'Handji Gifts& Co' 'Models & Co.'	'Boards & Toys Co' 'Cruz & Sons Co.'
Match	'ity'	'City' 'Makati City'	'Nantes' 'Paris'
Match	'ern'	'Stavern' 'Bern'	'Liverpool' 'Bergen'
Match	'(ern) (New)'	'Bern' 'Newark' 'New Bedford'	'Glendale' 'Cunewalde'
Match	'A'	'Allentown' 'Los Angeles'	'Nantes' 'Paris'
Match	'.A'	'Los Angeles'	'Allentown'
Match	'[A-C]'	'Burbank' 'Los Angeles' 'NYC'	'Frankfurt' 'Singapore'
Match	'es.'	'Manchester'	'Nantes'
Match	L[^o]s	'Lisboa'	'Los Angeles'

Using Query by Example operators

Users build a QBE expression by combining operators and values, for example, >10 is a QBE expression defining a value greater than 10. QBE expressions are available with BIRT Spreadsheet and e.Report files. Table 3-4 lists the operators that can be used to form ad hoc parameter expressions.

Table 3-4 QBE operators used in ad hoc parameters

Name	Operator	Usage
Ampersand	&	Matches if two or more conditions are true
Backslash	\	Used with an operator to make it a literal character
Brackets	[]	Matches any character in the set between the brackets
Caret	^	Matches everything not in the bracket set
Comma	,	Combines search terms and expressions
Exclamation	!	Matches everything not equal to the search expression
Greater than	>	Matches everything greater than the value that follows the operator
Greater than or equal to	>=	Matches everything greater than or equal to the value that follows the operator
Hyphen	-	Separates upper and lower limits of the search range
Less than	<	Matches everything less than the value that follows the operator
Less than or equal to	<=	Matches everything less than or equal to the value that follows the operator
Number sign	#	Matches any single ASCII numeric character [0-9]
Parenthesis	()	Matches all characters in the set between the parentheses
Percent sign	%	Matches any character, group of characters, or no character
Pipe sign		Matches if any one of multiple conditions is true
Single quotation mark	'	Converts an operator character in a string into a literal character
Underscore	_	Matches any single character

How to use the ad hoc parameter builder

For a field that supports typing an ad hoc value, you can type the value and use the ad hoc parameter builder operators and characters to provide a QBE expression in the field.



- 1 In Parameters, choose expression builder, as shown in Figure 3-5.

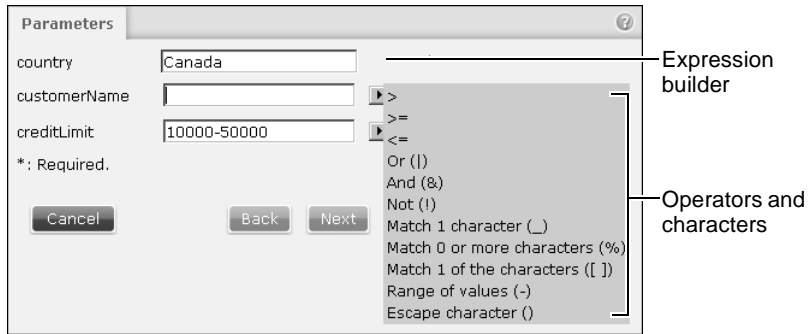


Figure 3-5 Using the ad hoc expression builder

- 2 Use a combination of text, operators, and characters to build a QBE expression for any of the parameter fields.

Figure 3-6 shows the result of adding two pipe signs (|) and typing several values. The resulting QBE expression specifies that the values must match 'A', 'B', or 'S'.



Figure 3-6 A QBE expression on the Requester page

- 3 Choose Next to provide Save As information or choose Finish to save the report job.

Table 3-5 provides examples of QBE expressions.

Table 3-5 Example results for QBE expressions

QBE expression	Matches	Does not match
Sm[aeiou]th	'Smith' 'Smath'	'Smooth' 'Smth'
ab[%]c	'ab%c'	'abac' 'ab[%]c'
Smith%	'Smith' 'Smithsonian' 'Smith '	'Smit'
ab%c	'abac' 'ab%c' 'abc'	
Sm_th	'Smith' 'Smoth'	'Smooth' 'Smth'

Using data types with Query by Example

A value in a QBE expression must match the data type of the data source field to which it applies. For example, you must use a numeric value in a QBE expression that filters a numeric field. Do not include characters, such as commas used as placeholders, when typing a numeric parameter value.

Using a null value in a QBE expression

To specify that a field in the database must or must not contain a data value, use the keyword Null. To specify that the field must not contain a data value, type Null as the QBE expression. To specify that a field must contain a data value, type !Null as the QBE expression. Null is not case-sensitive.

Using a date in a QBE expression

To supply a date in the short date format, use the locale-specific date separator and date format order. Table 3-6 lists examples of correct date formats in different locale settings.

Table 3-6 Using a date in a QBE expression

Locale setting	Correct format
US English	01/15/2011
French (France)	15/01/2011
Russian	15.01.2011

When you use a date in a QBE expression, use four-digit years rather than two-digit year abbreviations. For example, to signify January 15, 2011, type 01/15/2011 rather than 01/15/11.

Matching an exact string value in a QBE expression

To ensure that only exact values are found in data sources, enclose the text string in single quotation marks in the QBE expression. Returned data must match the enclosed string exactly. Returned data does not include values that have additional characters at the end of the string. A comma appears as a list separator for Smith, Jan. To specify a locale-independent list separator, use the pipe sign (|).

Table 3-7 lists the values that example QBE expressions return.

Table 3-7 Matching an exact string value in a QBE expression

QBE expression	Matches	Does not match
Smith	'Smith' or 'Smith ' or 'Smithson'	
'Smith'	'Smith'	'Smith ' 'Smithson'

Table 3-7 Matching an exact string value in a QBE expression

QBE expression	Matches	Does not match
Smith, Jan	'Smith, Jan' or 'Smith, John' or 'Janesson, Per'	
'Smith, Jan'	'Smith, Jan'	'Smith, John'
Red Green Blue	'Green' 'Red Green Blue'	
'Red Green Blue'	'Red Green Blue'	'Red' 'Green' 'Blue'

Making a literal character in a QBE expression

A specific syntax is required when a QBE expression attempts to match a value using an operator character as a literal character. Operator characters are shown in Table 3-4. Type a backslash (\) before each special character, or enclose the string in single quotation marks, which directs the application to match the string value exactly. For example, typing a backslash before the comma directs the application to interpret the comma literally in the following QBE expression:

```
16M x 1 Dynamic Ram\, 3.3 volts
```

Without the backslash, depending on your locale setting, Deployment Kit interprets the comma as an OR.

To specify a list separator that is locale-independent, use the pipe sign (|).

The following QBE expression matches the percent sign (%) literally in a string:

```
'ab\%c'
```

Using a special character to match one or more characters in a QBE string

Table 3-8 lists characters that have special meanings in a string in a QBE expression.

Table 3-8 Characters that have special meanings in a string in a QBE expression

Character	Meaning in QBE
Brackets, []	Match any one of the characters within brackets. Not supported by all data sources.
Percent, %	Match any character, group of characters, or no character.
Underscore, _	Match any single character.

Table 3-9 provides examples of QBE expressions that use the preceding special and literal characters.

Table 3-9 Examples of characters that have special meanings in a string in a QBE expression

QBE expression	Matches	Does not match
Sm[aeiou]th	'Smith'	'Smooth'
	'Smath'	'Smth'
Sm\[aeiou\]th	'Sm[aeiou]th'	'Smith'
ab[%]c	'ab%c'	'abac'
		'ab[%]c'
Smith%	'Smith'	'Smit'
	'Smithsonian'	
	'Smith '	
ab%c	'abac'	
	'ab%c'	
	'abc'	
Sm_th	'Smith'	'Smooth'
	'Smth'	'Smth'

Matching character sets and spaces with the percent sign

The percent sign (%) matches any set of characters or blank characters. Deployment Kit adds a percent sign to a string supplied as a QBE expression when all the following conditions are true:

- The database column is of type string.
- The input parameter value is not enclosed in single quotation marks and is not a range.
- The string does not contain a percent sign, such as Sm%th.

Deployment Kit adds a percent sign to ensure blank characters at the end of strings in the database do not interfere with the matching process. If you do not want Deployment Kit to add the percent sign (%) to the end of a string, enclose the string in single quotation marks in the QBE expression.

Table 3-10 shows the results of the application adding a percent sign to QBE expressions.

Table 3-10 Adding a percent sign to QBE expressions

QBE expression	SQL condition	Matches	Does not match
'Smith'	custName LIKE 'Smith'	'Smith'	'Smith '
Smith	custName LIKE 'Smith%'	'Smith' 'Smith ' 'Smithe' 'Smithsonian'	

To match values ending in a space character when the QBE expression contains a percent character, append a percent character to the QBE expression. For example:

```
Sm%th%
```

The above syntax is valid for a QBE expression with only a single value. Deployment Kit does not add a percent sign to an expression for a range of values. For example, if the database column custName is a string and the report user types D as the value of the ad hoc parameter, the query retrieves the data row that contains Design Boards.

If the user types a range of values, such as A-D, for the ad hoc parameter value, Deployment Kit does not match customer records where custName is Design Boards. This is because the value is a range and not a single value. For example, QBE expression values that retrieve values starting with A through D appear in Table 3-11, including one to which Deployment Kit adds a percent sign.

Table 3-11 Examples of QBE expressions to retrieve a range of values

QBE expression	SQL condition
A-E	custName BETWEEN 'A' AND 'E'
>A<&<E	custName > 'A' AND custName < 'E'
A B C D	custName LIKE 'A%' OR custName LIKE 'B%' OR custName LIKE 'C%' OR custName LIKE 'D%'

Matching character sets with brackets

Brackets ([and]) specify a set of matching characters. Deployment Kit manages any special characters enclosed by brackets as literal characters. For example, the following QBE expression encloses the percent sign (%) and uses it literally:

```
ab [%] c
```


Index

Symbols

- ^ operator 24
- _ (underscore) character 27
- , (comma) operator 24
- ! operator 24
- ' (single quotation mark) character 26, 27, 28
- ' (single quotation mark) operator 24
- () operator 24
- [] (square brackets) characters 27
- [] operator 24, 29
- \ (backslash) character 21, 27
- \ (backslash) operator 24
- & operator 24
- # operator 24
- % (percent sign) character 27, 28
- % (percent sign) operator 21, 24
- < operator 24
- <= operator 24
- > operator 24
- >= operator 24
- | (pipe sign) character 26
- | (pipe sign) operator 24
- (hyphen) operator 24
- _ (underscore) operator 21, 24

A

- accessing
 - Actuate Deployment Kits 3
 - folders 8
 - home folders 14
 - reports 6, 8
- Actuate Deployment Kit license 6
- Actuate Deployment Kits
 - filtering items for 12–13
 - localizing 13, 14
 - logging in to 14
 - navigating through 7, 8, 9, 10
 - overview 3, 8
 - personalizing features 10
- Actuate Java Components 2, 6
- ad hoc parameter builder 24
- ad hoc parameter types 19

- ad hoc parameters 18, 19, 24, 29
- applications 3

B

- backslash (\) character 21, 27
- banner (Actuate Development Kit) 8
- Between operator 20
- BIRT Data Analyzer 2
- BIRT data design 9, 11
- BIRT data designs 11
- BIRT Deployment Kit 7, 16
 - See* Actuate Deployment Kits
- BIRT Interactive Viewer 2, 7
- BIRT Report Studio 7
- BIRT reports 16, 18
 - See also* reports
- BIRT Spreadsheet Deployment Kit 16
 - See also* Actuate Deployment Kits
- BIRT Studio 2
- BIRT Viewer 2
- blank characters 28
- Boolean expressions 20
- browser-based tools
 - See also* web browsers
- buttons 19

C

- Categories view 8
- changing
 - default settings 16
 - functionality levels 10
 - sort order 12
- character filters 13
- character patterns 21, 24, 28, 29
- character strings. *See* strings
- characters
 - as literal values 21, 24, 27, 29
 - matching string values and 26, 27, 28
 - QBE expressions and 21, 26
- check boxes 19
- comma-separated values 19

- creating
 - QBE expressions 23, 25, 26
 - reports 3
- cube view files 11
- customizing Deployment Kit features 10

D

- dashboards 17
- data
 - filtering 18, 19, 20, 26
 - formatting 14, 26
 - grouping 18
 - retrieving 16, 17, 18, 19
- data design file 9
- data filters 20
- data sources
 - filtering data in 18, 19, 20, 26
 - retrieving data from 17, 18, 19
 - retrieving exact values in 26, 27
- data types 26
- date separators 26
- dates 26
- default settings 16
- default values 17, 18
- deleting
 - filter selections 13
 - report files 11
- deployment kits. *See* Actuate Deployment Kits
- designs 3, 9, 16
- details icon 9
- displaying
 - BIRT data designs 11
 - cube view files 11
 - licensing information 8
 - report files 8, 10, 12, 13
 - reports 3, 9, 16
 - spreadsheet reports 10, 16, 17
 - subfolders 8, 13
- documentation iii, 7
- documents 9, 13, 16
 - See also* reports
- Documents link 8
- Documents page 7, 8, 11, 12
- Documents You Can View category 9, 10
- drop-down lists 19

- dynamic filter operators 20
- dynamic filter parameters 19, 20
- dynamic filters 20

E

- e.reports 23
 - See also* reports
- Equal to operator 20
- exact string values 26, 27
- executable files 2, 9, 13, 16
- expression builder 24
- expressions 19, 20, 21
 - See also* QBE expressions

F

- features 10
- file links 16
- file lists 12
- file menu 10
- file systems 3
- file types 11
- files
 - See also* specific type
 - accessing 8
 - deleting 11
 - displaying 8, 10, 12, 13
 - filtering 13
 - managing 3
 - selecting 16
- Files and Folders page 3
 - See also* Documents page
- filter expressions 19, 20, 21
- Filter options 8, 12
- filtering
 - data 18, 19, 20, 26
 - items on Deployment Kit pages 12–13
- filters 13, 20
- filters selections 13
- folder links 8
- folders
 - accessing 8, 14
 - displaying 8, 13
 - filtering contents 13
 - removing files from 11
 - viewing contents 8, 12, 13
 - viewing details about 9, 10

Folders links 8
formatting data 14, 26
functionality levels 10

G

generating reports 9, 16
graphical user interfaces 10, 14
Greater than operator 20
Greater than or equal to operator 20
grouping data 18
GUIs. *See* graphical user interfaces

H

Help link 8
home folders 8, 14

I

immediate jobs 16, 17
In operator 20
input 17
Interactive Viewer 2, 7
Is false operator 20
Is not null operator 20
Is null operator 20
Is true operator 20
Items You Can Run category 9, 11

J

Java Components. *See* Actuate Java Components
jobs 16–17, 25

L

landing pages 2, 7
language settings 13, 14
Less than operator 20
Less than or equal operator 21
licenses 6
licensing information 8
Like operator 21
links 7, 8, 14, 16
list separators 19, 26
lists 12, 19, 26
literal values 21, 24, 27, 29
locales 13, 14, 26

login credentials 13, 14
login page 14

M

Match operator 21
menus 8
metacharacters 21
multiple-value parameters 18, 19
My Folder link 14

N

networked environments 2
No condition operator 21
Not between operator 21
Not equal to operator 21
Not in operator 21
Not like operator 21
Not match operator 21
Null keyword 26
null values 26
numbers 26

O

online documentation. *See* documentation
opening
 Actuate Deployment Kits 7, 14
 document files 16
 Java Components application 6
 spreadsheet reports 16
operators
 as literal characters 27
 filter expressions 19, 20
 QBE expressions 23
optional parameters 18
output 16

P

parameter types 18, 19
parameters
 assigning values to 19, 26, 29
 filtering data with 18, 19, 20, 26
 retrieving data with 17, 19, 24
 running jobs and 16
 setting values for 17, 18
 viewing spreadsheet reports and 10

- Parameters page 16, 18
- passwords 14, 18
- pattern matching 21, 24, 28, 29
- PDF files 17
- percent sign (%) character 27, 28
- pipe sign (|) character 26
- pipe-separated values 19
- predefined values 17, 18
- privileges 14
- public folders 8

Q

- QBE expressions
 - creating 23, 25, 26
 - defining ad hoc parameters for 19, 24
 - entering literal characters in 27, 29
 - formatting date values and 26
 - matching string values and 26, 27, 28
 - retrieving blank characters and 28
 - retrieving null values and 26
- queries. *See* QBE expressions
- query operators 23

R

- radio buttons 19
- range of values 19, 29
- regular expressions 21
- report designs 3, 9, 16
- report documents 9, 13, 16
- report executables. *See* report object executable files; spreadsheet object executable files
- report file types 11
- report files
 - See also* specific type
 - accessing 8
 - deleting 11
 - displaying 8, 10, 12, 13
 - filtering 13
 - managing 3
 - selecting 16
- report object executable files 13
 - See also* executable files
- report parameter values files 18
- report parameters. *See* parameters

- report viewers 2
 - See also* specific viewer
- reports
 - accessing 6, 8
 - creating 3
 - displaying 3, 9, 16
 - distributing information and 2
 - generating 9, 16
 - retrieving data for 16, 17, 18, 19
 - running 11, 16, 17
- repository 3
- requests. *See* jobs
- required parameters 18
- .rox files. *See* report object executable files
- .rptdesign files. *See* report designs
- .rptdocument files. *See* report documents
- Run and View icon 17
- Run page 16
- run requests. *See* jobs
- running
 - jobs 16–17
 - reports 11, 16, 17

S

- saving jobs 25
- searching
 - data sources 20, 24
- side menu 8
- single quotation mark (') character 26, 27, 28
- single-value parameters 18
- .soi files. *See* spreadsheet object document files
- sort order 12
- .sox files. *See* spreadsheet object executable files
- space characters 29
- Spreadsheet Deployment Kit. *See* BIRT Spreadsheet Deployment Kit
- spreadsheet designs 3
- spreadsheet object document files 16
- spreadsheet object executable files 9, 16
 - See also* executable files
- spreadsheet reports 9, 10, 16, 17, 23
- square brackets ([]) characters 27
- strings
 - matching blank characters in 28

- matching exact characters in 26, 27
- matching set of characters in 21, 24, 27, 28, 29

- subfolders 8, 13
- submitting jobs 16

T

- text patterns 21
- time stamps 14
- time zones 13, 14
- time-out messages 17
- types. *See* data types

U

- underscore (_) character 27
- unscheduled jobs 16, 17
- URLs 6, 14
- user interfaces 10, 14
- user names 14, 18
- user selection lists 19, 26

V

- values
 - See also* data
 - assigning to parameters 17, 18, 19, 26, 29
 - retrieving exact 26, 27
 - retrieving null 26

- retrieving specific 19, 20, 23
- selecting range of 19

- version information 8
- viewers 2

- See also* specific viewer

- viewing

- BIRT data designs 11
- cube view files 11
- licensing information 8
- report files 8, 10, 12, 13
- reports 3, 9, 16
- spreadsheet reports 10, 16, 17
- subfolders 8, 13

W

- wait periods 17
- web browsers 3
- web sites 14
- white space characters 29
- wildcard characters 13

X

- .xls files. *See* spreadsheet reports

Y

- year values 26

