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Working with Actuate BIRT Viewers

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Document No. 120201-2-749301 September 19, 2012

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About Working with Actuate BIRT Viewers

Working with Actuate BIRT Viewers provides users with information about using Actuate BIRT Viewer and Actuate BIRT Interactive Viewer. This document explains how to generate, view, and customize reports.

- *About Working with Actuate BIRT Viewers.* This chapter provides an overview of this document.
- *Part 1. Using Actuate BIRT Viewers.* This part contains information about using Actuate BIRT Viewer and Actuate BIRT Interactive Viewer.
- *Chapter 1. Introducing Actuate BIRT Viewers.* This chapter introduces the viewing environments for BIRT reports, and lists the modification capabilities each environment provides. The chapter also compares Actuate BIRT Viewer and Actuate BIRT Interactive Viewer.
- *Chapter 2. Navigating a report.* This chapter describes how you can begin working with reports by navigating a report page using the paging tool. The chapter also explains how to use a table of contents, display parameter values, work with hyperlinks, save a report, and print a report.
- *Chapter 3. Editing and formatting a report.* This chapter describes the formatting options in Interactive Viewer: formatting data columns and static text, formatting various types of data, and applying conditional formatting.
- *Chapter 4. Exporting report data and content.* This chapter describes the exporting options in Interactive Viewer: exporting report data to various flat file formats, and exporting report content to various formats such as AFP, Word, PowerPoint, Excel, PostScript, PDF, or Extensible HTML.
- *Chapter 5. Organizing data in a report.* This chapter discusses the functionality Interactive Viewer provides for organizing data, such as sorting data, moving columns, removing duplicate values, creating data groups, and so on. The chapter also describes how you can perform aggregate calculations, and set page breaks in a report.

- *Chapter 6. Performing calculations in a report.* This chapter describes how you can insert calculated columns in a report and explains how to build expressions and create custom expressions to create new computed columns.
- *Chapter 7. Filtering report data.* This chapter discusses how you can use Interactive Viewer to specify viewing parameter values, and create filters for data in a report.
- *Chapter 8. Modifying charts.* This chapter describes the types of charts in a report and explains how you can modify them using Interactive Viewer. The chapter provides procedures for changing the subtype and formatting of a chart, and also explains how to drill up and down through data hierarchies, drill through hyperlinks, and switch views between a chart and table or cross-tab view of data. The chapter also describes Flash charts and gadgets, and HTML5 charts, and explains how you can modify them.
- *Chapter 9. Modifying cross tabs.* This chapter describes cross tabs and explains how you can use Interactive Viewer to modify the formatting properties of data in a cross tab. The chapter also describes how you can analyze cross-tab data, modify charts in a cross tab, and export, print, and save a cross tab.
- *Chapter 10. Modifying summary tables.* This chapter describes summary tables, and explains how you can use Interactive Viewer to modify data in a summary table. The chapter also describes modifying a chart in a summary table, and saving a summary table.
- *Chapter 11. Functions and operators.* This chapter is a reference for all the functions available in Interactive Viewer. The chapter also describes the operators you can use when creating expressions for calculations.
- *Part 2. Actuate BIRT Viewer Reference.* This part contains information about configuring the Actuate BIRT viewers and accessing a BIRT viewer using a URI.
- *Chapter 12. Configuring Actuate BIRT Viewer.* This chapter describes how to configure the Actuate BIRT viewers.
- *Chapter 13. Actuate BIRT Viewer URIs.* This chapter describes how to access a BIRT viewer using a URI.

Part One

Using Actuate BIRT Viewers

Chapter

1

Introducing Actuate BIRT Viewers

This chapter contains the following topics:

- Introduction to the viewing environments
- Using Actuate BIRT Viewer
- Using Interactive Viewer
- Comparing the viewers

Introduction to the viewing environments

You can view BIRT (Business Intelligence Reporting Tools) reports using two web-based viewing environments, Actuate BIRT Viewer and Actuate BIRT Interactive Viewer. In this document, the term, viewers, refers to both Actuate BIRT Viewer and Actuate BIRT Interactive Viewer (Interactive Viewer). A report is a category of documents that presents formatted and structured content from one or more data sources, such as a database, a spreadsheet, or a text file. Figure 1-1 shows a simple listing report displaying credit limit information for customers, sorted by country.

Report column label

Report column

Country	Customer	Contact Name	Phone	City	Zip Code	Credit Limit
Australia						
	Australian Collectors, Co.	Ferguson Peter	03 9520 4555	Melbourne	3004	117300
	Anna's Decorations, Ltd	O'Hara Anna	02 9936 8555	North Sydney	2060	107800
	Souveniers And Things Co.	Huxley Adrian	+61 2 9495 8555	Chatswood	2067	93300
	Australian Gift Network, Co	Calaghan Ben	61-7-3844-6555	South Brisbane	4101	51600
	Australian Collectables, Ltd	Clenahan Sean	61-9-3844-6555	Glen Waverly	3150	60300
Austria						
	Salzburg Collectables	Pipps Georg	6562-9555	Salzburg	5020	71700
	Mini Auto Werke	Mendel Roland	7675-3555	Graz	8010	45300
Belgium						
	Petit Auto	Dewey Catherine	(02) 5554 67	Bruxelles	B-1180	79900
	Royale Belge	Cartrain Pascale	(071) 23 67 2555	Charleroi	B-6000	23500

Figure 1-1 An example report

This section describes the viewers and highlights the capabilities and functions of Actuate BIRT Viewer and Interactive Viewer. You use the viewers to navigate a report, print report data, and export the report and report data to several other formats. In addition, Interactive Viewer, as its name suggests, provides a high degree of interactivity. Users can easily modify the layout and formatting of reports, organize report data by sorting, filtering and grouping, perform calculations and compute report data, and edit graphical representations of report data by modifying charts in a report. In addition, you can modify cross tabs, and summary tables in a report. You can then save the modified reports using Interactive Viewer. Detailed information about performing each of these tasks is available in later sections of this document. In cases where you do not see a specific option that is described, upgrade to Interactive Viewer in order to access additional functionality.

A BIRT report can consist of several report components. At the very least, a BIRT report contains a table which holds data. In addition, a report can contain other elements such as charts, Flash charts and gadgets, HTML5 charts, a cross tab, or a summary table.

Users, working with BIRT dashboards to interact with gadgets, such as report gadgets, chart gadgets, Flash gadgets, cross-tab gadgets, or summary-table gadgets, can access most menu options described in this document by first

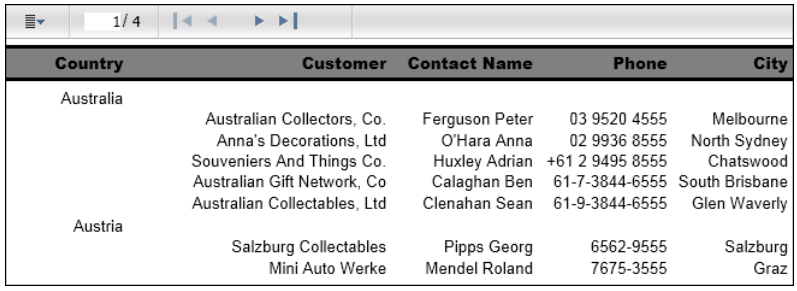
maximizing each gadget. For more information on working with dashboards, see *Building BIRT Dashboards.*

Using Actuate BIRT Viewer

To begin using Actuate BIRT Viewer, you must first generate a report. The primary interface in which you view the report is Actuate BIRT Viewer. You can launch Actuate BIRT Viewer from any of the following applications:

- Actuate Information Console
- Actuate BIRT iServer
- Actuate BIRT Studio
- Actuate BIRT Designer Professional
- Actuate Deployment Kit

The Actuate BIRT Viewer interface consists of a main toolbar with several icons that include the main menu with options, and the page navigation tool.The report itself occupies the remaining portion of the Viewer, as shown in Figure 1-2.



Country	Customer	Contact Name	Phone	City
Australia				
	Australian Collectors, Co.	Ferguson Peter	03 9520 4555	Melbourne
	Anna's Decorations, Ltd	O'Hara Anna	02 9936 8555	North Sydney
	Souveniers And Things Co.	Huxley Adrian	+61 2 9495 8555	Chatswood
	Australian Gift Network, Co	Calaghan Ben	61-7-3844-6555	South Brisbane
	Australian Collectables, Ltd	Clenahan Sean	61-9-3844-6555	Glen Waverly
Austria				
	Salzburg Collectables	Pipps Georg	6562-9555	Salzburg
	Mini Auto Werke	Mendel Roland	7675-3555	Graz

Figure 1-2 Viewing a report in Actuate BIRT Viewer

You use Actuate BIRT Viewer to perform the following tasks:

- View the table of contents.
- Navigate pages in a multipage report.
- Export data to several flat file formats.
- Export content to AFP, Excel, PostScript, PDF, Word, PowerPoint, or Extensible HTML formats.
- Link to the report page.
- Print reports.
- Show or hide report margins in the browser.

- Specify viewing parameters.
- Use hyperlinks in a report to view data in other reports or external web sites.
- Drill up and down hierarchical data to view summary or detail information.

Using Interactive Viewer

This section describes the additional functions available using Interactive Viewer. Interactive Viewer provides users with complete access to the features available in Actuate BIRT Viewer. In addition, Interactive Viewer enables users to easily customize reports based on individual needs and preferences. Using Interactive Viewer, users can modify the layout of the report, compute data, move or delete columns, create aggregate data, modify tables displaying summary information, modify charts and graphs, modify data in cross tabs, and rearrange data using simple menu options. You can view and modify a report containing up to 200 pages in Interactive Viewer.

When you purchase the Actuate BIRT viewers, you have immediate access to Actuate BIRT Viewer. To access Interactive Viewer, your system administrator must enable this option on your system, for which you must purchase the Interactive Viewer license.

To view a BIRT report in Interactive Viewer, first view the report using Actuate BIRT Viewer. From the main menu, choose Enable Interactivity to launch Interactive Viewer.

The change in the name of the viewing pane to Actuate Interactive Viewer indicates that you are in Interactive Viewer mode. Also, notice the appearance of the undo and redo buttons on the Viewer toolbar, as shown in Figure 1-3.

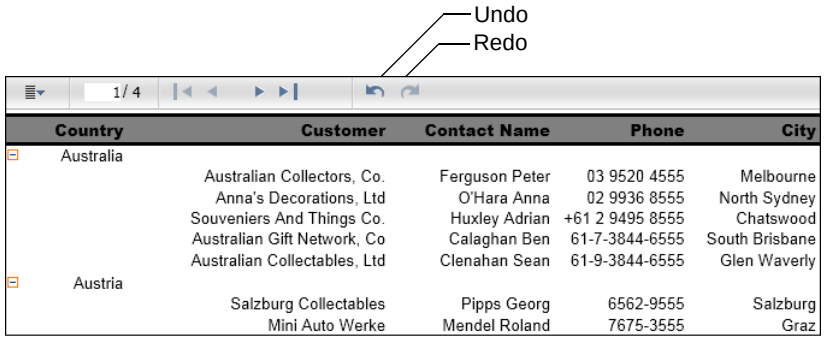


Figure 1-3 Viewing a report in Interactive Viewer

When you choose Disable Interactivity from the main menu, the Undo and Redo buttons disappear, and the name of the viewing pane changes to Actuate Viewer.

After launching Interactive Viewer, you can select any column in the report to highlight it. Notice the appearance of a toolbar on the top of the selected column providing a column menu, Sort, and Filter buttons, as shown in Figure 1-4.

Figure 1-4 Column toolbar

To modify the column, select the column menu, then choose an option from the menu that appears. You can also display the options that appear in the column menu by right-clicking the selected column to display a context menu. This document uses the context menu to select modification options. The example shown in Figure 1-5 displays a typical context menu.

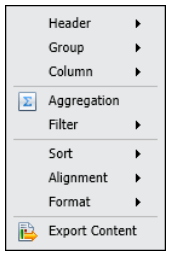


Figure 1-5 Column menu

You can use Interactive Viewer to perform the following additional tasks:

- Undo and redo the most recent action.
- Modify font properties of report data and report elements.
- Apply conditional formatting and format data strings.
- Sort, group, and filter report data.
- Perform calculations and compute data.
- Modify graphs and charts.
- Modify Flash charts and Flash gadgets.
- Modify HTML5 charts.
- Rearrange, move, hide, and delete columns.
- Create aggregate data.
- Add page breaks in a multipage report.
- Save a modified BIRT report design or document file.
- Modify cross tabs and analyze cross-tab data in Actuate BIRT Data Analyzer.
- Modify summary tables.

Comparing the viewers

In this section, Table 1-1 compares tasks you can perform using the viewers and highlights tasks you can exclusively perform using Interactive Viewer.

Table 1-1 Comparing the Actuate BIRT Viewers

Task	Actuate BIRT Viewer	Interactive Viewer
Add computed columns.		✓
Add page breaks in a report.		✓
Apply conditions and format data strings.		✓
Create aggregate data in a report table.		✓
Display the table of contents.	✓	✓
Display viewing parameters.	✓	✓
Export content.	✓	✓
Export data.	✓	✓
Hide or show report items.		✓
Link to the report page.	✓	✓
Modify charts and graphs.		✓
Modify cross tabs.		✓
Modify Flash charts and gadgets.		✓
Modify HTML5 charts.		✓
Modify summary tables.		✓
Modify text attributes and alignment.		✓
Move, hide, show, and delete report columns.		✓
Navigate a multipage report.	✓	✓
Print a report.	✓	✓
Save a modified report.		✓
Save a BIRT report design.		✓
Sort, group, and filter report data.		✓
Undo and redo tasks.		✓
Use hyperlinks present in the report.	✓	✓
View Flash charts and gadgets.	✓	✓
View HTML5 charts.	✓	✓
View summary tables.	✓	✓

Chapter

2

Navigating a report

This chapter contains the following topics:

- About navigation options
- Paging through a report
- Opening the table of contents
- Displaying parameter values
- Displaying margins
- Working with hyperlinks
- Saving a report
- Printing a report

About navigation options

The previous section introduced the viewers, and described the tasks you can perform using them. You can use Actuate BIRT Viewer to open and view the table of contents, navigate to specific sections in the report using the table of contents, view each page of the report, go directly to a specific page, and specify parameter values to view specific content in large reports. You can also obtain a unique URL for the report to link to it from other documents. In addition to these navigation options, you can use Interactive Viewer to save a modified report, and print reports. The following section describes how to navigate a generated report in the viewers, to enable you to modify or customize the report.

Paging through a report

The viewer toolbar consists of a main menu with additional options and a page navigation tool, as shown in Figure 2-1. You can view pages in a multipage report using the paging tool. The tool consists of a set of arrows that enable users to view the first or last page in a report, and to move forward or backward, page by page, through the report.

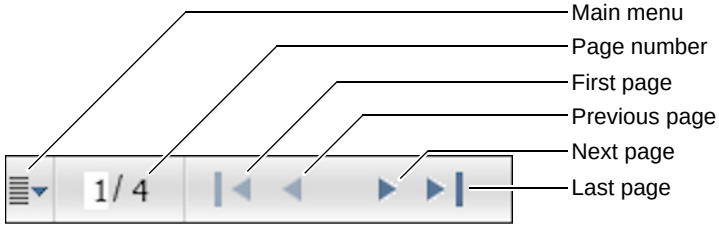


Figure 2-1 Actuate BIRT Viewer toolbar

To navigate directly to a specific page, type the page number in the Page number field, then press Enter. In Actuate 11 and later releases, Actuate BIRT Viewer supports progressive viewing for multipage reports. The progressive viewing feature provides efficiency by enabling users to view each page of the report as it is generated, without requiring the user to wait until the entire report is generated.

Opening the table of contents

A table of contents can be defined as a list of sections, that provides you with information about where each section begins. In the viewers, you can open a table of contents to view the report structure and navigate to specific sections of the report. To view the table of contents, choose TOC from the main menu. If the

report contains a table of contents, the TOC panel displaying the entries appears on the left of the viewer, as shown in Figure 2-2.

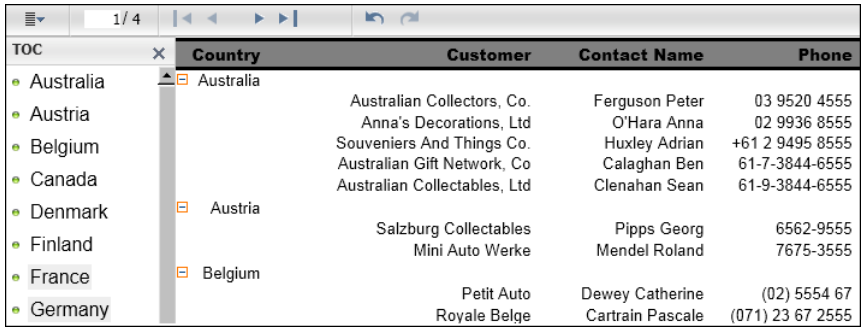


Figure 2-2 Displaying the table of contents

Because each entry in the table of contents is a link to a section in the report, selecting an entry in the table of contents displays the related section in the report. If you have a multipage report containing sections and subsections, you can expand the entries in the table of contents panel to navigate directly to the appropriate subsection.

To close the table of contents, choose Close from the top corner of the TOC panel.

Displaying parameter values

A parameter value is a way of limiting the report data retrieved when you run a report. For example, in a report that displays customer information, you can use parameter values to display sales history for a specific customer, or view the details of specific orders. If a report requires you to enter parameter values, you are prompted to type the value when you generate the report. Specifying parameter values enables you to navigate a report more effectively, and display only the information you need.

If the report requires you to enter parameter values to determine what data to display, you can modify these values to view other data, by choosing Parameters from the main menu. If you choose this option, and parameter values are not needed, a message appears informing you that the report contains no parameters. You learn more about using parameters later in this document.

Displaying margins

The viewers also provide the option to display or hide margins for any report design you are viewing. Selecting or deselecting this option displays or hides

margins in the browser window, and does not impact page margins when printing a report design or exporting a report design to other formats.

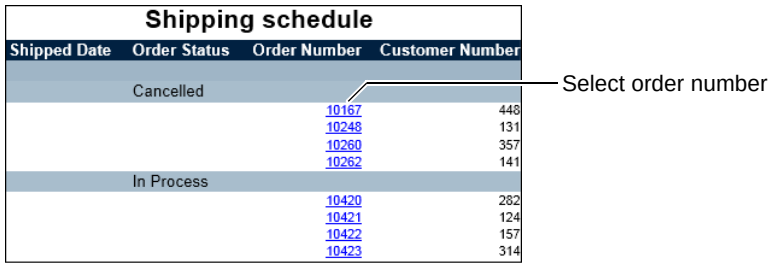
To display a margin, choose Show Margin from the main menu.

To hide a margin, choose Hide Margin from the main menu.

Working with hyperlinks

Sometimes report developers add interactive viewing features in reports using BIRT Designer Professional or BIRT Studio. Interactive viewing features such as hyperlinks enable a user to navigate a lengthy multipage report more efficiently.

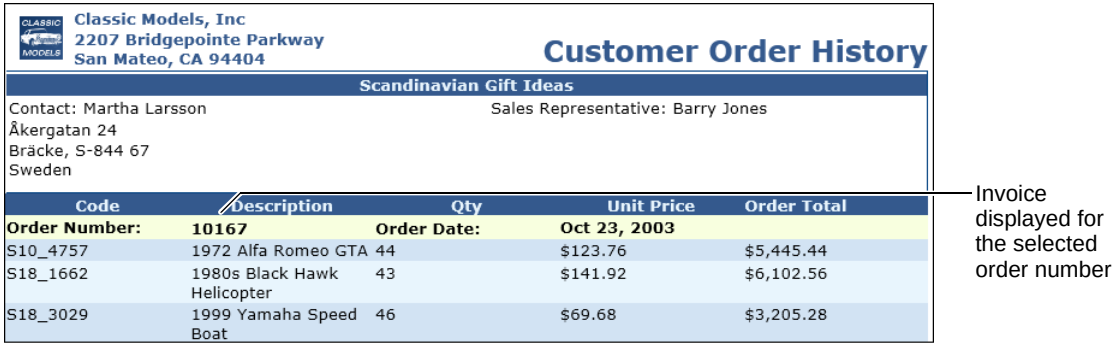
For example, the shipping schedule report shown in Figure 2-3, links each order number to the corresponding invoice. You can view the details of each invoice for orders that were shipped, canceled, in process, or on hold. Select an order number for which you want to view the invoice. Interactive Viewer displays the invoice for the order number selected in Figure 2-3, as shown in Figure 2-4.



Shipping schedule

Shipped Date	Order Status	Order Number	Customer Number
	Cancelled		
		10167	448
		10248	131
		10260	357
		10262	141
	In Process		
		10420	282
		10421	124
		10422	157
		10423	314

Figure 2-3 Drilling through the order number field



Classic Models, Inc
2207 Bridgepointe Parkway
San Mateo, CA 94404

Customer Order History

Scandinavian Gift Ideas

Contact: Martha Larsson
Åkergatan 24
Bräcke, S-844 67
Sweden

Sales Representative: Barry Jones

Code	Description	Qty	Unit Price	Order Total
Order Number:	**10167**	**Order Date:**	**Oct 23, 2003**	
S10_4757	1972 Alfa Romeo GTA	44	$123.76	$5,445.44
S18_1662	1980s Black Hawk Helicopter	43	$141.92	$6,102.56
S18_3029	1999 Yamaha Speed Boat	46	$69.68	$3,205.28

Figure 2-4 Invoice linked from each order number

If the report you are viewing contains hyperlinks, choose the link to view the associated content. For example, in a report listing customers and their web sites, choose a URL in the report to visit the corresponding web site. The content the

link references, opens in a new browser tab or window. If the hyperlink is associated with an e-mail address, your default e-mail client launches a new message window. The linked address, appears in the To field. For example, to contact the customer, choose the e-mail address in the report to send the customer an e-mail. Some hyperlinks can link elements within the same report. For example, a hyperlink created in a report element such as a summary table, cross tab, or chart can link to another chart, within the same report. Hyperlinks can also link to external reports stored in the iServer Encyclopedia volume. These hyperlinks are called drill-through hyperlinks. When you choose the link, the report launches in a new browser tab or window.

You can also use the Link To This Page option to share the currently viewed report with other users. When you share the report, the viewer generates a link to the report and makes this available to other designated users.

How to link to the current report page

Choose Link To This Page from the main menu. On Link To This Page, you can either copy the absolute link and paste it in an e-mail or instant messenger window, or you can copy the HTML code, as shown in Figure 2-5, and paste it in the required location. Choose OK to close the window.

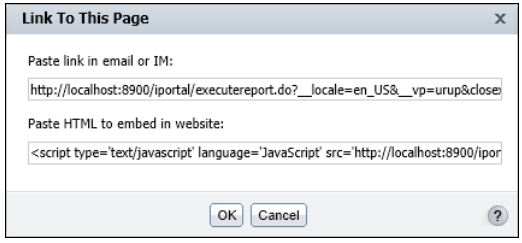


Figure 2-5 Linking to the current report

Saving a report

Many of the tasks you can perform in Interactive Viewer, such as sorting data, using conditional formatting, creating aggregate data, and inserting computed columns, are similar to tasks a report developer performs in the report design environment. Sometimes you need to modify the report and save it, so you can use it later, or make it available for other users to view and modify.

In Interactive Viewer, you can save a modified report as a BIRT report design or a BIRT report document file. To enable users to open the modified report in Actuate BIRT Studio, or Actuate BIRT Designer Professional, and to provide them with the ability to modify the report extensively, save the report as a BIRT report design (.rptdesign) file. To enable users to open the modified report in the viewers, and to limit the extent of the changes they can make to the report, save the report as a BIRT report document (.rptdocument) file. You cannot open a

report document file using Actuate BIRT Studio or Actuate BIRT Designer Professional. To edit a BIRT report document (.rptdocument) file in either report design tool, you must first save the file as a BIRT report design (.rptdesign) file using Interactive Viewer. The following section describes how to save a report using Interactive Viewer.

How to save a BIRT report design

You can save a modified BIRT report design file, or BIRT report document file, as a BIRT report design.

1 From the main menu, choose Enable Interactivity. You are now in Interactive Viewer.

2 Choose Save Design from the main menu. Save displays the default location where the report is saved, as shown in Figure 2-6. You have the following options:

- You can choose to save the report in the default location, which is the user's home directory (/Home/username), where username is the name of the user logged in to the application.
- To save the file in a different directory, select (/) to display a list of available directories from the path in Choose a Folder. Navigate to a new location from the path.

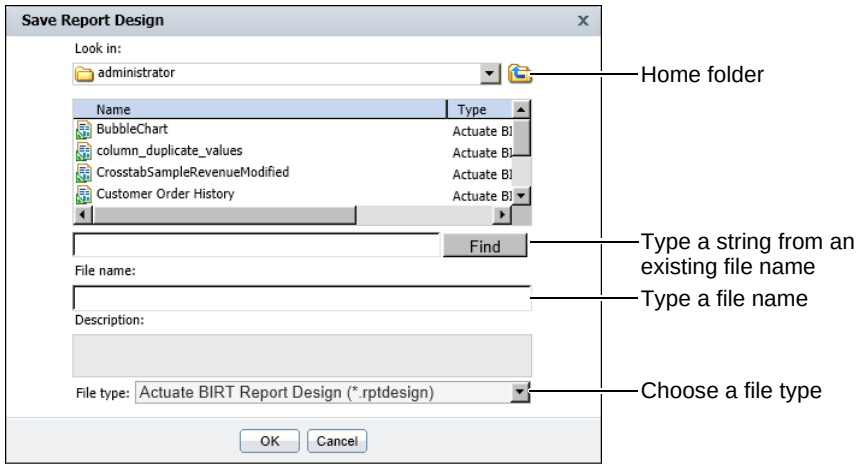


Figure 2-6 Saving a BIRT report design

3 Choose a file name for the report design.

- To overwrite an older version of the report, in Find, type the name of the report or a string of characters from the name. Then, press Enter, or choose Find. Save Report Design displays the reports that match the string you provided. Choose the file name from the menu that appears.

- To save the new report without overwriting an older version, type a new name in File name.

Choose OK. You save the report design as a BIRT report design (.rptdesign) file. To verify that your report has been saved, start your application server and navigate to the directory containing the report design file.

How to save a BIRT report document

1. From the main menu, choose Enable Interactivity, then choose Save Document. Save displays the default location where the report is saved, as shown in Figure 2-7. You have the following options:

   - You can save the file in the default location, which is the user's home directory (/Home/username), where username is the name of the user logged in to the application.
   - You can save the file in a different directory. To save the file in a different directory, select (/) to display a list of available directories from the path in Choose a Folder. Navigate to a new location from the path.

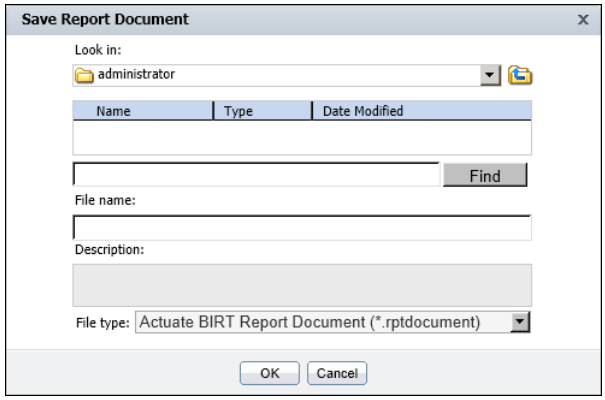


Figure 2-7 Saving a modified report

2. Choose a file name for the report.

   - To overwrite an older version of the report, in Find, type the name of the report or a string of characters from the name. Then, press Enter, or choose Find. Save displays the reports that match the string you provided. Choose the file name from the menu that appears.
   - To save the new report without overwriting an older version, type a new name in File name.

The report is saved as a BIRT report document (.rptdocument) file. To verify that your report has been saved, start your application server and navigate to the directory containing the report document file.

Printing a report

After viewing a report, you can print it in HTML or PDF format. In Interactive Viewer, you can print either the original report or the modified report. You can print a maximum of 200 pages.

How to print a report

1. From the main menu, choose Print.
2. On Print, complete the following tasks:
   1. In Format, select HTML or PDF.
      - If you select HTML, the report is formatted for printing as a continuous document in the browser window. Any page headers and footers appear in the body of the document, often multiple times, depending on how many pages the report contains. A multipage report does not retain its pagination properties when you choose to print it in HTML format.
      - If you select PDF, you can specify page style options for a multipage report. Select a page format from the list, as shown in Figure 2-8.
        - Auto is the default option. When you choose Auto, Interactive Viewer lays out the data such that the report content fits the width of the PDF page. If the report uses headers and footers, each header and footer are displayed in the appropriate location. Because the content is optimized in terms of font, and space, a single page in the report often displays on multiple pages in the PDF file. When you use the Auto option, existing pagination properties in the report are not retained in the PDF file, but the PDF output is paginated.

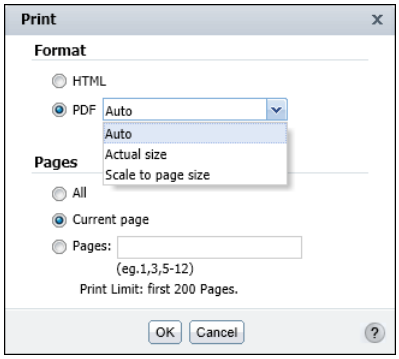


Figure 2-8 Printing a report

- Choosing Actual Size retains existing pagination properties from the original report. When you choose this option, the font size in the printed report is often significantly smaller than in the original report, to allow the content to fit within specified page boundaries. After you send the document to a printer, further modify options on the printer dialog box as needed, so that the printed report is legible.
- Choosing Scale to page size retains the existing pagination properties from the original report in the PDF output. Interactive Viewer shrinks report content such as fonts, and images, to fit each current report page on each page in the PDF output.

2 In Pages, indicate which pages to print. You can print all the pages in the report, only the current page, or a specific set of pages. To print specific pages, use commas to separate the page numbers. To print a range of pages, enter the start and end page, separating the two entries with a hyphen. To print from a specific page to the end of the document, enter the start page followed by a hyphen.

Choose OK.

3 Depending on your format selection in Print, you have the following options:

- If you selected HTML format, Print appears. Specify your printer options on Print.
- If you selected PDF format, the report appears in your web browser using a PDF viewer plug-in. You can preview the report, then choose Print to specify printer options. Review the options on the printer dialog box to make sure that the report content is legible.

Your report is sent to the printer you specify.

Chapter

3

Editing and formatting a report

This chapter contains the following topics:

- About editing and formatting options
- Changing font properties and alignment
- Formatting report data based on conditions
- Formatting data strings
- Reverting to default formats
- Copying a format to other columns
- Editing column and group headers

About editing and formatting options

Interactive Viewer provides you with the flexibility to modify the presentation properties of reports. This section discusses the editing and formatting options available to you.

How to select an element for formatting

In a report table, you can format column headers as well as data in the columns. Select the element, then choose the formatting option from the menu that appears.

Choose a column header to highlight it. To select data for formatting, select the entire column by clicking in the column area. A box appears, highlighting the selected element.

Formatting a column

You can use Interactive Viewer to define new font properties and change text alignment for a selected report column, or for the report table. You can also specify these style properties for one column, and copy the style to other columns. You can highlight report data based on certain defined conditions and format data strings depending on the type of data in a column. For example, you can format data strings into currency, telephone number, postal code, date-and-time, or decimal formats.

Formatting data in a merged column

Sometimes reports contain data that can be presented more effectively when you merge one or more report columns. For example, a report listing customers and their addresses is easier to read when the address, city, state, and postal code items are merged to present this information in a single column. Interactive Viewer does not allow you to merge columns, but you can modify data in existing merged columns using Interactive Viewer. You can change font properties, create conditional formatting rules, and format data in merged columns.

When working with a merged column, if you choose Format➛Font, or Format➛Conditional Formatting, from the context menu, Select Data Item appears, providing a list of data items, or columns, in the merged column, as shown in Figure 3-1.

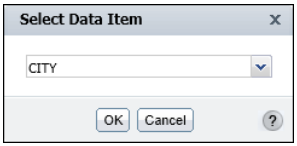


Figure 3-1 Selecting a data item

From the list, select a data item on which to perform an action. Choose OK.

You can now modify font properties, format data strings, and so on, for the selected column, as described in the following sections of this document.

To modify all the data rows in the merged column, you must repeat this step for each data item, and implement the change in format, font, and so on, each time.

Changing font properties and alignment

In Interactive Viewer, you can change the font properties and alignment of editable labels, column headers, and data in a report column. The properties you can modify include the font type, size, color, and background color. You can also display the font in bold, italic, or underlined style. As you modify these properties, you can view the appearance of the data in the column, in the Preview field.

You can choose to apply these properties to a single column, the entire table, or share the properties with other columns, without reapplying the style to each column.

How to change font properties

1. Select the item, such as table label, column header, or column to highlight it. Choose Format➛Font from the context menu. Font displays the current font property values, as shown in Figure 3-2. A value of Auto indicates that the default value is used.

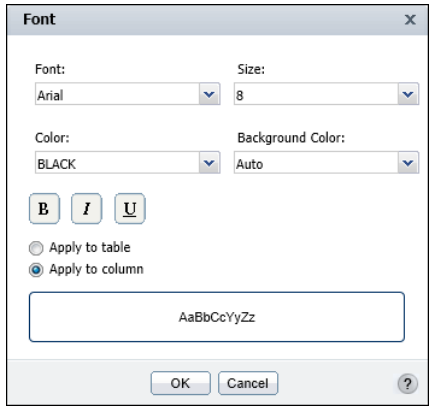


Figure 3-2 Defining font properties

2. Use the drop-down lists to change the font properties for the selected element.
   1. Select a font type and size.
   2. Select a font color.

3 To set a color, complete the following steps:

- Accept the default value of Auto, or select a different color in Basic Colors, as shown in Figure 3-3.

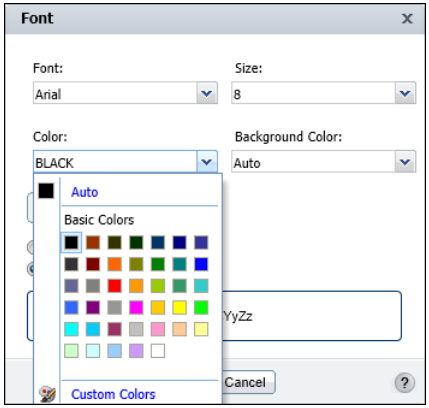


Figure 3-3 Selecting an available color

- Select Custom Colors, and use the spectrum bar to specify a color group. Then, select a shade in the gradient square, and choose Pick Color, as shown in Figure 3-4.

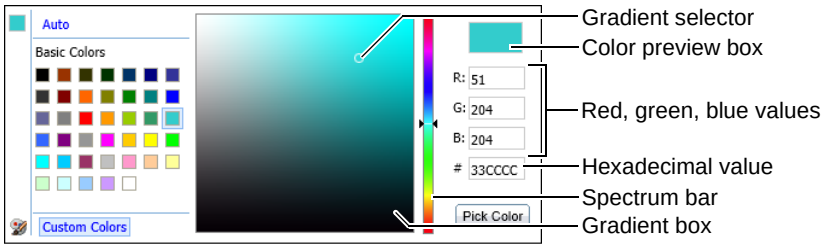


Figure 3-4 Selecting a custom color

The RGB value of the selected color appears in Color.

4 To apply the selected properties to the entire report table, select Apply to table.

5 To apply the selected properties to the selected column, select Apply to column.

Choose OK.

How to change the alignment of text

In Interactive Viewer, select the table label, column header, or column to highlight the element. From the context menu, choose Alignment, then choose Left, Center, or Right.

How to copy font and alignment properties to other columns

1 Select the column from which you want to copy font and alignment properties. From the context menu, choose Format➛Copy Style.

Copy Style appears, as shown in Figure 3-5.

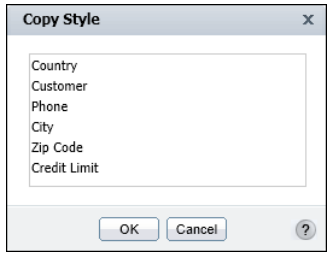


Figure 3-5 Sharing font and alignment properties with other columns

2 Select a column to which you want to copy the font and alignment properties. To select multiple columns, press Ctrl, then select each column.

Choose OK. The report displays the copied style properties in the specified columns.

Formatting report data based on conditions

When you format data in a selected column, the format applies to all the values. Often, it is useful to change the format of data when a certain condition is true. For example, you can display sales numbers in red if the value is a negative number and in black if the value is a positive number. Conditional formatting is the formatting of data according to defined conditions.

You also can change the format of data in a column according to the values in another column. For example, in a report showing customer names and the number of days each customer's invoice is past due, you can highlight in blue any customer name that has an invoice past-due value between 60 and 90 days. Then, you can highlight in red and bold any customer name that has an invoice past-due value greater than 90 days.

To apply conditional formatting, you create a rule defining when and how to change the appearance of data. You can apply conditional formats only to data in columns. The rule consists of the condition that must be true, and the text attributes to apply to column entries that satisfy the condition. You can define up to three conditions or rules for a single column and remove or modify conditional formatting for a column.

You can also influence the formatting of one column based on values in another column. For example, in a sales inventory report, when you apply conditional formatting to the Product column, you can define the condition based on the

Quantity in Stock column, such that conditional formatting is applied to the Product column if the quantity in stock is below a specified value. After you create the condition, you define the format in which to display data that satisfies the condition. The formatting appears on the selected column and not on the column on which you based the condition.

How to set conditional formats

1 To define the condition, select the data column on which to display conditional formatting. From the context menu, choose Format➛Conditional Formatting. Conditional Formatting appears, as shown in Figure 3-6. The example shown in Figure 3-6, highlights all customers with a credit limit of less than $100,000. The report in Figure 3-7 displays conditional formatting for the data fields in the Credit Limit column that satisfy the defined conditions.

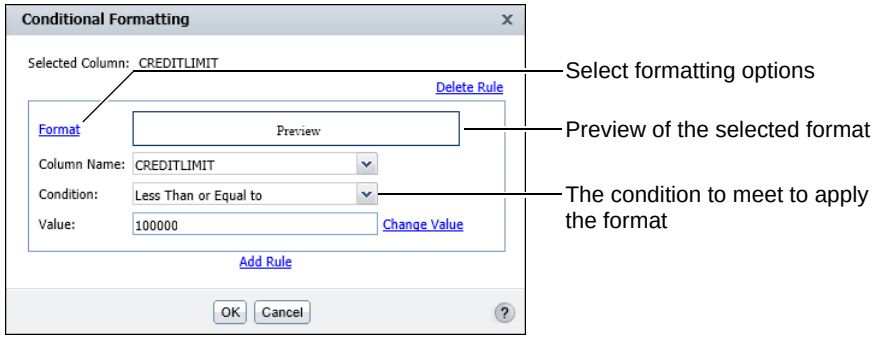


Figure 3-6 Defining conditional formatting

Country	Customer	Contact Name	Credit Limit
Australia			
	Australian Collectors, Co.	Ferguson Peter	117300
	Anna's Decorations, Ltd	O'Hara Anna	107800
	Souveniers And Things Co.	Huxley Adrian	93300
	Australian Gift Network, Co	Calaghan Ben	51600
	Australian Collectables, Ltd	Clenahan Sean	60300
Austria			
	Salzburg Collectables	Pipps Georg	71700
	Mini Auto Werke	Mendel Roland	45300

Figure 3-7 Customers with credit limits below $100,000

2 On Conditional Formatting, create a rule specifying the following information, then choose OK:

- The format to apply, such as bold style. Choose Format to select formatting options.
- The condition that must be true to apply the format, such as Credit Limit Less than or Equal to 100000.

Specifying a format for the data

To define text attributes for the selected data column, complete the following steps:

1. Choose Format➛Conditional Formatting from the context menu. On Conditional Formatting the Selected Column field contains the name of the column that displays the conditional format.
2. Choose Format and select the text attributes to display for the Credit Limit column. As you define the format, you can view how the data in the column appears in the Preview field, as shown in Figure 3-8. Choose OK.

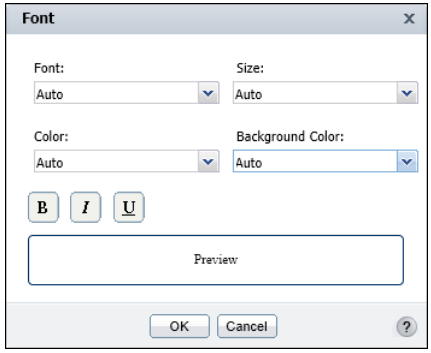


Figure 3-8 Defining the format

Specifying a condition

The condition in a conditional formatting rule is an If expression that must evaluate to True. For example:

```
If the order total is less than 1000
If the customer credit limit is between 100000 and 200000
If the sales office is Tokyo
If the order date is 7/21/2008
```

The Conditional Formatting dialog box helps you construct the If expression by breaking it down into its logical parts. In Figure 3-6, the expression consists of three parts. In Figure 3-9, the expression has four parts.

In Column Name, select a column. This column contains the value that determines when conditional formatting takes effect. The column you select here does not have to be the same as the column that you selected for formatting in the report. For example, if Product Name is the column selected for formatting, you can select Profit in this field to indicate that for a certain profit amount, conditional formatting applies to the product name.

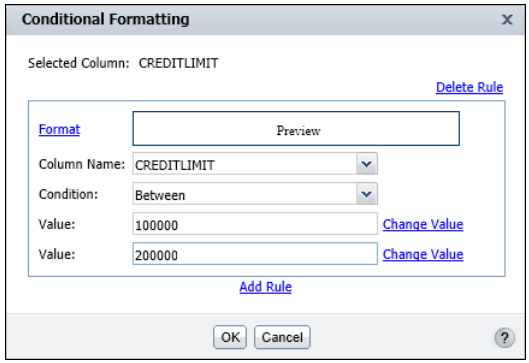


Figure 3-9 Selecting data fields between two values

In Condition, select the comparison test, or operator, to apply to the column you selected. You can select Equal to, Less than, Less than or Equal to, and so on. If you select Is Null, Is Not Null, Is True, or Is False, the If expression does not require additional information.

If you select an operator that requires a comparison to one or more values, one or more additional fields appear. For example, if you select Less than or Equal to, a third field appears. In this field, type the comparison value. If you select Between or Not Between, a third and fourth field appear. In these fields, type the lower and upper values, respectively, as shown in Figure 3-9.

Comparing to a literal value

The conditional expression, as shown in Figure 3-9 in the previous section, evaluates the Credit Limit column and compares each value to determine if it matches a value between 100000 and 200000. The 100000 and 200000 values are literal values that you type.

Alternatively, you can select a value from the list of values in the Credit Limit column. Selecting from a list of values is useful if the comparison value is a customer name and you do not know the exact customer names, or if the comparison value is a date and you do not know the date format to type. If the comparison value is a date, Interactive Viewer also provides a calendar tool, which you can use to select a date.

How to select a comparison value from a list of values

1. On Conditional Formatting, choose Change Value, below the Condition field.

   Select values appears. Choose Specify literal value, then choose Select Values. The values in the selected column appear. Figure 3-10 shows an example of the values in the credit limit column.

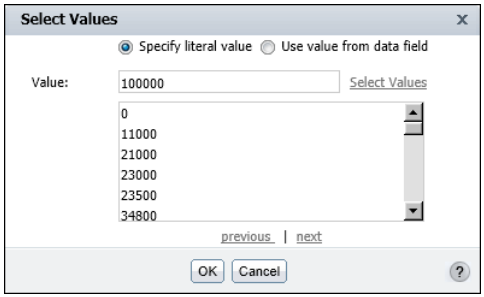


Figure 3-10 Selecting values

2 Select a value from the list, then choose OK. The value appears in the comparison value field on Conditional Formatting.

Comparing to a value in another column

In a conditional expression, you can compare the values of one column with the values of another column. For example, in a report that displays products, sales prices, and MSRP (manufacturer suggested retail price), you can create a conditional formatting rule that compares the sale price and MSRP of each product, and highlight the names of the products whose sales price is greater than MSRP.

How to compare to a value in another column

1 On Conditional Formatting, choose Change Value, below the Condition field.

2 On Select values, select Use value from data field. A list of columns used in the report appears.

3 Select a column from the list, then choose OK. The column name appears in the comparison value field on Conditional Formatting.

Figure 3-11 shows a condition that compares the sales price with the MSRP value. If the sale price value is greater, the product name displays in bold.

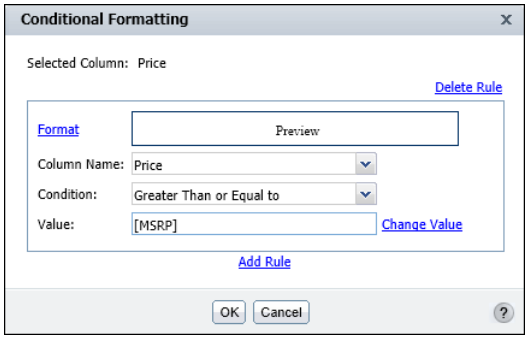


Figure 3-11 Comparing data to a value in another column

You can now define up to two additional rules for the report column on Conditional Formatting. Choose OK. Figure 3-12 shows the conditional formatting applied to the report column.

Product Line	Product Name	Sale Price	MSRP
Classic Cars			
	1962 LanciaA Delta 16V	$141.83	$147.74
	1969 Dodge Super Bee	$66.74	$80.41
	2002 Chevy Corvette	**$107.08**	$107.08
	1970 Triumph Spitfire	$126.39	$143.62
	1976 Ford Gran Torino	**$146.99**	$146.99
	1970 Triumph Spitfire	$127.82	$143.62
	1968 Ford Mustang	$173.17	$194.57
	1968 Ford Mustang	$171.22	$194.57
	1957 Corvette Convertible	$122.02	$148.80
	1968 Dodge Charger	$110.39	$117.44
	1972 Alfa Romeo GTA	**$136.00**	$136.00
	1982 Lamborghini Diablo	$30.59	$37.76
	1970 Plymouth Hemi Cuda	$72.62	$79.80
	1970 Plymouth Hemi Cuda	**$79.80**	$79.80

Figure 3-12 Report displaying conditional formatting

Specifying multiple conditional formatting rules

You can create up to three conditional formatting rules for a single column. You can, for example, create three rules to set the values of a profit column to one of three colors, depending on its value. Figure 3-13 shows this example.

Sales Office:	Boston		
Product Line	Product Name	Total	Profit
Classic Cars			
	1948 Porsche 356-A Roadster	$1,841.84	$440.44
	1948 Porsche 356-A Roadster	$3,187.80	$762.30
	1948 Porsche 356-A Roadster	$2,735.04	$740.74
	1948 Porsche Type 356 Roadster	$5,658.30	$2,861.10
	1948 Porsche Type 356 Roadster	$3,876.60	$2,136.12
	1949 Jaguar XK 120	$3,971.18	$1,797.68
	1949 Jaguar XK 120	$2,235.30	$817.80
	1952 Alpine Renault 1300	$6,214.70	$3,355.88
	1952 Alpine Renault 1300	$4,140.23	$1,872.89
	1952 Alpine Renault 1300	$7,995.41	$3,953.63
	1952 Alpine Renault 1300	$7,200.40	$3,257.20
	1952 Citroen-15CV	$2,593.02	$918.16
	1956 Porsche 356A Coupe	$2,842.34	$581.44
	1956 Porsche 356A Coupe	$5,055.30	$631.80
	1956 Porsche 356A Coupe	$3,578.12	$1,022.32
	1957 Corvette Convertible	$5,785.44	$2,428.80
	1957 Corvette Convertible	$2,499.80	$1,101.20
	1958 Chevy Corvette Limited Edition	$1,291.92	$623.70
	1958 Chevy Corvette Limited Edition	$679.00	$360.80
	1958 Chevy Corvette Limited Edition	$1,476.48	$712.80
	1961 Chevrolet Impala	$3,220.80	$1,668.96
	1961 Chevrolet Impala	$2,255.56	$1,253.33

Figure 3-13 A report with multiple conditional formatting rules

For each row of data in the report, Interactive Viewer evaluates the rules in the order in which they appear in the list of rules. As it evaluates each rule, Interactive Viewer applies the specified format properties if the condition is met.

When creating multiple rules for a column, be careful that the conditions do not cover overlapping values. Consider the following scenario:

- The first rule sets a profit value to blue if the value exceeds 5000.
- The second rule sets the profit value to green if the value exceeds 1000.

If the profit value is 6000, the value appears in green, not blue as you expect, because the condition in both rules is true (6000 exceeds 5000 and 1000), and the second rule supersedes the first rule. For the rules to make sense, the second rule should set the profit value to green if the value is between 1001 and 5000.

Deleting a conditional formatting rule

This section describes how you can delete conditional formatting rules from a report column.

How to delete conditional formats

1. Select the column, then from the context menu, choose Format➛Conditional Formatting.
2. On Conditional Formatting, choose Delete Rule for each conditional formatting rule that you want to remove. Choose OK.

Formatting data strings

Interactive Viewer provides common formats to change how numbers appear. You can, for example, display numbers with or without decimal values, in scientific notation, as a percentage, or as currency with the appropriate symbol. Sometimes, even though a column displays numbers, the data can have a string data type. Postal codes, for example, are frequently stored as string data. Numeric formats do not apply to numbers of string type. To help you understand what format you can apply to a report column, when you select a column for formatting the title of the formatting dialog box identifies the type of data in the column. This section discusses numeric data formats, date-and-time formats, and string data formats, and describes how you can apply these formats to data in a report. When you work with merged columns, select each column from the drop-down list of columns in the merged column, and define a new format each time, based on the column's data type.

When working with multiple columns containing the same data type, you can use Interactive Viewer to specify a format for the data in one column, and copy the format to other columns. This section also explains how to copy formatting properties.

About data formats

Data types are types of values—numbers, strings, and Booleans, for example—that you can manipulate in any programming language. Every element of report data has a certain data type, and every expression that you create returns a value of a particular data type.

This concept is important because, if the expression you type does not handle data types properly, you do not obtain the expected results. For example, you cannot perform mathematical calculations on numbers if they are of string type, and you cannot convert values in a date field to uppercase characters.

If you type an expression to manipulate a data field, make sure you verify its type, particularly if the data consists of numbers. Numbers can be of string type or numeric type. For example, databases typically store postal codes and telephone numbers as strings. Item quantities or prices are always of numeric type so that you can manipulate the data mathematically. IDs such as customer IDs, or order IDs are usually of numeric type so that the application can store them in numeric order, such as 1, 2, 3, 10, 11, rather than in alphanumeric order, such as 1, 10, 11, 2, 3.

To view the data type of a column, select the column and choose Format➛Format Data from the context menu. The name of the dialog box that appears tells you the type of data in the column. For example, if you select the credit limit column, the dialog box that appears is called Number column format.

Applying a number format

This section describes how to format numeric data by applying a standard number format or a custom number format.

How to apply a number format

1. Select a column that contains numeric data.
2. From the context menu, choose Format➛Format Data. Number column format appears, as shown in Figure 3-14.

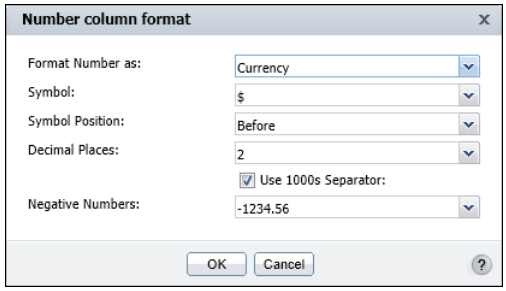


Figure 3-14 Setting number column format

3 On Number column format, in Format Number as, select a format. For example, you can format the credit limit column as currency in dollars ($) as shown in Figure 3-14. Select the appropriate options from the remaining drop-down lists on Number column format. Choose OK.

   You can select a standard format or define a custom format. Standard and custom formats are described in the next sections.

Selecting a standard number format

Table 3-1 shows the standard number formats that Interactive Viewer supports. The examples in the table reflect the English (United States) locale. If you work in a different locale, the data displays differently. For example, a number that appears as 1352.45 in the English (United States) locale appears as 1352,45 in the French (France) locale.

Table 3-1 Standard number formats

Format	Example of data display
General Number	6066.45 or 6066.5 or 6067, depending on the original value. This format displays up to two decimal places. Whole numbers and numbers with one or two decimal places appear in their original format.
Currency	$6,067.45 or ¥6067 or 6067€, depending on the symbol, symbol position, decimal place, and thousands separator values that you set.
Fixed	6067 or 6067.5 or 6,067.45, depending on the decimal place and thousands separator values that you set.
Percent	45% or 45.8% or %45, depending on the symbol position and decimal place values that you set. This format multiplies the original value by 100 and adds the percent (%) symbol.
Scientific	2E04 or 2.67E04, depending on the decimal place value you set. The number after the E represents the exponent of 10. For example, 2.67E04 means 2.67 multiplied by 10 raised to the fourth power.

Defining a custom number format

You can define a custom number format using special symbols to construct a format pattern. A format pattern shows where to place currency symbols, thousands separators, decimal points, or commas. Table 3-2 shows examples of custom format patterns and their effects on numeric data.

Table 3-2 Results of custom number formats

Format pattern	Data in the database	Result of formatting
0000.00	12.5 124.5 1240.553	0012.50 0124.50 1240.55
#.000	100 100.25 100.2567	100.000 100.250 100.257
$#,###	2000.00 20000.00	$2,000 $20,000
ID #	15	ID 15

Applying a date-and-time format

You can choose from several common formats to display date-and-time data. You can, for example, display dates as January 19, 2008 11:00:00 AM PST; Jan 19, 2008; or 1/19/08, and so on. This section describes how to select standard and custom date-and-time formats.

How to apply a date-and-time format

1. Select a column that contains date-and-time data.
2. From the context menu, choose Format➛Format Data.
3. On Date column format, select one of the formats from the list. You can select a standard format or define a custom format. The standard and custom formats are described in the next sections.
   - If you select a standard format, proceed to step 4.
   - If you select a custom format, specify a format code in the next drop-down list, then proceed to step 4.
4. Select a locale from the next drop-down list.

   Choose OK.

Selecting a standard date-and-time format

Table 3-3 shows the supported standard date-and-time formats. The examples in the table reflect the English (United States) locale. If you work in a different locale, the date displays differently. For example, a date that appears as March 5, 2008 in the English (United States) locale appears as 5 mars 2008 in the French (France) locale.

Table 3-3 Standard date-and-time formats

Format	Example of data display
General Date	March 5, 2008 4:42:00 PM PDT
Long Date	March 5, 2008
Medium Date	Mar 5, 2008
Short Date	3/5/08
Long Time	4:42:00 PM PDT
Medium Time	4:42:00 PM
Short Time	16:42

Defining a custom date-and-time format

You can define a custom date-and-time format using special symbols, shown in Table 3-4, to construct a format pattern. Use custom date formatting only for reports viewed in a single locale. Custom formats always display dates in the format you set, which can be inappropriate in other locales. For example, if you use the format MM-dd-yy, the date January 10, 2006 always appears as 01-10-06, regardless of the locale in which you view the report. For locales that customarily display dates in date-month-year format, Interactive Viewer interprets the date 01-10-06 as October 1, 2006.

Table 3-4 Symbols for defining custom date-and-time formats

Symbol	Description	Example
yy	Short year	08
yyyy	Long year	2008
MM	Month as a number	07
MMM	Short month name	Jul
MMMM	Full month name	July
d	Day in month	10
W	Week in month	2
w	Week in year	28
DD	Day in year	192
E	Short day of week	Thu
EEEE	Long day of week	Thursday
H	Hour in day (0 - 23)	0

(continues)

Table 3-4 Symbols for defining custom date-and-time formats (continued)

Symbol	Description	Example
k	Hour in day (1 - 24)	24
K	Hour in AM/PM (0 - 11)	0
h	Hour in AM/PM (1 - 12)	12
a	AM/PM	12:00:00AM
mm	Minutes	30
ss	Seconds	55

Table 3-5 shows examples of custom formats and their effects on a date stored as April 15, 2006 12:15:30 PM in the database.

Table 3-5 Results of custom date formats

Format pattern	Result of formatting
MM-dd-yy	04-15-06
E, M/d/yyyy	Fri, 4/15/2006
MMM d	Apr 15
MMMM	April
yyyy	2006
W	3 (the week in the month)
w	15 (the week in the year)
DD	105 (the day in the year)
h:mm:ss	12:15:30

Applying a Boolean format

A Boolean expression evaluates to True or False. For example, consider a calculated column displaying values for the following expression:

```
ActualShipDate <= TargetShipDate
```

If the actual ship date is before or on the target ship date, the expression evaluates to True. If the actual ship date is after the target ship date, the expression evaluates to False. If you do not format a column of Boolean data type, the column displays the values True and False. To specify different labels, select the column, and from the context menu, choose Format➛Format Data. Type the new labels on Boolean column format, as shown in Figure 3-15.

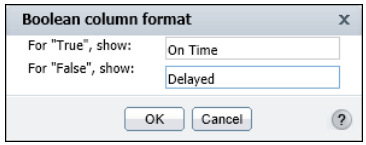


Figure 3-15 Specifying display values for True and False

Applying a string format

You can format string data to correct text that contains inconsistent capitalization, or to include characters, such as a space or a punctuation mark, at a specific place in the string. For example, you can display United States telephone numbers in one of the following formats:

```
(415) 555-2121
415.555.2121
415-555-2121
```

This section describes how you can select a standard string format, and how you can define a custom string format for data in a report.

How to apply a string format

1. Select a column that contains string data.
2. From the context menu, choose Format➛Format Data.
3. On String column format, select one of the formats from the list. You can select a standard format or define a custom format. Standard and custom formats are described in the next sections.

   Choose OK.

Selecting a standard string format

Table 3-6 describes the string formats that you can choose and illustrates how the formatted data appears.

Table 3-6 Standard string formats

Format	Description
Lowercase	The string displays in all lowercase, for example: `john smith`
Uppercase	The string displays in all uppercase, for example: `JOHN SMITH`

Defining a custom string format

You can define a custom string format using special symbols to construct a format pattern. Table 3-7 describes these symbols.

Table 3-7 Symbols for defining custom string formats

Symbol	Description
@	Character placeholder. Each @ character displays a character in the string. If the string has fewer characters than the number of @ symbols that appear in the format pattern, spaces appear. Placeholders are filled from right to left, unless you specify an exclamation point (!) at the beginning of the format pattern. See Table 3-8 for examples.
&	Same as @, except that if the string has fewer characters, spaces do not appear. See Table 3-8 for examples.
!	Specifies that placeholders are to be filled from left to right. See Table 3-8 for examples.
>	Converts string characters to uppercase.
<	Converts string characters to lowercase.

Table 3-8 shows examples of custom string format patterns and their effects on string data.

Table 3-8 Results of custom string formats

Format pattern	Data in the data source	Results of formatting
(@@@) @@@-@@@@	6175551007 5551007	(617) 555-1007 ( ) 555-1007
(&&&) &&&-&&&&	6175551007 5551007	(617) 555-1007 () 555-1007
!(@@@) @@@-@@@@	6175551007 5551007	(617) 555-1007 (555) 100-7
!(&&&) &&&-&&&&	6175551007 5551007	(617) 555-1007 (555) 100-7
!(@@@) @@@-@@@@ + ext 9	5551007	(555) 100-7 + ext 9
!(&&&) &&&-&&&& + ext 9	5551007	(555) 100-7 + ext 9
>&&&-&&&&&&-&&	D1234567xy	D12-34567-XY
<&&&-&&&&&&-&&	D1234567xy	d12-34567-xy

Reverting to default formats

To revert a data column back to its default font formats, select the column. From the context menu, choose Format➛Font. Select Auto from each drop-down list. To reset text alignment, select the element, and choose the appropriate alignment option.

If you applied a number, date-and-time, or string format to a column of data, you can restore these formats to those in the original report. Select the column. From the context menu choose Format➛Format Data. Then, select Unformatted from the drop-down list.

Copying a format to other columns

When working with columns of similar data types, you can apply a format to data in one column, and copy the format to data in other columns. For example, consider a simple report that lists price of each (sale price), profit, and revenue for products sold in a region. If you format the price of each column as currency in US dollars, you can copy this format for data in the profit and revenue columns, so that all amounts are formatted as currency in US dollars, in one simple step.

How to copy a data format

1. Select the column containing the formatting properties you want to share. From the context menu, choose Format➛Copy Format.

   Copy Format appears, as shown in Figure 3-16.

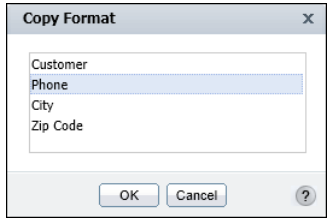


Figure 3-16 Sharing font and alignment properties with other columns

2. Select the column to which you want to copy the current formatting properties. To select multiple columns, press Ctrl, then select each column.

   Choose OK. The report displays the copied formatting properties in the specified columns.

Editing column and group headers

Column and group headers are label elements that contain static text. In a typical report, some labels are editable, while others are not. Examples of labels you can edit include report titles or author names. Examples of non-editable labels include standard copyright or confidentiality statements.

You can change the content of the column header by choosing the Header option from the context menu. You can modify properties such as the font, the font size, the background color, and so on. You can also edit the text of the label.

How to edit a header

1. Select the column. To delete existing text, choose Header➛Change Text from the column menu, as shown in Figure 3-17. Type the text to display and press Enter. The edited text appears on the header.

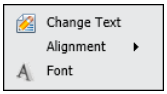


Figure 3-17 Modifying column labels

2. Select the column. From the column menu, choose Header➛Alignment, or Header➛Font and modify the properties as needed.

Chapter

4

Exporting report data and content

This chapter contains the following topics:

- About exporting options
- Exporting report data
- Exporting content

About exporting options

The BIRT Viewers enable you to export report data, report content, and elements, such as charts, cross tabs, or summary tables, to various formats. You can export data to several flat file formats that can be read by Excel. In addition, the BIRT Viewers use various emitters to enable you to export content, as well as elements to formats such as Excel, Word, PowerPoint, PostScript, and PDF.

When you export content, or elements to other formats, each emitter such as the PDF emitter or the Excel emitter provides several options that you can select to maintain the existing properties of the exported content, enabling users to easily perform additional analysis on the exported output. For example, when you export an element such as a cross tab to Excel, the Excel emitter supports exporting the content as a pivot table. This feature is specifically useful for sharing content with users without access to the BIRT Viewers, who can still analyze the output in Excel. You can also export a Flash chart to PDF format. The PDF emitter embeds the chart in the output file, retaining existing animation properties. You can modify the output file, based on the options available in that application. This section discusses the exporting options available when exporting report data or report content using the BIRT Viewers.

Exporting report data

You export report data to extract some or all of the data from a report, to use the data in another document, or format. For example, you can export customer sales data from a previous quarter, then use the numbers in a spreadsheet to create a forecast for an upcoming quarter.

The viewers support the ability to export report data as a comma-separated values (.csv) file, a pipe-separated values (.psv) file, a tab-separated values (.tsv) file, or a semicolon-separated values (.ssv) file. These files store data in a flat file format, which Excel can read. The difference between these formats is the character used as the data delimiter, which can be a comma, pipe, tab, or semicolon. You choose a format to export report data based on the requirements of the application to which you export the data, and the purpose for which you plan to use the exported data. You can also export data from BIRT Dashboard gadgets to these flat file formats.

Once you choose a format to export the data, Excel displays the exported data in a spreadsheet. You can now resize columns and format the data as you would do for any other spreadsheet.

When you export data, you cannot export a table or chart element, but you can export the data displayed in both these elements.

How to export data in comma-separated values file (.csv) format

1 From the main menu, as shown in Figure 4-1, choose Export Data.

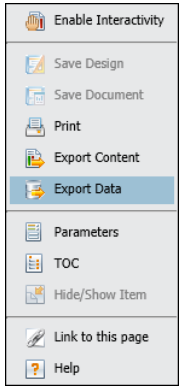


Figure 4-1 Exporting report data

2 On Export Data, Available ResultSets lists the report elements, such as tables, charts, cross tabs, Flash charts and gadgets, and so on, that contain data. Select an element from which to export data. The names on the list are internal names. For example, a report table element begins with the prefix ELEMENT, and is listed as ELEMENT_50, ELEMENT_65, and so on.

3 Available Columns lists the columns you can export from the specified table. You can export any of the data the report uses, including the data in aggregate rows and calculated columns. In Available Columns, select the columns to export one by one and choose the single right arrow after each selection, as shown in Figure 4-2. To select all columns, choose the double right arrow.

To deselect a column, choose a column from Selected Columns, then choose the single left arrow. To deselect all the selected columns, choose the double left arrow.

4 In Encoding Style, select UTF-8, or specify a style in Other. If you do not specify a style, Actuate BIRT Viewer uses the local encoding style.

5 In Miscellaneous, specify the following information:

- In Maximum Rows, type the maximum number of data rows to export. To export all the data rows in the report, accept the default value of No Limit.
- In Values Separator, choose the Comma (CSV) delimiter.
- In Localize Column Name, select an option from the following:
  - Select Export Column Name to export the column name specified in the data source.
  - Select Export Column Display Name to export the column name specified in the report design.

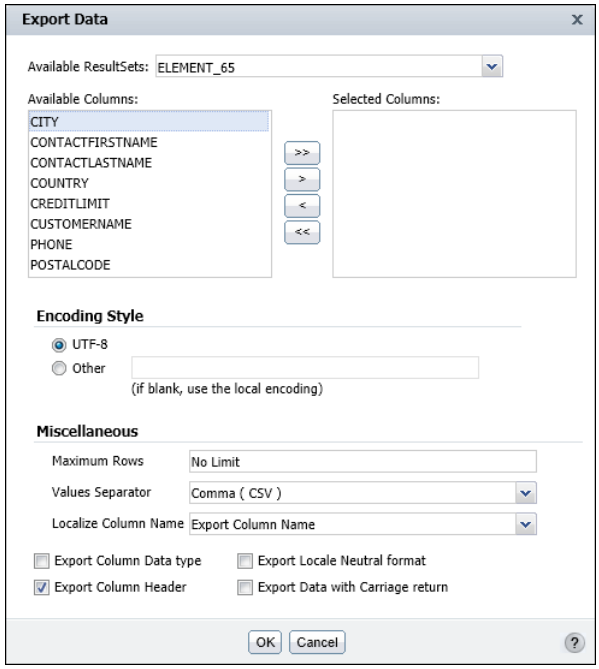


Figure 4-2 Exporting report data

- Select Export Column Name and Display Name to export the column names specified in the data source as well as the one specified in the report design.

6 You can select the following additional options to export column data type, export the data in locale neutral format, and export the column header.

- When you export report data to a flat file format, such as comma-separated values (.csv) format, tab-separated values (.tsv) format, pipe-separated values (.psv) format, or semicolon-separated values format, select Export Column Data Type to include the data type information in the flat file. In the following example, the second line identifies the type of data in the file:

```
FirstName, LastName, AccountID
STRING, STRING, INT
"Doe", Jane", 1234 …
```

- When you export report data that contains date-and-time values, the Actuate BIRT Viewers format these values according to the syntax in the current locale, by default. If no locale is configured, then the viewers use the US locale as the default. For example, if you export the date 01/10/2009 in the original format, it can be interpreted as January 10, 2009 or October 1, 2009, depending on whether the locale is US or France. On Export Data, select Export Locale Neutral Format to export report data

without considering locale information, so that the date is interpreted correctly in every locale.

- When you select Export Column Header, Actuate BIRT Viewer exports the column header in addition to the data in the column. The spreadsheet displays each exported column below the corresponding column header.
- When you select Export Data With Carriage Return, the BIRT Viewers export the data using a Carriage Return (CR) character for each line break.

Choose OK.

7 On File Download, the default name and the file extension of the spreadsheet file appear.

Choose Save.

8 On Save As, complete the following tasks:

1. In Save in, navigate to the folder in which you want to save the file.
2. In File name, change the name of the file. Choose Save. The comma-separated values (.csv) file appears in the new location.

When you open the file, the output data appears as an editable Microsoft Excel worksheet. You can expand the columns to view all the data.

Use the same process to export data to pipe-separated values (.psv) files, tab-separated values (.tsv) files, and semicolon-separated values (.ssv) files.

Exporting content

You can export an entire report, as well as each individual report element, such as a chart, summary table, or cross tab, to several different formats. Exporting content to one of these formats creates a file that can be used by applications other than the viewers.

In the BIRT Viewers, you can export report content to the following file formats:

- Advanced Function Printing (.afp)
- Microsoft Excel (.xls)
- Microsoft Excel (.xlsx)
- PDF (.pdf)
- PostScript (.ps)
- Microsoft Word (.doc)
- Microsoft Word (.docx)

- Microsoft PowerPoint (.ppt)
- Microsoft PowerPoint (.pptx)

The following sections describe the available formats, as well as the options available when exporting content to each format.

Exporting content to AFP format

You can use the BIRT Viewers to export a BIRT report, selected pages of a BIRT report, or a specific report element such as a chart, or cross tab, to Advanced Function Printing (AFP) format. AFP is a print stream technology that supports high-volume printing on high-capacity, and high-speed printers. If your enterprise generates large reports that require hard-copy printing, using AFP is a significantly more efficient option than exporting the report to PDF, or Word format, and then printing the report.

The AFP emitter enables you to specify several layout options as well as image rendering options for the exported content using the Export Content dialog box. You can set the following layout and resolution options:

- Page range
  Specify the number of pages to export if you are working with a multipage report design or document file.
- Chart DPI
  Specify the DPI at which the chart engine exports the chart component.
- Plex Mode
  Enables you to specify the sides of the page on which to print.
  - Simplex
    Selecting this option prints on a single side of the page
  - Duplex
    Selecting this option prints on both sides of a page.
  - Tumble
    Selecting this option prints the file as a continuous document. To navigate a printed document that uses this option, flip each page over longitudinally such that the end of the previous page becomes the top of the next page.

The AFP emitter provides several color options to optimize the quality of the exported images based on the native image format supported by the printer in use. You can select any of the following color options depending on the native image format supported by the printer you are using:

- Allow black and white images
  Selecting this option, exports existing black and white images.

- Allow single color images
  Selecting this option, exports existing single-color images.
- Allow grayscale images
  Selecting this option, exports existing grayscale images.
- Allow full color RGB images
  Selecting this option, exports existing full-color RGB images.
- Allow full color CMYK images
  Selecting this option exports existing full-color CMYK images.

The AFP emitter's available image format options enable users to closely control how images are rendered in the exported output. All images are transcoded to the closest format that corresponds to the options selected by the user. To preview the exported output before it is sent to a printer, download the AFP Viewer plug-in and view the resulting output in your web browser.

How to export a report or report element to AFP format

1. To export a report, or report element, such as a cross tab, or a chart, choose Export Content from the main menu, as shown in Figure 4-3. Export Content appears.

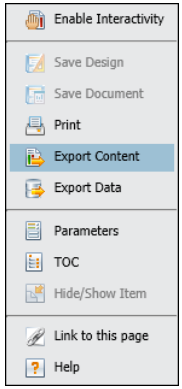


Figure 4-3 Exporting a report

On Export Content, in Export Format, select Advanced Function Printing (AFP) from the list, as shown in Figure 4-4.

2. Select Page Settings. In Page Settings, specify which of the following options to apply to the exported AFP file:
   - Page range
     If you do not specify a value in this field, the BIRT Viewers export all the pages in the current report design. If you are exporting a report component, leaving this field blank exports only the selected component.

- Chart DPI
  If exporting a chart, specify the export resolution DPI. If you do not specify a value, the BIRT Viewers export the chart using the value 192 DPI.
- Page DPI
  Select an option from the list. if you do not specify a value, the BIRT Viewers use the value 240 DPI.
- Plex Mode
  Specify one of the following plex modes for the exported file:
  - Simplex
  - Duplex
  - Tumble
- Allow black and white images
- Allow single color images
- Allow grayscale images
- Allow full color RGB images
- Allow color CMYK images

Choose OK.

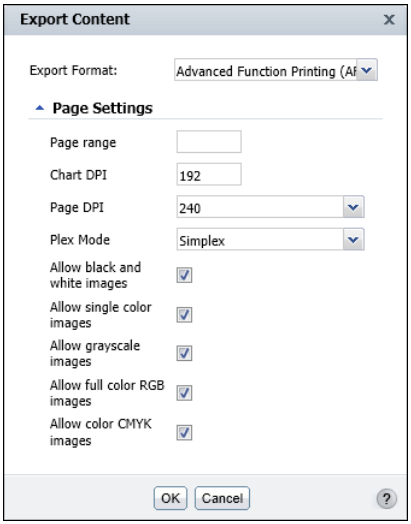


Figure 4-4 Selecting the AFP option

3 File Download appears. The default name assigned to the file and file extension are visible, as shown in Figure 4-5.

Figure 4-5 Downloading the exported file

Choose Open or Save.

When you open the file, the content is displayed in your web browser using the AFP Viewer plug-in, with the options you specified, as shown in Figure 4-6.

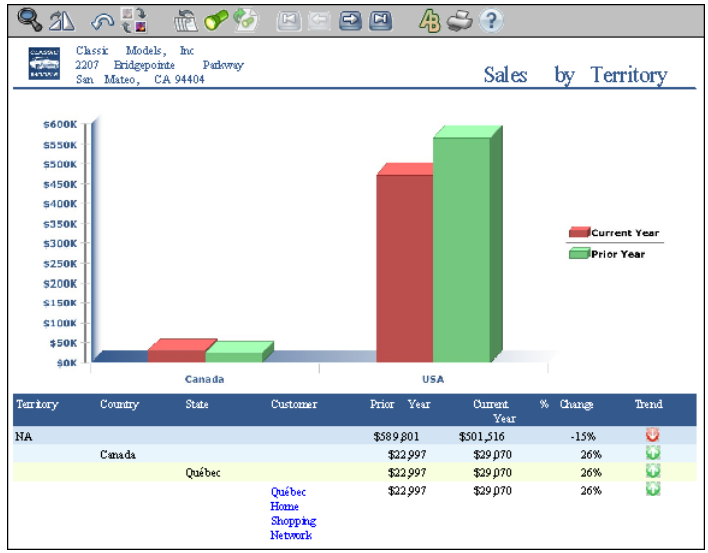


Figure 4-6 Previewing the exported report design in a web browser

Exporting content to Microsoft Excel

You can use the BIRT Viewers to export a BIRT report, selected pages of a BIRT report, or a specific report element such as a chart, or cross tab, to Microsoft Excel, Excel 2007, and Excel 2010. When exporting content to Excel 2010, we recommend that you use the XLSX format in order to avail several features supported only in XLSX format, and to avoid compatibility issues that occur when using Microsoft Office 2010. The exported content in either version of Excel has exactly the same layout as the HTML page. In addition, all versions of Excel support the following properties:

- Formulas used in computed columns and aggregations in the existing report or report element are maintained in Excel format. When exporting a BIRT report created in Actuate BIRT Designer Professional that contains expressions that use EasyScript, you can also export live formulas for the expressions to Excel.

- Regular BIRT charts with a single series are exported to Excel as editable Excel charts.
- Exported images are displayed in Excel.
- Cross tabs are exported to pivot tables in Excel.

Each output Excel document contains one content sheet, and one or more data sheets. If you are exporting a report containing a table view, and a chart view of data, exporting the chart view of the report to Excel results in the exported output displaying the chart. Similarly, if you export the table view to Excel, Excel displays tabular data.

You can set the following additional options:

- Export regular BIRT charts in the report as an image. If you select this option the Excel emitter does not allow you to edit the chart in Excel. To allow users to edit the chart as needed, deselect this option. When deselected, the chart appears in Excel, as shown in Figure 4-7, and can be edited.

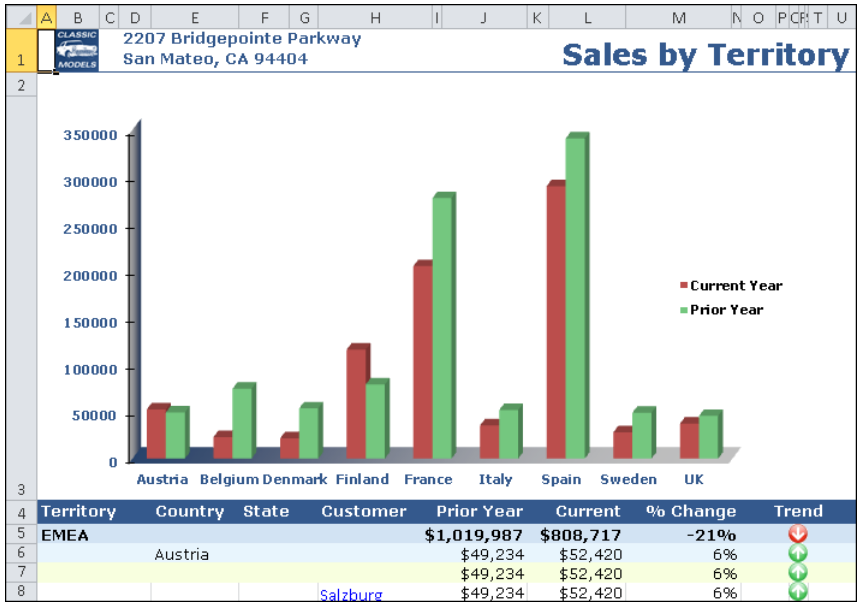


Figure 4-7 Exporting a chart to Excel

- Specify the output DPI for regular charts, to view the exported image in higher resolution. Increasing the DPI value can result in a larger output file size. If you do not modify this field, the BIRT Viewers export the chart at 192 DPI.
- Specify exporting live formulas for BIRT reports containing expressions created using EasyScript.

- To hide grid lines in the resulting spreadsheet, select hide grid lines. Hiding grid lines modifies the appearance of the output data in such a way that it resembles the report viewed in the BIRT Viewers more than it does a spreadsheet.
- To view report output on multiple sheets, select this option. Selecting this option does not maintain pagination properties when you export a multipage report.
- Select Enable Pivot table, when you export a cross tab to Excel. When selected, this option enables Excel to display cross-tab data as a pivot table providing the user with the ability to further analyze the data. Figure 4-8 shows a cross tab exported to Excel.

	A	B	C	D	E	F	G	H	I	J
1	Breakdown of annual sales by quarter by geography									
2			Year	Data						
3			2003		2004		2005		Total ORDERED	Total TotalSales
4	COUNTRY	CITY	ORDERED	TotalSales	ORDERED	TotalSales	ORDERED	TotalSales		
5	Australia	Chatswood	266	24013.521	803	67642.094	532	42251.51	1601	$133,907.13
6		Glen Waverly	447	35505.631	94	9415.13	164	10945.26	705	$55,866.02
7		Melbourne	591	53429.114	1335	127155.965			1926	$180,585.08
8		North Sydney	874	80101.925			595	56932.302	1469	$137,034.23
9		South Brisbane	336	33757.851			209	21432.312	545	$55,190.16
10	Australia Total		2514	226808.042	2232	204213.189	1500	131561.384	6246	$562,582.62
11	Austria	Graz	430	42252.872			102	8807.12	532	$51,059.99
12		Salzburg	442	35826.33	491	49233.672	509	52420.071	1442	$137,480.07
13	Austria Total		872	78079.202	491	49233.672	611	61227.191	1974	$188,540.07
14	Belgium	Bruxelles			685	62253.853	111	8597.73	796	$70,851.58

Report

Figure 4-8 Excel displaying an exported cross tab

This feature is useful when you need to share the cross tab with users using applications other than the BIRT Viewers. More information about cross tabs is available in later sections of this document.

How to export a report or report element to Excel

1. To export a report, or report element, such as a cross tab, or a chart, choose Export Content from the main menu, as shown in Figure 4-9. Export Content appears.
2. On Export Content in Export Format, select Excel, as shown in Figure 4-10.
3. Select Page Settings. In Page Settings, provide the following information:
   1. Select the page range, or specify the page numbers that you want to export.
   2. Select Text wrapping to eliminate the need for horizontal scrolling in the exported report.
   3. Select Enable pivot table to export the report as a pivot table, to facilitate data analysis in Excel.
   4. Select Auto adjustment for pivot table, to enable the BIRT Viewers to automatically adjust the content for display in a pivot table.

5 If exporting a regular BIRT chart:

   1 Specify the DPI at which the chart is exported. If you do not specify a value, the BIRT Viewers export the chart at 192 DPI.

   2 To export each chart as an image, select this option.

6 Select Enable live formulas, to export live formulas when exporting content from a BIRT report that contains expressions created using EasyScript.

7 Select Hide grid lines.

8 To export the output to multiple sheets, select this option.

Choose OK.

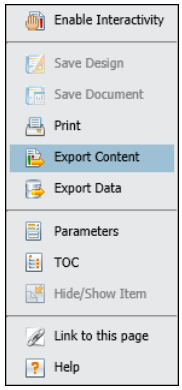


Figure 4-9 Exporting a report

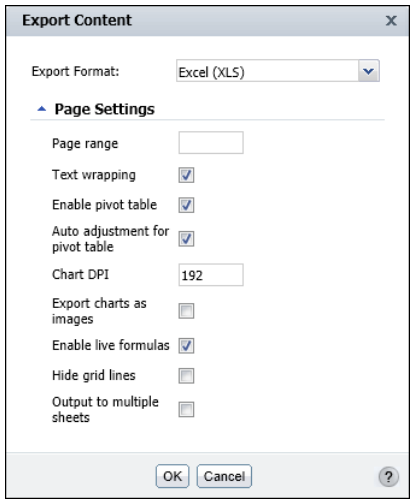


Figure 4-10 Exporting content to Excel

4 File Download appears. The default name assigned to the file and file extension are visible. Choose Open or Save.

When you open the file, the report displays in Excel, and can be edited as needed.

Exporting content to PDF format

You can export report content or report elements, such as charts, or cross tabs, to PDF format. The PDF emitter in the BIRT Viewers provide consistent layout, and pagination properties between PDF and HTML output formats. The PDF emitter also produces a high-quality PDF file, with a small file size. In addition it provides high quality images for charts, and scalable vector graphics (SVG) format in PDF output. The available customization options are described in the following section.

You can also export Flash charts and Flash gadgets to PDF format. When you export Flash charts and gadgets to PDF format, the BIRT Viewers support embedding the exported element in the PDF file, enabling you to easily interact with the Flash elements. Flash charts and gadgets retain their animation properties when exported to PDF format.

When you print an exported Flash chart or gadget, the embedded file in the PDF document, must be viewed in order for it to appear on the printed page. In a multipage report with Flash content on several pages, view each page, so that the embedded Flash elements are loaded, and then print the required pages for the Flash content to be visible in the printed output. If you do not view the pages before printing the file, the Flash content is not visible in the printed output, for pages that were not viewed.

More information about charts, Flash charts and Flash gadgets is available in later sections of this document.

How to export a report or report element to PDF format

1 Choose Export Content from the main menu. Export Content appears.

2 On Export Content in Export Format, select PDF.

Export content appears, as shown in Figure 4-11.

3 Select Page Settings. In Page Settings, complete the following steps:

1 Select the page range, or specify the page numbers that you want to export.

2 Select a layout for the exported file from the Page style menu.

3 When a report contains languages that are read from left to right, such as English or French, and those that are read from right to left, such as Hebrew or Arabic, the text from both languages can be presented in the same report in the appropriate direction. This text is called bidirectional (BIDI) text. Select BIDI processing if you have a report in two or more such

languages and need the data to be correctly presented in the PDF or PostScript output.

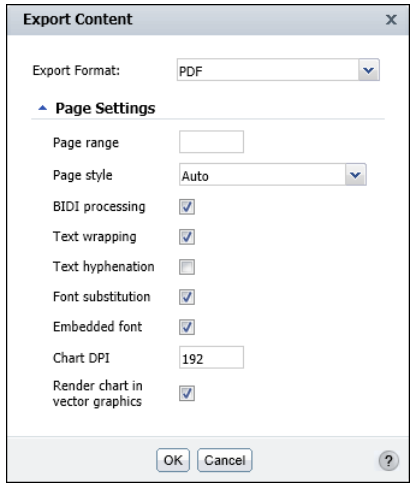


Figure 4-11 Selecting options to export a report

4. Select Text wrapping to eliminate the need for horizontal scrolling in the exported report.
5. Select Text hyphenation, if necessary.
6. Select Font substitution to substitute any fonts that the application cannot interpret. Font substitution is the process of using one font in place of another when the original font is not available. The classification of fonts into families enables the process of font substitution. For example, it ensures that only a sans serif font replaces another sans serif font.
7. Select Embedded font to embed a font currently being used, in the exported output.
8. Enter a value in Chart DPI, specifying the resolution at which to display the chart, if the report you are exporting contains one or more charts. A higher DPI results in a larger file size. If you do not specify a DPI, the chart engine exports the image with a DPI value of 192.
9. Select Render chart as vector graphics for existing charts in SVG format. This option for SVG images improves the resolution of the exported image, while maintaining a smaller file size.

Choose OK.

File Download appears, as shown in Figure 4-12. The default name assigned to the file and the file extension are visible. Choose Open or Save.

Figure 4-12 Exporting data

When you open the file, the report displays as a PDF document.

Exporting content to PostScript format

When you export content to PostScript format, the PostScript emitter displays the content in the output file, almost exactly the same way as it will appear when printed. The PostScript emitter provides the same options as the PDF emitter, with two exceptions:

- The option to export SVG images as vector graphics is not supported.
- The option to embed fonts from the report being exported is not supported.

How to export a report or report element to PostScript format

1. Choose Export Content from the main menu. Export Content appears.
2. On Export Content in Export Format, select PostScript.
3. Select Page Settings. In Page Settings, specify the following information:
   1. Page range.
   2. Page style.
   3. Enable BIDI processing.
   4. Enable text wrapping.
   5. Enable font substitution.
   6. If exporting a chart, specify the export DPI. If you do not specify a value, the BIRT Viewers export the chart at 192 DPI.
   7. Select Fit to Paper to enable the PostScript emitter to format the report according to the size of the paper in use.

   Choose OK.
4. File Download appears. The default name assigned to the file and file extension are visible. Choose Open or Save.

   When you open the file, the report displays in the format you specified.

Exporting content to Microsoft Word

The BIRT Viewers support exporting content to Microsoft Word, Word 2007, and Word 2010. When exporting content to Word 2010, we recommend that you use the DOCX format in order to avail several features supported only in DOCX format, and to avoid compatibility issues that occur when using Microsoft

Office 2010. To export content to either version of Word, on Export Content, specify the following information:

- Page range for the content you want to export
- If exporting a chart element, the DPI or resolution

How to export a report or report element to Word format

1. Choose Export Content from the main menu. Export Content appears.
2. On Export Content in Export Format, select Word or Word 2007.
3. Select Page Settings. In Page Settings, specify the following options:
   1. A page range.
   2. If exporting a chart, specify the export DPI. If you do not specify a value, The BIRT Viewers export the chart at 192 DPI.

   Choose OK.
4. File Download appears. The default name assigned to the file and file extension are visible. Choose Open or Save.

   When you open the file, the report displays in the Word format you specified.

Exporting content to Microsoft PowerPoint

The BIRT Viewers support exporting content to PowerPoint, PowerPoint 2007, and PowerPoint 2010 formats. When exporting content to PowerPoint 2010, we recommend that you use the PPTX format in order to avail several features supported only in PPTX format, and to avoid compatibility issues that occur when using Microsoft Office 2010. To export content, or a report element to either PowerPoint version, specify the following information on Export Content:

- Page range
- Page style
- BIDI processing
- Text wrapping
- Font substitution
- Chart DPI

How to export a report or report element to PowerPoint format

1. Choose Export Content from the main menu. Export Content appears.
2. On Export Content in Export Format, select PowerPoint or PowerPoint 2007.

3. Select Page Settings. In Page Settings, specify the following information:
   1. Page range.
   2. Page style.
   3. Enable BIDI processing.
   4. Enable text wrapping.
   5. Enable font substitution.
   6. If exporting a chart, specify the export DPI. If you do not specify a value, the BIRT Viewers export the chart at 192 DPI.

   Choose OK.
4. File Download appears. The default name assigned to the file and file extension are visible. Choose Open or Save.

   When you open the file, the report displays in the PowerPoint format you specified.

Chapter

5

Organizing data in a report

This chapter contains the following topics:

- About displaying and organizing report data
- Modifying the width of a column
- Managing a column
- Sorting data
- Organizing data in groups
- Aggregating data
- Hiding and displaying report elements
- Specifying page breaks

About displaying and organizing report data

Interactive Viewer enables you to organize report data in several ways. You can change the width of columns, and move and remove columns to improve presentation or change the order of data in a report.

You can sort data in a column in ascending or descending order, organize data columns into groups, and create aggregate data values. You can create aggregate data, at the end of a customer group, for example, by displaying the total amount of a customer's purchases or the average amount of each order. You can also create calculations, such as sums, standard deviations, rankings, and differences.

You can also use Interactive Viewer to change group and column headers, and to customize pagination in a multipage report by defining page breaks before or after groups. A group displays all the information about an item category in one place. For example, you can display all the information about one customer, then all the information about the next customer, and so on. You can display the information for customers and their orders by grouping the information by product, or you can display a company's sales by geographical region.

You can hide columns, as well as report elements based on your needs. You can also hide duplicate data rows in a column, or a group. This document describes these tasks in more detail.

Modifying the width of a column

In addition to modifying the alignment and text properties of column data, you can optimize the layout of a report by adjusting the width of report columns according to the space occupied by column data.

For example, Figure 5-1 and Figure 5-2 show two reports. In Figure 5-1, the report uses the default column width. In Figure 5-2, the same report is modified to optimize its column width. As the example shows, the report in Figure 5-2 looks neater, and eliminates wasted space when you print, or export the content to other formats.

Country	Customer	Contact Name
Australia		
	Australian Collectors, Co.	Ferguson Peter
	Anna's Decorations, Ltd	O'Hara Anna
	Souveniers And Things Co.	Huxley Adrian
	Australian Gift Network, Co	Calaghan Ben
	Australian Collectables, Ltd	Clenahan Sean
Austria		
	Salzburg Collectables	Pipps Georg
	Mini Auto Werke	Mendel Roland

Figure 5-1 Viewing a report with the default column width

Country	Customer	Contact Name
Australia		
	Australian Collectors, Co.	Ferguson Peter
	Anna's Decorations, Ltd	O'Hara Anna
	Souveniers And Things Co.	Huxley Adrian
	Australian Gift Network, Co	Calaghan Ben
	Australian Collectables, Ltd	Clenahan Sean
Austria		
	Salzburg Collectables	Pipps Georg
	Mini Auto Werke	Mendel Roland

Figure 5-2 Viewing a report with the modified column width

How to modify column width

Select the column. Place the cursor on the right or left border of the highlighted column. Using the cursor, drag the border inwards or outwards to increase or decrease the width of the selected column.

Managing a column

This section describes how to use Interactive Viewer to change the order of columns in a report, delete report columns that are not necessary, hide existing columns, and display hidden columns. When you delete a column from the report, you cannot insert it back into the report design at a later time. If you might have a need for data in the column later on, you can hide the column, and display it whenever necessary.

How to reorder columns

You can move columns to change the order of columns in a report table in one of the following ways:

- Choose the column to select it, then drag the column from its original location, and drop it in a new location, whose position is indicated by an arrow that appears on the top of the column label.

- Choose Column➛Move To Left from the context menu to move the column to the left of the previous column.

- Choose Column➛Move To Right from the context menu to move the column to the right of the column next to it.
- Alternatively, complete the following steps to move a column:

1. Select the column. From the context menu on the column toolbar, choose Column➛Reorder Columns. Arrange Columns appears, as shown in Figure 5-3.

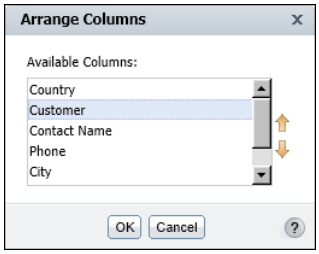


Figure 5-3 Arranging columns in Interactive Viewer

2 In Available Columns, select the column to move. Choose the up or down arrow on the right until the column is in the correct position. Moving a column up in the list, moves it to the left in the report. Moving a column down in the list, moves it to the right in the report. Choose OK.

How to remove one or more columns from the report

To remove a column, select the column and press Delete. You can also select the column, then choose Column➛Delete Column from the context menu.

To remove multiple columns, press Ctrl when selecting columns. Then, use the previously described method to delete the columns from the report.

How to hide a column

Select a column. From the context menu choose Column➛Hide Column. Interactive Viewer displays the report without the selected column.

How to display a hidden column

Select a column. From the context menu, choose Column➛Show Column. Show columns appears listing the hidden columns. In Pick Hidden Column, select the column to display. Choose OK. The column appears in the report.

Sorting data

Sorting data is an important task in creating a useful report. A customer phone list, for example, is easier to use if it is in alphabetical order. A sales report is more useful if it presents sales figures from highest to lowest, or the reverse, if you want to see lowest to highest performers.

You use sorting to display report content in a more meaningful order. For example, reports often display data in a seemingly random order depending on the report design. You can sort data in ascending or descending order, and you can sort by as many fields as needed. For example, you can sort a list of customers by credit rank, then by customer name.

Compare the reports in Figure 5-4. The report on the left displays data as in the original report. The report on the right displays the same data, sorted by country.

France	Atelier graphique	21000
USA	Signal Gift Stores	71800
Australia	Australian Collectors, Co.	117300
France	La Rochelle Gifts	118200
Norway	Baane Mini Imports	81700
USA	Mini Gifts Distributors Ltd.	210500
Poland	Havel & Zbyszek Co	0
Germany	Blauer See Auto, Co.	59700
USA	Mini Wheels Co.	64600

Australia	Australian Collectors, Co.	117300
Australia	Anna's Decorations, Ltd	107800
Australia	Souveniers And Things Co.	93300
Australia	Australian Gift Network, Co	51600
Australia	Australian Collectables, Ltd	60300
Austria	Salzburg Collectables	71700
Austria	Mini Auto Werke	45300
Belgium	Petit Auto	79900
Belgium	Royale Belge	23500

Figure 5-4 Comparing reports with sorted and unsorted data

You can sort data in ascending or descending order, and you can sort data by multiple columns. For example, you can sort the data in a report by country, and then by customer name. Figure 5-5 shows a sample of the results of this sort action. Countries appear in ascending alphabetical order. For each country, the customer names appear in alphabetical order.

Australia	Anna's Decorations, Ltd	107800
Australia	Australian Collectables, Ltd	60300
Australia	Australian Collectors, Co.	117300
Australia	Australian Gift Network, Co	51600
Australia	Souveniers And Things Co.	93300
Austria	Mini Auto Werke	45300
Austria	Salzburg Collectables	71700
Belgium	Petit Auto	79900
Belgium	Royale Belge	23500

Figure 5-5 Customer names sorted in alphabetical order

Sorting on a single column

To sort data on a single column, select the column. Choose the appropriate arrows to Sort Ascending or Sort Descending from the column toolbar. You can also choose Sort➛Sort Ascending or Sort Descending from the context menu.

Sorting on multiple columns

You can sort data by up to three columns. When you sort by multiple columns, you use the Advanced Sort option, shown in Figure 5-6. It is important to understand the order of precedence for a multiple sort action. On Advanced Sort, select the columns on which to sort, in the order in which you want to sort the data. For example, to sort data by country first, and then by customer name within each country, select the columns in that order on Advanced Sort.

How to sort data on multiple columns

1. Select a column. From the context menu, choose Sort➛Advanced Sort.
2. On Advanced Sort, in Sort By, select a column from the list, then choose either Ascending or Descending, as shown in Figure 5-6.
3. Select a second column from the next drop-down list. Choose the sort order.

   You can also select a third column on which to sort. Choose OK.

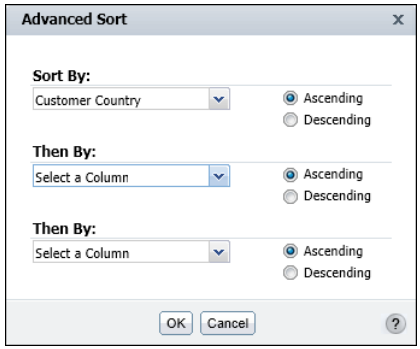


Figure 5-6 Sorting data on multiple columns

Sorting data in a merged column

When working with merged columns, if you choose Sort from the context menu, Select Data Item appears, as shown in Figure 5-7, providing a drop-down list of data items in the merged column.

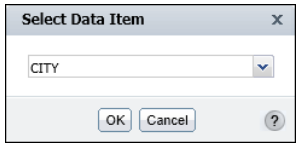


Figure 5-7 Selecting a data item

From the drop-down list, select the item on which to sort data. Choose OK.

You can now sort data in each of the columns, as described in the previous sections of this document. To modify each line of data in the merged column, you must repeat this step for each data item, then define the sort order, each time.

Reverting data to its original order

To revert data to its original unsorted order, select a column. From the context menu, choose Sort➛Advanced Sort. On Advanced Sort, for each column specified for a sort action, choose Select a Column from the drop-down list. Choose OK.

Organizing data in groups

Sorting data makes a report more readable and useful. Sorting is typically only one of the tasks you perform when organizing data in a report. It is common for reports to present data that is organized into meaningful groups, especially reports that contain large amounts of data. Consider the task of listing every item a corporation owns, along with information such as the category, purchase price,

purchase date, inventory code, location, and supplier. If a report presents all these items in an unorganized list or sorted list, it is not possible to determine how much the corporation spends, for example, on office furniture or computer hardware because this information cannot be easily calculated. The report cannot provide information such as which year had the most purchases, or which items are located in a field office and which items are in the warehouse.

To organize all this information into a useful inventory report, you create data groups. Data groups contain related data rows. For example, you can create a report that lists items by category—all office furniture in one group, all computer hardware in another group, all computer software in a third group, and so on. For each group, you can calculate aggregate data, such as the total purchase price or count of items in a group. Organizing data in groups makes it easier to compare and analyze information.

Compare the reports in Figure 5-8 and Figure 5-9. The report in Figure 5-8 displays customer information in a simple list. The data rows are sorted by country. Notice the repeated country names in the first column.

Country	Customer	Contact Name	Phone
Australia	Australian Collectors, Co.	Ferguson Peter	03 9520 4555
Australia	Anna's Decorations, Ltd	O'Hara Anna	02 9936 8555
Australia	Souveniers And Things Co.	Huxley Adrian	+61 2 9495 8555
Australia	Australian Gift Network, Co	Calaghan Ben	61-7-3844-6555
Australia	Australian Collectables, Ltd	Clenahan Sean	61-9-3844-6555
Austria	Salzburg Collectables	Pipps Georg	6562-9555
Austria	Mini Auto Werke	Mendel Roland	7675-3555
Belgium	Petit Auto	Dewey Catherine	(02) 5554 67
Belgium	Royale Belge	Cartrain Pascale	(071) 23 67 2555

Figure 5-8 Report with data sorted by country

The report in Figure 5-9 shows the same data. Unlike the previous report, this report groups the rows by country, removing the repeated entries.

Country	Customer	Contact Name	Phone
Australia			
	Australian Collectors, Co.	Ferguson Peter	03 9520 4555
	Anna's Decorations, Ltd	O'Hara Anna	02 9936 8555
	Souveniers And Things Co.	Huxley Adrian	+61 2 9495 8555
	Australian Gift Network, Co	Calaghan Ben	61-7-3844-6555
	Australian Collectables, Ltd	Clenahan Sean	61-9-3844-6555
Austria			
	Salzburg Collectables	Pipps Georg	6562-9555
	Mini Auto Werke	Mendel Roland	7675-3555
Belgium			
	Petit Auto	Dewey Catherine	(02) 5554 67
	Royale Belge	Cartrain Pascale	(071) 23 67 2555

Figure 5-9 Report with data grouped by country

A report that groups data provides a more effective way to view data. When you group data, you can:

- Add subtotals, counts, averages, or other aggregate information at the beginning or end of each group.

- Insert a page break before or after each group to start each data group on a new page.
- Hide the details of each group to view a summary report.

In addition, Interactive Viewer performs the following actions when you group data:

- Removes duplicate values for each group.
- Sorts the values of each group. For example, a country group displays the countries in alphabetical order, as shown in Figure 5-9.
- Generates a table of contents that displays the values of every group when you view the finished report in the viewers. The table of contents allows you to navigate to specific locations in the report. This feature is particularly useful when a report contains many pages.

How to group data

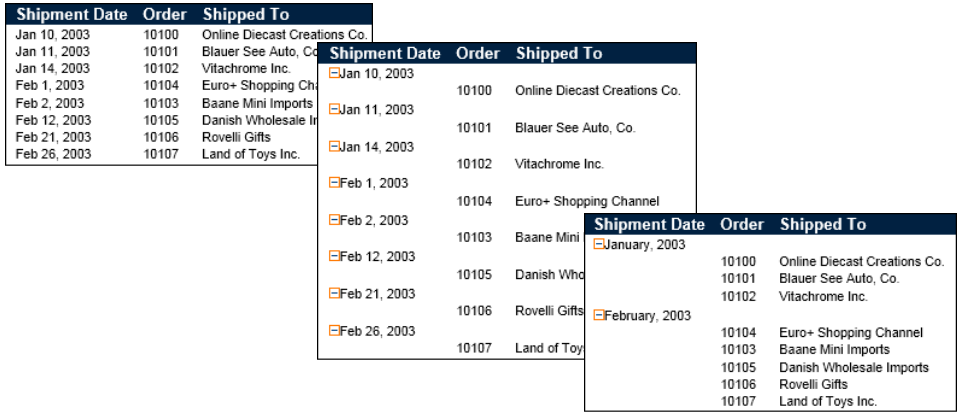
Select the column that contains the values to group. From the context menu choose Group➛Add Group.

If the column you selected contains string or numeric data, Interactive Viewer groups the data by each unique value in the column. If the column you selected contains date-and-time data, additional grouping options appear.

Grouping data on a date-and-time column

When you group data on a date-and-time column, you have two options. You can show every individual date or time value, or you can group the data by a specific time interval, which is the typical option. You can organize a shipping report, for example, showing shipment data by month or by quarter, rather than by date.

Figure 5-10 shows three reports that contain the same data.



Shipment Date	Order	Shipped To
Jan 10, 2003	10100	Online Diecast Creations Co.
Jan 11, 2003	10101	Blauer See Auto, Co
Jan 14, 2003	10102	Vitachrome Inc.
Feb 1, 2003	10104	Euro+ Shopping Cha
Feb 2, 2003	10103	Baane Mini Imports
Feb 12, 2003	10105	Danish Wholesale Ir
Feb 21, 2003	10106	Rovelli Gifts
Feb 26, 2003	10107	Land of Toys Inc.

Shipment Date	Order	Shipped To
Jan 10, 2003		
	10100	Online Diecast Creations Co.
Jan 11, 2003		
	10101	Blauer See Auto, Co.
Jan 14, 2003		
	10102	Vitachrome Inc.
Feb 1, 2003		
	10104	Euro+ Shopping Channel
Feb 2, 2003		
	10103	Baane Mini
Feb 12, 2003		
	10105	Danish Who
Feb 21, 2003		
	10106	Rovelli Gifts
Feb 26, 2003		
	10107	Land of Toy

Shipment Date	Order	Shipped To
January, 2003		
	10100	Online Diecast Creations Co.
	10101	Blauer See Auto, Co.
	10102	Vitachrome Inc.
February, 2003		
	10104	Euro+ Shopping Channel
	10103	Baane Mini Imports
	10105	Danish Wholesale Imports
	10106	Rovelli Gifts
	10107	Land of Toys Inc.

Figure 5-10 Comparing reports with grouped and ungrouped data

The report on the left displays data that has not been grouped, the second report groups shipment dates using individual date values, and the third report groups shipment dates by month.

How to group date-and-time data

1. Select the column that contains the date-and-time data. From the context menu, choose Group➛Add Group.
2. On Group Detail, select one of the group options. If you opt to group by interval:
   - Select an interval type, such as weeks, months, or quarters, from the drop-down list.
   - Type a number to indicate the grouping for the selected interval type. For example, if you selected Weeks, type 2 to group data in two-week periods.

   Figure 5-11 shows grouping the Shipped Date column by month.

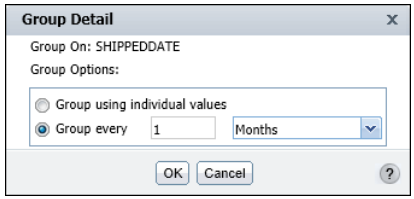


Figure 5-11 Grouping by shipping date

Grouping on multiple columns

When you group data on multiple columns, consider the order of precedence before you create the groups. To group customer data by state, then by city, create the groups in that order. The order in which grouped columns appear in a report indicates the order in which the groups were created. The first group appears as the leftmost column in the table, the second group appears next to it, and so on.

Changing the grouping order

After you create groups, you can change their order. Evaluate the effect of changing the grouping order. For example, changing the order of the state or province and city groups to city and state or province produces a report that organizes data illogically. On the other hand, changing the order of the sales office and product line groups to product line and sales office provides you with a different perspective on the sales data. The focus shifts from sales office performance to product line performance.

How to change the grouping order

1 Select a column. From the context menu, choose Column➛Reorder Columns. Arrange Columns, as shown in Figure 5-12, shows the columns in the order in which the report currently displays the data.

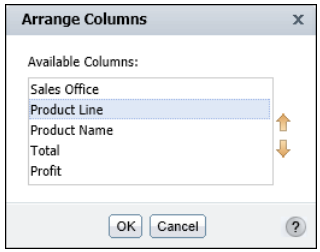


Figure 5-12 Reordering grouped columns

2 On Arrange Columns, select the grouped column from Available Columns. Use the up or down arrow buttons to move the column up or down the list. Choose OK.

Aggregating data

One of the useful features in a report is the ability to display summary, or aggregate, data. Many example reports in the previous sections of this document contain aggregate data. For example, a sales report can show the overall sales total; sales subtotals by product type, region, or sales representatives; average sales figures; or the highest and lowest sales figures.

Aggregating data involves performing a calculation on a set of values. For a simple listing report that does not organize data in groups, you can perform aggregate calculations on values in a selected column, across all the data rows in a table.

For example, consider a report that has a column calculating price*quantity. You can use the sum of the calculations in this column to obtain the total price of all items. You can create up to three aggregations for each report column.

When you aggregate data, you choose whether the aggregation appears in the table header or footer. If the column is grouped, you can display the aggregate value in the group header or footer. The report in Figure 5-13 displays aggregate data for the Total and the Profit columns at the end, or footer, of the table.

In a report that organizes data into groups, you can display aggregate data for a selected column or columns. You can also perform aggregations for each group of data rows, and for all the data rows in the table. In the example report shown in Figure 5-14, the aggregate data appears at the footer of each group.

Product Name		Total		Profit
1992 Porsche Cayenne Turbo Silver		$2,557.14		$952.20
1970 Dodge Coronet		$1,706.40		$541.08
1952 Alpine Renault 1300		$10,286.40		$5,554.56
1961 Chevrolet Impala		$2,121.28		$1,086.72
1992 Porsche Cayenne Turbo Silver		$4,471.20		$1,331.10
1992 Porsche Cayenne Turbo Silver		$3,782.61		$1,061.19
1970 Dodge Coronet		$1,441.59		$502.86
1970 Triumph Spitfire		$4,096.03		$1,246.51
1998 Chrysler Plymouth Prowler		$3,389.28		$1,054.55
1968 Ford Mustang		$8,317.80		$4,027.50
1992 Ferrari 360 Spider red		$2,980.34		$1,266.54
1957 Ford Thunderbird		$2,463.12		$1,231.56
1970 Plymouth Hemi Cuda		$1,570.56		$804.48
1968 Ford Mustang		$6,099.72		$2,953.50
1969 Ford Falcon		$4,069.44		$2,076.24
1982 Camaro Z28		$1,977.54		$907.35
1970 Triumph Spitfire		$4,623.15		$1,222.11
1970 Chevy Chevelle SS 454		$3,615.60		$661.20
1969 Dodge Charger		$5,643.00		$2,706.50
1968 Dodge Charger		$3,371.83		$1,192.19
	Max	*$10,286.40*	*Max*	*$5,554.56*
	Avr	*$3,929.20*	*Avr*	*$1,619.00*
	Sum	*$78,584.03*	*Sum*	*$32,379.94*

Aggregate data

Figure 5-13 Report displaying aggregate data

Product Line		Classic Cars	
Product Name	**Price of each**	**Quantity ordered**	**Total**
1968 Ford Mustang	$163.44	64	$10,460
1969 Dodge Charger	$115.16	97	$11,171
2001 Ferrari Enzo	$207.80	48	$9,974
1952 Alpine Renault 1300	$201.44	50	$10,072
1952 Alpine Renault 1300	$214.30	48	$10,286
		Total	*$51,963*
		Maximum	*$11,171*
		Average	*$10,393*

Aggregate data for the product line group, Classic Cars

Product Line		Vintage Cars	
Product Name	**Price of each**	**Quantity ordered**	**Total**
1917 Grand Touring Sedan	$141.10	76	$10,724
		Total	*$10,724*
		Maximum	*$10,724*
		Average	*$10,724*

Aggregate data for the product line group, Vintage Cars

Figure 5-14 Aggregate data by product line group

Adding and removing an aggregate value

When you aggregate data in a column, you specify the following information:

- The type of aggregate calculation. The report in Figure 5-14 displays, for the Total column, the sum of the values, the highest (max) value, and the average value. Interactive Viewer supports other types of aggregate functions, described later in this document. Each aggregation appears on a separate row.
- Whether to perform the aggregate calculation across all the data rows in the table, or across the data rows in each group, or both. Aggregating data for groups applies only to reports that organize data in groups.

- Whether to display the aggregate data in the footer or header of the table or the groups. The previous examples show aggregate data in the footers, which is typical. Choose header to display the aggregate data at the beginning of the table or group.

How to aggregate data

1. Select the column containing the data to aggregate. From the context menu, choose Aggregation. Aggregation appears. The syntax of the selected function appears in the lower part of Aggregation, as shown in Figure 5-15. From the Select Function menu, select the aggregate function to use.

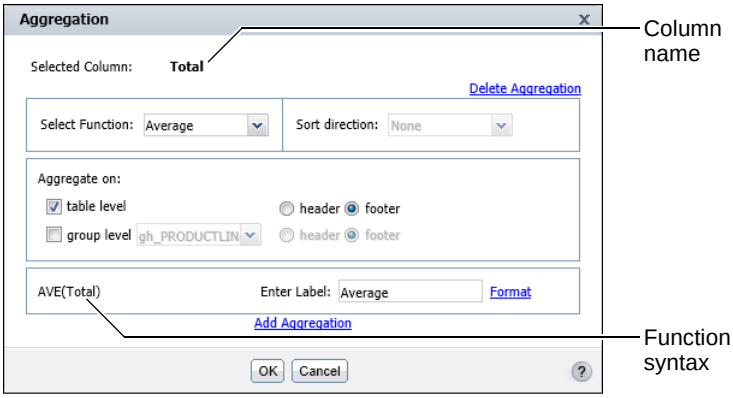


Figure 5-15 Aggregating the Total column as an average

2. Specify a sort direction for the resulting aggregation. If you select Ascending or Descending from the Sort direction list, the groups appear, in ascending or descending order in the report. Select none if you do not want to sort the groups in any order.
3. In Aggregate on:
   - Select table level to aggregate data across all the rows in the table. Select either header or footer as the location in which to display the aggregate data.
   - Select a group from the next list to aggregate data at the group level. Select either header or footer as the location in which to display the aggregate data.
4. In Enter Label, enter a name for the label. Optionally, set a font for the aggregation label, by choosing Format.
5. To create a second aggregation, choose Add Aggregation. In Select Function, select a function from the list. Repeat step 2 to step 4 to define the aggregation. Choose OK. Figure 5-16 shows two aggregations defined for the report.

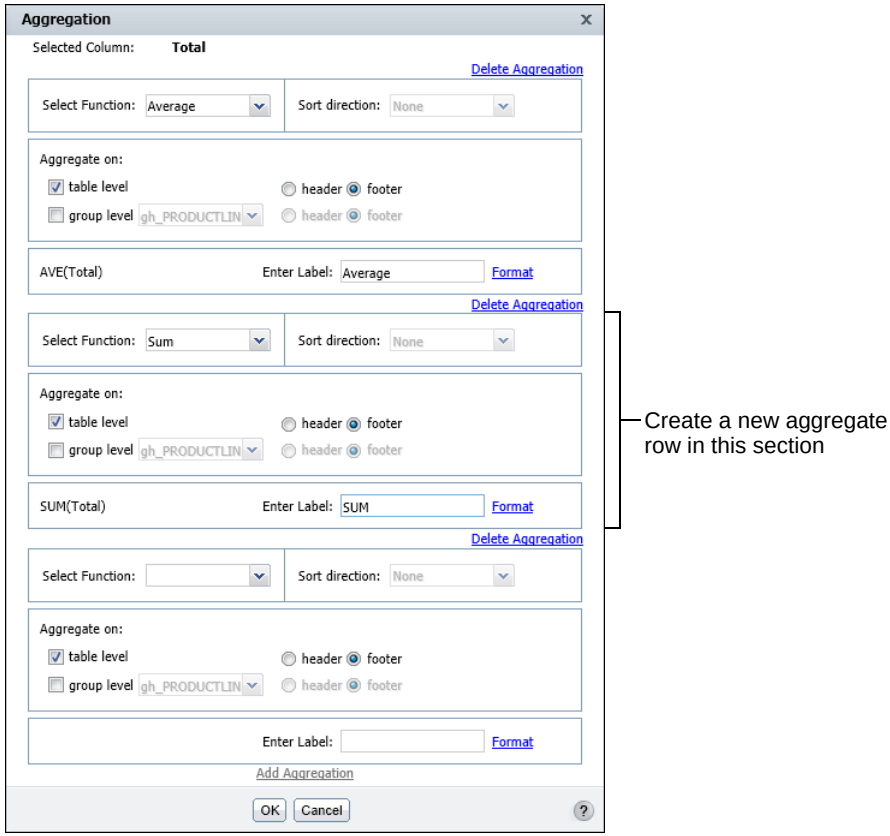


Figure 5-16 Adding an aggregate row for a column

How to add additional aggregate rows to a column

After you create a single aggregate value for a column, you can add up to two more aggregate values for the same column. For an order total column, for example, you can create a sum of all the values, count all the values, and get the average order total.

1. To add an aggregate value, select a column that contains an aggregate value. Choose Aggregation from the context menu.
2. On Aggregation, choose Add Aggregation.

   An additional section appears on Aggregation, shown in Figure 5-16.
3. Create the second aggregate value and choose OK.

How to aggregate data in a merged column

1. When working with merged columns, if you choose Aggregation from the context menu, Select Data Item appears.
2. Select the data item or column on which to perform an aggregation, from the drop-down list. Choose OK.

You can now create aggregations for each of the columns, as described in the previous sections of this document. To modify each line of data in the merged column, you must repeat this step for each data item, then define the aggregation, each time.

How to delete an aggregate value

1. Select the column that contains the aggregation to remove. From the context menu, choose Aggregation.
2. Aggregation appears, displaying all the aggregations for the column. Choose Delete Aggregation for the aggregation you want to remove. Choose OK.

Types of aggregate calculations

The aggregate calculations you can perform on a column depend on the type of data in the column. You can perform functions only on numeric data, that enable a mathematical calculation, such as SUM and AVERAGE.

The most common aggregate functions used for string data are Count and Count Value. Count returns the number of values in a column, including duplicate values. Count Value returns the number of distinct values in the column. You can use Count Value, for example, on a customer name column to get a count of the number of customers.

For date-and-time data, you can use the MIN and MAX functions to get the earliest and the latest date, respectively, from an order date column.

For a description of the aggregate functions available, see Chapter 11, “Functions and operators.”

Hiding and displaying report elements

This section describes how to use Interactive Viewer to hide or display elements in a report, such as a column or table header, a report table, a chart, a Flash chart or object, and an image in the report.

How to hide or display report items

1. Choose Hide/Show Items from the main menu. Hide or Show Items appears, as shown in Figure 5-17.

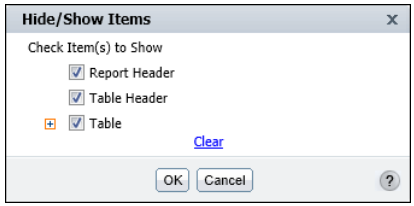


Figure 5-17 Hiding or displaying report items

2 Select the items to display. Deselect the items to hide. To hide all items, choose Clear. Then, choose OK.

Hiding group details

In a report containing multiple groups, it is sometimes useful to hide the details for a specific group if you do not want to display all the information at the same time. For example, in a sales report that groups orders by state and product, you can display only the state totals, by choosing the top-level group, state, and then selecting the Hide Detail option. Hiding the details from the state group recursively hides all data within the state group; the report hides product groups and the order details within each product group.

When you work with a report that organizes data in groups, you can change the report to a summary report by hiding the group details. Hiding details, particularly for a report that runs into hundreds of pages, helps you display key information at a glance.

Figure 5-18 shows two reports that contain the same data. The report on the left shows all details. The report on the right hides the details within each product line group.

Product Line	Classic Cars			
Product Name	Price of each	Quantity ordered		Total
1968 Ford Mustang	$163.44	64		$10,460
1969 Dodge Charger	$115.16	97		$11,171
2001 Ferrari Enzo	$207.80	48		$9,974
1952 Alpine Renault 1300	$201.44	50		$10,072
1952 Alpine Renault 1300	$214.30	48		$10,286
			Total	*$51,963*
			Maximum	*$11,171*
			Average	*$10,393*

Product Line	Vintage Cars			
Product Name	Price of each	Quantity ordered		Total
1917 Grand Touring Sedan	$141.10	76		$10,724
			Total	*$10,724*
			Maximum	*$10,724*
			Average	*$10,724*

Product Line	Classic Cars			
Product Name	Price of each	Quantity ordered		Total
			Total	*$51,963*
			Maximum	*$11,171*
			Average	*$10,393*

Product Line	Motorcycles			
Product Name	Price of each	Quantity ordered		Total
			Total	*$30,197*
			Maximum	*$11,503*
			Average	*$10,066*

Product Line	Vintage Cars			
Product Name	Price of each	Quantity ordered		Total
			Total	*$10,724*
			Maximum	*$10,724*
			Average	*$10,724*
			Total	*$92,884*
			Maximum	*$11,503*
			Average	*$10,320*

Figure 5-18 Comparing reports showing and hiding product details

How to hide group details

Select the grouped column whose details you want to hide. From the context menu, choose Group➛Hide Detail.

How to redisplay group details

Select the grouped column, then from the context menu choose Group➛Show Detail.

Suppressing duplicate values

Frequently, you find that you do not need to display all the data present in a report. For example, sometimes a report column displays duplicate values in consecutive data rows. When the duplication is unnecessary or makes the report difficult to read, you can suppress consecutive duplicate values. In addition, as you modify a report, you can collapse groups to display only the column headings and summary data, such as aggregate data rows.

You can also use Interactive Viewer to suppress duplicate values that appear in a grouped column. For example, a report that lists customer orders, grouped by customer, shows some data values such as the address, contact information, customer number, and so on, multiple times for every order placed by the customer. You can prevent the duplicate occurrence of these values by moving data rows from the column to the group header.

Avoiding repeated values in a column

In the report shown in Figure 5-19, the Location column shows the city name each time the name occurs.

customerName	city	state	salesRepEmployeeNumber
Diecast Classics Inc.	Allentown	PA	1216
Diecast Collectables	Boston	MA	1188
Gifts4AllAges.com	Boston	MA	1216
Collectables For Less Inc.	Brickhaven	MA	1188
Online Mini Collectables	Brickhaven	MA	1188
Auto-Moto Classics Inc.	Brickhaven	MA	1216
Gift Depot Inc.	Bridgewater	CT	1323
Signal Collectibles Ltd.	Brisbane	CA	1165
West Coast Collectables Co.	Burbank	CA	1166
Technics Stores Inc.	Burlingame	CA	1165
Marta's Replicas Co.	Cambridge	MA	1216

Figure 5-19 Duplicate values in columns

As Figure 5-20 shows, the report appears neater and more organized when duplicate values are not repeated.

Using Interactive Viewer, you can suppress consecutive occurrences of duplicate values. In the Location column in Figure 5-20, the Boston value is suppressed in the second, third, fourth, and fifth rows. If Boston occurs again after the listing for NYC, that occurrence of Boston is visible and subsequent consecutive occurrences are suppressed. The values must be exact duplicates to be suppressed.

customerName	city	state	salesRepEmployeeNumber
Diecast Classics Inc.	Allentown	PA	1216
Diecast Collectables	Boston	MA	1188
Gifts4AllAges.com			1216
Collectables For Less Inc.	Brickhaven		1188
Online Mini Collectables			
Auto-Moto Classics Inc.			1216
Gift Depot Inc.	Bridgewater	CT	1323
Signal Collectibles Ltd.	Brisbane	CA	1165
West Coast Collectables Co.	Burbank		1166
Technics Stores Inc.	Burlingame		1165
Marta's Replicas Co.	Cambridge	MA	1216

Figure 5-20 A report suppressing duplicate values

If a column extends across multiple pages, the first row on each page displays a value, even if duplicate values are suppressed for that column.

How to suppress duplicate values in a column

Select the column containing duplicate values. From the context menu, choose Column➛Do Not Repeat Values.

How to show hidden duplicate values in a column

Select a column that does not repeat duplicate values. From the context menu, choose Column➛Repeat Values.

Avoiding repeated values in a group

The example report in Figure 5-21 displays the values for Customer Number, E-mail, and Credit Limit multiple times for the same customer. By moving the data row values to the group header, you limit the appearance of these fields of data so that they only appear once.

Customer Country	Customer Name	Customer Number	Credit Limit	Product Line	Product Name
Australia					
	Anna's Decorations, Ltd	276	107800		
				Classic Cars	1993 Mazda RX-7
				Classic Cars	1965 Aston Martin DB5
				Classic Cars	1995 Honda Civic
				Classic Cars	1999 Indy 500 Monte Carlo SS
				Classic Cars	1992 Ferrari 360 Spider red

Figure 5-21 A report displaying duplicate values in a group

How to suppress duplicate values in a grouped column

1. Select the column with the duplicate values. From the context menu, choose Column➛Move to Group Header.
2. On Move to Group Header, as shown in Figure 5-22, perform the following tasks:
   - Select the group to which you want to move the data values, if the report contains more than one group.
   - Select the header row to which Interactive Viewer can move the data values.

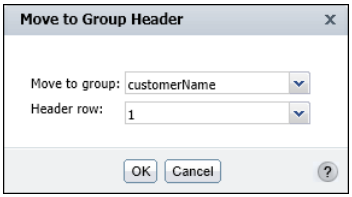


Figure 5-22 Selecting a group header

Repeat this step for each report column for which you want to move data rows to the group header. Choose OK. The value from the first data row in each group appears in each group header. The Credit Limit, E-mail, and Customer Number columns display a single data row for each Customer Name group header, as shown in Figure 5-23.

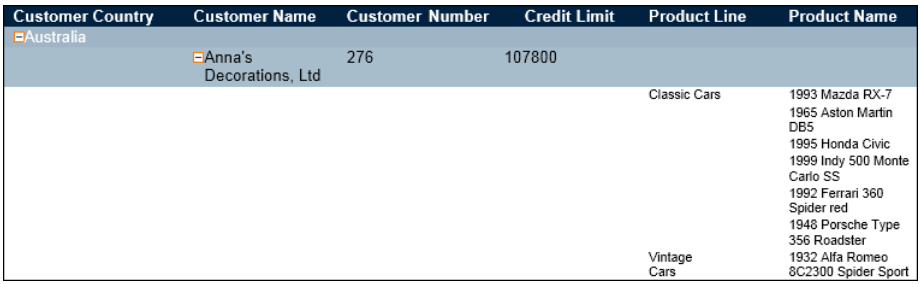


Figure 5-23 Displaying a report showing suppressed duplicate values

Specifying page breaks

Using Interactive Viewer, you can set page breaks after a preset number of rows in a data column and you can start each group on a new page by specifying a page break before or after grouped data.

How to set and remove a page break on a report column

1. Select a column. From the context menu, choose Group➛Page Break.
2. On Page Break, define an interval by typing the number of rows you want to display on each page, as shown in Figure 5-24. Choose OK.

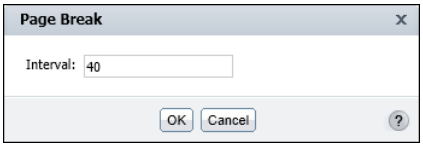


Figure 5-24 Setting a page break on a data column

3. To delete an existing page break, type 0 in the Interval field. Choose OK.

How to set and remove a page break on a grouped column

1 Select a grouped column. From the context menu, choose Group➛Page Break. Page Break appears, as shown in Figure 5-25.

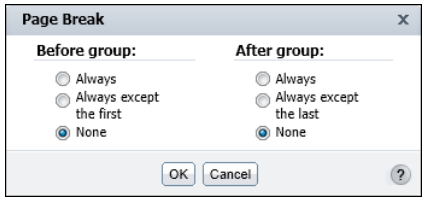


Figure 5-25 Setting a page break before or after groups

2 You can set a page break for every group, or for every group except the first or last groups. Choose OK.

3 To delete an existing page break, select None in Before group or After group. Choose OK.

Chapter

6

Performing calculations in a report

This chapter contains the following topics:

- About calculated data
- Building an expression
- Creating a custom expression

About calculated data

Most BIRT reports require calculations to track sales, finances, inventory, and other critical business activities. You can use Interactive Viewer to create calculations to count items in a warehouse or provide more complex financial data, such as tracking stock portfolio performance over time.

To display calculated data in a report, you create a computed column, such as the Total column in the report shown in Figure 6-1. In the example, you need to calculate the Total because the original report does not provide this data.

Customer Name	Order Number	Price of each	Quantity Ordered	Total
⊟AV Stores, Co.	10110			
		118.22	37	$4,374
		153	42	$6,426
		51.46	32	$1,647
		115.69	33	$3,818
		163.69	31	$5,074
		81.91	28	$2,293
		62	42	$2,604
		72.02	36	$2,593
		43.27	29	$1,255
		28.88	20	$578
		40.77	39	$1,590

Figure 6-1 Report with computed column

In Release 11 Service Pack 4, Interactive Viewer provides a convenient expression builder wizard to create computed data. You use Expression Builder to do one of the following:

- Enable Interactive Viewer to build an expression.

  Select a function to use, then select one or more columns across which Interactive Viewer performs the calculation.

- Create a custom expression.

  Select a function, then create an expression and validate it, after which Interactive Viewer performs the calculation.

About expressions

When you create a computed column, you build or create an expression that indicates how to calculate data. When you build an expression to create a computed column, first select a category, then select a function to use to compute the data. Interactive Viewer provides an expression builder containing categories with functions and operators that you use to create, modify, and view expressions. You can select the columns across which to perform the calculation. Figure 6-2 shows an example of building an expression to calculate the extended price, which is not included in the report.

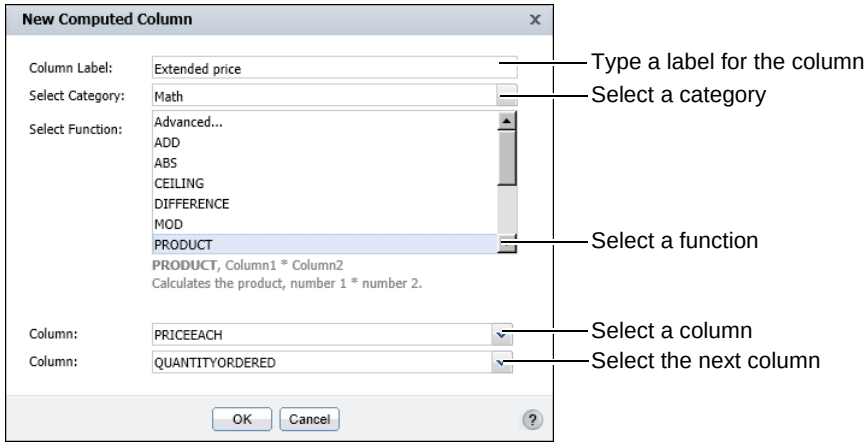


Figure 6-2 Building an expression

If you are already familiar with writing expressions, you can create custom expressions to insert computed columns in a report. In the example, as shown in Figure 6-3, you multiply each value in the QUANTITYORDERED field with the corresponding value in the PRICEEACH field, to obtain the value in the Total column. The following expression calculates the Total:

```
[PRICEEACH]*[QUANTITYORDERED]
```

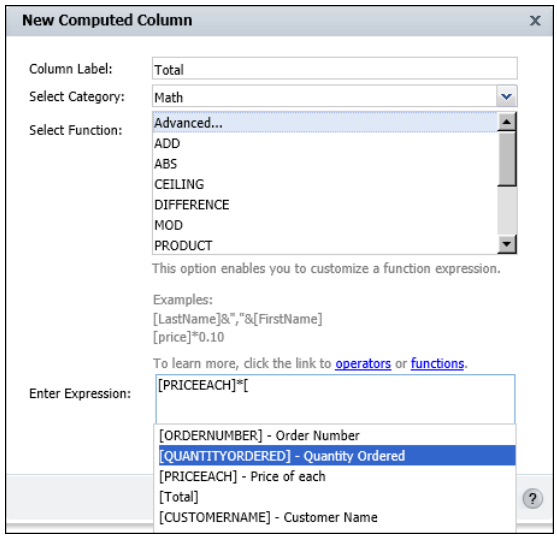


Figure 6-3 Performing a calculation

When you use a data field in an expression, you must enclose the field name within brackets ([ ]).

Interactive Viewer supports typical mathematical operations, such as addition, subtraction, multiplication, and division. In addition to mathematical calculations, Interactive Viewer supports functions for processing date-and-time and string data.

You can create a computed column to display data that is not displayed in the report, or if you want to display data differently from its appearance in the report. For example, if a customer name field contains values with leading or trailing blank characters, you can remove the blank characters by using the TRIM( ) function as follows:

```
TRIM([CustomerName])
```

Creating and editing a computed column

In Interactive Viewer, you can use the expression builder to enable the viewer to construct an expression for you, or you can construct a custom expression by selecting Advanced in the Category field. The expression you create is used to compute the new calculated column that appears in the report.

This section describes how to create and edit computed columns in a report.

How to build an expression for a new computed column

1. Select the column to the left of where you want to place the new computed column. From the context menu, choose Column➛New Computed Column. New Computed Column appears.
2. In Column Label, type a name for the new computed column. The name you specify appears in the column header.
3. In Select Category, select an option from the following categories:
   - Financial
   - Math
   - Date and time
   - Logical
   - Comparison
   - Text

   A list of functions appears in Select Function.
4. In Select Function, do one of the following:
   - Select a function from the list, then go to step 5.
   - Select Advanced to manually create an expression. Then perform the steps listed in “How to create a custom expression for a new computed column,” later in this chapter.

5 Based on the function you select, one or more column fields appears. In each Column field that appears, select a column from the list.

Choose OK. The new computed column based on the expression you built, appears in the report.

How to create a custom expression for a new computed column

1 In Enter Expression, type the expression that performs the calculation:

- To use a data field in the expression, type the left bracket ([), then select the required field from the list that appears. The list displays only fields in the report.
- To use a function, type the first letter of the function, then select the function from the list that appears. The functions indicate the arguments, if any, that you need to specify.

2 After you complete typing the expression, choose Validate. If the expression is syntactically correct, Information appears informing you that the expression is valid, as shown in Figure 6-4.

Figure 6-4 Expression valid confirmation message

If the expression contains an error, Information displays an error message. Choose OK.

3 On New Computed Column, choose OK. The computed column appears in the report.

How to edit a computed column

Select the computed column. From the context menu, choose Column➛Edit Computed Column. New Computed Column appears. To modify the expression, continue as described in the previous section.

Building an expression

The expression builder in Interactive Viewer supports typical mathematical functions, such as percent of total, running sum, and percent of difference. It also supports a range of financial, logical, date-and-time, text, and comparison functions.

Table 6-1 lists the functions available in each category of the expression builder.

Table 6-1 Categories and functions for creating a computed measure

Category	Function
Logical	■ IF
Financial	■ % OF ■ % OF DIFFERENCE ■ RUNNINGSUM
Text	■ FIND ■ LEFT ■ LEN ■ LOWER ■ RIGHT ■ SEARCH ■ TRIM ■ TRIMLEFT ■ TRIMRIGHT ■ UPPER
Math	■ ABS ■ ADD ■ CEILING ■ DIFFERENCE ■ MOD ■ PRODUCT ■ RANK ■ RATIO ■ ROUND ■ ROUNDDOWN ■ ROUNDUP ■ SQRT
Comparison	■ BETWEEN ■ IS ■ IS NULL ■ LIKE ■ NOT NULL
Date-and-time	■ NOW ■ TODAY

A detailed description of all functions is available in a later section of this document.

Creating a custom expression

An expression is a statement that produces a value. An expression can be a literal value, such as:

```
1.23
"Hello, World!"
```

An expression can contain any combination of literal values, operators, functions, and references to data fields, as shown in the following examples. For detailed descriptions of the functions that Interactive Viewer supports, refer to a later section of this document.

The following expression displays a customer's first and last names, which the database entry stores in two fields. The & operator concatenates string values.

```
[FirstName] & [LastName]
```

The following expression displays a full address by concatenating values from four data fields and adding commas as appropriate:

```
[Address1] & ", " & [City] & ", " & [State] & " " & [Zipcode]
```

The following expression calculates a gain or loss percentage. The expression uses the mathematical subtraction, division, and multiplication operators, -, /, and *.

```
([SalePrice] - [UnitPrice])/[UnitPrice] * 100
```

The following expression uses the DIFF_DAY function to calculate the number of days it took to process an order for shipping:

```
DIFF_DAY([OrderDate], [ShippedDate])
```

The following expression uses the ADD_DAY function to calculate a payment due date when the payment term is net 30:

```
ADD_DAY([InvoiceDate], 30)
```

The following expression uses the IF function to evaluate if the value in the country column is UK. If the condition is true, the function replaces the value with United Kingdom. If the condition is false, the country values are displayed as stored.

```
IF(([Country]="UK"),"United Kingdom",[Country])
```

Using numbers and dates in a custom expression

When you create an expression that contains a literal number, type the number according to the conventions of the US English locale. In other words, use a period (.), not a comma (,) as the decimal separator, even if you are working in, for example, the French locale. For example:

```
Correct: ([Quantity] * [Price]) * 1.5
Incorrect: ([Quantity] * [Price]) * 1,5
```

Similarly, when you create an expression that contains a literal date, type the date according to the conventions of the US English locale. For example, if you are working in the French locale, type 03/12/2007 to represent March 12, 2007. Do not type 12/03/2007, which is the convention for the French locale. You must enclose literal date values in double quotation marks(" "), as shown in the following expression that calculates the number of days from the order date to Christmas:

```
DIFF_DAY([OrderDate], "12/25/08")
```

How to add days to an existing date value

To create a column that displays date values that are greater than the date values in another column, complete the following steps.

1. Select a column. From the context menu, choose Column➛Choose New Computed Column. New Computed Column appears.
2. In Column Label, type a name for the calculated column. For example, type Forecast Shipping Date.
3. In Enter Expression, type the letter A. A list appears, displaying functions that begin with A.
4. Choose ADD_DAY(date, daysToAdd).
5. For the first argument, type a left bracket ([) and select the date column from the list. For example, select Order Date.
6. For the second argument, type the number of days to add. In this case, type 7.
7. Validate the expression and choose OK. The calculated column appears in the report. For every value in the Order Date column, the calculated column displays a date seven days later than the order date.

How to subtract date values in a calculated column

The following section describes how to display the difference between two date values.

1. Select a column. From the context menu, choose Column➛Choose New Computed Column. New Computed Column appears.

2. In Column Label, type a name for the calculated column. For example, for a calculation that subtracts the actual shipping date from the date requested, type Shipping Delay.
3. In Enter Expression, type the letter d. A list appears, displaying functions that begin with d.
4. Choose DIFF_DAY(date1, date2).
5. For the first argument, type a left bracket ([) and select the first date column from the list. For example, select Date Requested.
6. For the second argument, type a left bracket ([) and select the second date column from the list. For example, select Actual Shipping Date.
7. Validate the expression and choose OK. The calculated column appears in the report, displaying the difference between the two dates.

Using reserved characters in a custom expression

Some characters are reserved for internal use and have a special meaning. For example, as described in the examples in previous sections, Interactive Viewer uses brackets to denote a data field. The following characters are reserved in Interactive Viewer:

```
[
]
?
' (single quotation mark)
```

If the name of a data field contains reserved characters, Interactive Viewer removes the reserved characters when you select the data field to use in an expression. For example, if the name of a data field is OBSOLETE?, Interactive Viewer changes it to [OBSOLETE'?'] in the expression. If you type [OBSOLETE?] in the expression, an error message appears. To avoid syntax errors, always select the field and let the application construct the correct expression.

Figure 6-5 shows an example of a list of data fields, having reserved characters in the names of three fields. The following fields show both versions of the names, the changed name, enclosed in brackets, and the original name showing reserved characters:

```
[ORDER''S STATUS] - ORDER'S STATUS
[PRODUCTCODE']['4digit']'] - PRODUCTCODE[4-digit]
[OBSOLETE'?'] - OBSOLETE?
```

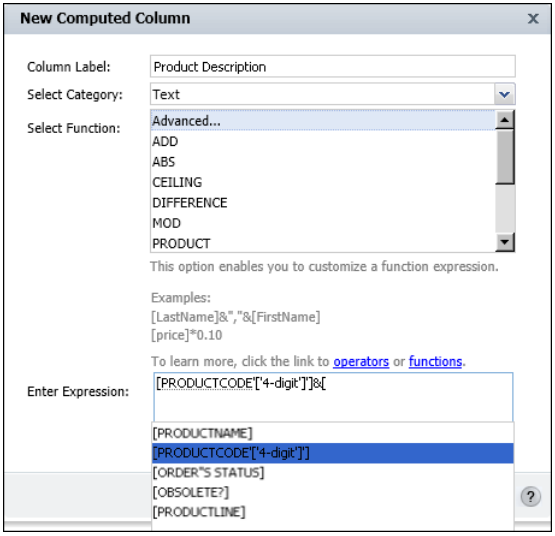


Figure 6-5 Data fields having reserved characters

Chapter

7

Filtering report data

This chapter contains the following topics:

- About data filtering
- Providing parameter values
- Creating a filter
- Defining multiple filter conditions

About data filtering

A report or report element often provides more information than you need. You can display specific rows of a report by using a filter. For example, instead of listing all customer sales, you can create a filter to list only the sales data for a particular week or a specific region.

Filtering data helps you work effectively with large amounts of data. It enables you to present the information that answers specific business questions, such as which sales representatives generated the top ten sales accounts, which products generated the highest profit in the last quarter, which customers have not made a purchase in the past 90 days, and so on.

Using Interactive Viewer, you can filter data at the report table level to narrow the scope of data in a table, and also to remove unwanted fields of data that show too much information. You can also filter data for report elements such as charts.

Sometimes when you view a report with existing filters, the report requires you to enter parameter values to determine which data to display, each time you run the report. You can view specific data in the report by modifying these parameter values, as described in this document.

Providing parameter values

If a report design already uses filters, and requires you to enter values to display data, you are prompted to enter these values before a report is run. The prompt value is called a parameter. Parameters enable users to control displayed content, without editing the report. You can modify the parameter values at any time by choosing the parameter option from the main menu. For example, in a report that displays sales data by sales office, you can use parameter values to select which sales office data to view in the report. Even if you are the only person reading the report, a parameter value enables you to view specific content in the report.

If you save a report design file containing parameters as a report document file, the user can no longer specify parameter values to view specific data. The viewers display data based on parameter values specified when the report design was saved as a report document file.

Reports using dynamic filters, require you to first select an operator, and then supply one or more parameter values for which the viewers display data. Supplying specific parameter values in such reports is often optional, and you can select the No Condition operator to view all the data in the report. You cannot create dynamic filters using the viewers.

How to enter parameter values at run time

1 Run the report from the list of available reports. If the report contains filters, and requires parameter values, the Parameters dialog box appears requiring you to enter or choose specific values, based on which data is retrieved and displayed.

2 Choose the field for which you want to view data, or enter a value. For example, in a report containing customer order history data, to view a specific customer's order history, choose the customer's name from the list, as shown in Figure 7-1.

   Choose Finish to view the report. The report in the example displays the order history for Boards & Toys Co.

Figure 7-1 Entering parameter values

How to modify parameter values in the viewers

1 From the main menu, choose Parameters.

2 A Parameters section appears in the lower pane of the viewer. The example in Figure 7-2 shows the details for Boards & Toys Co. Choose another customer from the list. Then choose Run report from the Parameters toolbar.

Figure 7-2 Viewer displaying report and the Parameters section

The report showing new data for the selected customer appears in the upper part of the viewer. To view all the data on the current page, use the scroll bar in the report section, or close the Parameters section.

You can only modify parameter values for reports that already contain filters and require the use of parameter values to view data. If the report you generate does

not use parameters, when you choose the Parameters option from the main menu, a message appears informing you that the report contains no parameters.

How to select an operator and specify one or more parameter values

1. Run the report from the list of available reports. If the report contains filters, and requires parameter values to display data, Parameters appears as shown in Figure 7-3.

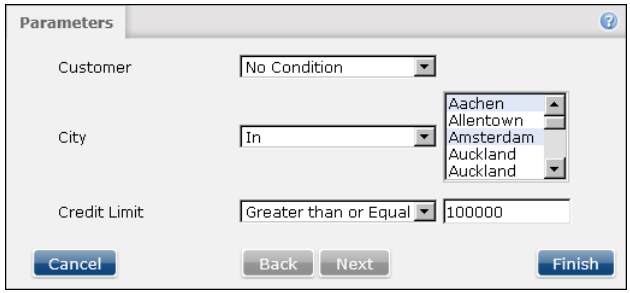


Figure 7-3 Specifying operators and parameter values

2. Select an operator in the first field, customer. To view data for all customers, select No Condition, as shown in Figure 7-3.
3. Select an operator from the drop-down list in the next field, City, and specify one or more values from the list of values that appears. To select more than one value, press Ctrl while selecting each additional value. To select a range of values select the first value, press Ctrl+Shift and select the last value in the range.
4. Select an operator from the drop-down list in the next field, Credit Limit, and type a value in the associated field that appears. To view all credit limits, select No Condition.

   Choose Finish. The report displays data for the parameter values you specified.

Creating a filter

To create a filter, you define a condition specifying which data rows to display. A filter condition is an If expression that must evaluate to True for a data row to be included. The following list shows examples of possible filter conditions:

```
If the credit limit is greater than 100000
If the sales office is San Francisco
If the order date is between 4/1/2008 and 6/30/2008
```

Figure 7-4 shows an example of a filter condition. When defining a filter condition, you can break it down into the following parts, as shown in Figure 7-4:

- The column to evaluate, such as credit limit
- The comparison operator specifying the type of comparison test, such as Equal To
- The value to which all values in the column are compared, such as 100000

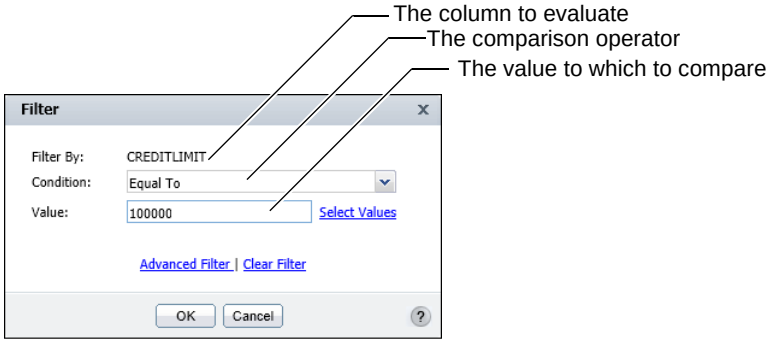


Figure 7-4 Creating a filter

How to create a filter

1. Select the column containing the data values to evaluate. For example, to create a filter that displays data rows based on specific values in the credit limit column, select the credit limit column.

2. From the Column toolbar, choose Filter. Filter appears.
3. In Condition, select the comparison test, or operator, to apply to the selected column. Depending on the operator you select, Filter displays either one or two additional fields, or a completed filter condition.
4. If you select an operator that requires a comparison value, you can specify the value in one of the following ways:
   - Type the value.
   - Choose Select Values to select from a list of existing data values. Figure 7-5 shows how you can select a credit limit value of 11000 from the list of possible credit limit values. Use the Previous and Next buttons to navigate the list of values that appears.

   Choose OK to apply the filter. If the report or report element such as chart, contains no data that matches the filter condition, Interactive Viewer does not display any data. Make sure you test the filter by applying it and viewing the resulting report.

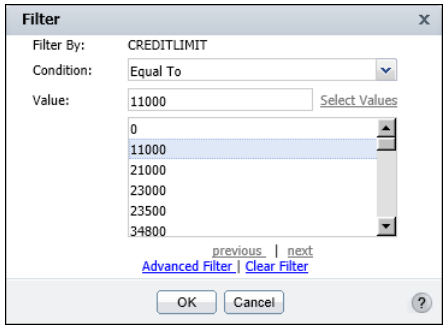


Figure 7-5 Selecting a value for the filter condition

Selecting multiple values for a filter condition

Sometimes you need to view a wider range of data, such as, sales details for several sales offices, not only for a single office. To select more than one comparison value, select the In operator, choose List Values, then select each value. Use the previous and next buttons to navigate the list of values that appears in the Find area. Figure 7-6 shows the selection of London and Paris from a list of sales office values. Choose OK.

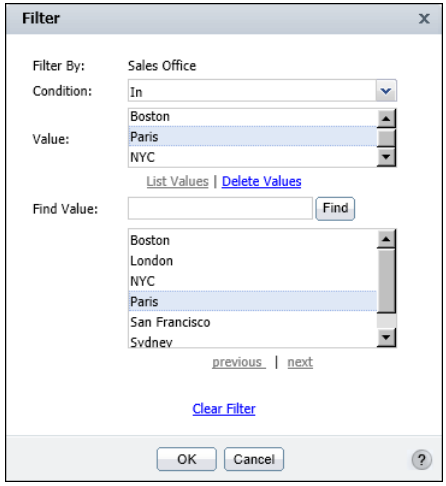


Figure 7-6 Selecting multiple values for a filter condition

Excluding data

When formulating a filter condition, you can use comparison operators, such as Equal to, Greater Than, or Less Than, to determine which data rows to view. Sometimes it is more efficient to specify a condition that excludes a small set of data. For example, you need sales data for all countries except USA. Instead of

selecting all the available countries except USA, and listing them in the filter condition, it is simpler to use the Not Equal To operator. Similarly, use the Not Between operator to exclude data in a specific range, and the Not Like operator to exclude data that matches a string pattern.

For example, the following filter condition excludes orders with amounts that are between 1000 and 5000:

```
OrderAmount Not Between 1000 and 5000
```

The filter condition in the next example excludes products with codes that start with MS:

```
ProductCode Not Like MS%
```

Filtering empty or null values

Sometimes report columns have blank data rows. Consider a customer database that contains an e-mail field. For customers who did not supply an e-mail address, the e-mail field in the column is empty or blank. An empty value, also called a null value, means that no value is available. Null values apply to all data types.

You can create a filter to exclude data rows when a specific column has null values. When filtering to exclude rows containing null values, use the Is Not Null operator. If you want to only view rows with null values in a particular column, use the Is Null operator. For example, the following filter condition excludes customer data where the e-mail column contains null values:

```
Email Is Not Null
```

The following filter condition displays only rows where the e-mail column contains null values:

```
Email Is Null
```

Displaying top or bottom values

For a report or report element that presents a large amount of numeric data, it is useful to view a snapshot of the highest or lowest values, such as the top 100 order totals or the counties whose median home prices are in the bottom 10 percent.

Select the column to highlight it, and choose Filter➛Top/Bottom N from the context menu. Top/Bottom N appears, as shown in Figure 7-7.

On Top/Bottom N, select Top N, Bottom N, Top Percent, or Bottom Percent to specify the condition. Enter a number in the next field, and choose OK.

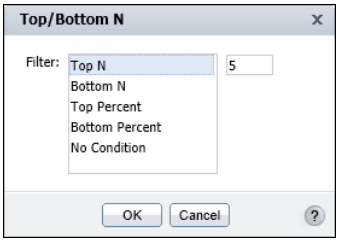


Figure 7-7 Filtering data using Top/Bottom N values

Specifying a date as a comparison value

When you create a filter condition that compares the date-and-time values in a column to a specific date, the date value must be in one of the following formats, regardless of your locale:

```
3/26/2008
3/26/2008 2:30:00 PM
```

Interactive Viewer provides a calendar you can use to conveniently select a date. Figure 7-8 shows how to access the calendar.

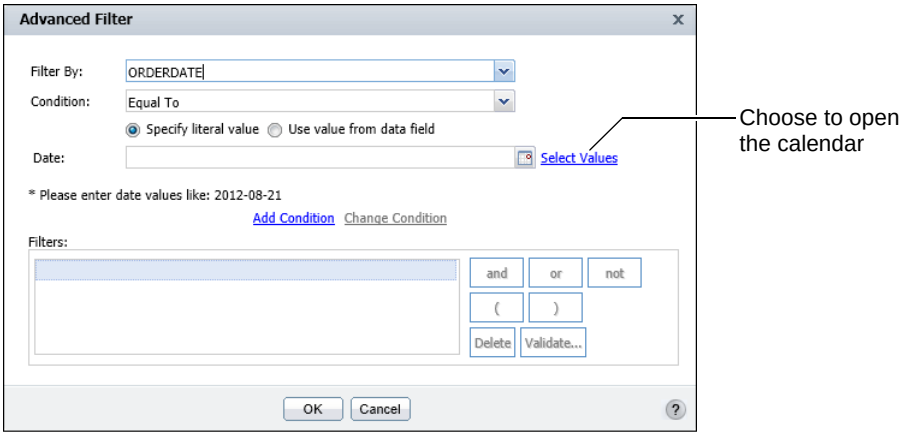


Figure 7-8 Selecting filter condition values using the calendar

The calendar appears displaying the current date, month, and year. The current date is highlighted by default, as shown in Figure 7-9.

To accept the current date, choose Today. To choose another date, select it.

The selected date value appears in Date, in Filter. Choose OK for the filter condition to take effect.

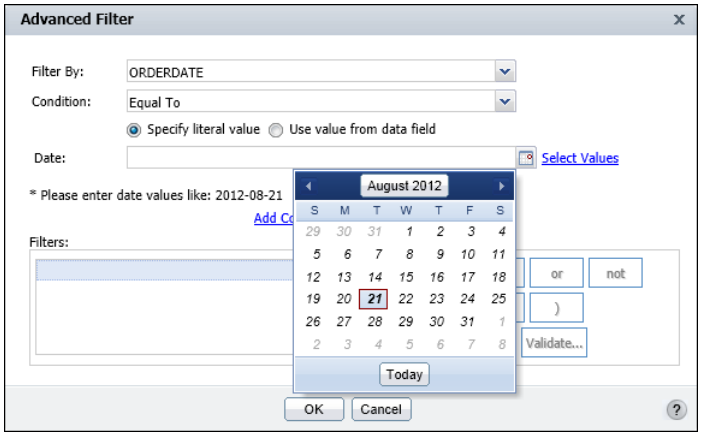


Figure 7-9 Selecting a date from the calendar

Comparing to a string pattern

For a column that contains string data, you can create a filter condition that compares each value to a string pattern instead of to a specific value. For example, to display only customers whose names start with M, use the Like operator and specify the string pattern, M%, as shown in the following filter condition:

```
Customer Like M%
```

You can use the following special characters in a string pattern:

- % 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.

To match the percent sign (%) or the underscore character (_) in a string, precede the characters with two backslash characters (\\). For example, to match S_10, use the following string pattern:

```
S\\_10
```

To match 50%, use the following string pattern:

```
50\\%
```

Defining multiple filter conditions

When you create a filter, you define at least one filter condition, but you can create as many filter conditions as you need to display relevant data. Each condition you add further narrows the scope of displayed data. For example, you can create a filter that returns rows where the customer's credit rank is either A or B and whose open orders total between $250,000 and $500,000. Each additional condition introduces complexity to the filter. Make sure you design and test filters with multiple conditions carefully. If you have too many filters that narrow the scope of the report excessively, no data displays in the report, or report element.

Adding a condition

There are two ways to define multiple filter conditions. You can select a column and define a filter, then select the next column and define a filter, and so on. Or you can use the Advanced Filter dialog box, as shown in Figure 7-10. You can use Advanced Filter to modify or delete existing filter conditions.

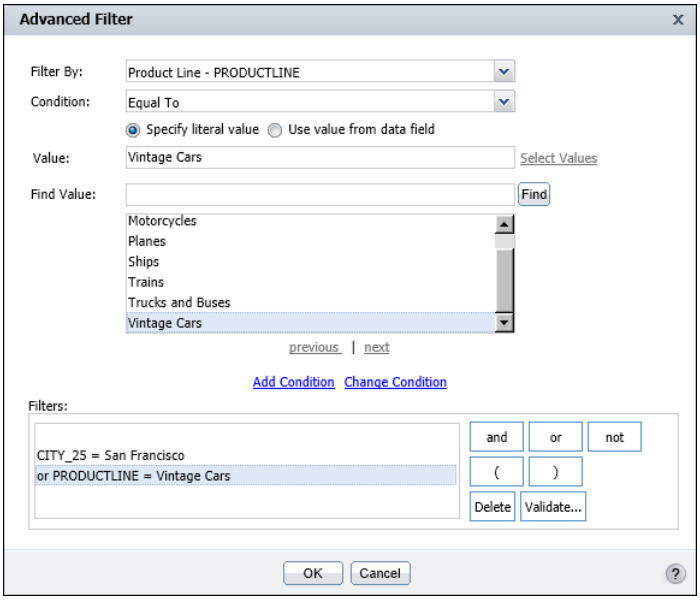


Figure 7-10 Adding a filter condition

For example, using the former method, you can define two filters, the first on the SALES OFFICE column, the second on the PRODUCTLINE column.

When you use this method to define multiple filters, Interactive Viewer constructs the following filter expression:

```
SALES OFFICE = San Francisco
and PRODUCTLINE = Vintage Cars
```

This filter returns only data rows that meet both conditions. Sometimes, you want to create a filter that returns data rows when either condition is true, or you want to create a more complex filter. To accomplish either task, you can use the Advanced Filter dialog box, as shown in Figure 7-10.

As the example shows, Advanced Filter provides more options for defining a filter with multiple conditions. It also displays all the filter conditions defined for the report table, or chart element.

How to define multiple filter conditions

1. Select the report column that contains the values to evaluate, then choose Filter from the column toolbar.
2. On Filter, choose Advanced Filter. Advanced Filter appears. Filter By displays the selected column.
3. Define the first filter condition as follows:
   1. In Condition, select a comparison operator.
   2. In Value, select or type the comparison value. For conditions that test equality and for the Between condition, you can either set a literal value or you can base the value on another data column by selecting the Use value from data field option. For example, you can request actual shipping dates that are greater than the forecast shipping dates, or actual sales that are less than sales targets.

      The conditions that support basing the filter value on another column are Equal to, Not Equal to, Less Than, Less Than or Equal to, Greater Than, Greater Than or Equal to, Between, and Not Between.
   3. Choose Add Condition.

   The filter condition appears in the Filters area.
4. Define the second filter condition as follows:
   1. In Filter By, select another column.
   2. In Condition, select a comparison operator.
   3. In Value, select or type the comparison value. You can select Specify literal value, or Use value from data field.
   4. Choose Add Condition.

   In the Filters area, the second filter condition appears below the first condition, as shown in Figure 7-11. By default, the second condition is preceded by the logical operator, AND.

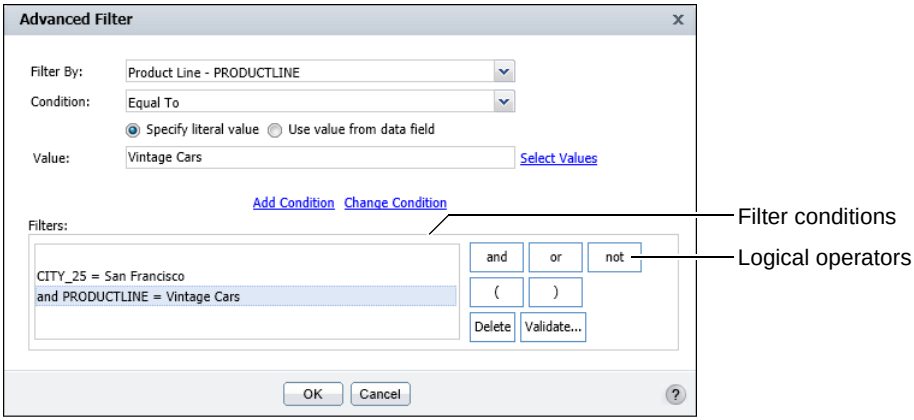


Figure 7-11 Adding or modifying a filter condition

5 Choose a different logical operator, if necessary.

6 Add additional filter conditions using the previously outlined method.

7 If you create more than two filter conditions and you use different logical operators, you can use the parentheses buttons to group conditions and define the order of evaluation of the filter conditions.

8 Choose Validate to verify the syntax of the filter conditions, then choose OK.

9 Verify that the report displays the results you need.

Selecting a logical operator

As you add each filter condition, Interactive Viewer adds the logical operator And between each filter condition. You can change the operator to OR. The AND operator means that both filter conditions must be true for a data row to appear in the report. The OR operator means that only one condition has to be true for a data row to appear. You also can add the Not operator to either the AND or OR operators to exclude a small set of data.

For example, the following filter conditions return only sales data for classic car items sold by the San Francisco office:

```
Sales Office = San Francisco
And Product Line = Classic Cars
```

The following filter conditions return all sales data for the San Francisco and Boston offices:

```
Sales Office = San Francisco
Or Sales Office = Boston
```

The following filter conditions return sales data for all product lines, except classic cars, sold by the San Francisco office:

```
Sales Office = San Francisco
And Not (Product Line = Classic Cars)
```

Specifying the evaluation order

Interactive Viewer evaluates filter conditions in the order in which they appear. If you define more than two conditions, use parentheses to group conditions to get the appropriate results. For example, A And B Or C is evaluated in that order, so A and B must be true or C must be true for a data row to be included. In A And (B Or C), B Or C is evaluated first, so A must be true and B Or C must be true for a data row to be included. To illustrate the benefit of using parentheses, compare the following examples.

The following filter contains four conditions and none of the conditions are grouped:

```
Sales Office = San Francisco
and ProductLine = Classic Cars
and Total >= 8000
or Profit >= 4500
```

Figure 7-12 shows the generated report. Although the filter specifies the San Francisco office and the Classic Cars product line, the report displays data for other sales offices and product lines. Without any grouped conditions, the filter includes rows that meet either conditions 1, 2, and 3 or just condition 4.

Sales Office:	London		
Product Line	Product Name	Total	Profit
Motorcycles			
	2003 Harley-Davidson Eagle Drag Bike	$11,503.14	**$5,495.82**
Motorcycles		*$11,503.14*	*$5,495.82*
London		*$11,503.14*	*$5,495.82*
Sales Office:	NYC		
Product Line	Product Name	Total	Profit
Classic Cars			
	1952 Alpine Renault 1300	$9,568.73	**$4,935.47**
	2001 Ferrari Enzo	$9,571.08	**$5,078.35**
Classic Cars		*$19,139.81*	*$10,013.82*
NYC		*$19,139.81*	*$10,013.82*
Sales Office:	Paris		
Product Line	Product Name	Total	Profit
Classic Cars			
	1952 Alpine Renault 1300	$10,072.00	**$5,143.00**
	1952 Alpine Renault 1300	$9,467.68	**$4,834.42**
	1969 Dodge Charger	$11,170.52	**$5,473.71**
	1992 Ferrari 360 Spider red	$9,449.40	**$4,775.40**
	2001 Ferrari Enzo	$8,434.52	**$4,515.33**
	2001 Ferrari Enzo	$9,974.40	**$5,386.08**

Figure 7-12 A report having multiple ungrouped filter conditions

The following filter contains the same four conditions, but this time the third and fourth conditions are grouped:

```
Sales Office = San Francisco
and ProductLine = Classic Cars
and (Total >= 8000
or Profit >= 4500)
```

Figure 7-13 shows the generated report using grouped filter conditions. In this example, only two rows meet the defined conditions. The Sales Office = San Francisco and ProductLine = Classic Cars conditions must be true, then either the Total >= 8000 condition or the Profit >= 4500 condition is true.

Sales Office:	San Francisco		
Product Line	**Product Name**	**Total**	**Profit**
Classic Cars			
	1952 Alpine Renault 1300	$10,286.40	**$5,554.56**
	1972 Alfa Romeo GTA	$8,616.96	**$3,133.44**
Classic Cars		*$18,903.36*	*$8,688.00*
San Francisco		*$18,903.36*	*$8,688.00*
		$18,903.36	*$8,688.00*

Figure 7-13 A report having grouped filter conditions

Changing a condition

In the Filters area on Advanced Filter, select the condition to modify, as shown in Figure 7-14. Modify the condition by changing the values in Filter By, Condition, or Value fields. Then, choose Change Condition. Choose OK to apply the modified condition.

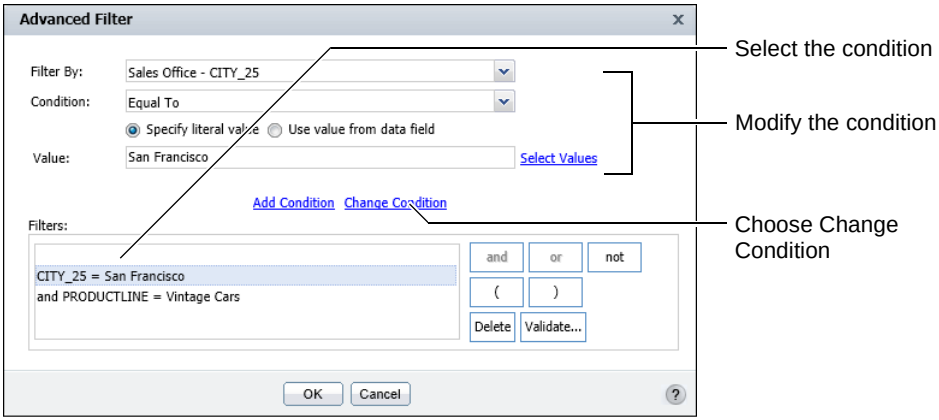


Figure 7-14 Changing a filter condition

Deleting a condition

To delete a condition, select the condition on Filter. Then, select Clear Filter. Choose OK.

To delete an advanced filter condition, in the Filters area on Advanced Filter, select the condition. Then, select Delete.

Verify that the remaining filter conditions are still valid.

Filtering data in a merged column

You can also filter data in merged columns. When working with merged columns, if you choose Filter from the context menu, Select Data Item appears, as shown in Figure 7-15, providing a drop-down list of columns in the merged column.

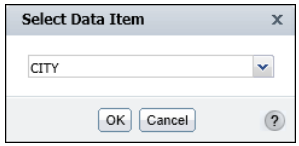


Figure 7-15 Selecting a data item

From the drop-down list, select the data item or column to filter data. Choose OK.

You can now create filters as described in the previous sections of this document. To modify each line of data in the merged column, repeat this step for each data item, and create a filter each time.

Chapter

8

Modifying charts

This chapter contains the following topics:

- About charts
- Types of charts
- Modifying charts in Interactive Viewer
- Modifying Flash charts and gadgets
- Modifying HTML5 charts

About charts

A chart is a graphical representation of data in a report. You use charts to display complex data in a format that is easily understood. A report can contain a chart that functions as a report itself, or it can combine a chart with other report elements to highlight relevant information. This section provides an overview of the different types of charts you can modify using Interactive Viewer, and explains how you can filter chart data, change chart subtypes, and format charts in a report.

A chart displays data as one or more sets of points. Charts are particularly useful for summarizing numeric data and showing the relationship between sets of values called series. The two types of series are category series and value series, typically denoted by the *x*- and *y*-axis. For example, a chart can show sales by region, average temperatures by month, or the price of a stock over three months.

Interactive Viewer also enables you to modify the subtype, formatting, and layout of Flash charts and Flash gadgets, as well as HTML5 charts, all of which are animated graphical representations of report data. This section describes Flash charts and Flash gadgets, and HTML5 charts, and explains how you can modify each of these BIRT report elements.

Types of charts

Specific types of data are best depicted with a specific type of chart. This section describes the common types of charts you can modify in Interactive Viewer.

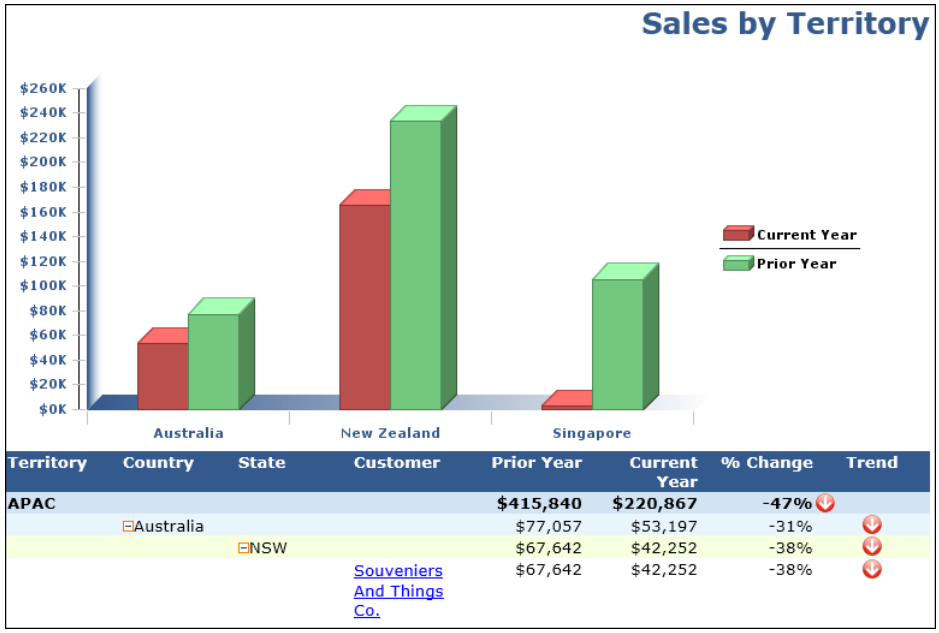
About bar charts

A bar chart typically displays data values as a set of vertical bars, but you can transpose the axis to display horizontal bars. When you view report data in a chart with vertical bars, you can easily compare the values. A bar chart is useful to show data changes from one time period to another, for example from one year, or quarter to another, or to illustrate comparisons among items.

Standard bar charts are side-by-side but you can have stacked and percent stacked bar charts that also show the relationship of individual items to a whole.

Side-by-side bar chart

Side-by-side bar charts show bars from each series, one beside the other. Each of these bars have the same width. The width depends on the number of series being plotted. Figure 8-1 shows a side-by-side bar chart that graphically presents a company's sales figures by geographical region.



Territory	Country	State	Customer	Prior Year	Current Year	% Change	Trend
APAC				$415,840	$220,867	-47%	
	Australia			$77,057	$53,197	-31%	
		NSW		$67,642	$42,252	-38%	
			Souveniers And Things Co.	$67,642	$42,252	-38%	

Figure 8-1 Side-by-side bar chart

Stacked bar chart

Stacked bar charts show bars stacked one above the other. The stacked bar chart shows totals for each series as well as the proportion that each series contributes to the grand total. The example in Figure 8-2 shows the company's sales figures for the current year and previous year, in the form of a stacked bar chart.

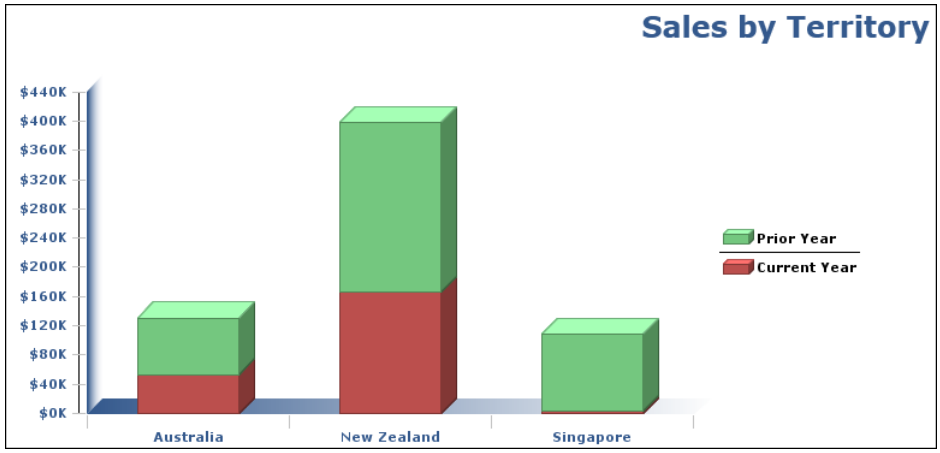


Figure 8-2 Stacked bar chart

Percent stacked bar chart

In a percent stacked bar chart, multiple series are stacked vertically and the values appear as a percentage of the whole. The example in Figure 8-3 shows the company's sales figures by geographical location in terms of a percentage of the whole. Figure 8-3 displays the sales values in percentages instead of the actual numbers shown in the previous bar charts.

The percent stacked bar chart is meaningful only when you need to display and compare multiple series. Do not use this chart subtype if you are displaying only one series, for example, only sales for Australia.

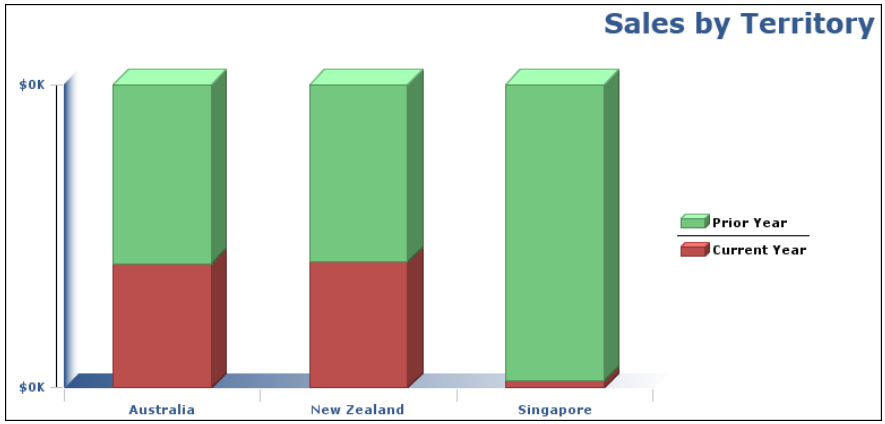


Figure 8-3 Percent stacked bar chart

About tube, cone, and pyramid charts

Tube, cone, and pyramid charts are variations of the bar chart that use tubular, conical, and pyramid-shaped risers in place of bars. You use a bar, tube, cone, or pyramid chart when.you want to display data values as a set of vertical or horizontal columns.

You can use Interactive Viewer to modify the subtype of tube, cone and pyramid charts to side-by-side, stacked, or percent stacked type depending on which type best represents the data being used. You can also specify formatting options for the chart, as described later in this document.

The example chart shown in Figure 8-4, Figure 8-5, and Figure 8-6 uses the same data, sales of a product line across quarters, to illustrate these different chart types.

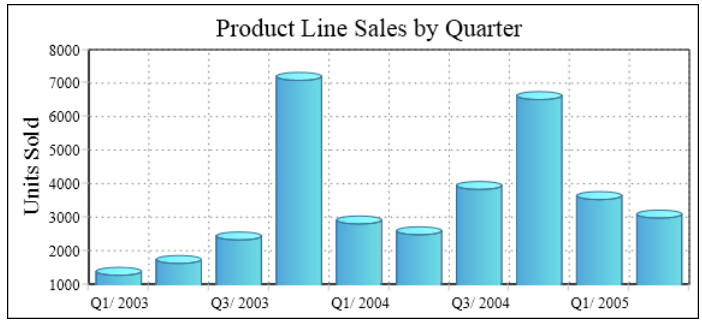


Figure 8-4 A tube chart showing sales by quarter

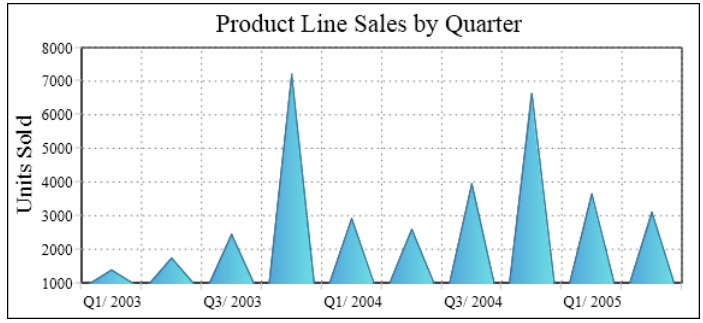


Figure 8-5 A cone chart showing sales by quarter

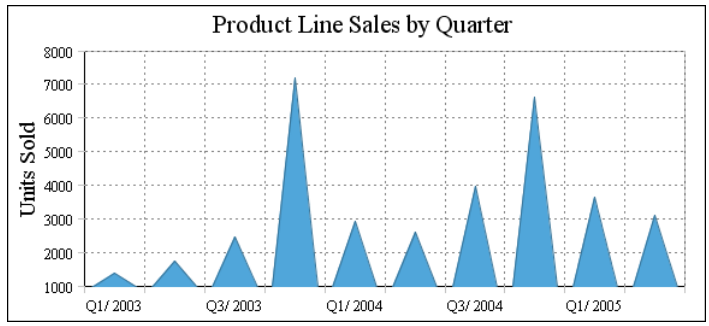


Figure 8-6 A pyramid chart showing sales by quarter

About area charts

An area chart displays data values as a set of points connected by a line, with the area shaded below the line. You use an area chart to present data that occurs over a continuous period of time. For example, you can use an area chart to view the percentage of orders and the corresponding unit volume for trains, ships, and planes over three months.

Stacked area chart

A stacked area chart consists of multiple series stacked vertically, as shown in Figure 8-7. The example shows that the stacked area chart is suitable for the data because the chart displays totals for all series as well as the proportion that each series contributes to the total. The height of the top line shows the total value for each category, for each quarter in this example. Each shaded area represents the sales amount for a specific region.

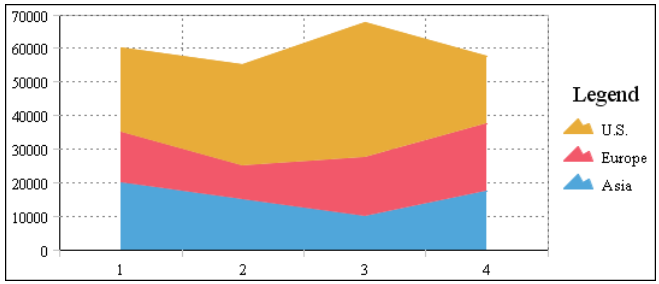


Figure 8-7 Area chart

Overlay area chart

Overlay area charts show areas from each series independent of each other. The areas appear by joining the values for the series. In an overlay area chart, the areas of multiple series overlap, as shown in Figure 8-8. As the example shows, this chart subtype is not suitable for showing multiple series if the data values overlap. Use an overlay area chart if you want to show only one series, for example, only sales for Asia.

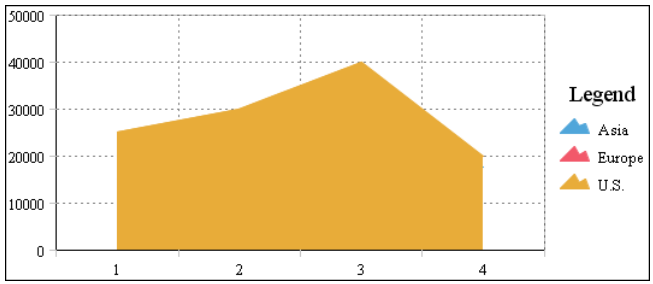


Figure 8-8 Overlay area chart

Percent stacked area chart

In a percent stacked area chart, multiple series are stacked vertically and the values appear as a percentage of the total. Figure 8-9 shows the sales values in percentages instead of the actual numbers as shown in the previous area charts.

The percent stacked area chart is meaningful only when displaying and comparing multiple series. If displaying only one series, the percent stacked area chart appears as in the example shown in Figure 8-10. The sales percentage of one region compared to the whole is 100%.

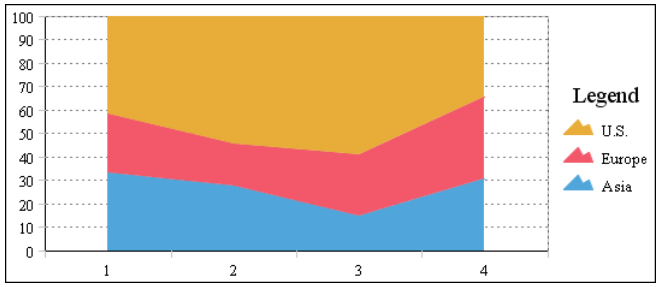


Figure 8-9 Percent stacked area chart showing sales figures

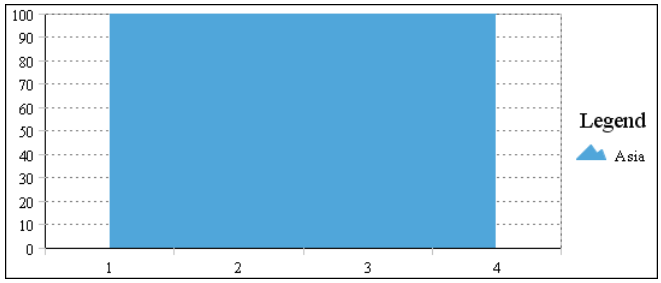


Figure 8-10 Percentage stacked area chart for a single series

About line charts

A line chart displays data values as a set of points connected by a line. You typically use line charts to present large amounts of data that occur over a continuous period of time. A line chart is the most basic type of chart in finance. Figure 8-11 shows an example of a line chart, displaying the value of the Euro against the US Dollar over 10 days.

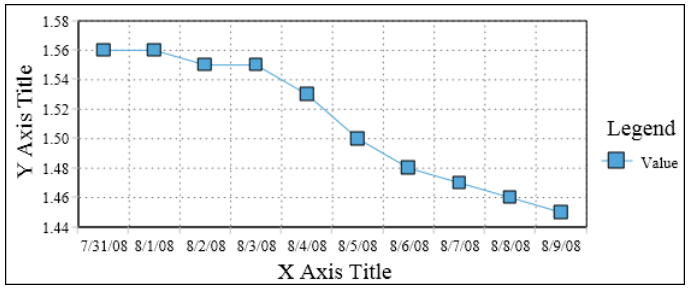


Figure 8-11 Line chart displaying currency exchange rates

A line chart is similar to an area chart, except that it does not fill in the area below the line, and it uses a square to mark each data value. There are three subtypes of line charts.

Overlay line chart

In an overlay line chart, multiple series appear as overlapping lines, as shown in Figure 8-12. The squares mark each data value. Overlay line charts show lines from each series independent of the others. The lines appear joining the values for the series.

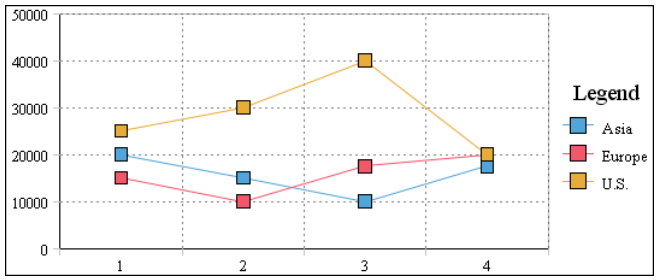


Figure 8-12 Overlay line chart showing sales by quarter across regions

Stacked line chart

In a stacked line chart, multiple series are stacked vertically, as shown in Figure 8-13. The stacked line chart shows totals for each series as well as the proportion that each series contributes to the grand total. In the example, the top line shows the total sales amounts for each quarter. The empty area between each line represents the sales amount for a region.

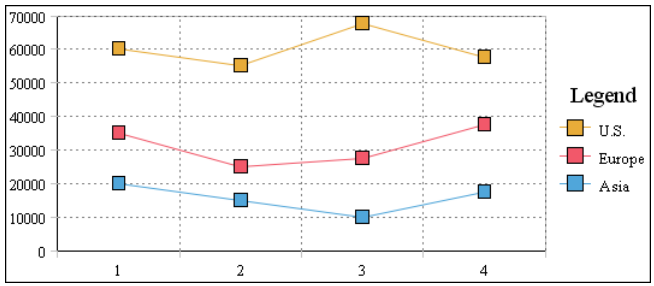


Figure 8-13 Stacked line chart

The stacked line chart is not as effective as the stacked area chart for comparing the amount that each region series contributes to the total because the areas are not shaded. In a stacked area chart, the shaded areas provide a clear visual cue that each part is compared to the whole.

In addition, as the example shows, a user can easily misinterpret the data in a stacked line chart. There is no obvious indication that the top line shows the total

sales amount for each quarter and that the middle line shows the difference in the sales amount between Europe and Asia. A user viewing this chart can misinterpret the top line to represent the sales data for the U.S., the middle line to represent the sales data for Europe, and the bottom line to represent the sales data for Asia.

Percent stacked line chart

A percent stacked line chart consists of multiple series stacked vertically and the values shown as a percentage of the whole. As shown in Figure 8-14, the sales values appear as percentages instead of numbers. Like the percent stacked area chart, the percent stacked line chart makes sense only when displaying and comparing multiple series. Do not use this chart subtype if you are displaying only one series, for example, only sales for Europe. Like the stacked line chart, the percent stacked line chart is not as effective as the percent stacked area chart.

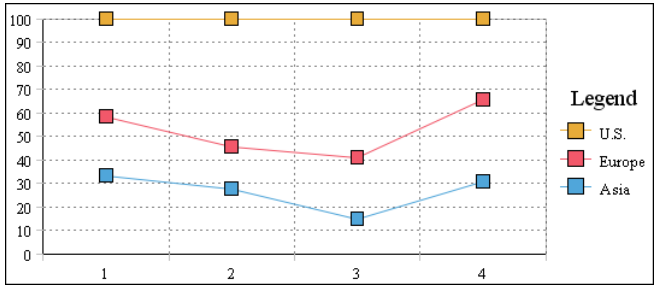


Figure 8-14 Percent stacked line chart

About pie charts

Pie charts show values as slices of a pie. The size of each slice is proportional to the value it represents. You plot pie charts for multiple series as multiple pies, one for each series. You use a pie chart to show the relationship of parts to the whole. For example, Figure 8-15 shows the contribution of each state to the total sales of a product.

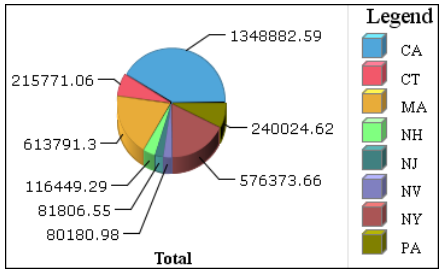


Figure 8-15 Pie chart

About meter charts

A meter chart is very effective when showing a small number of values in a prominent manner. A meter chart displays a value as a needle pointer on a circular or semicircular dial. You can use a meter chart to create a gauge or dashboard display. As Figure 8-16 shows, a meter chart resembles a speedometer, with tick marks and numbers, showing a range of values. In this example, the meter chart displays two pointers that represent two values, projected sales total and actual sales total.

You can show multiple dials in a chart, or one dial with multiple needles, by using a superimposed meter chart. For example, you can use one needle to show interior temperature, and another to show exterior temperature.

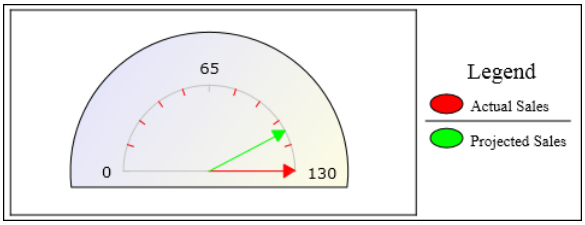


Figure 8-16 Meter chart showing projected sales and actual sales

Standard meter chart

A standard meter chart displays multiple values in multiple dials, where each dial displays a single value. The meter chart shown in Figure 8-17 displays the same data as the chart in Figure 8-16, by using two dials instead of a single dial.

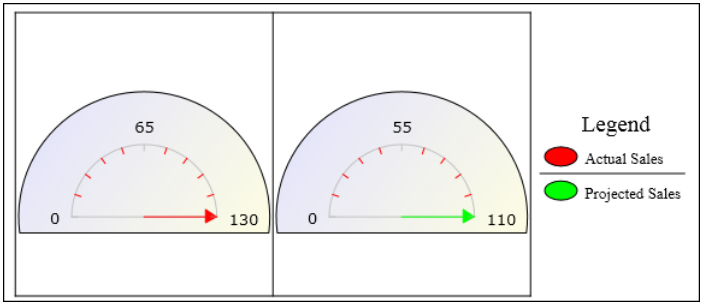


Figure 8-17 Standard meter chart

Superimposed meter chart

A superimposed meter chart displays multiple values in a single dial, as shown in Figure 8-16. The dials overlap each other so that the chart can represent multiple needles within a single region.

About stock charts

A stock chart shows data as points on a time continuum, such as days of the week. Stock values appear as a candlestick, a box with lines extending up and down from the ends. Open and close values mark the upper and lower edges of the box. High and low values mark the upper and lower points of the line.

Although a stock chart typically displays stock price data, you can also use a stock chart to show scientific data, such as temperature changes over time.

Candlestick stock chart

Candlestick stock charts contain boxes with lines extending up and down from the ends. The upper and lower edges are the open and close values of the stock. The upper and lower points of the line are the high and low values of the stock, as shown in Figure 8-18. The top and bottom of each box indicate the open and close values. If the close value is higher than the open value, the box is white. If the open value is higher than the close value, the box is shaded. This style immediately provides information about whether a stock posted a gain or a loss for a given day.

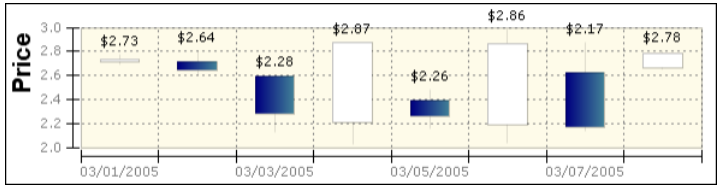


Figure 8-18 Candlestick stock chart

Figure 8-19 displays the data used for the stock charts shown in Figure 8-18 and Figure 8-20.

Weekly Price Summary	
High:	$2.98
Low:	$2.03
Ave. Open:	$2.51
Ave.Close:	$2.57

Figure 8-19 Stock chart data

Bar stick stock chart

Bar stick stock charts consist of a vertical line with two horizontal lines called ticks attached to it. The upper and lower points of the vertical line are the stock open and close values. The ticks are the high and low values, as shown in Figure 8-20.

Figure 8-20 Bar stick stock chart

The chart in Figure 8-18 shows that the stock posted a gain on the fourth and sixth day in the trading week and a loss on the other five days. The example in Figure 8-20 shows a stock with moderate fluctuation. When the stock is volatile on a given day, the two horizontal lines can appear far above or below the vertical line. As you can see from the examples, the candlestick stock chart shows the gain or loss pattern more clearly than the bar stick stock chart.

About scatter charts

A scatter chart presents data as *x-y* coordinates by combining two sets of numeric values into single data points. A scatter chart typically displays scientific and statistical data, because it shows if there is a relationship between two sets of measurements. Use a scatter chart to compare, for example, salaries and years of experience, weight and body fat, rainfall amounts and pollen levels, or test scores and hours of study. The greater the number of data values you include in a scatter chart, the clearer are the trends the data reveals.

A scatter chart shows data as points. Scatter charts display values on both axes. For example, the chart in Figure 8-21 shows the relationship between salary and years of experience. Each pair of values, salary and years of experience, is plotted as a single *x-y* value. The chart reveals a positive, or direct, relationship between salary and years of experience. As the number of years increases, the salary also increases. The chart also displays the salaries earned by men and women. In this example, the chart reveals that men consistently earn more than women.

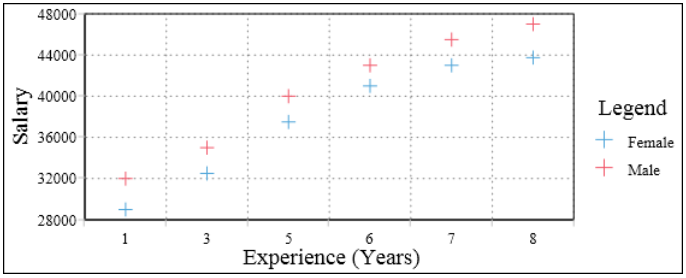


Figure 8-21 A scatter chart displaying the average salaries by years of experience

About bubble charts

A bubble chart resembles a scatter chart, but uses bubbles instead of data points. You choose a bubble chart instead of a scatter chart if you have three values per data point. For example, Figure 8-22 shows a bubble chart that plots the retail against the wholesale prices of products, calculates the discount, and uses the size of the bubbles to show the amount of the discount. The color-coding of the bubble identifies the product type. Bubble charts typically describe financial data. Use a bubble chart when you want to represent data using more than two values.

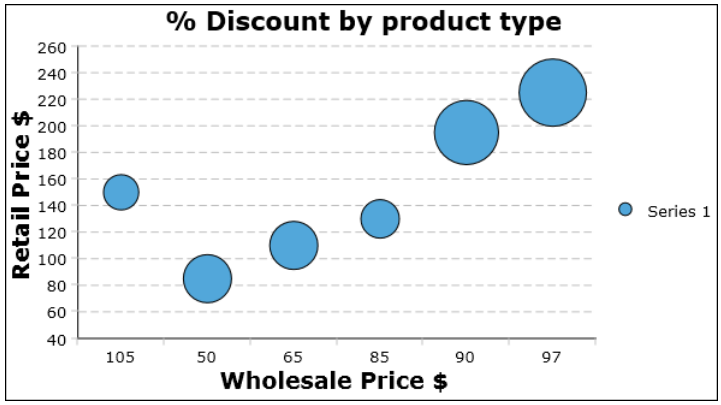


Figure 8-22 Displaying discount percentage for product types

About difference charts

A difference chart typically shows variation between two sets of data by shading the areas between points of comparison. You use a difference chart when you want to use shading and multiple graphs to accentuate the deviation between data variables. The chart shown in Figure 8-23 displays the lead time between the shipped date and the required date from the order date.

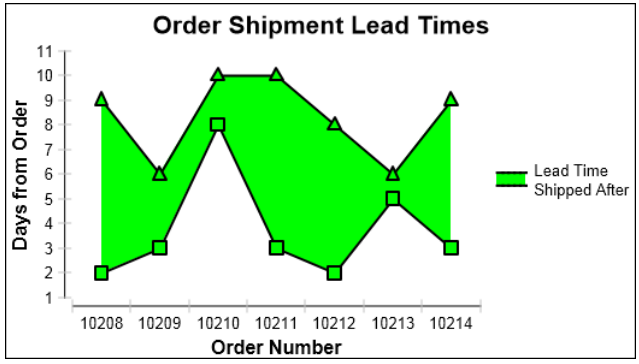


Figure 8-23 A difference chart displaying the time taken to ship orders

Modifying charts in Interactive Viewer

The basic characteristics of a chart are determined in the report design. You can modify the chart in Interactive Viewer in the following ways:

- Change the chart subtype.
- Filter data.
- Format the chart.

To choose any of these options, select the chart to highlight it, then right-click the chart area to display the context menu containing these options.

Changing chart subtype

Area charts, bar charts, cone charts, line charts, pyramid charts, and tube charts have a stacked subtype and a percent stacked subtype. In a stacked chart, the data points from one value series are arranged on top of the data points of another series. You can choose the percent stacked subtype to show the contribution of individual items to the whole.

If a type of chart offers subtypes, you can change the subtype in Interactive Viewer. Many chart types offer two-dimensional subtypes, in which the chart shape appears flat against the chart background. You can also display some charts in two dimensions with depth, or three dimensions. A chart with depth appears to have added dimension.

How to modify the chart subtype

1. Select the chart to highlight it. From the context menu choose Change Subtype.
2. On Chart Subtype choose an option from the available subtypes. Choose OK to apply your selection.

Filtering chart data

You can filter chart data in the same way that you apply filters to data in any report column. In a chart you can filter data on the *x*-axis or the *y*-axis. Select the chart, then choose Filter from the context menu. Chart Filter appears, as shown in Figure 8-24. Complete the steps to apply filters that define what data is displayed on the axes of the chart.

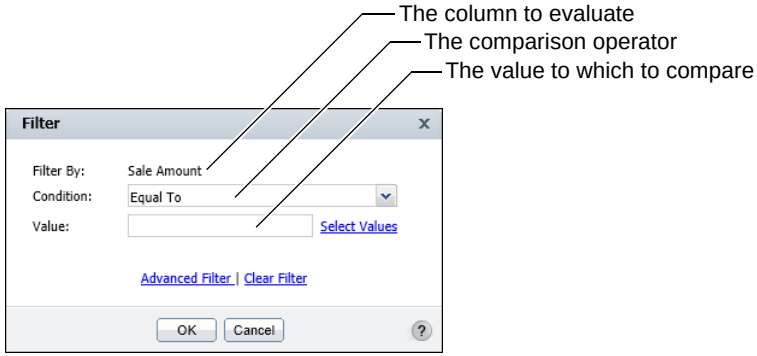


Figure 8-24 Creating a filter condition for a chart

You can set limitations on the data that the chart displays by applying a filter in the same way that you would for any report column. You can also change an existing filter condition or add conditions by choosing Advanced Filter from Chart Filter, as shown in Figure 8-25.

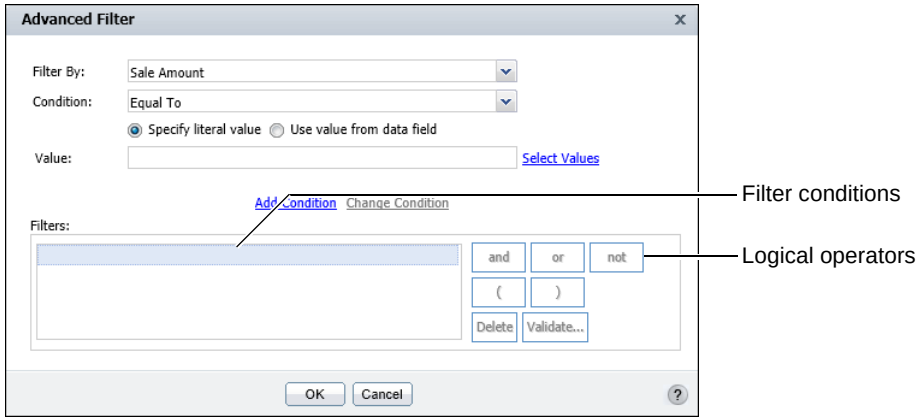


Figure 8-25 Adding and modifying a filter condition for charts

Formatting the chart

Charts include many different visual elements, as shown in Figure 8-26. You can customize the appearance of many of these elements using Interactive Viewer. To clarify the presentation of data, or to create a more pleasing composition, you can rearrange the layout of the chart. Some of the formatting for a chart, such as the colors of the bars in a bar chart and the background color of the chart, are defined in the original report, and cannot be modified. When viewing the report you can modify the fonts and font sizes of the chart title and axis labels, and the height and width of the chart. You can hide axis labels, place labels at an angle relative to the axis, and hide the legend or determine where to display the legend in relation

to the chart. Depending on the type of chart you are working with, you can also transpose the axes in some cases.

Figure 8-26 displays the elements of a basic bar chart that you can format using Interactive Viewer. In this example, the category series consists of a set of regions, and the value series consists of a set of sales figure values.

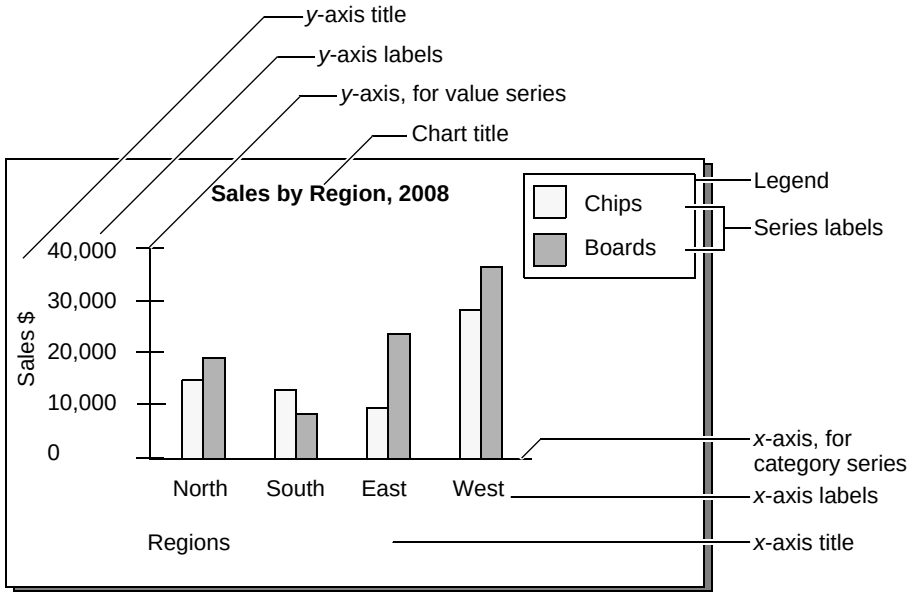


Figure 8-26 Elements of a chart

As mentioned in an earlier section, a chart organizes data points into value sets called series. Series can be of two types—a category series and a value series. The category series typically determines what text, numbers, or dates you see on the *x*-axis. The value series typically determines the text, numbers, or dates on the *y*-axis. A value axis positions data relative to the axis marks. The value of a data point determines where it appears on a value axis. You do not plot text on a value axis. In most charts with axes, the *x*-axis is the category axis, and the *y*-axis is a value axis.

The plotting options available for the *x*- and *y*-axes can differ in name and function, depending on the chart type. For example, when you modify a meter chart, which has no axes, you define the position of a needle on the dial instead of defining the *y*-axis. When you modify a pie chart, you define the size of the slices instead of the *y*-axis.

Using Interactive Viewer, you can change the titles of the axes, modify the scale of the *y*-axis, and modify the labels on the *x*-axis, by changing the way the values are displayed, and the existing interval. The following section describes how to perform each of these tasks.

Formatting the legend, title, and size of a chart

When you modify a chart, you can add a legend title, choose to display or hide the legend on the chart, and determine the legend position. You can modify the font, size, color, and style of the legend and in some cases legend items. You can also choose to display or hide the chart title and modify the appearance of the title text in the usual ways, by changing its font properties. In addition, you can modify the chart's size and the display dimension of a chart.

How to change the title of a chart

1. Select the chart, and choose Format Chart from the context menu.
2. On Format Chart, shown in Figure 8-27, in Chart, in Title, you can type a title for the chart, or select Auto to enable Interactive Viewer to specify a title. To specify font properties, select Title Font. On Font, specify the font, size, color, background color, and style. You can Preview your selection in the next field. Choose OK.

How to change the size of a chart

On Format Chart, in the Chart area, type the new values in the Width and Height fields, then choose a unit of measurement from the next drop-down list. The example shown in Figure 8-27 uses the unit of measurement, inches.

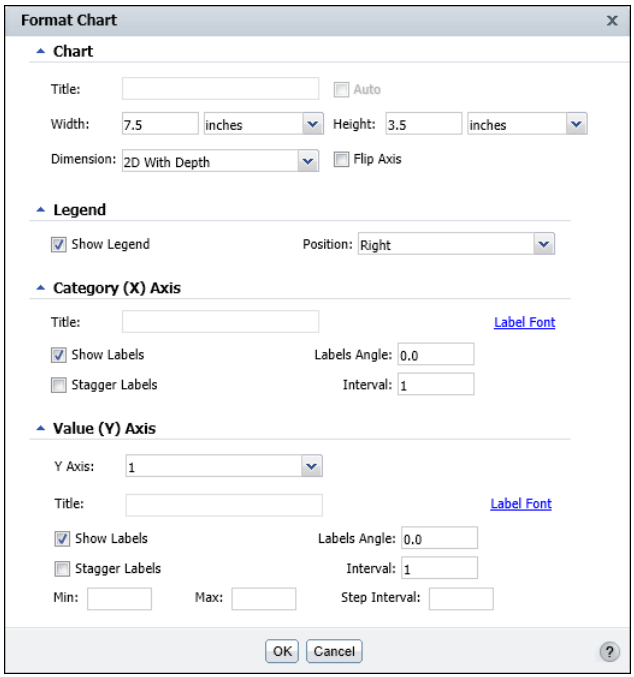


Figure 8-27 Formatting a chart

How to modify the dimension of a chart

Choose a dimension for the chart from the Dimension list. You can choose one of the following:

- 2D
- 2D with depth
- 3D

You can select two-dimensional subtypes for all charts. Choosing 2D displays the chart flat against the chart background. When you choose the 2D dimension for a column or bar chart, Interactive Viewer highlights the Use Glass Style field by default. This option displays the chart with rounded edges in a column or bar chart. Deselect this option to display a column or bar chart with sharp edges. Choosing 3D displays the chart against an additional axis to the existing *x*- and *y*-axes, providing greater depth. Choosing 2D with depth, also gives the chart an appearance of depth.

Figure 8-28 shows an example of a bar chart with a dimension setting of 3D on the left, and the same bar chart using a dimension setting of 2D with depth, on the right. Three-dimensional charts show how an object on the *z*-axis changes according to the *x*- and *y*-axes. The bar chart with two-dimensional depth setting gives the appearance of a three-dimensional object, but is arranged on the *x*- and *y*-axes only.

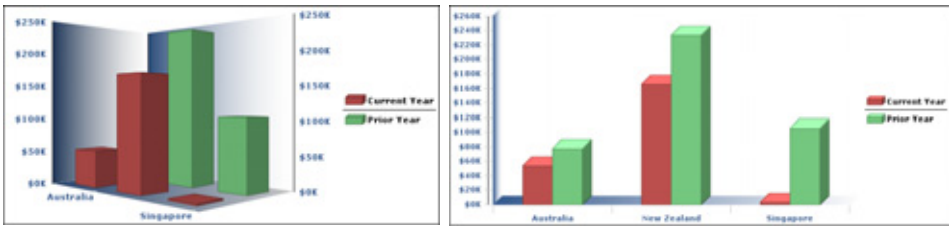


Figure 8-28 Comparing charts with 3D and 2D with depth settings

How to interchange the axes of a chart

To interchange the *x*- and *y*-axes of a chart, select Flip Axis in the Chart area on Format Chart. You can flip the axes for some chart types. If this feature is available for the chart type you are using, the Flip Axis box is visible.

How to format the legend of a chart

1. On Format Chart, select Show Legend to display a legend for the chart. If you do not select this box, the legend does not appear on the chart. In Position, select an option from the list to place the legend above, below, to the right, left, or inside the chart.

2 Type a title for the legend. If you leave this field blank, no legend title appears on the chart. In some cases, you can also specify font properties for the legend title and each legend item.

Formatting the *x*- and *y*-axes of a chart

You can use Interactive Viewer to modify axes titles of a chart, and the axis labels. You can also delete axis titles, and suppress labels. Figure 8-29 shows an example of the Format Chart dialog box.

Changing the axis titles

Charts other than pie charts and meter charts can have *x*-axis and *y*-axis titles. To add and format an axis title, using Format Chart, you can hide tan axis title, or modify an existing title. On Format Chart, in the *y*-axis section, type a title in the Title field. Then modify the font properties by choosing Title Font.

Changing the axis labels of a chart

A chart displays axis labels by default, to the left of the vertical axis, and below a horizontal axis. Using Interactive Viewer, you can specify whether to hide or display labels, and modify the position and appearance of labels so that they are easier to read. For example, you can rotate or stagger the labels on the *x*-axis so that they are easier to fit on the chart and read. You can also modify the label font by selecting Label Font and setting new font properties.

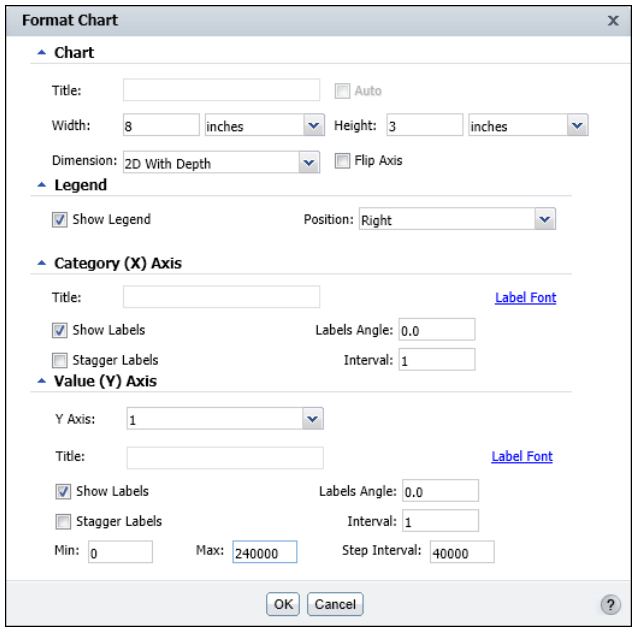


Figure 8-29 Formatting the axes

Sometimes a chart displays so many values on an axis that the label text overlaps and is not legible. You can rotate the labels at an angle relative to the axis or stagger the labels, so that they do not overlap, as shown in Figure 8-30. For example, you can show data points for every third month, every ten days, every other year, and so on. To change the label properties, navigate to Format Chart and specify the values in the Category (*X*) axis title area.

How to modify the axes labels of a chart

On Format Chart, complete the following steps:

1. You can specify the title of value or *y*-axis for a chart. You can also specify the title for an additional *y*-axis, if the chart contains more than one.
2. To display labels, select Show labels. To hide labels, deselect Show Labels.
3. To rotate the labels, specify a degree of rotation in the Labels Angle field.
4. To stagger labels, select Stagger Labels.
5. If label names are too long, or if the chart looks too crowded when you display all the labels, you can use Interactive Viewer to specify which labels to skip so that only the other labels appear on the chart. To skip labels, set the Interval value at which labels should appear. For example, to show every other label, use an Interval value of 2. To show every fifth label, use an Interval value of 5, and so on.You can also modify the font properties for labels by choosing Label Font. The example in Figure 8-30 shows a chart on the left with staggered labels, and one on the right with rotated labels.

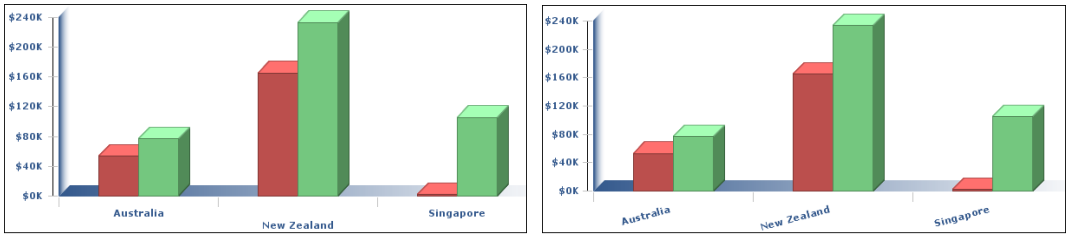


Figure 8-30 Staggered labels and rotated labels

Modifying scale

You can modify the scale of the value axis using Interactive Viewer to fit the data that the axis displays. Category axes do not support scale changes. The scale determines the range of values on a linear, logarithmic, or date-and-time axis. You can use the axis scale to change the following settings:

- Minimum and maximum values for an axis
- Step interval

  Step Interval is the interval between each value on the value axis or the distance between major grid marks.

To set the scale of the *y*-axis, on Format Chart type values for minimum, maximum, and step interval in the Value (*Y*) axis area. The chart on the left in Figure 8-30 uses a scale between 0 and 240000 and a step value of 40000.

Drilling up or down data hierarchies in a chart

In some charts that contain hierarchical data, such as a chart in a cross tab, Interactive Viewer supports drilling down into category or value series to view more detailed data, or drilling up to view summary data. In a chart, drill-up or drill-down capability is available for a category or value series. For example, if the category axis of a chart displays location in regions, such as North America, EMEA, APAC, and so on, you can select a region to view detailed data for that region. You can then select each country in the region to view detailed data for that country, and select each city to view details about sales, customers, and so on, in the selected city. Similarly, you can drill up from a city view, to get a summarized country view of the data, or a broader region view of the data.

In the following example, the category axis displays time in years. By selecting the label for each year, you can drill down to view detailed data for each quarter in the year and further to view details for each month in the quarter. Similarly, you can drill up to view summarized data for the same hierarchies. You can drill up from a month view, to a quarter view, or directly to a year view of the data in the chart. This section also explains how you can perform a similar action on hierarchical data in a value series.

How to drill down through a category series to view detailed information

1 In Interactive Viewer, select the chart. From the chart menu, choose Drill into 'Year', as shown in Figure 8-31.

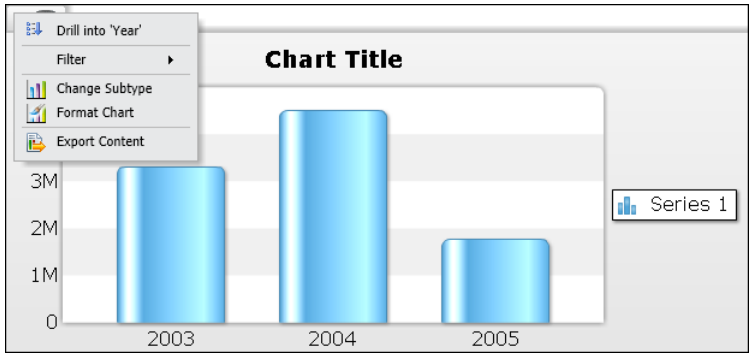


Figure 8-31 Drilling into a year category

2 Categories appears listing the years for which data is available. Select a year from the list, as shown in Figure 8-32. Choose OK.

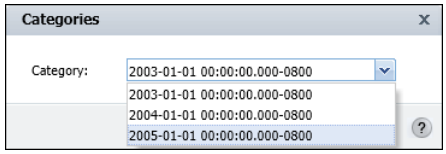


Figure 8-32 Selecting a year

The chart displays data for the selected year, as shown in Figure 8-33.

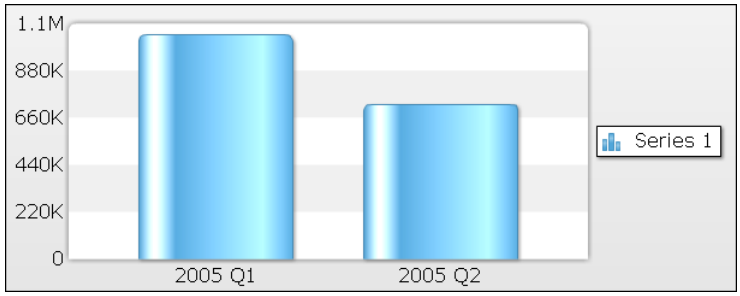


Figure 8-33 Chart displaying data for two quarters in the year 2005

3 To drill further into subcategories of the data, from the chart menu, choose Drill into 'Quarter'.

4 Categories appears listing the quarters for which data can be viewed. Select the quarter for which you want to view detailed data, then choose OK.

The chart displays data for the quarter you selected.

How to drill up through a category series to view summary information

To drill up to a higher level in the data hierarchy, from the context menu, as shown in Figure 8-34, choose Drill up to 'Year' or Drill up to 'Quarter'.

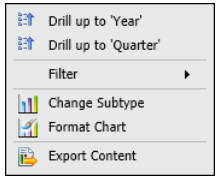


Figure 8-34 Drill-up menu

The chart in the report displays the data for the selected category.

In the following example, the category axis displays the Product Line, and the value axis displays sales. The data in the value series is grouped by year. You can drill down to view sales by product line for each year, or up to a higher level to view summary information across years.

How to drill down through a value series to view detailed information

1 In Interactive Viewer, select the chart. From the chart menu, choose Drill into 'Year,' as shown in Figure 8-35.

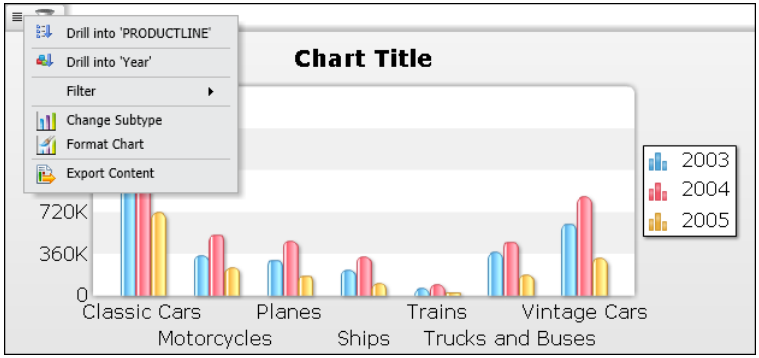


Figure 8-35 Drilling into time series

2 Series appears listing the years for which data is available. Select a year from the list, as shown in Figure 8-36. Choose OK.

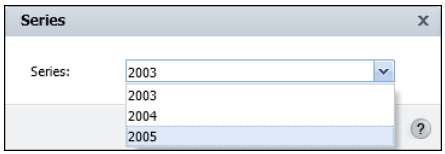


Figure 8-36 Selecting a series value

The chart displays data for the selected year, 2005, as shown in Figure 8-37.

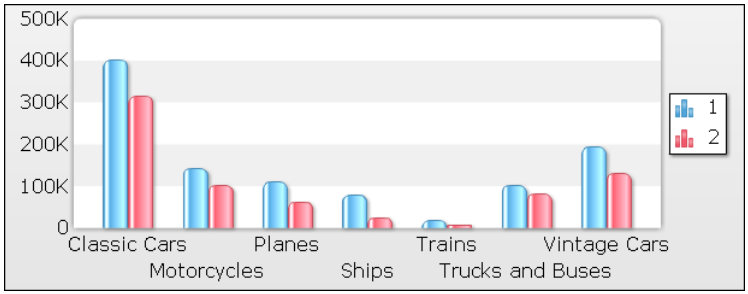


Figure 8-37 Chart displaying sales for each quarter in 2005

3 To drill further into subcategories of the data, from the chart menu, choose Drill into 'Quarter'.

4 Series appears listing the quarters for which data can be viewed. Select the quarter for which you want to view detailed data, then choose OK.

The chart displays data for the quarter you selected.

How to drill up through a value series to view summary information

To drill up to a higher level in the data hierarchy, from the context menu, as shown in Figure 8-38, choose Drill up to 'Year.' The chart in the report displays the data for the selected series.

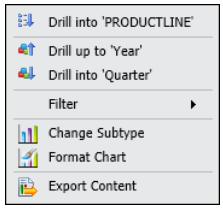


Figure 8-38 Selecting an option to view summary data

Interactive Viewer supports drill-up and drill-down capability for the following types of charts:

- Bar
- Line
- Area
- Pie
- Scatter
- Bubble
- Stock
- Difference
- Tube
- Cone
- Pyramid

Switching views between a chart and a report element

If data in a report table or a cross tab is also represented graphically in a chart, in some cases you can switch between the chart view of the data, and the tabular view of the data, using Interactive Viewer. The report developer must set this option when designing the report element and chart, for a user to be able to switch views in Interactive Viewer.

How to switch between a table and chart view of data

In Interactive Viewer, select the table, and choose Switch View from the main menu. The chart view of the data appears.

If you are working with a cross tab, choose Switch View from the context menu. You can also further Analyze the data in a cross tab, by choosing the Analyze option from the context menu. The cross tab is appears in BIRT Data Analyzer if you have purchased this licensed option.

Similarly to switch back to the table view, choose Switch View from the chart menu, as shown in Figure 8-39. The table or cross-tab view of the data appears.

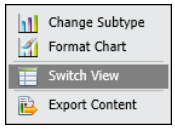


Figure 8-39 Selecting Switch View

Exporting data from a chart

You can export data from a chart to a flat file format, that uses a comma, tab, pipe, or semicolon delimiter. These file formats can be read by Microsoft Excel.

How to export data from a chart

Select the chart, and choose Export Data from the chart menu. On Export Data, specify the data to export, and other options, in the same way you did when exporting report data.

Exporting a chart

You can export a chart to Excel, Excel 2007 and 2010, Microsoft Word, Microsoft Word 2007 and 2010, Microsoft PowerPoint, Microsoft PowerPoint 2007 and 2010, PDF, and PostScript formats.

How to export a chart to other formats

Select the chart, and choose Export Content from the chart menu. On Export Content, specify the options in the same way you did when exporting report content. Additionally, you can specify:

- Resolution in DPI at which to export the chart
- Exporting the chart as an image

Modifying Flash charts and gadgets

Standard charts display data statically. Flash charts can contain animation or other features that Flash provides. Flash charts are similar to standard charts, and are used in the same manner. Flash gadgets are a chart-like set of visualizations that generally display a single value, such as a meter or a gauge.

Flash charts and gadgets add animation and other visual elements that display data in a manner that is easy to understand. Gadgets differ from charts in that they generally only display a single value or a set of independent values and can represent less complex sets of data.

If your report contains Flash charts and gadgets, you can use Interactive Viewer to modify the subtype of the chart or gadget, format the information that the chart or gadget illustrates, create filters for chart or gadget data, and export chart or gadget data, in a manner that is similar to performing these actions for standard chart data.

The example in Figure 8-40 shows a doughnut chart on the left, and a segmented doughnut chart on the right.

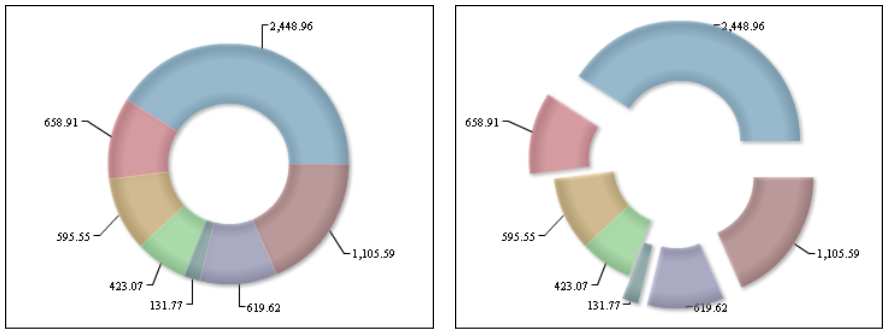


Figure 8-40 Regular and segmented doughnut Flash chart

Sometimes, based on the type of Flash chart or gadget you use, additional options are available in the context menu. For example, if you use a pie or doughnut chart, you can enable rotation, or enable slicing-off of the segments of the chart when you choose each segment. If you use a Flash bar chart, you can move the labels by dragging them from their original position and dropping them in a new position.

Using Flash gadgets

You can work with meter, linear gauge, cylinder, thermometer, bullet, and sparkline gadgets using Interactive Viewer. The following section describes these gadgets and shows examples of each type of gadget.

Meter gadget

A meter is similar to the speedometer or fuel gauge of a car. It uses a radial scale to display the data range, and a dial to indicate the data value. A meter displays the specific data, utilizing an indicator that moves within a circular range to indicate whether the monitored data is within defined limits. You can select colors for the data range to suit the application, such as green for satisfactory, yellow for caution, and red for alarm.

You can convert meter gadgets into linear gauge gadgets as described later in this document. The example in Figure 8-41 shows shipped orders illustrated using a meter gadget.

Figure 8-41 Meter gadget

Linear gauge gadget

A linear gauge is a slider gauge with many additional features. It uses a horizontal scale to display your data range and fully configured data needles to indicate data values.

You can convert linear gauge gadgets into meter gadgets. The example in Figure 8-42 uses a linear gauge to illustrate the amount for resolved orders.

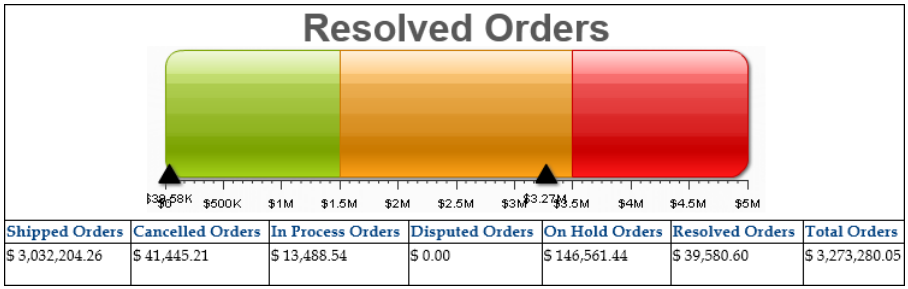


Figure 8-42 Linear gauge gadget

Cylinder gauge gadget

A cylinder gauge is represented by a vertical cylinder, whose fill level is indicative of the data to be displayed. It is used to show inventory levels, power plant reports, and fuel levels. The example in Figure 8-43 uses a cylinder gadget to illustrate the amount for orders that are on hold.

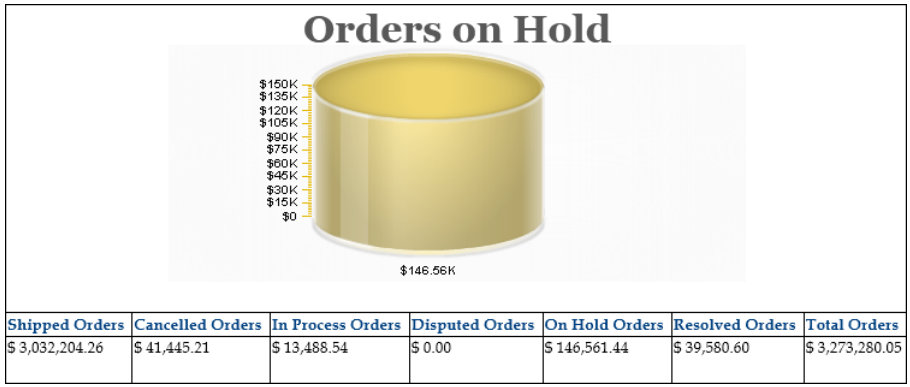


Figure 8-43 Cylinder gadget

You can convert cylinder gadgets into thermometer or bullet gadgets, as described later in this document.

Thermometer gadget

A thermometer gadget, as the name implies, displays temperatures. The fill level of the thermometer indicates the data to display.

You can convert thermometer gadgets to cylinder gadgets or bullet gadgets, as described later in this document. The example in Figure 8-44 shows a thermometer gadget illustrating the amount for cancelled orders.

Figure 8-44 Thermometer gadget

Bullet gadgets

A bullet gadget is a variation of a bar chart and serves as a replacement for dashboard gauges and meters, which typically require too much space, and are

cluttered with distracting decoration. There are horizontal and vertical bullet gadgets. The example in Figure 8-45, shows a horizontal bullet gadget, illustrating the amount for orders in progress.

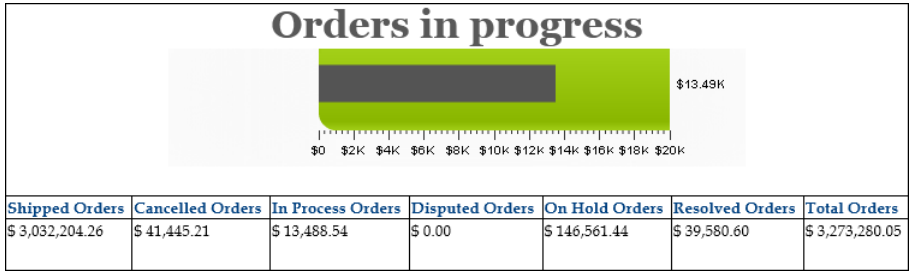


Figure 8-45 Bullet gadget

You can convert bullet gadgets into cylinder gadgets or thermometer gadgets, as described in this document.

Sparkline gadget

Sparkline gadgets are data-intense, design-simple, word-sized graphics charts for embedding in a context of words, numbers, and images. Whereas the typical chart shows as much data as possible, and is set off from the flow of text, sparkline gadgets are succinct, memorable, and located where they are discussed. The example in Figure 8-46, shows a sparkline gadget illustrating the volatility of product line orders. Sparkline gadgets have no subtypes.

Figure 8-46 Sparkline gadgets

The use of sparkline gadgets inline typically means that they are about the same height as the surrounding text. Also, sparkline charts can be used in space-efficient executive dashboards to show a lot of KPIs in a single view.

Modifying the subtype of a Flash chart or gadget

You can modify Flash charts in the same way that you modify a standard chart. Similar chart subtype options are available in the standard chart subtype and Flash chart subtype menus. For Flash gadgets the available subtypes depend on the gadget. For example, you can change the subtype of a meter gadget to a linear gadget, or change the subtype of a bullet gadget to a cylinder or thermometer gadget.

How to modify the subtype of a Flash chart

1. To change Flash chart subtypes, select the chart or gadget to highlight it, then choose Change Subtype from the chart menu.
2. On Chart Subtype, select a subtype, then choose OK.

How to modify the subtype of a Flash gadget

1. To change Flash gadget subtypes, select the gadget to highlight it, then choose Change Type from the gadget menu.
2. On Flash Gadget Type, select the subtype. Then, choose OK.

   The example in Figure 8-47, shows how you can change the subtype of a meter gadget to a linear gauge.

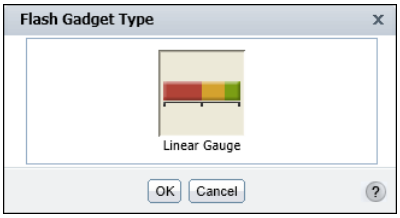


Figure 8-47 Changing the subtype of a meter gadget

In the example in Figure 8-48, you change the subtype of a cylinder gadget to a bullet, or thermometer gadget.

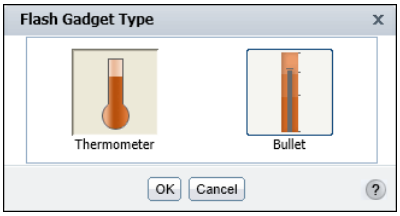


Figure 8-48 Changing the subtype of a cylinder gadget

Formatting a Flash chart

You can format data in Flash charts in the same way that you format data in a standard chart. You can modify the font used for the chart title, the axes, the legend, and the tooltip of a chart. The font used for the tooltip is called the base font. The font used for the chart title, axis labels, and legend is known as outside font. You can specify the font type, size and color for base fonts and outside fonts.

How to format a Flash chart

To format a Flash chart, select the chart. Then, choose Format Chart from the chart menu and modify the information on Format as needed. Choose OK.

Formatting a Flash gadget

Each gadget has a different set of formatting properties, which change specific aspects of the gadget's appearance. Figure 8-49 displays the formatting options you can modify in a linear gauge gadget. Figure 8-50 and Figure 8-51 display the Format Flash Gadget dialog box for the linear gauge gadget.

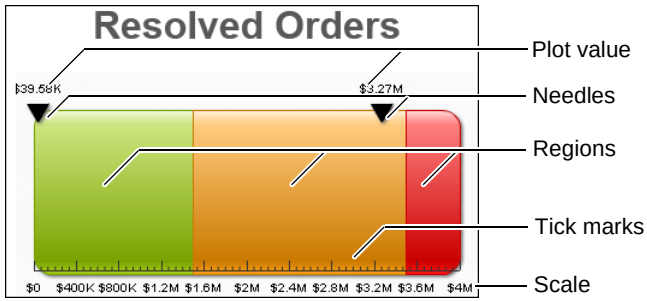


Figure 8-49 Formatting options displayed for a linear gauge gadget

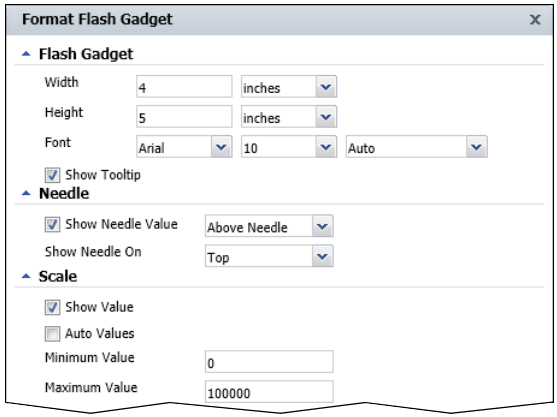


Figure 8-50 Formatting Flash gadget dimensions, needle values, and scale

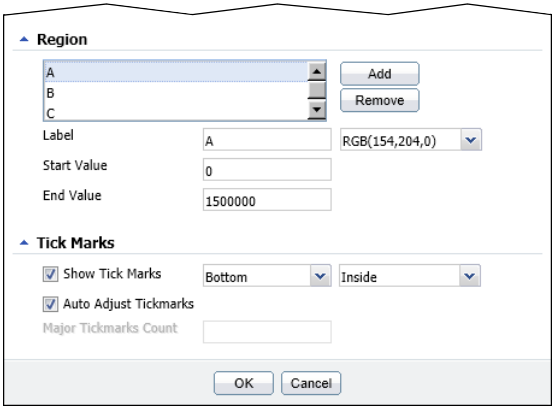


Figure 8-51 Formatting Flash gadget region and tick marks

For each Flash gadget you can modify a set of general formatting options, as well as needle, plot, scale, region, tick marks, and value properties.

The following section describes the formatting options you can modify for each type of gadget.

Modifying general properties

General properties of a gadget control overall appearance, such as color, size, and font properties. General properties can also define the title text, tooltip, and orientation for specific gadget types.

Table 8-1 describes the general formatting properties available to specific gadgets, and their usage.

Table 8-1 Formatting general properties

Option	Gadget	Usage
Color	Bullet, cylinder, thermometer	Sets the color of the gauge.
Font	All	Set the font type, size, style, and color of displayed values. You can select a standard color using color picker, or specify a custom color.
Height	All	Specifies the height of the gadget.
Orientation	Bullet	Specifies whether to display the gadget horizontally or vertically.
Title	Sparkline, bullet	Adds a title to the gadget.

Table 8-1 Formatting general properties

Option	Gadget	Usage
Tooltip	Linear gauge, meter	Specifies text for the tooltip.
Width	All	Specifies the width of the gadget.

Modifying needle properties

Needle properties define the position of a needle. A needle appears only in a linear gauge and in a meter gauge. Table 8-2 describes the needle properties you can modify in Interactive Viewer.

Table 8-2 Formatting needle properties

Option	Gadget	Usage
Show Needle On	Linear gauge, meter	Specifies the position of the needle
Show Needle Value	Meter	Displays or suppresses the value to which the needle points, and specifies the display position for the values

Modifying plot properties

Plot properties control the appearance of elements in the data plot area of bullet and sparkline gadgets. In both gadgets, you can specify whether to display or hide plot values.

Additionally, in a sparkline gadget, you can specify whether to display the open, close, lowest, or highest values. Table 8-3 describes the plot properties you can modify using Interactive Viewer.

Table 8-3 Formatting plot properties

Option	Gadget	Usage
Show Close Value	Sparkline	Enables and disables the display of the close value
Show High and Low Values	Sparkline	Enables and disables the display of the high and low values
Show Open Value	Sparkline	Enables and disables the display of the open value
Show Plot Value	Bullet, sparkline	Displays or suppresses the plotted values

Modifying scale properties

Scale properties define the range of values and the number of tick marks that a gadget displays. The scale properties affect the numbers displayed on the gadget, not its size. Minimum Value and Maximum Value specify the lowest and highest numbers, respectively. However, if the data set value (represented by the needle value) is lower than the minimum value or higher than the maximum value, the minimum or maximum value is ignored. Table 8-4 describes the scale properties you can modify using Interactive Viewer.

Table 8-4 Formatting scale properties

Option	Gadget	Usage
Auto Values	All	Enables a scale to be specified by Interactive Viewer
Maximum Value	All	Sets the highest value of the scale
Minimum Value	All	Sets the lowest value of the scale
Show Values	Cylinder, meter, bullet, linear gauge	Shows values of the scale

Modifying region properties

Region properties enable the division of the data plot into regions. Use regions to provide more information about values in a gadget. Table 8-5 describes the region formatting properties you can modify in Interactive Viewer.

Table 8-5 Formatting region properties

Option	Gadget	Usage
Color	Linear gauge, meter, bullet	Specifies the color of the region.
End Value	Linear gauge, meter, bullet	Specifies where the region ends.
Label	Linear gauge, meter, bullet	Specifies the name of the region.
Region	Linear gauge, meter, bullet	Chooses the region for which the settings apply. You can also add or remove a region from the list.
Start Value	Linear gauge, meter, bullet	Specifies where the region starts.
Show Labels	Linear gauge	Displays or suppresses the region labels.

Modifying tick marks

Ticks properties define the position and count of tick marks on a gadget. Tick marks can appear in the positions listed in Table 8-6.

Table 8-6 Formatting tick marks

Option	Gadget	Usage
Auto Adjust Tick Marks	All but sparkline	Enables or disables tick marks created evenly across the scale
Position	Cylinder, thermometer	Positions tick marks on the right side of the gadget
Position Above	Linear gauge, meter, bullet	Sets tick marks to appear above the gadget
Position Below	Linear gauge, meter, bullet	Sets tick marks to appear below the gadget
Position Left	Cylinder, thermometer	Positions tick marks on the left side of the gadget
Show Tick Marks	Linear gauge, meter, bullet, cylinder, thermometer	Enables or disables the display of tick marks on the gadget
Show Tick Values	Linear gauge, meter, bullet, cylinder, thermometer	Enables or disables the display of values on tick marks
Major Tickmarks Count	All but sparkline	Specifies the number of tick marks to display on the scale

Modifying the value property

You can also display or hide the value in a cylinder or thermometer gadget, as described in Table 8-7.

Table 8-7 Formatting the value property

Option	Gadget	Usage
Show Value	Cylinder, thermometer	Displays or hides the value illustrated in the gadget

How to format a Flash gadget

To format a Flash gadget, select the gadget. Select Format Flash Gadget from the gadget menu and modify the information on Format as needed.

Choose OK to apply your selection.

Filtering data in a Flash chart or gadget

You can also create filters for chart and gadget data in the same way you do for standard charts. You can limit the appearance of data on a chart or gadget by setting filters for the chart or gadget data.

How to filter data in a Flash chart or gadget

Select the chart or gadget, and choose Filter from the chart or gadget menu. Create conditions as needed. To define more than one condition, choose Advanced Filter and modify the options in the same way you did when creating filters for report data.

Drilling up or down data hierarchies in a Flash chart

Drilling up and down data hierarchies in a Flash chart function the same way as for regular charts. Interactive Viewer supports drilling up to view summary information and drilling down to view details for the following Flash chart types:

- Column
- Bar
- Line
- Pie
- Doughnut

Selecting a legend item to hide specific Flash chart data

If a Flash chart contains more than one value series, you can also use the legend of the chart to toggle between the series. For example, in Figure 8-52, from the legend, select Series 1 to hide profit values in the chart.

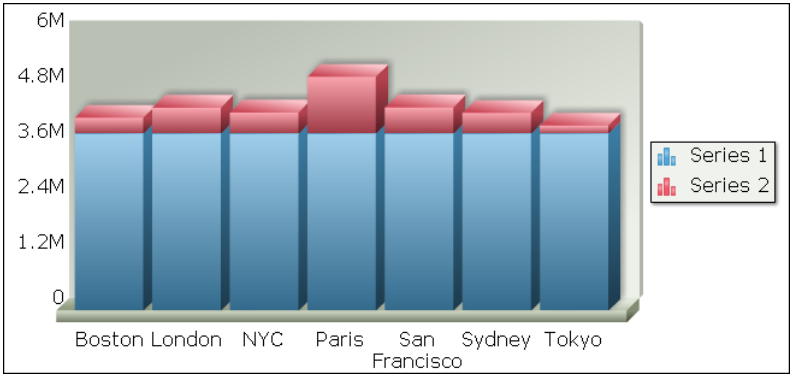


Figure 8-52 Selecting a legend value

The chart now displays revenue by sales office only, as shown in Figure 8-53. This option provides a quick view of the data for each series.

To redisplay profit values in the Flash chart, select Series 1 in the legend. The Flash chart displays both sets of values.

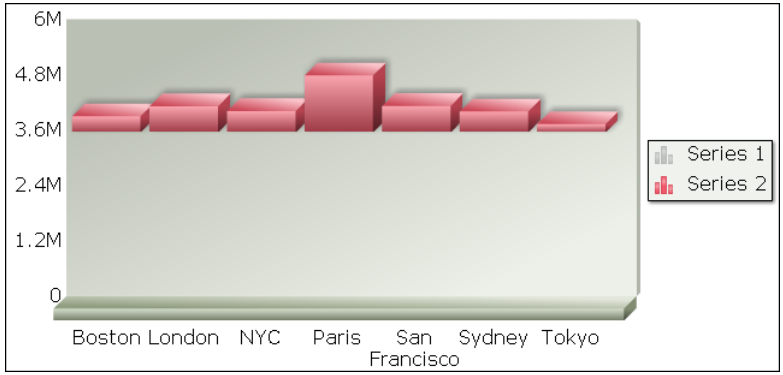


Figure 8-53 Chart displaying revenue by sales office

Exporting data from a Flash chart or gadget

In Actuate 11 and later releases, you can export data from a Flash chart or gadget to a flat file format, which uses a comma, tab, pipe, or semicolon delimiter. These file formats can be read by Microsoft Excel.

How to export data from a Flash chart or gadget

Select the chart or the gadget, and choose Export Data from the chart or gadget menu. On Export Data, specify the data to export, and other options, in the same way you did when exporting report data.

Exporting a Flash chart or gadget

Using Interactive Viewer, you can export a Flash chart, or gadget to PDF format.

How to export a Flash chart or gadget

Select the chart or the gadget, and choose Export Content from the chart or gadget menu. On Export Content, specify the options in the same way you did when exporting report content. Additionally, specify the resolution in DPI at which to export the chart or gadget.

Printing a Flash chart or gadget

Interactive Viewer enables you to print a Flash chart or gadget.

How to print a Flash chart or gadget

Select the Flash chart or gadget. From the context menu, choose Print Chart and specify the printer to which you want to send the print job.

Using effects

In some types of Flash charts, you can use the context menu to set or modify visual animation effects. For example, in a pie or doughnut chart, you can specify the following properties:

- Enable rotation of the pie or doughnut.
  This option causes the pie or doughnut to rotate.
- Enable slicing movement.
  This option causes each segment of the pie or doughnut, appears to slice away from the original chart.

Modifying Adobe Flash Player options

This section describes how to modify Adobe Flash Player to display redraw regions, debug and correct scripting errors, change the settings of the Flash player, and get more information about the version of Adobe Flash Player currently in use. To get more information about your version of Adobe Flash Player, select the chart or gadget, then choose About Adobe Flash Player from the context menu.

Displaying redraw regions

A redraw region is the area around a chart or gadget that is redrawn when that object changes. Everything in a redraw region is redrawn during the next rendering phase after an object changes. Displaying a redraw region provides you with information about changes made to the Flash chart. Sometimes Flash Player combines several closely spaced objects together in a single redraw region, improving performance speed of the objects being rendered.

To display redraw regions, select the chart or gadget, and choose Redraw region from the context menu. A red box appears on the object showing the redraw region.

Using the debugger option

You can use this option to debug and correct errors that occur in the scripts and code that run Flash charts and gadgets. To use the debugger option, select the chart or gadget, and choose Debugger from the context menu.

Modifying settings

You use this option to customize Adobe Flash Player settings based on your requirements. You can modify display, privacy, local storage, microphone, and camera settings. To modify Flash Player settings, select the chart or gadget, and choose Settings from the context menu. Make the modifications on the Adobe Flash Player Settings dialog box that appears. Choose Close.

Modifying HTML5 charts

In Release 11 Service Pack 4, Actuate BIRT Viewers support a new chart format built on HTML5 technology. HTML5 is an open standard for structuring and presenting content for the World Wide Web, and is increasingly regarded as the alternative to Flash when creating interactive and animated content for traditional and mobile devices. You can use the viewers to view HTML5 charts created using BIRT Designer Professional.

HTML5 charts are animated charts that you can view on all platforms and mobile devices. Report developers who create these charts can use scripting to customize properties such as presentation, design time, and generation time to a greater extent than when using Flash charts. Standard BIRT charts support extensive scripting but do not support animation.

Information about working with regular charts, Flash charts, and Flash objects in a report is provided in an earlier section in this document. The following section describes how you can use Interactive Viewer to work with HTML5 charts to modify formatting properties, create filters to view specific data, export data and export the charts to various supported formats. Figure 8-54 shows an example of an HTML5 bar chart displaying total sales by country and produce line.

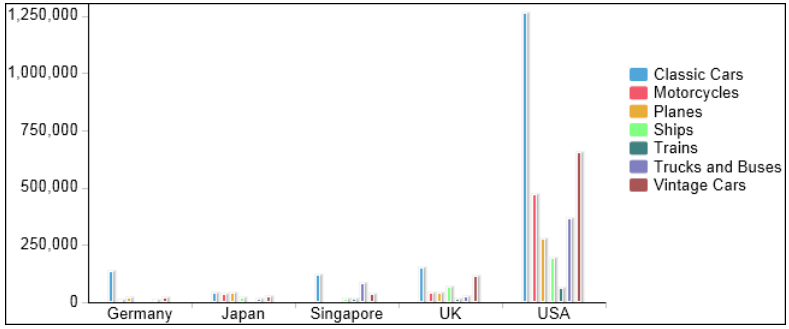


Figure 8-54 HTML5 bar chart displaying total sales amounts

Comparing HTML5, Flash, and standard charts

Table 8-8 provides a comparison of the different chart types supported in Actuate BIRT Viewers.

Table 8-8 Features available in HTML5, Flash, and standard charts

Function	HTML5	Flash	Standard
Displays in the web viewer	✓	✓	✓
Displays in PDF		✓	✓
Displays in other document formats (DOC, PPT, XLS, etc.) as a static image	✓		✓
Supported on mobile devices	✓	limited	✓
Provides animation	✓	✓	
Supports customization through scripting	✓	limited	✓
Rank in number of available chart types, 1 being the highest	3	1	2

In Release 11 Service Pack 4, HTML5 charts support commonly used chart types, such as column, bar, line, pie, doughnut, scatter, and area charts.

Formatting an HTML5 chart

The formatting options available for an HTML5 chart are similar to those available for standard charts. For a bar, column, line, or area chart, the formatting options available for HTML5 charts are the same as the options you use to format standard charts, except that you cannot set the dimension for HTML5 versions of these chart types. For pie and doughnut charts you can modify the chart title, and specify the width and height.

Filtering data in an HTML5 chart

You can also create filters for HTML5 chart data in the same way you do for standard charts. You can limit the appearance of data on a chart by setting filters for the chart data.

How to filter data in an HTML5 chart

Select the chart, and choose Filter from the chart menu. Create conditions as needed. To define more than one condition, choose Advanced Filter and modify the options in the same way you did when creating filters for report data.

Drilling up and down data hierarchies

Interactive Viewer supports drilling up to view summary information and drilling down to view details for the following HTML5 chart types:

- Column
- Bar
- Line
- Pie

Drilling up and down data hierarchies in an HTML5 chart function the same way as for regular charts.

Selecting a legend item to hide specific chart data

Using Interactive Viewer, you can select a legend item in an HTML5 chart, to hide data for that item in the chart. For example, the bar chart in Figure 8-55 shows sales totals by product line, grouped by country. Select each product line in the legend for which you want to hide data. In the example, the chart displays sales information for the Planes, Ships, and Trains product lines. Each selected legend item is displayed in gray, and the corresponding data hidden in the chart.

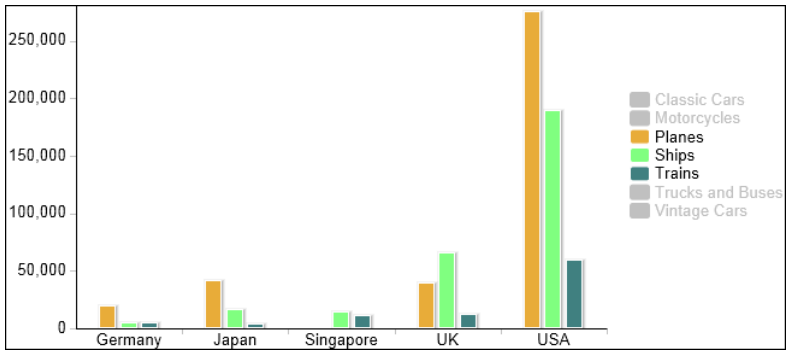


Figure 8-55 Selecting each legend item hides the data in the chart

Using effects in HTML5 charts

When working with a pie or doughnut chart in Interactive Viewer, selecting a slice in a pie chart or a segment in a doughnut chart causes that slice or segment to explode from the chart, or move outward. The example in Figure 8-56 shows a slice exploding from the pie chart.

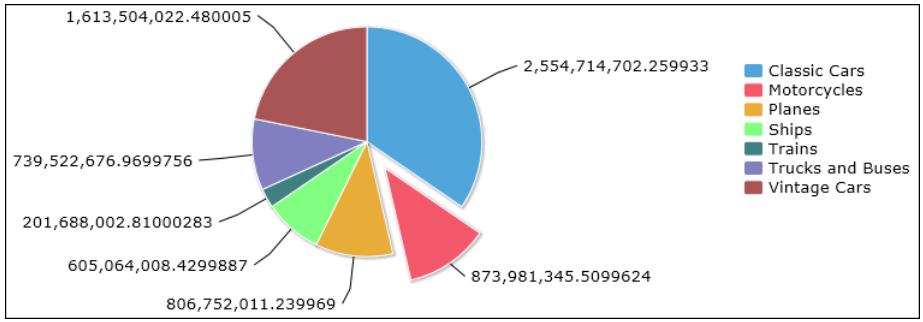


Figure 8-56 Exploding a slice in a pie chart

Exporting data from an HTML5 chart

You can export data from an HTML5 chart to a flat file format, which uses a comma, tab, pipe, or semicolon delimiter. These file formats can be read by Microsoft Excel.

How to export data from an HTML5 chart

Select the chart and choose Export Data from the chart menu. On Export Data, specify the data to export, and other options, in the same way you did when exporting report data.

Exporting an HTML5 chart

Using Interactive Viewer, you can export an HTML5 chart to all other supported formats, but the chart displays as a static image. The chart is identical in appearance to the chart displayed in the viewer.

How to export an HTML5 chart

Select the chart, and choose Export content from the chart menu. On Export Content, specify the options in the same way you did when exporting report content. Additionally, specify the resolution in DPI at which to export the chart.

Printing an HTML5 chart

Interactive Viewer enables you to print an HTML5 chart.

How to print an HTML5 chart

From the main menu, choose Print and specify the printer to which you want to send the print job.

Chapter

9

Modifying cross tabs

This chapter contains the following topics:

- About cross tabs
- Formatting cross-tab data
- Analyzing cross-tab data
- Exporting cross-tab content
- Modifying charts in a cross tab
- Printing a cross tab
- Saving a cross tab

About cross tabs

A cross tab displays summary, or aggregate values, such as sums, counts, or averages, in a row-and-column matrix similar to a spreadsheet. For example, you can use a cross tab to view sales data for each product line, by year, or total sales for each product line, by geography, and so on.

In Interactive Viewer, you can modify and format a cross tab to change the appearance of specific data values. You can also display detail information for data values to view important summary information at a glance. You can export cross-tab content to other formats such as Excel, Word, PowerPoint, PostScript, or PDF. You can also print cross tab content, modify charts, Flash charts and Flash gadgets in a cross tab, and save a cross tab as a BIRT design (.rptdesign) or BIRT document (.rptdocument) file.

If you need to drill further to analyze the data in various situations, you can launch Actuate BIRT Data Analyzer, which enables you to manipulate the data in the cross tab, create a pivot table of cross-tab data, and display more detailed information for existing data.

Introducing a cross tab

A cross tab is ideal for summarizing data in a compact and concise format. The aggregate values in a cross tab are arranged in dimensions and measures, and each cross tab can display multiple dimensions and multiple measures. The data for a cross tab is derived from a cube, which also arranges data in dimensions and measures. Dimensions are categories, such as products, customers, or sales periods, by which measures are aggregated. Measures represent values that are counted or aggregated, such as costs or units of products.

A cross tab has the following characteristics:

- It requires at least three fields. In the example cross tab shown in Figure 9-1, the three fields are year, product line, and revenue.
- One field populates the column headings in the cross tab. There is one column for each unique value in the field.
- One field populates the row headings in the cross tab. There is one row for each unique value in the field.
- One field's values are aggregated, and these values populate the cells of the cross tab. In the example, each cell displays a sales total by product line, for each month and quarter, in the year 2004. The sales total is calculated by applying the SUM aggregate function across the values in the extended price field.

Parts of a cross tab

A cross tab consists of the following three areas, as shown in Figure 9-1:

- The row area
- The column area
- The detail area

The row and column areas contain the dimensions. The dimension values form the row and column headings of the cross tab. The detail area contains one or more measures to display aggregate data.

Figure 9-1 shows the example report, which groups data by month, quarter, and year. Each number in the cross tab represents the sales total of a particular product for a particular month. Grand Total displays the total sales of all products for each month, the total sales for each quarter, and the total sales across months and quarters in 2004. Grand Total also displays the total sales for each product line by month, quarter, and for the whole year.

Rows

Columns

Year/QTR/Month 2004		Classic Cars	Motorcycles	Planes	Ships	Trains	Trucks and Buses	Vintage Cars	Grand Total
		Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue
1	1	$109,562	$39,987	$31,159	$26,310	$6,387		$42,909	$256,315
	2	$108,232	$45,694	$34,000	$24,894	$4,763	$35,749	$48,688	$302,021
	3	$99,512			$15,559	$9,879	$32,193	$45,252	$202,395
	1 Total	$317,307	$85,682	$65,159	$66,763	$21,029	$67,942	$136,849	**$760,730**
2	4	$89,998	$32,229	$33,882	$10,808			$33,352	$200,269
	5	$70,698	$47,873	$35,898	$3,440	$4,862	$31,729	$38,536	$233,036
	6	$46,025			$16,472		$41,967	$48,110	$152,574
	2 Total	$206,722	$80,101	$69,780	$30,719	$4,862	$73,696	$119,998	**$585,879**
3	7	$139,040	$65,156	$43,256	$20,260	$8,985	$36,967	$72,418	$386,082
	8	$140,458	$55,640	$32,083	$23,485	$7,132	$32,147	$65,019	$355,964
	9	$140,177	$6,515	$30,634	$23,114	$5,611	$37,720	$62,984	$306,755
	3 Total	$419,675	$127,311	$105,974	$66,859	$21,728	$106,834	$200,421	**$1,048,801**
4	10	$210,010	$69,147	$31,081	$40,881	$13,781	$68,620	$107,121	$540,642
	11	$397,834	$121,934	$97,607	$43,535	$12,148	$78,998	$183,657	$935,713
	12	$131,433	$43,069	$68,654	$43,838	$13,350	$52,612	$75,882	$428,838
	4 Total	$739,277	$234,150	$197,342	$128,254	$39,278	$200,231	$366,660	**$1,905,193**
	Total	$1,682,980	$527,244	$438,255	$292,595	$86,897	$448,703	$823,928	$4,300,603
Grand Total		$1,682,980	$527,244	$438,255	$292,595	$86,897	$448,703	$823,928	**$4,300,603**

Detail area

Figure 9-1 Parts of a cross tab

Formatting cross-tab data

You can use Interactive Viewer to improve the presentation of data in a cross tab. You can modify the appearance of the dimensions and measures in a cross tab by specifying formatting properties. For example, to indicate that the numbers displayed in the cross tab are currency amounts, you apply the currency format that displays a currency symbol alongside the amount. It is also easier to read the numbers if they are aligned to the right. Using color, you can differentiate the

product line subtotals that run horizontally across the report, from the quarterly and yearly grand totals that run vertically down the report.

In Interactive Viewer, you can change the appearance of data in a cross tab in the following ways:

- Format data and labels by specifying font properties, and text alignment for a label, data element, or for the cross tab.
- Change the width of a column or the height of a row.
- Format data strings depending on the type of data in the data element.

Selecting a cross-tab element

To view available formatting options, select a cross-tab element. From the context menu, choose Format, or Alignment to view the formatting options for the selected element. For example:

- To format a label, select the label, then from the context menu, select a formatting option.
- To format the data in a column, select a cell in the column, then from the context menu that appears, select a formatting option.
- To format the values in a group, select a cell in the grouped column, then from the context menu, select a formatting option. When you select a column to modify, the changes you specify are applied to the data values in each data group. If you choose the group at the highest level, the data values in this group are formatted based on the options you select. You must choose each group to specify formatting options for that group level. You can also specify formatting properties for the group label for each group.

Changing font properties and alignment

Using Interactive Viewer, you can change the font properties and alignment of values in cross-tab elements, including dimension and measure labels and data values. The properties you can modify include the background color, font color, size, and type. A value of Auto indicates that the default value applies. You can also specify whether to display the font in bold, italic, or underlined style.

How to change font properties

1. Select a cross-tab element. From the main menu, choose Format➛Font.

   Font displays the current font property values, as shown in Figure 9-2.

2. On Font, specify the new properties as follows:
   - Use the drop-down lists to modify the font properties for the selected element.
   - Choose an option to apply bold, italic, or underlined style.

Choose OK.

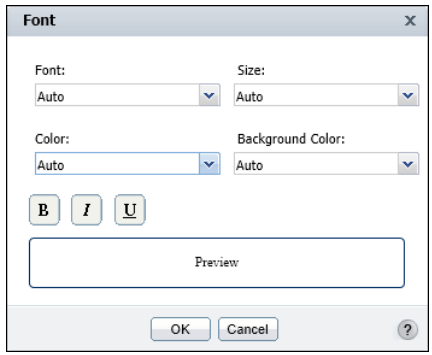


Figure 9-2 Specifying font properties

How to change text alignment

Select a cross-tab element. From the context menu, choose Alignment➛Left, Alignment➛Center, or Alignment➛Right.

Reverting to default formats

To revert a cross-tab element back to its default font formats, select the cross-tab element. From the main menu, choose Format➛Font. Select Auto from each drop-down list. To reset text alignment, select the element, and choose the appropriate alignment option.

If you applied a number format to data, you can restore the formats to those in the original cross tab. Select the data cell. From the context menu choose Format➛Format Data. Then, select Unformatted from the drop-down list.

Displaying details about data values

To view details about cross-tab data, select a cell in the data area. From the context menu, choose Show Detail Tooltip, as shown in Figure 9-3.

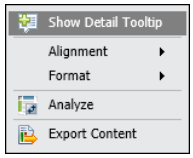


Figure 9-3 Choosing Show Detail Tooltip from the context menu

Now when you select any cell in the display area of the cross tab, the tooltip for that data value appears. A tooltip displays the column and row level details and the measure value, as shown in Figure 9-4.

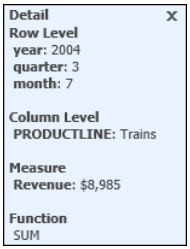


Figure 9-4 Detail information for the selected cell

Displaying this detail tooltip information is especially useful if you are analyzing data in a large cross tab where you cannot simultaneously view the column heading, row heading, and data cell in your browser window.

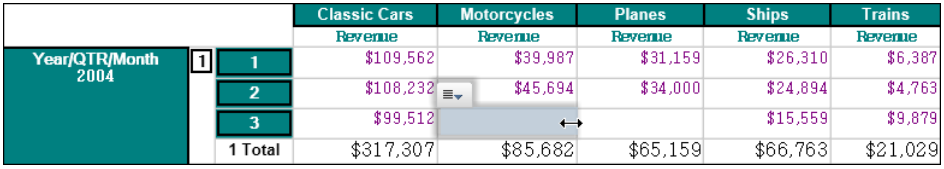
To return to the regular view, select any cell in the display area, and choose Hide Detail Tooltip from the context menu.

Changing the width of a column or height of a row

You can optimize the layout of a cross tab by changing the width of cross tab columns and the height of rows. Using this option enables you to eliminate the extra space when you print or export the cross tab to other formats, and also creates additional space to avoid truncated column entries in the cross tab.

How to change column width

Select any cell in the cross tab. Hover the mouse pointer on the right or left border of the highlighted cell, as shown in Figure 9-5. Using the mouse pointer, drag the border outward or inward to increase or decrease the width of the selected cell. The modified width applies to all rows in the column.



		Classic Cars	Motorcycles	Planes	Ships	Trains
		Revenue	Revenue	Revenue	Revenue	Revenue
Year/QTR/Month 2004	1	$109,562	$39,987	$31,159	$26,310	$6,387
	2	$108,232	$45,694	$34,000	$24,894	$4,763
	3	$99,512			$15,559	$9,879
	1 Total	$317,307	$85,682	$65,159	$66,763	$21,029

Figure 9-5 Modifying column width in a cross tab

How to change row height

Select any cell in the cross tab. Hover the mouse pointer on the top or bottom border of the highlighted element, as shown in Figure 9-6. Using the mouse pointer, drag the border up or down to increase or decrease the height of the selected element. The modified height applies to the entire row.

			Classic Cars	Motorcycles	Planes	Ships	Trains
			Revenue	Revenue	Revenue	Revenue	Revenue
Year/QTR/Month 2004	1	1	$109,562	$39,987	$31,159	$26,310	$6,387
		2	$108,232	$45,694	$34,000	$24,894	$4,763
		3	$99,512			$15,559	$9,879
		1 Total	$317,307	$85,682	$65,159	$66,763	$21,029
	2	4	$89,998	$32,229	$33,882	$10,808	

Figure 9-6 Modifying row height in a cross tab

Analyzing cross-tab data

You can use BIRT Data Analyzer to manipulate a cross tab to analyze its data. Using BIRT Data Analyzer, you can answer questions such as:

- What are the sales for product A over time?
- How do total sales break down by product?
- How many units of product B shipped to all locations in April?

You can add, remove, reorganize, and customize the data and its appearance in the cross tab to examine relationships and trends. Using BIRT Data Analyzer, you can perform the following tasks:

- Filter, group, and sort data.
- Format a cross tab.
- Perform calculations.

To launch BIRT Data Analyzer, select any cell in the cross tab, then from the menu, choose Data Analyzer.

For more information about BIRT Data Analyzer, see *Using BIRT Data Analyzer.*

Exporting cross-tab content

You can export cross-tab content to other formats, such as Excel, PDF, PostScript, PowerPoint, and Word, just as you can export content from a BIRT report. When you export a cross tab to Microsoft Excel, Excel displays the cross tab as a pivot table, in which you can further analyze existing data.

Modifying charts in a cross tab

You can modify charts present in a cross tab in Interactive Viewer, similar to how you would for a regular chart.

You can also sometimes switch views between a cross tab and chart, if this option was enabled at the time of creating the cross tab in BIRT Designer Professional.

Printing a cross tab

You can print a cross tab in the same way as you print a BIRT report.

Saving a cross tab

Sometimes you need to save a modified cross tab, to use later, or make it available for other users to view and modify. In Interactive Viewer, you can save a modified cross tab just as you save a BIRT report. You can save a cross tab to the following file types:

- Actuate BIRT report document (.rptdocument) file
- Actuate BIRT design file (.rptdesign) file

Chapter

10

Modifying summary tables

This chapter contains the following topics:

- About summary tables
- Editing and formatting summary-table data
- Organizing data in a summary table
- Creating a computed column in a summary table
- Filtering data in a summary table
- Modifying a chart in a summary table
- Saving a modified summary table

About summary tables

A summary table presents aggregate or summary information in a report, providing users with a concise view of the data at a glance. The aggregate information displayed in a summary table is typically displayed in the table header or footer, or the group or section header or footer in a detail BIRT report. A summary table is particularly useful when a user needs to work with large volumes of data, because the calculations are made at the data source level, making only the computed data visible to the user. Report developers can create a summary table using Actuate BIRT Studio or BIRT Dashboards by simply selecting the relevant data fields in the correct order, and inserting them into the report design. A summary-table report can provide users with information such as sales by territory, or sales by employee, or sales by employee, by territory.

Although hiding details for a group in a detail table can achieve the same presentation of aggregate information as a summary table, improved performance and reduced server load are a few unique benefits of using a summary table over hiding the details in a detail table.

You can use Interactive Viewer to edit and format data in a summary table, organize data columns, create filters for column data, and save a modified summary table. In addition, you can use both viewers to export a summary table, export data in a summary table to supported flat file formats, display a table of contents, and print a summary table.

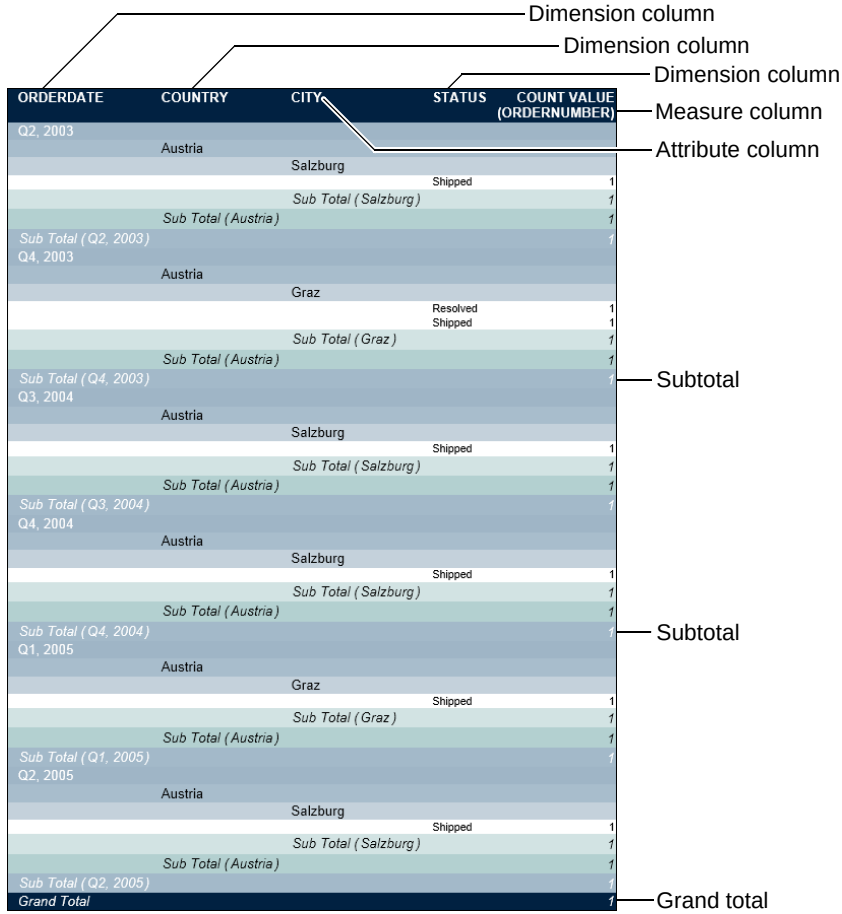
About columns in a summary table

The columns in a summary table are classified into dimension columns, attribute columns, and measure columns. The columns used to group data in other columns are dimension columns, and the columns whose aggregated values are evaluated are measure columns.

A dimension column groups data in other columns. Dimension columns are typically not aggregated. Some examples of dimension columns include order date, country, state, product line, and so on. A measure column is typically ungrouped, and contains aggregated data. Some examples of measure columns include number of orders, quantity ordered, profit, revenue, and so on. Sometimes a summary table can contain additional columns called attribute columns. Attribute columns are typically associated with a dimension column. For example, Product Code can be an attribute of the Product Line dimension.

Dimension columns are always displayed to the left in a report design. In the example, as shown in Figure 10-1, Order Date is a higher level or outer dimension group, and Country is another dimension group that contains the associated attribute Customer City. Dimension columns and their associated attribute columns are typically displayed side-by-side in a summary table. The example also displays a third dimension column, Order Status.

A grouped dimension column displays subtotals for the data in each group. A grouped dimension column does not display duplicate data values allowing for accurately calculated aggregate data.



ORDERDATE	COUNTRY	CITY	STATUS	COUNT VALUE (ORDERNUMBER)
Q2, 2003				
	Austria			
		Salzburg		
			Shipped	1
		Sub Total (Salzburg)		*1*
	Sub Total (Austria)			*1*
Sub Total (Q2, 2003)				*1*
Q4, 2003				
	Austria			
		Graz		
			Resolved	1
			Shipped	1
		Sub Total (Graz)		*1*
	Sub Total (Austria)			*1*
Sub Total (Q4, 2003)				*1*
Q3, 2004				
	Austria			
		Salzburg		
			Shipped	1
		Sub Total (Salzburg)		*1*
	Sub Total (Austria)			*1*
Sub Total (Q3, 2004)				*1*
Q4, 2004				
	Austria			
		Salzburg		
			Shipped	1
		Sub Total (Salzburg)		*1*
	Sub Total (Austria)			*1*
Sub Total (Q4, 2004)				*1*
Q1, 2005				
	Austria			
		Graz		
			Shipped	1
		Sub Total (Graz)		*1*
	Sub Total (Austria)			*1*
Sub Total (Q1, 2005)				*1*
Q2, 2005				
	Austria			
		Salzburg		
			Shipped	1
		Sub Total (Salzburg)		*1*
	Sub Total (Austria)			*1*
Sub Total (Q2, 2005)				*1*
Grand Total				*1*

Figure 10-1 A summary table

The following section describes how you can modify data in a summary table.

About modification options

In Interactive Viewer, you can modify summary tables by editing and formatting data, creating filters to display specific data, inserting calculations in a summary table, and so on. Table 10-1 compares the actions you can perform on dimension columns, attribute columns, and measure columns.

Table 10-1 Modification options for data in a summary table

Action	Dimension column	Attribute column	Measure column
Create a new computed column.			✓
Create filters.	✓	✓	✓
Delete the column.	✓	✓	✓
Edit and format the column header.	✓	✓	✓
Filter data using the Top/Bottom N condition.			✓
Format data.	✓	✓	✓
Modify aggregate data.			✓
Reorder columns.	✓		
Show or hide columns.	✓	✓	✓
Sort column data in ascending or descending order.	✓	✓	
Specify alignment properties.	✓	✓	✓
Specify font properties.	✓	✓	✓

Editing and formatting summary-table data

In Interactive Viewer, you can modify the appearance of the data in a summary table to edit and format column headers, column data, and font and alignment properties. You can also modify font properties and format aggregate data values.

How to format the column header

Select the column to highlight it, then select Header➛Change Text, Header➛Alignment➛Left, Center, or Right, or Header➛Font from the context menu, shown in Figure 10-2.

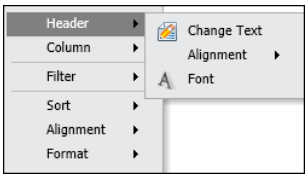


Figure 10-2 Modifying a column header

How to format column data

Select the column to highlight it, then choose Format➛Font or Format➛Format Data from the context menu.

How to format aggregate data values

Select the Subtotal or Grand Total value, and choose Format➛Font or Format➛Format Data from the context menu.

Organizing data in a summary table

You can organize data in a report by sorting column data, showing or hiding columns and report elements, and moving or deleting a column.

Sorting data

You can sort data in dimension columns, or attribute columns in a summary table, in descending order. A grouped column automatically sorts data in ascending order. To modify the sort order, select the column, and choose Sort➛Sort Descending from the context menu.

Showing and hiding columns in a report

You can hide or show dimension columns, attribute columns, and measure columns in a summary table.

Select a column to highlight it, then select Column➛Show Column from the context menu to display the column in the report.

Select a column to highlight it, then select Column➛Hide Column from the context menu to hide the column that you do not want to display in the report.

Moving and deleting a column

In Interactive Viewer, you can move an attribute or measure column, but cannot move a dimension column in a summary table. You can delete a dimension column, an attribute column, or a measure column. You can move attribute columns among other attribute columns in a summary table. When you move a measure column in a summary table, you can move it only within the other measure columns.

To move a measure column, select the column and choose Column➛Move to Left from the context menu.

To delete a column, select the column and choose Column➛Delete Column from the context menu.

Creating a computed column in a summary table

You can create a computed column for data in measure columns, as you would do for a regular report column. You can also edit an existing computed column in a summary table. You cannot create computed columns for data in dimension columns.

Filtering data in a summary table

You can filter data in dimension, attribute, and measure columns in the same way in which you filter data in a report table. You can create multiple filter conditions, and modify existing filter conditions. You cannot create filters for data in a dimension column containing date-and-time data.

You can also filter a measure column using the Top/Bottom N condition, as shown in Figure 10-3. Select the measure column, and choose Filter➛Filter or Filter➛Top/Bottom N from the context menu. You cannot use the Top/Bottom N condition to filter data values in a dimension or attribute column.

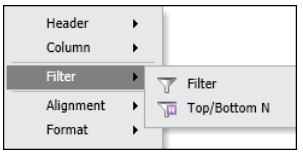


Figure 10-3 Filtering data in a summary table

Modifying a chart in a summary table

You can modify a chart in a summary table, in the same way you perform this task in a detail table. You can modify the subtype, formatting options, and export the chart to other formats.

Saving a modified summary table

You can save a modified summary table similar to how you perform this task for a BIRT report.

Chapter

11

Functions and operators

This chapter contains the following topics:

- Functions
- Operators

Functions

This section is a complete reference to all of the functions in Interactive Viewer. This reference organizes the functions into two sections based on those used in expressions when creating a computed column and functions that are used to perform aggregate calculations.

Functions used in computed column expressions

The following list of functions appear when you create expressions to compute column data. Each function entry includes a general description of the function, its syntax, the arguments to the function, the result the function returns, and an example that shows typical usage. Use this reference to find information about a function that you want to use when you insert a computed column to display calculated data in your report design.

% OF( )

Calculates the percentage value of a selected column compared to a selected base group value.

Category Financial

Column Select a column from the list.

% Base Select a base group from the list.

Returns For the selected column, Interactive Viewer calculates the percentage of the base group total and displays the percentage value.

Example For example, compare a single revenue value to the total value of all revenue, using the following calculation:

```
(<Column A>/<Column B>) * 100%
```

% OF DIFFERENCE( )

Calculates the percentage of the difference between values.

Category Financial

Column Select the first column from the list.

Column Select the second column from the list.

Returns Interactive Viewer calculates the percentage of the difference between the second measure and the first measure, as follows:

```
((ColumnB - ColumnA)/ColumnB) * 100%
```

Interactive Viewer displays the percentage of the difference in the column values.

ABS( )

Returns the absolute value of a number without regard to its sign. For example, 6 is the absolute value of 6 and -6.

Syntax ABS(num)

Argument **num**
The number, or numeric expression specifying the number, for which you need to find the absolute value.

Returns A number representing the absolute value of num.

Example The following example returns the absolute value for each number in the TemperatureCelsius data field:

```
ABS([TemperatureCelsius])
```

ADD_DAY( )

Adds a specified number of days to a date value.

Syntax ADD_DAY(date, daysToAdd)

Arguments **date**
The date or date expression representing the start date.

daysToAdd
The number of days to add to the start date. If you specify a negative number, the result is as if the number is subtracted from the start date.

Returns The date value that results from adding the specified number of days to the start date.

Example The following example adds 15 days to each date value in the InvoiceDate data field:

```
ADD_DAY([InvoiceDate], 15)
```

ADD_HOUR( )

Adds a specified number of hours to a date value.

Syntax ADD_HOUR(date, hoursToAdd)

Arguments

date
The date or date expression representing the start date. If a start date does not have a time value, the function assumes the time is midnight, 12:00 AM.

hoursToAdd
The number of hours to add to the start date. If you specify a negative number, the result is as if the number is subtracted from the start date.

Returns The date-and-time value that results from adding the specified number of hours to the start date.

Example The following example adds eight hours to each date value in the ShipDate data field:

```
ADD_HOUR([ShipDate], 8)
```

ADD_MINUTE( )

Adds a specified number of minutes to a date value.

Syntax ADD_MINUTE(date, minutesToAdd)

Arguments

date
The date or date expression representing the start date. If a start date does not have a time value, the function assumes the time is midnight, 12:00 AM.

minutesToAdd
The number of minutes to add to the start date. If you specify a negative number, the result is as if the number is subtracted from the start date.

Returns The date-and-time value that results from adding the specified number of minutes to the start date.

Example The following example subtracts 30 minutes from each date in the StartTime data field:

```
ADD_MINUTE([StartTime], -30)
```

ADD_MONTH( )

Adds a specified number of months to a date value.

Syntax ADD_MONTH(date, monthsToAdd)

Arguments

date
The date or date expression representing the start date.

monthsToAdd
The number of months to add to the start date. If you specify a negative number, the result is as if the number is subtracted from the start date.

Returns The date value that results from adding the specified number of months to the start date. This function always returns a valid date. If necessary, the day part of the resulting date is adjusted downward to the last day of the resulting month in the resulting year. For example, if you add one month to 1/31/08, ADD_MONTH( ) returns 2/29/08, not 2/31/08 or 2/28/08, because 2008 is a leap year.

Example The following example adds two months to each date value in the InitialRelease data field:

```
ADD_MONTH([InitialRelease], 2)
```

ADD_QUARTER( )

Adds a specified number of quarters to a date value.

Syntax ADD_QUARTER(date, quartersToAdd)

Arguments

date
The date or date expression representing the start date.

quartersToAdd
The number of quarters to add to the start date. If you specify a negative number, the result is as if the number is subtracted from the start date.

Returns The date value that results from adding the specified number of quarters to the start date. A quarter is equal to three months. For example, if you add two quarters to 9/22/08, ADD_QUARTER( ) returns 3/22/09.

Example The following example adds two quarters to each date value in the ForecastClosing data field:

```
ADD_QUARTER([ForecastClosing], 2)
```

ADD_SECOND( )

Adds a specified number of seconds to a date value.

Syntax ADD_SECOND(date, secondsToAdd)

Arguments

date
The date or date expression representing the start date. If a start date does not have a time value, the function assumes the time is midnight, 12:00 AM.

secondsToAdd
The number of seconds to add to the start date. If you specify a negative number, the result is as if the number is subtracted from the start date.

Returns

The date-and-time value that results from adding the specified number of seconds to the start date.

Example

The following example adds 30 seconds to each date value in the StartTime data field:

```
ADD_SECOND([StartTime], 30)
```

ADD_WEEK( )

Adds a specified number of weeks to a date value.

Syntax

ADD_WEEK(date, weeksToAdd)

Arguments

date
The date or date expression representing the start date.

weeksToAdd
The number of weeks to add to the start date. If you specify a negative number, the result is as if the number is subtracted from the start date.

Returns

The date value that results from adding the number of weeks to the start date.

Example

The following example adds two weeks to each date value in the OrderDate data field:

```
ADD_WEEK([OrderDate], 2)
```

ADD_YEAR( )

Adds a specified number of years to a date value.

Syntax

ADD_YEAR(date, yearsToAdd)

Arguments

date
The date or date expression representing the start date.

yearsToAdd
The number of years to add to the start date. If you specify a negative number, the result is as if the number is subtracted from the start date.

Returns

The date value that results from adding the number of years to the start date.

Example The following example adds five years to each date value in the HireDate data field:

```
ADD_YEAR([HireDate], 5)
```

BETWEEN( )

Tests if a value is between two specified values.

Syntax BETWEEN(value, upperBound, lowerBound)

Arguments

value
The value to test. The value can be a string, numeric, or date value.

upperBound
The first value in the range of values to which to compare. String and date values must be enclosed in double quotation marks (" ").

lowerBound
The second value in the range of values to which to compare. String and date values must be enclosed in double quotation marks (" ").

Returns True if value is between upperBound and lowerBound, or equal to upperBound or lowerBound; returns false otherwise.

Examples The following example tests each value in the SalesTotal data field to see if the value is between 10000 and 20000:

```
BETWEEN([SalesTotal], 10000, 20000)
```

The following example tests each value in the CustomerName data field to see if the value is between A and M:

```
BETWEEN([CustomerName], "A", "M")
```

The following example tests each value in the ReceiptDate data field to see if the value is between 10/01/07 and 12/31/07:

```
BETWEEN([ReceiptDate], "10/01/07 12:00 AM", "12/31/07 12:00 AM")
```

The following example uses BETWEEN( ) in conjunction with the IF( ) and ADD_DAY( ) functions to calculate a shipment date. If an orderDate value is in December 2007 (between 12/1/07 and 12/31/07), add 5 days to the orderDate value. If an orderDate value is in a month other than December, add 3 days to the orderDate value.

```
IF((BETWEEN([orderDate], "12/1/07 12:00 AM", "12/31/07 12:00
   AM")), (ADD_DAY([orderDate], 5)), (ADD_DAY([orderDate], 3)))
```

CEILING( )

Rounds a number to the nearest specified multiple.

Syntax CEILING(num, significance)

Arguments

num
The numeric value to round to.

significance
The multiple to round num to.

Returns The number that results from the rounding up. If num is an exact multiple of significance, no rounding occurs.

Examples CEILING( ) is commonly used to round up prices. For example, to avoid dealing with pennies, you can round up prices in a Price data field to the nearest nickel using the following expression:

```
CEILING([Price], 0.05)
```

If the Price value is 20.52, CEILING( ) returns 20.55.

The following example rounds up prices to the nearest dime:

```
CEILING([Price], 0.1)
```

If the Price value is 20.52, CEILING( ) returns 20.60. If the Price value is 20.40, CEILING( ) returns 20.40. No rounding occurs because 20.40 is already a multiple of 0.1.

The following example rounds prices up to the nearest dollar:

```
CEILING([Price], 1)
```

If the Price value is 20.30, CEILING( ) returns 21.0.

DAY( )

Returns a number from 1 to 31 representing the day of the month.

Syntax DAY(date)

Argument

date
The date or date expression from which you want to extract the day.

Returns The number of the day of the month for the specified date value.

Example The following example gets the number of the day for each date value in the ShipDate data field:

```
DAY([ShipDate])
```

DIFF_DAY( )

Calculates the number of days between two date values.

Syntax DIFF_DAY(date1, date2)

Arguments

date1
The first date or date expression to use in the calculation.

date2
The second date or date expression to use in the calculation.

Returns The number of days between date1 and date2.

Example The following example calculates the number of days between each value in the invoiceDate data field and each value in the paymentDate data field. The results show how long it takes to pay invoices.

```
DIFF_DAY([invoiceDate],[paymentDate])
```

The following example calculates the number of days from an order date to Christmas:

```
DIFF_DAY([orderDate], "12/25/08")
```

The following example calculates the number of days from the current date to Christmas. TODAY( ) is a function that returns the current date.

```
DIFF_DAY(TODAY(), "12/25/08")
```

DIFF_HOUR( )

Calculates the number of hours between two date values.

Syntax DIFF_HOUR(date1, date2)

Arguments

date1
The first date or date expression to use in the calculation. If the date does not have a time value, the function assumes the time is midnight, 12:00 AM.

date2
The second date or date expression to use in the calculation. If the date does not have a time value, the function assumes the time is midnight, 12:00 AM.

Returns The number of hours between date1 and date2.

Example The following example calculates the number of hours between each value in the startTime data field and each value in the finishTime data field:

```
DIFF_HOUR([startTime],[finishTime])
```

The following example calculates the number of hours from the current date to Christmas. NOW( ) is a function that returns the current date and time. If you supply a literal date as an argument, you must include the time value, as shown in the following example.

```
DIFF_HOUR(NOW(), "12/25/08 12:00 AM")
```

DIFF_MINUTE( )

Calculates the number of minutes between two date values.

Syntax DIFF_MINUTE(date1, date2)

Arguments

date1
The first date or date expression to use in the calculation. If the date does not have a time value, the function assumes the time is midnight, 12:00 AM.

date2
The second date or date expression to use in the calculation. If the date does not have a time value, the function assumes the time is midnight, 12:00 AM.

Returns The number of minutes between date1 and date2.

Example The following example calculates the number of minutes between each value in the startTime data field and each value in the finishTime data field:

```
DIFF_MINUTE([startTime],[finishTime])
```

The following example calculates the number of minutes from the current date to Christmas. NOW( ) is a function that returns the current date and time. If you supply a literal date as an argument, you must include the time value, as shown in the following example:

```
DIFF_MINUTE(NOW(), "12/25/08 12:00 AM")
```

DIFF_MONTH( )

Calculates the number of months between two date values.

Syntax DIFF_MONTH(date1,date2)

Arguments

date1
The first date or date expression to use in the calculation.

date2
The second date or date expression to use in the calculation.

Returns The number of months between date1 and date2. The function calculates the difference by subtracting the month number of date1 from the month number of

date2. For example, if date1 is 8/1/08 and date2 is 8/31/08, DIFF_MONTH( ) returns 0. If date1 is 8/25/08 and date2 is 9/5/08, DIFF_MONTH( ) returns 1.

Example The following example calculates the number of months between each value in the askByDate data field and each value in the ShipByDate data field:

```
DIFF_MONTH([askByDate],[shipByDate])
```

The following example calculates the number of months from each value in the hireDate data field to the end of the year:

```
DIFF_MONTH([hireDate], "1/1/09")
```

DIFF_QUARTER( )

Calculates the number of quarters between two date values.

Syntax DIFF_QUARTER(date1, date2)

Arguments

date1
The first date or date expression to use in the calculation.

date2
The second date or date expression to use in the calculation.

Returns The number of quarters between date1 and date2. DIFF_QUARTER calculates the difference by subtracting the quarter number of the month in date1 from the quarter number of the month in date2. The first quarter consists of the first three months in a calendar year, the second quarter consists of the next three months, and so on. For example, if date1 is 8/1/08 and date2 is 10/31/08, DIFF_QUARTER( ) returns 1. If date1 is 7/25/08 and date2 is 09/5/08, DIFF_QUARTER( ) returns 0.

Example The following example calculates the number of quarters between each value in the PlanClosing data field and each value in the ActualClosing data field:

```
DIFF_QUARTER([PlanClosing],[ActualClosing])
```

The following example calculates the number of quarters from each value in the orderDate data field to the end of the year:

```
DIFF_QUARTER([orderDate], "1/1/09")
```

DIFF_SECOND( )

Calculates the number of seconds between two date values.

Syntax DIFF_SECOND(date1, date2)

Arguments

date1
The first date or date expression to use in the calculation. If the date does not have a time value, the function assumes the time is midnight, 12:00 AM.

date2
The second date or date expression to use in the calculation. If the date does not have a time value, the function assumes the time is midnight, 12:00 AM.

Returns The number of seconds between date1 and date2.

Example The following example calculates the number of seconds between each value in the startTime data field and each value in the finishTime data field:

```
DIFF_SECOND([startTime],[finishTime])
```

The following example calculates the number of seconds from the current date to Christmas. NOW( ) is a function that returns the current date and time. If you supply a literal date as an argument, you must include the time value, as shown in the following example:

```
DIFF_SECOND(NOW(), "12/24/08 12:00 AM")
```

DIFF_WEEK( )

Calculates the number of weeks between two date values.

Syntax DIFF_WEEK(date1, date2)

Arguments

date1
The first date or date expression to use in the calculation.

date2
The second date or date expression to use in the calculation.

Returns The number of weeks between date1 and date2. The function calculates the difference by subtracting the week number of date1 from the week number of date2. For example, if date1 is 1/3/08 (week 1 of the year), and date2 is 1/7/08 (week 2 of the year), DIFF_WEEK( ) returns 1.

Example The following example calculates the number of weeks between each value in the askByDate data field and each value in the shipByDate data field:

```
DIFF_WEEK([askByDate],[shipByDate])
```

The following example calculates the number of weeks from each value in the orderDate data field to the end of the year:

```
DIFF_WEEK([orderDate], "1/1/09")
```

DIFF_YEAR( )

Calculates the number of years between two date values.

Syntax DIFF_YEAR(date1, date2)

Arguments

date1
The first date or date expression to use in the calculation.

date2
The second date or date expression to use in the calculation.

Returns The number of years between date1 and date2. The function calculates the difference by subtracting the year number of date1 from the year number of date2. For example, if date1 is 1/1/08 and date2 is 12/31/08, DIFF_YEAR( ) returns 0. If date1 is 11/25/08 and date2 is 1/5/09, DIFF_YEAR( ) returns 1.

Example The following example calculates the number of years between each value in the HireDate data field and each value in the TerminationDate data field:

```
DIFF_YEAR([HireDate],[TerminationDate])
```

The following example calculates the number of years from each value in the HireDate data field to the current date. TODAY( ) is a function that returns the current date.

```
DIFF_YEAR([HireDate], TODAY())
```

DIFFERENCE( )

Calculates the difference between values in two columns, ColumnB – ColumnA.

Category Math

Column In the first field, select a column from the list, or type a value to subtract from the second field.

Column In the second field, select a column from the list.

Returns Interactive Viewer subtracts the first value from the second value and displays the difference in the cross tab.

FIND( )

Finds the location of a substring in a string.

Syntax FIND(strToFind, str)

FIND(strToFind, str, startPosition)

Arguments

strToFind
The substring to search for. The search is case-sensitive.

str
The string in which to search.

startPosition
The position in str where the search starts.

Returns

The numerical position of the substring in the string. The first character of a string starts at 1. If the substring is not found, FIND( ) returns 0.

Example

The following example searches for the substring, Ford, in each ProductName value. If the product name is 1969 Ford Falcon, FIND( ) returns 6.

```
FIND("Ford", [ProductName])
```

The following example searches for the first hyphen (-) in each product code. If the product code is ModelA-1234-567, FIND( ) returns 7.

```
FIND("-", [ProductCode])
```

The following example uses FIND( ) in conjunction with the LEFT( ) function to display the characters preceding the hyphen in a product code. The LEFT( ) function extracts a substring of a specified length, starting from the first character. In this example, the length of the substring to display is equal to the numerical position of the hyphen character.

```
LEFT([ProductCode], FIND("-", [ProductCode]))
```

If the product code is ModelA-1234, LEFT( ) returns the following string:

```
ModelA
```

IF( )

Returns one value if a specified condition evaluates to True, or another value if the condition evaluates to False.

Syntax

IF(condition, doIfTrue, doIfFalse)

Arguments

condition
The condition to test.

doIfTrue
The value to return if condition evaluates to True.

doIfFalse
The value to return if condition evaluates to False.

Returns

Returns the doIfTrue value if condition is True or the doIfFalse value if condition is False.

Example The following example calculates and displays different discount amounts based on the value in the Total data field. If the Total value is greater than 5000, the discount is 15%. Otherwise, the discount is 10%.

```
IF([Total]>5000, [Total]*15%, [Total]*10%)
```

The following example uses IF( ) in conjunction with the BETWEEN( ) and ADD_DAY( ) functions to calculate a shipment date. If an orderDate value is in December 2007 (between 12/1/07 and 12/31/07), add 5 days to the orderDate value. If a orderDate value is in a month other than December, add 3 days to the orderDate value.

```
IF((BETWEEN([orderDate], "12/1/07 12:00 AM", "12/31/07 12:00
   AM")), (ADD_DAY([orderDate], 5)), (ADD_DAY([orderDate], 3)))
```

The following example checks each value in the Office data field. If the value is Boston, San Francisco, or NYC, the computed column displays U.S. If the value is something other than Boston, San Francisco, or NYC, the computed column displays Europe and Asia Pacific.

```
IF([Office]="Boston" OR [Office]="San Francisco" OR
   [Office]="NYC", "U.S.", "Europe and Asia Pacific")
```

IN( )

Tests if a value is equal to a value in a list.

Syntax IN(value, check1,…, checkN)

Arguments

value
The value to test. The value can be a string, numeric, or date value.

check1, …, checkN
The value or values to compare to.

Returns True if value is equal to one of the check values; returns false otherwise.

Example The following example tests if New Haven, Baltimore, or Cooperstown are values in the city data field. If any one of the cities is in the data field, IN( ) returns true.

```
IN([city], "New Haven", "Baltimore", "Cooperstown")
```

The following example tests if 9/15/08 or 9/30/08 are values in the payDate data field. If you supply a literal date as an argument, you must include the time value, as shown in the following example:

```
IN([payDate], "9/15/08 12:00 AM", "9/30/08 12:00 AM")
```

The following example uses IN( ) in conjunction with the IF( ) function to test if Ships or Trains are values in the ProductLine data field. If Ships or Trains is a

value in the field, the computed column displays Discontinued Item; otherwise, the product line value is displayed as it appears in the field.

```
IF(IN([ProductLine], "Ships", "Trains"),"Discontinued Item",
   [ProductLine])
```

ISNULL( )

Tests if a value in a specified data field is a null value. A null value means no value exists.

Syntax ISNULL(value)

Argument **value**
The data field in which to check for null values.

Returns True if a value in the specified data field is a null value; returns false otherwise.

Example The following example uses ISNULL( ) in conjunction with the IF( ) function to test for null values in the BirthDate data field. If there is a null value, the computed column displays No date specified; otherwise the BirthDate value is displayed.

```
IF(ISNULL([BirthDate]), "No date specified", [BirthDate])
```

LEFT( )

Extracts a substring from a string, starting from the leftmost, or first, character.

Syntax LEFT(str)

LEFT(str, n)

Arguments **str**
The string from which to extract a substring.

n
The number of characters to extract, starting from the first character.

Returns A substring of a specific length.

- If you omit n, the number of characters to extract, the function returns the first character only.
- If n is zero, the function returns an empty string.
- If n is greater than the length of the string, the function returns the entire string.

Example The following example displays the first letter of each name in the CustomerName data field:

```
LEFT([CustomerName])
```

The following example uses the LEFT( ) and FIND( ) functions to display the characters preceding the hyphen in a product code:

```
LEFT([ProductCode], FIND("-", [ProductCode]))
```

If the product code is ModelA-1234, LEFT( ) returns the following string:

```
ModelA
```

LEN( )

Counts the number of characters in a string.

Syntax LEN(str)

Argument **str**
The string expression to evaluate.

Returns The number of characters in the specified string.

Example The following example returns the length of each value in the ProductCode data field:

```
LEN([ProductCode])
```

The following example uses LEN( ) in conjunction with the RIGHT( ) and FIND( ) functions to display the characters that appear after the hyphen in a product code. RIGHT( ) extracts a substring of a specified length, starting from the last character. In this example, the length of the entire string returned by LEN( ) minus the length up to the hyphen is the number of characters to display.

```
RIGHT( [PRODUCTNAME], LEN([PRODUCTNAME] ) - (FIND
   ("-" ,[PRODUCTNAME] )))
```

If the product code is ModelA-Ford, RIGHT( ) returns the following string:

```
A-Ford
```

LIKE( )

Tests if a string matches a pattern.

Syntax LIKE(str, pattern)

Argument **str**
The string to evaluate.

pattern
The string pattern to match. You must enclose the pattern in double quotation marks (" "). Use the correct case when typing the characters to match; the match is case-sensitive. You can use the following special characters in a pattern:

- A percent character (%) matches zero or more characters. For example, %ace% matches any string value containing the substring ace, such as Facebook, and MySpace. It does not match Ace Corporation because this string contains a capital A, and not the lowercase a.
- An underscore character (_) matches exactly one character. For example, t_n matches tan, ten, tin, and ton. It does not match teen or tn.

To match a literal percent (%), underscore (_), precede those characters with a two backslash (\\) characters. For example, to see if a string contains M_10, specify the following pattern:

```
"%M\\_10%"
```

Returns True if the string matches the pattern; returns false otherwise.

Example The following example returns true for values in the customerName field starting with D:

```
LIKE([customerName], "D%")
```

The following example returns true for productCode values containing the substring Ford:

```
LIKE([productCode], "%Ford%")
```

The following example uses two LIKE( ) expressions to look for the substrings “Ford” or “Chevy” in each ProductName value. If a product name contains either substring, the computed column displays U.S. Model; otherwise, it displays Imported Model.

```
IF(((LIKE([ProductName], "%Ford%") = TRUE) OR (LIKE([ProductName],
   "%Chevy%") = TRUE)), "U.S. model", "Imported Model")
```

LOWER( )

Converts all letters in a string to lowercase.

Syntax LOWER(str)

Argument **str**
The string to convert to lowercase.

Returns The specified string in all lowercase letters.

Example The following example displays all the string values in the productLine data field in lowercase:

```
LOWER([productLine])
```

MOD( )

Returns the modulo value for a number and a divisor.

Syntax MOD(number, divisor)

Arguments

number
The number from which to derive the mod value.

divisor
The divisor for the mod function.

Returns Returns the remainder value of number divided by divisor.

Example The following example computes the remainder of PriceEstimate data field divided by 12, returning an integer. For example, if the PriceEstimate value is 27365, MOD( ) returns 5.

```
MOD([PriceEstimate], 12)
```

MONTH( )

Returns the month for a specified date value.

Syntax MONTH(date)

MONTH(date, option)

Arguments

date
The date or date expression whose month to retrieve.

option
A number representing the month format to return. Use one of the following values:

- 1 to get the month as a number from 1 to 12.
- 2 to get the full month name, for example, January. The result is locale-specific.
- 3 to get the abbreviated month name, for example, Jan. The result is locale-specific.

If you omit option, MONTH( ) returns the month as a number.

Returns The month for a specified date value.

Example The following example returns the month (1 - 12) for each value in the ShipDate data field:

```
MONTH([ShipDate])
```

The following example returns the full month name for each ShipDate value:

```
MONTH([ShipDate], 2)
```

NOTNULL( )

Tests if a value in a specified data field is a non-null value.

Syntax NOTNULL(value)

Argument **value**
The data field in which to check for non-null values.

Returns True if a value in the specified data field is not a null value; returns false otherwise.

Example The following example uses NOTNULL( ) in conjunction with the IF( ) function to test for non-null values in the BirthDate data field. If there is a non-null value, the BirthDate value is displayed; otherwise the string "No date specified" is displayed.

```
IF(NOTNULL([BirthDate]), [BirthDate], "No date specified")
```

NOW( )

Returns the current date and time.

Syntax NOW( )

Returns The current date and time. For example:

```
Sep 23, 2008 11:56 AM
```

Example The following example uses the DIFF_MINUTE( ) and NOW( ) functions to calculate the number of minutes from the current date and time to Christmas:

```
DIFF_MINUTE(NOW(), "12/25/08 12:00 AM")
```

PRODUCT( )

Returns the product of multiplication, ColumnA * ColumnB.

Category Math

Column Select the first measure name from the list.

Column Select the second measure name from the list.

Returns Interactive Viewer multiplies the value in the first column by the value in the second and displays the product.

QUARTER( )

Returns the quarter number for a specified date value.

Syntax QUARTER(date)

Arguments **date**
The date or date expression whose quarter number to get.

Returns A number from 1 to 4 representing the quarter for a specified date value. Quarter 1 starts in January.

Example The following example displays the quarter number for each value in the CloseDate data field:

```
QUARTER([CloseDate])
```

The following example displays a string—Q1, Q2, Q3, or Q4—for each value in the CloseDate data field:

```
"Q" & QUARTER([CloseDate])
```

RANK( )

Returns the rank of a value in a set of values. The rank of a value ranges from 1 to the number of values in the set. If two values are identical, they have the same rank.

Syntax RANK(expr)

RANK(expr, ascending, groupLevel)

Arguments **expr**
The expression specifying the values to evaluate. The field can be of string, numeric, or date type.

ascending
Use one of the following values:

- 0 to rank values in descending order. In descending order, the highest value is ranked 1, and the lowest value is equal to the number of values in the set.
- 1 to rank values in ascending order. In ascending order, the lowest value is ranked 1, and the highest value is equal to the number of values in the set.

If you omit the ascending argument, RANK( ) assumes 0 (descending order).

groupLevel
The numeric index of the group whose values to use in the calculation. 0 indicates the table, 1 indicates the first group, 2 indicates the second group, and so on. If you do not supply a value for groupLevel, the function performs the calculation over all the values in the table.

Returns A number representing the rank of a value in the specified data field in the table or in the specified group.

Example The following example ranks each value in the Score data field. The ranking is performed over all the values in the table.

```
RANK([Score])
```

The following example ranks each value in the Score data field in ascending order. The ranking is performed over all the values in each group at the second level.

```
RANK([Score], 1, 2)
```

RATIO( )

Returns the ratio, ColumnA/ColumnB.

Category Math

Column Select the first column from the list.

Column Select the second column from the list.

Returns Interactive Viewer divides the first column value by the second column value and displays the ratio value.

RIGHT( )

Extracts a substring from a string, starting from the rightmost, or last, character.

Syntax RIGHT(str)

RIGHT(str, n)

Arguments

str
The string from which to extract a substring.

n
The number of characters to extract, starting from the last character.

Returns A substring of a specific length.

- If you omit n, the number of characters to extract, the function returns the last character only.
- If n is zero, the function returns an empty string.
- If n is greater than the length of the string, the function returns the entire string.

Example The following example displays the last four characters of each value in the ProductCode data field:

```
RIGHT([ProductCode], 4)
```

The following example uses RIGHT( ) in conjunction with the LEN( ) and FIND( ) functions to display the characters that appear after the hyphen in a product code. This example assumes that the number of characters after the hyphen varies. Therefore, the length of the entire string (returned by LEN( )) minus the length up to the hyphen (returned by FIND( )) is the number of characters to display.

```
RIGHT([ProductCode], (LEN([ProductCode]) - FIND("-" ,
   [ProductCode])))
```

If the product code is ModelA-Ford, RIGHT( ) returns Ford. If the product code is ModelB-Toyota, RIGHT( ) returns Toyota.

ROUND( )

Rounds a number to a specified number of digits.

Syntax ROUND(num)

ROUND(num, dec)

Arguments

num
The number to round.

dec
The number of digits to which to round num. If you omit dec, ROUND( ) assumes 0.

Returns A number rounded to a specified number of digits.

Example The following example rounds the numbers in the PriceEstimate data field to return an integer. For example, if the PriceEstimate value is 1545.50, ROUND( ) returns 1546. If the PriceEstimate value is 1545.25, ROUND( ) returns 1545.

```
ROUND([PriceEstimate])
```

The following example rounds the numbers in the PriceEstimate data field to one decimal place. For example, if the PriceEstimate value is 1545.56, ROUND( ) returns 1545.6. If the PriceEstimate value is 1545.23, ROUND( ) returns 1545.2.

```
ROUND([PriceEstimate], 1)
```

The following example rounds the numbers in the PriceEstimate data field to one digit to the left of the decimal point. For example, if the PriceEstimate value is 1545.56, ROUND( ) returns 1550. If the PriceEstimate value is 1338.50, ROUND( ) returns 1340.

```
ROUND([PriceEstimate], -1)
```

ROUNDDOWN( )

Rounds a number down to a specified number of digits.

Syntax

ROUNDDOWN(num)

ROUNDDOWN(num, dec)

Arguments

num
The number to round down.

dec
The number of digits to which to round num down. If you omit dec, ROUND( ) assumes 0.

Returns

A number rounded down to a specified number of digits.

Example

The following example rounds down the numbers in the PriceEstimate data field to return an integer. For example, if the PriceEstimate value is 1545.25, ROUNDDOWN( ) returns 1545. If the PriceEstimate value is 1545.90, ROUNDDOWN( ) returns 1545.

```
ROUNDDOWN([PriceEstimate])
```

The following example rounds down the numbers in the PriceEstimate data field to one decimal place. For example, if the PriceEstimate value is 1545.56, ROUNDDOWN( ) returns 1545.5. If the PriceEstimate value is 1545.23, ROUNDDOWN( ) returns 1545.2.

```
ROUNDDOWN([PriceEstimate], 1)
```

The following example rounds the numbers in the PriceEstimate data field down to one digit to the left of the decimal point. For example, if the PriceEstimate value is 1545.56, ROUNDDOWN( ) returns 1540. If the PriceEstimate value is 1338.50, ROUNDDOWN( ) returns 1330.

```
ROUNDDOWN([PriceEstimate], -1)
```

ROUNDUP( )

Rounds a number up to a specified number of digits.

Syntax ROUNDUP(num)

ROUNDUP(num, dec)

Arguments **num**
The number to round up.

dec
The number of digits to which to round num up. If you omit dec, ROUND( ) assumes 0.

Returns A number rounded up to a specified number of digits.

Example The following example rounds up the numbers in the PriceEstimate data field to return an integer. For example, if the PriceEstimate value is 1545.25, ROUNDUP( ) returns 1546. If the PriceEstimate value is 1545.90, ROUNDUP( ) returns 1546.

```
ROUNDUP([PriceEstimate])
```

The following example rounds up the numbers in the PriceEstimate data field to one decimal place. For example, if the PriceEstimate value is 1545.56, ROUNDUP( ) returns 1545.6. If the PriceEstimate value is 1545.23, ROUNDUP( ) returns 1545.3.

```
ROUNDUP([PriceEstimate], 1)
```

The following example rounds up the numbers in the PriceEstimate data field to one digit to the left of the decimal point. For example, if the PriceEstimate value is 1545.56, ROUNDUP( ) returns 1550. If the PriceEstimate value is 1338.50, ROUNDUP( ) returns 1340.

```
ROUNDUP([PriceEstimate], -1)
```

RUNNINGSUM( )

Calculates a running sum for each data row. A running sum is a total accumulated from row to row.

Syntax RUNNINGSUM(expr)

Argument **expr**
The expression specifying the values to use in the calculation. The data type must be numeric.

Returns A cumulative total for each row.

Example The following example calculates a running sum for each value in the LineItemTotal. For example, if the LineItemTotal field contains 50, 75, 80, 90, and 95, RUNNINGSUM( ) returns 50, 125, 205, 295, and 390 for each row, respectively.

```
RUNNINGSUM([LineItemTotal])
```

SEARCH( )

Finds the location of a substring in a string. The substring can contain wildcard characters.

Syntax SEARCH(pattern, str)

SEARCH(pattern, str, startPosition)

Arguments

pattern
The string pattern to search for. You must enclose the pattern in double quotation marks (" "). You can use the following special characters in a pattern:

- An asterisk (*) matches zero or more characters, including spaces. For example, t*n matches tn, tin, and teen.
- A question mark (?) matches exactly one character. For example, t?n matches tan, ten, tin, and ton. It does not match teen or tn.

str
The string to search.

startPosition
The position in str where the search starts.

Returns The numerical position of the string pattern in the string. The first character of a string starts at 1. If the substring is not found, SEARCH( ) returns 0.

Example The following example searches for the string pattern, S*A, in each product code. If the product name is KBS5412A, SEARCH( ) returns 3.

```
SEARCH("S*A", [ProductCode])
```

The following example uses SEARCH( ) in conjunction with the LEFT( ) function to display the characters preceding the first space character in a product name. The LEFT( ) function extracts a substring of a specified length, starting from the first character. In this example, the length of the substring to display is equal to the numerical position of the space character.

```
LEFT([ProductName], SEARCH(" ", [ProductName]))
```

If the product name is 1969 Ford Falcon, LEFT( ) returns 1969.

SQRT( )

Calculates the square root of a number.

Syntax SQRT(num)

Argument **num**
The number, or numeric expression specifying the number, for which you want to find the square root. The number must be a positive number.

Returns A number that is the square root of num.

Example The following example calculates the square root of each value in the LotSize data field:

```
SQRT([LotSize])
```

The following example uses SQRT( ) to calculate the actual distance travelled uphill, given the base distance and elevation values. This example applies the Pythagoras theorem, which states that $a^2 + b^2 = c^2$. Using this theorem, the actual distance travelled is c, which means we want to calculate

$$c = \sqrt{a^2 + b^2}$$

which translates to the following expression:

```
SQRT((([Distance] * [Distance]) + ([Elevation] * [Elevation])))
```

TODAY( )

Returns the current date that includes a time value of midnight, 12:00 AM.

Syntax TODAY( )

Returns The current date in the following format:

```
Sep 25, 2008 12:00 AM
```

Example The following example calculates the number of days from the current date to Christmas:

```
DIFF_DAY(TODAY(), "12/25/08")
```

The following example calculates the number of years from each value in the HireDate data field to the current date:

```
DIFF_YEAR([HireDate], TODAY())
```

TRIM( )

Removes the leading and trailing blanks from a specified string. TRIM( ) does not remove blank characters between words.

Syntax TRIM(str)

Argument **str**
The string from which to remove leading and trailing blank characters.

Returns A string with all leading and trailing blank characters removed.

Example The following example uses TRIM( ) to remove all leading and trailing blank characters from values in the FirstName and LastName data fields. The expression uses the & operator to concatenate each trimmed FirstName value with a space, then with each trimmed LastName value.

```
TRIM([FirstName]) & " " & TRIM([LastName])
```

TRIMLEFT( )

Removes the leading blanks from a specified string.

Syntax TRIMLEFT(str)

Arguments **str**
The string from which to remove the leading blank characters.

Returns A string with all leading blank characters removed.

Example The following example concatenates a literal string with each value in the customerName data field. TRIMLEFT( ) removes all blank characters preceding the customerName value so that there are no extra blank characters between the literal string and the customerName value.

```
"Customer name: " & TRIMLEFT([customerName])
```

TRIMRIGHT( )

Removes the trailing blanks from a specified string.

Syntax TRIMRIGHT(str)

Argument **str**
The string from which to remove the trailing blank characters.

Returns A string with all trailing blank characters removed.

Example The following example concatenates each value in the Comment data field with a semicolon, then with a value in the Action data field. TRIMRIGHT( ) removes all blank characters after the Comment value so that there are no extra blank characters between the Comment string and the semicolon.

```
TRIMRIGHT([Comment]) & "; " & [Action]
```

UPPER( )

Converts all letters in a string to uppercase.

Syntax UPPER(str)

Argument **str**
The string to convert to uppercase.

Returns The specified string in all uppercase letters.

Example The following examples displays all the string values in the customerName data field in all uppercase:

```
UPPER([customerName])
```

WEEK( )

Returns a number from 1 to 52 representing the week of the year.

Syntax WEEK(date)

Argument **date**
The date or date expression whose week of the year to get.

Returns A number representing the week of the year for the specified date value.

Example The following example gets the week number of the year for each date value in the ShipDate data field:

```
WEEK([ShipDate])
```

WEEKDAY( )

Returns the day of the week for a specified date value.

Syntax WEEKDAY(date, option)

Arguments **date**
The date or date expression from which you get the day of the week.

option
A number representing the weekday format to return. Use one of the following values:

- 1 to get the day as a number from 1 (Sunday) to 7 (Saturday).
- 2 to get the day as a number from 1 (Monday) to 7 (Sunday).
- 3 to get the day as a number from 0 (Monday) to 6 (Sunday).
- 4 to get the full weekday name, for example, Wednesday. The result is locale-specific.
- 5 to get the abbreviated weekday name, for example Wed. The result is locale-specific.

If you omit option, WEEKDAY( ) assumes option 1.

Returns The day of the week for a specified date value.

Example The following example gets the full weekday name for each date value in the DateSold data field:

```
WEEKDAY([DateSold], 4)
```

YEAR( )

Returns the four-digit year value for a specified date value.

Syntax YEAR(date)

date
The date or date expression from which you extract the year part.

Returns The number representing the four-digit year for the specified date value.

Example The following example retrieves the four-digit year for each date value in the ShipDate data field, and adds 15 to the four-digit year. If the ShipDate value is Sep 16, 2008, YEAR( ) returns 2023.

```
(YEAR([ShipDate]) + 15)
```

Functions used in aggregate calculations

Table 11-1 describes the range of functions that perform aggregate calculations. In Interactive Viewer, you can perform aggregate calculations across the data rows in a group, section, or across an entire report table.

Table 11-1 Aggregate functions

Aggregate function	Description
AVERAGE	Returns the average, or mean for a set of data rows. For example, if a report column contains values 5, 2, 7, and 10, AVERAGE returns 6.
COUNT	Counts the number of data rows. If a column contains values 5, 2, 7, and 10, COUNT returns 4.
COUNT VALUE	Counts the number of unique values in a set of data rows. If a report column contains values 5, 2, 5, 7, and 10, COUNTVALUE returns 4.
FIRST	Returns the first value in set of data rows. If a report column contains data rows 5, 2, and 10, FIRST returns 5.
LAST	Returns the last value in a set of data rows. If a report column contains data row values 2, 5, 7, and 10, LAST returns 10.
MAX	Returns the largest value in a set of data rows. If a report column contains data row values 5, 2, 7, and 10, MAX returns 10. For string values, MAX returns the last alphabetical value. For date values, MAX returns the latest date.
MEDIAN	Returns the median, or middle value in a set of data rows. If a report column contains values, 5, 2, 7, and 10, MEDIAN returns 6.
MIN	Returns the smallest value in a set of data rows. If a report column contains data row values 5, 2, 7, and 10, MIN returns 2. For string data, MIN returns the first alphabetical value. For date values, MIN returns the earliest date.
MODE	Returns the mode, or the value that occurs most frequently in a set of data rows. If a report column contains values, 5, 2, 5, 7, and 10, MODE returns 5.
QUARTILE	Returns the quartile value in a set of data rows, given a specified quart (0-4). A quartile can be defined as any three values that divide a set of values into four equal parts, such that each part represents 1/4 of the set of values. MIN, MEDIAN, and MAX return the same value as QUARTILE when quart is equal to 0, 2, and 4, respectively. If a set of data rows contains 50, 75, 80, 90, and 95, and you specify a quart of 2, QUARTILE returns 80.
STDDEV	Returns the standard deviation of a set of data rows. Standard deviation is a statistic that shows how widely values disperse from the mean value. If a set of data rows contains 50, 75, 80, 90 and 95, STDDEV returns 17.536.

(continues)

Table 11-1 Aggregate functions (continued)

Aggregate function	Description
SUM	Adds all the values in a set of data rows. If a report column contains 50, 75, 80, 90, and 95, SUM returns 390.
VARIANCE	Returns the variance of a set of data rows. Variance is a statistical measure expressing large the size of the differences between the values. The variance increases as the differences between the numbers increase. If a set of data rows contains 50, 75, 80, 90, and 95, VARIANCE returns 307.5. If a set of data rows contains 5, 2, 5, 7, and 10, VARIANCE returns 8.7.
WEIGHTEDAVE	Returns the weighted average value in a set of data rows, given weights specified in another set of values. In a weighted average, each number is assigned a weight or degree of importance. These weights determine the relative importance of each number on the average. Grades are often computed using a weighted average. For example, for a set of scores 50, 75, 80, 90, and 95, with respective weights, 10, 25, 15, 30, and 20, WEIGHTEDAVE returns 81.75.

Operators

This section is a complete reference to all the operators you can use when you create expressions. This reference organizes the operators into the following categories:

- Operators in computed column expressions
- Operators in conditional formatting and filter condition expressions

Operators in computed column expressions

Table 11-2 lists the operators you can use when you write expressions for a computed column.

Table 11-2 Operators in computed column expressions

Operator	Use to	Example
+	Add two or more numeric values together.	[OrderAmount] + [SalesTax]
-	Subtract one numeric value from another.	[OrderAmount] - [Discount]
*	Multiply numeric values.	[Price] * [Quantity]
/	Divide numeric values.	[Profit]/12

Table 11-2 Operators in computed column expressions

Operator	Use to	Example
^	Raise a numeric value to a power.	[Length]^2
%	Specify a percent.	[Price] * 80%
=	Test if two values are equal.	IF([ProductName] = "1919 Ford Falcon", "Discontinued Item", [ProductName])
>	Test if one value is greater than another value.	IF([Total] > 5000, [Total]*15%, [Total]*10%)
<	Test if one value is less than another value.	IF([SalePrice] < [MSRP], "Below MSRP", "Above MSRP")
>=	Test if one value is greater than or equal to another value.	IF([Total] >= 5000, [Total]*15%, [Total]*10%)
<=	Test if one value is less than or equal to another value.	IF([SalePrice] <= [MSRP], "Below or equal to MSRP", "Above MSRP")
AND	Test if two or more conditions are true.	IF(([Gender] = "Male" AND [Salary] >= 150000 AND [Age] < 50), "Match found", "No match")
OR	Test if any one of multiple conditions is true.	IF(([City] = "Boston") OR ([City] = "San Francisco"), "U.S.", "Europe and Asia")
&	Concatenate string values.	[FirstName] & " " & [LastName]

Operators in conditional formatting and filter condition expressions

Table 11-3 lists the operators you can use when you create expressions for conditional formatting and filter conditions.

Table 11-3 Operators in conditional formatting and filter condition expressions

Operator	Use to	Example
Any Of	Test if a column value is equal to any one of the specified values.	Country Any Of USA, Canada, Mexico
Between	Test if a column value is between two specified values.	Profit Between 1000 and 2000
Bottom N	Test if a column value is among the lowest *n* values.	SalesAmount Bottom N 10

(continues)

Table 11-3 Operators in conditional formatting and filter condition expressions (continued)

Operator	Use to	Example
Bottom Percent	Test if a column value is in the bottom *n* percent of all values.	SalesAmount Bottom Percent 5
Equal to	Test if a column value is equal to a specified value.	Country Equal to France
Greater Than	Test if a column value is greater than a specified value.	Total Greater Than 5000
Greater Than or Equal to	Test if a column value is greater than or equal to a specified value.	Total Greater Than or Equal to 5000
In	Test if a column value is in the list of specified values. Usage similar to the Any Of operator.	Country In USA, Canada, Mexico
Is False	Test if a column value is false.	LoanApproved Is False
Is Not Null	Test if a column value is not a null value. A null value means no value is supplied.	CreditLimit Is Not Null
Is Null	Test if a column value is a null value.	CreditLimit Is Null
Is True	Test if a column value is true.	LoanApproved Is True
Less Than	Test if a column value is less than a specified value.	Total Less Than 5000
Less Than or Equal to	Test if a column value is less than or equal to a specified value.	Total Less Than or Equal to 5000
Like	Test if a column value matches a string pattern.	ProductName Like %Ford%
Not Between	Test if a column value is not between two specified values.	Profit Not Between 1000 and 2000
Not Equal to	Test if a column value is not equal to a specified value.	Country Not Equal to France
Not In	Test if a column value is not in the specified list of values.	Country Not In USA, Canada, Mexico
Not Like	Test if a column value does not match a string pattern.	ProductName Not Like %Ford%
Top N	Test if a column value is among the top *n* values.	SalesAmount Top N 10
Top Percent	Test if a column value is in the top *n* percent of all values.	SalesAmount Top Percent 5

Part Two

Actuate BIRT Viewer Reference

Chapter

12

Configuring Actuate BIRT Viewer

This chapter covers the following topics:

- Configuring the Actuate BIRT Viewer toolbar using iv_config.xml
- Configuring an Actuate BIRT Viewer using web.xml
- Configuring a BIRT Viewer Java Extension
- Configuring default export formats

Configuring the Actuate BIRT Viewer toolbar using iv_config.xml

The Actuate BIRT Viewer provides a toolbar and context menus that support many of the formatting, sorting, and grouping tasks you perform on data. The toolbar and menus also support adding or deleting columns or groups, and working with fonts and text alignment. You also can print reports and export content or data. Enable or disable each of these features using the configuration file iv_config.xml. Its location is:

```
<context root>\WEB-INF\iv_config.xml
```

The iv_config.xml file contains lists of features that are enabled or disabled based on security roles as defined in Actuate iServer. The default roles included for iv_config.xml are:

- All
- Active Portal Intermediate
- Active Portal Advanced
- Active Portal Administrator

The Active Portal roles are created when iServer is installed or, if you are using the Java Component Actuate BIRT Viewer, set in the web.xml DEFAULT_WORKGROUP_FUNCTIONALITY_ROLE parameter. You can add additional iServer roles as needed. Each set of features for a role is called a feature control. Each feature control contains the user role being described, and the set of features that are marked individually as available or not available. The following section of iv_config.xml shows the default feature control for the Active Portal Advanced role:

```
<FeatureControl>
   <Role>Active Portal Advanced</Role>
   <Features>
      <Feature>
         <FeatureName>SaveDesign</FeatureName>
         <Availablity>false</Availablity>
      </Feature>
      <Feature>
         <FeatureName>SaveDocument</FeatureName>
         <Availablity>true</Availablity>
      </Feature>
      …
   </Features>
</FeatureControl>
```

All <FeatureControl> tags are placed within the <FeatureConfiguration> element. Each feature is described by the <Feature> tag, and its availability is described with the <Availability> tag. If a particular feature is available to a role, availability is set to true. If the feature is not available, it is set to false.

Exception stack trace display is also controlled in the iv_config.xml file. When an exception occurs, the viewer can display a stack trace can be displayed in the exception dialog. The trace is used for support purposes, and is set to false by default. This value is not associated with user roles and is placed outside the <FeatureControl> tag. The format of the iv_config.xml file appears as shown in the following code:

```
<IVConfig>
   <!-- Disable stack trace on exception dialog -->
   <ExceptionStackTrace>false</ExceptionStackTrace>

   <!-- Config features -->
   <FeatureConfiguration>
      <!-- All -->
      <FeatureControl>
         …
      </FeatureControl>
      <FeatureControl>
         …
      </FeatureControl>
         …
   </FeatureConfiguration>
</IVConfig>
```

Table 13-1 lists the features that can be set, and how the availability tag affects them.

Table 13-1 Actuate BIRT Viewer feature set

Feature	Availability tag description
AdvancedSort	Shows or hides the Advanced Sort item in the context menu
Aggregation	Shows or hides the Aggregation item in the context menu
Analyze	Enables or disables the Analyze item in the cross tab toolbar and context menu
AutoEnableIV	Enables or disables interactivity by default
CalculatedColumn	Shows or hides the New Computed Column and Edit Computed Column items in the context menu

(continues)

Table 13-1 Actuate BIRT Viewer feature set (continued)

Feature	Availability tag description
ChartSubType	Shows or hides the Chart Subtype item in the context menu
ChartProperty	Shows or hides the Chart Property item in the context menu
ColumnEdit	Shows or hides the Hide Column, Show Columns, and Delete Column items in the context menu
CollapseExpand	Shows or hides the Hide Detail and Show Detail items in the context menu
ColumnResize	Shows or hides the Column Width item in the context menu
ConditionalFormat	Shows or hides the Conditional Formatting item in the context menu
EditReport	Shows or hides the Enable Interactivity item in the toolbar main menu
ExportData	Shows or hides the Export Data menu item in the toolbar main menu
ExportElement	Shows or hides the Export Content menu item in the context menu
ExportElementData	Shows or hides the Export Data menu item in the context menu
ExportReport	Shows or hides the Export Content menu item in the toolbar main menu
FacebookComments	Shows or hides the Facebook Comment menu item in the toolbar main menu
FlashGadgetFormat	Shows or hides the Format Flash Gadget item from the gadget context menu
FlashGadgetType	Shows or hides the Change Type from the gadget context menu
Filter	Shows or hides the Filter item in the context menu
Format	Shows or hides the Format, Change Font, and Alignment items in the context menu
GrandTotal	Enables or disables the Grand Total option in the aggregation dialog
GroupEdit	Shows or hides the Move To Group, Add Group, and Delete Group items in the context menu

Table 13-1 Actuate BIRT Viewer feature set (continued)

Feature	Availability tag description
HideShowItems	Shows or hides the Hide/Show Item menu item in the toolbar main menu
Highlight	Shows or hides highlighting
HoverHighlight	Shows or hides the mouse over rectangles on page elements
LinkToThisPage	Shows or hides the Link To This Page item in the main menu
MainMenu	Enables or disables the toolbar's main menu
MoveColumn	Shows or hides the Move to Left and Move to Right items in the context menu
PageBreak	Shows or hides the Page Break item in the context menu
PageNavigation	Shows or hides the page navigation icons in the navigation bar
Parameter	Shows or hides the Parameter item in the toolbar
Print	Shows or hides the Print menu item in the toolbar main menu
Resize	Enables or disables the Resize feature
ReorderColumns	Shows or hides the Reorder Columns item in the context menu
SaveDesign	Shows or hides the Save Design menu item in the toolbar main menu
SaveDocument	Shows or hides the Save Document menu item in the toolbar main menu
ScrollControl	Shows or hides the scroll control panel in page content
ServerPrint	Shows or hides the Server Print menu item in the toolbar main menu
ShareFormat	Shows or hides the Copy Format menu item in the context menu
ShareStyle	Shows or hides the Copy Style menu item from the context menu
ShowTooltip	Shows or hides tooltips
Sort	Shows or hides the Sort Ascending and Sort Descending items in the context menu

(continues)

Table 13-1 Actuate BIRT Viewer feature set (continued)

Feature	Availability tag description
SubTotal	Enables or disables the SubTotal option in the aggregation dialog
SuppressDuplicate	Shows or hides the Repeat Values and Do Not Repeat Values items in the context menu
SwitchView	Shows or hides the Switch View item in the context menu
Toc	Shows or hides the TOC menu item in the toolbar main menu
TextEdit	Shows or hides the edit text icon on text elements
Toolbar	Shows or hides the toolbar
ToolbarHelp	Shows or hides the toolbar Help menu item
TopBottomNFilter	Shows or hides the Top/BottomN item in the context menu

Configuring an Actuate BIRT Viewer using web.xml

Actuate BIRT Interactive Viewer (IV) parameters in web.xml affect how BIRT reports are run and viewed. Table 13-2 describes these configuration parameters for BIRT reports, BIRT Viewer, and Interactive Viewer.

Table 13-2 Actuate BIRT Viewer web.xml parameters

Parameter name	Description
ALLOW_EXPORT_PAGE_LIMIT	Indicates the maximum number of pages that can be exported or printed at a time from an Actuate BIRT Viewer. For example, if the value of this parameter is 200, no more than 200 pages will be exported or printed from a report using the viewer.
ALLOW_IV_PAGE_LIMIT	Specifies whether Information Console checks for a page limit before triggering an operation.
AUTOSUGGEST_DELAY	Configure the delay before the parameters page opens an automatic suggestion for a parameter. The value is measured in milliseconds, and the default value is 500.
AUTOSUGGEST_FETCH_SIZE	The number of autosuggest parameter values to load on the parameters page. The default value is -1, which loads all values.

Table 13-2 Actuate BIRT Viewer web.xml parameters (continued)

Parameter name	Description
AUTOSUGGEST_LIST_ SIZE	The number of autosuggest parameter values to display on the Parameters page when active. If more values exist than are displayed, the user can scroll through the other values. The default value is 10.
BIRT_ARCHIVE_ MEMORY_TOTALSIZE	The total memory available for BIRT report document files, in kilobytes. The default value is 50 megabytes.
BIRT_CHART_MAX_ROW	The maximum number of rows bound to a chart in a BIRT report. The default value is 10000 rows.
BIRT_CHART_MAX_ VARIABLE_SIZE	The maximum size for a variable used in a Flash chart, measured in bytes. The default value is 0, which allows a variable to be of any size.
BIRT_CUBE_FETCH_ LIMIT_COLUMN_EDGE	The maximum column limit for accessing a data cube. The value must be a non-negative integer; 0 indicates no limit.
BIRT_CUBE_FETCH_ LIMIT_ROW_EDGE	The maximum row limit for accessing a data cube. The value must be a non-negative integer; 0 indicates no limit.
BIRT_DATA_RESULTSET_ MAX_BUFFER_SIZE	The result set buffer size, in megabytes, for a data set in a BIRT report. The default value is 10 megabytes.
BIRT_ HTMLRENDEROPTION_ ENGCASSTYLE	Enables the agentStyleEngine property for the HTML render option for a BIRT report. This setting is related to using a browser's internal CSS capabilities when rendering reports in HTML. It provides better column alignment and faster rendering, especially in a browser other than Microsoft Internet Explorer. The default value is true.
BIRT_JDBC_ CONNECTION_POOL_ SIZE	Specifies the number of idle connections cached by BIRT JDBC connection pool. The default value is 10.
BIRT_JDBC_ CONNECTION_POOL_ TIMEOUT	Specifies how long an idle connection will remain in the BIRT JDBC connection pool in seconds. The default value is 3600.
BIRT_MAX_MEMORY_ SIZE_ PER_ARCHIVE	The amount of memory used by each BIRT report document file, in kilobytes. A report larger than this size is written to disk instead of being cached in memory. Use this parameter for performance tuning. The default value is 200 kilobytes.
BIRT_RESOURCE_PATH	The path to Actuate BIRT shared resources, including libraries and templates for the BIRT report designs and BIRT Studio. The default value is <context root>\resources.

(continues)

Table 13-2 Actuate BIRT Viewer web.xml parameters (continued)

Parameter name	Description
BIRT_SCRIPT_LIB_PATH	Path for the BIRT script libraries (JARs). The default value is <context root>\scriptlib.
BIRT_SAVE_REPORT_ DOCUMENT_ENABLED	Determines if temporary report files are saved. Enables the user to save output from BIRT Interactive Viewer using the __outputDocName URL parameter. Using this parameter saves the document to the folder assigned to BIRT_SAVE_REPORT_DOCUMENT_FOLDER. Default is true.
BIRT_SAVE_REPORT_ DOCUMENT_FOLDER	Path to the folder where temporary report files are created. The default path to which to save BIRT Report Documents saved using the __outputDocName parameter. This parameter is made available by setting the BIRT_SAVE_REPORT_DOCUMENT_ENABLED parameter.
BIRT_VIEWER_LOCALE	Locale that determines formatting for numbers and dates on BIRT reports. The default value is the locale of the machine on which Information Console is installed.
CACHE_CONTROL	Specifies how a web browser caches information using one of the following values: ■ NO-CACHE indicates that the browser does not cache information and forwards all requests to the server. With NO-CACHE, the back and forward buttons in a browser do not always produce expected results, because choosing these buttons always reloads the page from the server. If multiple users access Information Console from the same machine, they can view the same cached data. Setting CACHE_CONTROL to NO-CACHE prevents different users viewing data cached by the browser. ■ NO-STORE indicates that information is cached but not archived. ■ PRIVATE indicates that the information is for a single user and that only a private cache can cache this information. A proxy server does not cache a page with this setting. ■ PUBLIC indicates that information may be cached, even if it would normally be non-cacheable or cacheable only within an unshared cache. ■ UNSET (no value) is the default value. The browser uses its own default setting when there is no CACHE_CONTROL value.

Table 13-2 Actuate BIRT Viewer web.xml parameters (continued)

Parameter name	Description
CACHE_CONTROL *(continued)*	Caching information reduces the number of server requests that the browser must make and the frequency of expired page messages. Caching increases security risks because of the availability of information in the cache. For additional information about cache control, see the HTTP/1.1 specifications.
DEFAULT_LOCALE	The default locale. The default locale is en_US. Users can select a locale when they log in.
DEFAULT_TIMEZONE	The default time zone. The default time zone is Pacific Standard Time (PST).
DEFAULT_WORKGROUP_ FUNCTIONALITY_ROLE	Specifies the functionality role for all users using BIRT Viewer. The default value is Active Portal Intermediate.
EXPORT_AS_ ATTACHMENT	Determines whether a Microsoft Excel, PowerPoint, or Word report for BIRT Viewer is opened in the Microsoft Internet Explorer browser or a separate application. ■ When the value is true, the exported report opens in a separate Microsoft Word, Microsoft PowerPoint, or Microsoft Excel application. ■ When the value is false, the exported report opens in the browser window with Microsoft Word, Microsoft PowerPoint, or Microsoft Excel embedded inside the browser. The Firefox browser always opens these report formats in a separate application.
IV_ENABLE_IV	Determines whether the Enable Interactivity option is usable in the BIRT Viewer control menu. If false, the Enable Interactivity option is disabled.
JAVA_REPORT_API_ IMAGE_CACHE_ EXPIRATION	Specifies how long in seconds to cache images for Actuate BIRT reports and business reports. The default value is 86,400, which is one day.
JREM_TASK_QUEUE_SIZE	Specifies the maximum queue length for the Java Report Engine thread pool. The default value is 1000.
JREM_THREAD_POOL_ SIZE	Specifies the maximum number of threads in the Java Report Engine thread pool. The default value is 10.
JREM_THREADPOOL_ MAXSYNC_ TASKRUNTIME	Specifies the maximum time a synchronous report generation is allowed to run. The default value is 600.

(continues)

Table 13-2 Actuate BIRT Viewer web.xml parameters (continued)

Parameter name	Description
JREM_THREADPOOL_ MONITORTHREAD_ POLLINGINTERVAL	Controls the interval in seconds at which the Java Report Engine thread pool checks for Java report execution time-out or queue time-out. The default value is 30.
JREM_THREADPOOL_ SYNC_TASKQUEUE_ TIMEOUT	Specifies the maximum time, in seconds, that a Java synchronous request stays in the Java Report Engine task queue before timing out, in seconds. The default value is 300.
NUMBER_OF_FILTER_ VALUES	Specifies the number of distinct values to display when a user chooses to filter a report on a column in BIRT Viewer. The default value is 200.
DEFAULT_COLUMN_ PAGE_BREAK_INTERVAL	Specifies the number of columns to display on one page when viewing a cross tab. Must be a non-negative number. Default value is 10.
DEFAULT_PAGE_BREAK_ INTERVAL	Specifies the number of rows to display in one page when viewing a report. If set to 0, there are no page breaks.
DEFAULT_ROW_PAGE_ BREAK_INTERVAL	Specifies the number of rows to display on one page when viewing a cross tab. Must be a non-negative number. Default value is 40.
PROXY_BASEURL	Indicates a proxy server's URL if the network uses one between the BIRT Viewer web application and the client. The default value is blank, which indicates that the network does not use a proxy server.
REPOSITORY_CACHE_ TIMEOUT_SEC	Specifies, in seconds, how long to retain temporary files that BIRT Viewer creates when a user modifies the appearance of a report. The default value is 900, which is 15 minutes.
TEMP_FOLDER_ LOCATION	Path to the folder where temporary files are created.

Configuring a BIRT Viewer Java Extension

The BIRT Design Engine API provides the IBirtViewerExtension, IBirtViewerContext, IBirtViewerOp, and IBirtViewer Session Java interfaces to extend the functionality of BIRT Viewer. Classes implementing these interfaces are associated with the BIRT Viewer web application when they are added in the birtviewer-extension.xml configuration file. Its location is:

```
<context root>\WEB-INF\birtviewer-extension.xml
```

For example, to enable myIVExtension.jar to operate on the BIRT Viewer, add an entry to birtviewer-extension.xml as follows:

```
<?xml version="1.0" encoding="UTF-8" ?>
<BirtWebViewerExtension>
<!--  Class name for Interactive viewer extension -->
  <InteractiveViewer>com.actuate.sample.MyIvExtension
   </InteractiveViewer>
  </BirtWebViewerExtension>
```

Save the compiled code archive to the <context root>\WEB-INF\lib folder for the BIRT Viewer web application and restart the application to enable the custom interface. The interfaces are part of the com.actuate.birtviewer.extension package of the BIRT Design Engine API.

The IBirtViewerExtension interface defines the event handler methods that activate implemented code, as follows:

```
package com.actuate.birtviewer.extension;

public interface IBirtViewerExtension{

// Event handler that runs when a design changes
void afterDesignChange( IBirtViewerContext context, IBirtViewerOp
   operation, ReportDesignHandle designHandle );

// Event handler after design get opened.
void afterDesignOpen( IBirtViewerContext context,
   ReportDesignHandle designHandle );

// Event handler that runs when a design is saved
void afterDesignSave( IBirtViewerContext context, IBirtViewerOp
   operation, ReportDesignHandle designHandle, String path );

//Event handler that runs when viewer creates a new session object
void afterViewerSessionStart( IBirtViewerContext context );

// Event handler that runs before a design change occurs
void beforeDesignChange( IBirtViewerContext context, IBirtViewerOp
   operation, ReportDesignHandle designHandle );

// Event handler that runs before a design opens
void beforeDesignOpen( IBirtViewerContext context, String path );

// Event handler that runs before a design is saved
boolean beforeDesignSave( IBirtViewerContext context,
   IBirtViewerOp operation, ReportDesignHandle designHandle,
   String path );

// Event handler before soap response get sent back.
void beforeResponse( IBirtViewerContext context, IBirtViewerOp
   operation, GetUpdatedObjectsResponse response );

// Triggered when session object gets destroyed.
void beforeViewerSessionClose( IBirtViewerSession session );
}
```

The IBirtViewerContext interface defines methods that retrieve information from the HTTP session, as follows:

```
package com.actuate.birtviewer.extension;

public interface IBirtViewerContext {

// Gets the base URL for the viewer
String getAppBaseUrl( );

// Gets reportlet id/bookmark if user is working on a reportlet.
String getReportletId( );

// Gets the extended session object
IBirtViewerSession getSession( );

// Gets the current user name
String getUserName( );

// Gets the volume profile name
String getVolumeProfile( );

// Gets the resource folder name
String getVolumeResourceFolder( );
}
```

The IBirtViewerOp interface defines methods that retrieve information from the extended session for BIRT Viewer, as follows:

```
package com.actuate.birtviewer.extension;

public interface IBirtViewerOp {

// Gets column ids if target element is a table
String[] getColumnIIds( );

// Gets the operation name
String getName( );

// Gets the target element instance ids
String[] getTargetIIds( );

// Get target element type
String getTargetType( );
}
```

The IBirtViewerSession interface defines methods that retrieve and set a session from the extended session for BIRT Viewer, as follows:

```
package com.actuate.birtviewer.extension;

public interface IBirtViewerSession {

// Check whether key exists.
boolean containsKey( String key );
```

```
//Get attribute from session.
Object getAttribute( String key );

//Set attribute into session.
void setAttribute( String key, Object attribute );
}
```

Configuring default export formats

The iServer platform provides output format emitters as plug-ins. These emitters can be configured so that content exported by the BIRT Viewer has specific settings. To configure emitter default options, add a RenderDefaults.cfg file to the emitter configuration JAR file for the emitter with specific options set with text. For example, to configure the Microsoft Excel (.xls) file emitter, add RenderDefaults.cfg to the following JAR file:

```
<iServer root>\Jar\BIRT\platform\plugins\
   com.actuate.birt.report.engine.emitter.config.xls_11.0.4.<date_
   stamp>.jar
```

RenderDefaults.cfg contains one parameter and value pair on each line to configure each default setting. For example, to configure the XLS emitter to disable pivot tables and to not hide grid lines by default, the RenderDefaults.cfg file contains the following entries:

```
excelRenderOption.EnablePivotTable=false
excelRenderOption.hideGridlines=false
```

After adding the configuration file to the emitter configuration JAR file, re-archive and save the JAR file to the plugins folder. Then, restart the iServer Service. After these steps, the viewer displays the configured default options when exporting a report to the XLS output format, as shown in Figure 13-1.

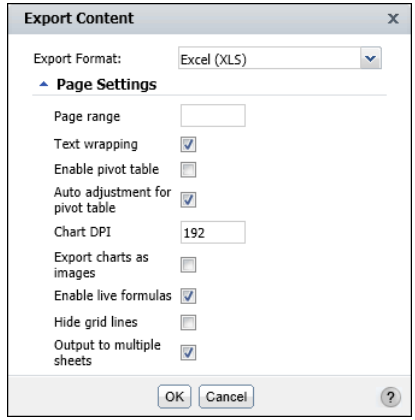


Figure 13-1 Export content with the pivot table default disabled

Table 13-3 lists the default settings parameters for the different file formats the emitters produce.

Table 13-3 Configurable default settings for exporting content

Format	Parameter	Description
All	ChartDpi	Sets the chart resolution. For example, ChartDpi=120.
PDF	pdfRenderOption .bidiProcessing	Enables bidirectional text support.
	pdfRenderOption .embeddedFonts	Embeds fonts in the output document.
	pdfRenderOption .fontSubstitution	Enables font substitution for unknown fonts.
	pdfRenderOption .hyphenation	Enables splitting words with a hyphen at line breaks.
	pdfRenderOption .pageOverflow	Controls rendering content when the content exceeds the page size. Integer values indicate the following options: ■ 1: clips the content ■ 2: scales the content to fit the page ■ 4: (default) divides the content into multiple pages ■ 8: expands the page to fit content
	pdfRenderOption .textWrapping	Enables text wrapping.
	RenderChartInSVG	Renders charts as vector graphics.
PPT/ PostScript	BIDIProcessing	Enables bidirectional text support. For example, BIDIProcessing=false.
	FontSubstitution	Sets font substitution for unknown fonts. For example, FontSubstitution=false.
	TextWrapping	Enables text wrapping. For example, TextWrapping=false.
XLS/XLSX	excelRenderOption .AutoFitPivotTable	Enables BIRT Viewer to automatically adjust content for display in pivot tables.
	excelRenderOption .EnableLiveFormula	Enables formulas for derived values.

Table 13-3 Configurable default settings for exporting content

Format	Parameter	Description
XLS/XLSX *(continued)*	excelRenderOption .EnablePivotTable	Enables pivot tables.
	excelRenderOption .ExportChartsAsImages	Renders charts as images only.
	excelRenderOption .hideGridlines	Hides grid lines.
	excelRenderOption .multipleSheet	Enables multiple worksheet output.
	excelRenderOption .wrappingText	Enables text wrapping.

Chapter

13

Actuate BIRT Viewer URIs

This chapter contains the following topics:

- About the BIRT Viewer servlet
- Information Console file manager URIs overview
- Information Console file manager URIs quick reference
- Common URI parameters
- Information Console file manager URIs reference

About the BIRT Viewer servlet

Java servlets extend web server functionality. The BIRT Viewer is a Java servlet that manages binary content and performs tasks such as uploading and downloading binary files.

You invoke the BIRT Viewer servlet using the following syntax:

```
http://<application server>:<port>/<context root>/iv
```

where

- application server is the name of the machine hosting the application server.
- port is the port on which the application server listens for requests.
- context root is the Information Console context root.
- iv is the name to which the servlet is mapped in the web application's web.xml file. A typical location for web.xml is <context root>\WEB-INF\web.xml.

Servlet names are case-sensitive. Do not modify the servlets, their names, or their mapping in web.xml.

Using open-source BIRT URIs in Actuate BIRT Viewer

Actuate BIRT Viewer fully supports the URIs for the open-source BIRT Viewer. After migrating from open-source BIRT to Actuate BIRT, you can use the same URIs in the Actuate BIRT Viewer that you used in open-source BIRT.

Accessing the BIRT Viewer using a URI

The BIRT Viewer servlet displays a BIRT report and provides tools to affect the document and design files. This servlet provides both the BIRT Viewer and the BIRT Report Interactive Viewer. The Interactive Viewer is licensed separately from the BIRT Viewer.

The BIRT Viewer displays the report with toolbar options to navigate the report and a menu to perform additional tasks, as shown in Figure 14-1.

Figure 14-1 BIRT Viewer

The Interactive Viewer displays the report with toolbar options to navigate the report, a menu to perform additional tasks, and provides context menus to edit and format report elements, as shown in Figure 14-2.

Figure 14-2 BIRT Interactive Viewer

The BIRT Viewer servlet supports rptdocument file formats. For backwards compatibility with previous releases, the BIRT Viewer also supports the bizdocument file format.

Name com.actuate.iv.servlet.IVServlet

URI parameters Table 14-1 lists and describes the URI parameters for the Interactive Viewer servlet.

Table 14-1 IVServlet URI parameters

URI parameter	Description
__bookmark	Name of the element of a report to display instead of the whole report file.
__floatingfooter	Boolean value to add a margin under the footer.
__format	A format for the displayed report: ■ pdf: Adobe PDF ■ xls: Microsoft Excel ■ doc: Microsoft Word ■ ppt: Microsoft PowerPoint ■ ps: PostScript ■ html: HTML ■ flashchartsxml: used to display a fusion chart ■ flashgadgetsxml: used to display Flash gadgets in a fusion chart. ■ reportlet: This is used together with __bookmark to show a particular part/element of the report.
__from_page_range	The page range of a report to display.

(continues)

Table 14-1 IVServlet URI parameters (continued)

URI parameter	Description
__from_page_style	The page style to use for a report in pdf or ps formats: ■ auto: The page size and content size remains the same. ■ actualSize: Change the page size to fit the content. ■ fitToWholePage: Change the content size to fit the page size. Used with the __format parameter.
__imageid	Identifier of the report file image to display.
__instanceid	Identifier of the report file to display.
__launchiv	A Boolean value that enables interactivity.
__locale	Code for a locale. For example FR_fr specifies the French language and the country, France.
__page	The number of a page to render.
__report	Name of the report file to display.
__rtl	Boolean value that specifies right-to-left orientation for the report.
repositoryType	The name of the object to download.
serverURL	The URL that accesses iServer, such as http://ESL02835:8000.
userid	The user's identifier, required to log in to the Actuate iServer.
volume	A string value specifying the Encyclopedia volume for this report.

Information Console file manager URIs overview

The following sections describe the Java Component Information Console JSPs that manage files and folders. For a repository managed with iServer, the Information Console provides this functionality. For information about Information Console URIs, see *Information Console Developer Guide.*

The following sections provide quick reference tables and detailed reference information about Actuate Information Console URIs. An Actuate Information Console URI is a directive to Actuate Information Console to perform an action, such as showing a list of files, rather than change the appearance of the application.

Information Console pages use the .do extension for the Struts action mapping to a page. The complete page name appears as part of the reference material. Actuate Information Console page and folder names are case-sensitive.

Information Console file manager URIs quick reference

Table 14-2 lists the Information Console file manager URIs.

Table 14-2 Actuate Information Console URI pages

Actuate Information Console page	Description
about page	Displays information about Actuate Information Console
banner page	Displays a banner at the top of each Information Console file manager page
browse file page	Provides file and folder browsing functionality for the submit request pages
delete file status page	Displays whether a file was successfully deleted
detail page	Supports error handling and presenting object details
drop page	Supports deleting files or cancelling running jobs
error page	Retrieves an error message from the exception or the request and displays it
execute report page	Submits a run report job request to the server
getfiledetails page	See file or folder detail page
getfolderitems page	See index page
home page	Provides the link from the My Folder button to the Information Console file manager home page
list page	Supports listing files and folders
page not found page	Displays an error message when a JSP is unavailable in Information Console file manager
parameters page	Presents a list of the request parameters

Common URI parameters

All Actuate Information Console file manager URIs have the parameters shown in Table 14-3. String values that are too long are truncated for all parameters. The web browser that you use determines the length of parameters.

Table 14-3 Common URI parameters

URI parameter	Description
locale	The current user's locale, such as U.S. English (en-US). Information Console locale names have the form nn_CC. nn is the language abbreviation and CC is the country code.
serverURL	Contains the URI that accesses the Actuate web application, such as http://Services:8000.
timezone	The current user's time zone.
volume	The volume to which the user is connected.
__vp	The name of a server configured in VolumeProfile.xml. Information Console uses the volume information in a VolumeProfile entry except when a volume parameter specifies a different one.

Information Console file manager URIs reference

This section provides the detailed reference for Information Console file manager URIs. In the definitions, <context root> represents the name of your Actuate Information Console context root. Table 14-4 lists the topics in this section and the pages discussed in each topic. All pages are under the Information Console context root.

Table 14-4 Actuate Information Console pages

Page	Information Console file
about page	iportal\activePortal\private\options\about.jsp
banner page	iportal\activePortal\private\common\banner.jsp
browse file page	browsefile.do iportal\activePortal\private\query\browse.jsp
delete file status page	iportal\activePortal\private\filesfolders \deletefilestatus.jsp
detail page	
■ error detail page	iportal\activePortal\errors\detail.jsp getfiledetails.do
■ file or folder detail page	iportal\activePortal\private\filesfolders\filedetail.jsp
drop page	deletefile.do

Table 14-4 Actuate Information Console pages

Page	Information Console file
error page	errors\error.jsp iportal\activePortal\private\common\errors\error.jsp
execute report page	executereport.do
index page	getfolderitems.do iportal\activePortal\private\filesfolders \filefolderlist.jsp
list page	getfolderitems.do iportal\activePortal\private\filesfolders \filefolderlist.jsp
home page	iportal\activePortal\private\common\breadcrumb.jsp
page not found page	iportal\activePortal\errors\pagenotfound.jsp
parameters page	iportal\activePortal\private\newrequest \parameters.jsp
viewer page for BIRT reports	IVServlet

about page

Displays the help about page, containing information about Actuate Information Console. Called when the user chooses the About tab on the options page. The default about page for Information Console is similar to Figure 14-3.

Name <context root>\iportal\activePortal\private\options\about.jsp

Parameters The about page uses the common URI parameters.

Used by iportal\activePortal\private\options\optionspage.jsp

Figure 14-3 Information Console about page

banner page

Provides the banner that appears across the top of all Actuate Information Console web pages. The default banner displays the Actuate logo, user name, cluster name, and volume name, and provides links for Logout, Options, and Help. The banner page obtains the user name, cluster name, and volume name from variables maintained by the authenticate page.

Name <context root>\iportal\activePortal\private\common\banner.jsp

Used by iportal\activePortal\private\login.jsp
iportal\activePortal\private\channels\channelnoticelist.jsp
iportal\activePortal\private\channels\channeloperationstatus.jsp
iportal\activePortal\private\filesfolders\deletefilestatus.jsp
iportal\activePortal\private\filesfolders\filedetail.jsp
iportal\activePortal\private\filesfolders\filefolderlist.jsp
iportal\activePortal\private\jobs\getjobdetails.jsp
iportal\activePortal\private\jobs\joboperationstatus.jsp
iportal\activePortal\private\jobs\selectjobs.jsp
iportal\activePortal\private\newrequest\newrequest.jsp
iportal\activePortal\private\newrequest\newrequest2.jsp
iportal\activePortal\private\newrequest\submitjobstatus.jsp
iportal\activePortal\private\options\options.jsp
iportal\activePortal\private\query\create.jsp
iportal\activePortal\private\query\execute.jsp

browse file page

Contains file and folder browsing functionality used by other submit request pages.

Name <context root>\browsefile.do

<context root>\iportal\activePortal\private\query\browse.jsp

Parameters workingFolder is the name of the folder for which to display contents in the folder browser window. The browse file page also uses the common URI parameters.

Used by iportal\activePortal\private\newrequest\browse.jsp
iportal\activePortal\private\query\browse.jsp

delete file status page

Summarizes the result of a deletion performed by the drop page and indicates whether a file was successfully deleted. The delete file status page includes authenticate to obtain user session data. Information Console performs the deletion as part of an action and then forwards to the delete file status page.

Name <context root>\iportal\activePortal\private\filesfolders\deletefilestatus.jsp

Used by Not applicable.

detail page

Displays detailed information about repository objects. There are two detail pages:

<context root>\iportal\activePortal\errors

<context root>\iportal\activePortal\filesfolders

error detail page

Provides a template error page that can be embedded in another page.

Name <context root>\iportal\activePortal\errors\detail.jsp

Used by iportal\activePortal\private\common\errors\error.jsp
iportal\activePortal\viewer\print.jsp
iportal\activePortal\viewer\saveas.jsp
iportal\activePortal\viewer\searchframe.jsp
iportal\activePortal\viewer\viewdefault.jsp
iportal\activePortal\viewer\viewtoc.jsp

file or folder detail page

Displays detailed information about the selected viewable folder or file. Users request file details by choosing the magnifying glass icon to the right of files listed on the folder page, or folder details by choosing the magnifying glass icon to the right of the folder name in the breadcrumb. Users can request another viewable document or delete the current file or folder from the file or folder detail page. filedetail.jsp uses the HTML code in <context root>\iportal\activePortal \private\filesfolders\filedetailcontent.jsp to display the information.

Name <context root>\getfiledetails.do

<context root>\iportal\activePortal\private\filesfolders\filedetail.jsp

Parameters Table 14-5 describes the parameters for the file or folder detail page. The file or folder detail page also uses the common URI parameters.

Table 14-5 File or folder detail URI parameters

URI parameter	Description
name	The full path name of the repository object for which to show details. This parameter is ignored if objectID is also specified.
objectID	The repository object's unique identifier.
version	The repository object's version number. The default is the latest version.

Used by Not applicable.

drop page

Deletes the specified file or folder. The drop page includes the banner page to obtain user session data.

Name <context root>\deletefile.do

Parameters Table 14-6 describes the parameters for the drop page. The drop page also uses the common URI parameters.

Table 14-6 File or folder drop URI parameters

URI parameter	Description
ID	The unique identifier of the repository object to delete.
name	The full path name of the repository object to delete. Multiple name parameters, to delete more than one file or folder at a time, are allowed. This parameter is ignored if ID is also specified.
redirect	URI to which to redirect the job deletion page. The default redirect page is processedaction_status.

Used by Not applicable.

error page

Displays the specified error message. Information Console uses two pages. All Information Console code uses <context root>\iportal\activePortal\private \common\errors\error.jsp.

Name <context root>\iportal\activePortal\errors\error.jsp

<context root>\iportal\activePortal\private\common\errors\error.jsp

Used by iportal\activePortal\private\login.jsp
iportal\activePortal\private\common\closewindow.jsp
iportal\activePortal\private\common\sidebar.jsp
iportal\activePortal\private\common\errors\errorpage.jsp
iportal\activePortal\private\options\options.jsp
iportal\activePortal\private\query\create.jsp
iportal\activePortal\private\query\execute.jsp
iportal\activePortal\private\templates\template.jsp
iportal\activePortal\viewer\closewindow.jsp
iportal\activePortal\viewer\print.jsp
iportal\activePortal\viewer\saveas.jsp
iportal\activePortal\viewer\searchframe.jsp
iportal\activePortal\viewer\searchreport.jsp
iportal\activePortal\viewer\viewframeset.jsp

execute report page

Submits a run report job request.

When executing a report job or query, a cancel button appears after a specified wait time passes. You can change the time by setting the EXECUTE_REPORT_WAIT_TIME configuration parameter in the appropriate Actuate Information Console configuration file.

For reports that accept run-time parameters, you can set the parameter in the URL by adding an ampersand (&), the parameter name, and an equal(=) sign, followed by the parameter value in quotes.

Name <context root>\executereport.do

Parameters Table 14-7 describes the parameters for the execute report page. The execute report page also uses the common URI parameters.

Table 14-7 Execute report URI parameters

URI parameter	Description
__ageDays	Use with __ageHours to determine how long output objects exist before they are automatically deleted. Use only if __archivePolicy is set to Age. __ageDays can be any positive number.

(continues)

Table 14-7 Execute report URI parameters (continued)

URI parameter	Description
__ageHours	Use with __ageDays to determine how long output objects exist before they are automatically deleted. Use only if __archivePolicy is set to Age. __ageHours can be any positive number.
__executableName	The name of the executable file for this request.
invokeSubmit	Controls whether the browser is redirected to the parameter screen or whether the report job is run immediately. If true, the report job is executed without displaying the parameters. If false, the parameters are displayed. False is the default.
__outputDocName	The name and path of the resulting BIRT document. This parameter is only usable for BIRT Reports when the BIRT_SAVE_REPORT_DOCUMENT_ENABLED parameter is set to TRUE in web.xml. If the given path is absolute, then executereport saves the report to that path. If the given path is relative, then executereport saves the report to the path set in the BIRT_SAVE_REPORT_DOCUMENT_PATH web.xml parameter.
__priority	Specifies the job submission priority. Values are High, Medium, and Low.
__priorityValue	Specifies a number ranging from 1 to 1000 and corresponding to the job submission priority. You can only specify values allowed by your functionality level.
__progressive	Indicates whether to display the report document after it generates. If false, the report document displays after it generates. If true, the report document displays progressively, as it generates.
__serverURL	Contains the URI that accesses the JSP engine, such as http://Services:8900.
__wait	If "wait", Information Console waits for the report generation to be completed before displaying it. If "nowait", Information Console displays the first page right away even if the report job is not completed.

For example, the following URL executes the Sales By Territory.rptdesign report immediately with the Territory run-time parameter set to EMEA:

```
http://localhost:8080/ActuateJavaComponent/executereport.do?
   __requesttype=immediate&__executableName=/Public
```

```
/BIRT%20and%20BIRT%20Report%20Studio%20Examples
/Sales%20by%20Territory.rptdesign&userid=anonymous&
__saveOutput=false&Territory=%22EMEA%22&invokeSubmit=True
```

The following parameter names are reserved for internal use only by the execute report page:

- doframe
- inputfile
- jobType
- name
- selectTab

Used by Not applicable.

home page

Provides two sets of links. On the right side it provides a graphical and a text shortcut link from the My Folder button to the current user's Actuate Information Console home folder. If the Information Console installation includes BIRT Studio, there is another shortcut link, BIRT Studio, to BIRT Studio. On the left side, it provides the links and other text for the breadcrumb, or path from the repository root to the current folder.

Users access their home page by choosing the My Folder link below the Actuate Information Console page banner.

Figure 14-4 shows the default My Folder and breadcrumb links.

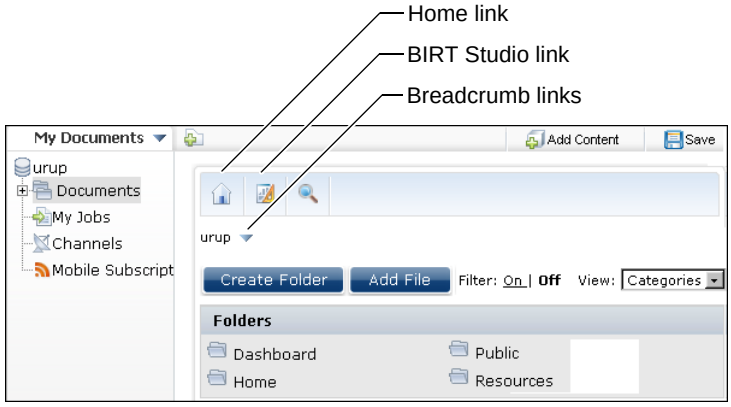


Figure 14-4 My Folder and breadcrumb links

Name <context root>\iportal\activePortal\private\common\breadcrumb.jsp

Used by iportal\activePortal\private\skins\tabbed\templates\mypagetemplate.jsp
iportal\activePortal\private\skins\tabbed\templates\template.jsp
iportal\activePortal\private\skins\classic\templates\template.jsp
iportal\activePortal\private\skins\treeview\templates\template.jsp

index page

Provides the entry point and structure for the parts of Actuate Information Console generated from multiple files.

The index page is the default entry point to the Actuate Information Console web application. The index page provides the entry point and structure to support the Files and Folders functionality. The structure is a table that Actuate Information Console uses to format and present files and folders data. Page content varies depending on the Actuate Information Console directive.

The index page uses the banner page to provide the reporting web page banner. filefolderlist.jsp uses the HTML code in <context root>\iportal\activePortal \private\filesfolders\filefolderlistcontent.jsp to display files and folders data.

Name <context root>\getfolderitems.do

<context root>\iportal\activePortal\private\filesfolders\filefolderlist.jsp

Parameters Table 14-8 describes the parameters for files and folders index page. The files and folders index page also uses the common URI parameters.

Table 14-8 File and folder index URI parameters

URI parameter	Description
startUpMessage	Specifies a message to appear when Actuate Information Console calls this page.
subpage	Specifies the content of the page. Possible values are: ■ _list: include list ■ _detail: include detail Specifying any other value for subpage invokes the page not found page.

list page

Lists files in a container, such as a folder.

The list page presents a list of files and folders that reside in the current working repository folder. Users request folder listings by choosing links on the reporting

web page. The list page includes a filter section where users specify criteria for viewing report documents.

When users access a repository for the first time, Actuate Information Console displays their home folder, if they have one, or the top folder in the repository. All files and folders in that folder that they have permission to view appear in the list page. Users can specify a filter to choose the types of files to view.

Name

<context root>\getfolderitems.do

<context root>\iportal\activePortal\private\filesfolders\filefolderlist.jsp

Parameters

Table 14-9 describes the parameters for the list page. The list page also uses the common URI parameters.

Table 14-9 File and folder list URI parameters

URI parameter	Description
applyFilter	If true, apply filter. If false, filter not applied.
filter	The filter specifying the file and folder names to list. Filter is a string. The default is "".
folder	The folder for which to list the contents. Folder name is a string. If no folder is specified, list uses the last working folder known for the session if cookies are enabled. If cookies are not enabled, list uses the user's home folder as specified in the user settings.
onlyLatest	If true, show only the latest version of a file if multiple versions exist. If false, show all versions of a file if multiple versions exist. The default is false.
resetFilter	Any non-null value for resetFilter causes the filter to return to its original state. Users can reset the filter by choosing the Default button on the listing page.
showDocument	If true, show all viewable documents. If false, do not show viewable documents. The default is true.
showExecutables	If true, show all report executables. If false, do not show report executables. The default is true.
showFolders	If true, show all folders. If false, do not show folders. The default is true.

Used by

Not applicable.

page not found page

Displays an error message when Actuate Information Console cannot find the page that a user specifies. This page is an Information Console page only.

Name <context root>\iportal\activePortal\errors\pagenotfound.jsp

Used by Not applicable.

parameters page

Displays report job parameters. Parameters include the headline, output file name, and report executable file name. Users access the parameters list by choosing Parameters.

Parameters looks like Figure 14-5.

Name <context root>\iportal\activePortal\private\newrequest\parameters.jsp

Used by iportal\activePortal\private\newrequest\newrequestpage.jsp

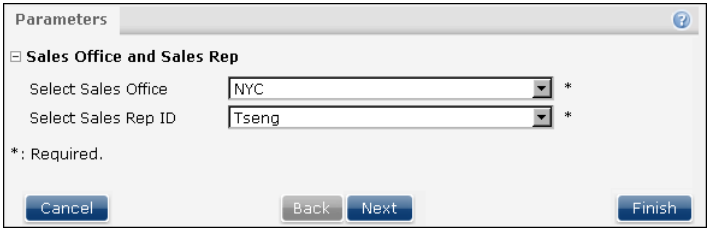


Figure 14-5 Parameters page

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